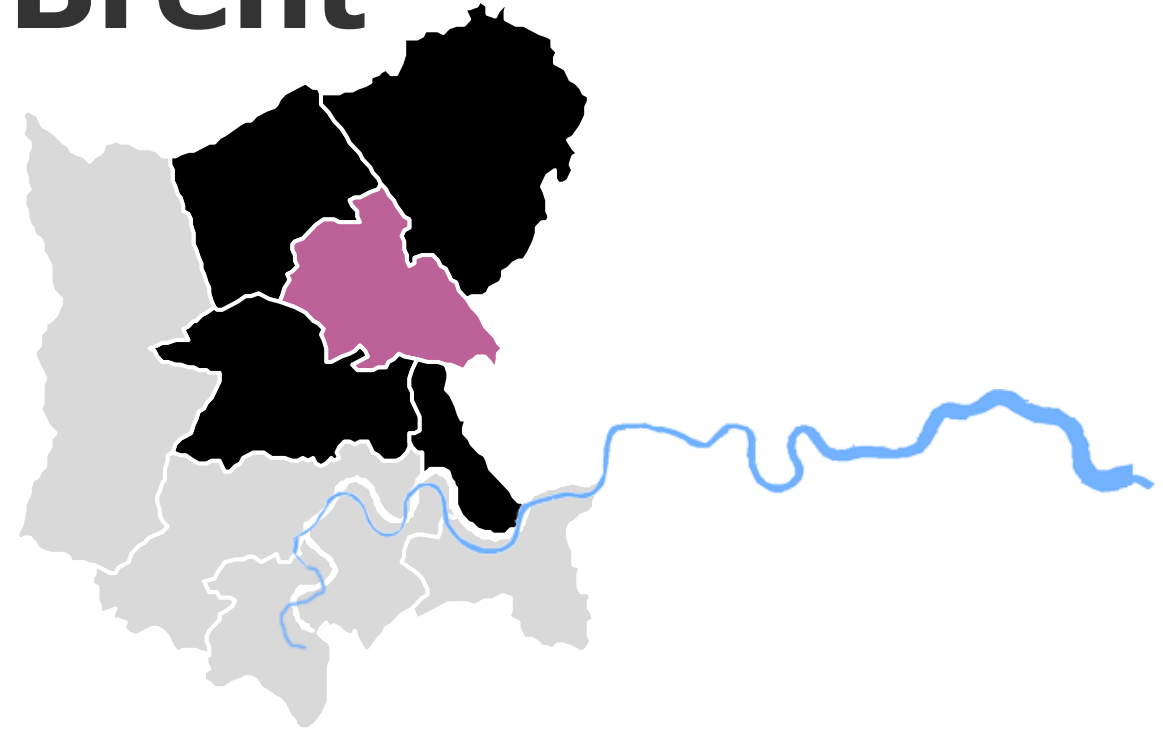


West London Local Area Energy Plan London Borough of Brent



The London Borough of Brent's masterplan for a lower-carbon, whole-energy-system future, shaped by a data-driven LAEP identifying effective local pathways and actions toward net zero.

April 2026



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Definition of Terms

ASHP	<i>Air Source Heat Pumps</i>
Charging Device	<i>Device used to support electric vehicle charging</i>
Charging Point	<i>A physical output on a charging device</i>
Cumulative emissions	<i>Cumulative emissions refer to the total quantity of greenhouse gases (e.g., CO₂, CH₄, N₂O) released into the atmosphere over a specified period of time (2025 – 2050)</i>
Deep retrofit	<i>Measures done to improve the energy efficiency of an existing property, includes triple glazing and solid wall insulation.</i>
Demonstrator Projects	<i>Help navigate aspects of uncertainty or bring longer-term solutions into the near-term. Often these feed into Key Decision Points on the Pathway.</i>
DNO	<i>Distribution Network Operator</i>
Do Nothing	<i>A baseline (counterfactual) scenario where no decarbonisation actions take place beyond already committed investments. This is also referred to as Business and Usual (BAU).</i>
Enabling actions	<i>A key component of the Local Area Energy Plan pathway. Mostly occur in the near-term to develop market conditions which enable long-term scale up activities. Often these are not under Local Government control.</i>
Energy systems	<i>Production and provision of energy to a local area and it's built environment</i>
EPC	<i>Energy Performance Certificate</i>
EV	<i>Electric Vehicle</i>
Flexibility	<i>The ability to deliberately shift the timing and/or location of electricity consumption or generation so that supply and demand remain balanced at least-cost and without overloading the grid and supporting the net zero transition.</i>
Fuel Poverty	<i>As defined by DESNZ, a household is classed as being in fuel poverty if the household EPC is Band D or below and their disposable income (after housing and fuel costs) is below the poverty line.</i>

Definition of Terms

Heat network	System to supply heat from a central source to consumers, via a network of underground pipes carrying hot water.
Key Decision Points	<i>Milestones that indicate a fork in the pathway between decarbonisation options. Typically preceded by Enabling Actions or Innovation & Demonstrator Projects and feed into Scale Up activities</i>
Low Regrets	<i>Actions/projects common under various Scenarios but may require further Enabling Action before they can be progressed. These could occur in the near-term but may require longer-term resolution of uncertainties or market conditions to evolve naturally.</i>
LSOA	<i>Lower layer Super Output Areas, geographical areas used for census statistics.</i>
Net Zero	<i>Total greenhouse gas (GHG) emissions would be equal to or less than the emissions removed from the environment.</i>
Opportunity Areas	<i>Area where an intervention is recommended in high numbers but may have uncertainties or barriers associated with delivery.</i>
OSP	<i>Off-street parking</i>
Outline Priority Projects	<i>Near-term components on the Pathway that provide the local area with projects that can immediately be implemented to make progress towards net zero</i>
Pathway	<i>The most cost-effective and co-beneficial way for boroughs to achieve a Net Zero energy system.</i>
Quick Wins	<i>Near-term actions/projects of short duration and with high confidence that the intervention is the correct choice. Requires fertile market conditions and has relatively few barriers to implementation</i>
Scale-up	<i>Long duration major decarbonisation activities not expected to happen naturally in today's market conditions. Preceded by a Key Decision Point in situations of low certainty or an Enabling Action in situations of high certainty.</i>
Scenario	<i>Scenarios provide a of the future energy system and are a common modelling approach to establish the optimal Pathway.</i>
Shallow Retrofit	<i>Measures done to improve the energy efficiency of an existing property, includes loft insulation, single to double glazing upgrade, cavity wall insulation.</i>
Just transition	<i>A just transition ensures that the shift to a low-carbon energy system is delivered in a fair and inclusive way, so that costs, benefits and opportunities are shared equitably across communities.</i>

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Executive Summary

01

This section provides a high-level snapshot of the Brent's Local Area Energy Plan (Phase 2). It highlights the purpose of the report, key findings or insights, key recommendations, and the expected impacts or benefits for the borough.

Executive Summary

In July 2019, the London Borough of Brent declared a Climate and Ecological Emergency and pledged to do all reasonable in the Council's gift to aim for carbon neutrality for 2030 and work with government to achieve the national 2050 target.

To support this transition, the London Borough of Brent has developed a Local Area Energy Plan. The plan is based on a whole systems energy model which assesses the borough's future energy needs and the most effective pathways to reach net zero turning long-term goals into near-term delivery priorities and investment decisions. The modelling was run across five London boroughs and was overseen by the GLA.

This report proposes the optimal pathway for the London Borough of Brent to achieve its net zero ambition by proposing the actions and investments needed to deliver an integrated, whole-system transition.

Viewed in isolation, the financial cost of transitioning to net zero is higher than merely maintaining the status quo in a carbon intensive energy system. However, over and above reducing carbon emissions, prospective local delivery of the plans set out in this LAEP would offer a range of wider benefits which support the London Borough of Brent's strategic priorities. The 2040 pathway for West London avoids an estimated 22.7MT tonnes of CO₂e over the coming decades, and with the societal cost of carbon valued at £273 per tonne of CO₂e in [2025](#) under UK Government guidance, the cost of inaction would be substantially higher.

Beyond carbon reduction, delivering the measures set out in this LAEP brings a wide range of additional local benefits:

- **Health & Housing Benefits** - Warmer, better-insulated homes reduce damp and mould, improving respiratory health and lowering pressures on health services.
- **Cleaner Air & Healthier Streets** - Cutting emissions means less traffic pollution and better air quality.
- **Lower Energy Bills** - Upgrading homes and improving energy efficiency can save households money and improve comfort ([2025](#)).
- **Social benefits** - Including reduced traffic and air pollution, reduced fuel poverty, and enhanced energy security ([2023](#)).
- **Economic Opportunities** - Creating jobs in green industries and attracting investment.
- **Community Collaboration** - Bringing councils, businesses, residents, and local community actors together to work towards shared goals.



Executive Summary

Why 2040? Aligning ambition with deliverability

At the time of publication, the London Borough of Brent remains committed to its 2030 carbon neutrality aspiration. It is acknowledged that achieving whole-system net zero requires enabling actions that need to be delivered at a national scale, including electricity network reinforcement, heat network construction, supply-chain growth, decarbonised heat sources and realistic retrofit costs.

Local Area Energy Planning follows a specific technical methodology. This document explores different scenarios and pathways for energy planning in the borough which aligns ambition with deliverability. This modelling suggests that 2040 is the pathway which is the earliest achievable date by which the entire energy system can reach net zero.

This document and LAEP pathway modelling therefore:

- **Aligns ambition with deliverability**, reflecting the real-world timing of network reinforcement, finance cycles, procurement, engineering works and workforce capability.
- **Gives the London Borough of Brent a sequenced plan** that accelerates near-term decarbonisation and reduces cumulative emissions, while avoiding unrealistic assumptions about infrastructure dependencies.
- **Supports the 2030 ambition** by front-loading early action in homes, buildings, heat networks and EV charging, ensuring rapid progress in the 2020s even if full system-wide net zero is delivered in the years to come.

Why LAEP action is urgent

Meeting local net zero, affordability and resilience goals depends on addressing several urgent energy system challenges. The LAEP whole systems energy modelling estimates that:

- Housing is the largest source of local emissions, accounting for around 38% of total emissions. The remaining emissions come from transport (28%), commercial (17%), industry (8%), and the public sector (8%)¹. Around 14,000 households are in fuel poverty. Around three-quarters (70%) of homes rely on gas as their main heating source.
- Transport remains a major contributor to air pollution and emissions, in 2024 more than 22% of the registered vehicles were diesel or petrol. Progress in shifting to cleaner and lower-carbon transport modes will support both climate and air-quality objectives.
- Local clean energy generation is growing but remains modest today with 6.8 GWh of renewable generation in the borough. Further growth will strengthen energy resilience and reduce reliance on fossil-fuelled electricity.
- Electricity network capacity is a critical consideration. Reinforcement of substations, together with smart approaches such as flexibility services and smart charging, will be needed to support heat electrification, electric vehicles and new local generation. Heat networks can also reduce pressure on the electricity grid and provide a strategic route for low-carbon heat in high-density areas.

The LAEP provides the shared evidence base required for partners, utilities, businesses and communities to coordinate action, prioritise investment and support a fair and cost-effective transition to net zero.

¹ DESNZ - 2005 to 2023 UK local and regional greenhouse gas emissions. Available at: <https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-statistics-2005-to-2023>

Executive Summary

Pathway to net zero

The evidence base of the LAEP builds on Phase 1 (2023) borough-level analysis and modelling to define a cost-effective, whole-system pathway to a net zero energy system within different scenarios. This modelling suggests that 2040 is the pathway which is the earliest achievable date by which the entire energy system can reach net zero. It also identifies opportunities to accelerate action in line with the borough’s 2030 ambition. The resulting plan outlines the need for large-scale fabric upgrades; a mixed heat strategy with extensive air-source heat pumps and heat networks in dense zones; rooftop PV prioritised on social housing, schools and warehouses; EV chargers; and smart flexibility to manage peaks and make best use of available headroom.

The pathway models a coordinated transition across all major sectors:

By 2040, the pathway includes:

- **Major demand reduction** in homes through deep and shallow retrofit: ~46,300 wall insulation upgrades, ~55,400 loft upgrades and ~2,100 glazing improvements.
- **A fundamental shift away from gas heating**, with 114,715 of dwellings requiring low carbon heating upgrades.
- **Decarbonised non-domestic heat**, including 3,300,000 m² of non-domestic buildings to receive low carbon heating upgrades.
- **A fully electrified vehicle fleet**, enabled by more than 5,000 new public EV chargers, plus domestic chargers where off-street parking allows.
- **Local clean generation at scale**, reaching ~112 GWh/year of rooftop solar PV across homes, schools, the Council estate and commercial buildings.

Measure	Quantity	Estimated CAPEX ¹
Domestic retrofit – wall insulation	46,300 properties require wall insulation, an increase of 28% from current. • Cavity insulation: 9,000 (5%) properties • Solid wall insulation: 37,300 ((23%) properties	£485 million • £9 million • £476 million
Domestic retrofit – loft insulation	55,400 properties require loft insulation, an increase of 34% from current.	£55 million
Domestic retrofit – glazing	2,100 properties require glazing upgrades, an increase of 1% from current.	£18 million
Domestic low carbon heating ²	114,715 (70%) of dwellings require low carbon heating upgrades	£0.9 billion
Non-Domestic low carbon heating ²	3,300,000 m ² of non-domestic buildings require low carbon heating upgrades	£1.2 billion
Heat Network Infrastructure	Borough-wide heat network infrastructure e.g. pipework, energy centres etc.	£0.5 billion
Energy generation (including solar potential)	112 GWh total generation potential for the borough by 2040.	£170 million
EV	4,700 Public EV chargers are recommended for delivery	£92 million
Electricity Network	Capacity and infrastructure upgrades	£0.3 billion

¹Estimated CAPEX was taken from Energy Systems Catapult Modelling. Additional detail on costing is included in the Technical Annex.

²Individual building level heating solutions and heat network connection costs

Executive Summary

Assumptions and parameters considered in the LAEP cost modelling

Total spend presented in this report is comprised of Capital Expenditure (CAPEX), Operational Expenditure (OPEX), and energy fuel costs. Discounting was not applied and all costs are expressed in today's terms without the impact of inflation. All costs are generally based on national-level assumptions, with the specific datasets used listed in the technical annex. The report distinguishes between annualised cost (costs presented per year) and total cost.

What does the LAEP pathway do?

This pathway balances the London Borough of Brent's urgent climate ambitions with the real constraints of building stock suitability for retrofit, network capacity and supply-chain readiness. It prioritises actions that deliver affordability, comfort, health and social equity, particularly in fuel-poor or hard-to-heat homes, while creating the conditions for deep decarbonisation in the 2030s.

Who is this LAEP for and how will it be used?

- **The London Borough of Brent Council:** to prioritise investment, shape planning policy, guide funding bids and lead by example
- **Businesses, landlords & residents:** to support action on retrofit, heat, EV charging and local generation.
- **Subregional partners:** to enable heat networks, smart energy systems and cross-borough delivery
- **Infrastructure providers:** to coordinate upgrades and align reinforcement with local electrification.
- **Community Energy Groups:** to promote locally-owned renewable energy projects in strategic sites.

The London Borough of Brent's energy context: West London Capacity Constraints

West London faces some of the most complex electricity network constraints in the UK, affecting housing delivery, heat pumps, EV charging, and the wider net-zero transition. Phase 1 LAEP identified the London Borough of Brent as being affected by these constraints.

Modelling for the London Borough of Brent shows that several primary and distribution substations will need reinforcement before 2030. The most acute constraint is the 22217_GMT distribution substation which requires a capacity upgrade of 537%, an upgrade unlikely to be delivered within the decade. This sharp rise in demand is fuelled by adoption of electric vehicles, large-scale rollout of electric heating technologies such as heat pumps, and the ongoing expansion of local data-centre facilities.

Phase 1 LAEP (2023) provided the first comprehensive picture of these challenges across West London, highlighting constrained areas across West London and identifying the relationship between future development, data centre load, heat electrification and the timing of capacity upgrades. It also confirmed that, without early intervention, grid constraints could delay key development sites, slow progress on decarbonisation and increase costs.

Phase 2 builds directly on this foundation. It sets out:

- How heat electrification, retrofit and EV rollout will drive future demand
- Where grid upgrades, flexibility and smart solutions must be prioritised
- How local deployment (e.g., solar PV, heat networks, pilots) can reduce pressure on constrained substations
- Sequencing that allows the borough to act now while supporting DNO investment over the 2020s and 2030s.

Executive Summary

The Council's role

The London Borough of Brent, along with four other West London Boroughs, have taken part in the development of this Local Area Energy Plan - working alongside Ramboll, Energy Systems Catapult, the GLA and other stakeholders to create a shared, evidence-based pathway for achieving a net zero energy system. Within the context of Local Area Energy Planning, the London Borough of Brent is one actor within this process. The Council's role is to convene, coordinate and enable; ensuring that the Borough's ambitions are translated into a clear route map for action, investment and collaboration.

However, the Council cannot deliver the full set of actions required to reach net zero on its own. Most of the changes identified in the LAEP, from large-scale retrofit and clean-heat deployment to network reinforcement, EV charging expansion and local renewable energy, depend on a wide coalition of actors, including residents, landlords, housing associations, private developers, community energy groups, technology providers, finance partners, and the electricity and gas network operators. Many interventions also rely on regional coordination through the GLA and West London partners, and on national policy, regulation and funding frameworks led by Government and Ofgem.

Within this wider system, the London Borough of Brent Council will do all reasonable within its gift to:

- **Provide strategic leadership**, embedding net zero ambitions in planning, housing, regeneration and corporate decision-making.
- **Enable and accelerate delivery**, using its influence within its own estate, and local programmes to unlock early projects and crowd-in wider investment.
- **Coordinate partners**, ensuring alignment across infrastructure upgrades, heat network development, retrofit programmes, transport planning and energy-system operations.
- **Champion fairness**, ensuring that the transition benefits all residents, particularly fuel-poor and vulnerable households, and supports local jobs and community participation.

The LAEP is therefore a collective plan for the borough, not a Council-only delivery programme. It sets out what needs to happen, where and when, and identifies shared responsibilities across the local energy ecosystem. Progress towards net zero will depend on joint delivery by the London Borough of Brent Council, residents, businesses, community actors, energy networks, London-wide partners and national government working together.

Executive Summary

The London Borough of Brent Council will lead, convene and enable, but the transition to a net zero energy system will only be achieved through shared action across the borough, region and national system. The LAEP sets out the roadmap; delivery will be a collective effort.

What happens next

The following coordinated actions will ensure delivery of the LAEP's vision for a net zero energy system:

Establish Governance & Align Programmes (Immediate – 12 months)

- Strengthen the integration and embedding of LAEP implementation within its existing climate programme governance structure.
- Embed LAEP priorities into Local Plan, regeneration strategies, planning guidance, asset management, and capital programmes.
- Coordinate early actions with GLA, WLA and UK Power Networks, ensuring network planning aligns with projected demand from heat, EVs, and local generation.

Advance Priority Projects (2026–2028)

Over the next 2–3 years, the LAEP proposes progressing three high-impact Priority Projects where the Council has the strongest ability to act and early progress can unlock wider system benefits. Currently, there is no secured funding to deliver these programmes, and further work is needed to obtain the resources required for implementation.

Cost-effective fabric first Retrofit program for social housing

- Supporting the London Borough of Brent's Climate & Ecological Emergency strategy the cost-effective fabric-first retrofit for the London Borough of Brent's social housing bundling measures for cost efficiencies.
- This will target high-fuel-poverty LSOAs. Delivery is aligned with asset management cycles where possible.

Council-Owned Property Retrofit (Non-Domestic)

- The London Borough of Brent Council will lead by example under its Climate & Ecological Emergency Strategy by retrofitting its non-domestic estate to a fabric-first standard upgrading insulation, glazing and airtightness optimising building controls, and transitioning from fossil systems to low-carbon heat pumps with rooftop solar PV and battery storage where appropriate.

Expansion of heat network around the London Borough of Brents council owned assets

- Expand and interconnect low-carbon heat networks around council assets in Growth Areas (Wembley Park and South Kilburn), using anchor loads to serve nearby council housing and heat network zones to improve network viability. Design for future integration with flexibility and local renewables, in line with the London Borough of Brent's decentralised energy and air-quality goals.

Build Partnerships & Secure Investment (Ongoing, 2026–2030)

- Develop joint funding proposals with partners to unlock investment in retrofit, heat networks, and flexibility.
- Work with the DNO to schedule distribution and primary substation upgrades, including major reinforcement at Bulwer Street, to enable borough-wide electrification.
- Support local skills programmes to grow the retrofit, heat pump, and heat network workforce.

Deliver at Scale (2030–2040)

- Expand heat networks across all viable zones and scale heat pump deployment where networks are not suitable.
- Complete borough-wide retrofit rollouts in all tenures.
- Accelerate EV charging integration, smart systems, flexibility markets and local generation.

This phase will rely heavily on infrastructure providers, private investment, commercial building owners, residents and national policy frameworks.

Keep the LAEP Live (Ongoing)

- Review progress every 3–5 years, updating assumptions, technologies, and spatial opportunities. The UKPN LAEP+ tool can help with this by providing access to regularly updated geospatial data and modelling functions that support tracking changes and refining the plan over time.
- Maintain continuous collaboration with the GLA, WLA, UKPN, NESO, National Grid, DESNZ, Ofgem, community actors and private sector partners, ensuring the pathway stays aligned with changing conditions.

Introduction

02

This section summarises key aspects of local energy system change, introduces the role of the London Borough of Brent's Local Area Energy Plan in supporting the local transition to net zero, and outlines the methodology used to underpin the analysis presented in this plan.

An evidence base and framework for action

A shared map for the London Borough of Brent's energy future

This Local Area Energy Plan (LAEP) for the London Borough of Brent sets out a whole-system view of how the energy system across the Borough can reach net zero in the most cost-effective resilient, and socially beneficial way. Owned by the London Borough of Brent and co-created with local stakeholders, the plan combines local knowledge with whole-system modelling to show, at a strategic level, what must change in homes, businesses, transport and infrastructure. By placing electricity, heat and mobility side-by-side, it gives decision-makers an evidence base and framework for action.

A framework for guiding the development of delivery programmes and projects

Sitting at the strategic end of the delivery chain, the London Borough of Brent's LAEP describes the whole-system transition needed, setting out the "low-regret" changes that are essential to reaching the Borough's net zero ambitions. From that picture flows a pipeline of projects and supporting actions that will create momentum and drive delivery. Some projects are already well-defined; others remain uncertain while technology costs, business models and policies evolve. As these mature, the plan will help the Council, public-sector partners, local businesses and community groups to refresh priorities, secure funding and keep pace with change.

A practical tool for local action

Although the LAEP cannot provide every detail needed to develop each project, it is a powerful coordination device. It highlights the critical interventions, network upgrades, building retrofits, local generation, that recur in every credible pathway. It signals where joint working with neighbouring boroughs and regional bodies can cut costs, speed delivery and unlock benefits greater than any area could achieve alone. It offers a governance framework for tracking progress and a credible evidence base for winning innovation funding and private investment. Above all, it strengthens the case for change: cleaner air, thriving supply chains, reduced fuel poverty and warmer, healthier homes and workplaces.

By using this plan together London Borough of Brent, its public-sector partners, local businesses and the communities it serves, it can move from ambition to action and take a decisive leap toward a net zero future for everyone who lives, works and learns in the London Borough of Brent.

Understanding Our Energy System

Our energy system is everything that helps us heat our homes, power our buildings, and move around our towns. It includes the energy we produce, the networks that deliver it, and the technologies that use it every day. Although we often think about these parts separately (electricity, heat, transport) they are all connected and affect one another.

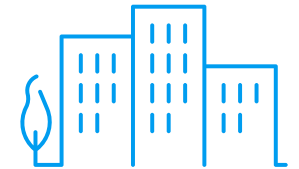
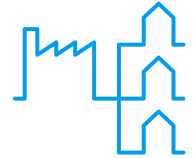
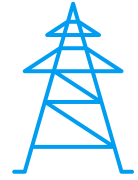
Across West London, the boroughs and the GLA have set ambitious goals to cut carbon emissions and improve the quality of life for residents. But achieving these goals means our energy system needs to change significantly. Much of today's system still relies on fossil fuels, and demand for electricity is expected to rise as we switch to low-carbon heating and electric vehicles. Our existing networks were not designed for this future.

A Local Area Energy Plan (LAEP) helps local partners understand what this transition means in practice. It focuses on the areas they can influence most directly:

- How buildings are heated,
- How electricity is generated and used locally,
- How transport is powered, and
- How local networks need to evolve to support these changes.

Some sectors, such as aviation and other national-scale systems, sit outside the scope of a LAEP, but the plan provides a detailed picture of what must change within neighbourhoods, boroughs and local networks.

By taking a whole-system view, a LAEP helps plan changes in a coordinated way. It avoids solving one problem only to create another somewhere else, supports investment where it delivers the greatest benefit, and helps ensure the transition **is fair, affordable and resilient for all communities.**



What is a Local Area Energy Plan?

A plan for delivering net zero

A Local Area Energy Plan is intended as a masterplan for how an area can reach net zero. It is a whole-systems approach to explore how to cut carbon emissions in homes, businesses, transport, and energy networks across a whole area. It spatially maps the scale and type of interventions needed to achieve net zero. The plan is led by local councils and developed together with key partners, ensuring it reflects local priorities while supporting national climate goals. The analysis is based on the best available datasets and well-tested modelling approaches, meaning that even with expected data limitations, the conclusions remain sound and appropriate for strategic planning.

Realising the full local benefits of investing in net zero

A Local Area Energy Plan does not just map the route to net zero, it sets out an approach that can also deliver real benefits for people, communities, and the local economy [\(2023\)](#).

- **Cleaner Air & Healthier Streets** – Cutting emissions means less traffic pollution and better air quality.
- **Lower Energy Bills** – Upgrading homes and improving energy efficiency can save households money and improve comfort [\(2025\)](#).
- **Social benefits**– Including reduced traffic and air pollution, reduced fuel poverty, and enhanced energy security [\(2023\)](#).
- **Economic Opportunities** – Creating jobs in green industries and attracting investment.
- **Community Collaboration** – Bringing councils, businesses, residents, and local community actors together to work towards shared goal.

By creating a clear plan for the area and working closely with local partners, we avoid duplication, share resources, and make sure every step moves us closer to a greener, fairer future.

A long-term vision for an evolving context

A Local Area Energy Plan sets out a long-term vision for how an area will decarbonise its energy system and reach net zero. It provides clear direction but remains flexible. It should be updated every 3–5 years or sooner if major changes occur in technology, policy, or local priorities. This ensures the plan stays relevant and effective as the world around us evolves.

Scope

A Local Area Energy Plan looks at how energy is used today and how it will be used in the future, up to 2050, within a defined area. It provides detail similar to an urban masterplan but focused on energy.

The plan covers:

- **Energy Use and Emissions** – Current consumption and greenhouse gas emissions, plus future projections.
- **Buildings and Infrastructure** – Homes, businesses, and industry, including electricity, heat, and gas networks.
- **Energy Solutions** – Local generation and storage, renewable options, and opportunities for decarbonised transport.

The West London Local Area Energy Plan focuses on established, proven technologies to support delivery of the net zero pathway. Successful implementation of these projects will be underpinned by complementary financial and commercial considerations, which should be developed alongside the technical work and are addressed outside the scope of this document.

Wider Benefits of the LAEP

Viewed purely through a financial lens, the transition outlined in the LAEP will require greater upfront investment than simply maintaining the current, fossil-fuel-based energy system. However, this comparison overlooks the much larger long-term costs of inaction and the substantial co-benefits delivered by a modern, efficient, low-carbon energy system. When these wider benefits are considered, the LAEP represents a cost-effective, resilient, and socially beneficial pathway.

Energy resilience and affordability

- A system based on local, low-carbon energy—such as solar PV paired with storage and flexibility—reduces exposure to volatile international fossil-fuel markets.
- Over time, electrification and energy-efficiency measures provide lower, more predictable energy bills, improving energy security for residents, businesses and essential public services.

Local green jobs and economic opportunity

- Delivery of retrofit, heat pumps, heat networks, flexibility services and local solar generation creates sustained local employment across trades, construction, engineering, and maintenance.
- Investment in clean-energy infrastructure stimulates local supply chains, supports skills development, and helps anchor long-term economic activity within the borough.

Carbon reduction and cost-effective abatement

- The actions within the LAEP deliver large-scale reductions in carbon emissions across heat, power and transport.
- Each intervention—retrofit, heat pumps, heat networks, EV rollout, solar PV—provides a cost per tonne of carbon saved that compares favourably to the future economic cost of not reducing emissions, including health, infrastructure and climate impacts.

Air-quality and health improvements

- Petrol/diesel and gas boilers and vehicles are currently the largest sources of local air pollution.
- Electrifying heat and transport significantly reduces NO₂, PM_{2.5}, and other harmful pollutants, leading to improved respiratory and cardiovascular health, reduced NHS burden, and better quality of life.

Tackling fuel poverty

- Fabric-first retrofit, efficient heating systems, and smart-energy measures reduce the amount of energy required to keep homes warm.
- Lower bills, improved comfort, and better-performing homes help lift households out of fuel poverty, particularly in areas with high deprivation or poor housing conditions.

Adaptation benefits

- Climate change already imposes rising costs on local authorities, households and businesses through overheating, flooding and public-health impacts.
- The transition pathway reduces future adaptation costs by lowering emissions, improving building performance, and reducing exposure to extreme weather, making the borough more resilient in the long term.

Broader social value

- Cleaner air, quieter streets, better homes and reduced energy insecurity all support the London Borough of Brent's wider Connected Communities ambition: stronger social connection, healthier neighbourhoods, and more equitable access to the benefits of the energy transition.

Joint Approach to Developing West London's LAEP

Development of the West London Local Area Energy Plan

The West London Local Area Energy Plan was co-developed by the West London boroughs working together with the Greater London Authority (GLA) and the West London Alliance (WLA). The boroughs commissioned consultancy partners, Ramboll and Energy Systems Catapult, to provide the analytical evidence base and to support the collaborative development of the plan. The LAEP has been shaped through iterative engagement with borough officers, the GLA and WLA, ensuring the final plan reflects West London's specific political priorities, constraints and ambitions for net zero.

Energy Systems Catapult

Energy Systems Catapult (ESC) led the technical modelling and scenario development. Using their established Local Area Energy Planning methodology, ESC generated whole-system energy scenarios, tested thousands of iterations, and identified low-regret interventions for West London. They ensured modelling outputs were robust, appropriately granular and aligned with stakeholder priorities, and able to be presented within the GLA Data Hub. ESC also supported technical discussions throughout the co-development process, helping boroughs understand the assumptions, uncertainties and implications of different pathways.

Ramboll

Ramboll translated ESC's modelling outputs into spatial materials and practical planning tools. This included producing interactive maps, spatial analysis and ArcGIS layers to visualise deployment pathways across the sub-region. Ramboll authored the LAEP report, integrating modelling insights with stakeholder engagement findings, governance considerations and delivery approaches. Ramboll also led discussions on implementation pathways and just-transition considerations, ensuring the plan reflects local priorities, community needs and feasible delivery models.

Joint Activities

Ramboll and ESC jointly facilitated a series of collaborative workshops with the boroughs, the GLA and the WLA. These sessions combined ESC's technical expertise with Ramboll's facilitation and planning experience, applying systems-thinking techniques and action-learning principles. This approach helped build local capacity and ensured the LAEP was co-created with those who will be responsible for its delivery, embedding shared understanding and ownership across the West London partners.

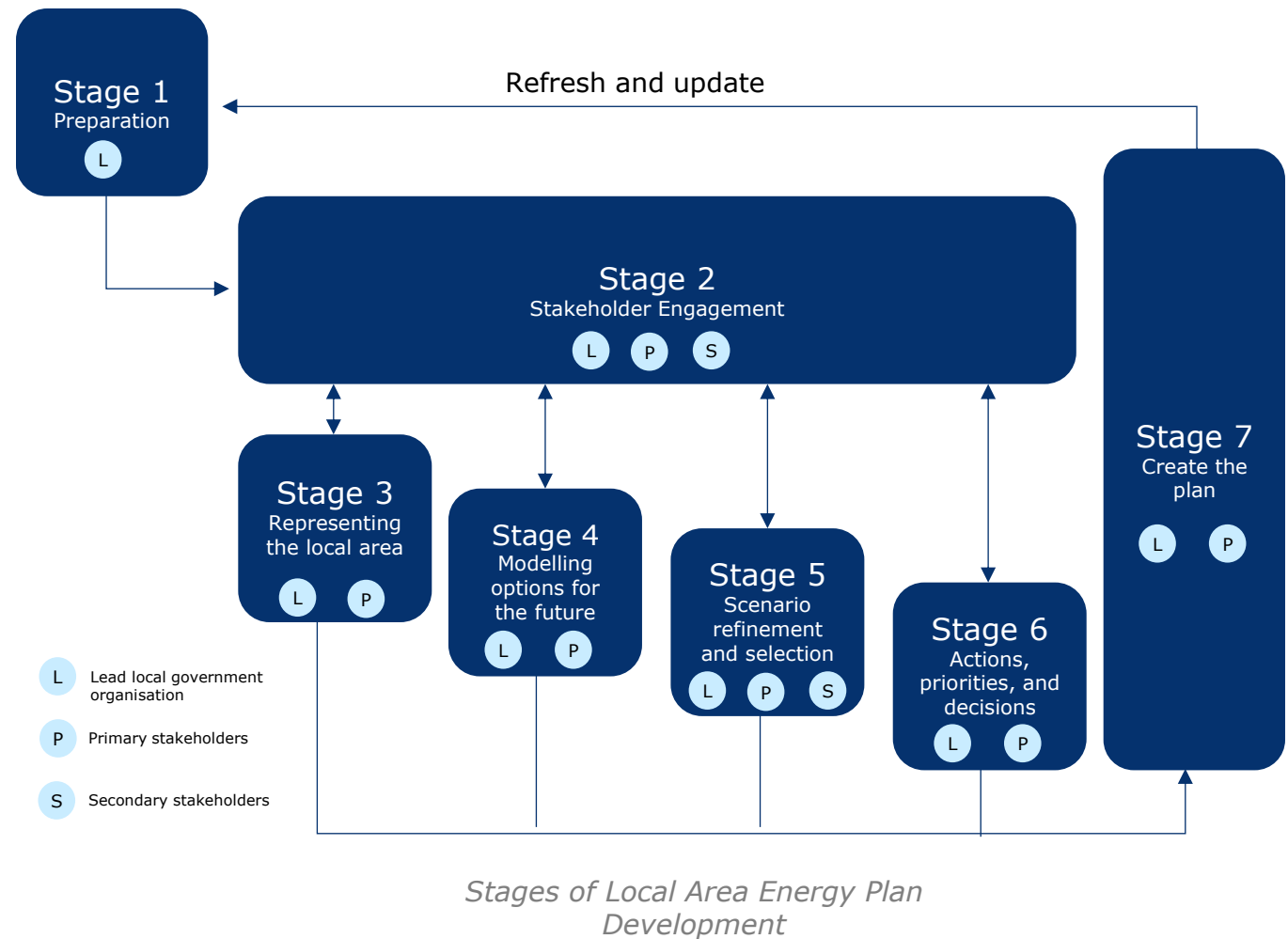


Leveraging the Benefits of a Sub-Regional Approach to Achieve Net Zero

The development of the Local Area Energy Plan used the Energy Systems Catapult's [7-stage methodology](#), ensuring robust technical analysis to create a high-level route map for decarbonisation. From this process, the plan sets out the actions that local boroughs can take directly, either by delivering measures themselves or by enabling others to act. It also identifies where action is needed from local stakeholders and residents, and highlights the key asks of national government, regulators and energy infrastructure providers to ensure the transition can be delivered.

The LAEP development process explored how the five West London boroughs could collaborate and align their delivery efforts to accelerate progress toward net zero. Working together at a sub-regional level enables boroughs to share learning, coordinate investment, and benefit from economies of scale, while still producing borough-specific pathways that reflect local needs. This collaborative approach strengthens future delivery by identifying shared opportunities and common challenges that are best addressed collectively.

This work built on the Local Area Energy Plan Phase 1 (2023), which established a comprehensive baseline of the energy system across nine West London boroughs (Barnet, London Borough of Brent, Ealing, Hammersmith & Fulham, Harrow, Hillingdon, Hounslow, Richmond-upon-Thames, Wandsworth) and the Old Oak and Park Royal Development Corporation (OPDC). Phase 1 focused on evidence gathering and scenario modelling (Stages 1-3 LAEP Methodology). Five West London boroughs (Barnet, London Borough of Brent, Ealing, Hammersmith & Fulham, Harrow) chose to progress into Phase 2. This second phase progressed into high-level actionable plans, addressing previous recommendations and challenges and introducing delivery models and prioritised actions (Stages 4-7 LAEP Methodology). This emphasis on implementation reflects local priorities and differentiates the approach from a standard LAEP, ensuring outputs are both technically robust and geared towards impact.



Policy Drivers for Net Zero Action

The Local Area Energy Plan is intended to play a central role in supporting the London Borough of Brent's transition to net zero. In July 2019, as part of its declaration of a Climate and Ecological Emergency, the London Borough of Brent pledged to do all reasonable in the Council's gift to aim for carbon neutrality for 2030 and work with government to achieve the national 2050 target. The LAEP provides a practical, evidence-based pathway to help deliver this ambition and ensures the borough's net zero ambitions are grounded in, and supported by, the wider policy landscape at local, regional and national levels.

2050

National

UK Government

Has legally committed to reducing greenhouse gas emissions to net zero by 2050 through the [Climate Change Act \(2008\)](#).

Relevant Policies

- [Energy Act \(2023\)](#)
- [Net Zero Strategy: Build Back Greener \(2021\)](#)
- [The Heat and Buildings Strategy \(2021\)](#)
- [Energy White Paper \(2020\)](#)
- [Clean Growth Strategy \(2017\)](#)
- [Warm Homes Plan \(2026\)](#)

2030

Regional

Greater London Authority

Declared a climate emergency in 2018. Since then, it has set a journey to become net zero by 2030 through the 'Accelerated Green' pathway adopted in January 2022.

Relevant policies:

- [London Plan \(2021\)](#)
- [London Environment Strategy \(2018\)](#)



Local

London Borough of Brent

The London Borough of Brent declared a Climate and Ecological Emergency in July 2019 and pledged to do all reasonable in the Council's gift to aim for carbon neutrality for 2030 and work with government to achieve the national 2050 target. The Council's declaration has made overarching commitments to achieve carbon neutrality including to develop a Carbon Offset Fund and redirect investment into renewables. The London Borough of Brent's Climate and Ecological Emergency Strategy (2021-2030) sets the proposed priorities and a pathway to carbon zero and aligns with London's wide decarbonisation ambitions.

Relevant policies:

- [Climate and Ecological Emergency Strategy \(2021-2030\)](#)
- [London Borough of Brent Local Plan 2019-2041 \(2022\)](#)
- [London Borough of Brent EV Charging Strategy](#)

These suite of policies provide support and incentives for delivery of net zero energy projects. In particular, the priority projects and enabling actions recommended within this Local Area Energy Plan are designed with these local, regional and national levers in mind.

Engaging Key Partners to Inform the LAEP and Drive Delivery

Developing a Local Area Energy Plan required collaboration across local authorities, regional bodies, network operators, and community stakeholders. Engagement was undertaken to ensure the plan reflected local priorities, technical constraints, and opportunities for decarbonisation.

Local Authorities (West London Boroughs)

Engaged as core decision-makers to shape the LAEP vision, validate modelling scenarios, and review outputs. Input was provided by teams across Housing and Retrofit, Energy and Sustainability, Planning and Regeneration, and Transport, ensuring alignment with borough priorities and existing programmes.

Regional Bodies (GLA, WLA)

Engaged to maintain consistency with London-wide energy and climate objectives and to integrate the LAEP into strategic frameworks such as the London Plan and Environment Strategy.

Energy Networks (UKPN, SSEN, NESO, NGET, Cadent)

Engaged to provide insight on grid capacity, reinforcement timelines, and investment plans, ensuring LAEP pathways were realistic and aligned with network development.

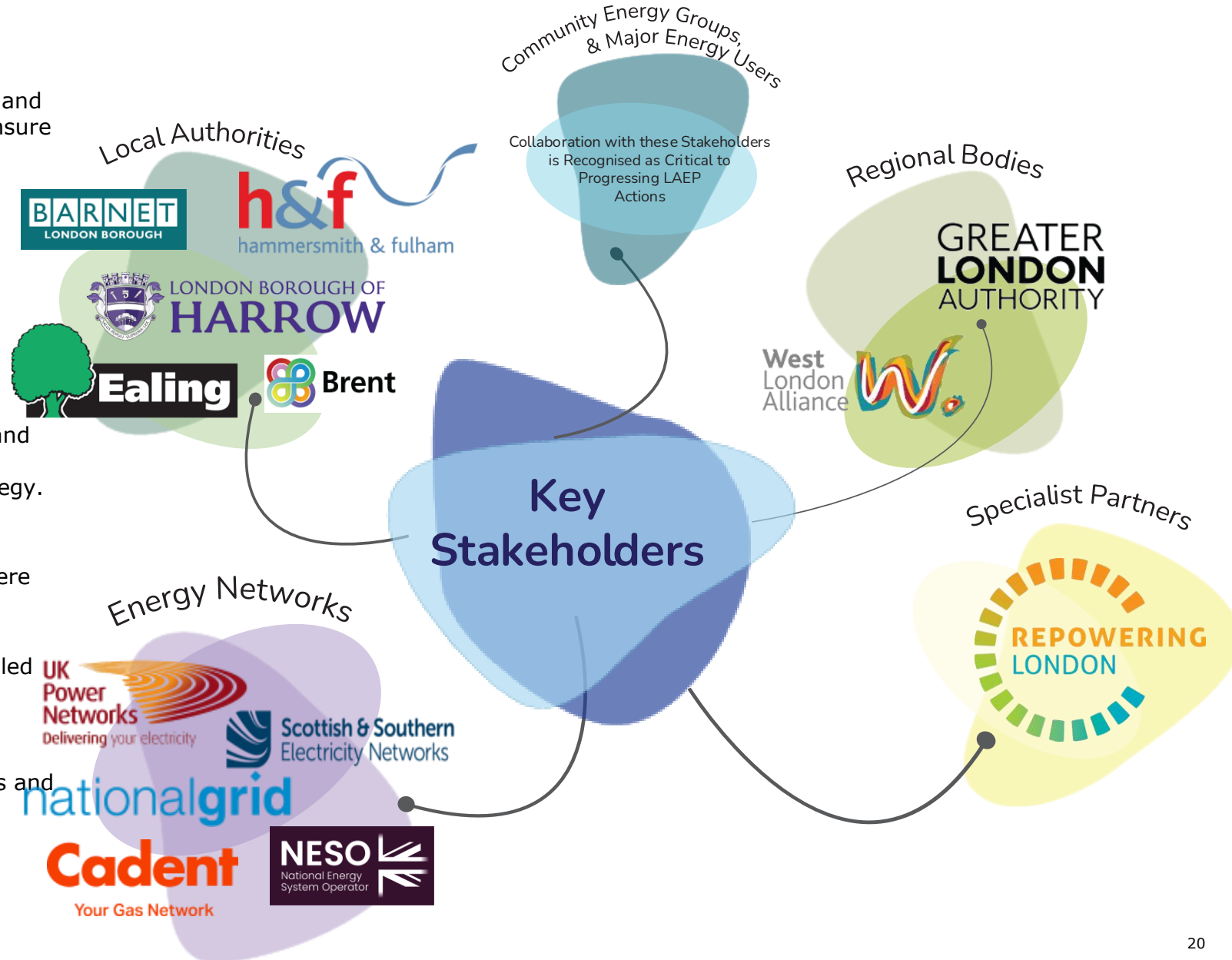
Community Energy Groups

Engaged to identify local delivery opportunities, community-led projects, and the needs of major energy users, supporting practical implementation routes.

Specialist Partners (Repowering London)

Engaged to share expertise on community ownership models and provide case studies to inform just transition and delivery pathways.

While this Plan outlines the scale and types of interventions, further public engagement will be needed during project delivery.



Baseline

03

This section provides a snapshot of the Borough's current energy context, covering its geography, socio-economic profile, energy system, built environment, transport activity, and electrical demand. The baseline establishes the starting point for assessing future decarbonisation pathways.

About the London Borough of Brent

The London Borough of Brent is a large, diverse Outer London borough situated in West London. It is served by strategic road corridors including the North Circular Road (A406) which connect the borough with London and the wider region. The borough comprises a mix of dense town centres, suburbs and extensive employment and industrial areas.

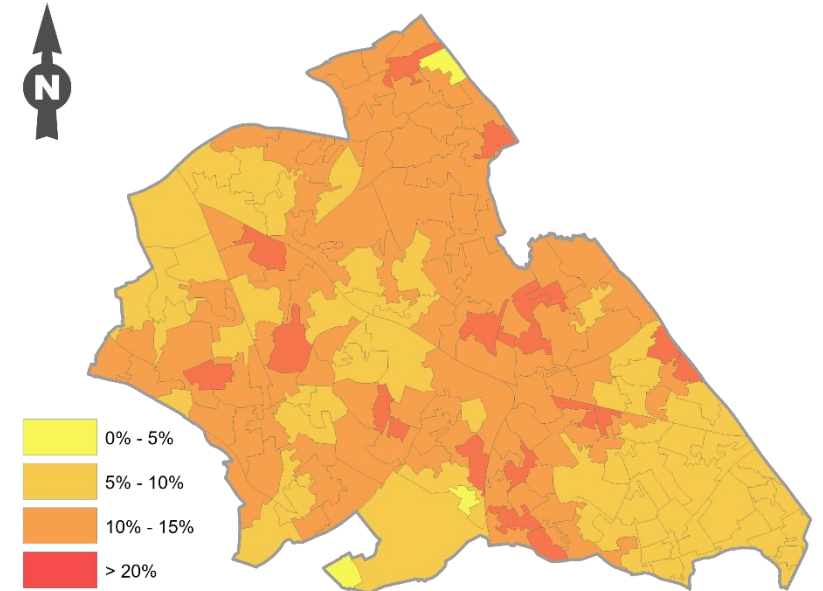
The London Borough of Brent's economy visitor cluster at Wembley Metropolitan Centre with a strong industrial base across Park Royal and Staples, Alperton and Church End. The London Borough of Brent's town centres such as Wembley, Kilburn, Harlesden, Willesden, Neasden, Kingsbury, and Alperton provide services and retail spaces.

Population and growth

London Borough of Brent is the fifth largest borough in London by population with around 340,000. London Borough of Brent has experienced substantial growth driven by London's overall prosperity, with major regeneration projects transforming areas such as Wembley and South Kilburn. London Borough of Brent has experienced a 65% increase in the number of households in privately rented homes in the last decade.

Fuel Poverty

Fuel poverty is a critical concern in London Borough of Brent. The tripling in energy prices since 2020 and the cost-of-living crisis has exacerbated the impact of fuel poverty in the borough. In the London Borough of Brent, approximately 14,000 are fuel poor, with the greatest levels of fuel poverty in the west in Cricklewood & Mapesbury, Stonebridge, and Roundwood. Addressing the London Borough of Brent's energy needs is critical, especially as the borough aims to promote greater energy efficiency and decentralised energy systems to tackle fuel poverty and improve the health and wellbeing of its residents.



Current proportion of households in fuel poverty by LSOA in the London Borough of Brent¹

Approximately 14,000 households in the London Borough of Brent are fuel poor¹, meaning they cannot meet their energy needs at a reasonable cost.

¹Fuel Poverty in England: sub-regional - data.gov.uk

Baseline: Energy System

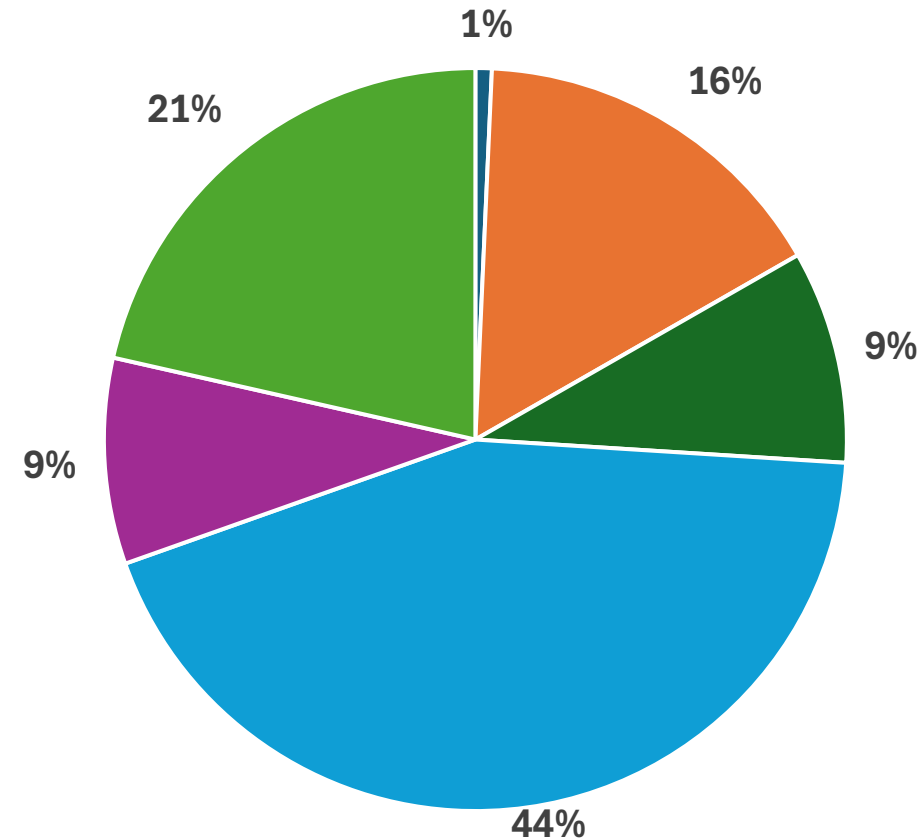
Modelling indicates that current energy consumption in the London Borough of Brent is attributed largely to three energy sectors: power, heating and transportation. The pie chart illustrates how different energy sources contribute to overall consumption across the Borough in 2025, forming the baseline for the Local Area Energy Plan¹.

Gas accounts for more than half of the London Borough of Brent's energy consumption with an estimated annual total of 2,370 GWh (53% combined between non-domestic and domestic gas). Gas consumption in the London Borough of Brent is primarily used for heating domestic and non-domestic buildings.

Transport related energy consumption accounts for approximately 22% of energy consumed in the London Borough of Brent with the vast majority (21%) from Petrol/Diesel and 1% from electric vehicles.

Electricity consumption accounts for 25% of total energy demand in the borough. Domestic electricity consumption accounts for 16% of total energy consumption in the borough while non-domestic electricity accounts for 9% of the total energy consumption.

Further information about the baseline energy system is available in the WL LAEP 1 Report².



EV Charging

Domestic Electricity

Non-Domestic Electricity

Domestic Gas

Non-Domestic Gas

Petrol/Diesel

¹Current energy system, was taken from Energy Systems Catapult modelling based on 2025 figures. Additional detail is included in the Technical Annex.

²<https://www.london.gov.uk/programmes-strategies/better-infrastructure/infrastructure-coordination/planning-service/local-area-energy-planning-london?ac-230032=230025>

Baseline: Buildings

Domestic Buildings

The London Borough of Brent's stock varies markedly across the borough with higher-density, mixed-use late 19th and early 20th century terraces in the south, and lower-density interwar suburbs in the north. A significant portion of these boroughs were built before modern standards. Tall buildings and higher densities have increased in Growth Areas such as Wembley and South Kilburn as part of regeneration and housing delivery.

Currently, 45,001 (27%) of domestic buildings have cavity and non-cavity insulated walls. 128,844 (79%) have double or triple glazing. 2,760 (2%) have loft insulation¹. These baseline figures include existing homes as well as planned new developments to 2050, as defined in the modelling approach.²

Domestic Heating

Domestic heating in the London Borough of Brent is still dominated by fossil-fuel systems, with approximately 70% of homes currently heated by gas boilers. Of the remaining, 30% use heat pumps, electric storage heating, or are connected to communal or district heat networks.

In terms of tenure type, 61% of homes are flats in the London Borough of Brent reflecting its high-density. The remaining stock consists of, 19%

terraced and 17% semi-detached houses, with just 3% detached which demonstrates its inter-war suburban fabric.

114,715 (70%) of domestic buildings use gas, coal or oil boilers. The remaining 30% use heat pumps, are connected to a heat network, or use electric storage heating. These baseline figures include existing homes as well as planned new developments to 2050, as defined in the modelling approach.²

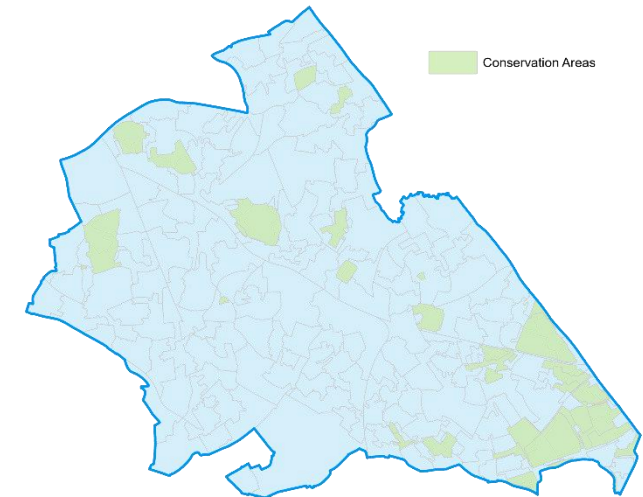
Non-domestic Buildings

Non-domestic buildings (commercial, public and industrial) account for a significant share of heat consumption in the London Borough of Brent. Nearly all non-domestic buildings continue to rely on fossil-fuel systems, with around 60% of existing buildings heated by gas boilers. Within London Borough of Brent, industrial sites form part of this non-domestic profile, contributing to borough heat loads through continuous process-driven energy demand.

Approximately 3,400,000m² of non-domestic buildings in the London Borough of Brent use gas for heating. The remaining 2,200,000m² use heat pumps, heat networks, or electric resistive technology. These baseline figures include existing homes as well as planned new developments to 2050, as defined in the modelling approach.²

Conservation Areas

London Borough of Brent has 22 conservation areas with distinct architectural and historic qualities. It includes Victorian properties, gothic style buildings, Arts and Crafts inspired houses. Buildings in these areas will need special considerations to support conservation objectives alongside decarbonisation interventions.



Map showing conservation areas in the London Borough of Brent

¹Loft insulation of 300mm or greater

² Baseline ('as now') figures include both existing buildings and planned new developments up to 2050. In the modelling approach used, this field represents the "starting state" of the future building stock. New developments are only included in cost and carbon calculations from the point at which they are built. Including future buildings in the baseline allows the LAEP to illustrate the full scale of change required across the stock expected to exist by 2050.

Baseline: Transport

Approximately 6,800 million miles are driven by cars, light commercial vehicles, and heavy goods vehicles across the West London sub region. The largest proportion of this travel is attributed to car journeys accounting for over 80% of total distance travelled. Across West London, most of these journeys are made in vehicles with internal combustions engines fuelled by petrol or diesel with an almost negligible contribution from electric vehicles. The London Borough of Brent Long Term Transport Strategy 2015-2035 (LTTS) provides the strategic direction for investment in transport in the borough, with the overarching aim of improving transport options for all and to reduce the negative impacts of travel on the borough.

VEHICLES

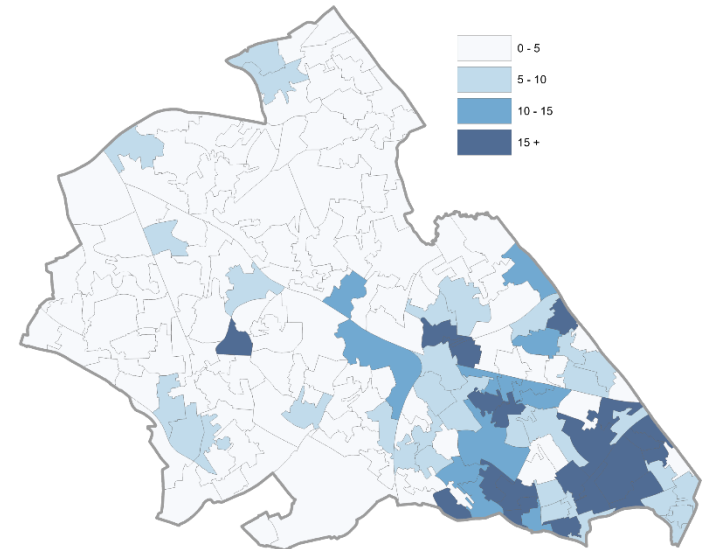
Out of the 111,116 registered vehicles in the London Borough of Brent in 2024, 5% (5,827) were battery electric and 3% (3,173) were plug-in hybrid.¹

Transport Connections

The London Borough of Brent is extremely well connected with the M1, North Circular Road, A41, and M25, providing direct routes to central London, Heathrow Airport, Luton, and other major destinations. Heathrow Airport is situated approximately 10 miles from the borough and can influence traffic in the area. Proposals for Heathrow expansion, including a potential third runway, indicate that annual aircraft movements could increase from approximately 480,000 to more than 740,000, which would increase traffic significantly.

Electric Vehicles

The London Borough of Brent has an expanding electric vehicle (EV) charging network, with more than **1,150 publicly available charging devices points²** installed across the borough. Charging provision includes lamp-column chargers, fast-charging pedestals and Source London sites. Currently, 34% of residents are within a 5-minute walk of a public charge point. EV ownership continues to grow, with more than 10,000 battery electric or plug-in hybrid registered in 2024.



Modelled Estimates for Existing Publicly Available EV Charging Devices in the London Borough of Brent

¹<https://www.gov.uk/government/collections/vehicles-statistics>

²<https://www.gov.uk/government/statistics/electric-vehicle-public-charging-infrastructure-statistics-october-2025>

Baseline: Electrical Demand

Electricity demand in the London Borough of Brent reflects the borough's combination of residential, commercial and industrial buildings. LAEP modelling shows that electricity consumption accounts for 25% of total energy demand in the borough. Domestic electricity consumption accounts for 16% of total energy consumption in the borough while non-domestic electricity accounts for 9% of the total energy consumption.

Major Electricity Users and Wider System Context

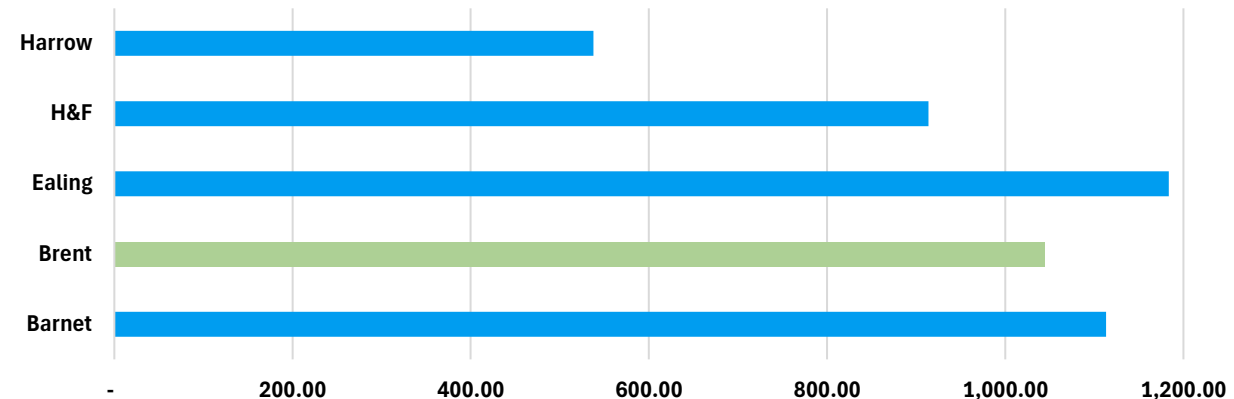
The London Borough of Brent's electricity system is shaped not only by buildings demand but also by several major high-load users, most notably data centres. The Borough hosts two data centres. The NHS estate is another notable consumer, while industrial facilities such as McVitie's in Harlesden and the Taylor's Lane power plant further contribute to the non-domestic profile.

On the network side, capacity headroom is tightening at key UKPN primary substations, so larger connections are likely to depend on staged reinforcements, flexibility arrangements and future transmission upgrades. Transport electrification and ongoing development will add further load, underscoring the need for coordinated planning with network operators and major users.

The London Borough of Brent's annual electricity demand is estimated to be 1,044GWh. Comprised of domestic, non-domestic, and EV charging demand. When compared to neighbouring boroughs, the London Borough of Brent sits in mid-range of regional demand, helping to illustrate its relative electricity needs within the wider West London system.

Local Renewable Generation and Solar PV

Rooftop solar PV is the primary local renewable generation technology in the London Borough of Brent. Solar PV installations are spread across both residential and non-residential buildings. Current deployment totals 6.8 MW across 1,206 systems. There is opportunity to expand Solar PV across both residential and non-residential roofs, with particularly strong opportunities on large commercial and industrial buildings. Areas with high potential include Stonebridge, Dolls Hill and Queens Park.



Modelled Estimates for Total Annual Electricity Demand by Local Authority

Exploring the Future Energy Scenarios in the Borough

04

This section presents the future energy scenarios developed for the London Borough of Brent, summarising their purpose, underlying assumptions, and key impacts on energy demand and emissions. These scenarios inform the Borough's pathways to net zero.

Balancing Ambition and Delivery

The London Borough of Brent's Local Area Energy Plan has been developed as part of the wider West London sub-regional LAEP programme, which brings together shared evidence, modelling and strategic insights across neighbouring boroughs. This report focuses specifically on the London Borough of Brent's local pathway, priorities and delivery actions, while recognising the value of working collaboratively across the sub-region.

The plan has been developed by looking at different scenarios for the local energy system across different timescales. Although the Borough's current policy ambitions set out 2030 as the target delivery timeline, the scale and pace of investment required to meet this would be significant. 2040 has emerged as the most realistic timescale which allows these dependencies to unfold while giving space to phase investment, build supply-chain capacity and ensure a just and affordable transition for residents and businesses. It also ensures the London Borough of Brent remains on a credible pathway towards longer-term national targets while enabling tangible progress this decade. The following pages show how different timelines impact the scale of capital investment over time.

Aligning with the wider West London area brings clear benefits. Energy systems, heat networks, transport corridors and grid infrastructure often extend beyond borough boundaries, meaning coordinated planning can reduce costs, avoid duplication and unlock shared opportunities. Sub-regional collaboration also helps attract investment, strengthen the supply chain and support the development of consistent approaches to delivery across local authorities.

What this means for the London Borough of Brent?

The 2040 pathway provides the London Borough of Brent with a clear, staged route, showing what needs to happen first, how early projects build momentum, and what remains to be delivered through the late 2020's and 2030s. It is a **live** plan: it will be reviewed and updated regularly to reflect policy, technology and market changes, and to remain aligned with real-world progress in the London Borough of Brent and across West London.

Five Scenarios for West London's Energy Future

Scenarios were used to provide a vision of the future energy system and inform a decision on the optimal pathway for the local area. Scenarios were based on a range of plausible versions of the future Net Zero energy voiced by Borough leads. Scenarios focused on areas of specific interest or uncertainty and are modelled through fixing and varying parameters and assumptions. An overview of the 5 scenarios in this Local Area Energy Plan is provided below.

Standard Required Local Area Energy Plan Scenarios		Tailored West London Scenarios		
Do Nothing	Net Zero 2050	Net Zero 2030	High Heat Network	High Shallow Retrofit
Narrative: No actions take place beyond already committed investments and peripheral decarbonisation progress (e.g. electricity grid). This is not required to meet local carbon targets and is not a Net Zero Scenario. Main Points: - Required by Treasury to provide a counterfactual for cost and carbon impacts and comparison purposes. - Does not include a Net Zero target. - Includes planned new developments and assumptions around electric vehicle uptake.	Narrative: A "core" or "central" decarbonisation scenario. Uses a cost-optimal balance of technologies to meet the UK's national Net Zero target of 2050. Main Points: - Follows the CCC Carbon Budgets for decarbonisation by 2050 as adopted by UK Government. - Local generation deployment follows National Grid's Future Energy Scenarios (FES) 'Leading the Way' scenario. 100% EV uptake by 2050.	Narrative: A highly ambitious scenario in line with the GLA's net zero target. This scenario provides insights on prioritising actions for an earlier target and reveals the need for higher deployment rates and greater capital costs. Main Points: - Follows the Mayor of London's 2030 Net Zero target for the GLA 100% EV uptake by 2030	Narrative: A 2050 decarbonisation scenario with a higher deployment of heat networks. This scenario can provide greater insight on locations where heat networks are not a cost-effective option. Main Points: - In line with the UK Government 2050 Net Zero target - Increased deployment of heat networks 100% EV uptake by 2050 - Net Zero by 2050	Narrative: A 2050 decarbonisation scenario with a widespread deployment of shallow retrofit with a focus on areas of high fuel poverty. This scenario includes a higher shift away from car travel. Main Points: - In line with the UK Government 2050 Net Zero target - Increased deployment of retrofit measures - Increased modal shift to active travel 100% EV uptake by 2050 - Net Zero by 2050

Scenarios Overview

Modelled Measures	Net Zero 2030	Net Zero 2050	High Heat Network	High Shallow Retrofit
Carbon Reduction Target	2030	2050	2050	2050
EV Charger Deployment	100% EV uptake by carbon reduction target			
Transport Modal Shift	10% reduction in car travel in all boroughs in favour of alternative means of transport			Reduction in car travel: Barnet, London Borough of Brent, Harrow - 10% Ealing, H&F - 27% ¹
Shallow Retrofit Measures	Deployment of measures varied between 0 – 100% across all simulations			Fixed at 100%
Deep Retrofit Measures	Deployment of measures varied between 0 – 100% across all simulations			
Heat Network Deployment	0% to maximum feasible deployment		60 th percentile deployment of 2050 scenario set as minimum. Varied to maximum feasible deployment	0% to maximum feasible deployment

¹Increased modal shift in the High Shallow Retrofit scenario represents an energy efficient scenario where there is both high uptake of retrofit and behaviour change towards reduced car travel. The modal shift is higher in boroughs that are more densely populated due to the increased availability of public transport and walkability of boroughs.

Scenario Insights – What Does This Mean for Planning?

Scenario Insights:

- **Net Zero 2030:** Rapid electrification drives steep electricity demand growth early, requiring accelerated grid reinforcement and investment in flexibility solutions to meet ambitious borough and GLA targets.
- **Net Zero 2050:** A slower transition spreads demand growth over time, reducing short-term pressure on infrastructure but requiring sustained investment and long-term coordination.
- **High Heat Network:** Electricity demand rises more gradually as heat networks reduce reliance on individual heat pumps, highlighting the need for strategic heat network deployment in dense areas.
- **High Shallow Retrofit:** Retrofit lowers overall energy demand, but electricity still dominates as heating and transport decarbonise—emphasising the importance of retrofit programmes to manage peak loads and costs.

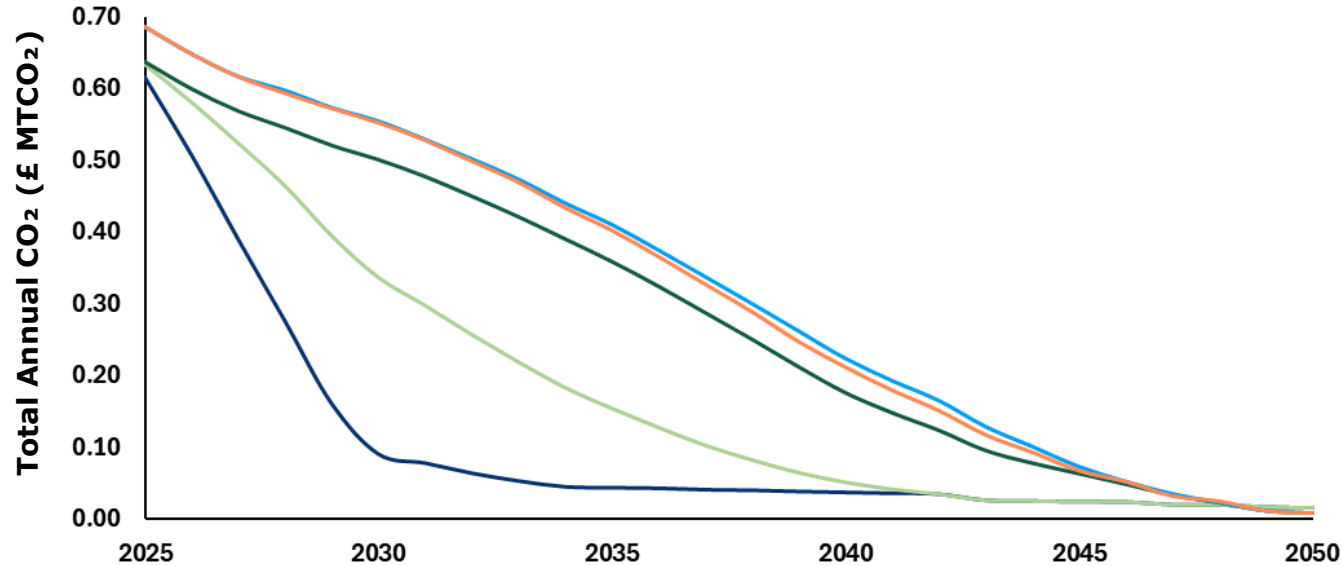
Key Takeaways:

Electricity consumption grows significantly in all scenarios as gas heating and petrol/diesel vehicles are phased out. Hydrogen plays a smaller but strategic role for hard-to-decarbonise sectors. These shifts underline the need for:

- **Grid reinforcement and flexibility planning** across all scenarios.
- **Coordinated investment in heat networks and retrofit** to manage demand and costs.
- **Transport planning** to support EV uptake and modal shift.

The Impact of Timing on Carbon Emissions

The graph shows curves for annual carbon emissions from 2025 to 2050 for each scenario, covering both buildings and transport. All scenarios assume a fully decarbonised electricity grid by their target, widespread adoption of electrified heating such as heat pumps, and widespread adoption of electric vehicles.



2.7
MTCO₂

Net Zero 2030

4.7
MTCO₂

Net Zero 2040

7.4
MTCO₂

Net Zero 2050

8.3
MTCO₂

High Heat Network

8.2
MTCO₂

High Shallow Retrofit

The **Net Zero 2030** pathway emits **over 2.5 times less carbon¹** than scenarios that delay action until 2050. This difference matters because cumulative emissions drive climate impacts, not just the end target.

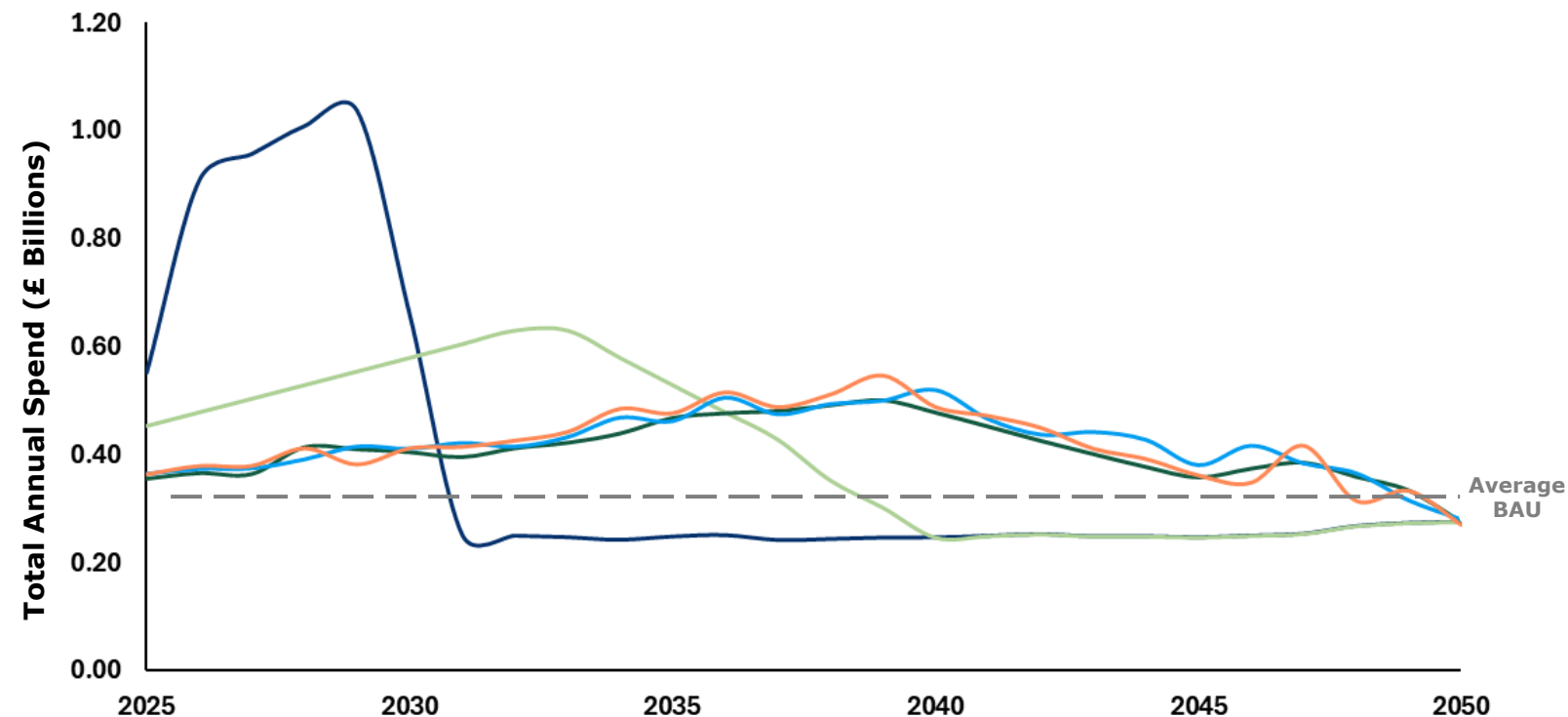
Implications for Decision-Makers:

- Early action reduces cumulative emissions, helping boroughs meet climate commitments and avoid locking in high-carbon infrastructure.
- Net Zero 2030 requires rapid investment and coordination but delivers the greatest climate benefit.
- Later pathways (e.g., Net Zero 2050) spread costs but result in higher cumulative emissions, which may conflict with local and regional ambitions.
- The 2040 target provides for a more achievable rate of deployment whilst still delivering significant cumulative emissions saving.

¹Carbon emissions, were taken from Energy Systems Catapult modelling. Additional detail is included in the Technical Annex.

Comparing Costs Across Net Zero Pathways

The graph illustrates curves for **total annual spend¹ (CAPEX, OPEX, and fuel costs)** from 2025 to 2050 for each scenario.



What does this mean for planning?

- Net Zero 2030 delivers the lowest overall spend and greatest carbon savings—up to £0.3 billion less than other scenarios. However, this pathway is likely to be a sharp investment spike, peaking at over £1 billion in 2029, which may be challenging for delivery and financing.
- Net Zero 2040 offers a more balanced approach: lower cumulative spend than 2050 and retrofit-heavy scenarios, with costs spread more evenly over time. This reduces financial risk and supports phased delivery while still achieving significant carbon reductions.
- Later pathways (2050, High Heat Network, High Shallow Retrofit) result in higher total spend and slower carbon savings, which may conflict with borough and GLA ambitions.

Implications for Decision-Makers:

- Early action saves money overall but requires upfront funding and strong coordination.
- Phased approaches reduce delivery risk but increase cumulative costs and emissions.
- Boroughs need to weigh budget constraints, delivery capacity, and climate commitments when selecting a preferred pathway.

¹Total spend, was taken from Energy Systems Catapult modelling and includes CAPEX, OPEX, and fuel costs. Costs displayed are estimates and do not include discount costs/inflation and are built on assumptions and benchmarks. Additional detail on costing is included in the Technical Annex.

Summary of Opportunities and Scale of Change

05

This section summarises the Borough's main decarbonisation opportunities and the scale of change required, including priority locations, relevant technologies, and indicative deployment levels needed to achieve net zero.

Summary of Opportunities

The following section of the LAEP summarises opportunities and scale of change required in the London Borough of Brent, four priority projects to accelerate

1. Quantifying the scale of change

The first section outlines the scale of intervention required across the London Borough of Brent's buildings, transport, and energy systems to achieve the borough's net zero pathway. These measures are modelled using Energy System Catapult's LAEP model, which synthesizes a variety of data and technology assumptions to produce maps and datasets that indicate *where* measures should be implemented, the *quantity* of measures required and estimate *costs*, calculated as CAPEX. **This indicates the total energy system wide expenditure required and not exclusively costs and programmes for the council.** The measures, introduced in previous sections and to be further explored here, include:

- Domestic retrofit – Wall insulation
- Domestic retrofit – Loft insulation
- Domestic retrofit – Glazing
- Domestic low carbon heating
- Non-Domestic low carbon heating
- Energy generation
- Electric Vehicles (EV)

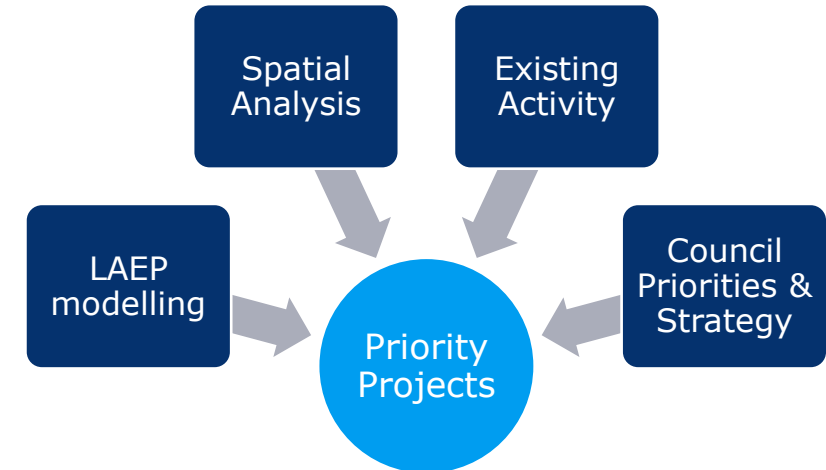
2. Priority Projects – Early High-Impact Opportunities

Using this data, the report presents four example priority projects which are near-term, high-impact actions to accelerate progress to net zero. Each project has been selected based on whole-system modelling and alignment with local priorities:

- **Cost-effective fabric first Retrofit program for social housing** – accelerating fabric upgrades to create warmer homes.
- **Council-Owned Property Retrofit (Non-Domestic)** – progressing fabric upgrades to reduce energy bills and consumption.
- **Heat Network focused Priority Project**– support the decarbonisation of heat by connecting homes to heat networks, reducing bills and emissions.

3. Next Steps and roadmap to Net Zero

The final section of this section sets out next steps and provides a roadmap to net zero. The roadmap outlines the priority actions identified through the Local Area Energy Plan pathways in the immediate, medium and long-term as well supporting actors and stakeholders.



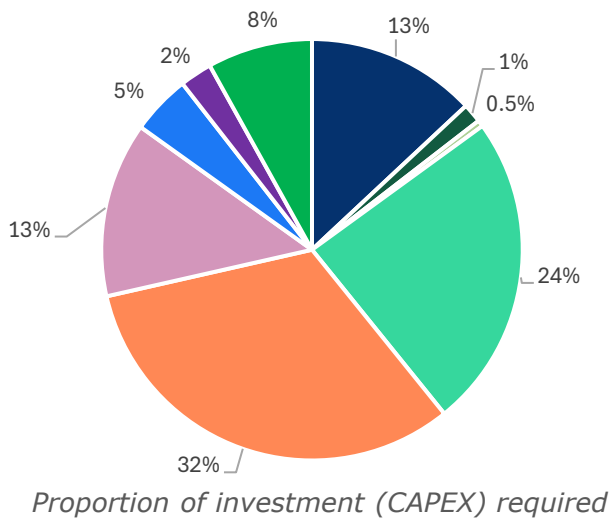
Summary of Interventions

The table on the right summarises the overall scale of the opportunity across the borough, indicating how much retrofit, low-carbon heating, renewable energy generation and EV infrastructure may be required to follow the borough’s pathway to net zero.

These figures represent the total system-wide need, not a delivery programme for the Council alone. Achieving this scale of change will depend on coordinated action across the local energy system, involving residents, businesses, landlords, community groups, utilities, and regional partners, supported by the Council’s enabling role and wider national policy frameworks.

An estimated CAPEX is provided from the Local Area Energy Plan modelling to give a high-level indication of potential investment requirements. Further feasibility work will be needed to understand delivery options, funding routes and the role of different stakeholders in bringing these measures forward.

- Domestic retrofit – Wall insulation
- Domestic retrofit – Loft insulation
- Domestic retrofit – Glazing
- Domestic low carbon heating
- Non-Domestic low carbon heating
- Heat Network Infrastructure
- Energy generation
- EV
- Electricity Network



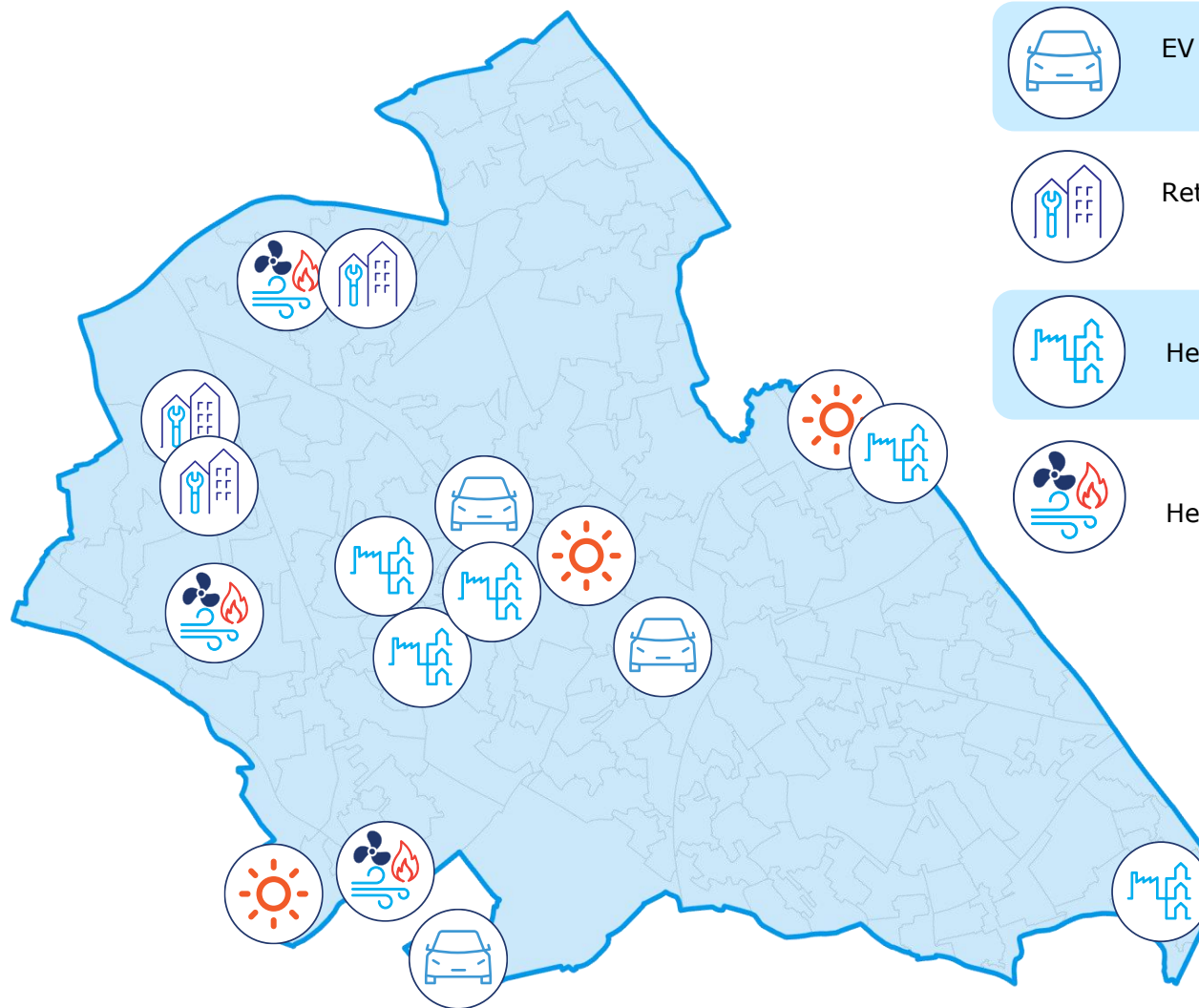
Measure	Quantity	Estimated CAPEX ¹
Domestic retrofit – wall insulation	46,300 properties require wall insulation, an increase of 28% from current. - Cavity insulation: 9,000 (5%) properties - Solid wall insulation: 37,300 ((23%) properties	£485 million £9 million £476 million
Domestic retrofit – loft insulation	55,400 properties require loft insulation, an increase of 34% from current.	£55 million
Domestic retrofit – glazing	2,100 properties require glazing upgrades, an increase of 1% from current.	£18 million
Domestic low carbon heating ²	114,715 (70%) of dwellings require low carbon heating upgrades	£0.9 billion
Non-Domestic low carbon heating ²	3,300,000 m² of non-domestic buildings require low carbon heating upgrades	£1.2 billion
Heat Network Infrastructure	Borough-wide heat network infrastructure e.g. pipework, energy centres etc.	£0.5 billion
Energy generation (including solar potential)	112 GWh total generation potential for the borough by 2040.	£170 million
EV	4,700 Public EV chargers are recommended for delivery	£92 million
Electricity Network	Capacity and infrastructure upgrades	£0.3 billion
Total Estimated CAPEX		£3.7 billion

¹Estimated CAPEX was taken from Energy Systems Catapult Modelling. Additional detail on costing is included in the Technical Annex.

²Individual building level heating solutions and heat network connection costs

Where to prioritise action first

The icons on the map highlight the parts of the borough with the highest potential for each opportunity area. These indicate where action could be prioritised first, based on where opportunities are most concentrated. These locations show only the priority zones, not the full scale of change needed.



Opportunity Area Legend



Solar PV



EV



Retrofit



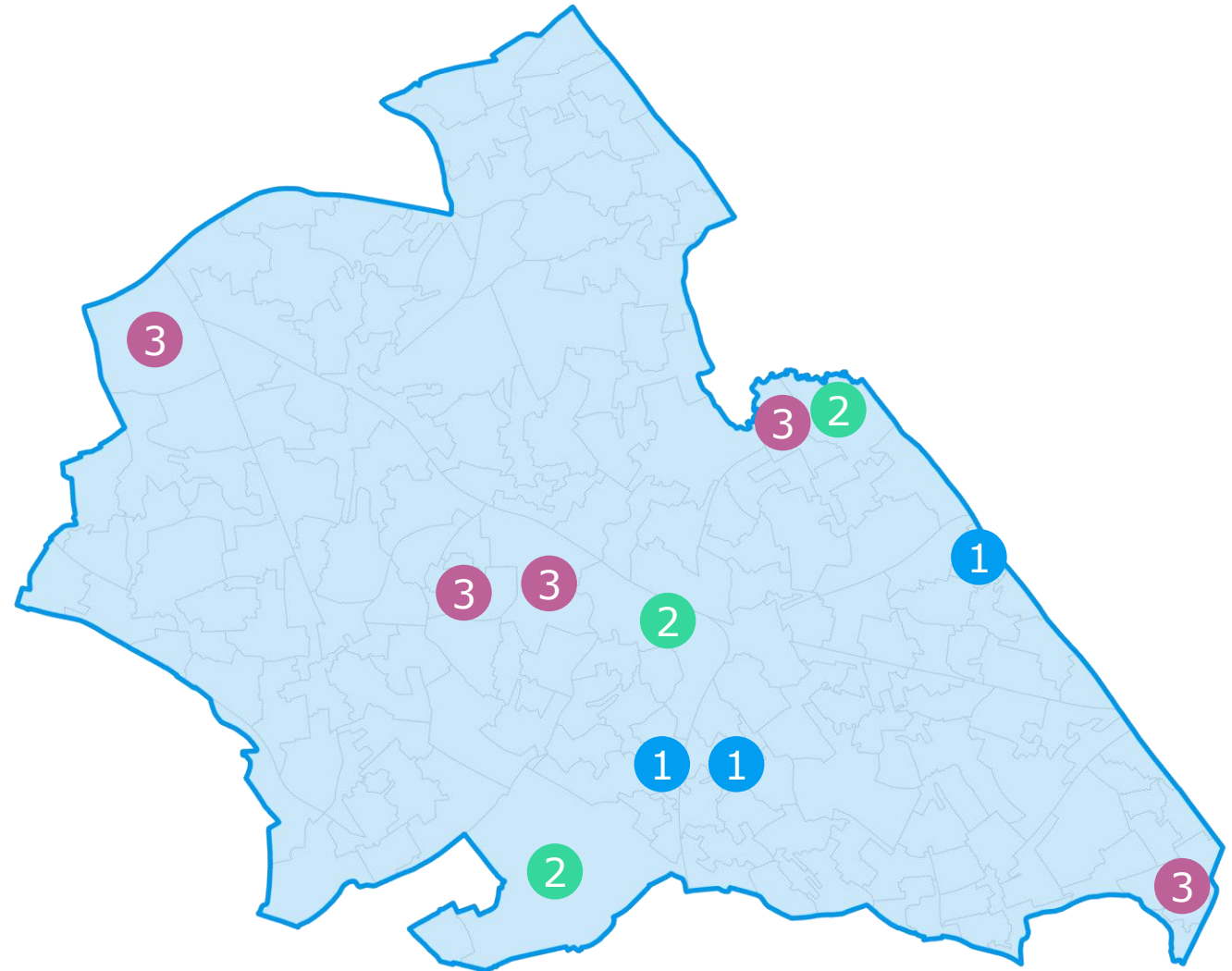
Heat Network



Heat Pump

Priority Projects

- Priority projects are near-term, high-impact actions identified through the Local Area Energy Planning process to accelerate progress toward net zero.
- They represent practical opportunities that can be delivered early because they are technically feasible, cost-effective, and align with areas where the Council has influence or control. They do not prevent the progression of projects in other areas of the borough in the short or long term.
- These projects typically build on existing local initiatives, address major sources of emissions, and deliver tangible benefits for residents and businesses—such as lower energy bills, improved comfort, and local economic opportunities.
- Acting as catalysts for wider system change, priority projects provide a clear starting point for implementation and help maintain momentum toward long-term decarbonisation goals.
- Each project has been selected based on whole-system modelling and alignment with local priorities to deliver maximum impact.
- Priority projects have also been selected to build on work already underway and to focus on areas where the Council has clearer levers for delivery—such as its own estate, housing stock, and existing programmes. This ensures early actions are realistic, build momentum, and make best use of assets already within local influence.
- While priority projects draw on areas where the Council has technically high influence, project delivery is dependent on funding being available to do so.



1 Cost-effective fabric first retrofit program for social housing

3 Expansion of heat network around the London Borough of Brents council owned assets

2 Council-Owned Property Retrofit strategy (Non-Domestic)

Retrofit Focused Priority Projects : Domestic

1

Retrofit is one of the highest-impact actions for reducing heat demand across the London Borough of Brent, with whole-system modelling showing fabric upgrades are essential to the borough’s least-cost pathway to net zero. With well over 100,000 homes and buildings in the borough, and around 12,000 homes owned by the council, a fabric-first retrofit programme can deliver material reductions in energy demand and carbon at scale. Targeted retrofit improves comfort, cuts heat loss, and lowers exposure to rising energy prices which is particularly important in areas with older housing and higher fuel-poverty risk.

Priority Project targeting fuel poor areas

Given an estimated 14,000 households in fuel poverty, retrofit offers co-benefits in health, affordability, and resilience for the most vulnerable residents. Priority areas such as Cricklewood, Stonebridge, and Roundwood show strong potential for early action from an energy systems perspective due to building condition and the concentration of fuel poverty. These locations offer a practical starting point for accelerating delivery while reducing disruption and making best use of planned maintenance programmes.

Supporting Strategic Objectives

Retrofit also supports wider borough objectives within the council's climate strategy to do all in the council's gift to achieve an average EPC B across the council's housing stock by 2030.

Early delivery in council stock (e.g., tower blocks) creates a platform to scale across all tenures through proven designs, supply-chain maturation, and performance monitoring through proven designs, supply-chain maturation, and performance monitoring.



Retrofit projects can support and create local jobs promote investment into training and skills development²



Reduced heating costs can lead to improved comfort and health due to efficient and warm housing. In one study, 79% of people reported a warmer home had a positive impact on physical health³



UK 100 analysis has found that social housing retrofit can act as a catalyst in the retrofit transition across the wider housing stock⁴

Cost-effective fabric first Retrofit program for social housing

Project Description: Supporting the London Borough of Brent’s Climate & Ecological Emergency strategy the cost-effective fabric-first retrofit for the London Borough of Brent’s social housing bundling measures for cost efficiencies. This will target high-fuel-poverty LSOAs. Delivery is aligned with asset management cycles where possible.

LSOA* / (Ward)	E01000556 (Cricklewood & Mapesbury), E01000595 (Stonebridge), E01000527 (Roundwood) *LSOAs with highest proportion of households in fuel poverty.
Number of dwellings in target LSOAs	Number of dwellings: 2437 Number of fuel poor households: 426 Total modelled wall upgrades: 1003 Total modelled glazing upgrades: 987 Total modelled roof upgrades: 57
Archetypes included	Flats, detached, semi-detached, terrace
Local area benefits	EPC uplift, lower emissions and bills for the borough's poorest residents, warm and comfortable homes

¹Carbon emission and bill saving estimates taken from: <https://energysavingtrust.org.uk/energy-at-home/reducing-home-heat-loss/> ²<https://www.ippr.org/articles/train-local-work-local-stay-local> ³<https://es.catapult.org.uk/news/93-percent-of-health-professionals-recommended-warm-home-prescription/> ⁴<https://www.uk100.org/publications/end-wait-insulate-social-housing-energy-efficiency-and-energy-crisis>

Retrofit Focused Priority Projects: Non-domestic

2

Non-domestic buildings are a major part of the London Borough of Brent's energy demand. The council owns roughly 200 non-domestic buildings across its corporate estate, making retrofitting this stock a high-impact for cutting energy demand and decarbonising operations¹.

Strategic Alignment

This project supports the London Borough of Brent's commitment in the Climate & Ecological Emergency to develop a plan to achieve net zero carbon emissions from the council's estate and operations by 2030. A comprehensive, fabric-first and controls-led retrofit programme, followed by low-carbon heat and on-site renewables, could significantly reduce heating and electricity use, lower operating costs, and improve indoor environmental quality.

Building on Existing Council Capability and Progress

The council is already developing technical expertise and delivery capability through its Heat Decarbonisation Plan (Net Zero Routemap). The project includes updating existing plans for its largest sites, creating new plans for additional buildings, and crucially; delivering the technical expertise and consultancy support required to submit funding applications (previously the Public Sector Decarbonisation Scheme).

Scale

The LAEP data supports this by identifying which areas (by LSOA level) should be prioritised to both most effectively meet the councils net-zero pathway delivering the greatest whole energy systems benefit.

- Estate coverage: Approximately 20 council-owned non-domestic properties across priority LSOAs E01033938 (Stonebridge), E01000601 (Stonebridge), and E01000615 (Wembley Park) with a floor area: 687,604 m² of non-domestic floor area modelled for heat pump installation.
- Building types: Health and community facilities, offices/conference, retail/showrooms, sports, warehouses, arts/leisure, day centres/hostels/nursing homes, education, agricultural/farm/garden shops, and emergency services.
- Measures: Fabric-first (insulation, glazing, airtightness), controls optimisation, transition to heat pumps, with rooftop solar PV and battery storage where appropriate.

This in turns ensures that the retrofit program:

- Supports the Borough Plan's "Greener, Cleaner Future" commitment to lead by example by reducing energy use, demonstrating local delivery capacity that accelerates area-wide transition
- Lowers overall energy demand and therefore council costs
- Reduces pressure on constrained electricity substations
- Improves readiness for heat pumps and other low-carbon technologies
- Support the development and testing of delivery models which could support the private sector

Council-Owned Property Retrofit (Non-Domestic)

Project description: The London Borough of Brent Council will lead by example under its Climate & Ecological Emergency Strategy by retrofitting its non-domestic estate to a fabric-first standard upgrading insulation, glazing and airtightness optimising building controls, and transitioning from fossil systems to low-carbon heat pumps with rooftop solar PV and battery storage where appropriate.

LSOA* / (Ward)	E01033938 (Stonebridge), E01000601 (Stonebridge), E01000615 (Wembley Park) *LSOAs with largest floor area receiving heat pump installations.
Square Meters in target LSOAs	Council owned properties: ~20 Non-domestic floor area modelled to install a heat pump: 687,604
Archetypes included	Health centres and hospitals, Hospitality, Offices and conference centres, Shops and show rooms, Sports facilities, Warehouses, Arts and amusements, Day centres; hostels and nursing homes, Education, Agricultural; farm and garden shops, Emergency services
Local area benefits	• Lower running costs for public services and improved comfort in libraries, leisure centres and community hubs, with cleaner air in AQMA hot-spots. • Local jobs and skills in retrofit and heat pumps, plus greater energy resilience through on-site generation and demand flexibility.

¹The London Borough of Brent Climate & Ecological Emergency Strategy 2021–2030 (Appendix A), page 21

Heat Network focused Priority Project

3

Decarbonising heat is a critical priority for the London Borough of Brent’s Local Area Energy Plan, as gas heating remains the largest single source of emissions in the borough. A significant portion of the London Borough of Brent’s greenhouse gas emissions come from energy used to heat and power buildings.

Scale and impact

- Modelling indicates that around 3,300,000 m² will need heat upgrades with ~900,000 m² of non-domestic floor area recommended for connection to a heat network. Heat networks are the most effective solution in high-density, mixed-use LSOAs.
- System benefit: Sequencing heat networks with electrification of heat sources (large heat pumps), integration of local renewables and thermal storage, and interconnection around council anchor loads delivers the least-cost pathway to net zero by displacing gas use and enabling flexibility.

Building on existing activity

The London Borough of Brent’s existing heat network activity evidences a strong foundation for scaling delivery de-risking and accelerating connections as opportunities arise. The council is already exploring innovative approaches to heat network delivery such as the utilisation of waste heat from the Pure Data Centre to supply a low carbon network in Staples Corner

In South Kilburn, an open procurement is underway to appoint a contractor to design and build a low carbon ASHP led heat network.

In line with LAEP, the council should design for future interconnection, thermal storage, and flexibility to maximise carbon savings and affordability.

Wembley Park contains a mature network, operated by Metropolitan and is pursuing a Pathway to Zero Carbon. The council should agree a staged decarbonisation plan with clear carbon/affordability milestones and prioritise connecting nearby council assets and new housing to strengthen coverage and resilience.

In Kenton, a feasibility study should look to connect council assets, creating future resilience and reducing grid pressures.

Utilising council owned assets to deliver wider system benefits

With direct control over its estate, the Council is well-placed to lead on delivering low-carbon heat networks. As reliance on individual gas boilers is reduced and exposure to volatile gas prices declines, heat networks deliver:

- Significant and durable carbon savings across connected buildings
- Stable and predictable heat costs for residents and businesses
- Health and air-quality benefits through the removal of combustion from homes
- System-wide efficiencies and flexibility, including integration with thermal storage and future low-carbon heat sources

Expansion of heat network around the London Borough of Brents council owned assets

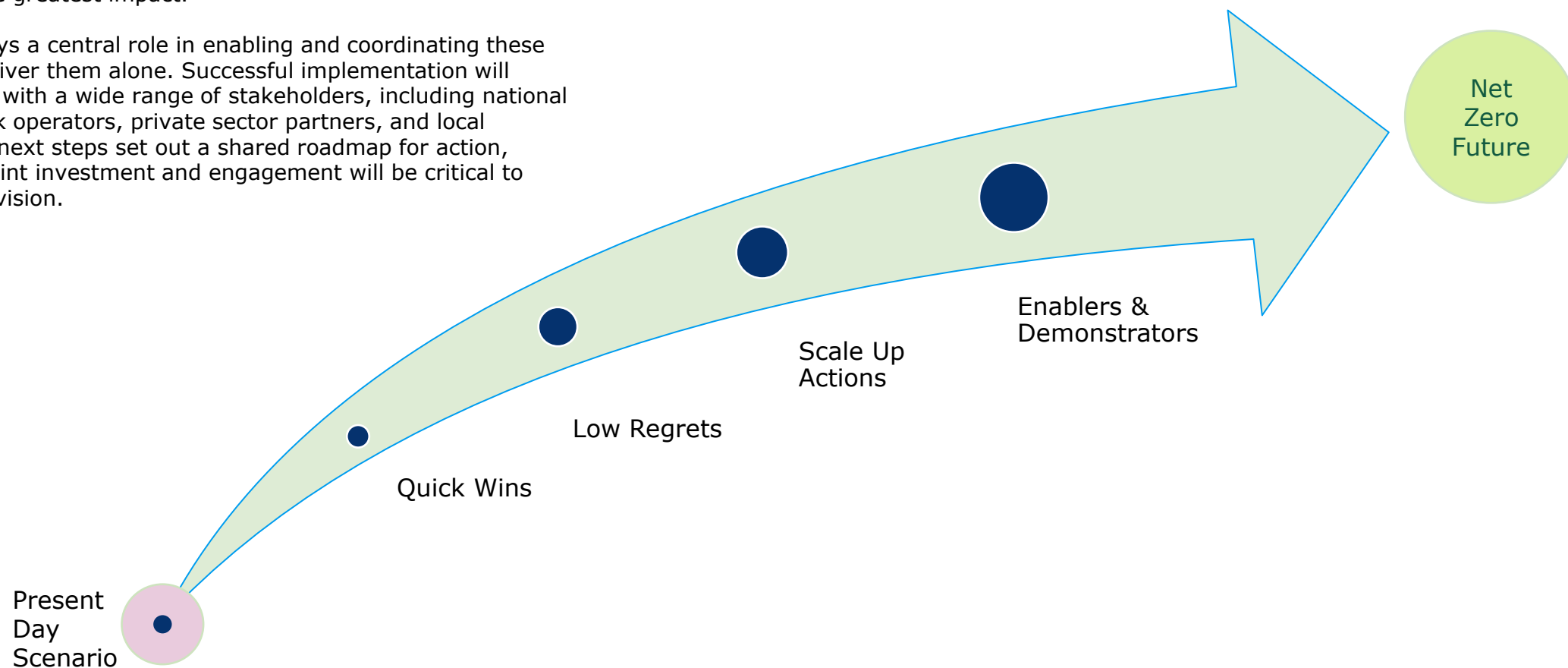
Project Description: Expand and interconnect low-carbon heat networks around council assets in Growth Areas (Wembley Park and South Kilburn), using anchor loads to serve nearby council housing and heat network zones to improve network viability. Design for future integration with flexibility and local renewables, in line with the London Borough of Brent’s decentralised energy and air-quality goals.

LSOA* / (Ward)	E01000568 (Kenton), E01000615 (Wembley Park), E01033942 (Wembley Park), E01000545 (Kilburn)
Square Meters in target LSOAs	Council owned properties: ~10 Non-domestic floor area modelled to connect to a heat network: 464,565 m ²
Archetypes included	Education, Day centres, hostels and nursing homes, Offices and conference centres, Shops and show rooms, Hospitality, Sports facilities Arts and amusements, Factories and workshops, Health centres and hospitals, Warehouses
Local area benefits	• Air-quality improvements in AQ Focus Areas (NO₂/PPM) • Delivers decentralised energy consistent with the London Borough of Brent’s strategy • Enables future integration of local solar/thermal storage and flexibility • Prepares estates for net-zero heat without overloading the local electricity grid

Next Steps

This section outlines the priority actions identified through the Local Area Energy Plan pathways, providing clear direction on how to sequence and resource delivery for the transition to a net zero energy system. The Local Area Energy Plan acts as an evidence-based framework to guide decision-making, helping the council and partners prioritise investment and effort where it will have the greatest impact.

While the council plays a central role in enabling and coordinating these actions, it cannot deliver them alone. Successful implementation will require collaboration with a wide range of stakeholders, including national government, network operators, private sector partners, and local communities. These next steps set out a shared roadmap for action, highlighting where joint investment and engagement will be critical to achieving the plan's vision.



Possible Actions [1/2]

Delivery Stream	Immediate (0–2 yrs)	Medium (3–5 yrs)	Long-Term (6+ yrs)	Lead for immediate term actions	Partners for delivery of long-term actions
Domestic Retrofit	Home Energy Advice, building on and continuing the London Borough of Brent Well and Warm Energy Advice Scheme Council owned property retrofit	Skills and supply chain development Retrofit pilot in conservation areas in south-east Brent	Street-by-street deep retrofit integrated with heat decarbonisation technologies and PV deployment. Integrate with ASHP/heat networks and local microgrids to cut winter peaks and bills	London Borough of Brent Council	Housing Associations; DESNZ; Community Energy Groups; Colleges/Training Providers; DNOs; Approved Contractors
Domestic Electrification of Heat	Activate/expand heat networks in Growth Areas: Wembley Park, South Kilburn and Staples Corner; review where heat network zones could facilitate network expansion. Early DNO capacity checks (South Brent pinch-points).	ASHP pilots and early cohorts in high-potential suburban LSOAs (north/north-west: Kenton, Preston, Fryent, Queensbury/Barnhill) Smart controls and tariff optimisation	Expand ASHP programme (clustered installs, bulk procurement); integrate hot-water storage and flexibility.	London Borough of Brent Council	GLA, DNOs, Housing Associations, Heat Network Developers
Non-Domestic Electrification of Heat	Council non-domestic building estate retrofits: fabric/glazing, ASHP/GSHP where viable	Operate/extend heat networks to public estates; connect hospitals/universities where feasible. Support commercial buildings to switch to low-carbon heat via frameworks/PPAs.	District heat and private-wire microgrids for industrial/retail estates;	London Borough of Brent Council	Businesses, DNOs, Heat Network Developers

Possible Actions [2/2]

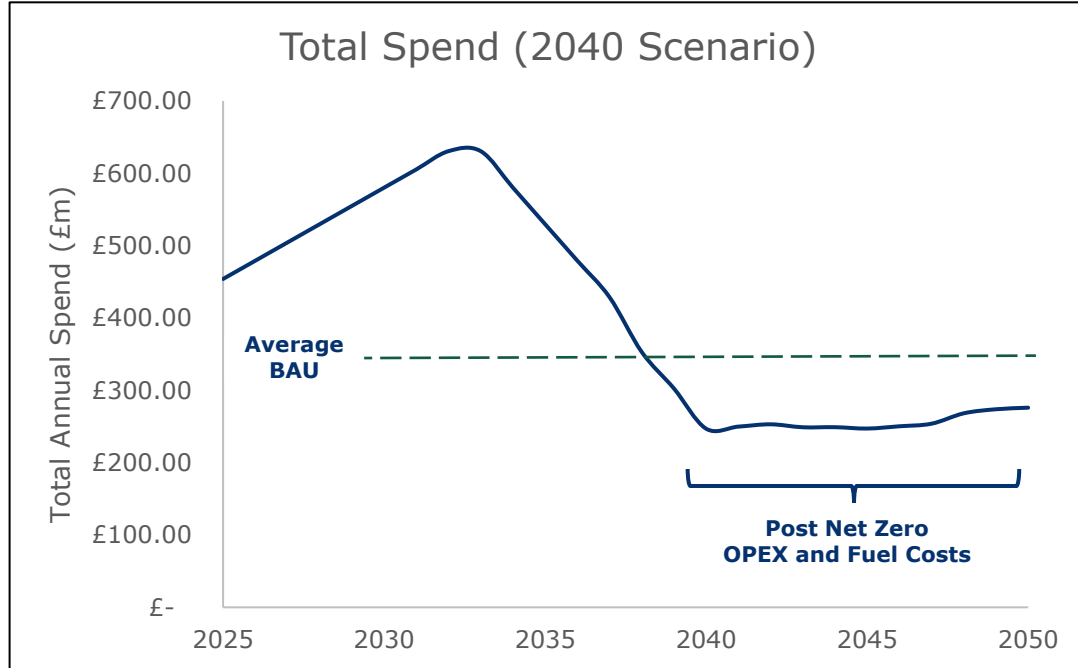
Delivery stream	Immediate (0–2 yrs)	Medium (3–5 yrs)	Long-Term (6+ yrs)	Lead for immediate term actions	Partners to facilitate delivery of long-term actions
EV Infrastructure	Install lamp-column/on-street chargers in high-need LSOAs and dense streets	Scale rapid hubs on corridors and taxi/fleet locations Destination charging in town centres; rapid hubs on key routes (A5/North Circular, Wembley) Prioritise AQ Focus Areas to cut NO₂/PM hotspots	Integrate solar canopies + batteries and local microgrid Explore V2G/V2V integration	London Borough of Brent Council	TfL, Private Operators, Energy Networks
Renewable Generation (Solar PV)	Install PV + batteries on schools/public estate Support local solar cooperative	PV-ready roof replacements on council stock pair PV with heat-pump sites and EV hubs	Integrate PV with heat electrification and EV hubs Expand cooperative models for private homes and businesses	London Borough of Brent Council	Community Energy Groups, Installers, Businesses
Governance & Policy	Update planning/Supplementary Guidance Solar Local Development Order Data-sharing MoUs with UKPN/SEN	ASHP planning guidance Joint lobbying to GLA/DESNZ/Ofgem on grid connection queue reform	Review and update policies Advocate for national reforms on planning, pricing, and data sharing Maintained long term funding streams	London Borough of Brent Council	GLA, DESNZ, Ofgem, National Government

Route to Net Zero

06

This section outlines the Borough's pathway to net zero, drawing on modelled emissions trajectories and indicative transition steps. It summarises the scale and sequencing of change required across buildings, transport, and energy systems, and highlights the key actions and enabling conditions needed.

Net Zero [2040]



Total spend includes CAPEX, OPEX, and fuel costs¹.

2040 Scenario: A total spend of **£10.5 billion** is needed to achieve net zero in the London Borough of Brent by 2040 between the years 2025 – 2050.

BAU Scenario²: A total spend of **£8.6 billion** to maintain the current energy system between the years 2025 – 2050.

¹Additional detail on costing is included in the Technical Annex.

²BAU Scenario assumes no further decarbonisation occurs beyond what is already complete or planned. The grid still decarbonises over time according to the green book. This scenario is included to understand the true cost of decarbonisation – i.e. what is the additional cost over the status quo

DOMESTIC BUILDINGS

46,300 (28%) properties to receive wall insulation, 2,100 (1%) properties to receive double or triple glazing, and 55,400 (34%) properties to receive improvements to loft installation.

DOMESTIC HEATING

114,715 (70%) properties to install a heat pump, electric storage heating, or connect to a heat network.

NON-DOMESTIC HEATING

3,300,000 m² of non-domestic space to install a heat pump or be connected to a heat network.

VEHICLES

By 2040, all vehicles are expected to be EVs with a 10% modal shift towards other means of transport.

ELECTRICITY

By 2040, electricity demand is estimated to be ~1,733 GWh.

Pathway Delivery Streams

Reaching Net Zero is complex and will involve collaboration and strategic planning. Breaking the pathway into clear delivery streams helps focus action on the areas that matter most, like homes, heating, transport, and governance. Each stream tackles a specific challenge and opportunity, making it easier to plan, coordinate, and measure progress.

- 1) Retrofit:** This stream focuses on improving the energy efficiency of existing buildings through fabric upgrades such as insulation and windows. Heating system improvements and the integration of renewable technologies like solar panels are likely to be delivered alongside these measures, though they are quantified separately for clarity within the Local Area Energy Plan. The overall aim is to reduce energy demand, lower bills, and cut carbon emissions.
- 1) Electrification of Heat:** Replacing fossil fuel-based heating (like gas boilers) with low-carbon alternatives such as heat pumps or district heat networks. This shift supports decarbonisation and requires careful planning to manage electricity grid capacity.
- 2) Solar PV:** Installing solar photovoltaic panels on suitable rooftops or sites to generate clean electricity locally. This helps reduce reliance on fossil fuels and lowers energy costs for homes, businesses, and public buildings.
- 3) EV Infrastructure Roll-out:** Expanding electric vehicle charging points in homes, streets, and public spaces to support the transition to zero-emission transport. This includes planning for future demand and coordinating with energy networks to avoid grid constraints.
- 4) Governance & Policy:** Creating strong local leadership, clear planning policies, and robust data systems to guide delivery. This includes embedding climate goals in local plans, setting building standards, securing funding or financing, and engaging communities in decision-making.

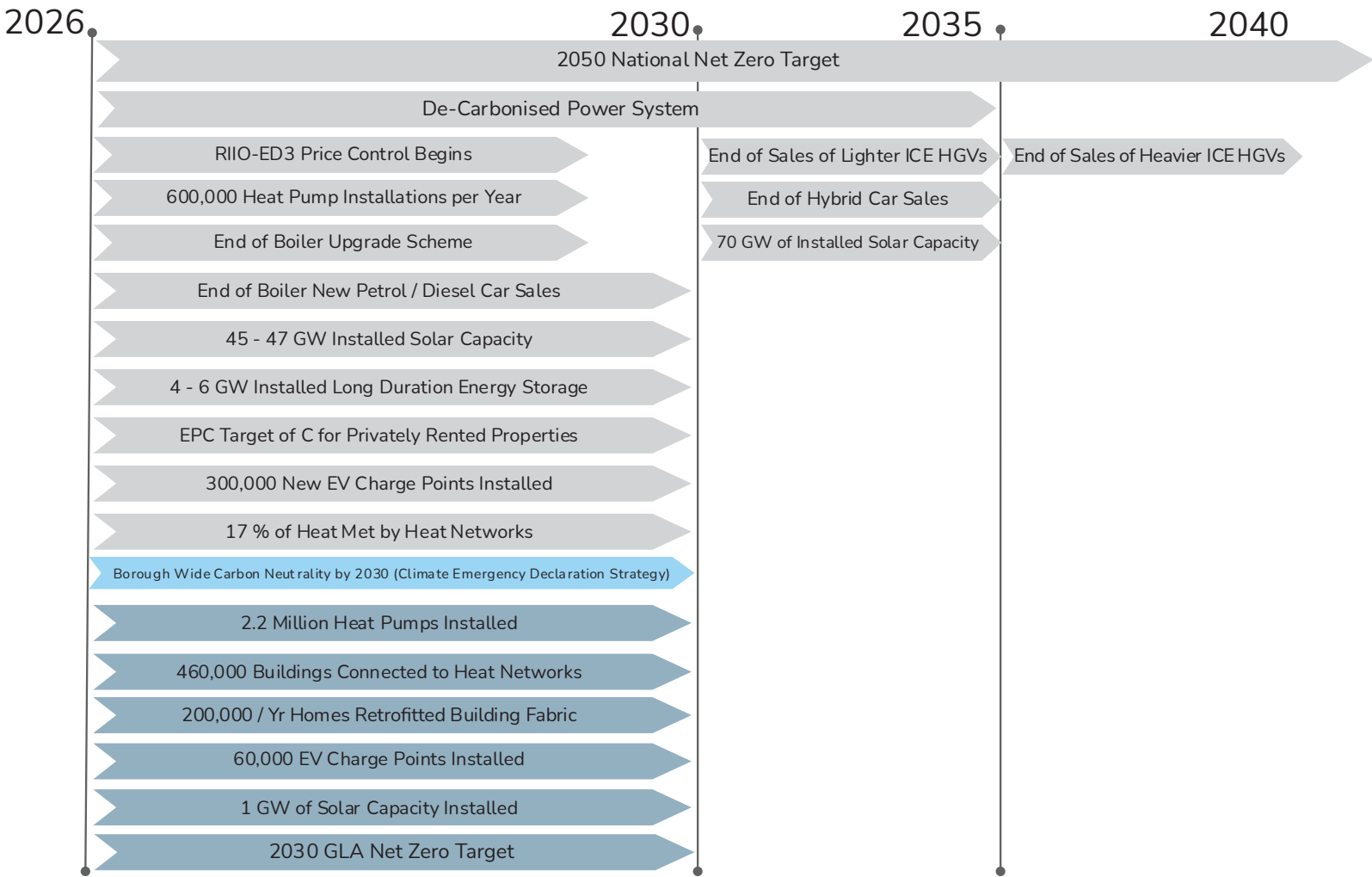
While delivery streams are presented individually, combining elements across streams can create integrated delivery packages that reduce costs and make projects more attractive for funding and financing. For example, coordinating retrofit measures with low-carbon heating upgrades and solar PV installation can deliver greater bill savings and improve overall system efficiency. This whole-system approach aligns with the principles of Local Area Energy Planning, ensuring that interventions are not developed in isolation but as part of a coordinated pathway to net zero

National and London Net Zero Targets

Policy Drivers Shaping the Local Net Zero Pathway

This timeline sets out the key national, London-wide and borough-level policy milestones and targets that influence the borough’s pathway to net zero. It highlights major commitments across heat, buildings, transport and energy supply, showing when regulatory changes, phase-outs and deployment targets are expected to occur. Together, these milestones define the wider policy environment within which the Local Area Energy Plan operates.

By mapping these commitments along the pathway, the timeline also shows the national and regional dependencies that local delivery relies on—such as the transition away from fossil-fuel vehicles, the scale-up of heat pumps and heat networks, the expansion of renewable generation and progress towards a decarbonised electricity system. This provides essential context for the borough’s local pathway and ensures it remains aligned with wider policy direction.



➤ National Policy Regulations ➤ Local Policy Regulations ➤ Borough Targets

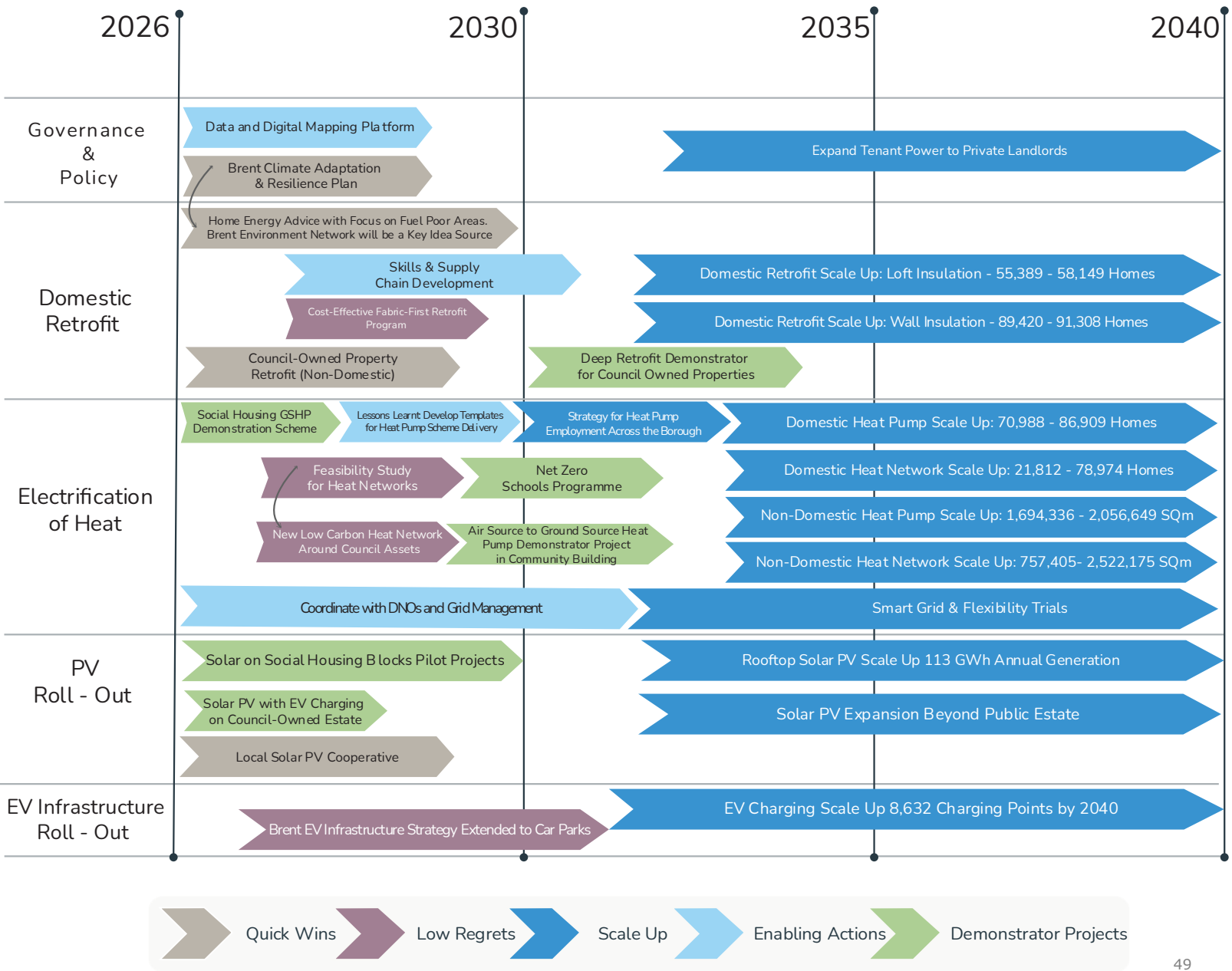
The London Borough of Brent's Pathway to Net Zero

Phased Approach to Net Zero Delivery

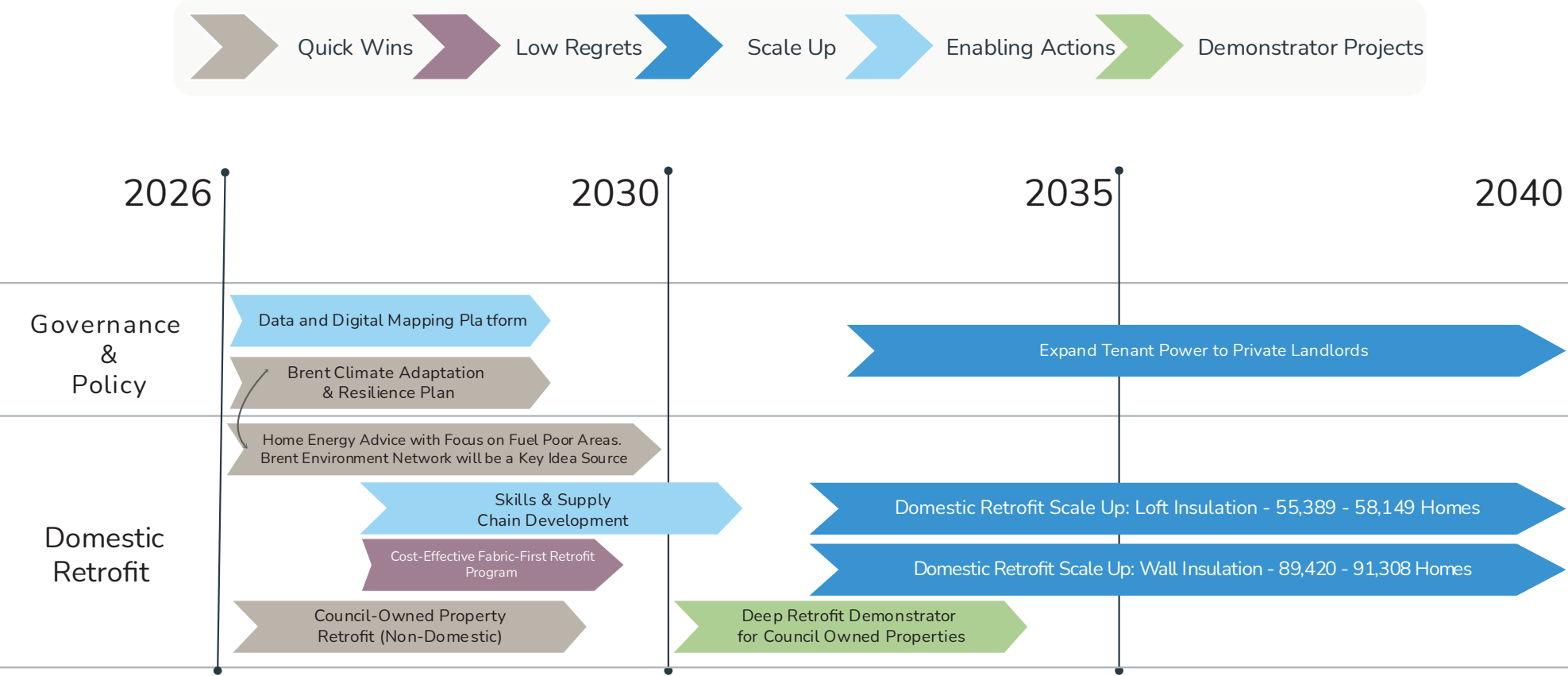
The pathway sets out the sequencing of activity required across the borough to progress towards net zero, showing where early action is needed and how initial projects can build momentum for larger-scale delivery in later years. It illustrates how near-term enabling actions—such as local policy development, early retrofit initiatives, feasibility work and pilot schemes—create the foundations for wider rollout across buildings, heat, power and transport.

The pathway also highlights how delivery scales over time, with the values shown towards the end of the timeline indicating the remaining level of deployment required after early actions are completed. This helps illustrate the ongoing scale of change the borough will need to plan for beyond the first phase of delivery.

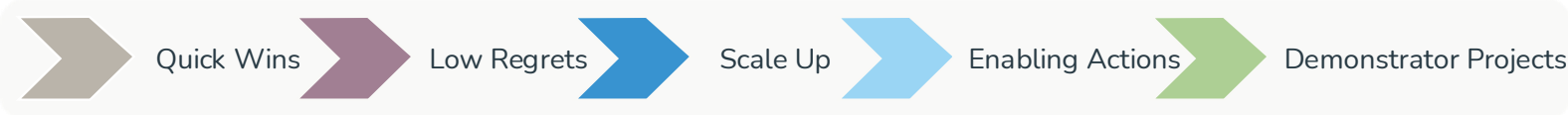
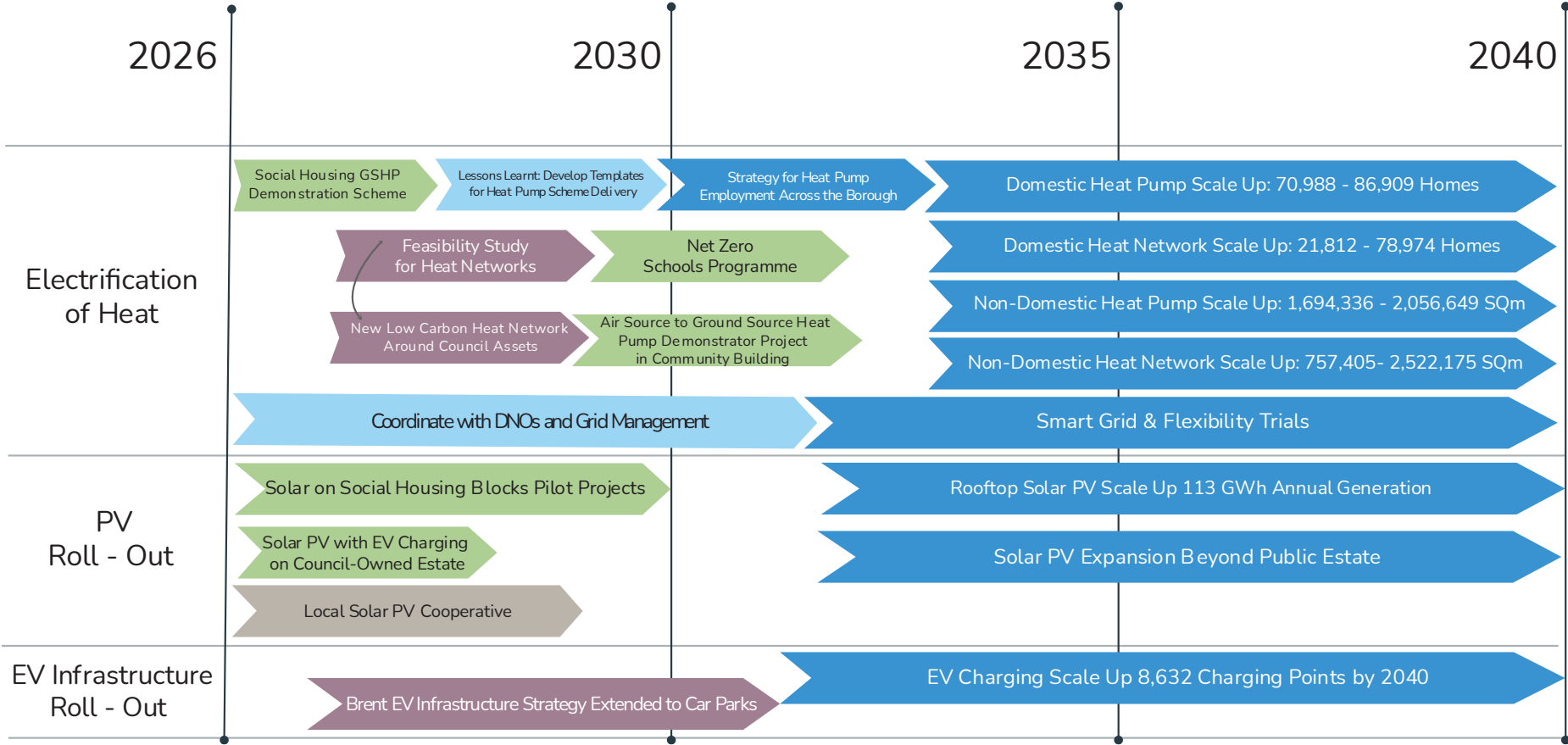
As with other Local Area Energy Plans, this pathway should be viewed as a live, evolving plan. It will need to be reviewed and updated regularly to reflect changes in policy, technology, market conditions and local delivery progress, ensuring that it remains aligned with what is happening on the ground and continues to support an effective and evidence-led transition.



The London Borough of Brent's Pathway to Net Zero [1/2]



The London Borough of Brent's Pathway to Net Zero [2/2]



Modelling Results & Scale of Change

07

This section presents sector-by-sector decarbonisation pathways, summarising the scale of change, priority measures, and technologies needed across buildings, heat, transport, electricity systems, and local energy generation. It highlights spatial needs and indicative deployment levels to show how each sector can support the Borough's net zero transition.

Domestic Retrofit | Overview

A significant proportion of dwellings across the London Borough of Brent are recommended for energy efficiency retrofit measures such as insulation, glazing, and roof insulation. These upgrades will reduce energy demand and improve the building’s readiness for installation of efficient low carbon heating systems such a heat pumps or heat networks. This need is consistent across all ambition levels with earlier net zero targets requiring more rapid treatment of homes.

Modelling indicates that **at least 55,400 dwellings¹ (approx. 34% of the borough’s housing stock)** will receive **some** level of upgrade by 2040.

Retrofit upgrades are split into two categories:

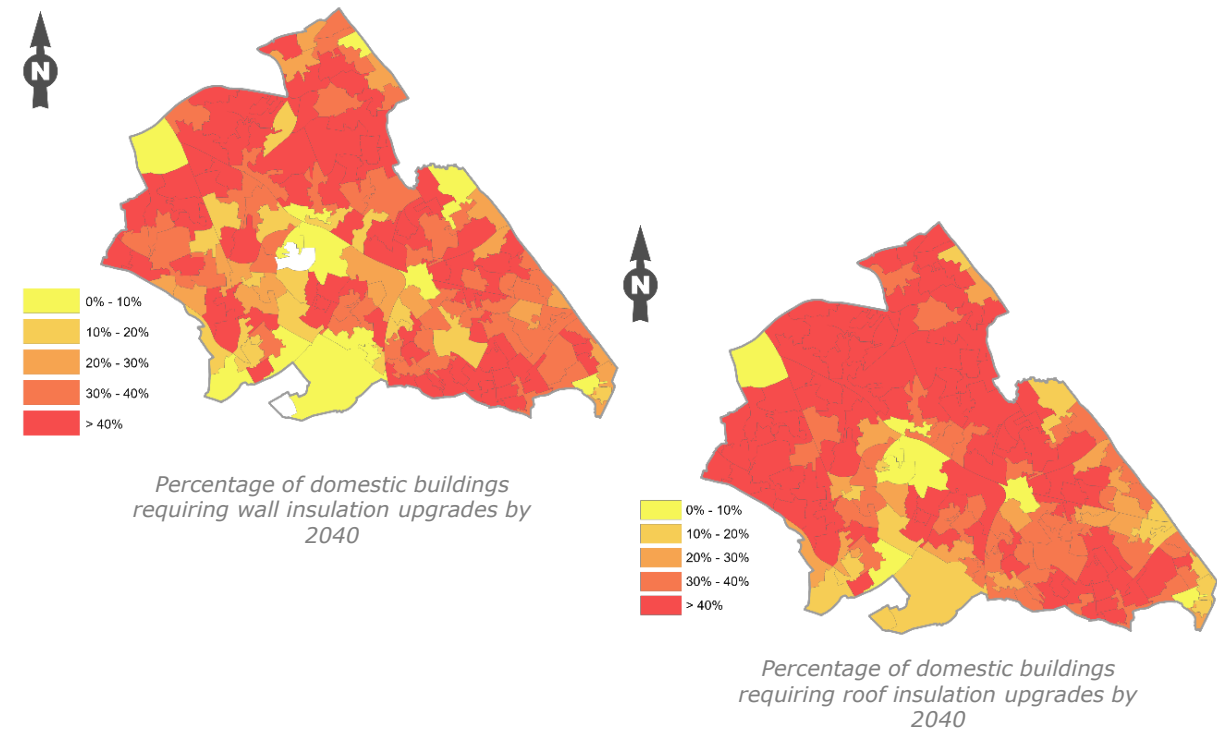
- **Shallow upgrades:** loft and cavity wall insulation and double glazing.
- **Deep upgrades:** external or internal wall insulation and triple glazing.

Prioritising delivery in areas with high fuel poverty will maximise bill savings and health benefits which is a key objective of the London Borough of Brent’s Climate and Ecological Emergency Strategy. Opportunity areas, where there is scale or a high amount of shallow retrofit measures required are summarised on the table to the right calling for early interventions. Areas with significant new-build development must be built to the highest energy efficiency standards supported by local planning policy.

Local Area Benefits

- Reduced energy bills and fuel poverty reduction.
- Lower carbon emissions and reduced strain on local energy networks.
- Health benefits from warmer, drier homes.
- Local job creation and skills development in retrofit trades.
- Improved air quality and health benefits

While this plan outlines the lowest-cost pathway to a net zero energy system, additional deep fabric upgrades may be desirable to meet other local priorities, particularly fuel poverty alleviation, health improvements, and job creation. The London Borough of Brent may wish to consider targeted delivery programmes to further deliver co-benefits.

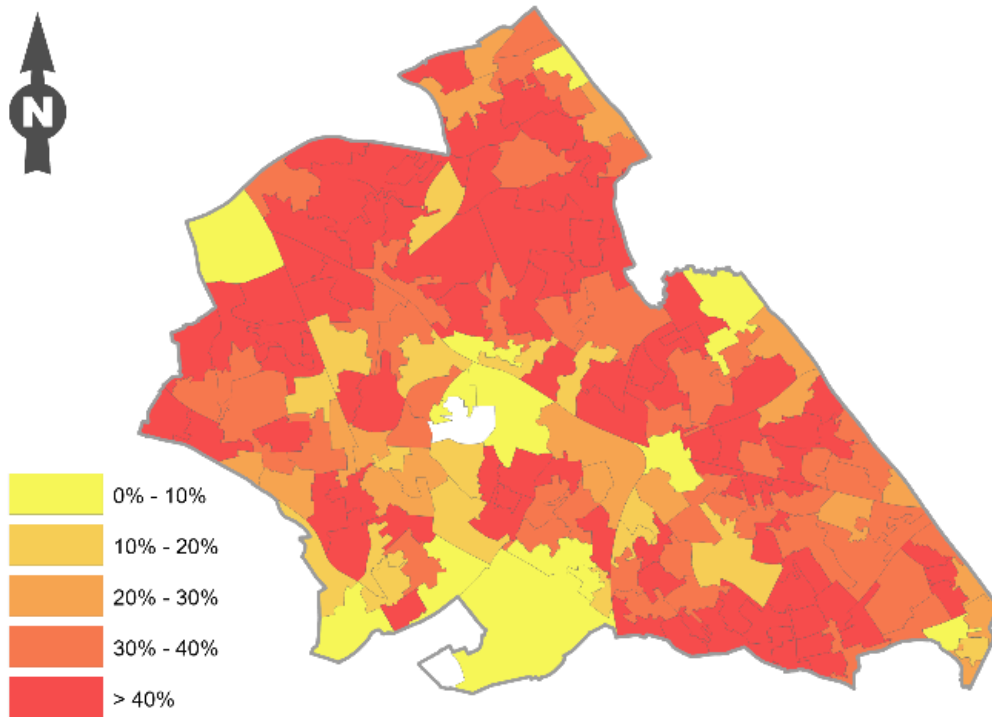


LSOA	Proportion of dwellings in Fuel Poverty	Dwelling Count ²	Number of properties receiving fabric upgrades		
			Wall Insulation	Loft Insulation	Double/ Triple Glazing
E01033463 (Kenton)	14%	877	465	602	3
E01000583 (Queens Park)	8%	1076	420	394	57
E01000523 (Harlesden & Kensal Green)	14%	973	431	405	20
Borough Total	2%	163,993	46,300	55,400	2,100

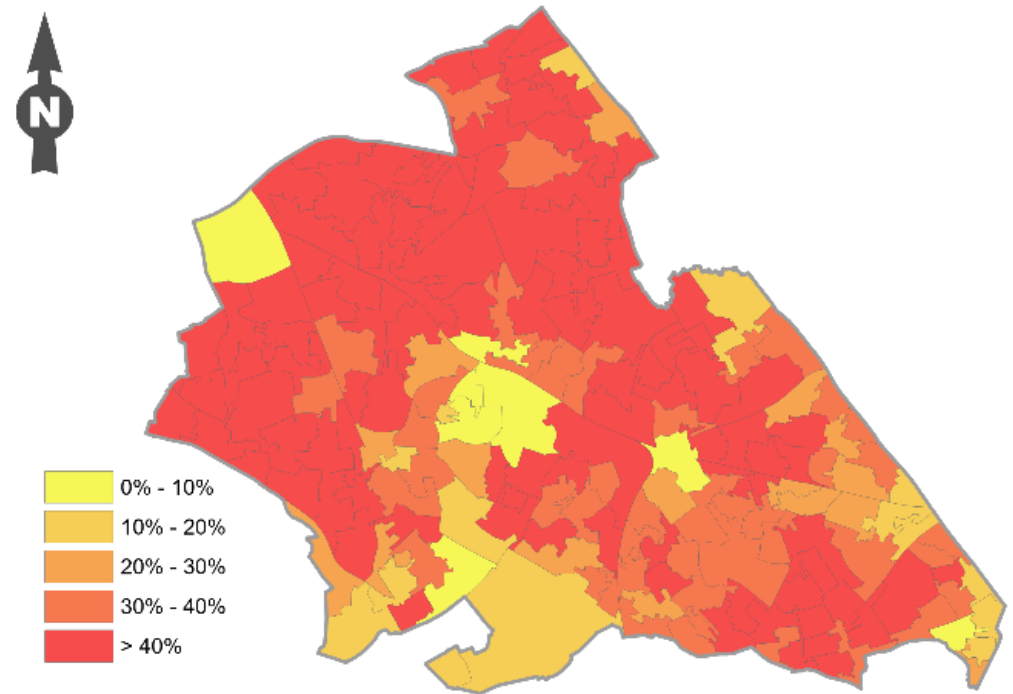
¹The Modelled results are reported as aggregate measure totals at LSOA level rather than for individual buildings. The results do not indicate whether multiple measures apply to the same property, and the total fabric upgrade figure is therefore shown as a minimum ("at least") estimate.

²Values were taken from Energy Systems Catapult modelling. Figures include both existing buildings and planned new developments up to 2050. In the modelling approach used, this field represents the "starting state" of the future building stock. New developments are only included in cost and carbon calculations from the point at which they are built.

Domestic Retrofit | Overview



Percentage of domestic buildings requiring wall insulation upgrades by 2040



Percentage of domestic buildings requiring roof insulation upgrades by 2040

Domestic Retrofit | Scale of Change

Scale of Intervention

- 46,300 (28%) for wall insulation upgrades, estimated CAPEX £485 million¹
- 55,400 (34%) for loft insulation upgrades, estimated CAPEX £55 million
- 2,100 (1%) for glazing upgrades, estimated CAPEX £18 million

Wall Upgrades:

- 9,000 (5%) properties recommended for cavity insulated upgrades, estimated CAPEX £6 million
- 37,300 (22%) properties recommended for solid wall installation, estimated CAPEX £476 million

Priority delivery zones identified based on fuel poverty and housing typology.

Risks

- Conservation areas will require tailored solutions to balance carbon reduction with heritage requirements.
- Ensuring quality and standards of works is critical to deliver full benefits of comfort gains, cost savings, and emissions reductions. Limited availability of skilled contractors and materials could delay delivery and increase costs.
- Low participation or resistance from residents may impact uptake and delivery timelines.
- Securing sufficient funding and ensuring affordability for residents could be challenging, particularly for large-scale interventions.

Delivery Priorities

- Fuel Poverty Zones: Target early delivery in areas with high deprivation to maximise health and cost benefits.
- Street-by-Street Approach: For terraces and solid wall properties, coordinated delivery will reduce costs and disruption.
- Integration with Heat Decarbonisation: Complete fabric upgrades before or alongside heat pump or heat network installation to minimise system size and cost.
- Delivery programmes: Ensure programmes continue identifying the key local archetypes of dwellings to support supply chain development and information provision to residents.

¹To estimate fabric upgrade CAPEX, the number of properties assumed to require fabric upgrades, was multiplied by measure costs. Both values were taken from Energy Systems Catapult modelling. Additional detail on costing is included in the Technical Annex.



Domestic Retrofit | Pathway Components [1/2]

Decarbonising homes is a critical component of the London Borough of Brent's Local Area Energy Plan, as heating and powering buildings account for the majority of borough emissions. The domestic retrofit pathway prioritises a fabric-first approach, improving insulation and airtightness to reduce energy demand. In practice, these measures should be coordinated with low-carbon heating upgrades and renewable technologies such as solar PV to maximise efficiency and deliver greater bill savings. This integrated, whole-system approach reflects the principles of Local Area Energy Planning, ensuring interventions are sequenced and complementary rather than isolated. Alongside technical measures, effective resident engagement will be essential to achieve uptake and deliver warmer, healthier, and more affordable homes.

Home Energy Advice

- The London Borough of Brent Well and Warm program is a free service led by the London Borough of Brent Council and Groundwork's Green Doctors for vulnerable residents struggling with energy bills and keeping their homes warm. Experts provide home visits, free energy-saving measures, advice on bills, and support with debt relief.
- Coordinate with the London Borough of Brent Environment Network, which supports residents and community groups to take climate action by providing practical advice and resources on energy efficiency and sustainability. This includes guidance on reducing energy use at home, connecting people to local initiatives, and promoting measures such as LED lighting, draught-proofing, and other low-cost improvements.
- Prioritise fuel-poor households and vulnerable residents (e.g., older people, families with young children, those with health conditions).
- Link advice to funding schemes like the Boiler Upgrade Scheme and Great British Insulation Scheme.

Skills & Supply Chain Development

- Expand the Green Skills Centre of Excellence as a partnership between the London Borough of Brent Council and College of North London to include accredited courses in PAS 2035-compliant retrofit.
- Support SMEs and local contractors to build capacity, following best practice from other Local Area Energy Plans that integrate social value into procurement.



Quick
Wins

Project deployed in the next year for a short duration. Should face few barriers for implementation.



Enabling
Actions

Could serve to enable long-term activities by developing the conditions to progress.

Domestic Retrofit | Pathway Components [2/2]

Cost-Effective Fabric-First Retrofit Programme

- Begin with council-owned housing and fuel-poor homes.
- Focus on shallow retrofit measures (insulation, glazing, ventilation) and integrate clean heat options where feasible.
- Align delivery with existing asset management strategies and plan (e.g., Housing Asset Management Strategy) using data-driven prioritisation based on energy performance and resident needs. Coordinate with heating system replacement cycles to minimise disruption.

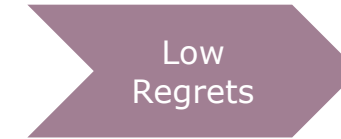
Deep Retrofit Demonstrator

- Deliver a pilot for external wall insulation (EWI) on a small cluster of council-owned properties in a fuel poor area.

Note: External Wall Insulation (EWI) has sometimes proven challenging to deliver cost-effectively, so this pilot could focus on capturing lessons learned and consider exploring alternative approaches, such as whole-house retrofit models like Energiesprong.

Non-Domestic council-owned property retrofit

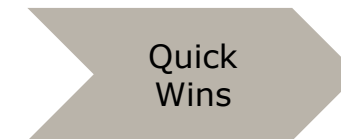
- Begin with council-owned non-domestic buildings, prioritising those with the highest energy demand.
- Look at fabric-first measures (insulation, glazing, airtightness) and optimisation of building controls; integrate clean heat options such as air-source heat pumps and connection to heat networks where appropriate, and rooftop solar PV with storage where feasible.
- Align delivery with the London Borough of Brent's Climate & Ecological Emergency Strategy and existing property asset management plans, using data-driven prioritisation based on building performance and operational needs. Coordinate with planned maintenance cycles to minimise disruption.



Project could occur in the near term but should come accompanied by Enabling Actions to progress.



Could serve to reduce uncertainty of wider and longer projects by reducing scale.



Project deployed in the next year for a short duration. Should face few barriers for implementation.

Domestic Electrification of Heat | Overview

Decarbonising domestic heating is essential for achieving net zero across the London Borough of Brent. Most homes currently rely on gas boilers, which account for a significant share of local emissions. Transitioning to low-carbon heat sources—such as heat pumps—and implementing heat networks will reduce carbon emissions, improve air quality, lower long-term energy costs, and improve the system’s resilience.

Modelling indicates that **around 114,715** (70%) of the borough’s housing stock) will receive some level of upgrade by 2040, at an estimated cost of **£1.3 billion**.

- **Heat pumps:** Suitable for most houses and low-rise flats, though grid capacity in the area should be considered; an additional 70,988 dwellings are modelled for air source heat pump installation by 2040.
- **Heat networks:** Target high-density areas and clusters of housing for shared heat infrastructure, amounting to an additional 18,377 dwellings modelled for connection to a heat network by 2040.

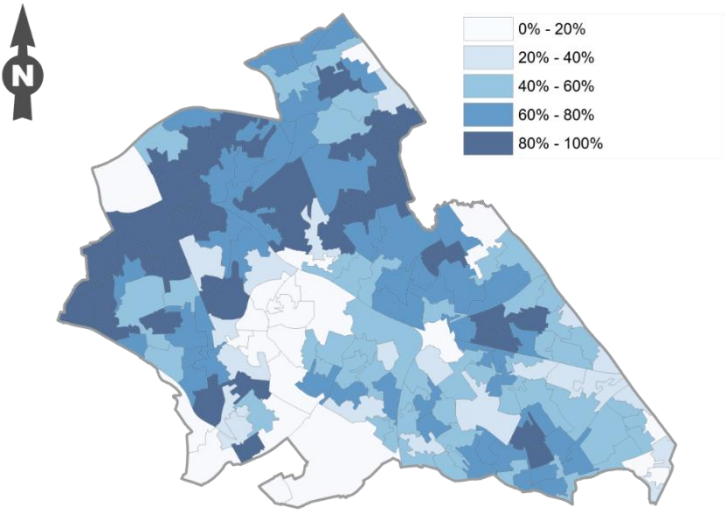
Percentage of dwellings by heating technology by 2040

Heat Network	Air Source Heat Pump	Electric Storage Heating*
13%	52%	34%

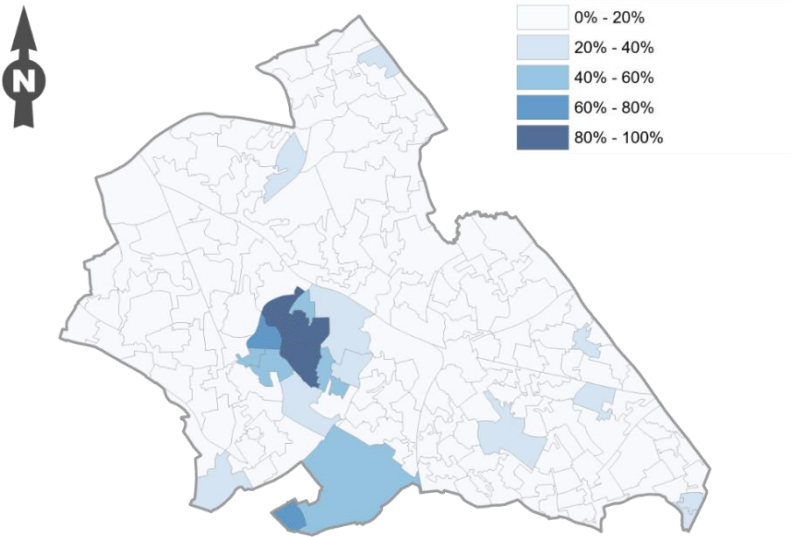
Local Area Benefits

- Significant carbon reduction and improved air quality.
- Lower exposure to volatile gas prices.
- Enhanced comfort and health outcomes for residents.
- Local job creation in heat pump installation

*LAEP modelling assigns heating solutions based on assumed technical feasibility. Flats have predominantly been modelled as using electric heating due to assumptions around space constraints for dwelling-level ASHPs and limited suitability for heat network connections. In practice, flats should be assessed at the building level, where communal systems and/or individual ASHPs may be viable. The modelled electric heating outcomes should therefore be understood as indicative, as electric heating would typically be considered only where building-level solutions are not feasible, taking account of cost considerations.

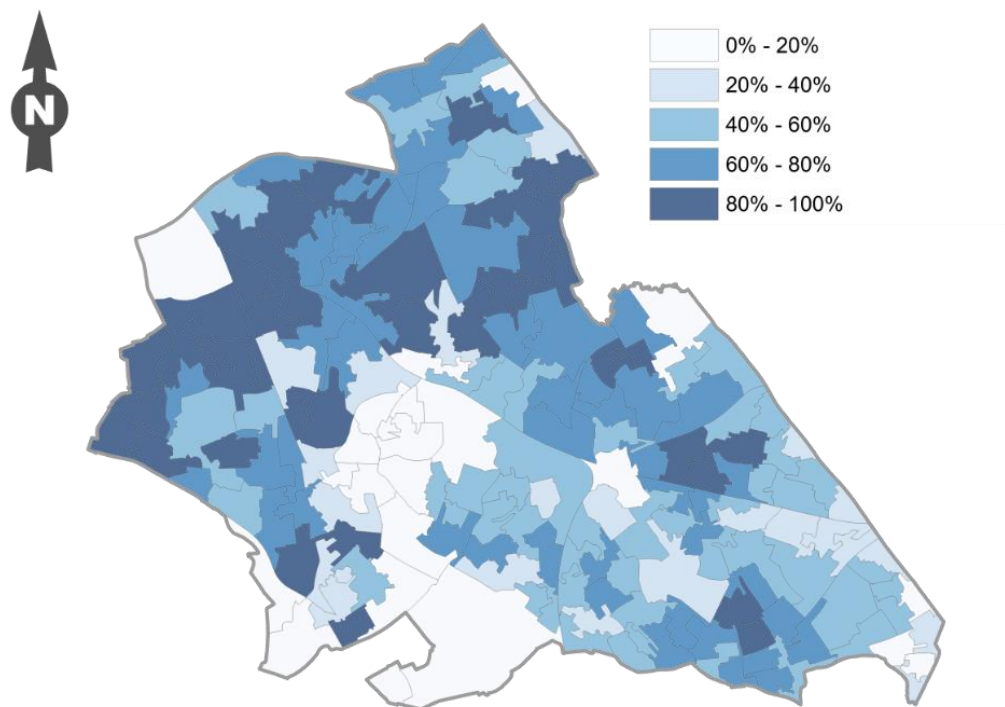


Percentage of properties requiring a heat pump installation by 2040

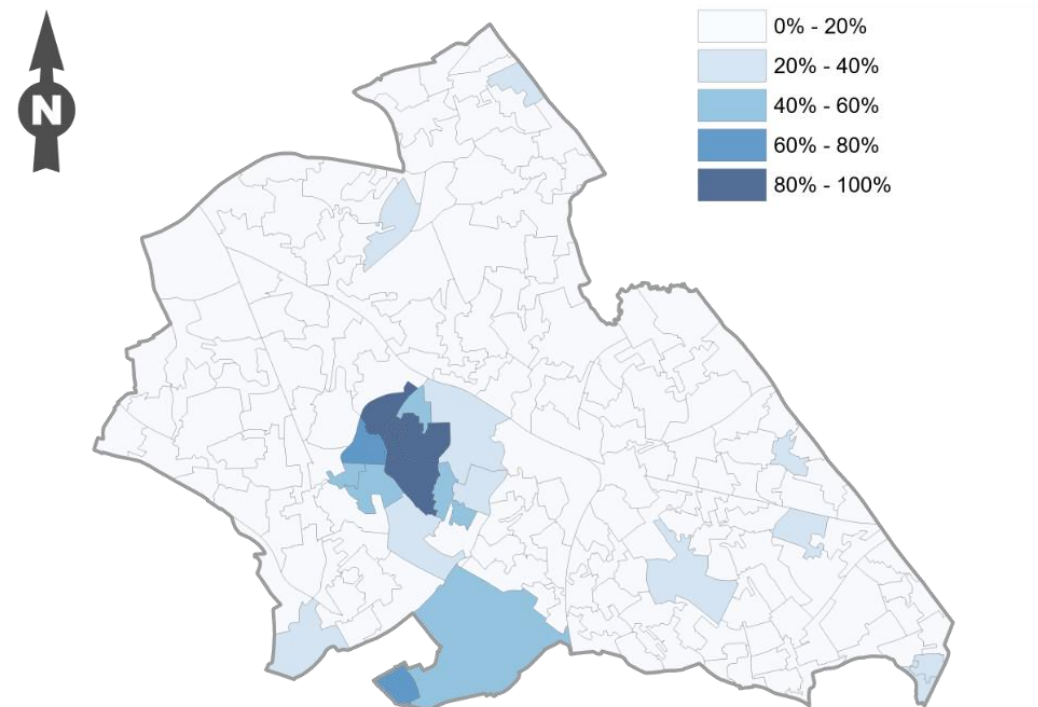


Percentage of properties requiring to connect to a heat network by 2040

Domestic Electrification of Heat | Overview



Percentage of properties requiring a heat pump installation by 2040



Percentage of properties requiring to connect to a heat network by 2040

Domestic Electrification of Heat | Delivery priorities and scale of change

(1) Air Source Heat Pumps

Scale of Intervention

An additional **71,000 (43%)** dwellings are recommended for heat pump installation. By 2040, 52% of total housing stock is modelled to be upgraded to a heat pump.

Estimated capital investment: **£666 to £721 million¹** (across private and public spending)

Priority delivery zones identified based on housing typology suitable for heat pump retrofit and properties which are unlikely to connect to a local district heating network.

Risks (Heat Pumps & Heat Networks)

- Conservation areas require tailored solutions to balance carbon reduction with heritage constraints
- High upfront costs may deter uptake, even with incentives
- Limited installer capacity and skills shortages could delay delivery

LSOAs in the London Borough of Brent with the highest modelled installations of air source heat pumps

LSOA	Proportion of dwellings in Fuel Poverty	LSOA Dwelling Count	Heat Pump Deployment	CAPEX
E01033463 (Kenton)	14.4 %	877	785	£ 8.4 – 9.0M
E01000607 (Sudbury)	16.2 %	702	686	£ 7.0 – 7.6M
E01000523 (Harlesden & Kensal Green)	14.4 %	973	658	£ 5.6 – 6.1M
Total Heat Pump Deployment in Borough			71,000	£ £666 - £721M

¹To estimate ASHP CAPEX, Energy Systems Catapult modelling was used to determine the number of properties assumed to require a heat pump and their breakdown by property type (flat, semi-detached, detached, terraced). Unit cost benchmarks on a £/kW basis were taken from Energy Systems Catapult, while heat pump sizing by property type was based on Ramboll design assumptions informed by previous project experience.

²Estimated CAPEX for domestic heat network connections was taken from Energy Systems Catapult Modelling and includes the cost of the heat interface unit and the cost of the service pipe connecting the property to the heat network.

³Estimated CAPEX for heat network infrastructure was taken from Energy Systems Catapult Modelling and includes heat network infrastructure costs for domestic and non-domestic properties. The CAPEX includes all costs⁶⁰ for infrastructure outside of individual property boundaries such as heat network pipes and energy centre costs.

Domestic Electrification of Heat | Delivery priorities and scale of change

(2) Heat Networks

Scale of Intervention

An additional **18,400** (11%) dwellings are recommended for connection to a heat network. By 2040, 13% of total housing stock is modelled to be upgraded to connect to heat network

Estimated domestic capital investment (e.g. heat interface units): **£79 million²** (largely from private sector).

Estimated capital investment for borough-wide heat network infrastructure: **£473 million³**

Delivery in designated heat network zones could be prioritised to maximise cost and carbon benefits.

- Electrifying heat could raise household energy costs where electricity remains expensive or homes are poorly insulated, increasing fuel-poverty risk.
- Disruption to residents during installation (e.g., noise, temporary heating loss)
- Grid capacity constraints for electrification (e.g., heat pumps)
- Performance risk if systems are not properly designed or operated
- Uncertainty around long-term energy prices and policy support

LSOAs in the London Borough of Brent with the most connections to heat networks

LSOA	Proportion of dwellings in Fuel Poverty	LSOA Dwelling Count	Heat Network Connections	CAPEX for domestic connections (£millions)
E01033942 (Wembley Park)	7.5 %	3,326	3,326	£ 14.3m
E01000615 (Wembley Park)	9.9 %	8,617	2,771	£ 11.9m
E01033940 (Wembley Park)	5.5 %	3,230	1,810	£ 7.8m
Total Heat Network Connections			18,400	£ 79m

¹To estimate ASHP CAPEX, Energy Systems Catapult modelling was used to determine the number of properties assumed to require a heat pump and their breakdown by property type (flat, semi-detached, detached, terraced). Unit cost benchmarks on a £/kW basis were taken from Energy Systems Catapult, while heat pump sizing by property type was based on Ramboll design assumptions informed by previous project experience.

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³Estimated CAPEX for heat network infrastructure was taken from Energy Systems Catapult Modelling and includes heat network infrastructure costs for domestic and non-domestic properties. The CAPEX includes all costs⁶¹ for infrastructure outside of individual property boundaries such as heat network pipes and energy centre costs.

Non-Domestic Electrification of Heat | Overview

Decarbonising heat in non-domestic buildings is a major priority for achieving borough-wide net zero targets. Many of the schools, offices, retail spaces, and community facilities currently rely on gas boilers, which account for a significant share of emissions. Transitioning these buildings to low-carbon heat sources, primarily air source heat pumps and heat networks, will deliver substantial carbon savings, improve air quality, and reduce long-term operating costs.

Initial modelling indicates that **around 3,300,000 m²**. Most buildings will connect to a heat network or install a local heat pump.

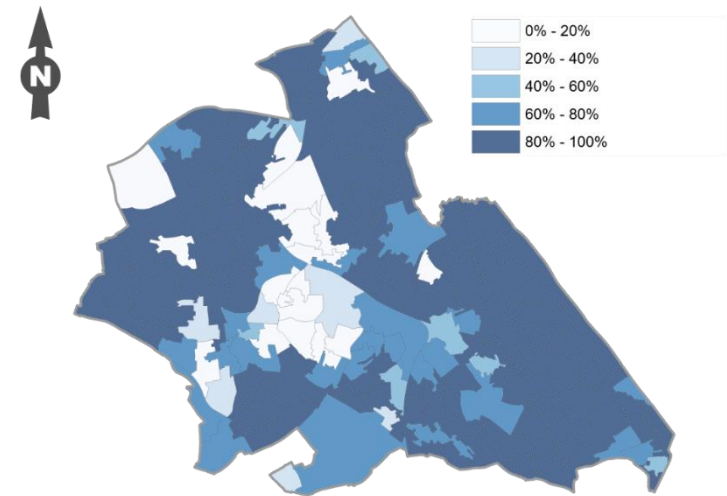
- **Heat pumps:** Commercial size units capable of delivering higher heat output than domestic heat pumps.
- **Heat networks:** Target high-density areas and clusters of housing for shared heat infrastructure.

Percentage of non-domestic floor area by heating technology by 2040

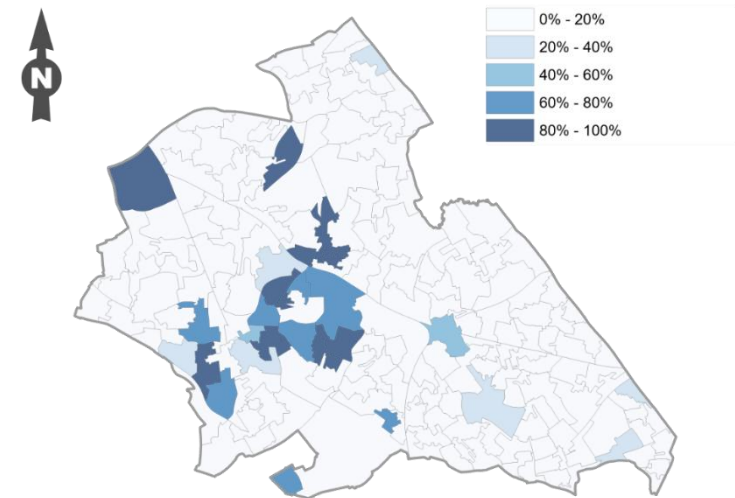
Heat Network	Air Source Heat Pump	Gas and Electric
53%	44%	4%

Local Area Benefits

- Lower heating bills for businesses and public services through efficient systems.
- Significant emissions savings and improved local air quality.
- Reduced exposure to volatile gas prices by switching to electricity and shared heat networks.
- Improved thermal comfort in workplaces and community spaces, supporting health and productivity.
- Creation of skilled roles in heat pump installation, heat network engineering, and maintenance.
- Enable the integration of thermal storage - providing additional resilience to consumer heat supply and potentially enabling access to flexibility markets to reduce the overall price of heat to consumers.

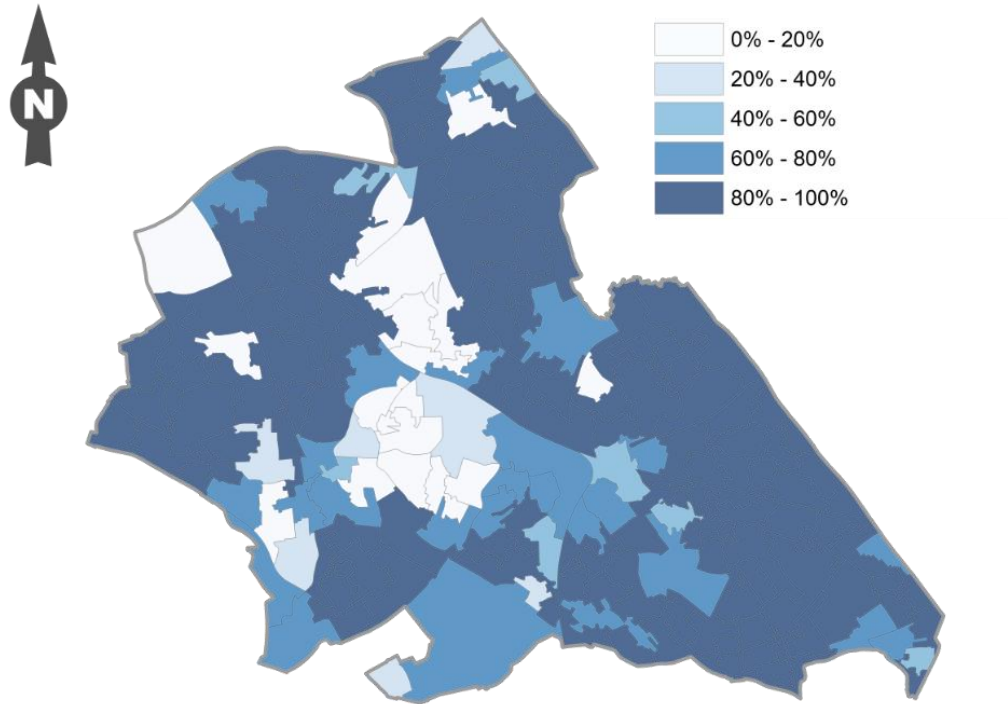


Percentage of non-domestic heat pump deployment required by floor area by 2040

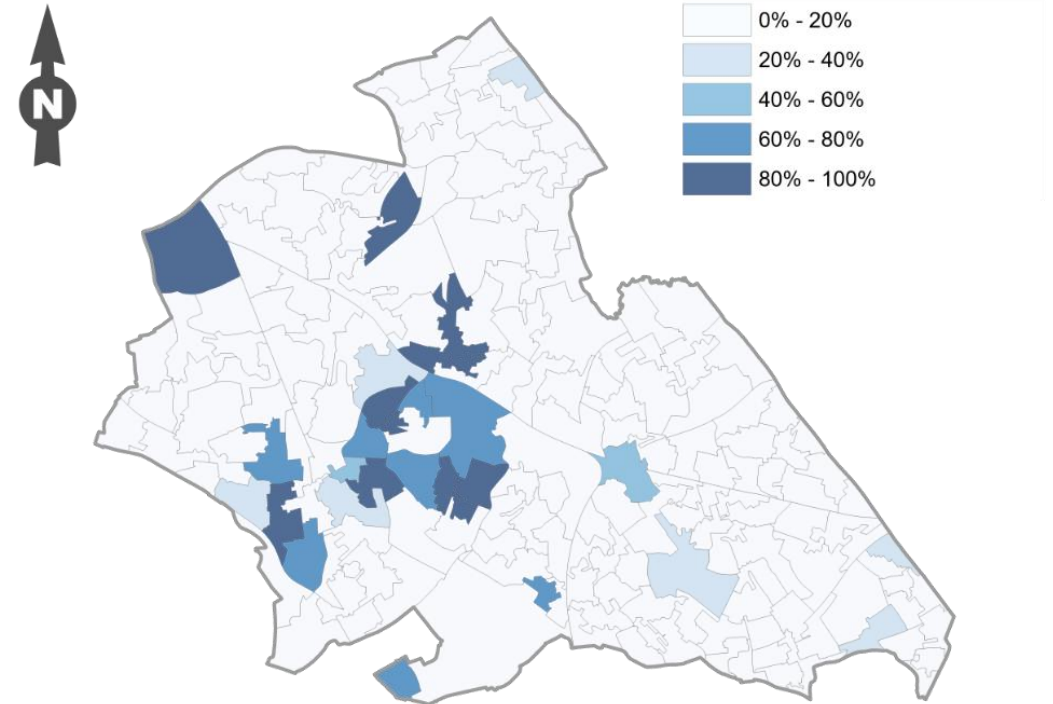


Percentage of non-domestic connection to heat networks required by floor area by 2040

Non-Domestic Electrification of Heat | Overview



Percentage of non-domestic heat pump deployment required by floor area by 2040



Percentage of non-domestic connection to heat networks required by floor area by 2040

Non-Domestic Electrification of Heat | Delivery priorities and scale of change

(1) Air Source Heat Pumps

Scale of Intervention

An additional **2,400,000 m² of non-domestic floor area** is recommended for heat pump installation.

By 2040, 44% of total non-domestic floor area is modelled to be heated by heat pumps.

Priority should be given to areas with no capability of heat network connection.

Top 3 LSOAs in the London Borough of Brent modelled to install non-domestic air source heat pumps

LSOA	Activity	Heat Pump
E01033938 (Stonebridge)	Warehouses	342,200m ²
E01000601 (Stonebridge)	Warehouses	106,600m ²
E01000615 (Kenton)	Miscellaneous	87,200m ²
Borough Total		2,500,000m ²

(2) Heat Networks

Scale of Intervention

An additional **900,000 m² of non-domestic floor area** is recommended for connection to a heat network.

By 2040, 53% of total non-domestic floor area is modelled to be supplied by a heat network.

Estimated capital investment for heat network : **£473million²**.

Priority for near-term action should be given to areas with a high concentration of public buildings and commercial premises.

Top 3 LSOAs in the London Borough of Brent modelled to connect to a heat network

LSOA	Activity	Heat Network
E01000568 (Kenton)	Education	147,400
E01000615 (Kenton)	Warehouses	46,100
E01000484 (Kenton)	Education	34,700
Borough Total		900,000m ²

¹Estimated CAPEX for heat network infrastructure was taken from Energy Systems Catapult Modelling and includes heat network infrastructure costs for domestic and non-domestic properties. The CAPEX includes all costs for infrastructure outside of individual property boundaries such as heat network pipes and energy centre costs.

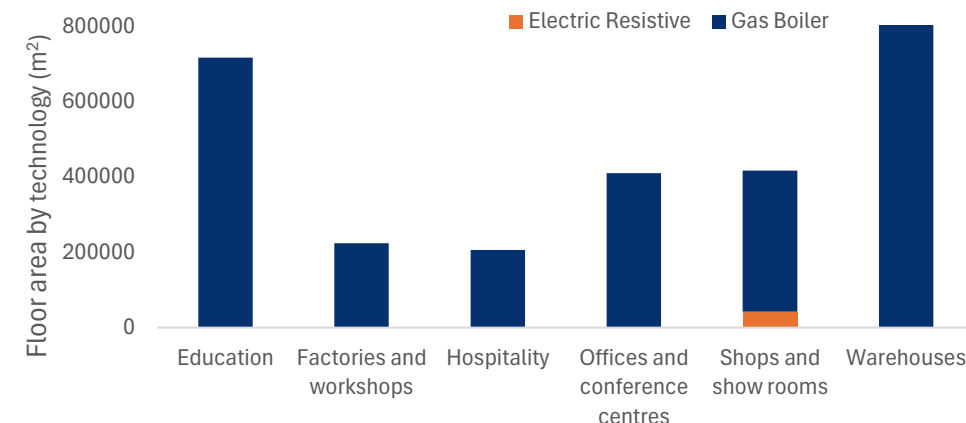
Non-Domestic Electrification of Heat | Delivery priorities and scale of change

Risks

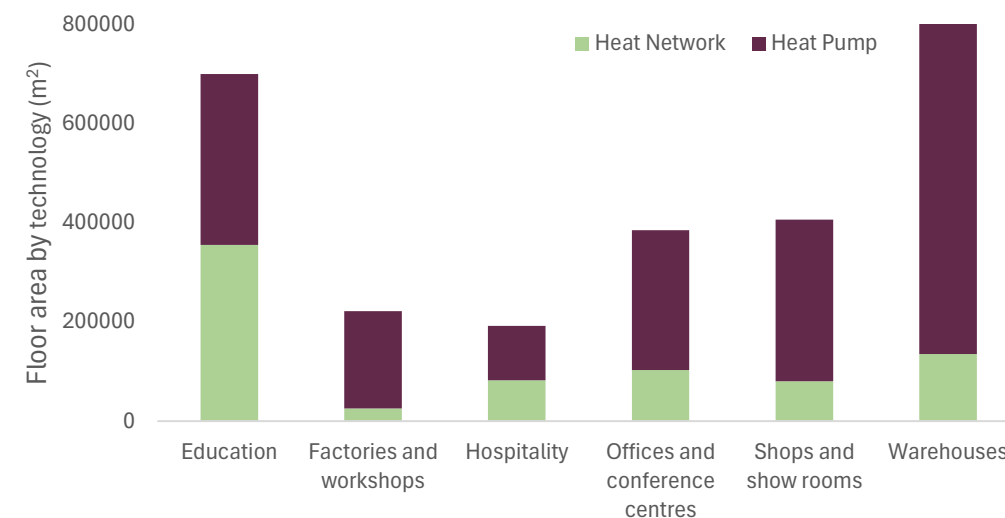
- Increased electricity demand from heat pumps will require network reinforcement.
- In the absence of strong policy and regulation, heat offtakers lack requirements to participate in the network may slow the development of heat networks.
- Heritage buildings and multi-tenant properties may face design and installation challenges.
- Limited availability of qualified installers and engineers could slow delivery.
- Installation works may cause temporary disruption to operations and access.
- Reliance on national funding schemes and future heat network zoning policy introduces delivery risk.

Delivery Priorities

- Council-Owned Assets First: Prioritise schools, libraries, and leisure centres for early adoption of heat pumps and heat network connections, integrating with solar PV where feasible.
- Community Benefit: Target community buildings in deprived areas to maximise social impact and reduce energy costs for essential services.
- Integration with Heat Networks: Align heat pump deployment and retrofit with planned heat network zones to optimise system sizing and avoid duplication.
- Demonstrator Projects: Showcase low-carbon heat in flagship sites (e.g., schools, leisure centres) to build confidence, supply chain capacity, and provide learning for wider rollout.
- Commercial Engagement: Work with landlords and business improvement districts to coordinate upgrades and unlock investment in shared heat infrastructure.

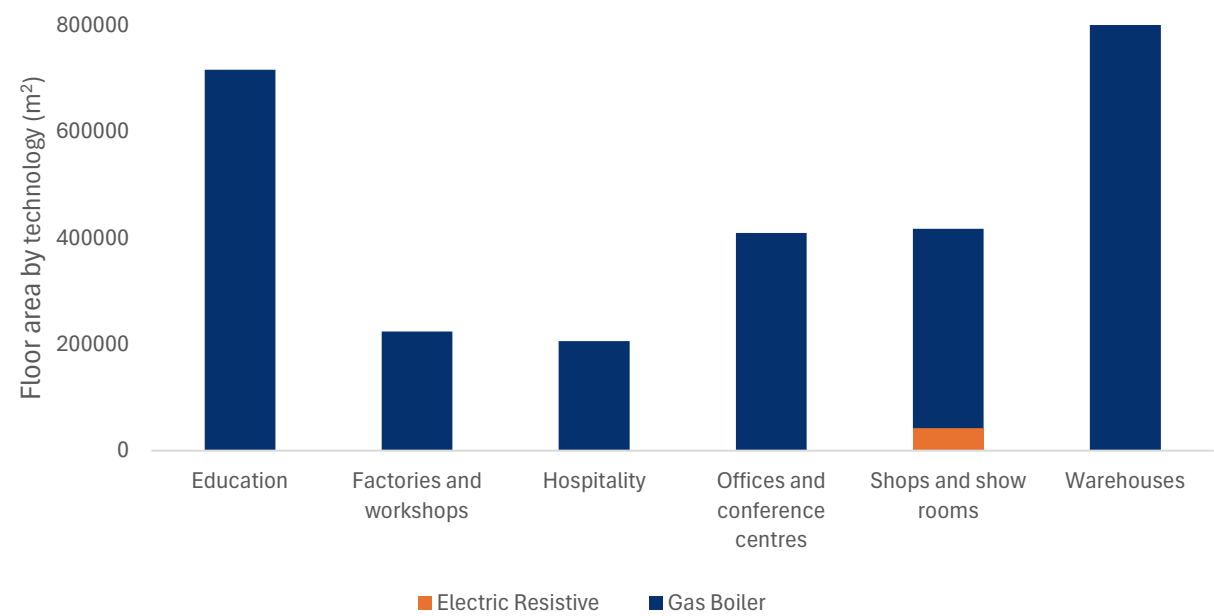


Current non-domestic heating by activity

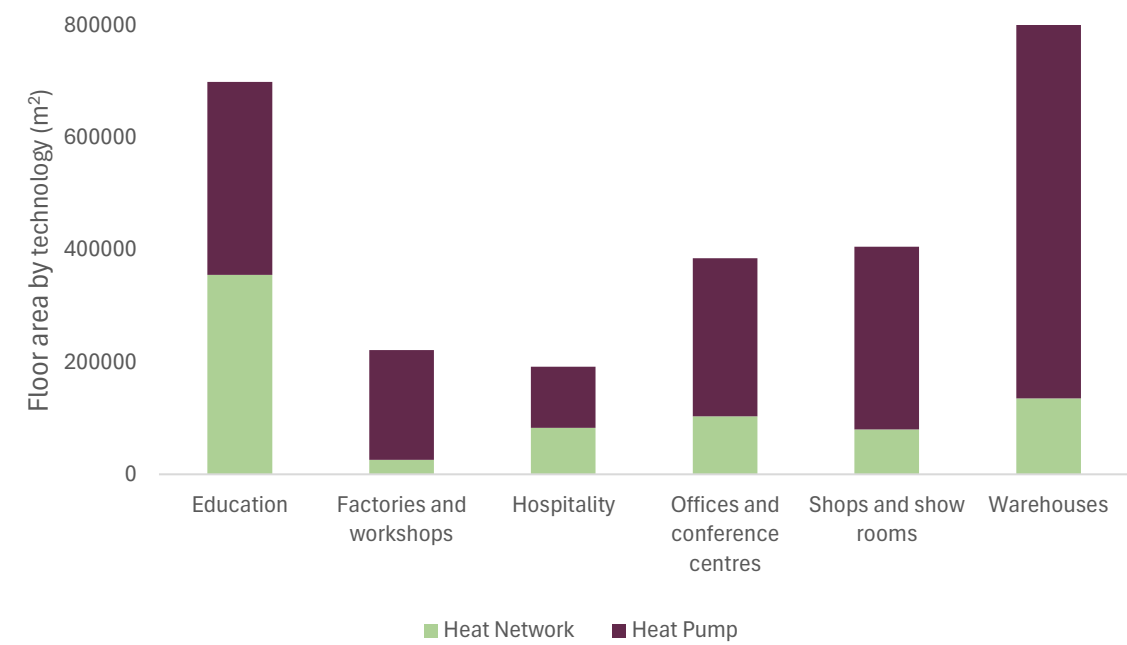


Additional non-domestic heating by activity

Non-Domestic Electrification of Heat | Delivery priorities and scale of change



Current non-domestic heating by activity



Additional non-domestic heating by activity

Electrification of Heat (Non-Domestic & Domestic)

Pathway Components [1/2]

Decarbonising heat is a critical priority for the London Borough of Brent's Local Area Energy Plan, as gas heating remains the largest single source of emissions in the borough. A significant portion of the London Borough of Brent's greenhouse gas emissions come from energy used to heat and power buildings, making the transition to low-carbon heat essential for achieving the borough's 2030 net zero target. This pathway focuses on electrification through heat pumps, heat networks, and smart energy systems, supported by fabric upgrades and renewable generation. Delivery should align with the delivery of heat networks as part of the Wembley and South Kilburn regeneration areas.

With heat network zoning set to be delivered through forthcoming regulations enabled by the Energy Act 2023—supported by DESNZ's Advanced Zoning Programme and the ongoing national zoning pilot—a Heat Network Zoning Coordinator role will be essential in preparing the borough for future statutory requirements. This role will help H&F stay aligned with emerging national guidance and evolving zoning methodology as government continues to refine the approach.

By sequencing interventions and integrating flexibility solutions, this pathway ensures a coordinated, whole-system approach to heat decarbonisation. The borough should also consider opportunities to improve the efficiency and reduce the carbon intensity of existing communal heating networks, with potential support from the Heat Network Technical Assistance Scheme and the Heat Network Efficiency Scheme.

Social Housing GSHP Demonstrator

- Heat upgrades for council-owned housing in Roundwood Ward and Brondesbury Park.
- Use lessons learnt to capture best practice and develop a template to support the delivery of other social housing heat pump schemes.

Heat Network Feasibility Studies

- Undertake detailed feasibility studies for heat networks using large public sector buildings as anchor loads, aligned heat network zones and upcoming legislation in Kenton.
- Assess opportunities for network expansion in Wembley Park and South Kilburn using the DESNZ heat network zoning model.



Could serve to reduce uncertainty of wider and longer projects by reducing scale.



Project could occur in the near term but should come accompanied by Enabling Actions to progress.

Electrification of Heat (Non-Domestic & Domestic)

Pathway Components [2/2]

Net Zero Schools Programme

- Retrofit selected schools with solar PV, battery storage, and heat pumps to create exemplar low-carbon education facilities.
- Leverage the London Borough of Brent's commitment to retrofit all corporate buildings and grant-maintained schools to net zero by 2030, supported by partnerships such as Asset Plus.

Smart Grid & Flexibility Trials

- Collaborate with Distribution Network Operators (DNOs) to manage peak loads from EV charging and air-source heat pump adoption.
- Consider piloting demand-side response and energy storage solutions in social housing, building on national flexibility trials like CrowdFlex and leveraging smart meter rollout for real-time energy management.

Develop strategy for ASHP across the borough

- Collaborate with local residents and businesses to identify areas with high amount of gas boilers
- Prioritise end-of-life timelines
- Link to funding schemes like the Boiler Upgrade Scheme and Great British Insulation Scheme.



Could serve to reduce uncertainty of wider and longer projects by reducing scale.



Long duration project to achieve major decarbonisation targets.



Long duration project to achieve major decarbonisation targets.

Transport (EV) | Overview

The transition to electric vehicles (EVs) is a key component of the London Borough of Brent’s net zero strategy. While the borough already has a higher uptake of EVs compared to the UK average of circa 3.8%, significant expansion of charging infrastructure is required to meet projected demand by 2040. This includes both on-street residential charging and rapid charging hubs for commercial fleets and through-traffic.

A significant proportion of vehicles across the London Borough of Brent are petrol or diesel. Out of the 111,116 registered vehicles in the London Borough of Brent in 2024, **5%** (5,827) were **battery electric** and 3% (3,173) were plug-in hybrid¹. This proportion of vehicles is expected to grow with an increase of convenient, cost effective and accessible charge points throughout the borough.

In line with the London Plan’s transport policies, new developments in the borough are required to incorporate electric vehicle charging infrastructure, including active provision for at least 20% of parking spaces and passive provision for all remaining spaces, ensuring sites are future-ready for the transition to zero-emission transport. This underscores the value of coordinating local charging roll-out with new development so that future growth in homes and commercial space supports wider borough-level EV readiness.

Initial modelling indicates that charging infrastructure will require major upgrades by 2040, at an estimated capital investment of **£92 million**². This figure includes costs would be shared across public and private funding and financing and not borne by the council alone.

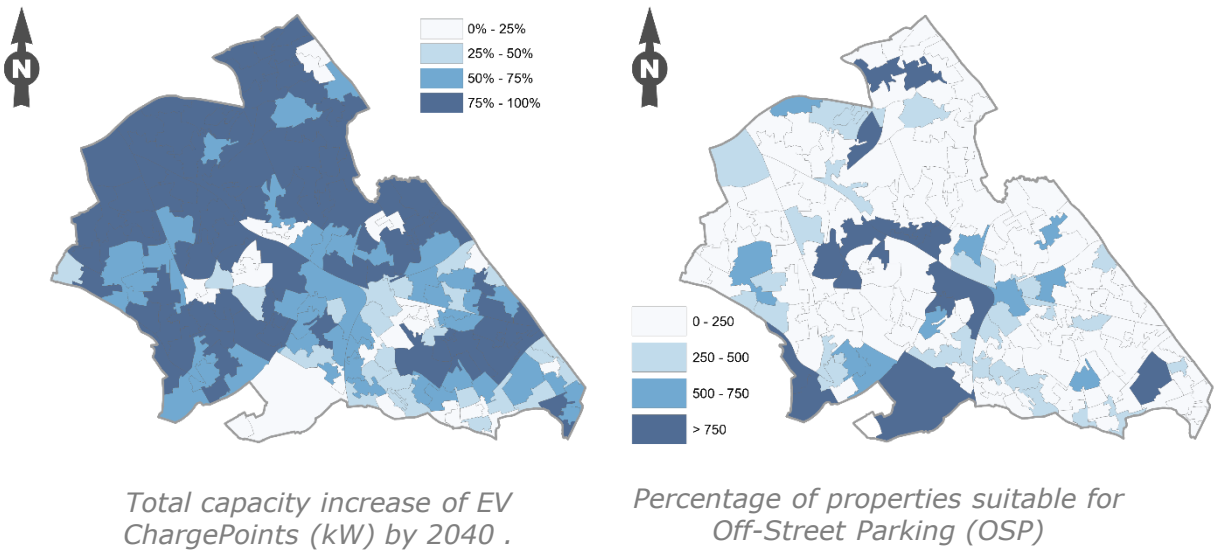
Upgrades are split into two categories:

- Domestic (off-street) EV Charging
- Public EV Charging

¹<https://www.gov.uk/government/collections/vehicles-statistics>

²Estimated CAPEX for EV ChargePoint infrastructure was taken from Energy Systems Catapult Modelling. Additional detail on costing is included in the Technical Annex.

³EV ChargePoints deployed by the model range from 3kW to 150kW

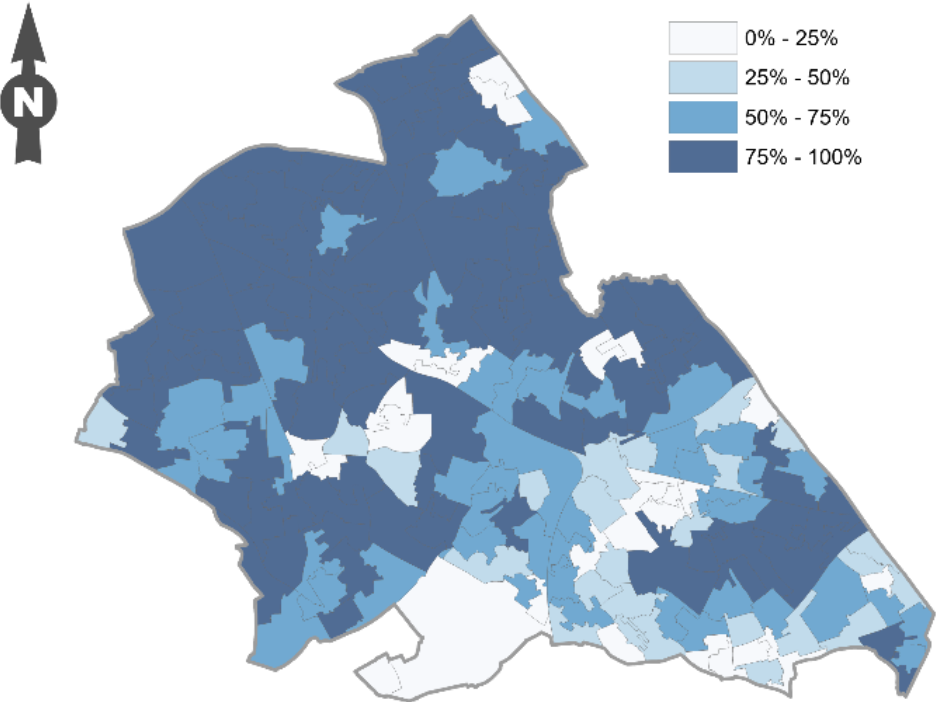


LSOA (Ward)	Properties Suitable for Off Street Parking	Modelled Increase in EV ChargePoint Deployment (kW) ³
E01033939 (Stonebridge)	0 %	5,143
E01033931 (Barnhill)	0 %	3,709
E01000601 (Stonebridge)	58 %	2,411

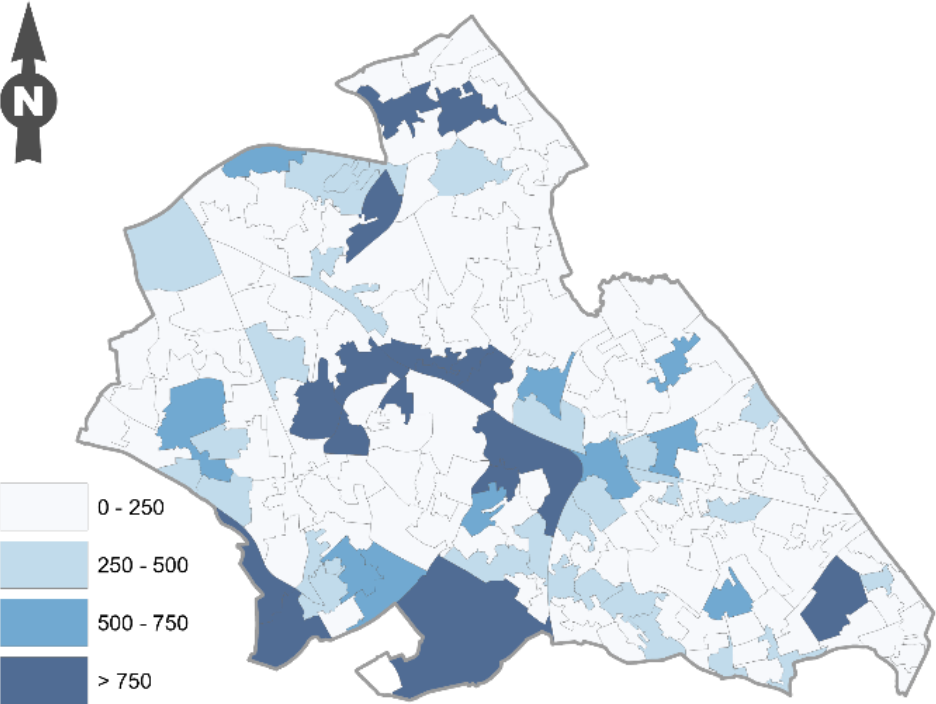
Local Area Benefits

- Reduced NOx and particulate emissions from road transport.
- Significant emissions savings from replacing petrol/diesel vehicles.
- Potential savings in running costs for residents and businesses using EVs.
- Opportunities for local businesses in EV servicing and charging infrastructure.
- Cleaner air contributes to improved public health outcomes.

Transport (EV) | Overview



Total capacity increase of EV ChargePoints (kW) by 2040 .



Percentage of properties suitable for Off-Street Parking (OSP)

Transport (EV) | Delivery Priorities & Scale of Change

Scale of Intervention

An additional **4,700 Public EV chargers** are recommended for delivery, alongside individual domestic EV chargers at all domestic properties suitable for off-street parking. The modelling identified that approximately 60% of domestic properties are suitable for off-street parking.

Estimated capital investment for public and domestic EV chargers: **£92million¹**.

Risks

- Increased electricity demand may require reinforcement and smart charging solutions.
- Dense urban areas may lack suitable sites for rapid charging hubs.
- Capital investment for charging infrastructure could deter private sector involvement without strong incentives.
- Future changes in EV technology or alternative fuels could impact infrastructure planning.
- Slow uptake among residents without off-street parking or confidence in charging availability.
- Changes in national and regional policy (e.g. TfL congestion charge policies) can influence the uptake of EV's across the borough

Delivery Priorities

- Strategic Integration with Energy Planning: Align EV rollout with grid capacity upgrades and local renewable generation to minimise network stress.
- Community Engagement: Provide clear guidance and incentives for residents and businesses to switch to EVs.
- Sustainable Transport Promotion: Complement EV infrastructure by encouraging active travel and public transport use to reduce congestion, improve air quality and support wider place-based outcomes.

¹Estimated CAPEX for EV ChargePoint infrastructure was taken from Energy Systems Catapult Modelling. Additional detail on costing is included in the Technical Annex.



Transport (EV) | Pathway Components

Decarbonising transport is a key pillar of the London Borough of Brent's net zero strategy, as road transport remains a major contributor to local air pollution and carbon emissions. This pathway builds on that success by expanding infrastructure to meet projected EV uptake, support clean air targets, and enable a fair transition for residents without off-street parking

EV Charging Hubs in Car Parks

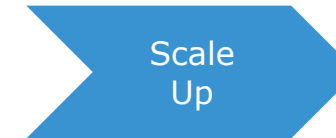
- Install multi-point EV charging hubs in council-owned and public car parks, prioritising areas with high projected EV uptake and limited off-street parking, with delivery potentially enabled through a range of commercial models (e.g., concession contracts or other partnerships with charge point operators).
- Highlight that EV infrastructure will help meet clean air targets, reduce nitrogen oxide emissions, and support local economic growth by attracting visitors and businesses.

Borough-Wide EV Charging Strategy

- Develop a comprehensive plan for EV charging across the borough, covering:
- Residential streets with limited off-street parking, using lamppost column chargers and shared mobility schemes.
- Town centres and high-demand locations to support residents, businesses, and visitors.
- Align with the Mayor of London's EV Infrastructure Delivery Plan and TfL's 2030 strategy, ensuring integration with smart charging solutions to manage grid impacts.
- Incorporate evidence-based site selection using housing type, travel patterns, and grid capacity data.



Project could occur in the near term but should come accompanied by Enabling Actions to progress.



Long duration project to achieve major decarbonisation targets.

Local Generation (Solar PV) | Overview

Expanding rooftop solar PV across the London Borough of Brent will play an important role in reducing reliance on grid electricity, cutting carbon emissions, and lowering energy bills for residents and businesses. The borough's dense urban environment presents challenges, but significant opportunities exist on domestic rooftops, schools, commercial buildings, and public sector assets.

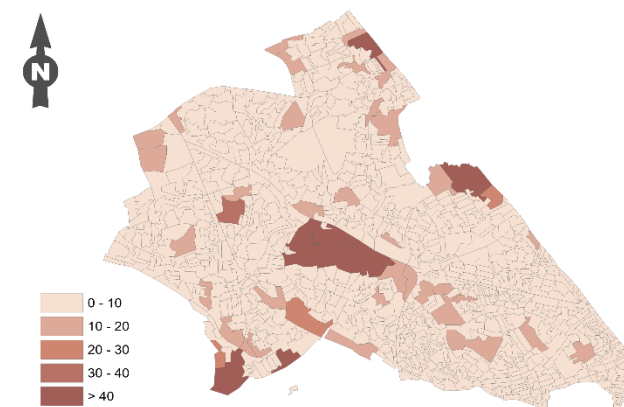
Pairing solar PV generation with other technologies such as ASHP can further support bill reductions and bolster flexibility to the local energy system, allowing access to flexible electricity tariffs and reducing peak demand on the electricity grid. Larger sites could also benefit from participating in grid balancing mechanisms.

Solar PV has been modelled as a fixed proportion of annual electricity demand (5%) to reflect its consistent cost-effectiveness when assessed primarily on cost and carbon outcomes, without weighting other competing priorities. For the Local Area Energy Plan, the focus is therefore on identifying locations with the greatest generation potential and the highest impact on reducing fuel bills, particularly in fuel-poor areas. As an urban/suburban borough, the opportunity to deploy renewable energy is limited in comparison to a rural, less dense area.

PV deployment is modelled to meet ~5% of demand. This indicates **that total annual energy generation from Solar PV could be up to 112 GWh by 2040**, split across domestic and non-domestic sites. This would require an estimated capital investment of approximately **£171 million¹**. Priority should be given to social housing, schools, and large commercial rooftops, where economies of scale can be achieved. While batteries are not typically considered a core technology for achieving net zero, they provide valuable flexibility to local energy systems. This flexibility enables consumers to benefit from variable electricity tariffs and helps reduce peak demand on the grid. Batteries have not been quantified within this Local Area Energy Plan because current modelling focuses on technologies with well-established deployment pathways and cost data. Battery uptake is highly dependent on consumer choice, market signals, and future tariff structures, which introduce significant uncertainty. Nevertheless, facilitating battery installation alongside PV delivery programmes should be considered as an important enabling action.

Local Area Benefits

- Emissions savings from local renewable generation.
- Reduced electricity costs for households and businesses.
- Increased local generation reduces reliance on the national grid.
- Opportunities for local installers and supply chain development.
- Potential for shared energy schemes and reinvestment in local projects.



Solar PV potential (GWh)²

¹Estimated CAPEX for Solar PV infrastructure was taken from Energy Systems Catapult Modelling. Additional detail on costing is included in the Technical Annex.

²London's LAEP Data Hub https://laep-datahub-alpha-cityhall.hub.arcgis.com/datasets/d6d157bae90145839a23c1319b491dea_0/explore?location=51.591707%2C-0.262715%2C12

Local Generation (Solar PV) | Delivery priorities and scale of change

Scale of Intervention

112 GWh annual generation potential by 2040.

Estimated capital investment: **171 million¹** by 2040.

Risk

- Limited space or structural constraints on older buildings may restrict deployment.
- Conservation areas may face additional planning hurdles.
- High capital investment could deter uptake without strong incentives.
- Long-term upkeep and monitoring needed to ensure efficiency.
- Challenges with deployment on flats due to the absence of a single meter point, complicating shared consumption and limiting wider roll-out.

Delivery Priorities

- Council-Owned Assets First: Install solar PV on council owned assets (e.g. schools, libraries, and leisure centres) to lead by example and reduce public sector energy costs.
- Social Housing Deployment: Target blocks and estates for early rollout to tackle fuel poverty and reduce bills for vulnerable households.
- Commercial Engagement: Work with landlords and businesses to unlock large roof spaces for PV deployment.
- Integration with Retrofit & Heat: Combine PV installation with fabric upgrades and heat pump deployment to maximise system efficiency.

- Community Energy Schemes: Continue work to support local energy cooperatives and shared ownership models to increase uptake and social benefit.
- Collaborate with Neighbouring Boroughs: Aligning with the West London Energy Flexibility & Solar – Solar Strategic Guidance for Boroughs:
 - Explore joint procurement or aggregated funding bids to share costs and increase scale, making PV deployment more financially viable.
 - Coordinate with the Distribution Network Operator to address grid capacity and flexibility needs, and secure funding through mechanisms like the GLA Green Finance Fund.

¹Estimated CAPEX for Solar PV infrastructure was taken from Energy Systems Catapult Modelling. Additional detail on costing is included in the Technical Annex.

Local Generation (Solar PV) | Pathway Components

Expanding local renewable generation is a key pillar of the London Borough of Brent’s Net Zero strategy, as electricity demand will rise with the shift to low-carbon heating and transport. The London Borough of Brent has strong potential for solar PV deployment across council-owned buildings, schools, housing estates, and commercial rooftops, alongside opportunities for community-led energy projects. Building on the London Borough of Brent’s climate commitments, the next step is to accelerate rooftop PV installations, integrate battery storage, and explore smart energy systems to maximise local generation and flexibility. The council can enable projects through mechanisms such as the Smart Export Guarantee, alongside partnerships with community energy groups, to support schemes that cut emissions and reduce energy bills for residents. This pathway will help the London Borough of Brent decarbonise electricity supply, improve energy resilience, and ensure a fair transition, with benefits shared across the borough, including for those in social housing.

Local Solar PV Cooperative

- Develop community-owned solar projects modelled on Jack Tizard School’s rooftop installation in White City.
- Enable residents and businesses to invest in shared solar schemes, generating local clean energy and reinvesting benefits into the community.
- Build on existing Community Energy partnerships to successfully deliver cooperative solar projects on schools and public buildings.

Solar on Social Housing Blocks

- Identify opportunities for installing solar PV on social housing blocks, particularly in the north of the borough where there is the highest solar potential.
- Pair installations with battery storage on public buildings to manage peak demand and grid constraints.
- Explore future integration of vehicle-to-grid (V2G) and vehicle-to-vehicle (V2V) technologies to enhance flexibility and resilience.

Solar PV Expansion Beyond Public Estate

- Encourage adoption of solar PV on private homes and commercial buildings through highlighting incentives, financing options, and cooperative models.
- Provide technical advice and signposting to support mechanisms such as the Smart Export Guarantee.
- Promote borough-wide campaigns to raise awareness of the benefits of rooftop solar and community energy participation.



Project deployed in the next year for a short duration. Should face few barriers for implementation.



Could serve to reduce uncertainty of wider and longer projects by reducing scale.



Long duration project to achieve major decarbonisation targets. Should be preceded by Enabling Actions.

Hydrogen for Industry | Overview

Hydrogen is recognised as a key contributor to the decarbonisation of heavy industry and is uniquely placed to reduce carbon emissions from energy intensive industries where electrified decarbonisation solutions may not be suitable. These typically include industries requiring high temperatures or movement of heavy machinery, such as steel and cement production, chemicals manufacturing, and large-scale metal processing.

Local Area Benefits

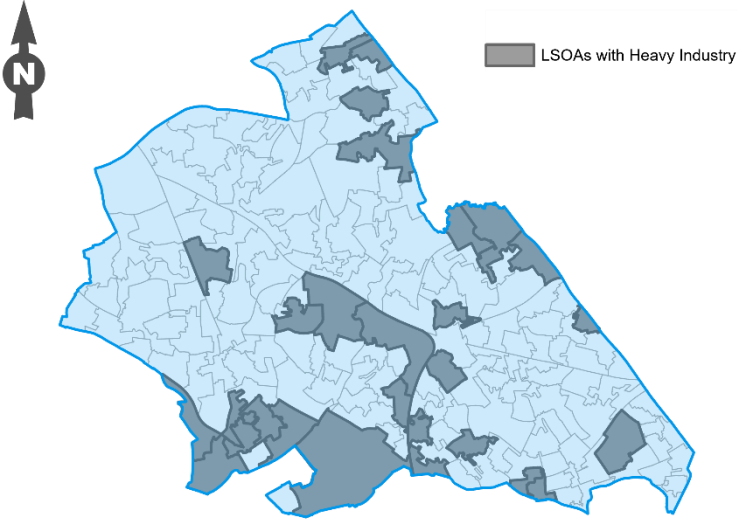
- **Repurposing Gas Grid:** Parts of the existing gas grid may already be suitable for transitioning to hydrogen. The Iron Mains Replacement Programme (IMRP) replaces 'at-risk' iron gas mains with plastic 'hydrogen-ready' pipes.
- **Dual Purpose:** Hydrogen may also be a suitable energy source to supply energy centres for district heat networks.

Risks

- **Infrastructure Redundancy:** As heat becomes increasingly decarbonised through the use of ASHPs and Heat Networks, the reduction in gas demand may lead to a scaling back of the gas grid which could result in limited opportunity for hydrogen roll out. The Mayor's Accelerated Green Pathway models the gas network to be largely redundant due to the uptake of electrified heat.
- **Slow Consumer Readiness:** Transition to hydrogen is likely to require the replacement or conversion of gas/diesel powered machinery to support hydrogen use. This may result in a slower uptake of hydrogen due to increased cost and risks to industrial processes.
- **Economic feasibility:** Costs of production and supply of hydrogen for heat remain uncertain.

Delivery priorities for the borough:

- **Focus on strategic, high-energy sites:** Identify sites with a heavy industrial and manufacturing base, or a potential for locating energy centres where hydrogen may be viable long-term.
- **Align with Regional and National policy:** Keep borough energy and decarbonisation planning consistent with UK and GLA hydrogen strategy and infrastructure developments.



LSOAs with Heavy Industry modelled to transition to Hydrogen

Number of LSOAs with Heavy Industry	Total Floor Area modelled to transition to hydrogen (m ²)
28	79,478

Policy Caveat on Hydrogen for Heat:

Current evidence and national policy indicate that hydrogen is not considered a viable option for residential heating or most non-domestic buildings due to cost, efficiency, infrastructure, and safety challenges. Its role in London's decarbonisation pathway is expected to be minimal for building heat, with national and regional strategies (including the Mayor's Accelerated Green Pathway) prioritising electrification and heat networks as the primary solutions. Planning for hydrogen in residential or commercial heat strategies is therefore not advised, instead limit consideration to strategic industrial sites and, where electrification is not feasible, energy centres supporting district heat networks.

Policy & Governance

08

This section summarises the policy landscape and governance arrangements required to deliver the LAEP, highlighting key policy gaps, delivery roles, and the actions and structures needed to support a coordinated transition to net zero.

Policy

Clear and consistent policy frameworks at **national, regional and local levels** are essential to deliver the full range of actions needed for net zero. For London boroughs, regional policy led by the Greater London Authority (GLA) and the London Plan is particularly influential, often setting more ambitious carbon reduction expectations than national government and shaping how energy, buildings, transport and infrastructure are planned across the city. A net zero energy system therefore relies on strong coordination between national policy and funding, regional planning requirements, and local delivery mechanisms. Without this alignment, technical solutions risk delay, higher cost and under-delivery. Strong and stable policy signals also provide clarity for investors and enable long-term planning.

For the London Borough of Brent, national initiatives such as Heat Network Zoning and the proposed Warm Homes Plan will shape future opportunities for energy efficiency and low-carbon heating, including heat pumps. At the same time, the London Plan, the Mayor's environmental strategies, and GLA programmes play a critical role in guiding sustainable development, driving higher building performance standards, and supporting boroughs through targeted funding for energy efficiency, renewable energy and wider carbon-reduction work. Local policy remains central to translating these ambitions into on-the-ground delivery.

The London Borough of Brent can strengthen its approach through:

- Planning guidance prioritising retrofit and low-carbon heating
- Local incentives for heat pump installation
- Support for heat network development in designated zones
- Targeted programmes for fuel-poor households

Together, these measures will accelerate uptake and ensure national policy delivers tangible local benefits.

National Policy & Funding: National government sets the regulatory and financial environment for local delivery. Critical enablers include:

- Clear long-term signals on heat decarbonisation policy (e.g., boiler phase-out timelines).
- Addressing the imbalance between gas and electricity prices to make electrification affordable and attractive for households and businesses.
- Continued support for schemes such as Social Housing Decarbonisation Fund and the Boiler Upgrade Scheme.
- Reforming planning and building regulations to mandate higher energy performance standards.
- Continued support for EV rollout.

Governance

Strong governance ensures that technical solutions are backed by policy, funding, and social legitimacy. While councils play a central role in setting the vision and embedding climate goals into statutory plans, success depends on collaboration across **local, regional, and national** actors, supported by clear policy frameworks and sustained investment.

Local Authority Leadership:

Provide strategic direction but need strong partnerships and resources to deliver. Key actions include:

- Embedding net zero objectives in Local Plans and Supplementary Planning Documents.
- Setting standards for solar-ready and heat pump-ready buildings in new developments.
- Using shared data tools to monitor progress and inform decisions.
- Building internal capacity through dedicated teams and training.

Regional Coordination:

Collaboration with the Greater London Authority and neighbouring boroughs is essential to:

- Align heat network zoning, EV infrastructure, and energy strategies.
- Coordinate funding bids and shared procurement frameworks.
- Enable regional governance structures (e.g., Ofgem's proposed Regional Energy Strategic Plans) to support delivery at scale.
- Governance across different delivery programmes to support coordination and whole energy system opportunities.
- Clarity on areas where the council has responsibility vs where the council is acting as an enabler for other parties.

Community Engagement & Fairness:

Governance must ensure fair and inclusive delivery by:

- Involving residents and businesses in decision-making.
- Providing accessible advice and financial support for vulnerable households.
- Ensuring transparency in how priorities and investments are set.
- Governance to support routes to accessing funding and financing.

Governance and Policy | Pathway Components

Delivering the London Borough of Brent's Local Area Energy Plan will require strong governance, supportive policies, and sustained investment. While the borough can lead on planning and coordination, many interventions will depend on national frameworks, regulatory alignment, and funding mechanisms. This pathway sets out actions to strengthen local delivery while highlighting areas where partnership with central government and industry will be essential such as grid capacity, retrofit financing, and consistent data-sharing standards across DNOs, housing providers, and private networks to enable whole-system planning. It reflects the London Borough of Brent's ambition to ensure that local plans are underpinned by the resources, tools, and enabling conditions needed to achieve net zero in a timely and cost-effective way.

Data & Digital Mapping Platform

- Build on Local Area Energy Plan spatial analysis for ongoing monitoring and scenario planning.
- Use tools such as UK Power Networks' Local Area Energy Plan+ platform to integrate energy, housing, and transport data for decision-making.

The London Borough of Brent Climate Adaptation and Resilience Plan

- Develop a borough-wide plan to address climate risks such as flooding, overheating, and extreme weather events. Identify priority actions for adaptation across housing, transport, and public spaces, integrating nature-based solutions where feasible.
- Align delivery with the London Borough of Brent's Climate & Ecological Emergency Strategy and existing emergency planning frameworks, using data-driven risk assessments and stakeholder engagement to prioritise interventions.
- Coordinate with infrastructure investment cycles to maximise efficiency.



Enabling
Actions

Could serve to enable long-term activities by developing a wider strategy, knowledge, and confidence. Will likely require external (i.e. National) support.



Quick
Wins

Project deployed in the next year for a short duration. Should face few barriers for implementation.

Network Capacity

09

This section summarises overall electricity network capacity in the borough, noting key constraints and future pressures, and highlights the importance of working closely with the distribution network operator to enable the transition to net zero.

Network Capacity Constraints | Overview

The transition to a net zero energy system will significantly increase electricity demand across the London Borough of Brent, driven by the uptake of heat pumps, electric vehicles, rooftop solar PV, and heat networks. This will place additional pressure on the local electricity network and potentially lead to capacity constraints on the network causing bottlenecks delaying decarbonisation. Proactive planning with defined timelines of decarbonisation enables the DNO to plan investment in network capacity upgrades. Electricity network reinforcement is managed by UK Power Networks (UKPN). The Borough’s future demand projections, submitted through DFES, will help inform UKPN’s ongoing investment planning.

Total Annualised Cost for all network capacity upgrades required in the London Borough of Brent: **£3.6 million**. The total annualised cost refers to the total forecasted cost of upgrading substation capacity, annualised over the lifetime of the substation – assumed to be 40 years.

Key Findings:

- **Primary Substation Upgrades Required:** Multiple primary substations require capacity upgrades in excess of 100%, indicating critical constraints for electrification in the borough. The approximate annualised upgrade cost for all primary substations in the London Borough of Brent is £2.1 million.
- **Main Distribution Substation Upgrades:**
 - 22198_GMT requires a capacity upgrade of 372% at an estimated annualised cost of £14.2k
 - 8U2465_GMT requires a capacity upgrade of over 188% at an estimated annualised cost of £10.0k
 - 22217_GMT requires a capacity upgrade of over 537% at an estimated annualised cost of £11.4k

What to Consider in Local Area Energy Plan Network Planning:

- **Early Engagement with DNOs:** Work closely with the Distribution Network Operator (DNO) to align capacity upgrades with planned heat and transport interventions.
- **Phased Reinforcement:** Prioritise upgrades in areas with high projected demand (heat network zones, EV hubs, regeneration sites).
- **Smart Solutions:** Explore demand-side flexibility, smart charging for EVs, and thermal storage to reduce peak loads.
- **Integration with Local Energy:** Co-locate rooftop solar PV and battery storage to alleviate network stress and improve resilience.
- **Future-Proofing:** Design upgrades to accommodate long-term electrification trends and avoid repeated interventions.
- **Energy-Intensive Developments:** Consider the network impacts of high-demand developments, such as data centres or large digital infrastructure, which may require significant additional capacity.

Primary Substation Name	Increase in peak demand (MW)	Capacity upgrade	Cost of upgrade (thousands)
KIMBERLEY RD	195.7	417 %	£ 606.2
BEE PRIMARY 33/11kV	171.2	356 %	£ 498.2
BERESFORD AV PRIMARY 33/11kV	63.2	329 %	£ 190.7

Distribution Substation Name	Increase in peak demand (MW)	Capacity upgrade	Cost of upgrade (thousands)
22198_GMT	6.1	372 %	£ 14.2
8U2465_GMT	6.0	188 %	£ 10.0
22217_GMT	4.9	537 %	£ 11.4

Summary of top 3 primary and distribution substation upgrades needed.

About This Plan

This Local Area Energy Plan for the London Borough of Brent was developed by Ramboll and Energy Systems Catapult, combining technical modelling, spatial analysis and delivery planning expertise.

The work was commissioned by the Greater London Authority (GLA) in partnership with the London Borough of Brent Council as part of the wider programme to support Local Area Energy Planning across West London.

The Plan reflects a collaborative process involving the project partners, local authority officers and wider stakeholders to ensure the analysis and recommendations align with local priorities and delivery considerations.



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