

Cambridgeshire Local Area Energy Plan

Version E – 10.03.26



Version History



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Executive Summary

Introduction

What is the Cambridgeshire Local Area Energy Plan (LAEP)?

The **LAEP is a strategic framework designed to guide Cambridgeshire’s transition towards a more sustainable, low carbon and resilient energy system to meet future growth of the region.** It requires collaboration among local authorities, government, energy providers, businesses, and communities to ensure the right infrastructure is in the right places to deliver local ambitions.

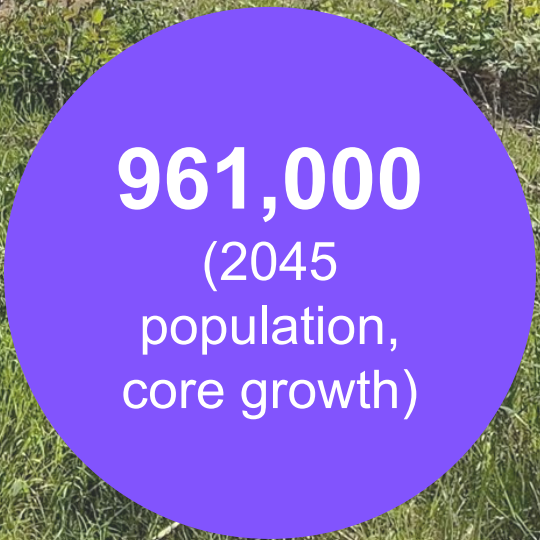
It sets out **locally tailored interventions** across buildings, transport, industry, and energy generation; integrating forecasted housing and employment growth. The plan **supports both existing communities and future growth** while reinforcing long-term sustainability and energy security.

Cambridgeshire is set to grow

Cambridgeshire is recognised as a high-growth area, and there are a multitude of forecasts for future population and employment space. If electrical network infrastructure does not keep pace with population growth, Cambridgeshire’s growth and net zero ambitions could be impeded, by an electrical network struggling to keep pace. Therefore, in addition to catering for the transition to net zero, the LAEP also estimates the electrical infrastructure needed to support the region’s growth ambitions.

Purpose and Strategic Objectives of the LAEP

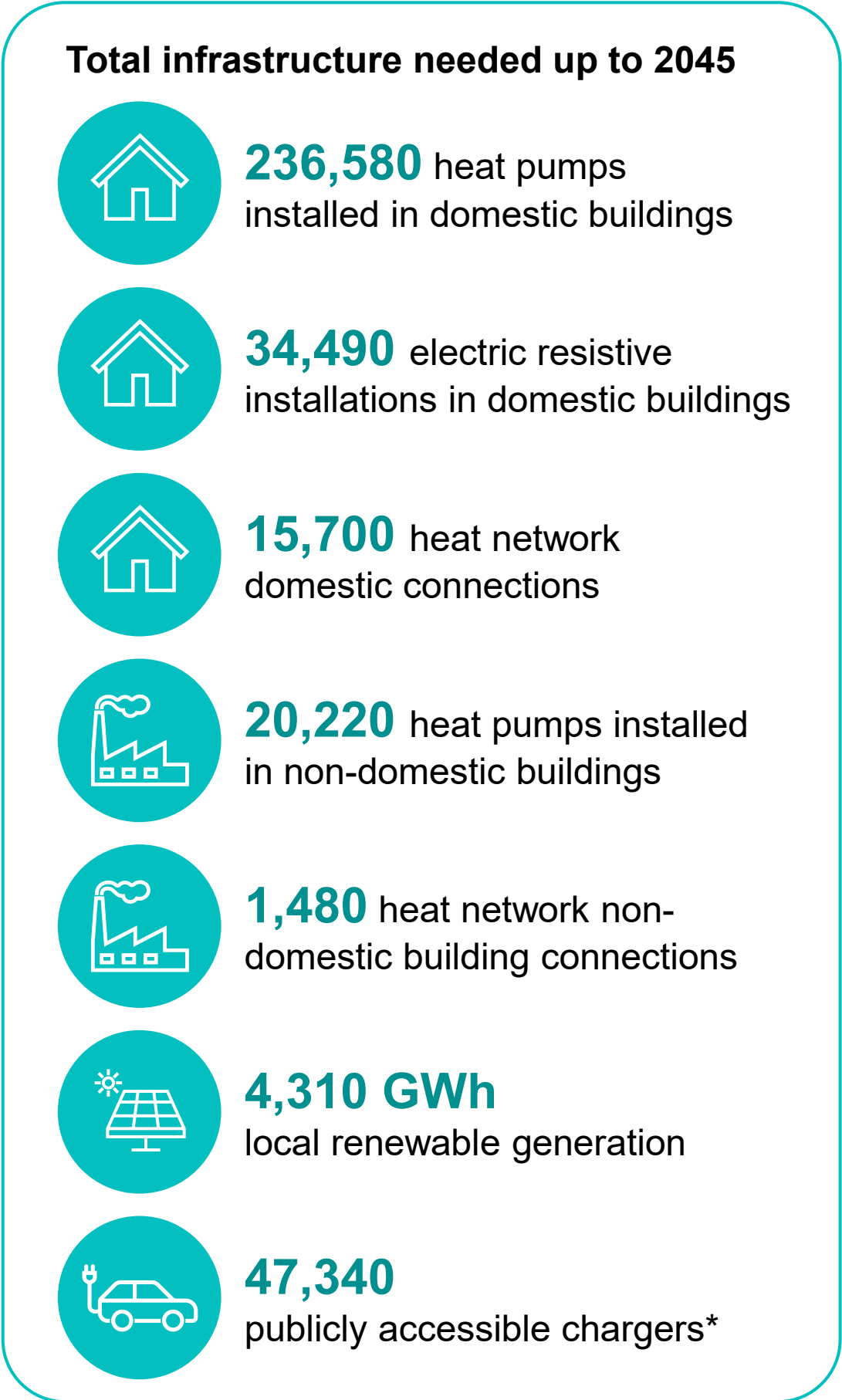
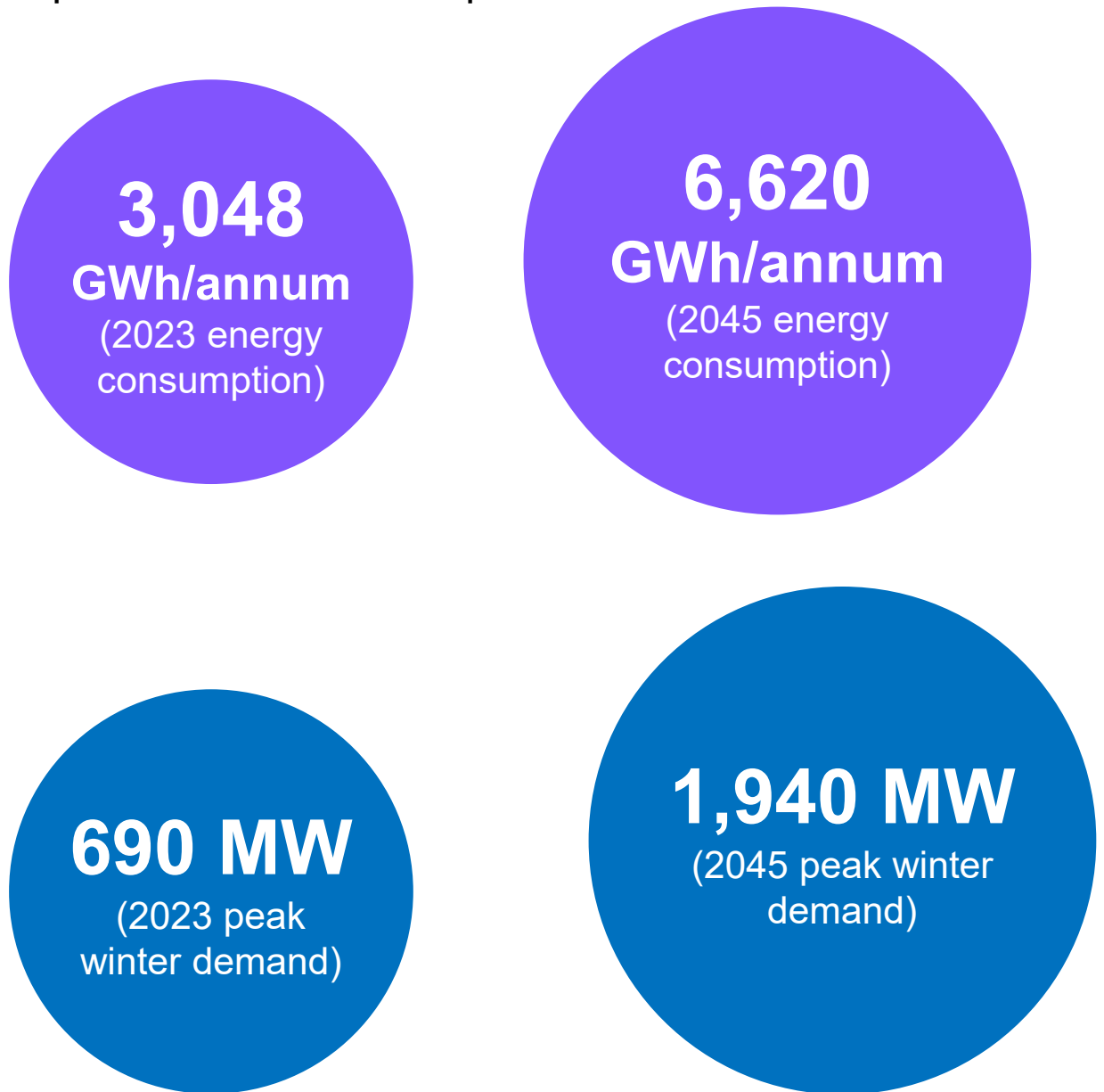
1. Develop a strategic understanding of the energy infrastructure required to support planned and future growth, and provide the evidence needed to make a compelling case for proactive investment.
2. Support achievement of a clean energy transition by 2045 while ensuring a secure, reliable, and resilient energy supply.
3. Provide robust, locally relevant data on future energy needs to inform electricity network operators and planners (including UK Power Networks and National Energy System Operator), Local Plans, and wider spatial planning frameworks.
4. Ensure the benefits of the clean energy transition are realised locally, reducing inequalities and delivering social and economic benefits for communities.
5. Identify policy and financing barriers and propose practical, actionable solutions to overcome them.



The LAEP In Numbers

A summary of the key infrastructure needs for the recommended pathway (holistic transition) is shown here, primarily focused on mature technologies only, up to 2045.

Further explanation on the pathways considered is provided within this report.

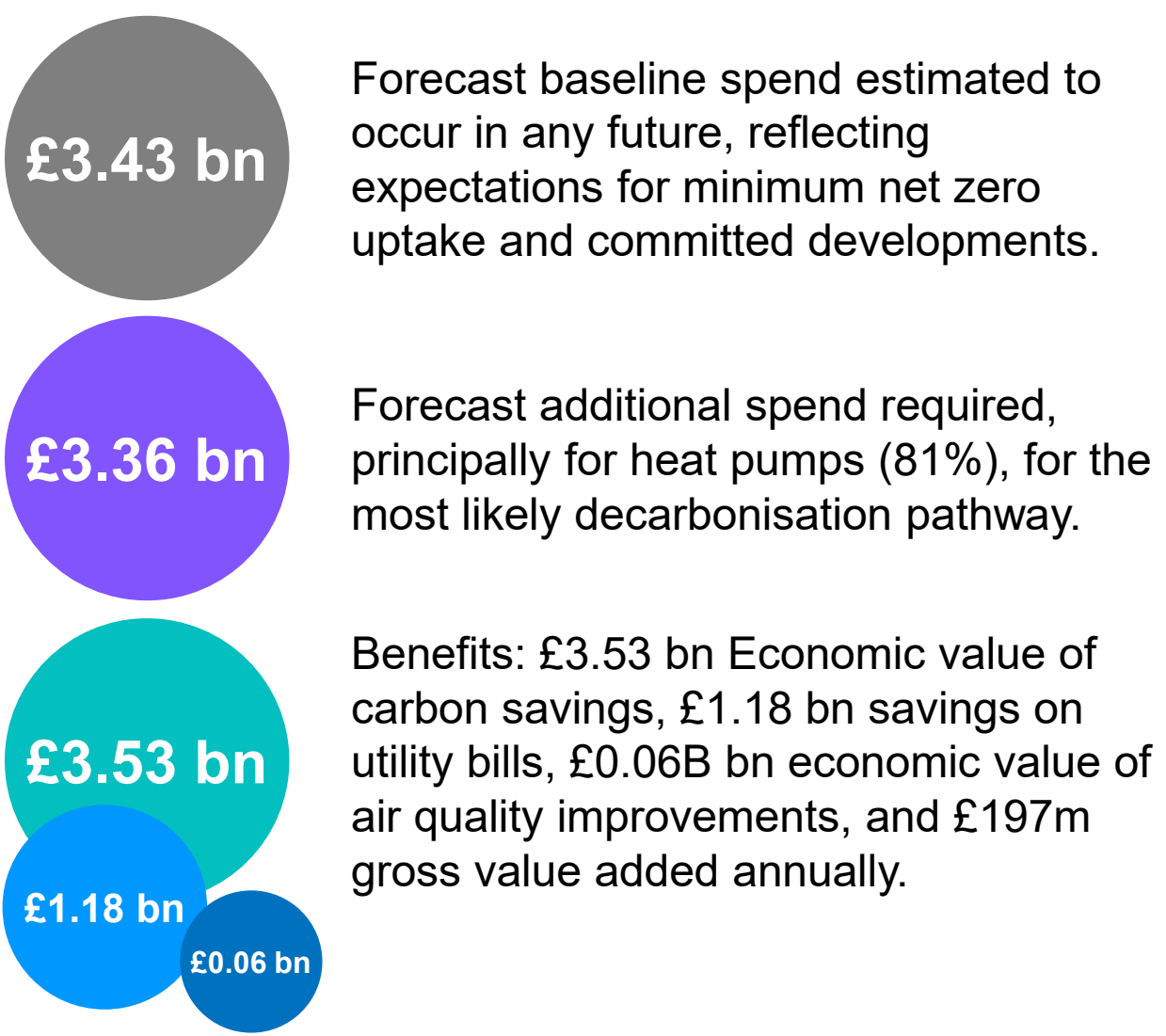


Note: *Public chargers (sockets) required by 2045 to support projected EV uptake, complementing predominantly home/ workplace charging.

Note: All technology figures shown represent the total installed capacity or number required by 2045, not annual deployment rates.



Delivering Cambridgeshire’s clean energy ambitions will require substantial long-term capital investment to deliver the significant benefits from the low carbon energy transition**.



Note: **All costs and benefits shown are presented in present value (applying the impact of discounting, reducing the valuation of costs the further they occur into the future).

The Investment and Benefits in Greater Detail

Four future scenarios, or pathways, were modelled as part of the LAEP, with the ‘Holistic Transition’ Scenario representing the most likely pathway. The Holistic Transition provides the best balance of costs and benefits for Cambridgeshire.

£3.36 bn

This is additional capital expenditure (CAPEX) required between now and 2045 above baseline spend for energy and the built environment that is assumed to occur in any scenario¹. The bulk of additional spend is:

- **£1.3 billion** for domestic air source heat pumps
- **£0.9 billion** for non-domestic air source heat pumps

Additional CAPEX of the holistic transition is on top of **£3.43 billion** of baseline spend, the majority of which relates to **£2.9 billion** for ground mount solar and EV infrastructure that will likely be paid for by private organisations.

Summary results: Holistic transition costs and benefits vs. counterfactual ¹	
	£m
CAPEX above baseline spend ¹	-3,361
Saving on utility bills	1,184
Economic value of carbon savings	3,534
Economic value of air quality improvements	60

Proactive investment in low carbon interventions delivers benefits that far exceed the costs. The savings on bills principally arises from non-domestic customers switching from low to high efficiency electric heating, and rooftop solar². The benefits from carbon savings and air quality improvements are from switching from fossil fuel heating systems to low carbon heating systems, such as air source heat pumps and low carbon heat networks.

Significant benefits to the economy can also be achieved through the investment in a low carbon energy transition, which could create and sustain local jobs. Through the period to 2045, the average gross value added (GVA) to the economy **every year could be £197m**, with a total contribution from investment of £5.7 bn.

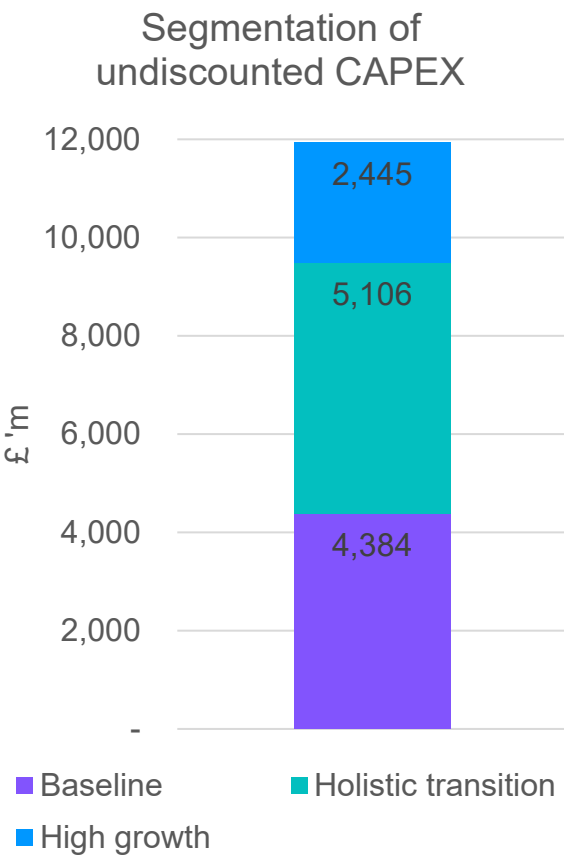
1) Capital expenditure (CAPEX) is presented in 2025 present value (applying the impact of discounting, reducing the valuation of costs and benefits the further they occur into the future) when considered in economic analysis. The application of discounting allows comparison against other types of costs and benefits, which are valued on the same present value basis applying Green Book methodology and a discount rate of 3.5%. The estimated financial outlay for CAPEX in 2025 real terms, without the impact of discounting, is £5.1 billion, and is expanded upon on the next page.

2) This assumes Green Book price forecasts which assumes the current ratio between gas and electricity prices remains broadly consistent. Should energy prices be re-balanced to reduce electricity costs compared to gas, these bill savings will increase



Capital expenditure

The capital expenditure in real terms without the impact of discounting (undiscounted CAPEX), for the most likely scenario, is £5.1 billion¹. This provides an estimate of the total potential outlay in today’s prices, estimating the cash cost before inflation.



The value of CAPEX in the **Holistic Transition** is in addition to baseline spend that is assumed to occur in any scenario.

Baseline spend of £4.4 bn¹ is estimated to occur in any future, reflecting expectations for minimum uptake and committed developments. This includes £2.1 bn for ground mount solar PV developments, which are assumed to be developed in any scenario based upon current developer applications. **Due to restrictions in the connection pipeline, no additional ground mount solar PV spend is assumed in any scenario on top of the baseline.**

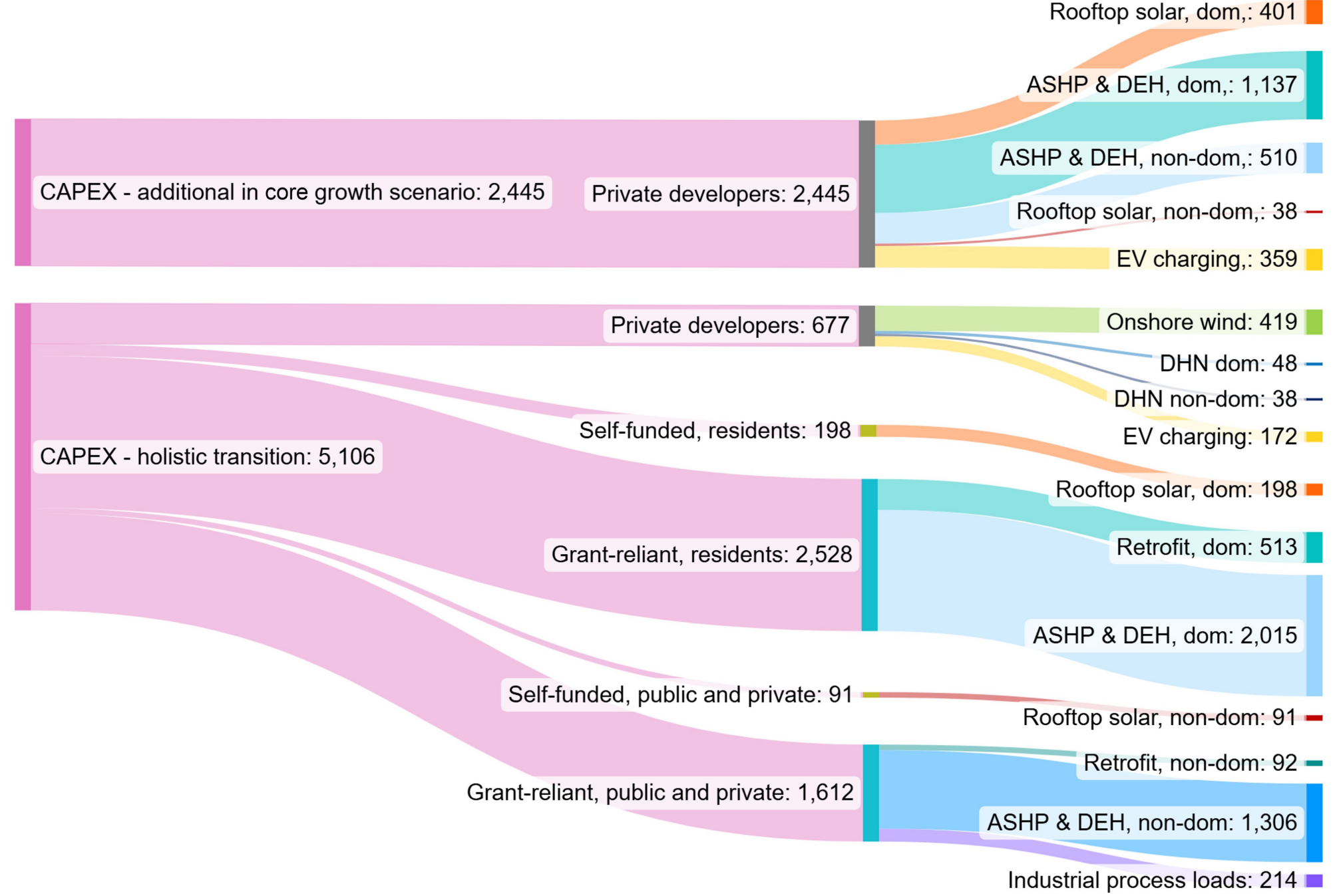
A high population and economic development growth future may require additional spend of £2.4 bn on top of the holistic transition scenario, although these costs would likely be borne by private developers.

The undiscounted CAPEX for the Holistic Transition and Core growth scenario is shown in the figure to the right, categorised by 1) who might pay, and 2) by intervention. The categories for who might pay include distinction between those where grant support is expected, and those where businesses and residents are typically expected to fully self fund due to a clear financial return on investment.

Availability of central government grants could significantly reduce the local investment requirements. The CAPEX presented is the gross figure without assuming application of grants. Existing schemes such as the Warm Homes Plan will contribute to the funding requirement, but the ongoing availability of any scheme is uncertain.

1) When discounting is applied to reduce the value of future costs, the present value of cost is £3.36 bn for the holistic transition and £3.43 bn for the baseline, see earlier page. These discounted figure used in economic assessment to compare against other discounted costs and benefits.

Undiscounted CAPEX by funding category and intervention (£ million)²

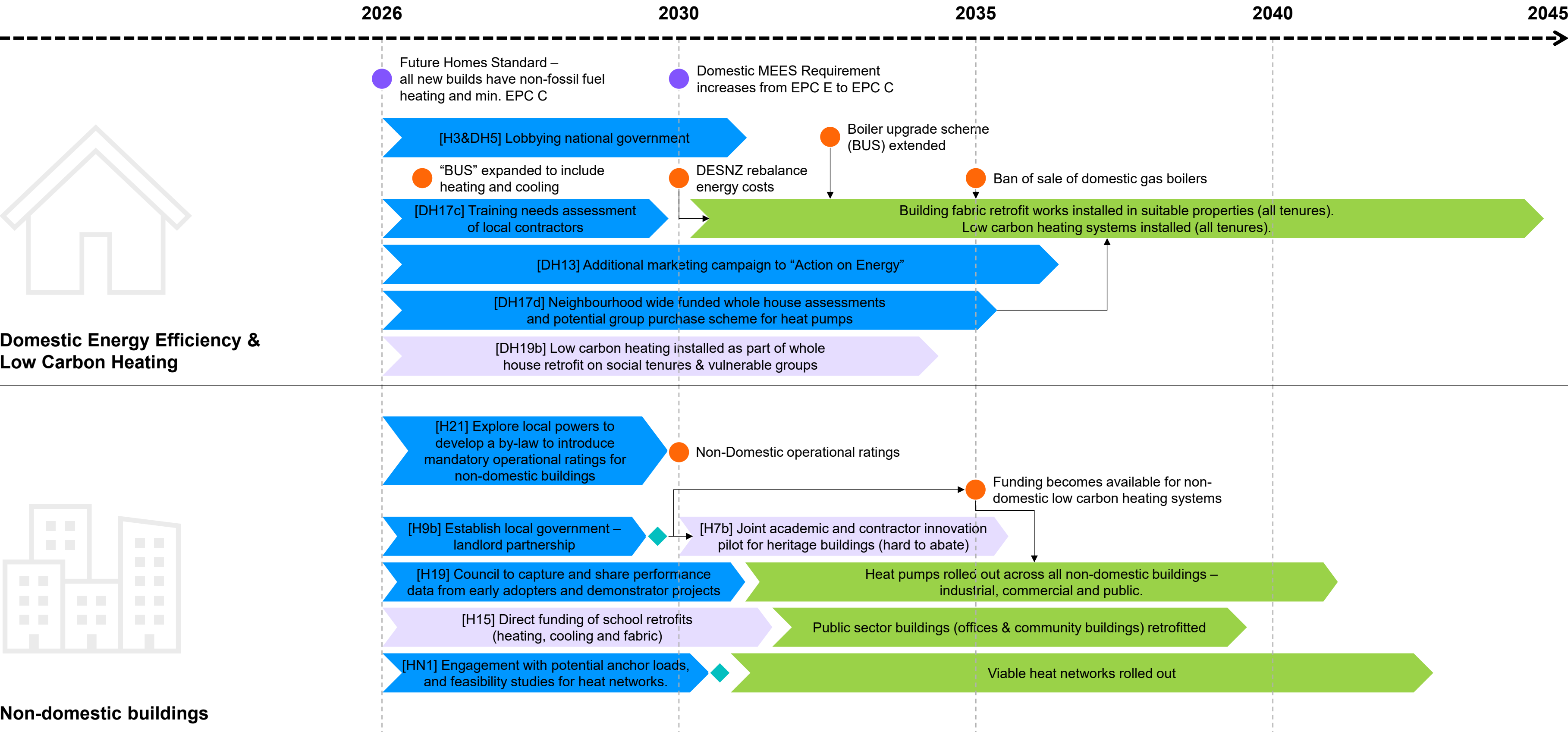
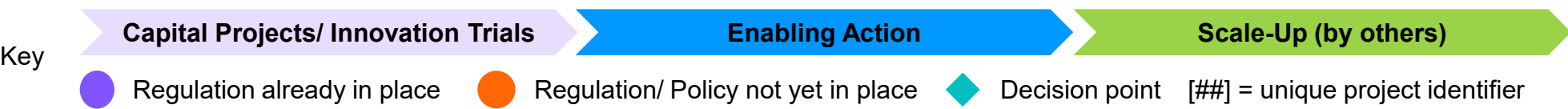


Acronyms applied in the chart are as follows:

EV	DHN	dom	non-dom	ASHP	DEH
Electric Vehicle	District Heat Network	Domestic property	Non-domestic property, including public and private sector.	Air Source Heat Pump	Direct Electric Heating

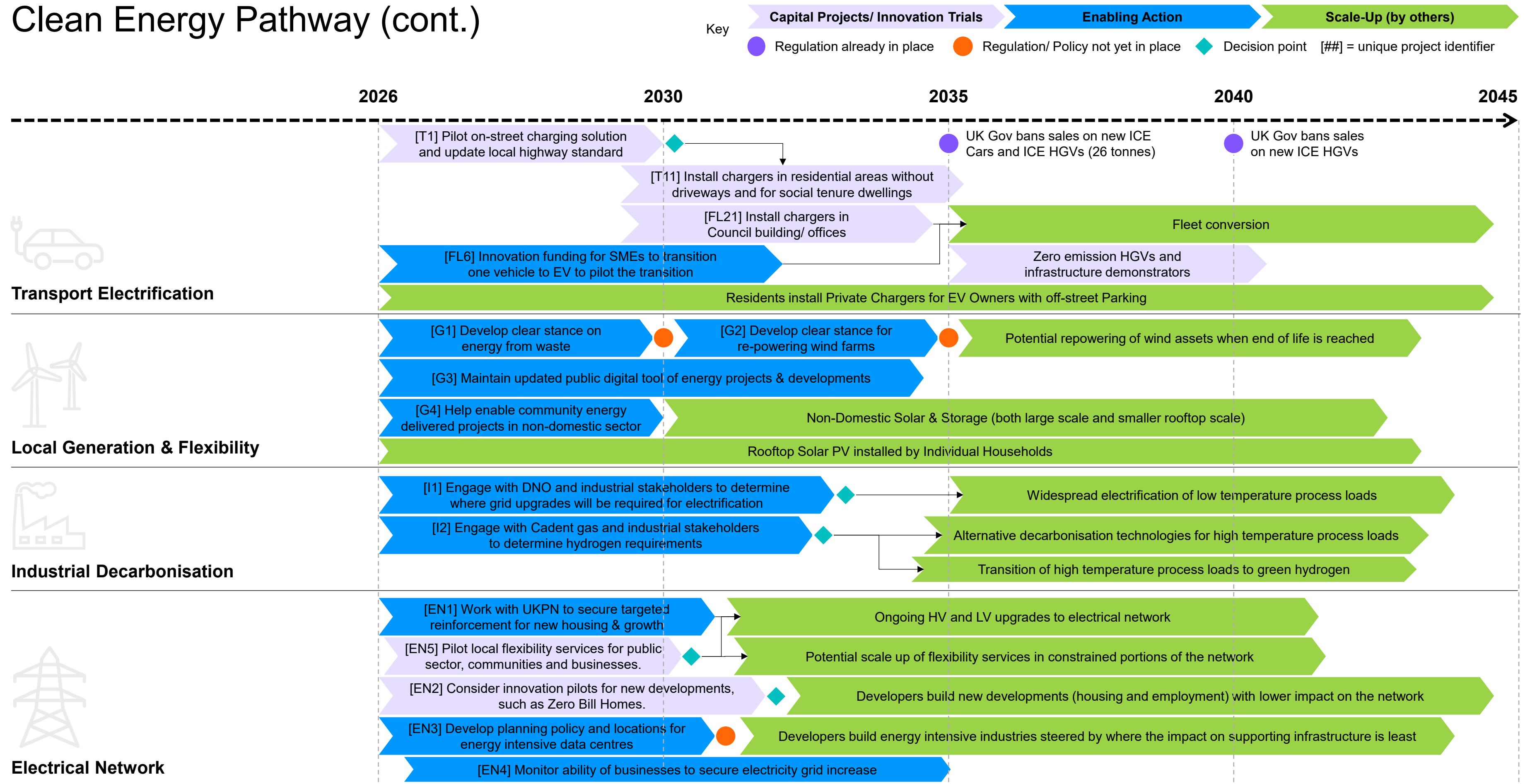
2) Private developer categories refers to investment that is expected to come from private organisations where there are established business models for capital to be recovered through sale of goods or services. This covers generation assets, public EV charging infrastructure, and new build developments.

Clean Energy Pathway



Note: These activities were generated through a detailed barrier analysis and solution screening exercise, detailed in the Technical Report. The above shows only the shortlisted solutions selected, while the Technical Report contains the full list of solutions considered. Barriers to getting to net zero, and the potential solutions to overcome them, have been informed extensively through stakeholder engagement captured in the CAG report (separate document)

Clean Energy Pathway (cont.)



Note: These activities were generated through a detailed barrier analysis and solution screening exercise, detailed in the Technical Report. The above shows only the shortlisted solutions selected, while the Technical Report contains the full list of solutions considered. Barriers to getting to net zero, and the potential solutions to overcome them, have been informed extensively through stakeholder engagement captured in the CAG report (separate document)

Spatial Focus

Spatial analysis has identified priority zones where targeted interventions can deliver the greatest impact for clean energy, social equity, and system efficiency.

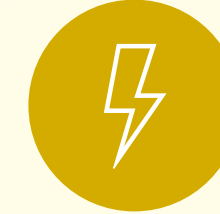
These areas should be reviewed in further detail and prioritised where appropriate by City and District Councils during implementation. As stated throughout the LAEP, interventions (public chargers, air sourced heat pumps, building fabric upgrades) are needed across all districts.

The spatial focus indicates areas where there is a concentration, or a higher need, for a particular intervention. Prioritising these areas can lead to more impactful outcomes earlier and serve as potential demonstrations/ pilots for other areas.



Industrial Decarbonisation

Industrial clusters in Whittlesey, Wisbech, Fordham & Chippenham, Huntingdon, and St Neots are priorities for electrification and preparation for hydrogen transition.



Grid Constraints and Electricity Headroom

Across the county, primary substations including those in Cambridge City (St Anthony St), Fenland (Wisbech Railway, March, Guyhirn), and East Cambridgeshire (Chatteris, Exning, Aldreth) face early constraints, requiring proactive reinforcement and potentially some demand-side response.



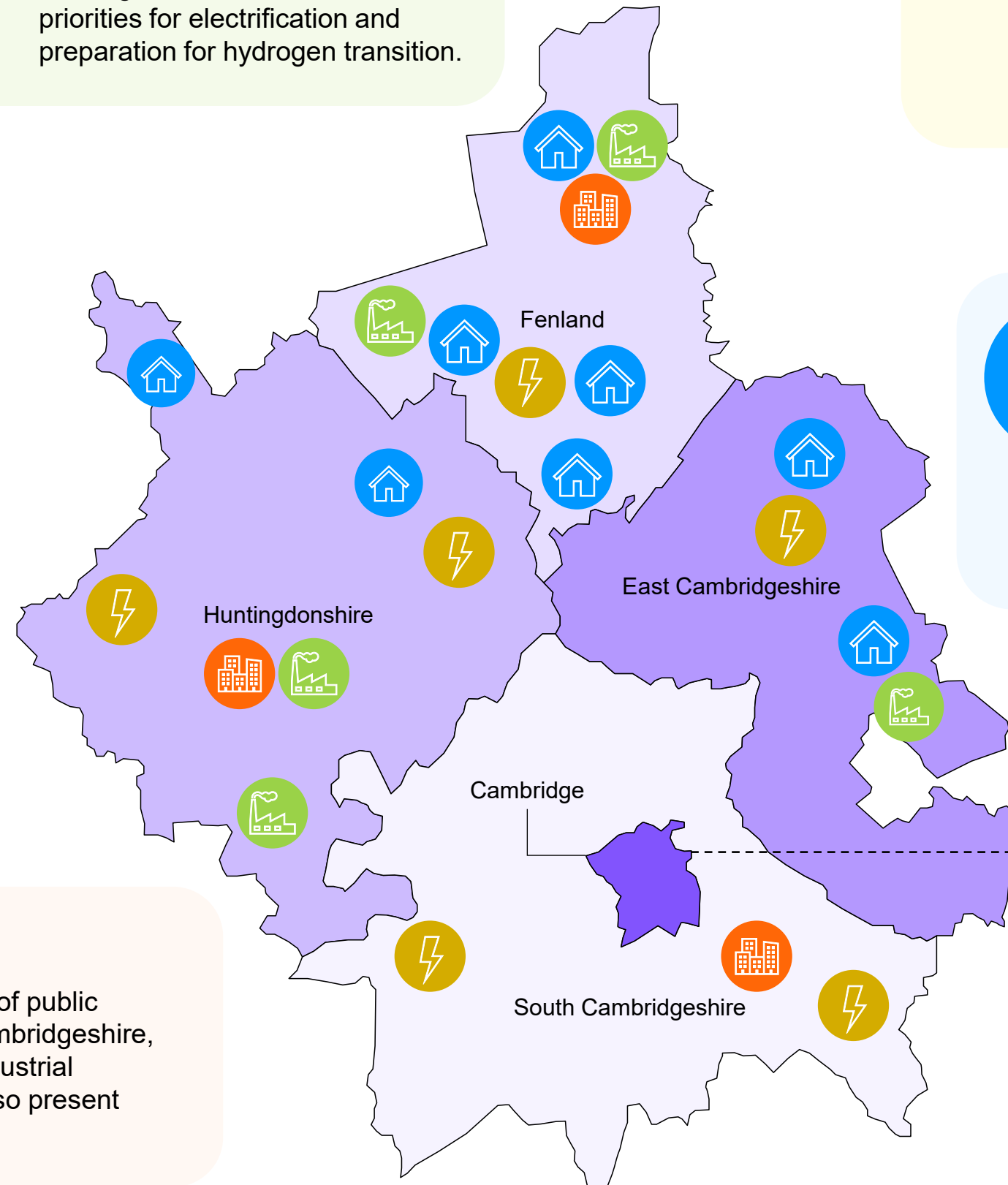
Fuel Poverty and Low EPC Ratings

Priority areas include parts of Fenland (e.g. Wisbech, March, Chatteris, Whittlesey), East Cambridgeshire (e.g. Soham, Littleport, Ely outskirts), North and East Cambridge City (e.g. Arbury, East Chesterton, King's Hedges), and Huntingdonshire (North of Ramsey, Elton).

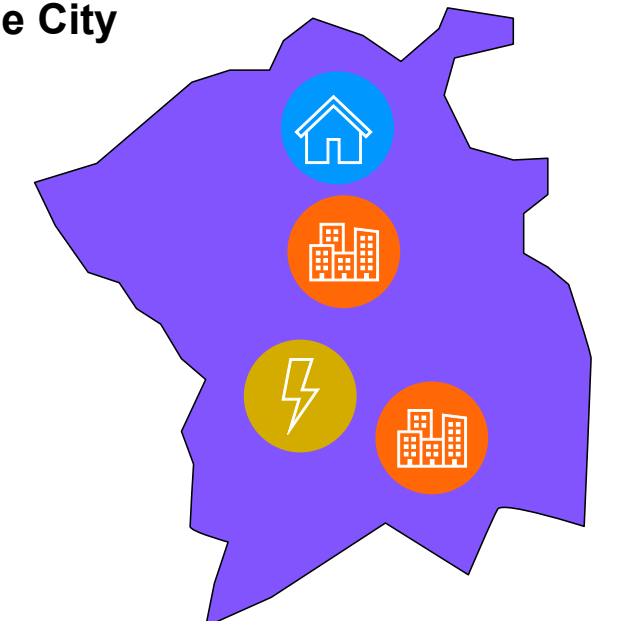


District Heating Potential

High-density urban areas and clusters of public buildings in Cambridge City, South Cambridgeshire, Fenland, and Huntingdonshire. The industrial decarbonisation hotspots listed may also present opportunities for district heating.



Cambridge City





Introduction

Introduction



What is the Cambridgeshire Local Area Energy Plan (LAEP)?

The **LAEP is a strategic framework designed to guide Cambridgeshire’s transition towards a more sustainable, low carbon and resilient energy system to meet future growth of the region.** It requires collaboration among local authorities, government, energy providers, businesses, and communities to ensure the right infrastructure is in the right places to deliver local ambitions.

It sets out **locally tailored interventions** across buildings, transport, industry, and energy generation, integrating projected growth in housing, employment, and infrastructure to align decarbonisation with development growth. The plan **supports both existing communities and future growth** while reinforcing long-term sustainability and energy security. By aligning national targets with local priorities, it ensures the transition is technically robust, socially inclusive, economically viable, and underpinned by a secure energy supply.



Purpose and Strategic Objectives of the LAEP

1. Develop a strategic understanding of the energy infrastructure required to support planned and future growth, and provide the evidence needed to make a compelling case for proactive investment.
2. Support achievement of a clean energy transition by 2045 while ensuring a secure, reliable, and resilient energy supply.
3. Provide robust, locally relevant data on future energy needs to inform electricity network operators and planners (including UK Power Networks and National Energy System Operator), Local Plans, and wider spatial planning frameworks.
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This document is the Cambridgeshire Local Area Energy Plan Report. Its purpose is to set out the findings and recommendations of the technical analysis that underpins the plan more accessible to a wider audience, while retaining the key insights needed to inform decision-making.

Important Note:

This document is supported by detailed technical analysis. For full details, including modelling assumptions, cost breakdowns, and comprehensive intervention analysis, readers should refer to the [Cambridgeshire LAEP Technical Report](#). The two documents are designed to work together: the technical report provides depth and evidence, while this summary distils the core messages and priorities for decision-makers and stakeholders.

The document provides an outline of:

- **Local context**
- **Policies** underpinning the LAEP and the strategic context for achieving net zero
- **Overview of the scenarios** modelled and the approach
- **Detailed modelling** and analysis undertaken in the technical report, presented in simplified form.
- **Estimated costs** of interventions required to deliver the transition
- **A roadmap of actions**, sequenced in 5-year periods to 2045, covering buildings, transport, industry, and energy generation.

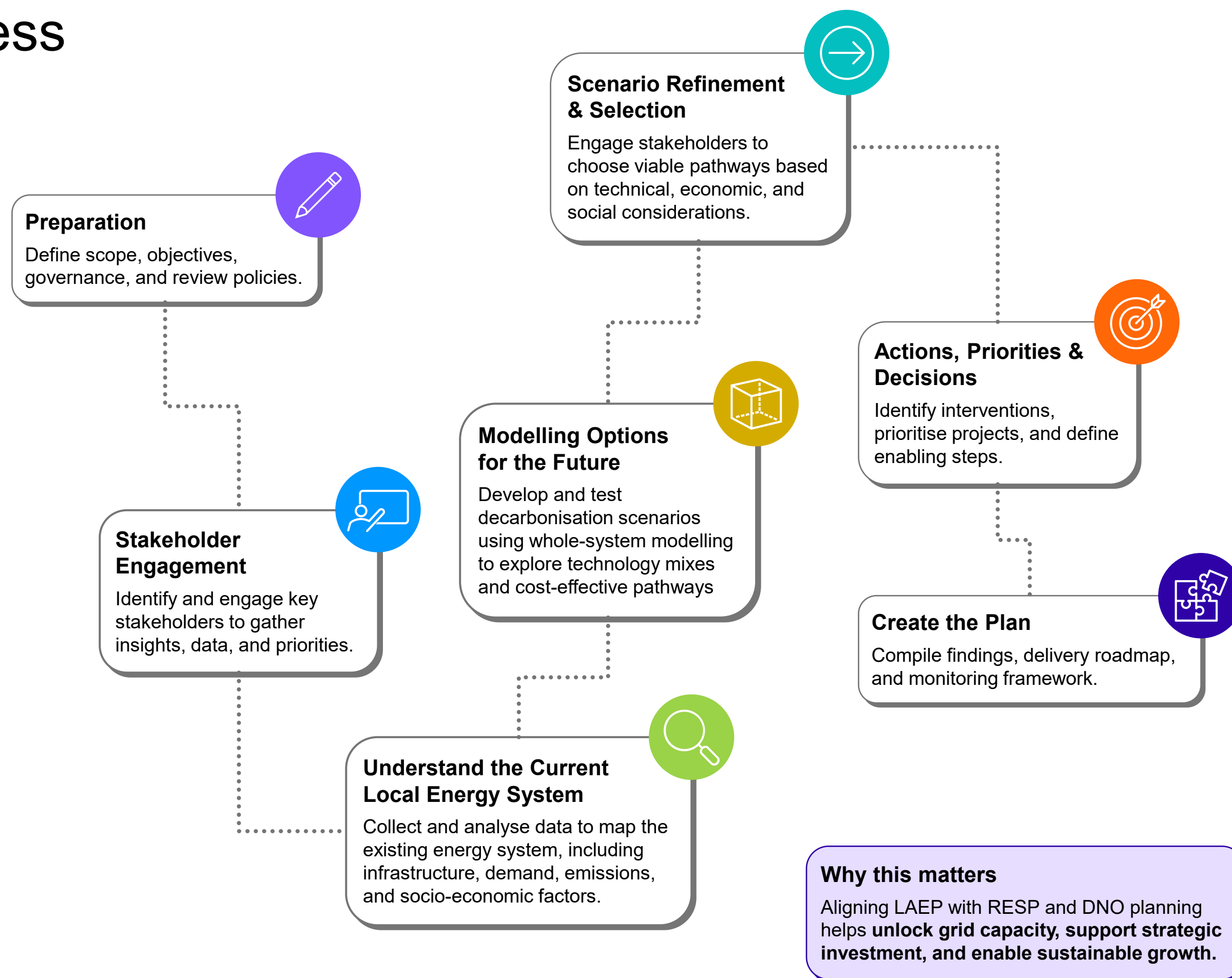
LAEP Development Process

This LAEP's approach aligns with the seven stages of local area energy planning, as set out by Energy Systems Catapult (ESC) shown on the right.

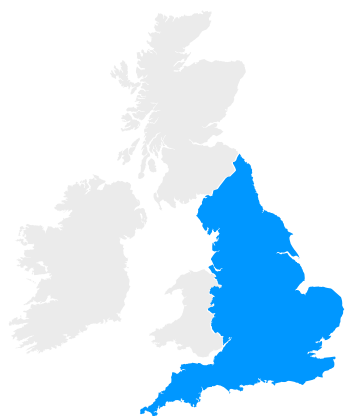
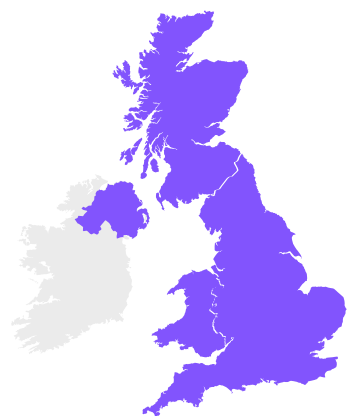
The plan is built on robust evidence, using scenario modelling, based on UK Power Networks' Distribution Future Energy Scenarios (DFES), which are derived from the National Energy System Operator's Future Energy Scenarios Pathways (FESP) and adapted for local context. This approach ensures consistency with regional and national energy planning frameworks.

The LAEP has been shaped through an extensive stakeholder engagement programme designed and delivered by CAG Consultants. Engagement activities included surveys, social media outreach, media coverage, webinars, briefings, and targeted technical engagements. Collaboration with local authorities, businesses, community groups, and institutional partners has helped the plan reflect local priorities and practical delivery considerations. Stakeholder feedback directly informed pathway selection, the design and prioritisation of interventions, the identification of barriers and opportunities, and the development of the implementation plan.

Economic appraisal underpins the plan's recommendations, with each pathway assessed for capital investment requirements, system benefits, and potential bill savings. This approach quantifies the scale of investment needed, while justifying the benefit to society brought by transitioning to net zero.



Policy Landscape Shaping Local Energy



The policy landscape shaping Cambridgeshire’s LAEP is informed by national legislation, regional strategies, and local planning frameworks.

The review focused on current legislated and adopted policies at all levels that influence Cambridgeshire’s emissions and progress towards net zero. The policies referenced are not intended to represent a comprehensive or exhaustive list, but rather those most relevant at the time of LAEP development. Draft and emerging policies have also been incorporated where appropriate to ensure that the analysis reflects the evolving policy landscape.

As policies continue to develop and local priorities change, a future policy review is recommended to maintain alignment with the latest policy direction. Collectively, these policies establish the foundation for the county’s transition to net zero carbon emissions by 2045, guiding the scope, ambition, and delivery mechanisms of the LAEP.

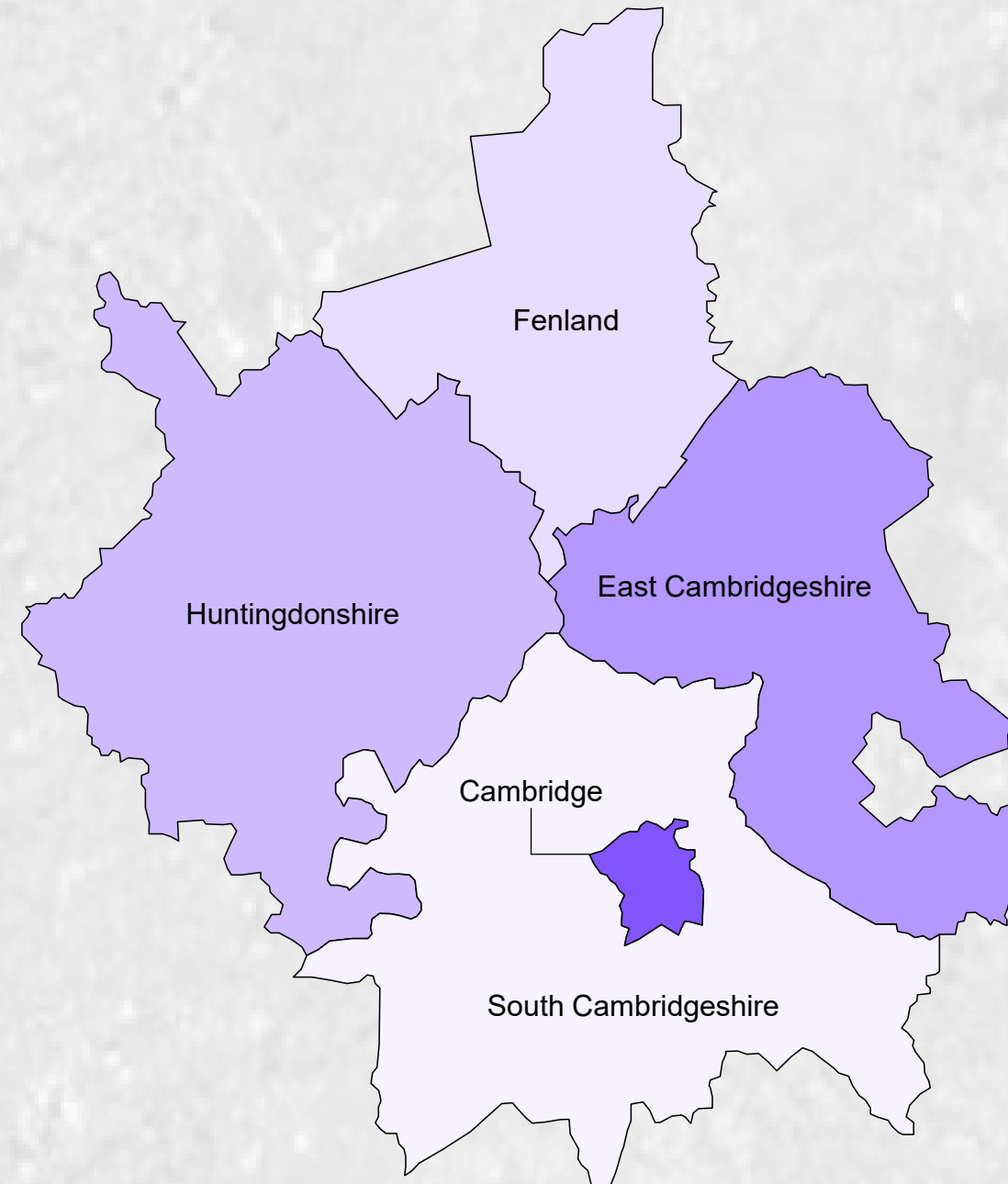
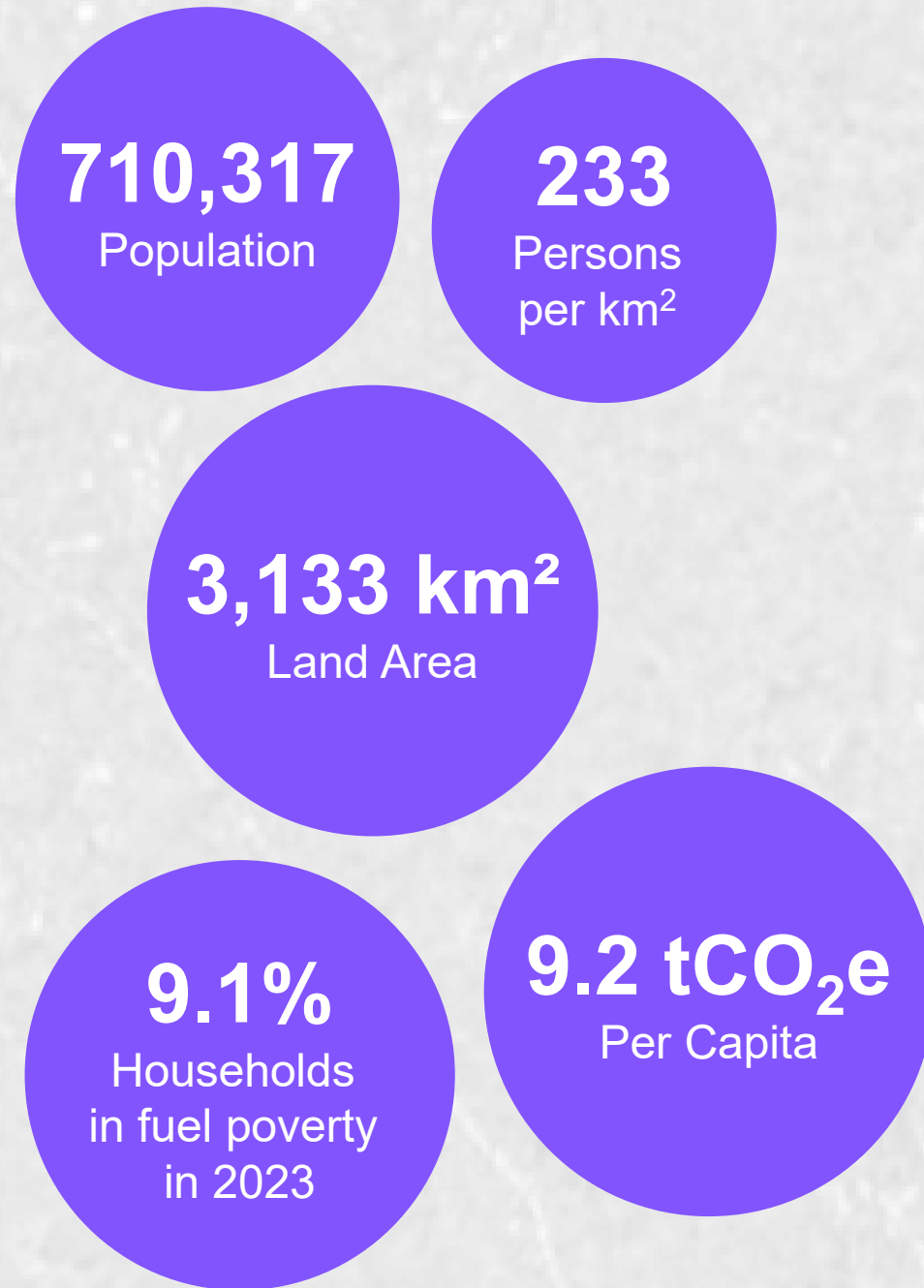
National	Regional	Local
UK 7 th Carbon Budget (2025)		Cambridge Local Plan (2018)
Clean Power Action Plan (2024)	Cambridgeshire and Peterborough Local Growth Plan	East Cambridgeshire Local Plan 2015 (as amended 2023)
National Energy System Operator (NESO) Pathways to Net Zero		Fenland Local Plan (2014)
Connections reform		Huntingdonshire Local Plan to 2036
Planning & Infrastructure Bill (2025)	Cambridgeshire and Peterborough Combined Authority Infrastructure Delivery Framework	South Cambridgeshire Local Plan (2018)
Future Homes and Buildings Standard (2025)		Greater Cambridge Local Plan – Policy CC/ NZ: Net Zero Carbon New Buildings
Integrated National Transport Strategy		
UK’s Modern Industrial Strategy (2025)		



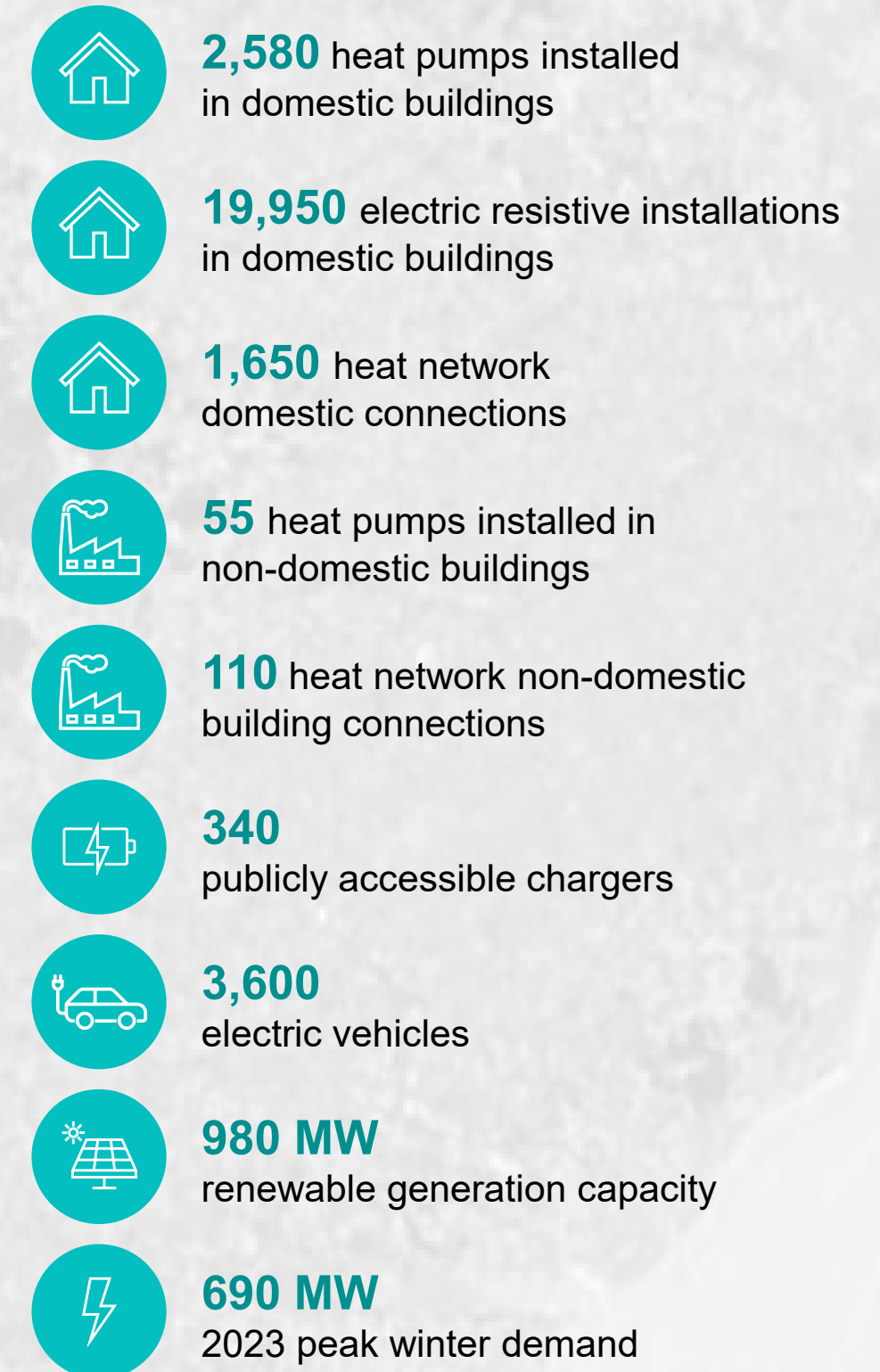
Energy System Today

Cambridgeshire Local Context

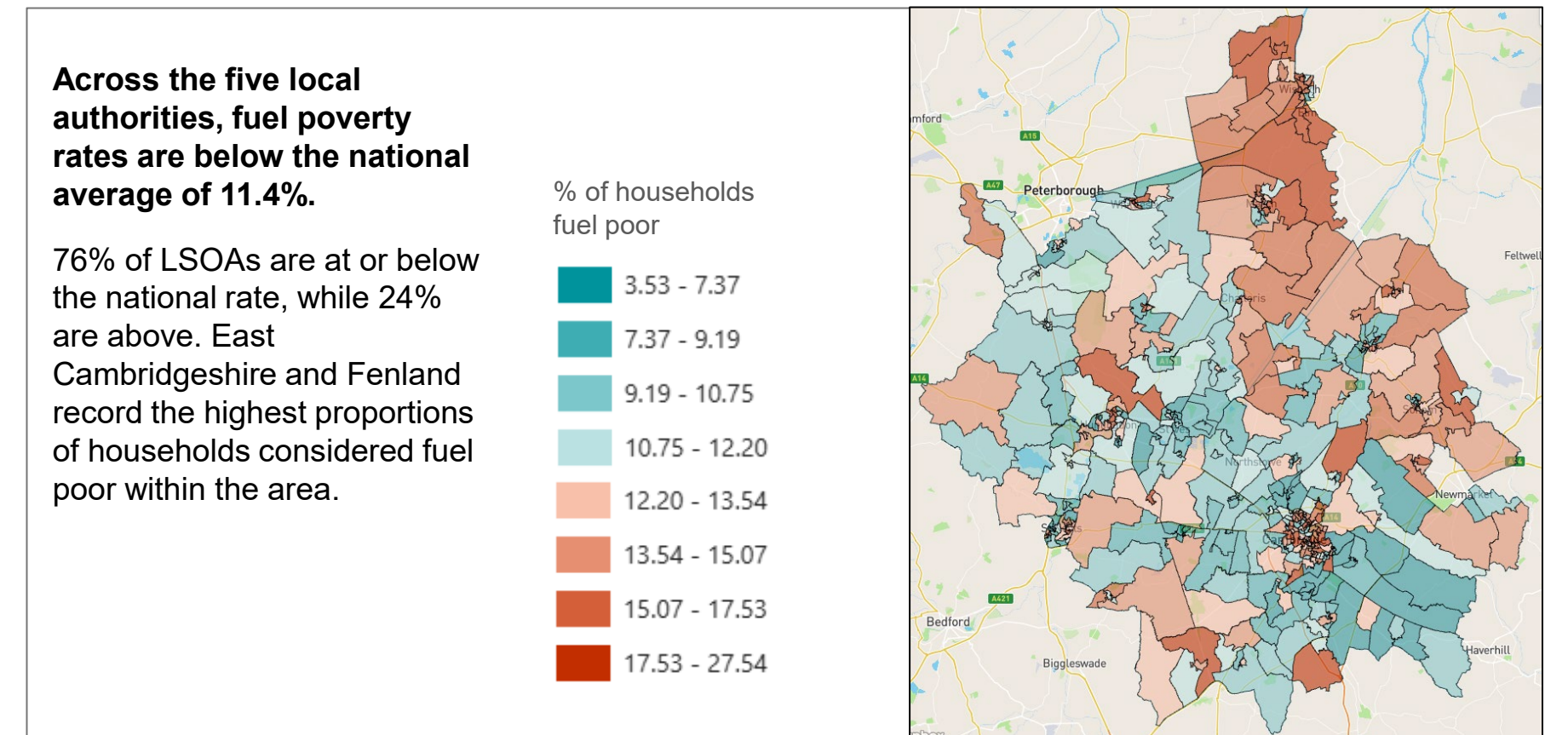
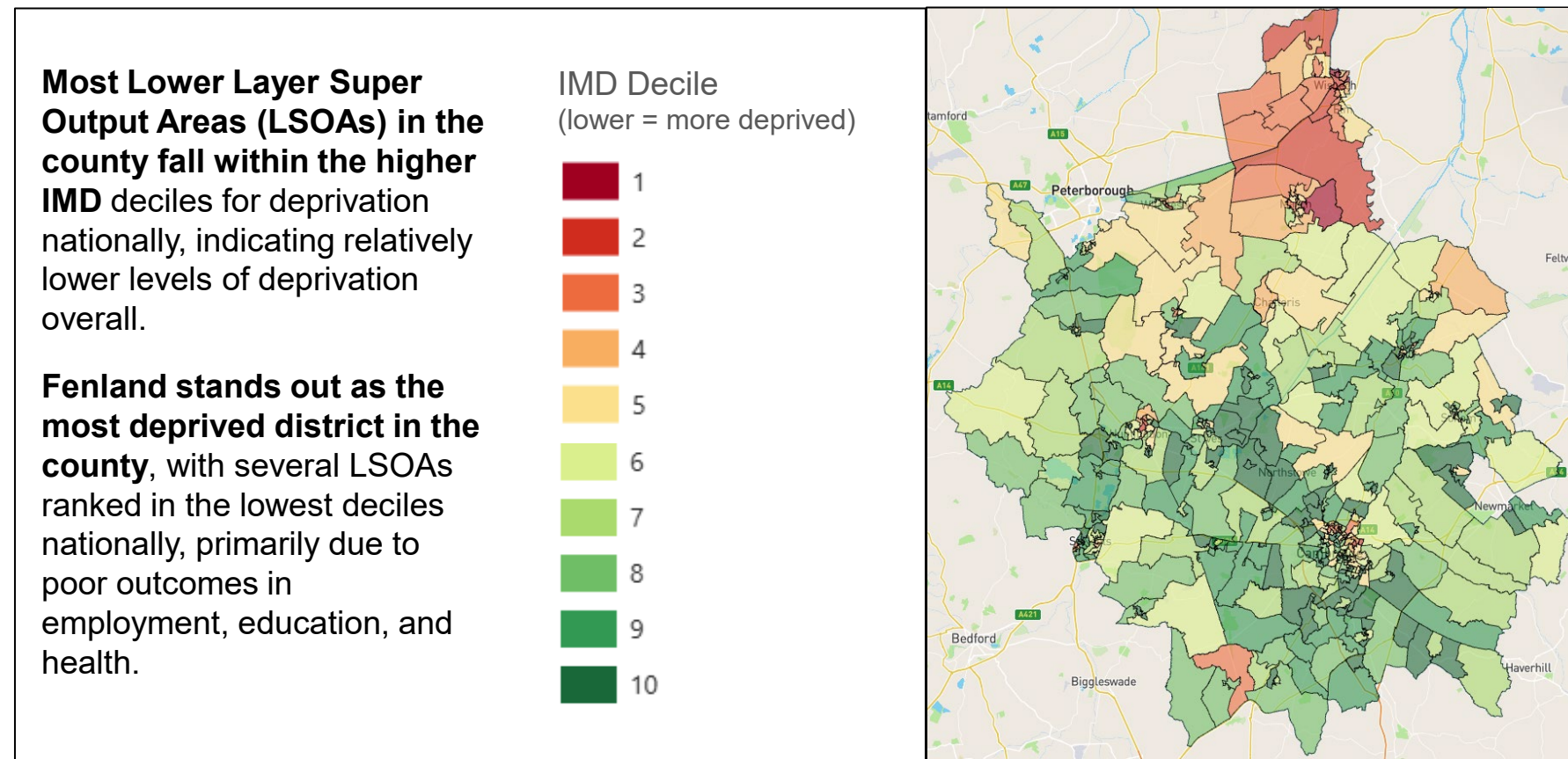
Area Demographics



Baseline statistics (2023)

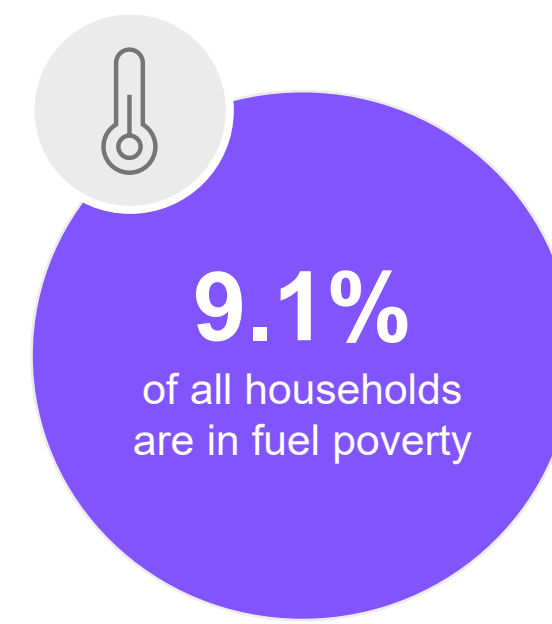


Deprivation And Fuel Poverty



Deprivation

The level of deprivation in Cambridgeshire can be assessed using the Index of Multiple Deprivation (IMD), which measures deprivation across factors such as education, employment, health and disability, and housing.



Fuel Poverty

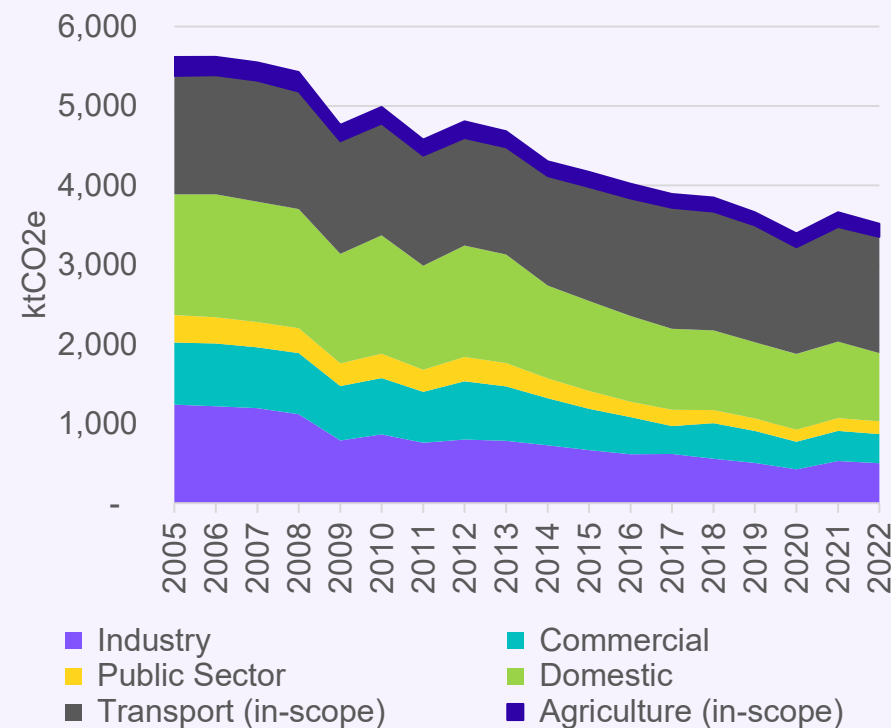
Fuel poverty is defined by the Low-Income Low Energy Efficiency (LILEE) indicator, which classifies a household as fuel poor if it has a Fuel Poverty Energy Efficiency Rating (FPEER) of D or lower and its income falls below the poverty line after spending the required amount to heat the home to an adequate level.

Emissions And Energy Baseline In Cambridgeshire

Historical Carbon Emissions

Cambridgeshire's in-scope **emissions have fallen by 35% between 2005 and 2022**, with the most significant reductions in the industrial, commercial, and public sectors driven primarily by electrical grid decarbonisation.

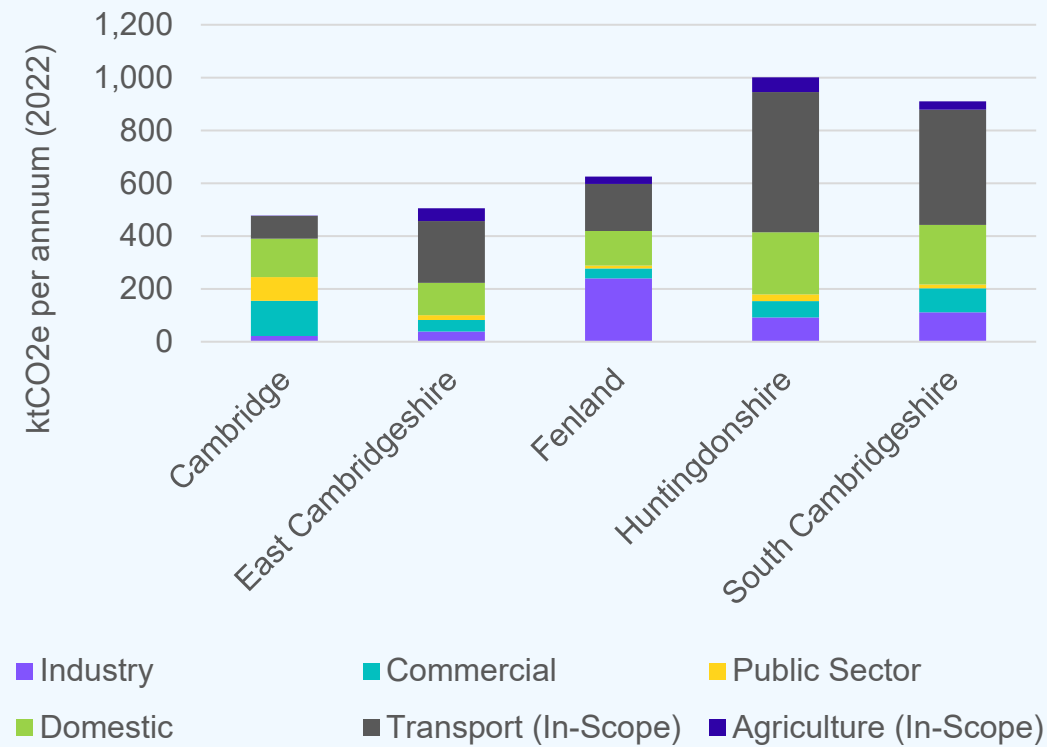
However, sustained population and housing growth, a slow uptake in electric vehicles (EVs), and the primary heating source being natural gas mean interventions are still needed to get to net zero.



12%

 Population and housing growth since 2005

Source: [UK local authority and regional greenhouse gas emissions statistics - GOV.UK](#)



Emissions Breakdown by Local Authority

Emissions profiles differ across Cambridgeshire's districts.



Cambridge has higher commercial and public sector emissions than other councils.



Fenland has comparatively higher industrial emissions.



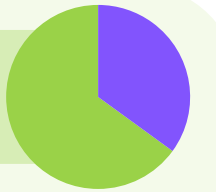
Huntingdonshire and South Cambridgeshire show higher transport emissions due to major roads and commuting.



East Cambridgeshire has a mixed profile, with transport, domestic, industrial, and agricultural contributions.

Source: Mott MacDonald analysis of [UK local authority and regional greenhouse gas emissions statistics - GOV.UK](#)

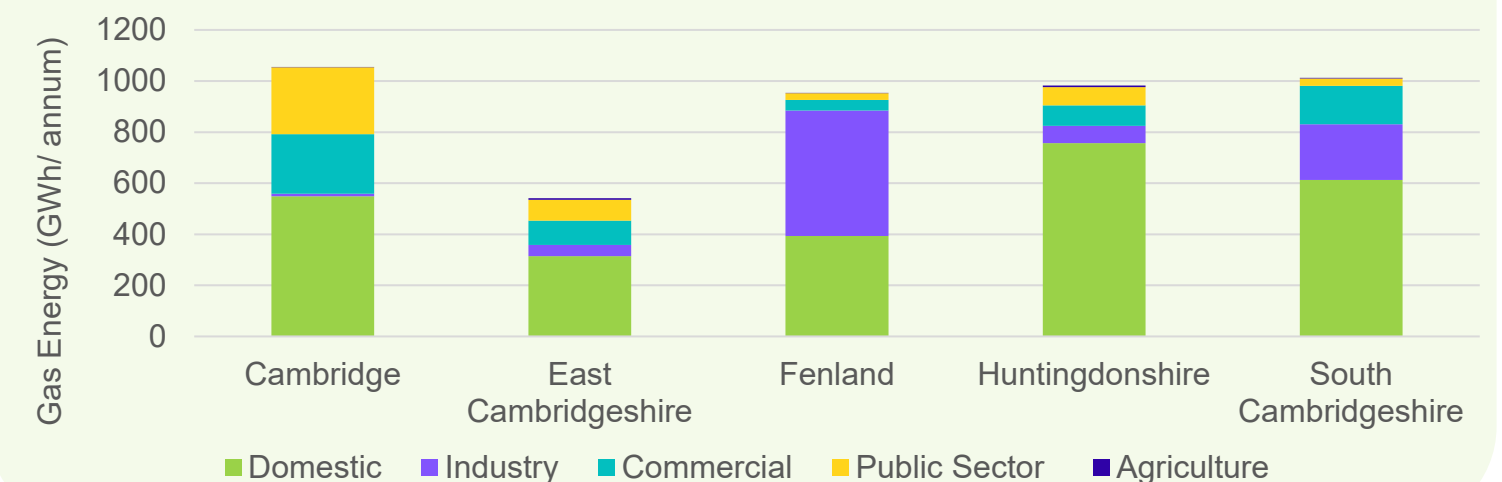
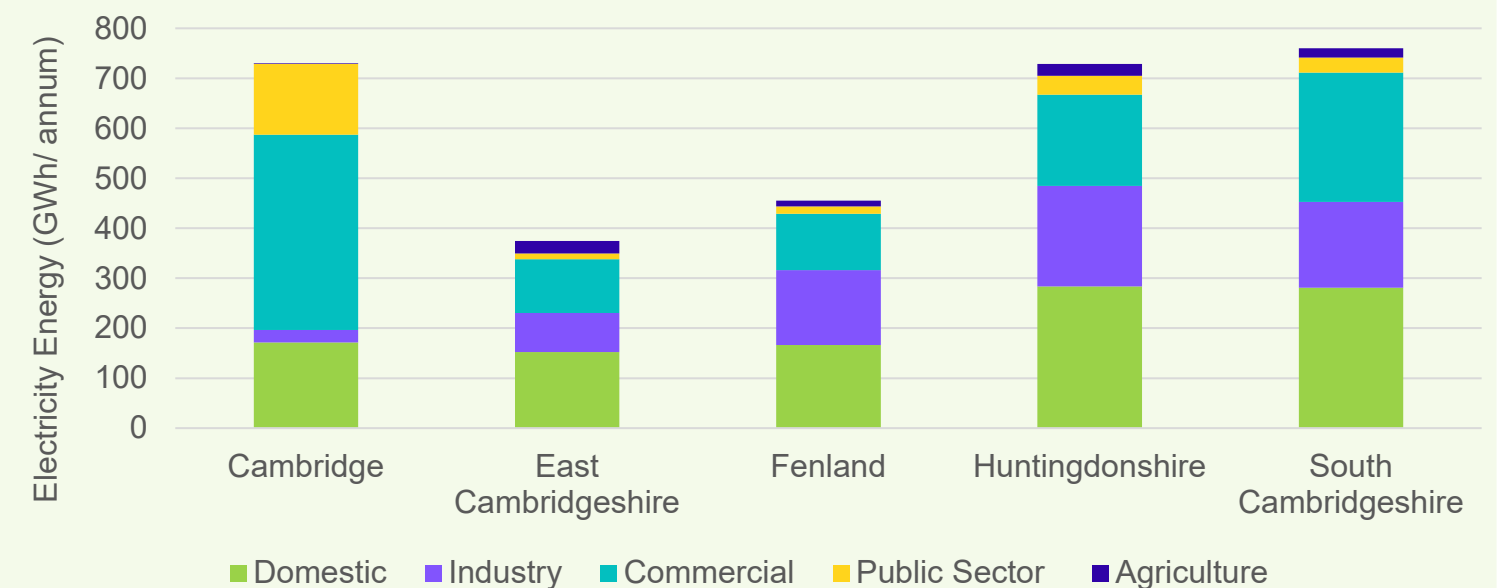
 Domestic buildings account for about **35% of electricity consumption**, with **65% from non-domestic sectors**.



2023 Electricity and Gas Consumption by Sector

Cambridgeshire's energy use is currently higher for natural gas than electricity across all districts, reflecting the prevalence of gas heating and certain industrial processes. Electricity consumption also forms a substantial share, particularly in non-domestic buildings where it represents around 64% of total demand.

Cambridge's gas demand is concentrated in commercial and public buildings; Fenland's is driven by industry; Huntingdonshire has a mixed profile; and South Cambridgeshire's demand reflects business parks and logistics. These variations show the need for **targeted interventions across retrofit, heating decarbonisation, and energy efficiency measures**.



Source: Estimated from the [emissions statistics data breakdown per Local Authority](#) published by the Department for Energy Security and Net Zero

Cambridgeshire Electricity Generation And Consumption

In 2023, around 45% of electricity consumed in Cambridgeshire was generated locally, primarily from low-carbon sources.

The remainder was imported via UK Power Networks' substations connected to the national transmission network.

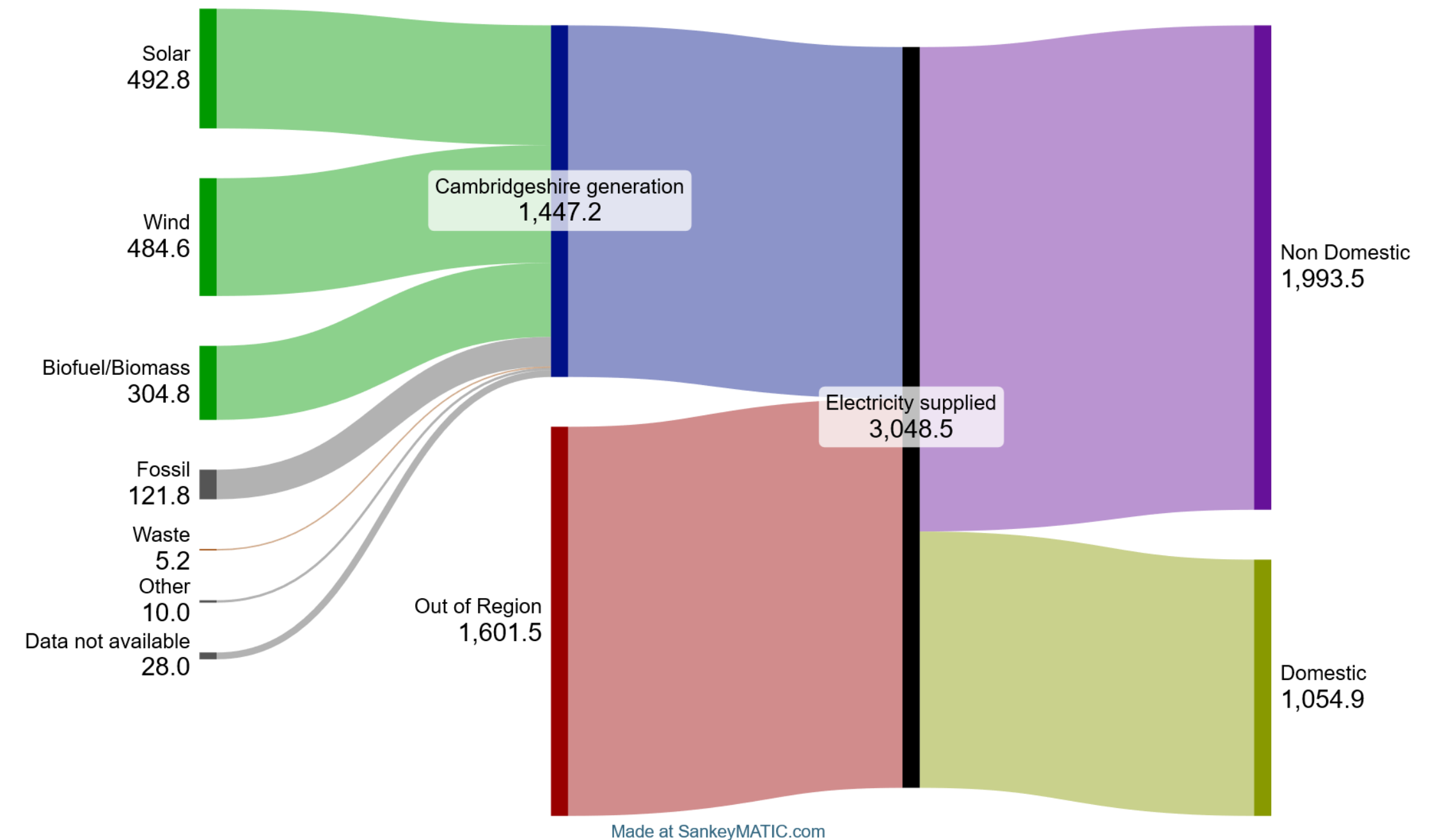
- The domestic sector accounted for 1,054.9 GWh (35%) of total consumption,
- while the non-domestic sector, including commercial, industrial, and public buildings, used 1,993.5 GWh (65%) as shown in the Sankey diagram.

Electricity affordability is already a material issue for many businesses across Cambridgeshire, particularly those with large process loads or 24-hour operations. Higher electricity prices can affect competitiveness and investment decisions. Expanding local low carbon generation, including community energy led rooftop solar on non-domestic buildings, together with greater use of flexibility services, will play an important role in helping businesses manage future electricity costs.

As both heating, transport and industrial loads transition to low carbon alternatives (primarily electricity), **this consumption is expected to grow significantly.**

In the face of that increasing demand, Cambridgeshire will need to expand its volume of renewable generation if it wants to maintain or increase its share of energy generated locally. This will mean deciding whether to re-power the wind assets likely to come to end of life within the next 20 years and balance the competing needs for solar PV with the needs of preserving the excellent quality agricultural land in the area and impact on local communities.

2023 Electricity Sankey Diagram (GWh)



Source: [Total final energy consumption at regional and local authority level: 2005 to 2022 - GOV.UK](#) and [Digest of UK Energy Statistics \(DUKES\) - GOV.UK](#)

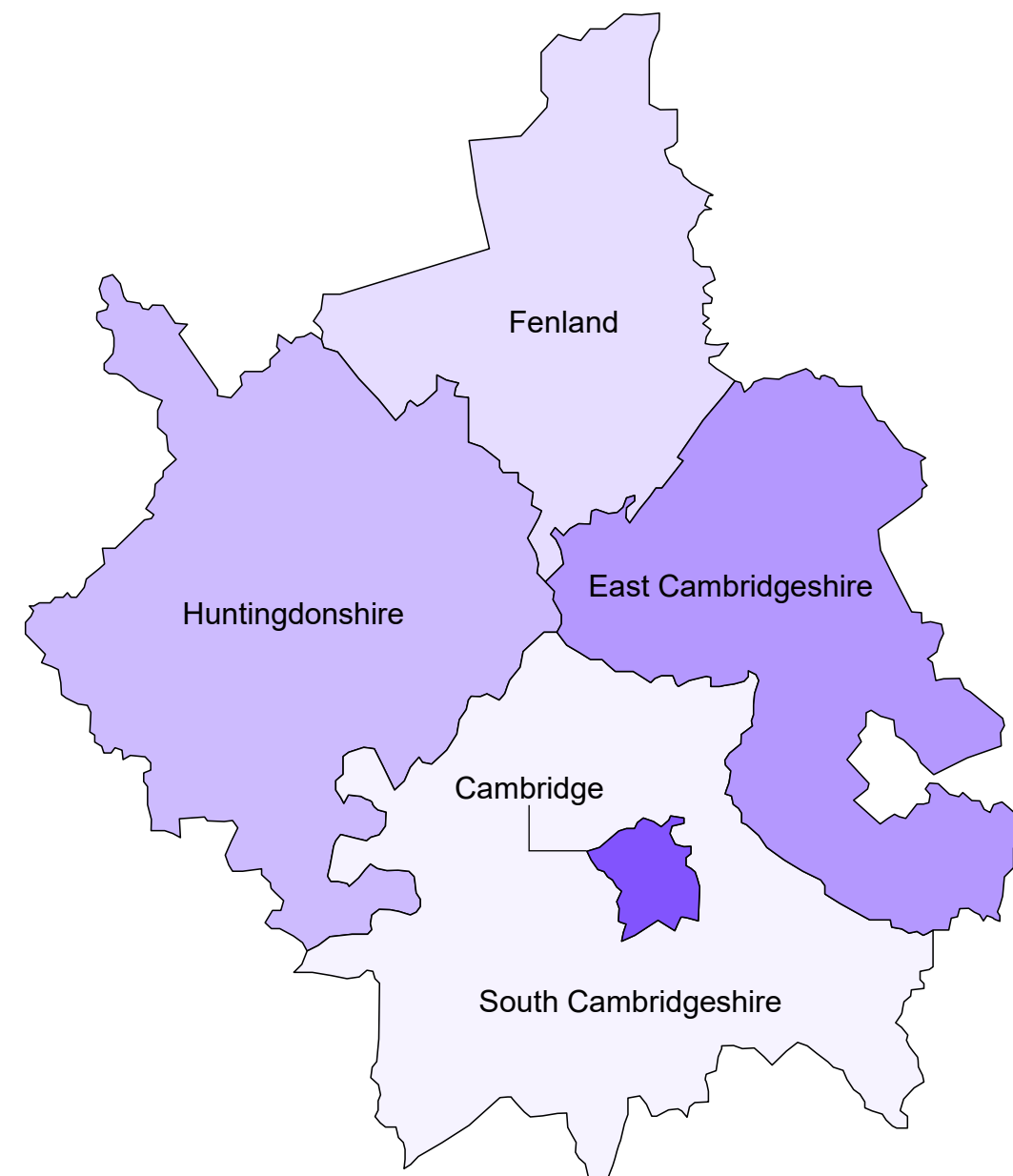


The Future State

Infrastructure Needs for the Recommended Pathway (Holistic Transition)

A summary of the key infrastructure needs for the recommended pathway is shown here, primarily focused on mature technologies only.

Further explanation on the pathways considered is provided within this section.



93.7% Total county-wide emission reduction from 2023 to 2045

4,310 GWh local renewable generation

6,620 GWh/annum Annual electricity consumption

1,020 MW Large scale battery capacity

47,340 publicly accessible chargers*

236,580 heat pumps installed in domestic buildings

34,490 electric resistive installations in domestic buildings

15,700 heat network domestic connections

20,220 heat pumps installed in non-domestic buildings

1,480 heat network non-domestic building connections

Note: *Public chargers (sockets) required by 2045 to support projected EV uptake, complementing predominantly home/ workplace charging.

Exploring Future Pathways To Net Zero

Cambridgeshire's Local Area Energy Plan uses scenario modelling to explore how technology choices, policy decisions, and behavioural changes could shape the county's energy future. **These scenarios provide a framework for assessing impacts, investment needs, and benefits on the path to meeting energy needs and achieving net zero by 2045.**

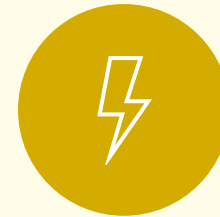
While the LAEP focuses on technologies that are currently deployable at scale, it is recognised that other emerging technologies, such as modular nuclear reactors, may have a significant future role locally and nationally in the future. Although not included in this iteration of the LAEP these technologies remain part of the broader innovation landscape shaping future national energy scenarios. The scenarios modelled are drawn from UK Power Networks' Distribution Future Energy Scenarios (DFES), which build on NESO's Future Energy Scenarios Pathways (FESP) and are tailored to reflect local conditions. **The LAEP scenarios modelled are summarised on the right.**

Each incorporates common assumptions on population growth, housing development, and employment expansion, ensuring future energy demand reflects realistic trajectories. Comparing these scenarios enables the plan to assess the impacts, investment needs, and benefits of different technology and policy choices over time. Spatial distribution of growth is also considered, recognising that different areas face distinct challenges and opportunities. This approach enables Cambridgeshire to evaluate trade-offs and synergies between interventions, supporting informed decision-making and prioritisation.



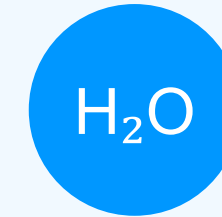
Counterfactual

A scenario in which limited consumer engagement and system changes occur. The energy system follows "business as usual" trends and, eventually, does not reach net zero by 2045. Low-carbon technology adoption still increases in response to national policies; however, uptake is significantly slower than in net zero-compliant scenarios.



Electric Engagement

A future energy system characterised by high levels of consumer engagement and electrification. The scenario sees society embrace more rapid deployment of renewables and heat pumps, rapid EV adoption, and behaviour change.



Hydrogen Evolution

The scenario expects lower levels of consumer engagement, but strong development of hydrogen for sectors that are challenging to electrify. The scenario assumes hydrogen is only used for hard to abate industrial processes, and potentially some hard to abate ground transport. Notably, hydrogen for home heating is omitted.



Holistic Transition

A balanced scenario that achieves net zero with a mix of widespread electrification and system changes. It relies both on strong consumer engagement as well as favourable policy environment for system changes. This scenario diverges from the DFES scenario, which includes hydrogen for space heating; our version does not incorporate hydrogen for heating.



Growth assumptions

Cambridgeshire is a recognised high-growth area, and future energy planning depends heavily on assumptions about population and housing growth. For this study, the analysis is based on 2023 population and dwelling stock forecasts provided by Cambridgeshire County Council, which indicate a higher level of growth (26% by 2045) than the UKPN DFES projections (11% by 2045). These 2023-based forecasts reflect the scale of development set out in current Local Plans and have been applied across the modelling all scenarios.

It is important to note that this LAEP was developed prior to the publication of the Local Growth Plan, and delivery of new homes may be higher taking into account the ambitions to significantly grow the economy. Some public estimates suggest that housing could double or even triple by 2050, substantially above the ~31% increase suggested by the 2023-based forecasts. To reflect this uncertainty, a **Core-growth sensitivity analysis** was undertaken for electrical network impacts using the Local Growth Plan figures (a 37% increase by 2045).

Scenarios: High Level Overview Of Assumptions

		Counterfactual	Electric Engagement	Hydrogen Evolution	Holistic Transition
Carbon Reduction Target		None	2045		
Building	Fabric Upgrades	Low uptake. Minimal efficiency improvements beyond those required for MEES regulations.	High uptake. Most homes install fabric improvements when installing a heat pump	Medium uptake. Homes <EPC C install fabric improvements when installing a heat pump	High uptake. Most homes install fabric improvements when installing a heat pump
Heating	Heating	Assumes no gas boiler ban; modest heat-pump uptake in the 2030s.	All heat decarbonised by 2045. Significant heat pump uptake in 2030s, assuming gas boiler ban is implemented in 2035 and energy prices re-balanced.		
	Role of hydrogen	None: not considered viable for space heating.			
	District Heat Network Connections	<10% of Cambridge homes, minimal elsewhere.	~5% of homes by 2045	Lower than Electric Engagement or Holistic Transition	~5% of homes by 2045
Industry	Low-Temperature Process Loads	Remain on fossil fuels	Fossil fuel use fully converted to electricity		
	High-Temperature Process Loads	Remain on fossil fuels	All fossil fuel use transitioned to hydrogen		
Transport	Modal Shift	0% modal shift			Approximate 6% reduction in vehicle miles
	Cars and Vans Decarbonisation	100% of car and van sales BEV by 2035	100% of Car sales BEV/ PHEV by 2030. 100% of van sales BEV/ PHEV by 2035.		
	HGV Decarbonisation	Ban of ICE HGVs <26t in 2038, >26t in 2043.	Ban of ICE HGVs <26t in 2033, >26t in 2040.		Ban of ICE HGVs <26t in 2033, >26t in 2038.
	Role of Hydrogen	None: BEV HGVs expected to be the dominant fuel source, with Fuel Cell Electric Vehicles not expected until much later, if at all*.			
Local Generation	Rooftop solar	Low uptake defined by DFES	Medium uptake defined by DFES		High uptake defined by DFES
	Ground mount solar	Ground mount solar presently in the planning pipeline			
	Onshore Wind (2045)	Declines as existing sites reach end of life	Maintained or repowered		

Source: *DFES 2025 Report (ERM, 2025) page 56, 68,
Note: Further elaboration on assumptions is provided in the technology specific sections of this report.

Net Zero Pathways Carbon Analysis

Cambridgeshire's pathway to net zero is defined by the combined impact of a suite of interventions targeting buildings, transport, industry, and local energy systems, each quantified for their contribution to county-wide decarbonisation.

The cumulative effect of interventions, including fabric retrofits, heat networks, heat pumps, other electric heating, EV uptake, and industrial process decarbonisation, has been modelled to quantify the pathway to net zero. Carbon reductions are calculated based on changes in fuel and electricity consumption resulting from the uptake of low carbon technologies.

By 2045, all three net zero scenarios achieve a reduction in annual emissions of approximately **2.8 million tonnes of CO₂e**, representing a **93.7% reduction from 2023 levels**. The Holistic Transition scenario is considered the preferred scenario as it achieves the highest carbon reduction impact and balances widespread electrification with targeted system changes. In contrast, the counterfactual ("do nothing") scenario falls well short of net zero, with around 1,000 kilotonnes of residual emissions per annum remaining in 2045.

The three net zero trajectories appear similar as they converge toward net zero, however the scenarios differ in their costs, infrastructure demands and exposure to energy-system risks. They also have different cumulative carbon savings as shown later in this section.

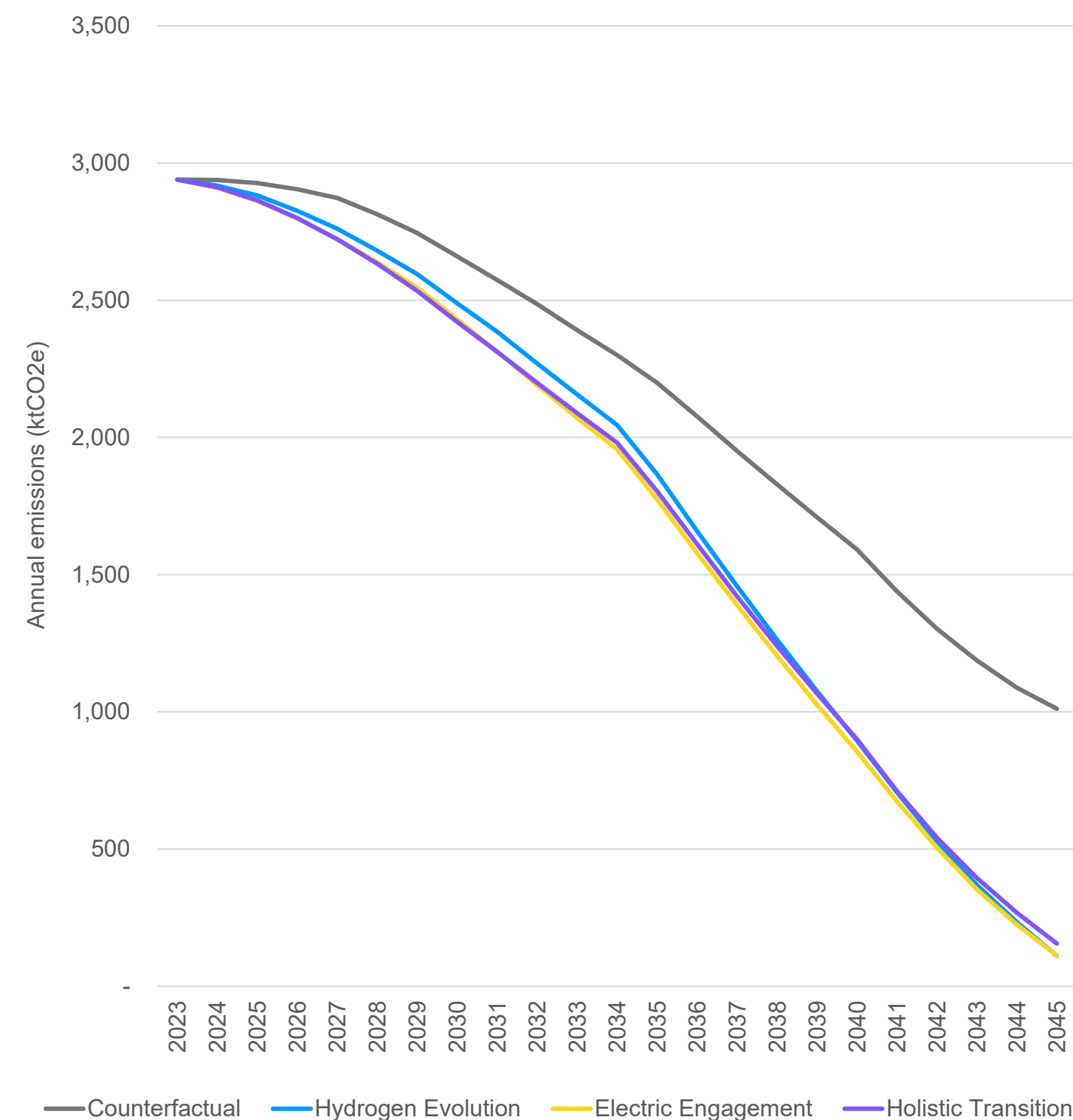
What the graph doesn't show is the risks associated with doing nothing. The counterfactual, would result in higher long-term costs for consumers, and carries the risk of energy supply disruption arising from greater climate impacts.

The largest single contributor to emission reductions is the transition from conventional ICE cars to EVs, **accounting for 35% of total reductions**. The next largest contributions come from the installation of air source heat pumps in domestic (**27%**) and non-domestic (**22%**) properties, replacing existing gas or other fossil fuel-based heating methods.

Despite these significant reductions, even the net zero compliant scenarios do not fully reach net zero by 2045. **Residual emissions are predominantly from through traffic on trunk roads, which are outside the direct scope of the LAEP, and from high temperature industrial processes using green hydrogen**. These remaining emissions will require additional measures such as carbon sequestration through re-wilding, peatland restoration, and tree planting, to be addressed in future updates to the region's Local Nature Recovery Strategy (LNRS).

The findings highlight both the scale of progress achievable through current interventions and the need for ongoing action to close the gap to net zero, ensuring a sustainable and resilient future for Cambridgeshire.

Cambridgeshire annual emissions by scenario



Source: Mott MacDonald analysis

Economic Assessment

Meeting energy needs and achieving net zero across Cambridgeshire by 2045 will require significant investment, but this will bring substantial benefits.

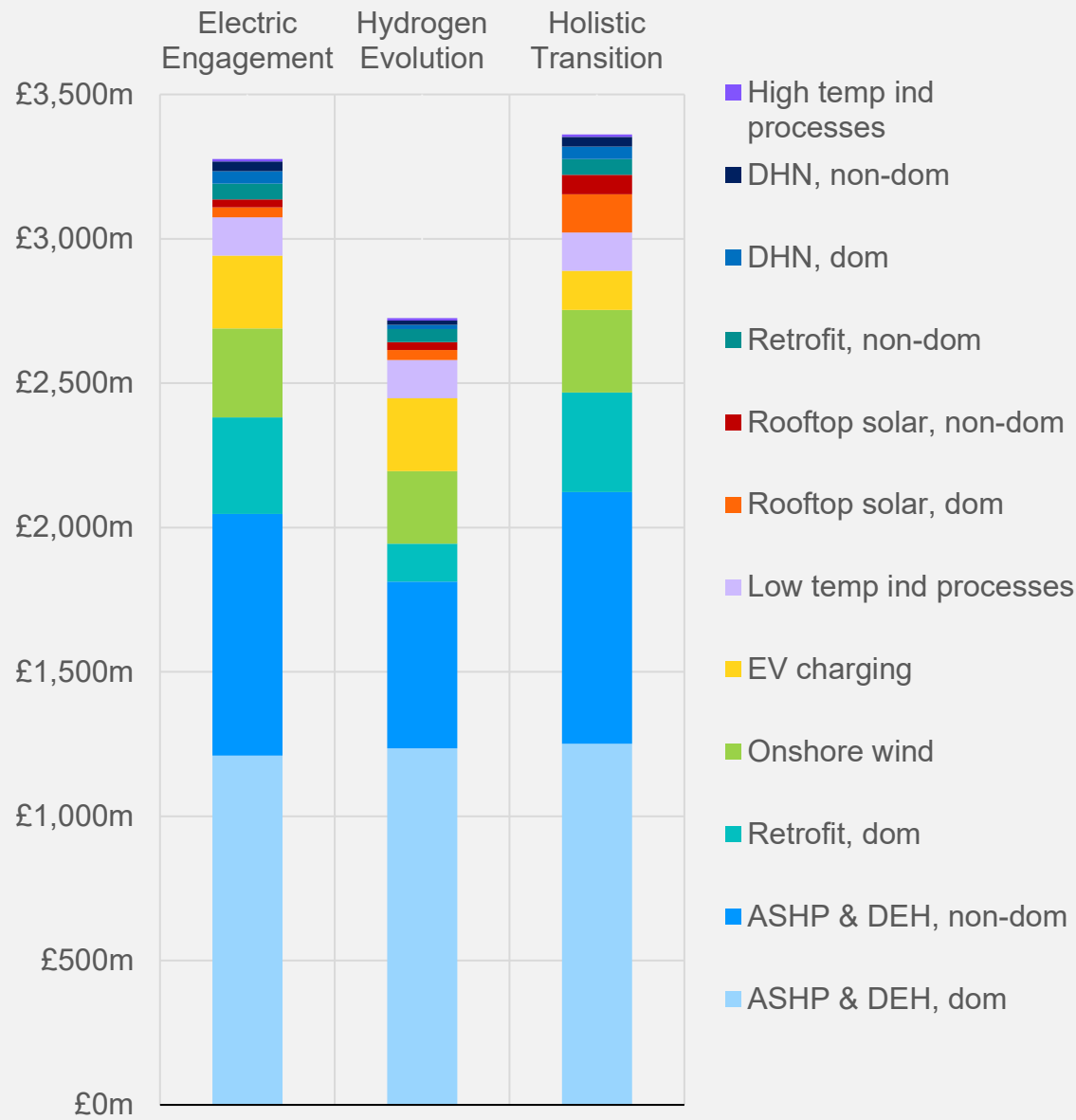
The LAEP assumes a counterfactual scenario where limited consumer engagement and system changes occur, essentially a “business as usual” trajectory that does not reach net zero by 2045. Under this scenario, residents gradually switch to EVs and install private chargers at a slow pace, and a substantial amount of ground-mounted solar already in the connections queue proceeds. Discounted capital expenditure (CAPEX) for this counterfactual is approximately **£3.4 billion**, of which £2.9 billion relates to solar and EV infrastructure expected under any scenario.

To achieve net zero, additional investment above this baseline is required. Across scenarios, this ranges between **£2.7 billion and £3.4 billion** in present value terms: £2.7 billion under Hydrogen Evolution, £3.3 billion under Electric Engagement and £3.4 bn for the preferred Holistic Transition scenario. In the Core growth scenario, this number could be as high as £5.0 billion (present value terms).

Under the most likely scenario, the Holistic Transition scenario, approximately **£3.4 billion** of additional capital investment is required to achieve net zero, in **present value terms**. This could unlock benefits that exceed this outlay in terms of carbon benefits, bill savings, and air quality by 2045. Removing the impact of discounting and estimating the cash cost in 2025 prices, **undiscounted CAPEX shown in the figure below** for this scenario is **£5.1 billion**. This provides an estimate of the total potential outlay in today’s prices. It is useful to see the real financial commitment required to deliver the interventions.

A comparison of the costs and benefits between scenarios is included on the following pages, which demonstrate that the holistic transition delivers the greatest benefits compared to other scenarios.

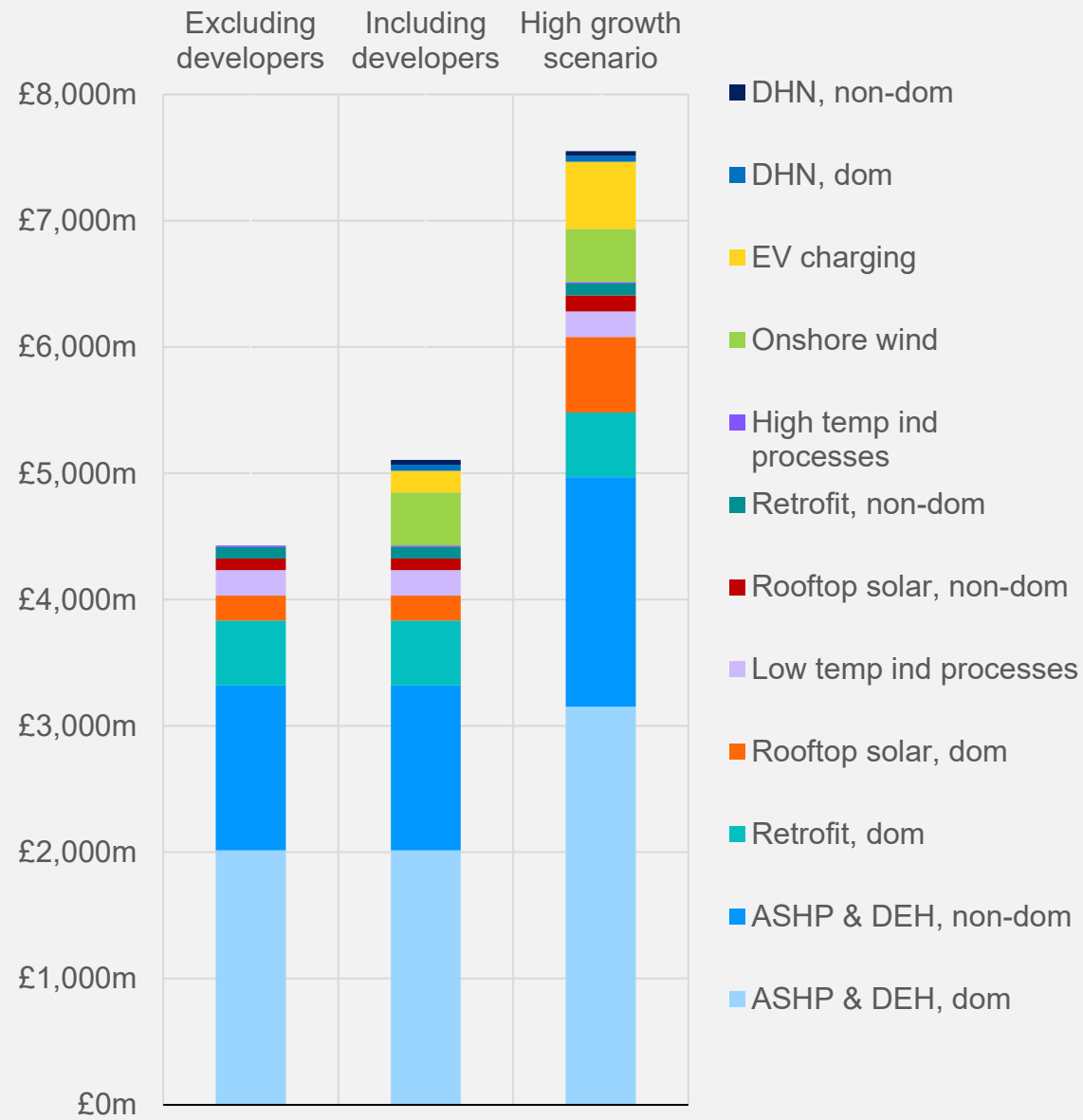
CAPEX vs. counterfactual, by scenario, real, discounted, 2025.



This graph shows how the value of discounted CAPEX varies between scenarios.

Discounted CAPEX shows the present value of future costs, applying Green Book methodology for valuation of costs and benefits. Discounting reduces the value of costs and benefits the further they occur in the future and allows comparison with other types of costs and benefits.

Holistic Transition CAPEX vs. counterfactual, real, undiscounted, 2025.



This graph shows how the value of undiscounted CAPEX can be segmented for the Holistic Transition scenario.

Undiscounted CAPEX shows the estimate of costs at today’s prices, with no discounting adjustment to devalue costs the further they occur in the future. These values indicate the real financial commitment required to deliver the interventions.

Acronyms applied in the chart are as follows:					
EV Electric Vehicle	DHN District Heat Network	dom Domestic property	non-dom Non-domestic property, including public and private sector.	ASHP Air Source Heat Pump	DEH Direct Electric Heating

Economic Assessment (cont.)

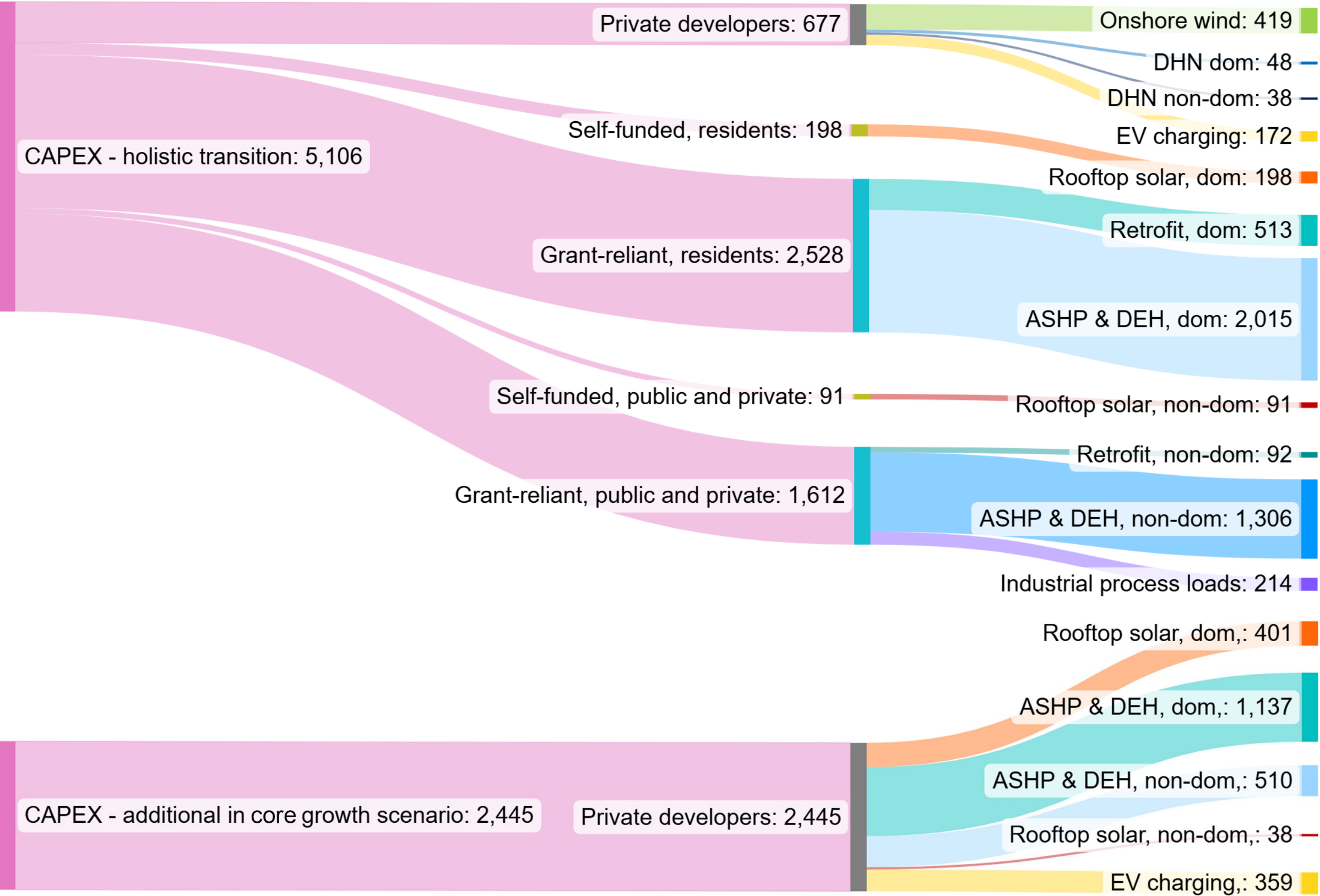
Undiscounted CAPEX for the Holistic Transition is categorised by intervention according to who might pay, and whether the intervention requires government grant for investment to be made under current market conditions where there is not a clear financial payback.

Around **85% of the present value CAPEX** is expected to be funded by a combination of business and resident capital supported by grants, and circa 15% brought forward by private developers. In the Holistic Transition scenario, the bulk of spend is on air source heat pumps and domestic fabric retrofit which will likely be paid for by a combination of private residents and public funding. While the investment requirement is significant, the societal benefits are far reaching, **delivering carbon and air quality improvements, lower energy bills, and economic growth**. With clear direction, this investment can also help reduce inequality and fuel poverty across the region.

Acronyms applied in the chart are as follows:

EV Electric Vehicle	DHN District Heat Network	dom Domestic property
non-dom Non-domestic property, including public and private sector.	ASHP Air Source Heat Pump	DEH Direct Electric Heating

Potential funding and financing mapping to undiscounted CAPEX in the Holistic Transition (£ million)



Scenario Comparison

The scenarios illustrate different potential pathways to achieving net zero, recognising the significant uncertainty surrounding future regulatory changes, technological developments, and the pace of uptake over the next 20 years.

They should therefore be interpreted as plausible futures rather than prescriptive implementation plans. The table on the right presents the resulting infrastructure requirements, providing a consolidated overview of the intervention-specific analysis.

Parameter	Counterfactual	Electric Engagement	Hydrogen Evolution	Holistic Transition
Thermal demand % reduction domestic	None	12%	10%	13%
Thermal demand % reduction non-domestic	None	9%	8%	9%
Domestic Heating transition (number of ASHPs installed)	Only 20% of homes have a low carbon heat supply in 2045	230,000	235,000	235,000
Domestic Direct Electric Heating (number of directive electric installations)	Only 20% of homes have a low carbon heat supply in 2045	25,000	20,000	15,000
Non-Domestic Heating transition (number of ASHPs installed)	Only 20% of buildings have a low carbon heat supply in 2045	20,000	13,000	19,000
District Heat Network connections	400 in Cambridge, minimal uptake in other authorities.	1,300	860	1,300
Publicly accessible EV chargers	45,748	53,306	53,579	48,356
Rapid or high-powered EV chargers (>50kW)	13,653	15,841	15,841	14,227
Rooftop PV (MW)	152	204	204	314
Largescale solar (MW)	3,496	3,496	3,496	3,496
Largescale wind (MW)	0	300	244	279
Electrical Demand increase (MW)	352	949	911	856
Year existing regional headroom is exceeded	2044	2036	2036	2037

Scenario Comparison (cont.)

The assessment of benefits across these scenarios is grounded in a robust economic appraisal proportionate to the stage of appraisal, quantifying both the costs and the societal returns of the transition.

The benefits are assessed using discounted present values, in line with HM Treasury Green Book guidance, and include:



Carbon savings
Quantified using the government’s carbon appraisal values, reflecting the avoided social cost of emissions.



Air quality improvements
Valued based on reductions in pollutants such as NOx and particulates, with benefits accruing to public health and productivity.



Bill savings
Calculated from reduced energy consumption and fuel switching



Economic contribution
Estimated as Gross Value Added (GVA), reflecting the local economic activity generated by investment in low carbon technologies and infrastructure.

Summary of the key results per scenario

Colour coding indicates the comparative ranking of costs and benefits between scenarios for each metric, Green indicates the best-performing scenario, amber indicates moderate performance, and red indicates the weakest performance.

Parameter	Counterfactual	Electric Engagement	Hydrogen Evolution	Holistic Transition
Cumulative carbon emissions (ktCO ₂ e)	49,936	40,079	41,113	40,521
2045 electrical demand increase (MW)	352	949	911	856
CAPEX above counterfactual (£m)	-	-3,276	-2,725	-3,361
Economic value of carbon savings (£m)	-	3,485	3,147	3,534
Savings in utility bills (£m)	-	992	527	1,184
Economic value of air quality improvements (£m)	-	59	54	60
Economic contribution (GVA) (£m)	-	5,366	4,513	5,690

The comparative analysis demonstrates that proactive investment in net zero interventions delivers benefits that far exceed the costs. The Holistic Transition scenario, in particular, offers a compelling case for action: it not only **achieves the region’s climate goals** but also **unlocks substantial economic, social, and environmental value** for Cambridgeshire’s residents and businesses.

Based on this assessment, the Holistic Transition is identified as the preferred scenario. While the CAPEX required is higher than in the other net zero scenarios, it delivers greater overall benefits, results in higher carbon savings, and places the lowest additional burden on the electrical network.

It must be re-iterated however, that selecting the Holistic Transition scenario identifies the potential future that provides the greatest benefit. It is used as the preferred scenario for presenting costing results and comparing against growth scenarios. It does not represent a prescriptive implementation roadmap to follow.

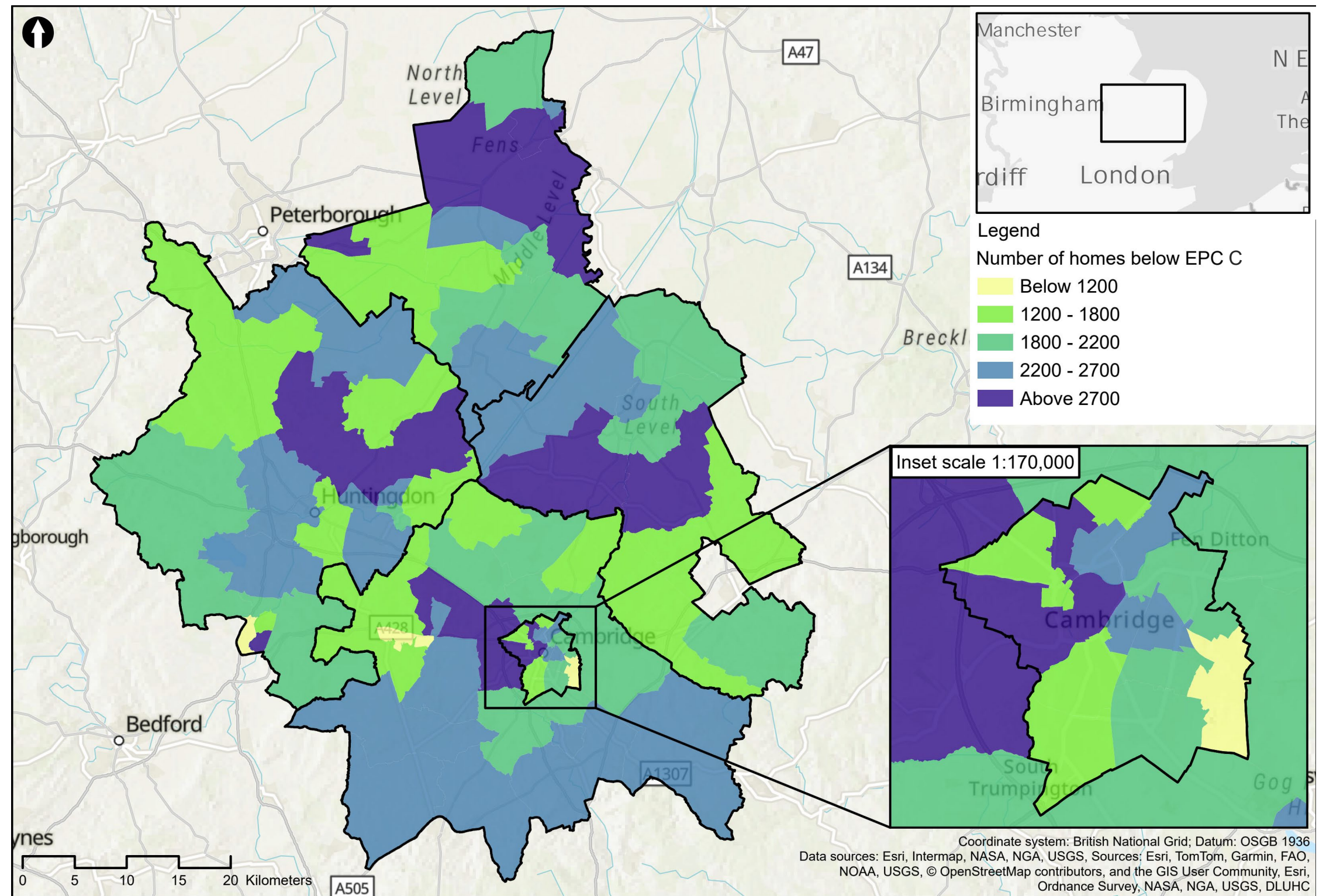


Buildings & Heat

Domestic Buildings Today (cont.)

Homes below EPC C

This maps the number of domestic properties currently below EPC C by Middle Super Output Area (MSOA). Purple indicates priority areas for improving the energy efficiency of domestic buildings.



Domestic Buildings in 2045

Making Homes and Buildings Warmer, Greener, and More Affordable.

Improving the energy performance of homes and buildings is essential for reducing bills, improving comfort, and cutting carbon emissions. For households, this means upgrading insulation, such as cavity walls, lofts, and windows, and moving towards modern heating systems that are cleaner and more efficient. These changes make homes warmer in winter, cooler in summer, and cheaper to run. It is very important to retrofit homes to a minimum standard before switching heating sources to an air source heat pump (ASHP) or other low-carbon heating solution, being ‘heat pump ready.’ This approach leads to smaller equipment, lower electrical demand, higher efficiency, lower operating costs, and improved comfort.

The final energy saving profile from domestic retrofit has been modelled using analysis of EPC data on the energy efficiency rating of specific building fabrics and is represented on the right. Here, the “medium uptake” case includes Minimum Energy Efficiency Standard (MEES) compliance for rented properties, and that any owner-occupied property with an EPC rating below C improves any individual fabric that has an energy efficiency rating of “very poor” or “poor” in the EPC data.

The high uptake case has the same assumptions as the medium case, but for homes below EPC C, “average” rated fabrics also get upgraded. For homes EPC C and above, “poor” or “very poor” rated fabrics also get upgraded.

In both the medium and high cases, cavity wall insulation is the most common intervention type required, followed by loft-top up insulation (when a loft is partially insulated but requires more to reach current building standards). Solid wall insulation is also included, which may be too costly and disruptive for many homeowners and landlords to implement in practise given current energy prices and the cost of installation. The LAEP identifies nudges and projects that can help overcome this, but similar to the roll out of heat pumps (discussed on the next slide), a re-balance of energy prices or government mandate is likely to be required.

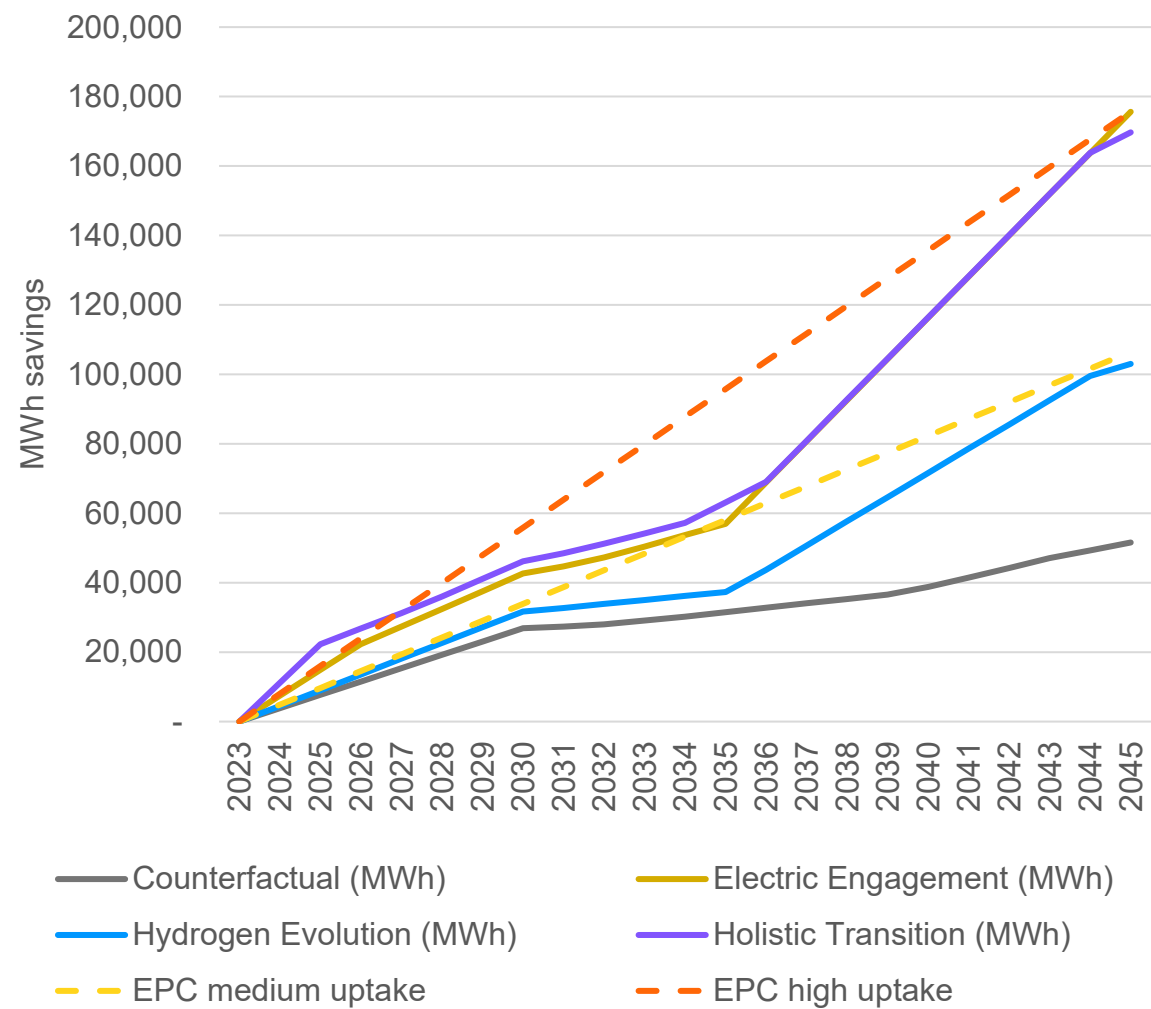
Priority Actions

The Council and Housing associations can continue their work in directly implementing fabric and heating upgrades in social tenures and for vulnerable residents.

More broadly, neighbourhood-scale retrofits and group purchase schemes could offer economies of scale and create opportunities for community engagement.

Finally, engagement with local contractors to scale up training and apprenticeship programmes is needed, as well as expanding the awareness campaign around Action on Energy (CISL, 2025).

Projected yearly energy savings from domestic retrofits



Source: Mott MacDonald modelling based on GIS EPC imputation data, and DFES thermal efficiency data



236,600² heat pumps installed in domestic buildings



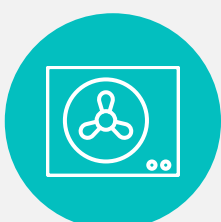
34,500 electric resistive installations in domestic buildings



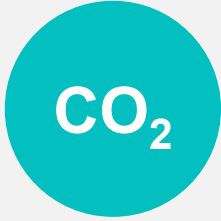
15,700 heat network domestic connections



154,700 homes currently below EPC C and will likely need energy efficiency upgrades



20,200 heat pumps installed in non-domestic buildings and **1,500** heat network non-domestic building connections



This will save over **800ktCO₂e** per annum after grid decarbonisation



Cost **£1,600m¹**, with likely reliance on government grants to subsidise investment from homeowners.

1) 2025 real terms, present value, vs. a business-as-usual scenario.
2) All figures here rounded to nearest 100, for simplicity

Domestic Buildings in 2045 (cont.)

Decarbonisation of Heat

Decarbonising the energy required for space heating and domestic hot water represents the biggest challenge for domestic buildings, with the bulk of their emissions arising from fossil fuel combustion for heat. 69% of all homes in Cambridgeshire use natural gas as their fuel source, 20% use oil or LPG, and only 11% currently having electrified heat (note: these percentages differ from those on the Domestic buildings today slide, which show total domestic energy consumption by fuel type rather than number of homes).

For the County's energy system to become resilient and zero-carbon, each home currently using a fossil fuel boiler will need to transition to a low carbon alternative. So most homes will have to install a heat pump or electric resistive system, unless within a district heat network zone (see heat networks section).

Uptake rates of heat pumps within the County had been increasing in each of the last three years, based on UK Government data on the Boiler Upgrade Scheme. However, only around 5% of the estimated 12,000 boiler replacements in Cambridgeshire each year are opting to instead switch to a heat pump. Assuming an average boiler lifespan of 15 years, to reach net-zero by 2045 the vast majority of new heating system installations will need to be heat pumps, or other low carbon alternatives, from 2030.

A key barrier to heat pump uptake is that, at current fuel costs, many homes transitioning from a gas boiler to a heat pump may have an increase in energy bills. This runs the risk of exacerbating fuel poverty and minimising wider benefits from heat pump installations. To minimise this risk, heat pumps should be well designed and installed using trusted suppliers, cost effective fabric retrofit works should also be completed before heat pump installation to ensure optimal performance and time-of-use tariffs should

be well signposted. But as stated on the previous page, motivating residents to make either of these changes is likely to require a re-balancing of energy costs or a regulated mandate.

In summary, Decarbonisation of heat in Cambridgeshire has the potential to save nearly 600kt of carbon emissions. It is crucial that action is taken to encourage the uptake of low carbon heating systems, where viable to meet net zero targets. The transition to low carbon heating systems has the potential to create significant wider benefits in the County, through job creation and improved air quality, due to the removal of local air pollution caused by fossil fuel boilers.

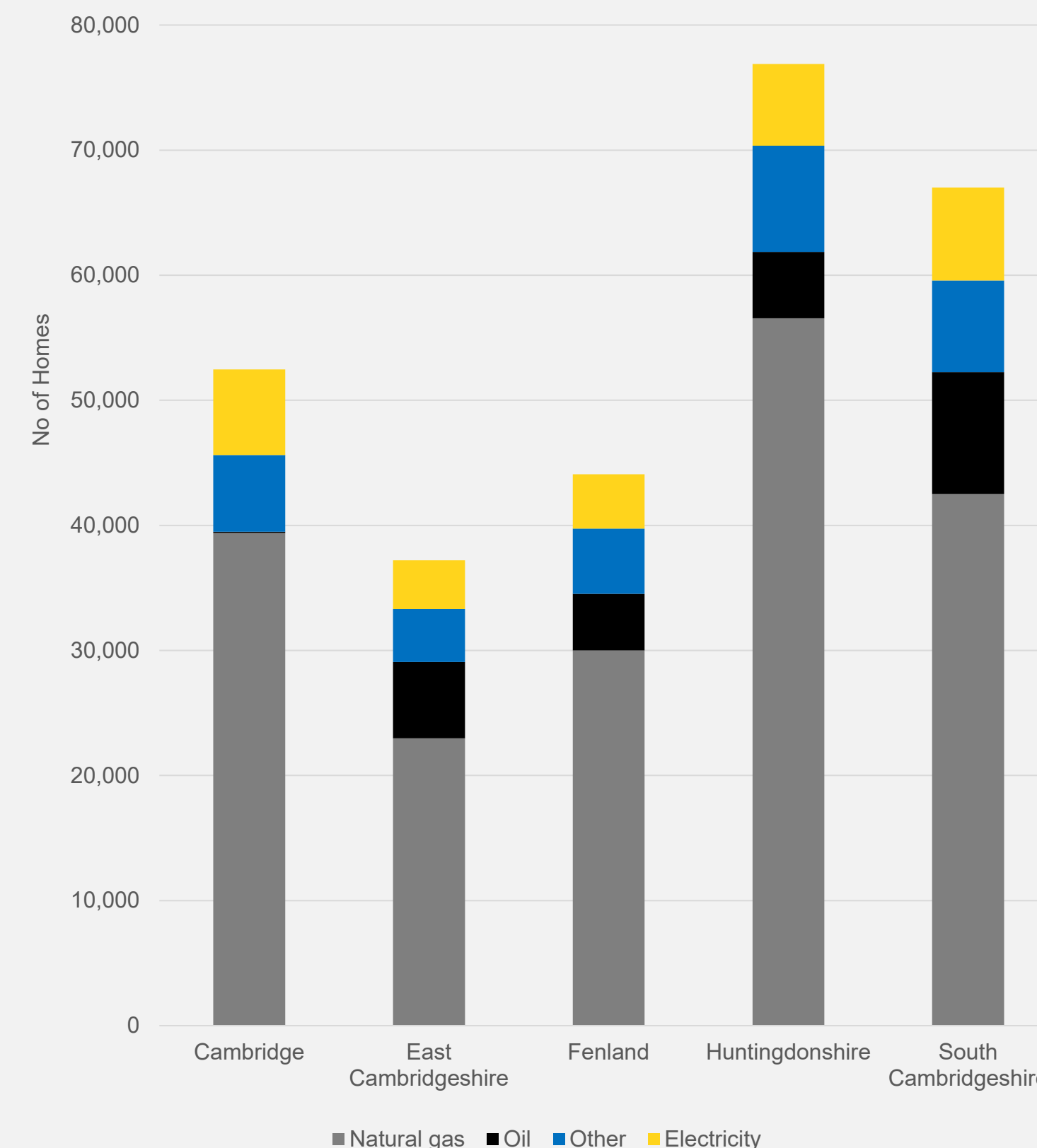
Why not hydrogen for heating?

In consultation with the District Councils, it was agreed that hydrogen for space heating is not likely to be a viable option for heat decarbonisation in the County in the short to medium term. Of note, is that currently the industry view on hydrogen as a replacement for natural gas in the gas grid to help decarbonise home heating, is very unlikely¹. It is generally recognised that to produce green or blue hydrogen requires vast amounts of renewable electricity and comes at a cost premium to fossil fuel-based feedstocks.

There is a growing consensus in the industry, that green hydrogen should be reserved for hard to abate sectors, such as industrial processes which have no electric alternative, rather than for home heating for which there is a mature electric technology. While the government (DESNZ) is yet to conclude on this ongoing debate, the LAEP has not factored in hydrogen as decarbonisation intervention for home heating. Future iterations of the LAEP may continue to watch this space, and as hydrogen technologies mature, alternative systems can be considered.

1) CCC (2025) 7th Carbon Budget, page 14

Domestic fuel type breakdown by local authority



Source: Census data, 2021

Non-domestic Buildings

The most suitable fabric and energy efficiency measures for non-domestic buildings depend heavily on their primary use.

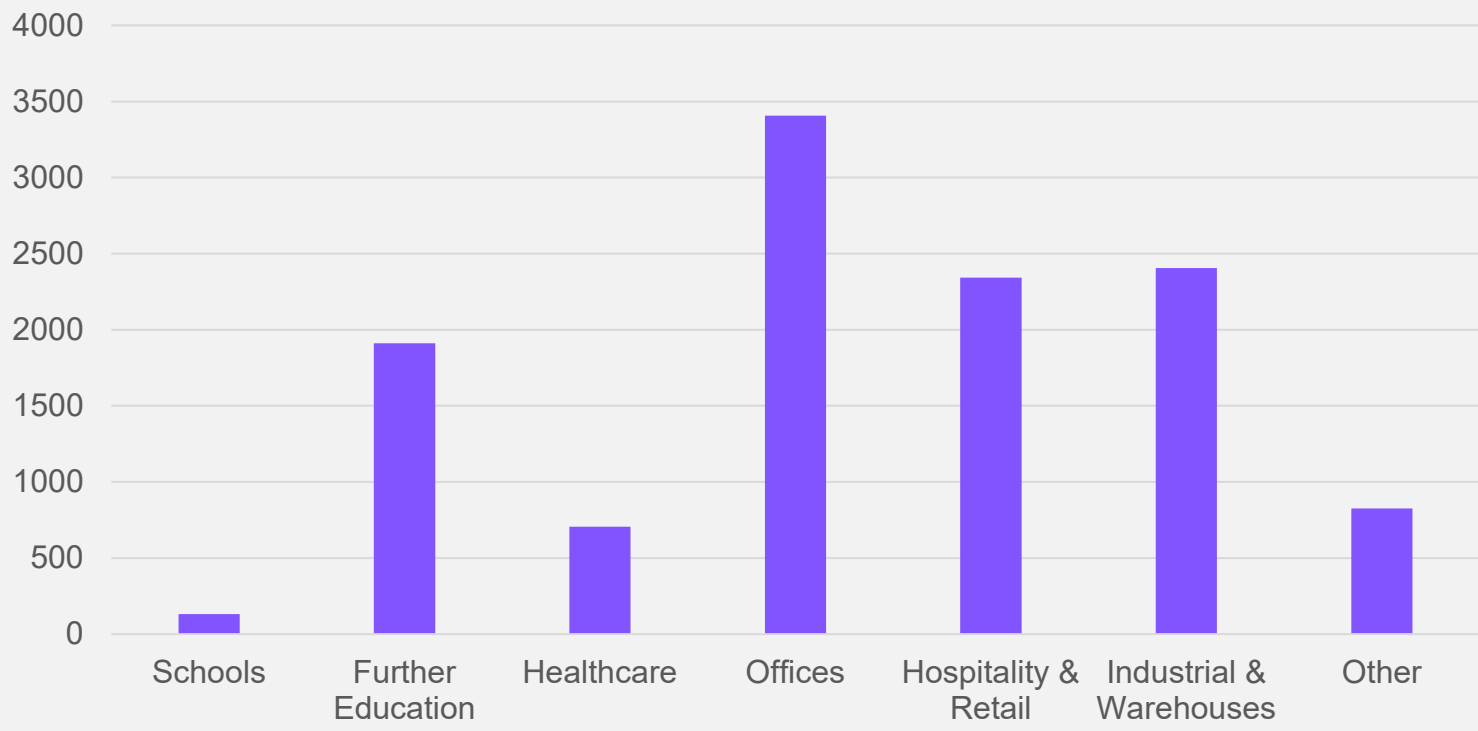
Variations in building fabric, equipment types, and occupancy patterns influence which interventions are most effective. Funding mechanisms also differ, with public sector buildings typically having greater access to UK Government grants compared to privately owned commercial buildings. Like the domestic sector, many commercial and public buildings face high thermal demand and poor energy performance. Upgrades to insulation, lighting, and heating systems can deliver substantial carbon savings and reduce operational costs.

About half of non-domestic buildings in Cambridgeshire are currently rated below EPC C, with a higher proportion at F or G compared to the domestic sector. EPC coverage is around 65%, but most reports lack detailed information on fabric condition and construction types. Priority areas for improvement include Central and West Cambridge, Wisbech South and Peckover (Fenland), and Huntingdon Central & West.

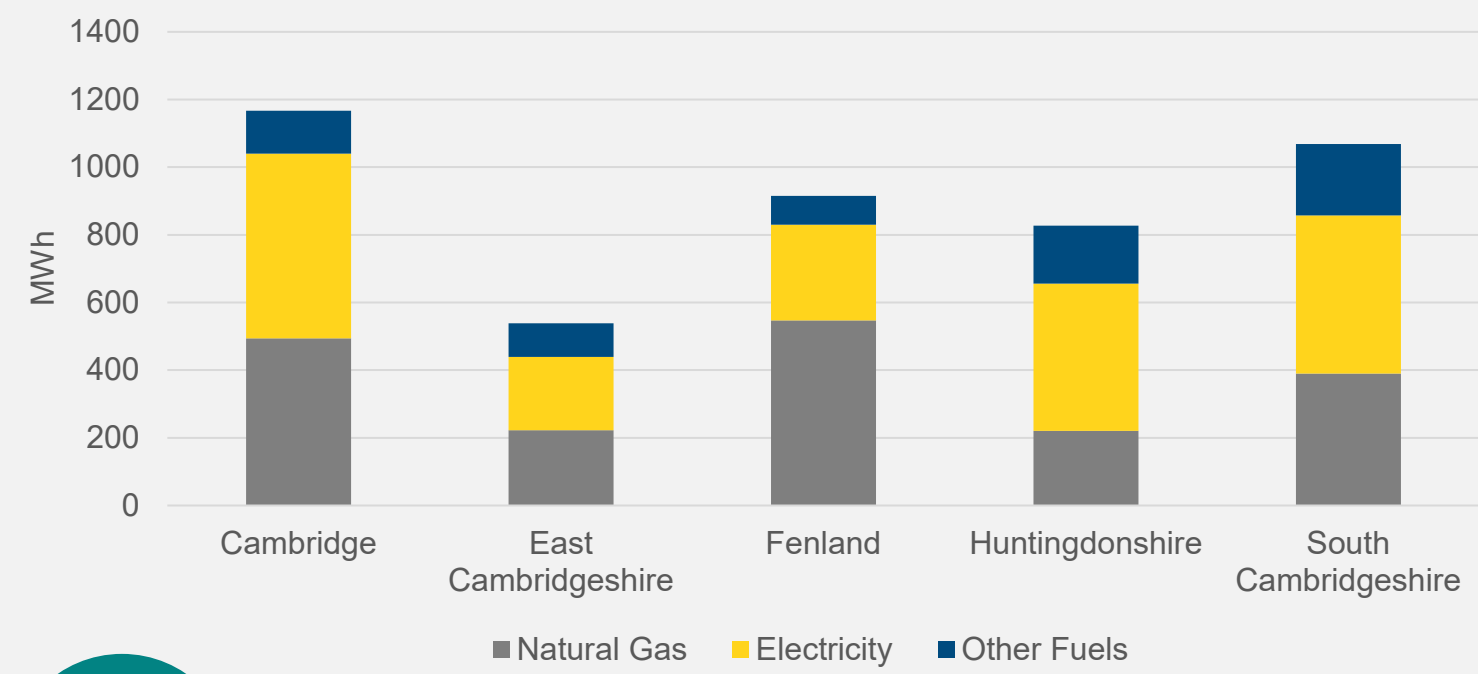
There are approximately 20,000 non-domestic buildings in Cambridgeshire, with the highest numbers found in Huntingdonshire and South Cambridgeshire. Building types include offices, warehouses, industrial facilities, schools, healthcare, and hospitality, with each district showing a different mix. For example, Cambridge has a significant proportion of further education buildings, while Fenland and Huntingdonshire have a higher share of industrial and warehouse.

Non-domestic energy use is dominated by natural gas and electricity. Across the county, electricity use is highest in Cambridge and South Cambridgeshire, while natural gas use is particularly high in Fenland where there are relatively high process loads used in industrial buildings. The energy use fuel type breakdown (MWh) shows that natural gas remains the primary fuel for heating and process loads, with electricity as the main source for lighting, equipment, and some heating.

Number of non-domestic buildings by type



Non-domestic energy use fuel type breakdown (MWh)





8200 non-domestic buildings currently below EPC C

Source: Mott MacDonald GIS imputation data based on EPC and Census data (top graph) and Census data, 2021 (bottom graph)

Non-domestic Buildings (cont.)

Key Actions

Detailed energy profiles by building type and district identify priority areas for action.

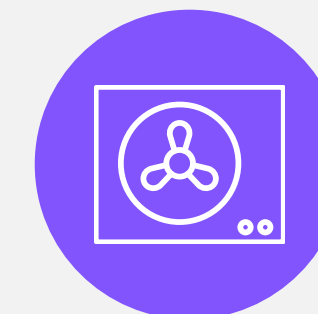
Introducing **mandatory operational ratings for non-domestic buildings** was recommended by the UK Green Building Council (2020) and would create the correct incentives for landlords to invest in their buildings and tenants to make informed decisions – likely putting a premium on better performing buildings. As so much of the non-domestic building stock is rented, **establishing local government–landlord partnerships** could help identify barriers and unlock opportunities for retrofitting and low-carbon heating systems. These partnerships could also serve as a platform to **enable community energy projects in the non-domestic sector**, linking opportunities that arise through collaboration.

The Council could also facilitate sharing **real-world performance data** from commercial and industrial buildings that have adopted low-carbon heating and cooling, enabling other owners to make informed business case decisions.

Schools should be a particular focus due to their public visibility and operational needs. The Council could **provide increased support to schools as a priority**: directly funding, seeking central government funding or enabling retrofits or community energy projects for schools. Improving heating and cooling in schools will not only reduce emissions but also ensure resilience in the face of a changing climate.



8200 non-domestic buildings currently below EPC C



20,000 heat pump installations & **1,500** district heat network connections required to decarbonise heating in non-domestic buildings



Cost **£927m¹** with likely reliance on government grants to subsidise business investment.

Where heat pumps replace electric heating, significant bill savings are possible.

1) 2025 real terms, present value, vs. a business-as-usual scenario.



This will save up to **430 ktCO₂e** per annum after grid decarbonisation

Heat Networks

Current (2023) heat network connections by district council

District Council	Households connected to district or communal network	Total number of households	% connected to district or communal network
Cambridge	1,139	54,689	2.08%
East Cambridgeshire	77	38,607	0.20%
Fenland	168	45,651	0.37%
Huntingdonshire	161	79,914	0.20%
South Cambridgeshire	106	69,645	0.15%

District heat networks are a key UK Government priority for decarbonising heat supply. They use a large, centralised heating plant to heat water that is distributed through pipes to connected buildings for space heating and, in some cases, domestic hot water. In dense areas where clusters of buildings with high heat demand are located close together, district heat networks often represent the lowest-cost low-carbon heating option compared to each building having its own decentralised system. By sharing one large centralised system, connected buildings can benefit from economies of scale and reduced capital, operating and maintenance costs.

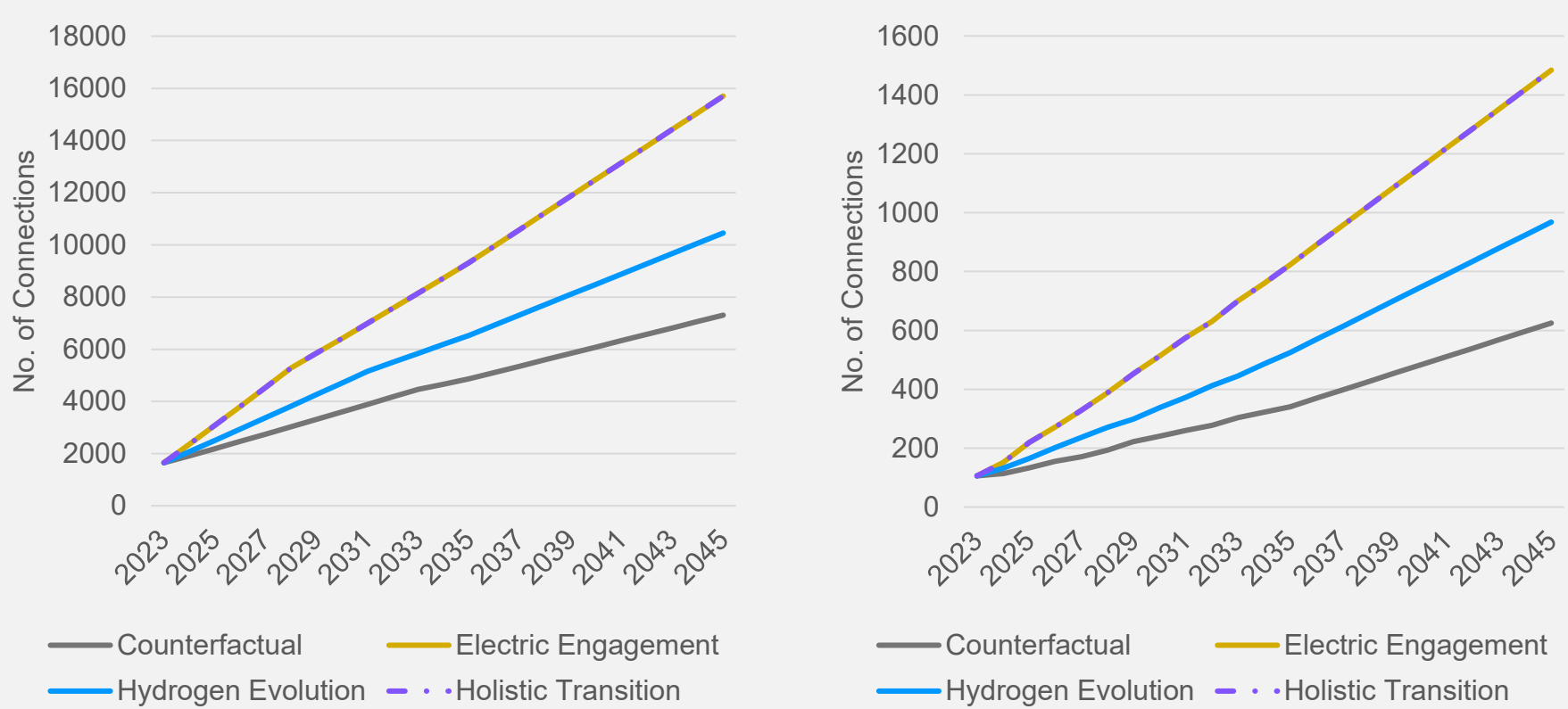
Existing Heat Network Provision

Cambridgeshire currently has limited heat network coverage, with two district scale heat networks currently in operation. The Swaffham Prior heat network is designed to serve 300 homes and is fully supplied by renewable, low-carbon heat with no fossil fuel sources. The Eddington heat network in North West Cambridge serves 1000 homes via a CHP unit – low carbon alternatives should be assessed for this network when the CHP reaches end of life. All other existing systems in Cambridgeshire are communal-scale, typically consisting of a central plant serving multiple dwellings but not extending to a wider district network.

The proportion of households connected to such systems varies greatly:

- Cambridge City has the highest percentage, with about 2% of its households connected to district or communal systems.
- All other districts each have well below 1% of households connected

Heat network connection comparisons for domestic (left) and non-domestic (right) scenarios



Source: DFES data

Scenario-Based Projections for Heat Network

Domestic Connections

Across the four modelled DFES scenarios, uptake varies substantially. The counterfactual scenario maintains low deployment, concentrated mainly in Cambridge, while the Electric Engagement and Holistic Transition scenarios show significant expansion, with around 5% of households' county-wide served by heat networks by 2045. The Hydrogen Evolution scenario assumes lower uptake due to greater reliance on individual building technologies, though still higher than the counterfactual. These projections indicate a future where heat networks form one of several low-carbon heat pathways alongside heat pumps and other electrified solutions.

Non-Domestic Connections

For non-domestic buildings, similar patterns emerge: Electric Engagement and Holistic Transition show the strongest growth, while the counterfactual projects almost no expansion outside Cambridge. Net zero-aligned scenarios indicate increasing connections in mixed-use areas, industrial zones, university and hospital campuses, and civic centres. These trends reinforce that heat networks are most suitable in zones with large public or commercial anchor loads that can support financial viability.

DESNZ NMR Heat Network Zones In Cambridgeshire

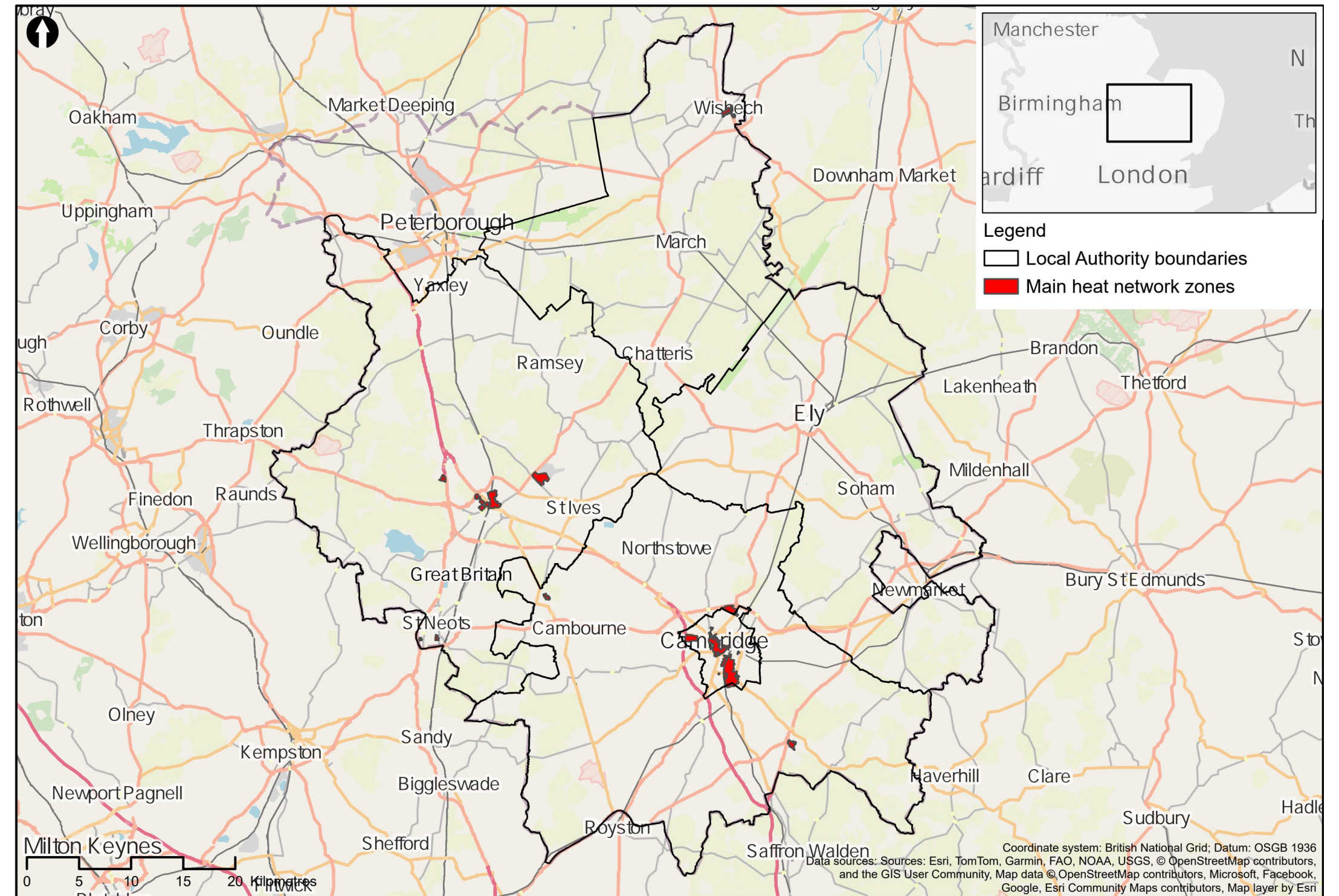
The Department for Energy Security and Net Zero (DESNZ) National Model Run (NMR) provides a forecast of areas that are suitable for heat network developments.

The zonal outputs and their modelled data from the third iteration of their NMR were provided, which indicate the zones throughout the county where the implementation of a district heat network would likely represent a cheaper way to decarbonise heat demand compared to building level systems. These are targeted around accelerating the development of heat networks for businesses and homes.

The NMR identifies a number of zones across Cambridgeshire where heat networks appear viable based on heat density, anchor loads, and techno-economic thresholds, highlighted in red in the image.

It can be seen that DESNZ have only allocated one zone in **Fenland**, covering the centre of Wisbech. **Huntingdonshire** includes zones covering areas in the centre and West of Huntingdon, most of Wyton and Alconbury, and areas in the South-West and South-East of St Neots.

Indicative network zones in **Cambridge City** include large areas in the centre, South-East and West of the city. **South Cambridgeshire** has three relatively small zones, in Abington, Papworth Everard and the science park just to the North of Cambridge City. **East Cambridgeshire** has no zones in the DESNZ NMR model.



CambridgeLEAP_KT_working | MSOA_Heat_Network_Zones_Landscape | 03 Oct 2025



It should be noted that there are currently proposals for heat networks ongoing in Cambridgeshire outside of these DESNZ zones, which may be developed. These include the Melbourn super loop, where low grade heat will be supplied by a network and then topped up via small “shoebox” heat pump units at each connected property, and the Grantchester Heat link, which is currently investigating options for supplying the village of Grantchester with a heat network supplied by either air or water source heat pumps. There may therefore be other areas not included in the DESNZ zones outlined above, which may be suitable for heat network developments. The identification of these areas will depend on suitable technical feasibility assessments being carried out.

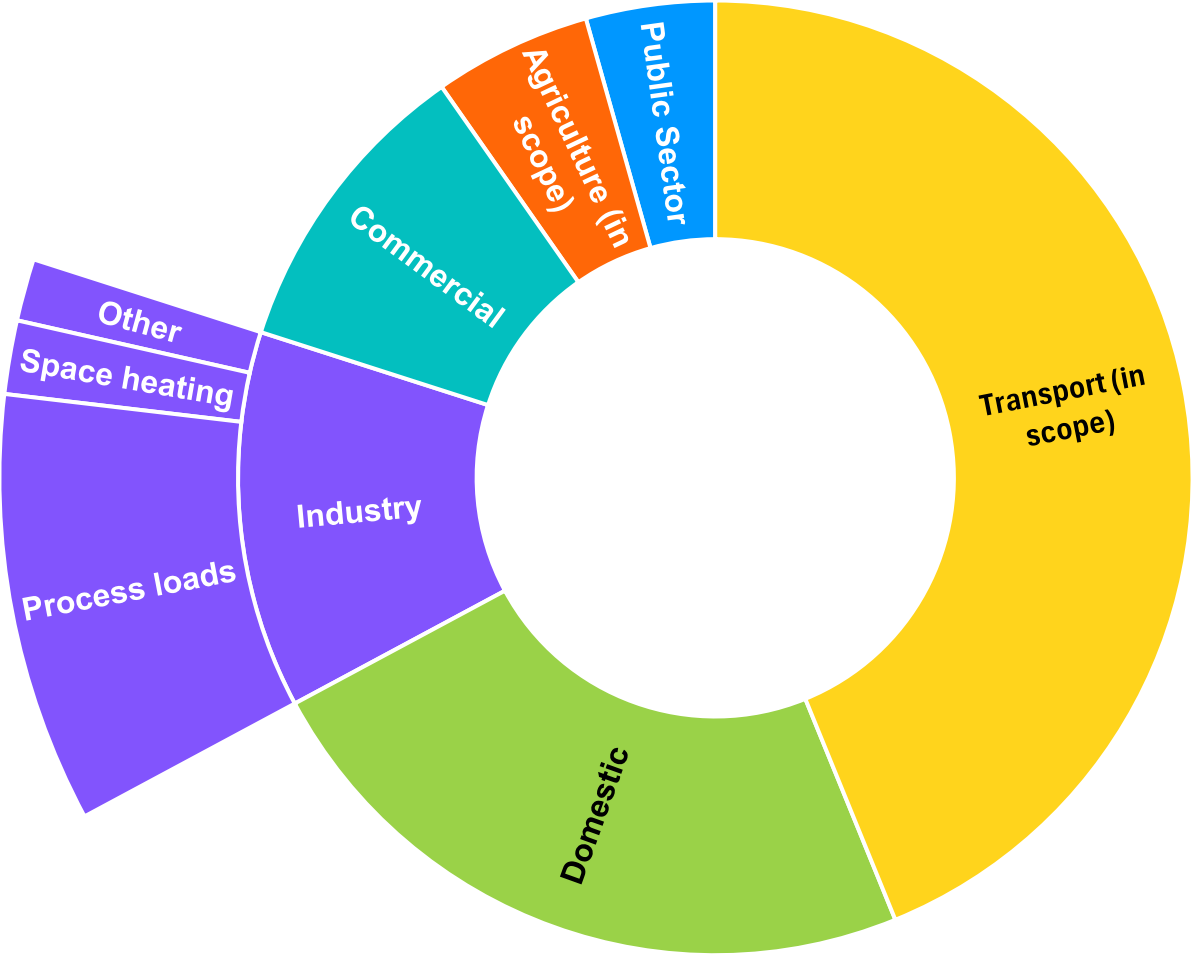


Industrial Process Loads

Industrial Process Load Decarbonisation

Industrial activity is a material contributor to Cambridgeshire’s carbon emissions, accounting for approximately **9% of the county’s total in-scope greenhouse gas emissions**.

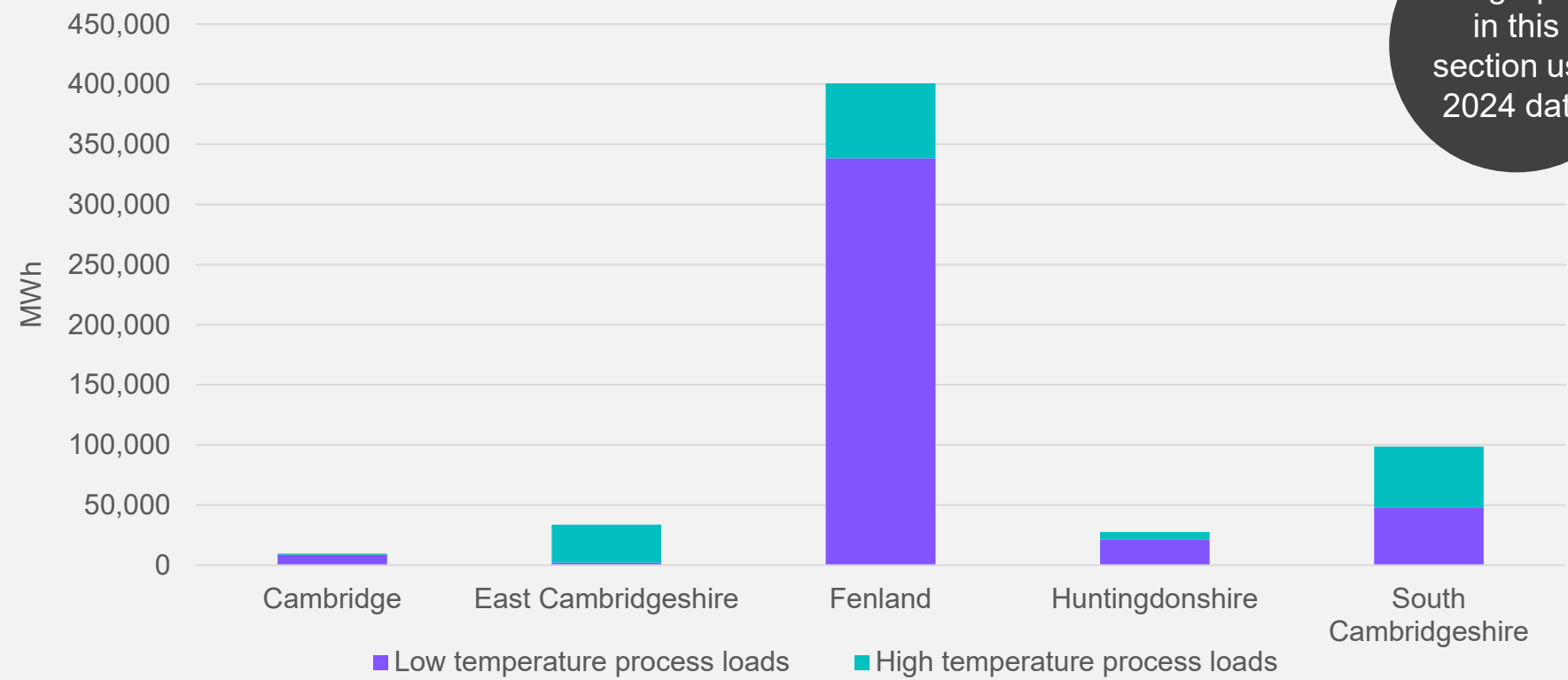
The sector’s diversity, ranging from food packaging and processing in Fenland to chemical manufacturing and plastics and resins production in South Cambridgeshire, and paper packaging products in East Cambridgeshire, requires tailored solutions that balance technical feasibility and economic viability.



Currently, industrial energy use is dominated by fossil fuels, with an estimated 567 GWh of natural gas consumed annually for process loads, concentrated within **10 industries that account for 95% of total industrial gas use**.

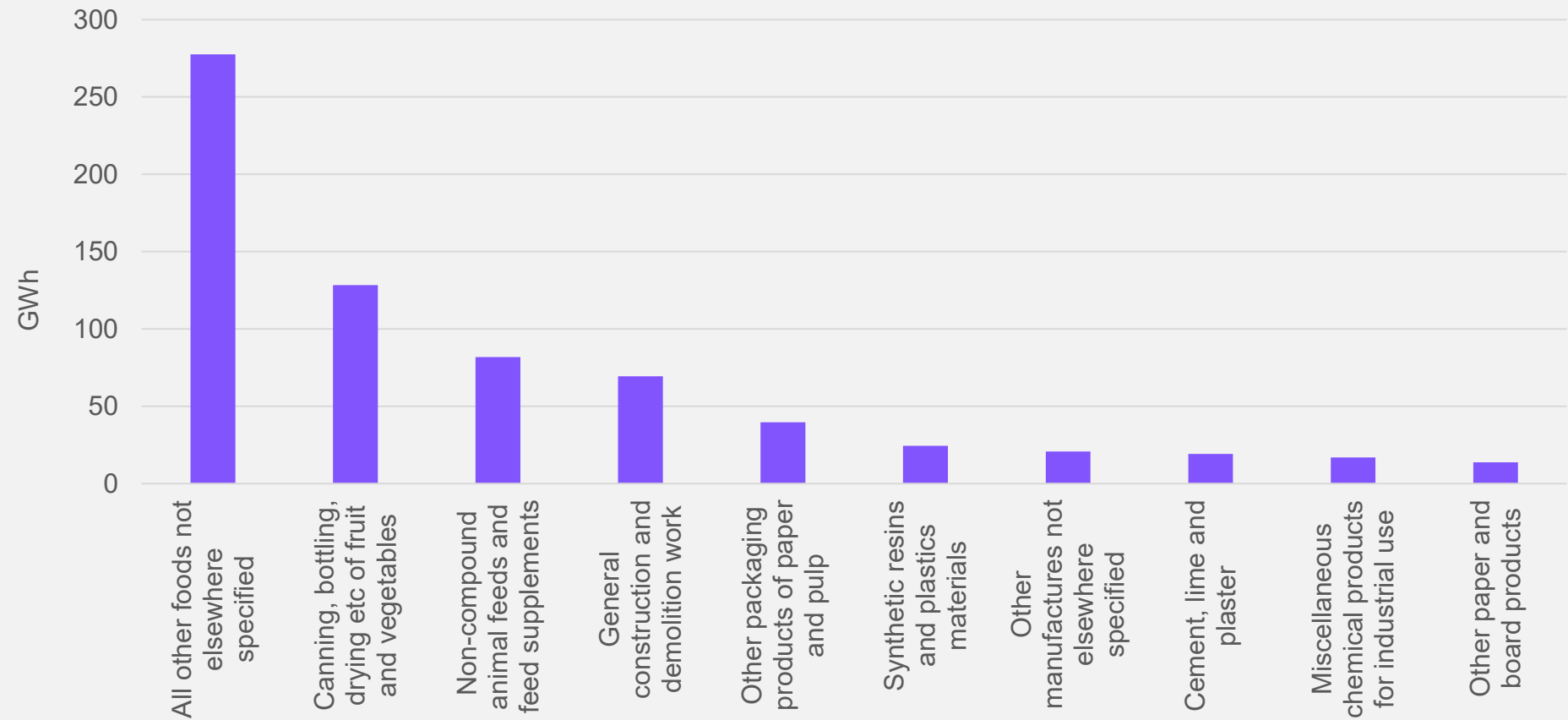
Source: UK local authority and regional greenhouse gas emissions statistics - GOV.UK

Industrial energy consumption in Cambridgeshire



All graphs in this section use 2024 data

Top 10 Industries by gas consumption



Source: Cadent gas data and Mott MacDonald analysis

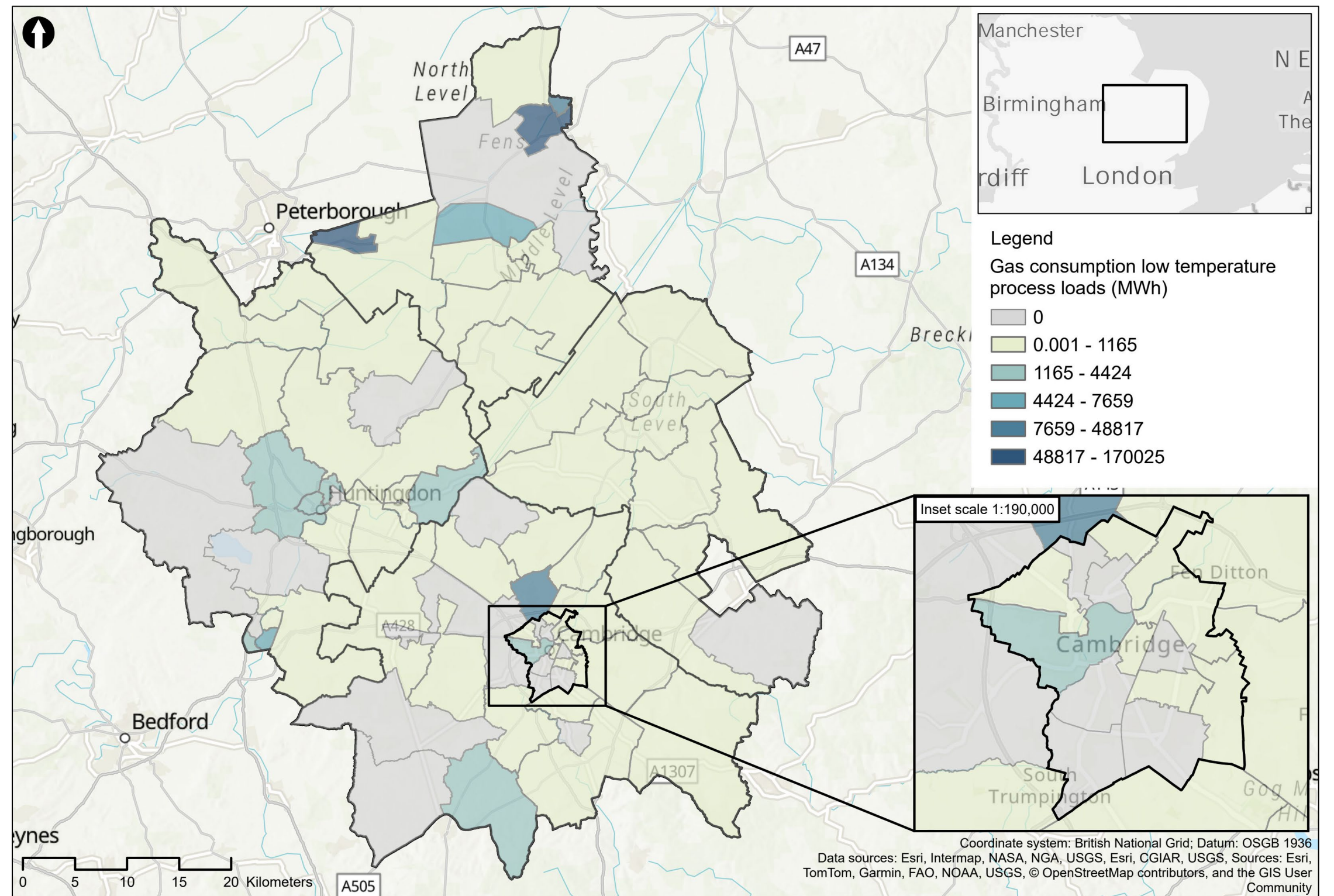
Industrial Process Load Decarbonisation (cont.)

Spatial analysis highlights that Fenland contains the highest concentration of industrial process loads, predominantly low temperature and therefore strong candidates for electrification.

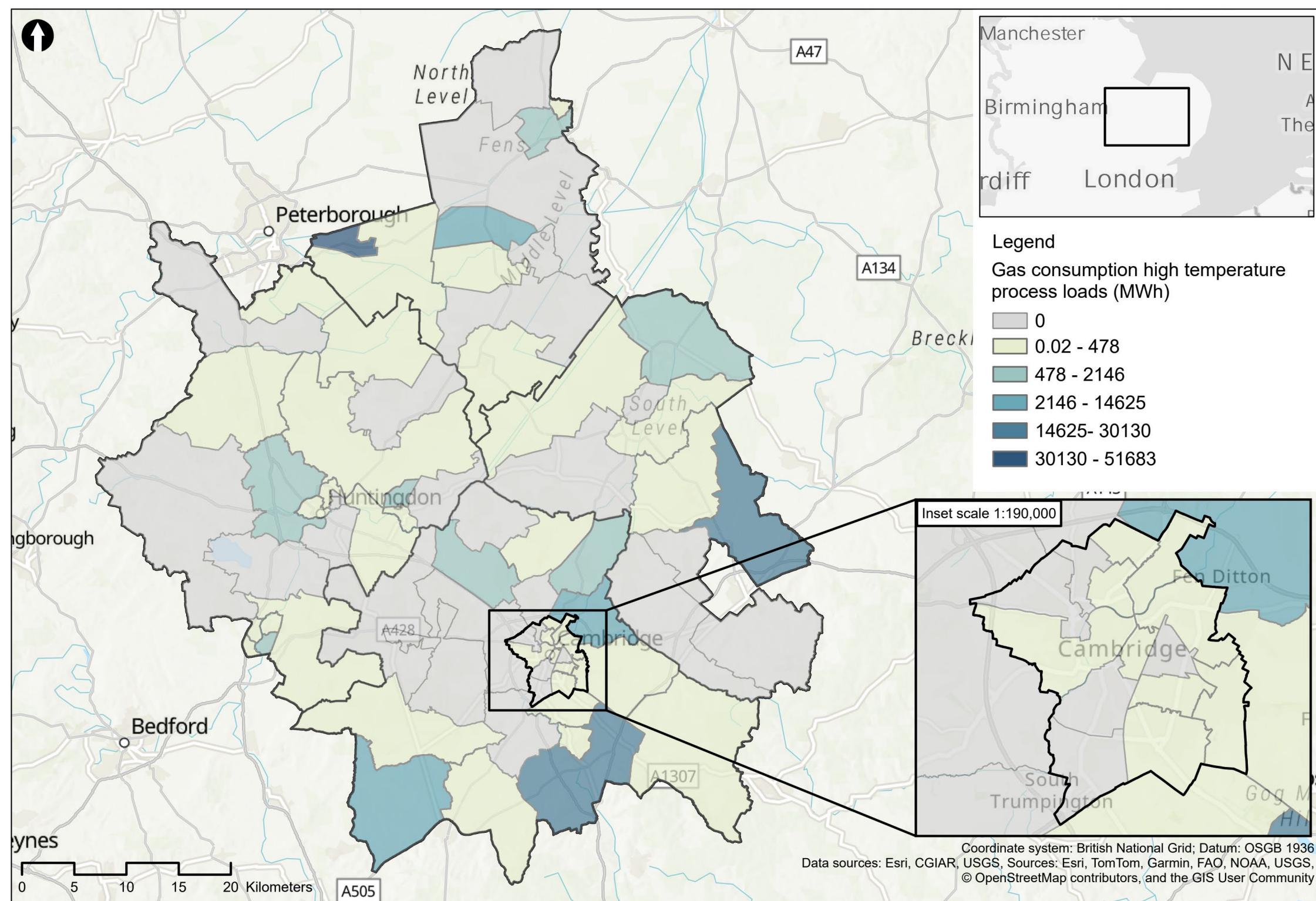
In contrast, East Cambridgeshire has a greater share of high temperature loads, making hydrogen a more significant part of its decarbonisation pathway. Industrial clusters in Whittlesey, Wisbech, and other areas are identified as priority zones for targeted intervention.

1 Low temperature map

Low-temperature processes, common in sectors such as food production and light manufacturing, are well-suited to electrification. These processes typically operate below 200°C and either already have cost-effective electrification technologies or are expected to in the near future. Electrifying these processes delivers immediate benefits, including reduced emissions, lower operational costs, and improved air quality. To enable this transition, we estimate an additional 334 GWh of electricity will be required for low-temperature loads.



Industrial Process Load Decarbonisation (cont.)



CambridgeLEAP_TGY_working | MSOA_Process_Load_Mapping | 09 Oct 2025

2 High temperature map

High-temperature processes, typical in heavy industry, pose significant challenges for decarbonisation and are likely to require hydrogen as the primary solution. Hydrogen offers a viable pathway for many of these applications, with a technological readiness level of 7-8 for standard boilers. However, its deployment will depend on infrastructure availability, supply chain readiness, and supportive policy frameworks. Some high temperature processes may also require a more innovative technology than typical burners not yet commercially available. We estimate a future additional 143 GWh of hydrogen to transition high-temperature loads.

Key actions for industrial decarbonisation

Industrial process emissions could be reduced by **89.8% by 2045** through a combination of fuel switching, efficiency improvements, and strategic deployment of clean technologies. Electrification of low temperature industrial process loads is projected to reduce their emissions to zero by 2045, as the carbon intensity of grid electricity falls sharply with decarbonisation. In contrast, high temperature process loads that transition to hydrogen will still result in some residual emissions, the magnitude of which will depend on the carbon intensity of the hydrogen supplied. Therefore, it is important that industries electrify their process loads where viable, due to the lower carbon content compared to using green hydrogen.

Industrial decarbonisation plans from stakeholders will be essential, and the County can assist by liaising between the DNO and industry stakeholders to ensure network expansion keeps pace. With regards to high temperature loads, this will require coordinated planning to secure hydrogen production and distribution, alongside investment mechanisms and complementary measures to ensure long-term viability. Ongoing innovation, monitoring, and support for fuel switching are essential as technology and market conditions evolve.



Transportation

Transport

Transport is one of the largest contributors to carbon emissions in Cambridgeshire, driven by continued reliance on fossil fuels across urban and rural areas.

While electric vehicle (EV) adoption is increasing, **local transport emissions have remained largely static**, with EV uptake being outpaced by population growth. The most effective approach **combines rapid EV uptake with investment in public transport, active travel networks, and widespread charging infrastructure to meet the net zero ambitions.**

Modelling of future scenarios reveals that without intervention, only modest improvements in emissions will be achieved. The counterfactual pathway assumes slow uptake of EVs, limited modal shift, and inadequate charging infrastructure, which risks locking in high emissions and missing national targets. In contrast, net zero-aligned scenarios demonstrate the potential for significant reductions through a combination of electrification, infrastructure investment, and behavioural change.



25,571

total number of registered electric vehicles in 2024



825

Existing publicly accessible chargers* in 2024

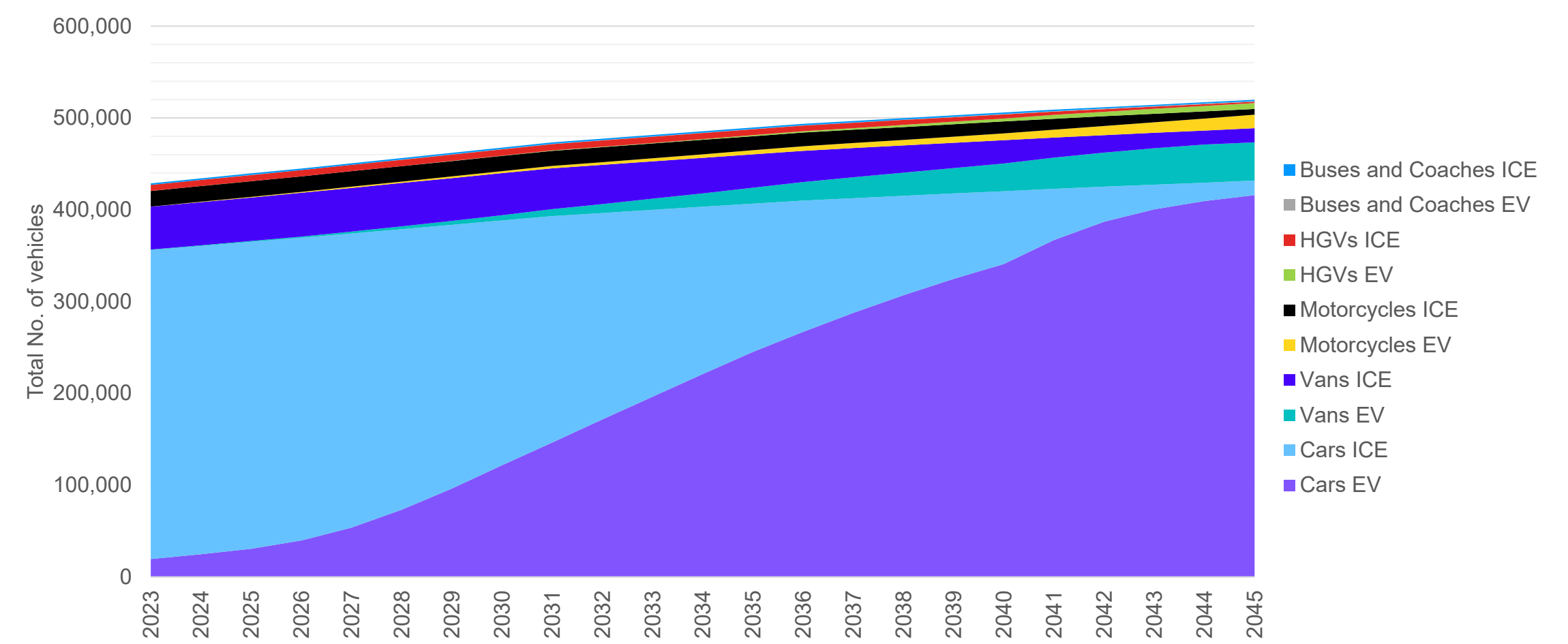


206

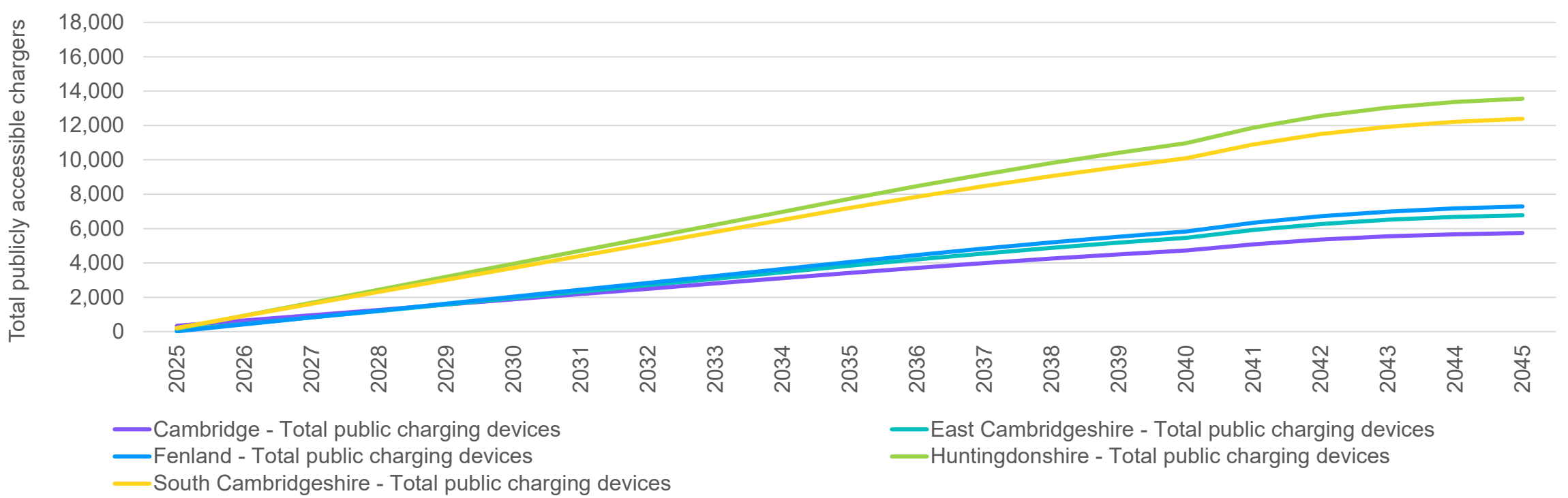
Existing rapid or high-powered chargers (>50kW) in 2024

Note: Throughout this report the word charger is used to represent a single charging socket. Often ‘chargepoints’ installed can include multiple chargers/sockets, enabling more than one vehicle to be charged at a time.

Electric vehicle (EV) adoption



Estimated requirements for publicly accessible chargers (Counterfactual)



Source: Mott MacDonald modelling based on DFES data, Cambridgeshire Population Forecast and UK Government Vehicle Statistics (top graph) and Mott MacDonald analysis based on vehicle projections from DFES and Energy Savings Trust benchmarks for charger provision (bottom graph)

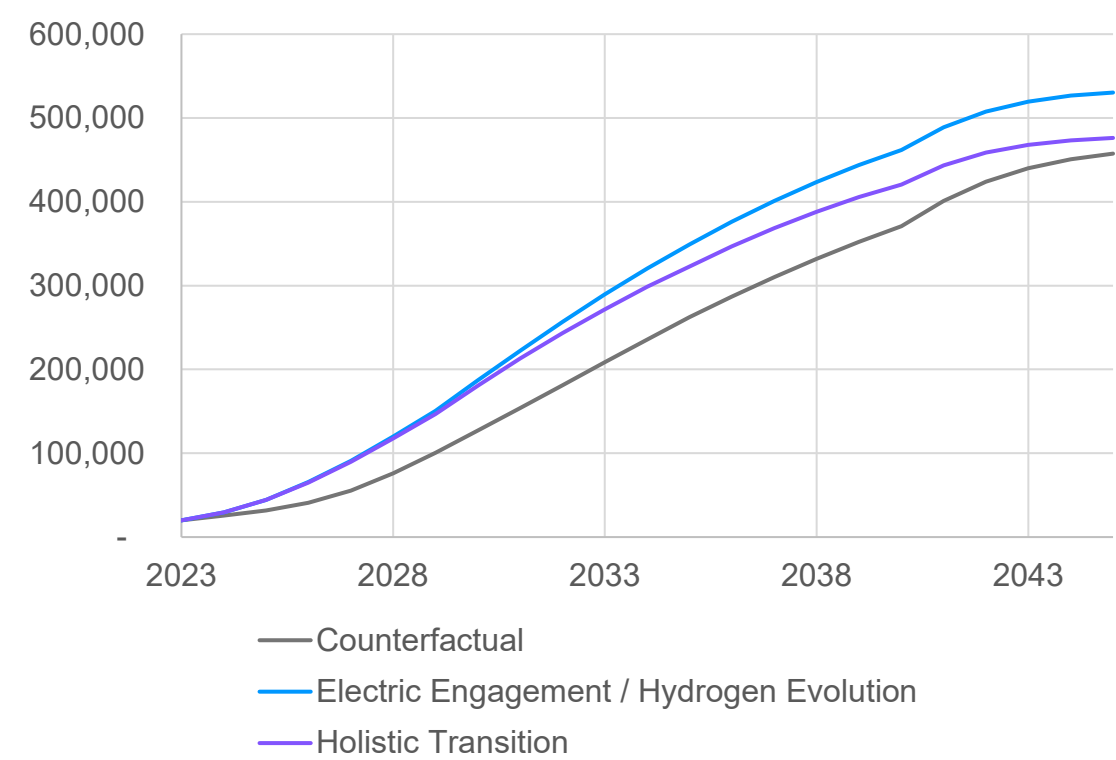
Transport (cont.)

Projected EV Uptake

EV uptake across the scenarios is expected to pick up speed in the late 2020s, plateauing in growth through the late 2040s. The figures below presents the future EV uptake by scenario. While all scenarios show steady growth, the rate varies. The electric engagement/ hydrogen evolution scenario projects the fastest growth, indicating strong policy support, infrastructure investment. The Holistic transition also achieves the same level of electrification, however, includes an approximate 6% reduction in passenger vehicles given an assumed mode shift to public transport or active travel; which explains why the below graph shows a higher number of EV cars and vans in the electric engagement/ hydrogen evolution scenario.

Other vehicles (buses and HGVs) are discussed in detail in the technical report, as are non-domestic needs.

Projected Growth in EV Cars and Vans



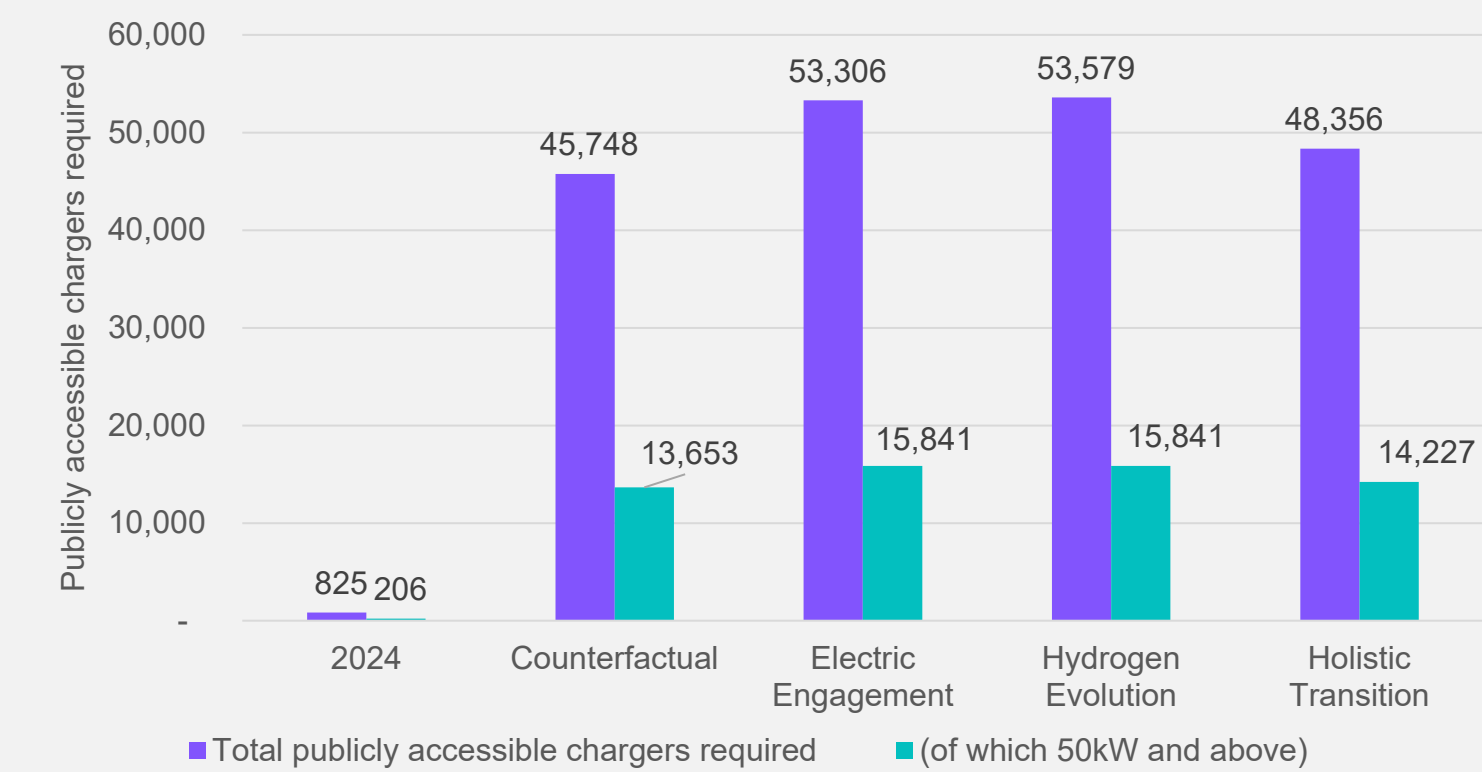
Source: Mott MacDonald modelling based on DFES data

Projected EV charger infrastructure

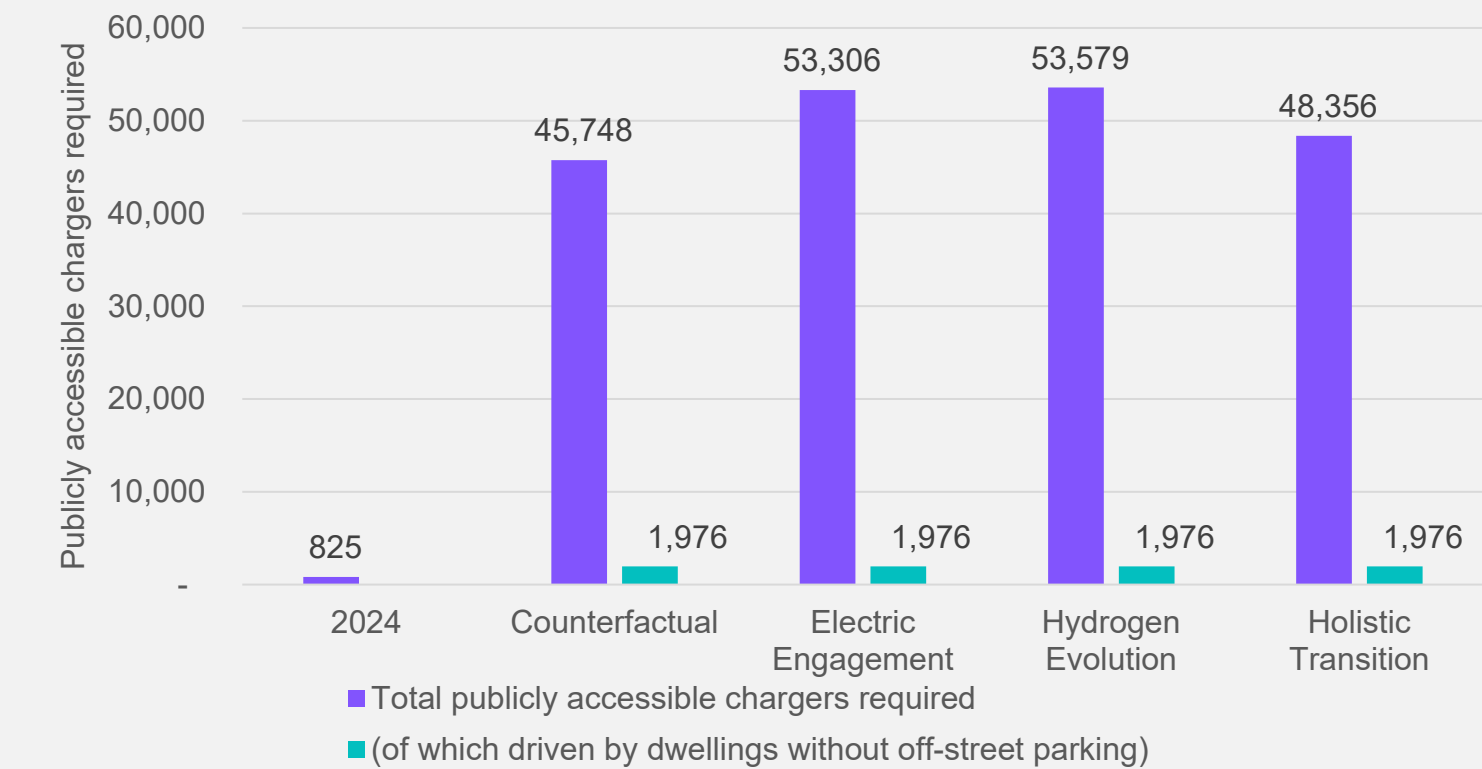
Detailed projections highlight the scale of infrastructure needed to support EV uptake across Cambridgeshire, including public on-street, workplace, and destination charging. We estimate the need for a significant scale-up in the number publicly accessible chargers (sockets), and a sustained installation rate of ca. 6,000 chargers per year for the next decade through to 2035. This deployment rate is significant, representing a close to ten-fold increase on the existing installed base of 8,265 public chargers. Huntingdonshire and South Cambridgeshire consistently show the highest demand for EV chargers, driven by the higher ownership of electric vehicles. We estimate that under all scenarios a baseline of rapid chargers (50kW and above) of 12,500-15,000 is required across the region to support net zero by 2045. This is shown in the figure on the top right.

A specific area in which private investment may not have a business case and public investment may be required is existing residential areas with limited access to private off-street parking (such as terraced housing, flats and estates, where residents may be unable to install home chargers). To ensure a just transition, public sector funded charging infrastructure, such as on-street chargers and installations in public sector-owned social housing estate/ flat charging must be prioritised to remove that barrier for residents who risk being late adopters to EVs and to support equitable access across all communities. The figure on the bottom right estimates the proportion of the chargers required to address the needs of households without off-street parking.

Proportion of rapid chargers needed



Proportion of chargers needed for homes without off-street parking



Source: Mott MacDonald modelling based on DFES projections
Note: Throughout this report the word charger is used to represent a single charging socket. Often 'chargepoints' installed can include multiple chargers/ sockets, enabling more than one vehicle to be charged at a time.

Transportation Focus Areas

What are the barriers?

Barriers to EV adoption for the average citizen have been widely studied. In the production of this LAEP, barriers to resident charging infrastructure and business charging infrastructure were reviewed, supplemented by stakeholder feedback throughout. Interventions were then mapped to these barriers, to identify policies/ projects/ innovations that could help unblock them. Many of the barriers are already being addressed at a national level. For example, it is widely understood that EV cost parity with ICE vehicles is a key driver for future EV adoption, as the upfront cost of EV remains a dominant barrier.

For most of the passenger car fleet, EV uptake will occur naturally, with residents installing home chargers where possible. **However, local authorities play a critical role in removing barriers for those without off-street parking.**

The level of investment to address the needs of households without off-street parking is similar across all the local authorities as shown the table below:

Local Authority	Chargers needed for homes without off-street parking
Cambridge	465
East Cambridgeshire	285
Fenland	320
Huntingdonshire	465
South Cambridgeshire	440
Total	1,976



Residents without off-street parking

Focusing on those without off-street parking, research from the Department for Transport (DfT) (2022) shows that in a survey of 1,000 people without access to off-street parking, "requiring more deviation from current parking and refuelling behaviours... is a major barrier when thinking about transitioning to an [EV]". Of options presented to the respondents, running a cable from home or near-home on-street charging scored best, with rapid charging stations or workplace charging following closely behind.

Councils should focus their efforts on priority areas:

1. Updating highway policies and standards to enable cross-pavement charging and prioritising dense areas with limited off-street parking for public on-street charger rollout (see next page).
2. The Council can also support flat blocks and housing estates with other charging solutions, or financial support for residents' associations, to cover blocks of flats or estates that have leasehold properties.

DfT (2022) Public Electric Vehicle Charging Infrastructure, Deliberative and quantitative research with drivers without access to off-street parking.
Left image contains public sector information licensed under the Open Government Licence v3.0: [Cross-pavement solutions for charging electric vehicles - GOV.UK](#)



Vulnerable groups

As one of the core objectives of the LAEP is to reduce inequality in the region, and at minimum ensure that the transition to net zero does not increase inequality or leave any portions of society behind, several interventions specifically targeting vulnerable groups have been identified. For individuals who are more cost sensitive, growing the second-hand market of EVs is critically important. To date that has been accomplished primarily by fleet operators (businesses) purchasing new EVs. However, we see it that **the Council is better placed trying to directly support vulnerable groups** by financial support to families looking to purchase their first EV in the second-hand market (either by low interest loan, or grant).

Providing charging infrastructure in social tenures, either directly managed by the councils or managed by housing associations, is also a highlighted as a focus area.

Transportation

Focus Areas (cont.)

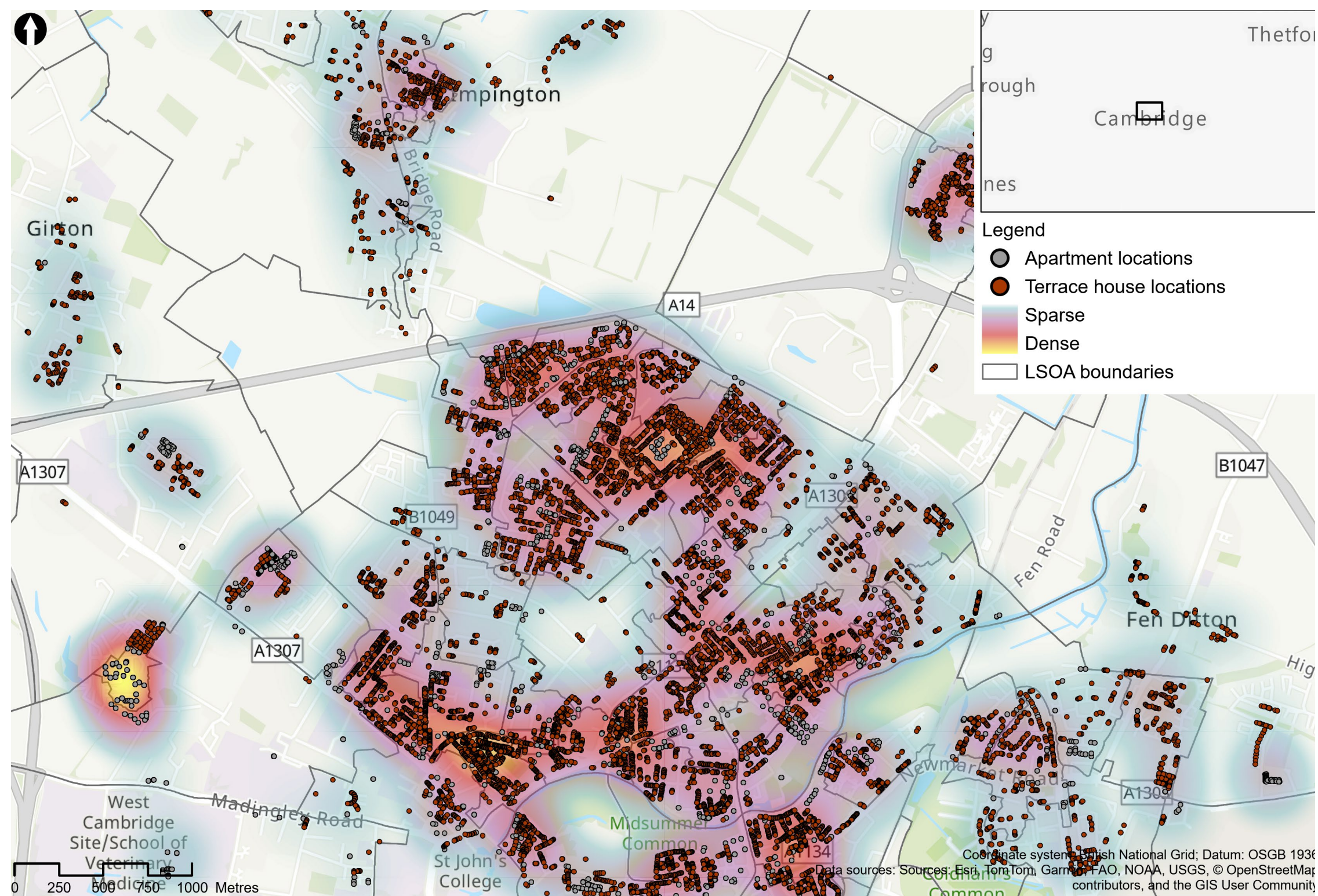
Priority Areas

The LAEP identified a number of priority areas within each district, where public charging provision is needed. The highest priority area (LSOA) in each district is listed below:

- Cambridge: Newmarket Road Retail Area
- South Cambridgeshire: Orchard Park
- Fenland: Wisbech Park
- Huntingdonshire: St Ives Town Centre and Park and Ride
- East Cambridgeshire: Soham High Street

The map to the right illustrates one such priority area (South Cambridgeshire) by showing the density of apartments and terraced housing, which potentially lack off-street parking. Darker, denser areas indicate neighbourhoods with the highest concentration of residents who are likely to rely on public charging. These density clusters help identify where pilot schemes or neighbourhood-wide infrastructure could be rolled out to support households without access to private charging.

Example: homes requiring on street EV infrastructure in Cambridge, South of A14 to City Centre





Local Generation

Local Generation and Storage

Local electricity generation is central to Cambridgeshire’s clean energy transition, reducing reliance on imported energy, boosting the local economy and business rates, improving resilience, and enabling community-led initiatives.

The county already benefits from a strong renewable portfolio (figure top right), dominated by solar PV, which accounts for most new planned capacity and a significant share of local generation. Renewables, primarily solar, wind and biogas/ biomass account for 88.6% of Cambridgeshire’s local electricity generation.

South Cambridgeshire has the highest number of rooftop solar installations of any council in the UK as of the end of 2024, and Cambridgeshire ranks 3rd for total ground mount and rooftop solar capacity in the UK behind Kent and Wiltshire.

The progression of renewable energy generation connections >1 MW in Cambridgeshire is shown in the top right figure, taken from the Embedded Capacity Register available in LAEP+. 425 MW of solar was connected between 2013 and 2018 in the solar boom which accounts for 80% of current solar capacity. Wind installations were introduced from 2005 amounting to an approximate 212 MW connected as of May 2025. We estimate more than 95% of wind capacity will reach end of life in the next 10 years unless it is re-powered.

The current pipeline of connections for large solar PV and battery storage (figure bottom right) exceeds the requirements set out in the Clean Power 2030 Action Plan for the region.

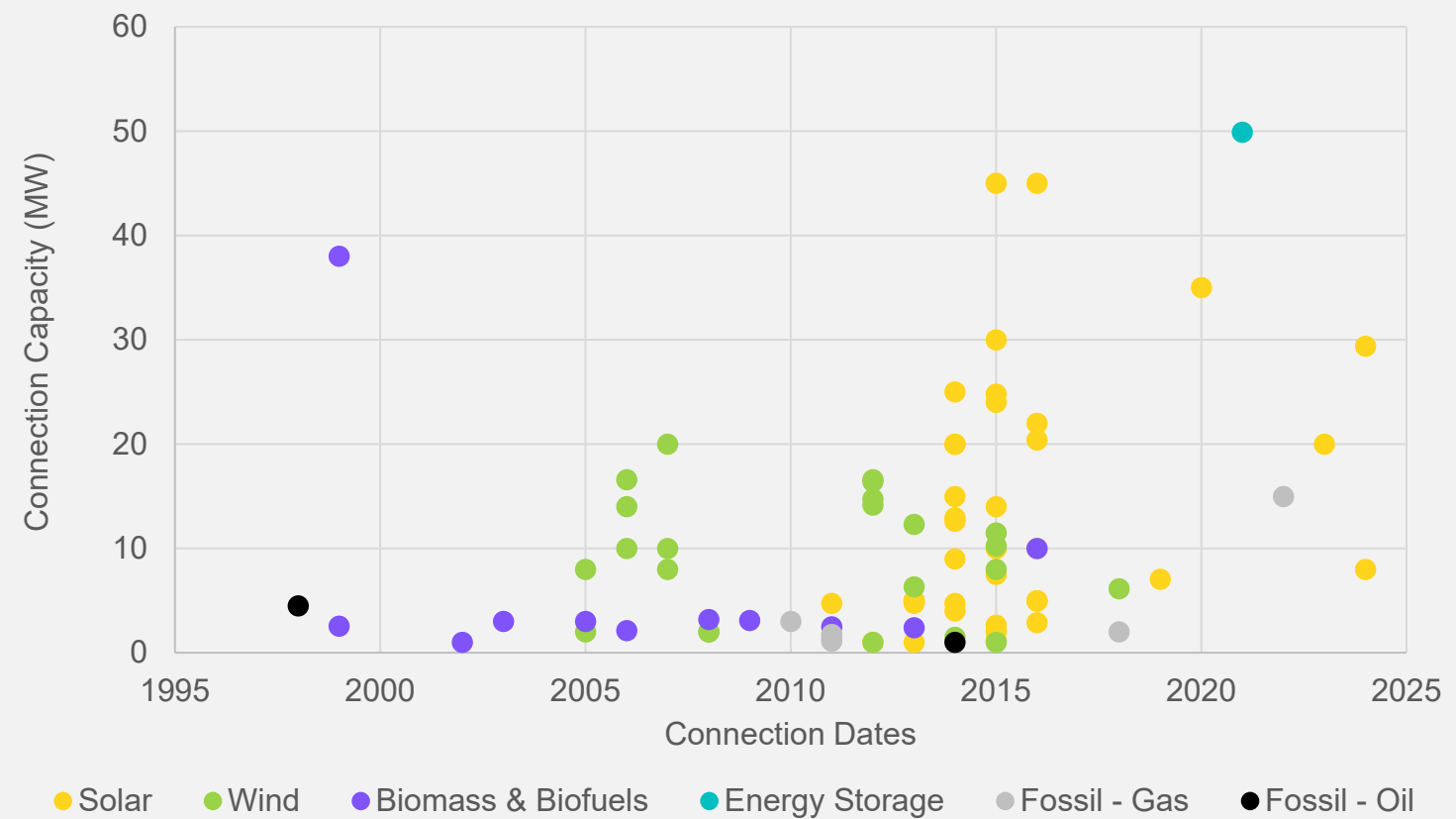
Clean Power 2030 states that by 2035 9,500 MW of solar is needed to connect in the Central England region (an area including Cambridgeshire and most adjacent counties) in transmission and distribution. The 3,000 MW expected in projects from the current pipeline for Cambridgeshire to 2035 accounts for 32% of total capacity when the land area of Cambridgeshire relative to ‘Central England’ is approximately 25%.

However, the forecasted growth in solar is heavily dependent on five large schemes:

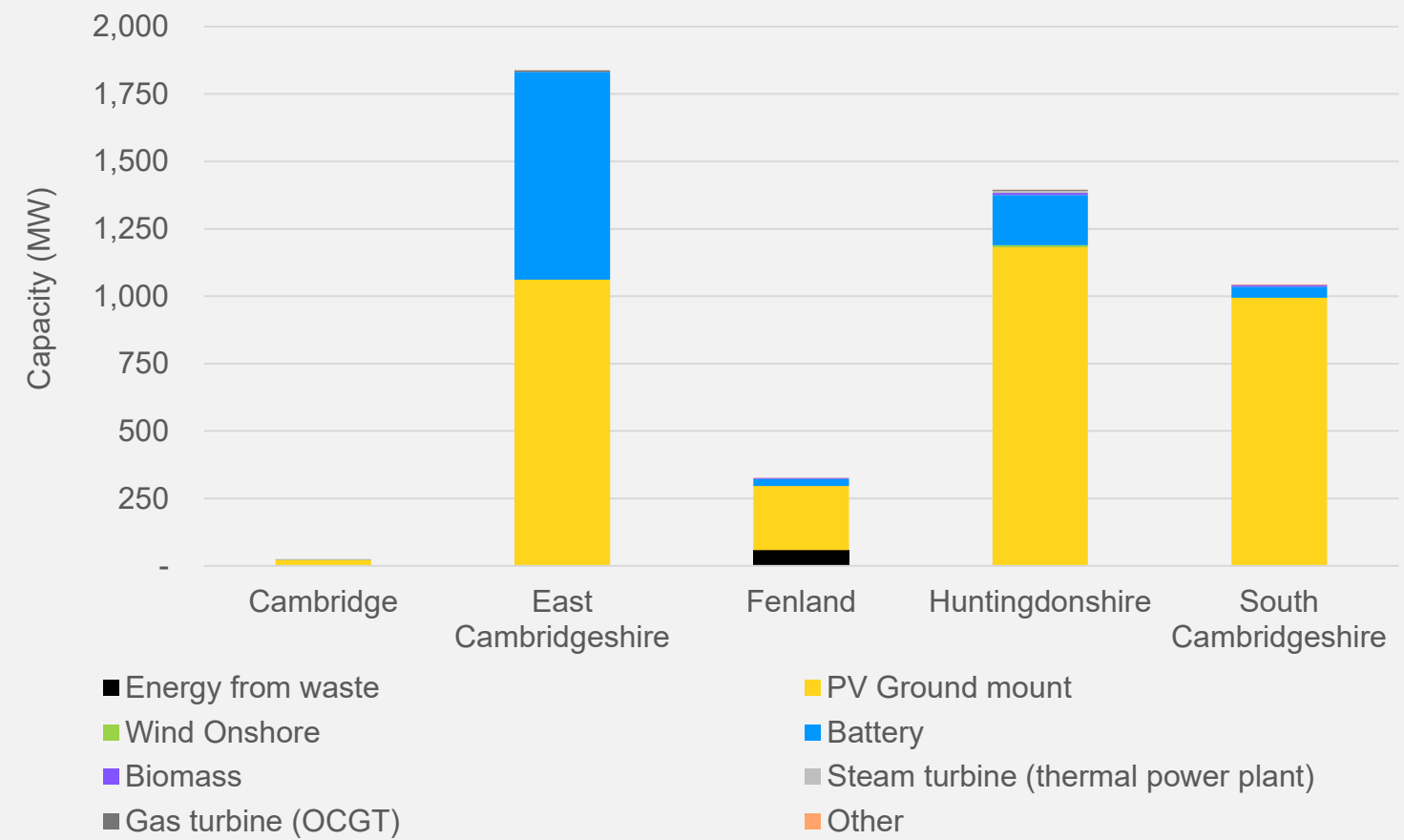
- 500 MW Kingsway Solar Farm at pre-application in South Cambridgeshire
- 500 MW Sunnica Solar Farm with storage in East Cambridgeshire, granted DCO.
- 400 MW East Park Solar Farm at pre-application in Huntingdonshire and Bedfordshire
- 400 MW Church Road storage approved in East Cambridgeshire
- 240 MW Len Fen Drove Solar Farm approved in East Cambridgeshire

If all projects are progressed, by 2045 Cambridgeshire is projected to **locally generate 65% of the energy it consumes in the future.**

Historical installation of energy generation



Generation pipeline within each local authority area



Source: LAEP+ Tool data, combined with Embedded Capacity Register <1 MW. Data accessed May 2025.

Local Generation (cont.)

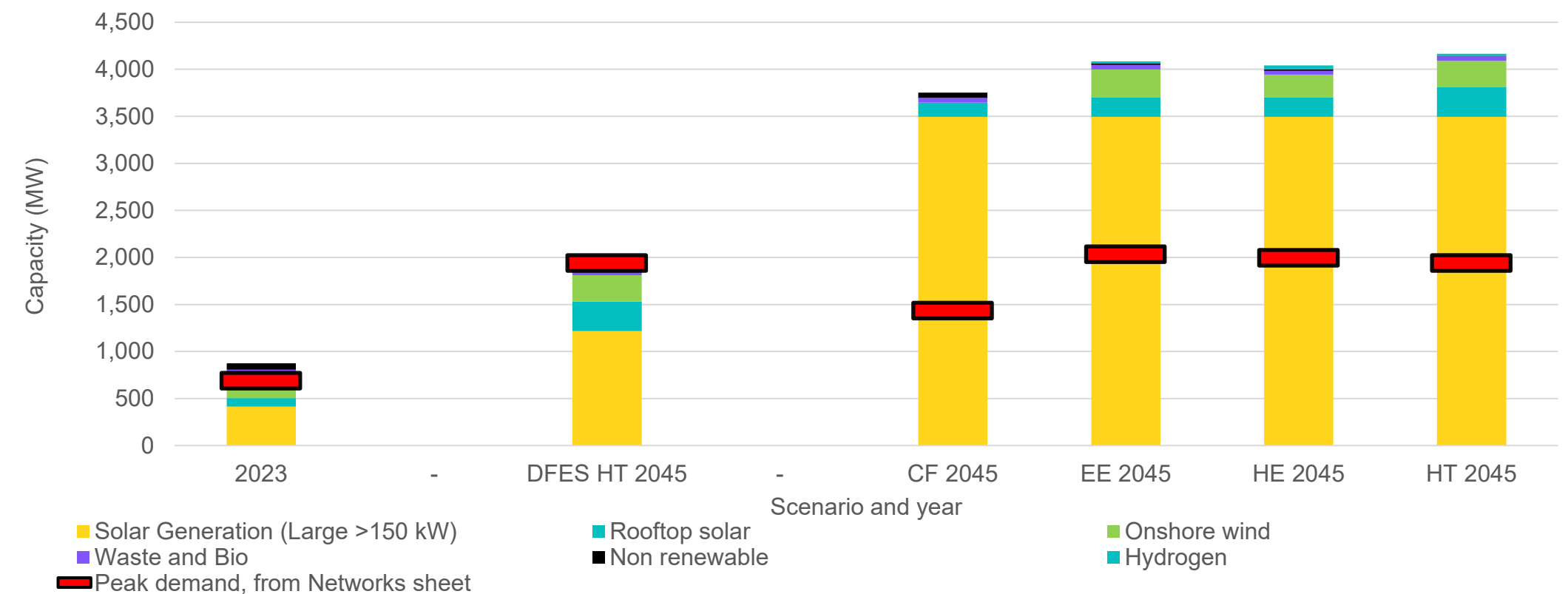
Should the full buildout occur of all solar projects in the pipeline, the power generating capacity in Cambridgeshire is projected to exceed the renewable generating capacity today.

A modified UKPN DFES projected composition of distributed generation across Cambridgeshire is shown top right for each scenario. For ground mount solar installations, the DFES projection for 2045 has been replaced by the current volume of projects in the pipeline for Cambridgeshire. This means the capacity is equal in all scenarios but provides a more realistic view than the DFES values which are on average 3.5 times smaller.

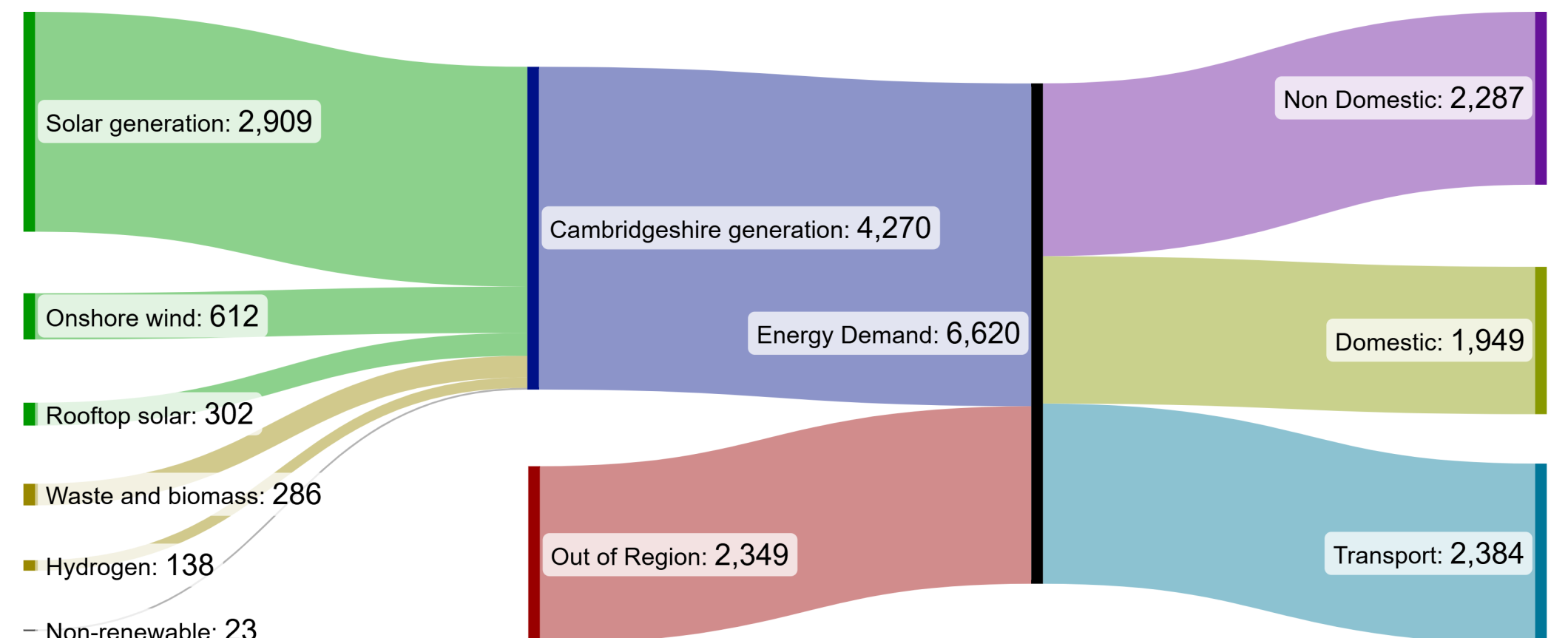
Overlaid onto the generation capacity is the Winter Peak After Diversity Maximum Demand for 2023 and projected values for each scenario in 2045. This value is the peak demand for Cambridgeshire and would represent demand during a mid-winter evening. While the generating capacity exceeds the demand, this does not mean that Cambridgeshire can meet all of its energy needs at all times of year. This peak demand shown represents demand during a mid-winter evening, and assumes all primary substations experience their maximum demand at the same time. This instantaneous winter peak power demand, will not align with the maximum generation capacity of technologies like solar (which will generate less in the winter and see their peak early afternoon as opposed to mid evening).

Accounting for seasonal fluctuations and looking at energy consumption across the year (figure bottom right), we see that Cambridgeshire will likely remain a net importer of energy over the course of the year. **However, in a net zero future, Cambridgeshire will locally generate 65% of the electricity it consumes annually, compared to 48% in 2023. This is quite an achievement, given electrical demand will more than double in 2045 compared to 2023 levels.**

Future Projections of Renewable Generation by technology and scenario



2045 Holistic Transition Electricity Sankey Diagram (GWh/ annum)



Source: DFES data, DCO, REPD, ECR<1 MW and ECR>1 MW, UKPN LTDS (top graph) and Mott MacDonald analysis (bottom graph)

Local Generation and Community Energy

What is Community Energy?

Community Energy refers to energy generation developed, owned and controlled by community groups, typically below 2 MW, such as ground-mounted solar schemes of around 5,500 panels.

Local projects include Reach Community Solar Farm (0.26 MW) and the Gamlingay community wind turbine (0.33 MW), both funded through community share offers and in operation for 9 to 11 years, providing financial benefit and green electricity. Additional rooftop solar projects have been delivered in Chatteris and Cambridge, and district heat network projects are under development at Great Staughton (900 homes) and Grantchester (280 homes).

Across the UK, community energy projects vary widely, including EV charge points linked to buildings with rooftop solar, delivery of low-carbon technologies such as ASHPs, GSHPs, fabric upgrades and energy efficient lighting for existing buildings, and development of district heat networks, such as Grand Union Community Energy's (GUCE) scheme for 2,000 homes, schools and local businesses.

How can Community Energy support the LAEP?

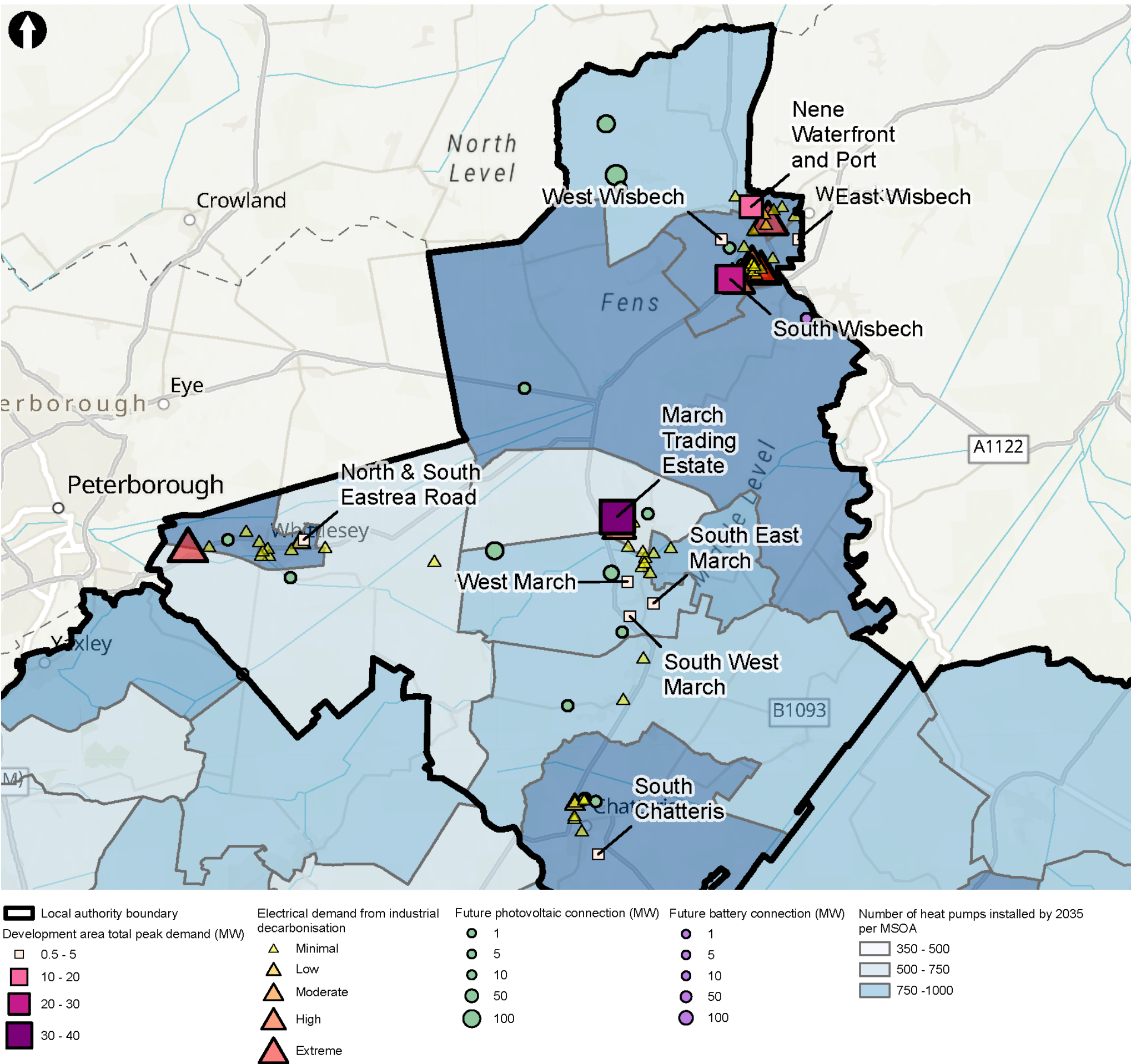
Starting with solar generation, the LAEP forecasts a total of 363 MW of rooftop solar to be installed by 2045, of which 35% is estimated to

be greater than a 4kW installation (and thus more likely to be in the non-domestic sector). Schools are one potential area where community energy projects could play a role, as evidenced by the schemes already delivered within the area.

Another potential opportunity could be large energy users (primarily in the industrial sector), who may be transitioning process loads from gas to electricity or who already have high electrical demands. The figure to the right shows qualitatively where large existing gas loads may be electrified in Fenland. This figure shows where new developments are planned. The March Trading Estate comprised primarily of employment area, could present opportunities for community energy to deploy behind the meter generation or storage technologies.

Community energy could also play a role in the flexibility space. The Clean Power 2030 Action Plan identifies a need for consumer-led flexibility to increase from 2 GW to 10–12 GW by 2030, with 25% expected from residential demand flexibility. Community Energy could explore rooftop solar, batteries and vehicle-to-grid solutions in new housing developments to reach the minimum 1 MW scale needed to participate in balancing mechanism markets. Community Energy representatives continue to advocate for regulatory changes to allow “complex sites” where multiple community assets behind individual meters can retain full credit for supplied power.

Energy Heatmap and Generation in Fenland



Local Generation Next Steps

Cambridgeshire's generation mix is decarbonising faster than the wider GB grid.

The regional pipeline includes multiple projects, including NSIPs, at different stages of consideration. Delivery of these projects is subject to the national planning process. NESO's Clean Power 2030 analysis applies regional capacity envelopes for modelling purposes; Cambridgeshire appears on track to reach the envelope assumed for the Central England region by 2035.

Local authorities should:

- **Engage with communities** on the implications of increased renewable development, particularly where proposals may cluster or overlap.
- **Note** that NESO's regional capacity modelling groups Cambridgeshire within the 'Central England' region. Local Plans may wish to consider these boundaries and capacity envelopes when reviewing evidence.

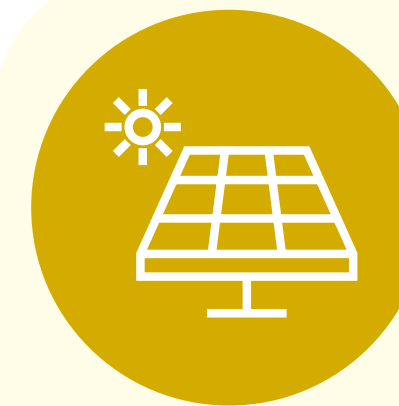
- **Ensure evidence is up to date** on landscape, ecology, heritage and amenity to support decision-making where applications may concentrate.
- **Develop evidence** on wind repowering and potential future wind opportunities, recognising repowering may not be viable at all existing sites.
- **Encourage community-benefit and locally delivered renewable schemes**, where appropriate and supported locally.
- **Recognise** that existing Energy from Waste and similar plant continue to feature in national scenarios to 2035. Decisions on their future role (including end-of-life and any retrofit options) sit with national and local decision-makers.



Modelled technical potential from the LAEP indicates **~3,500 MW** of ground mount solar generating capacity and **~279 MW** of onshore wind. For context, this corresponds to approximately 18km² (0.56% of total land area) for solar and 35km² (1% of total land area) for wind. These figures represent technical modelling outputs and are not land allocations or suitability assessments.



4,310 GWh
generation projection by
2045 under the Holistic
transition scenario



By 2045, Cambridgeshire is
forecast to install
363 MW
of rooftop solar under the
Holistic Transition scenario.



Electrical Network

The Existing Electrical Network

How is the existing network configured?

Cambridgeshire's electricity distribution is operated by UKPN* as part of its Eastern Power Network (EPN) area.

The local distribution grid intersects with several Grid Supply Points (GSPs), which are the high voltage connections to the National Grid Transmission converting 400kV or 275kV to the 132kV distribution network.

Connecting to the GSPs there are Bulk Supply Points (BSPs), (typically converting 132kV to 33kV), which each serve ~100,000 customers. These in turn connect to primary substations (typically 33kV to 11kV). The primary substations distribute power to the cities, towns and villages of Cambridgeshire and each serve ~20,000 customers. The “last mile” consists of a variety of pole-mounted and ground-mounted distribution substations, converting 11kV to household voltage, each serving up to 1,000 customers.

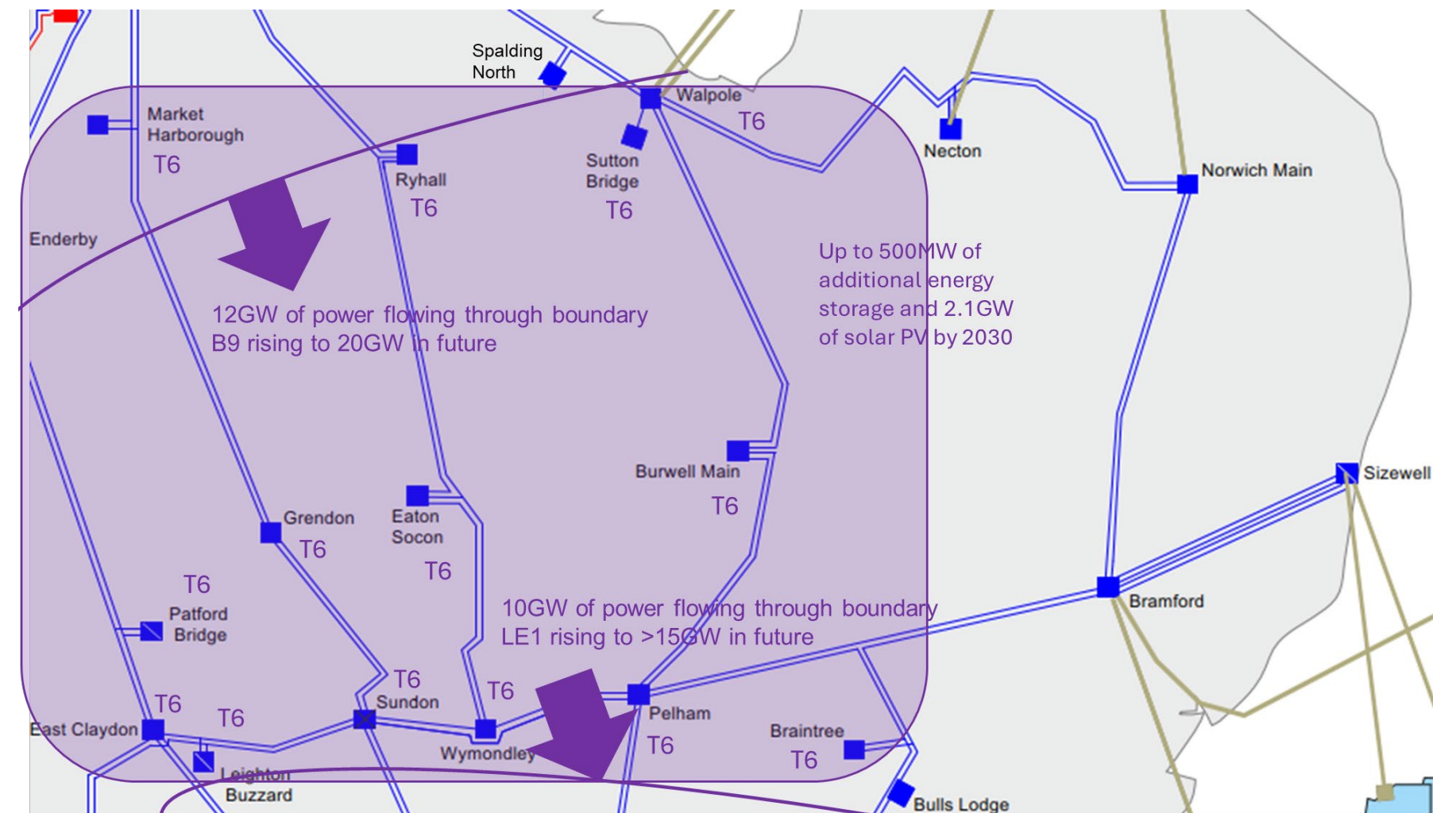
There are six GSPs in Cambridgeshire:

- **Burwell GSP:** A major node supplying Cambridge and East Cambridgeshire Area.
- **Walpole GSP** at the border with Norfolk: Serving Fenland, Huntingdonshire and East Cambridgeshire. It also serves **Sutton Bridge GSP**.

- **Eaton Socon GSP:** Located on the western edge of Cambridgeshire, supplies Huntingdonshire and part of South Cambridgeshire.
- **Pelham** and **Wymondley** are two separate but closely interconnected GSPs. The substations cover South Cambridgeshire area.

The figure on the right provides a simplified pictorial view of the operation of the transmission network in the region. Four major overhead line routes pass north-to-south through the wider region. These four overhead line routes represent four of the five routes which cross an invisible line drawn from the Wash to Cardigan Bay in Wales forming a virtual electrical boundary between the Midlands and the South of mainland Britain (known by NESO as the boundary “B9”).

At a lower voltage level, there are 50 Primary Substations in Cambridgeshire, most of which having more than 5% spare capacity in 2023. Upgrades have already occurred as part of the broader £85 million Fulbourn to Sawston programme, designed to support growing demand from electric vehicles, heat pumps, and other low-carbon technologies, helping to future-proof the city's energy network. Additionally, two new BSP substations have been approved for funding at Cambridge East and Trumpington.



Source: NESO Electricity Ten Year Statement and NESO Clean Power 2030 Connection Reform Annex.
Note: *UKPN is not the only DNO in the County, but operates the majority of the distribution network.

Network Impacts From Growth

How does growth affect the network?

Cambridgeshire’s location within a transmission corridor that carries nearly 25% of GB’s peak demand means the network is already heavily loaded.

At the same time, limited interconnection between parts of the distribution system restricts the ability to move electricity around the county, creating network pinch points that will intensify as demand increases. Without intervention, these constraints will become a major barrier to economic growth and decarbonisation, particularly as After Diversity Maximum Demand (ADMD) increases due to the projected load growth from wider electrification across homes, transport, and industry. This rising demand creates heightened pressure on local networks, especially in areas seeing new development and uptake of low-carbon technologies. The LAEP highlights that without reinforcement, the existing network cannot accommodate the additional electrical load associated with this transition.

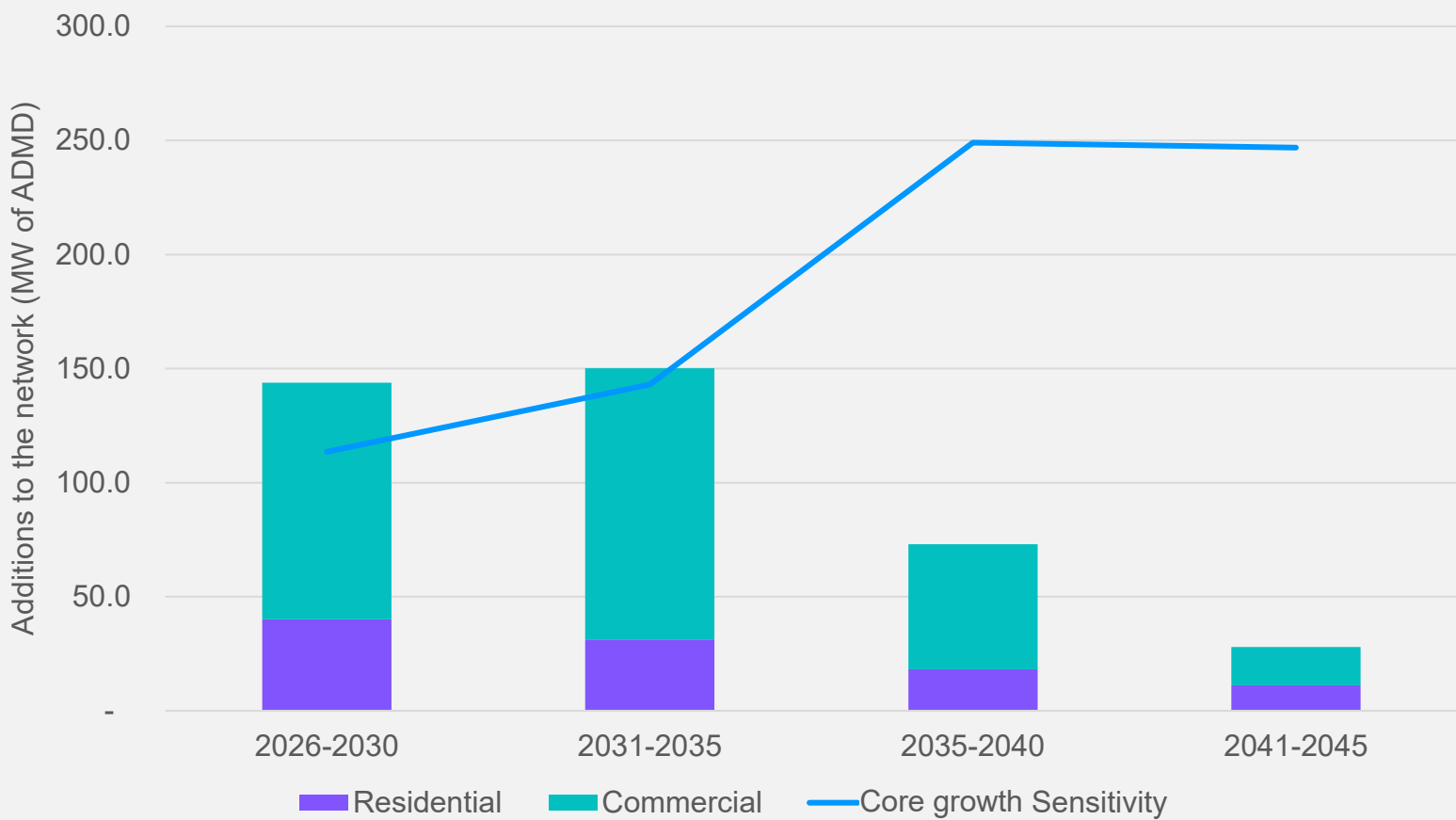
The Infrastructure Delivery Framework (IDF) report (2024) identifies 55 development schemes across Cambridgeshire, comprising approximately 55,564 planned dwellings and 5.8 million square metres of employment floor space. The planned number of dwellings were then uplifted (60% on average), to align with the County Council Dwelling Forecast used in this study.

Given the uncertainty on how much the region may grow, a sensitivity analysis was conducted for a higher than baseline growth future. From the Figure, we see that the Core growth scenario is slightly below the County Dwellings forecast up to 2035, however after 2035 the demand added to the electrical network is significantly higher. While the exact figures have a high degree of uncertainty in them, **there are two key messages:**

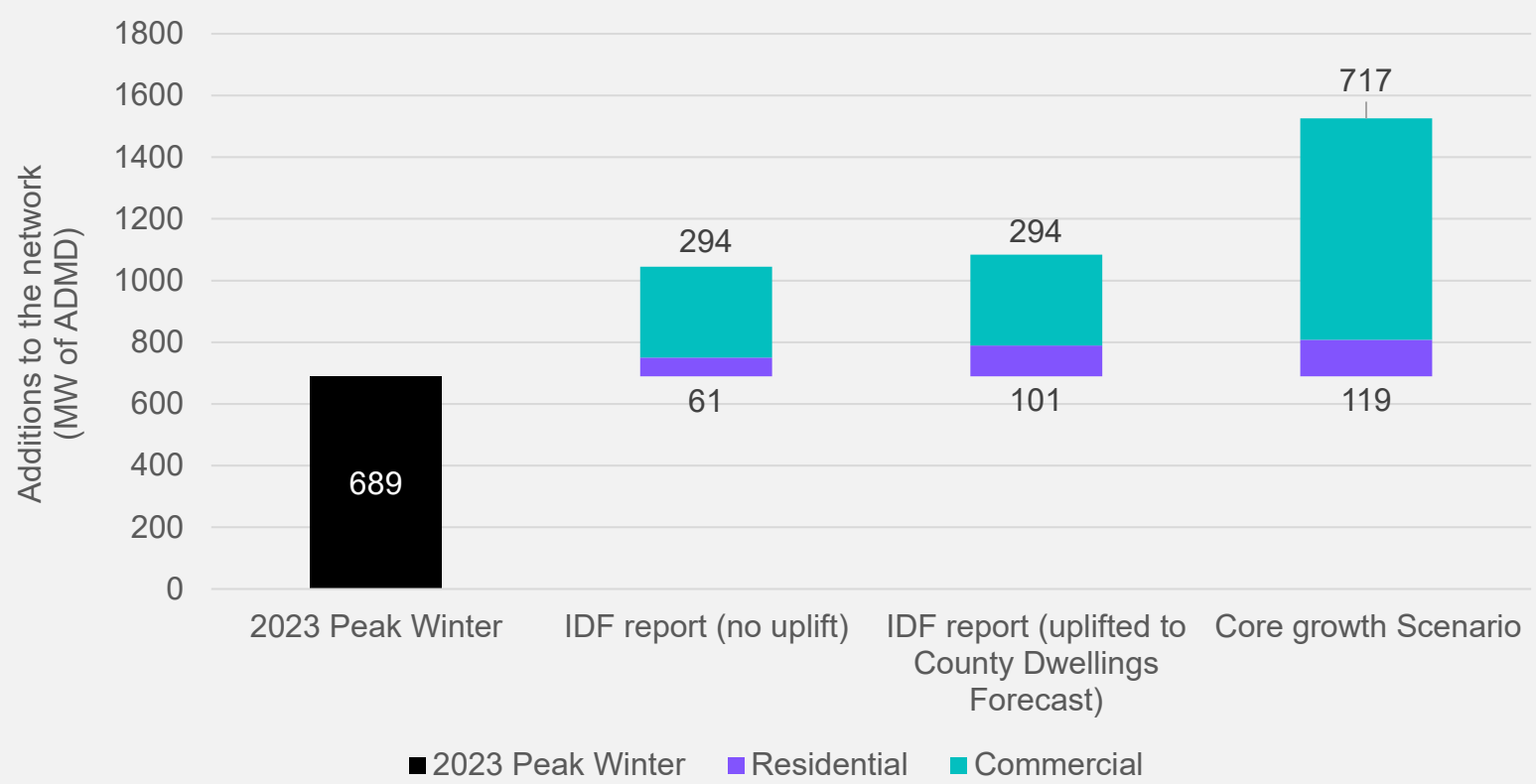
- 1. Commercial and Industrial demands are significant:** The impact on the electrical network will be more heavily influence by the non-domestic demands than housing. Efforts should be made to ensure the DNOs have forward visibility of non-domestic growth.
- 2. The Core Growth forecast has a larger influence after 2035:** For the next 10 years the network will reach capacity more or less at the same time for both growth forecasts, however how large of an increase is needed (e.g. the size of replacement equipment) is highly sensitive to how much the region will grow after 2035.

Note: these ADMD values aggregated at county level are indicative and represent an **unlikely worst-case scenario**. They assume that the peak demands across industry and domestic would occur at the same time, across the county. They should be subject to more detailed modelling by the DNO outside of the LAEP.

Estimates of future additional load added in each period



Total additions of additional load to 2045



Source: Mott MacDonald analysis

Network Impacts From Net Zero And Growth

How does the transition to net zero affect the network?

To model the ADMD of the aggregate of low carbon technologies, the scenario technology deployments described in previous sections were added per served primary substation. Heat electrification represents the largest contributor to rising peak load, with EV uptake playing a smaller role.

Across all net zero scenarios, substations move into negative headroom by the late 2030s. The figure on the next page illustrates the estimate of headroom at primary substations in 2035 for the holistic transition scenario. Headroom values within the inset table are provided in megawatts (MW). Each substation is colour-coded using the standard RAG rating: Green indicates more than 5% spare capacity, Amber represents a positive headroom of 5% or less, and Red signifies negative headroom, where demand exceeds available capacity.

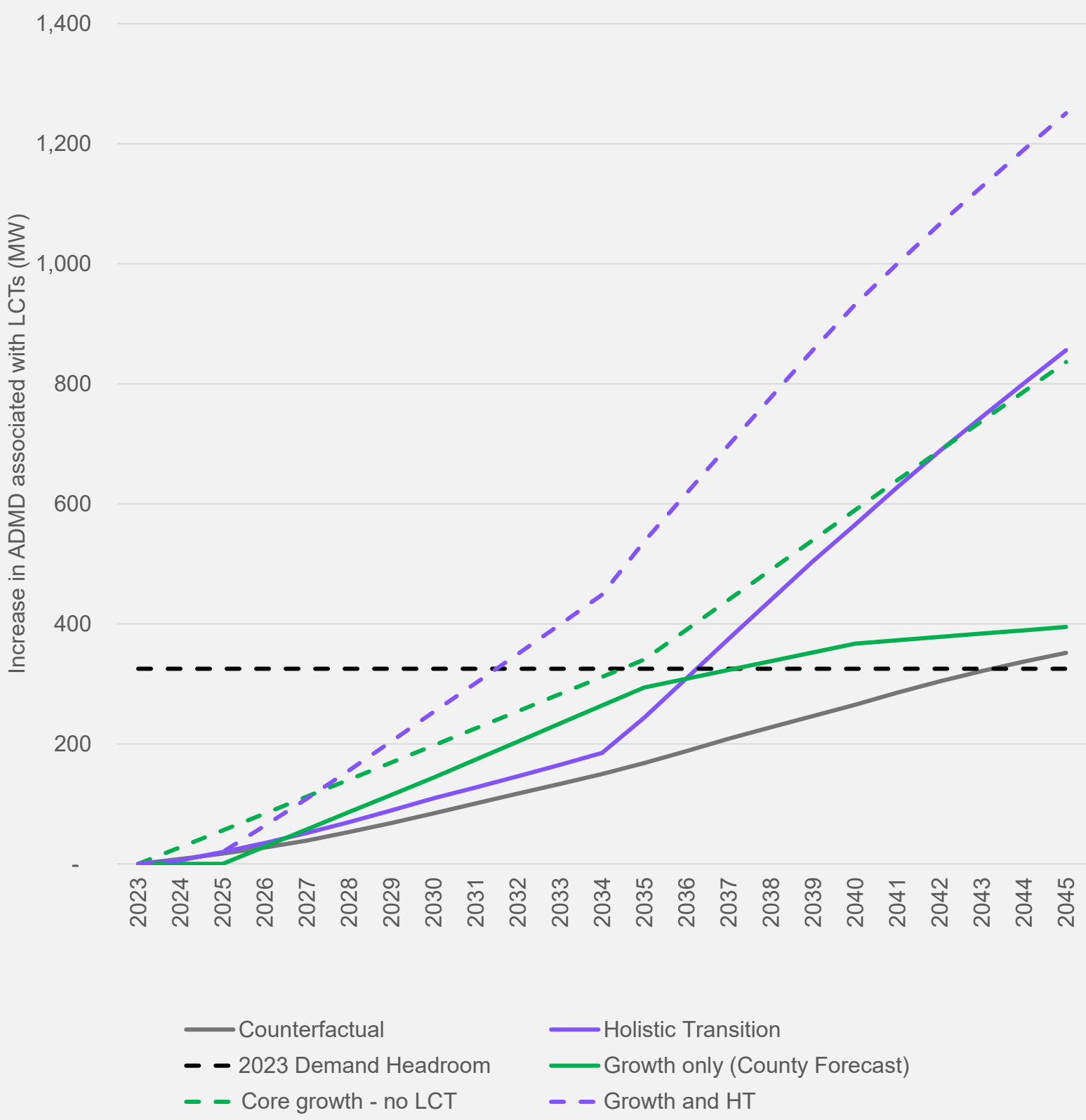
The figure on the next page highlights network pinch points from the net zero transition, underscoring areas where targeted reinforcement is needed to support future demand and enable low-carbon technology deployment.

How does the demand from Growth compare with net zero?

The figure on the right shows when headroom will be breached as a whole in the region, for the growth only scenarios, net zero only scenarios, and a combined scenario. We see that:

- The proportion of increased electrical demand that relates to conservative growth is relatively small.
- The variability between growth scenarios is significant. This impact primarily occurs after 2035.
- The transition to net zero (holistic transition line) results in approximately the same impact on the network as the Core growth forecast, albeit the impact is delayed (breaching headroom later). This is important, as the electrical network will first be a blocker to growth, before it impedes on the transition to net zero.
- The impact on the network from both conservative growth and full transition to net zero could be significant. This shows a near 1,200 MW of demand being added, which is considerable considering the 2023 peak demand recorded by UKPN was 689 MW.

Growth vs. net zero comparison



Note: LCT = Low carbon technology, and can refer to an EV, heat pump, electric resistive heating, or industrial fuel switching.
Source: Mott MacDonald ADMD analysis based on DFES technology uptake for heating and County Dwellings forecast for EVs

Consumer Led Flexibility and Demand Side Response



How much flexibility could households provide?

Consumer led flexibility refers to households shifting electricity use away from peak periods. This can be achieved by either changing behaviours to reduce electricity use during peak times or by using home battery systems charged up during off-peak and used during peak times. Clean Power 2030 Action Plan estimates domestic flexibility has the potential to reduce domestic After Diversity Maximum Demand (ADMD) by up to 25%¹, although real world delivery will depend on uptake, incentives and enabling technologies.



Can flexibility help support the local energy system?

LAEP modelling shows that while domestic flexibility can reduce peak loads, most future network impact is expected to come from the non-domestic sector and from wider electrification of heat and transport. Domestic flexibility therefore provides useful support but does not remove the need for network reinforcement.



The role of community energy

Community energy groups can support residents to adopt flexibility measures, such as smart charging or home battery optimisation. These approaches can help build engagement and deliver benefits locally, though they currently remain at relatively small scale.



Can Demand Side Response (DSR) relieve network constraints?

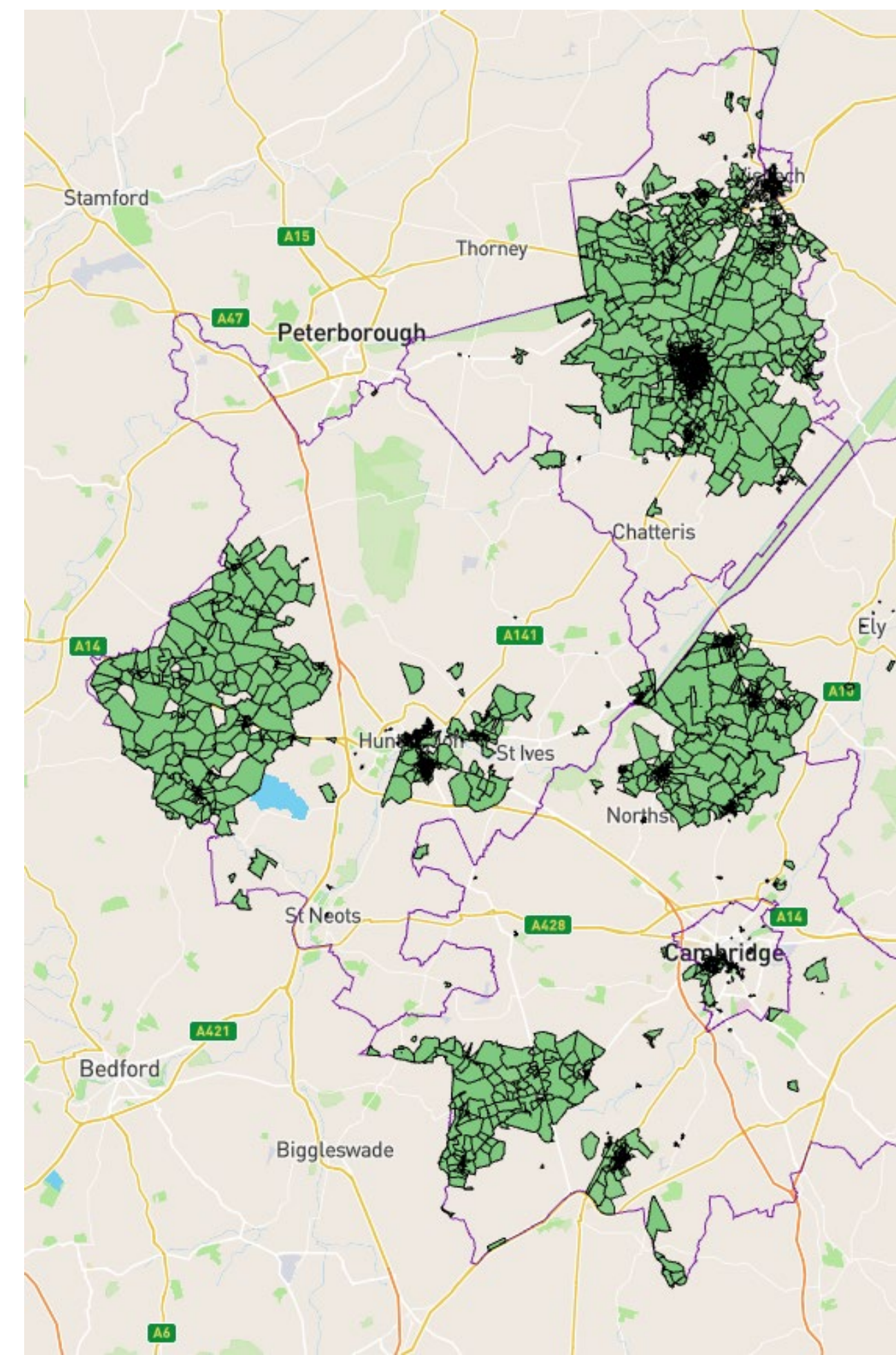
DSR can help manage local constraints by temporarily reducing demand in targeted areas. UK Power Networks has procured DSR across Cambridgeshire in recent years, although overall volumes remain small relative to wider network needs. DSR can still play a useful role in managing constraints and enabling growth in specific locations, but will not remove the need for network investment given the scale of development in the region.



What about Vehicle to Grid?

Vehicle to Grid (V2G) could provide additional flexibility by allowing EVs to export electricity back to the network. National trials are ongoing, but V2G remains at an early stage, with uncertainties around costs, technology standards and commercial models.

Overview of regions in which UK Power Networks has sought Demand Side Response during recent tender rounds

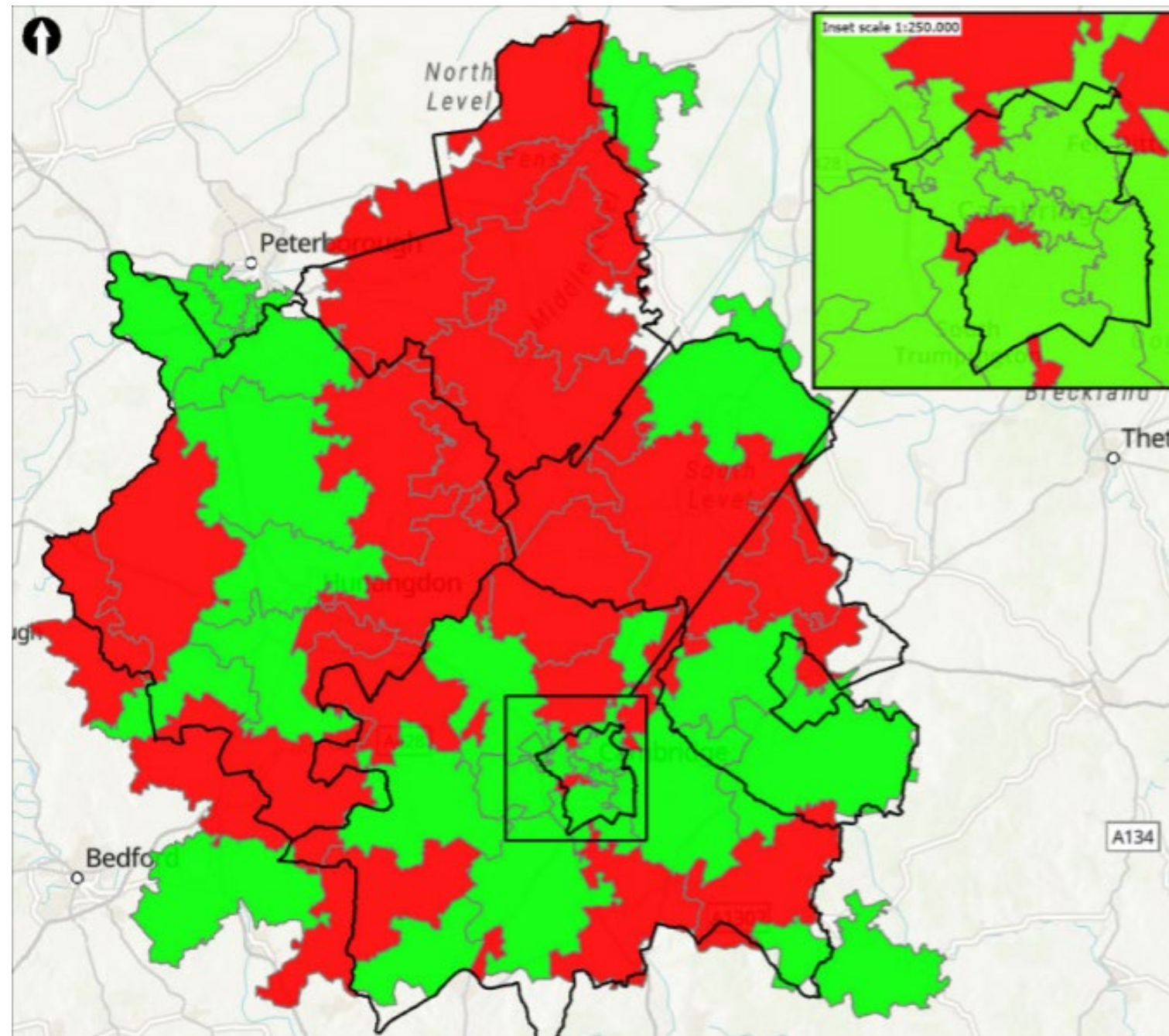


Sources:

- 1) Gov (2024) Clean Power 2030 Action Plan: A new era of clean electricity. (Figure 13).
- 2) Figure right: LAEP+ filtered for competition pot “demand” using UKPN 2023 data

Network Impacts From Net Zero (left) and Growth (right)

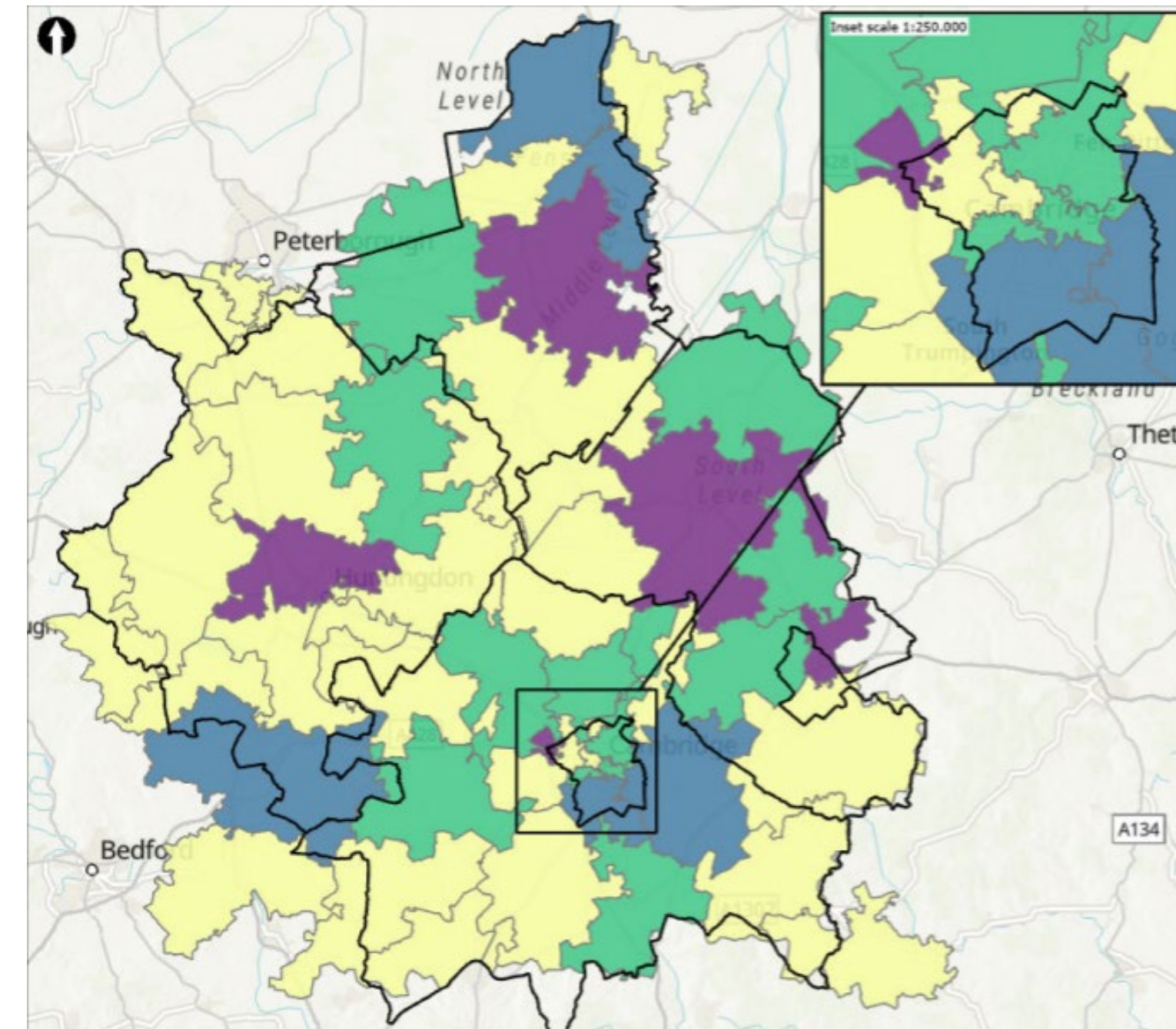
Substation spare capacity (“headroom”) in 2035 under a Holistic Transition scenario



Projected 2035 demand headroom

- Red: Negative headroom
- Green: Positive headroom of more than 5%
- Black outline: District council boundary
- White outline: UKPN primary substation boundary

ADMD added per primary, between 2030 and 2035, from Growth only.



Annual changes in ADMD from developments - 2035

- Purple: More than 10MW being added
- Blue: Between 5-10MW being added
- Green: Less than 5MW being added
- Yellow: 0MW being added
- Black outline: District council boundary

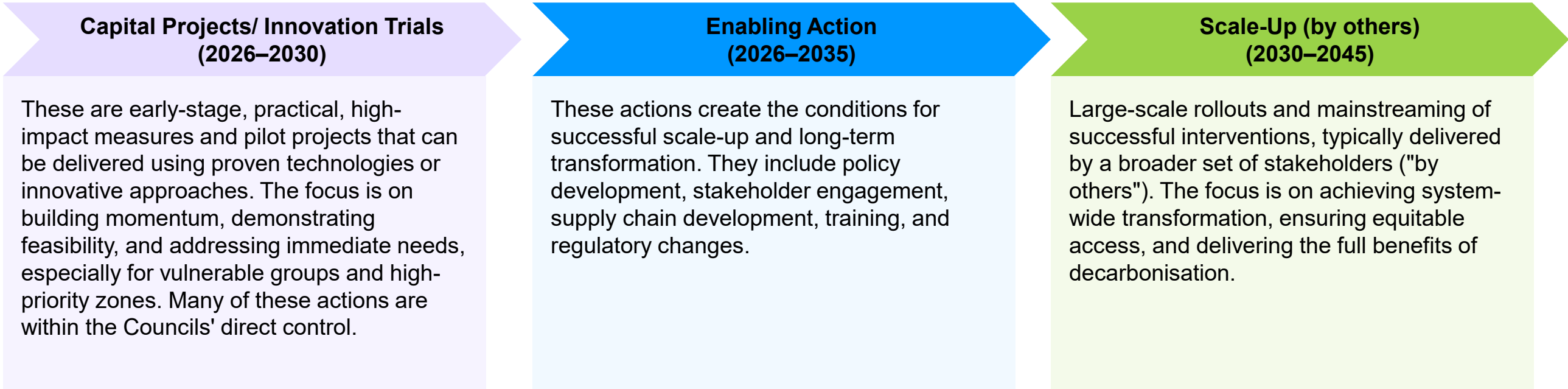


Implementation Plan

Implementation Strategy

The LAEP presents a sequenced pipeline of priority projects to support strategic planning and investment in energy infrastructure to support economic growth.

The approach ensures a transition toward a more sustainable, low carbon and resilient system that is inclusive, maximising local benefits and aligning with national and regional policy objectives. The pathway is illustrated through three indicative activity types, with critical regulations and decision points highlighted (see right).



Structure of this section

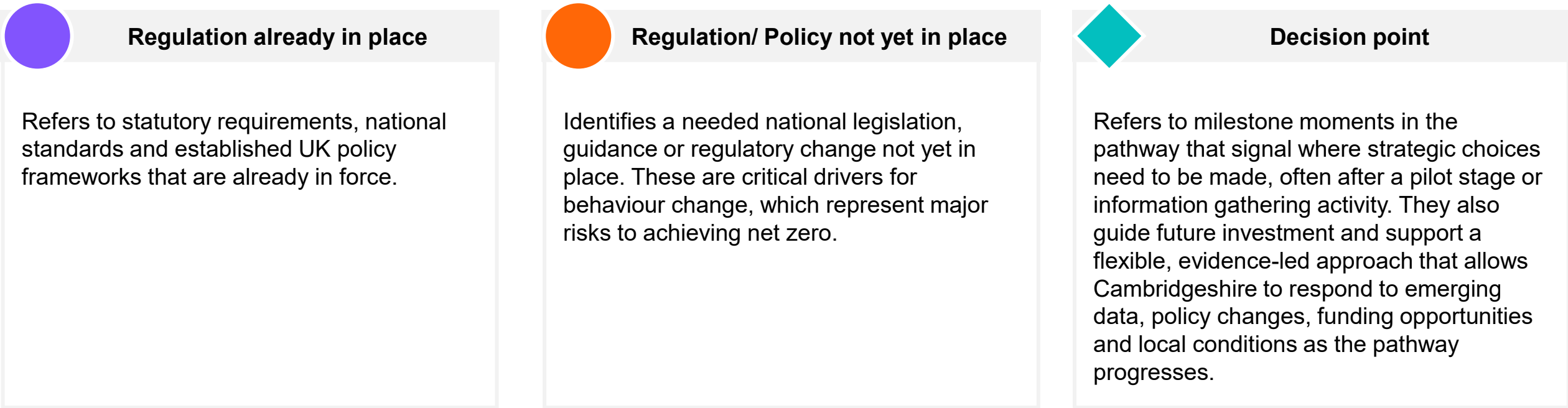
A decarbonisation pathway is first shown, presented as a plan on a page. This highlights the shortlisted capital projects, pilots, enabling actions, and scale-up measures across key sectors. Key risks and dependencies are also highlighted.

Following this, the top three activities needed within the next five years, are then presented in more detail. Stakeholders needed, risks, and side benefits are also identified.

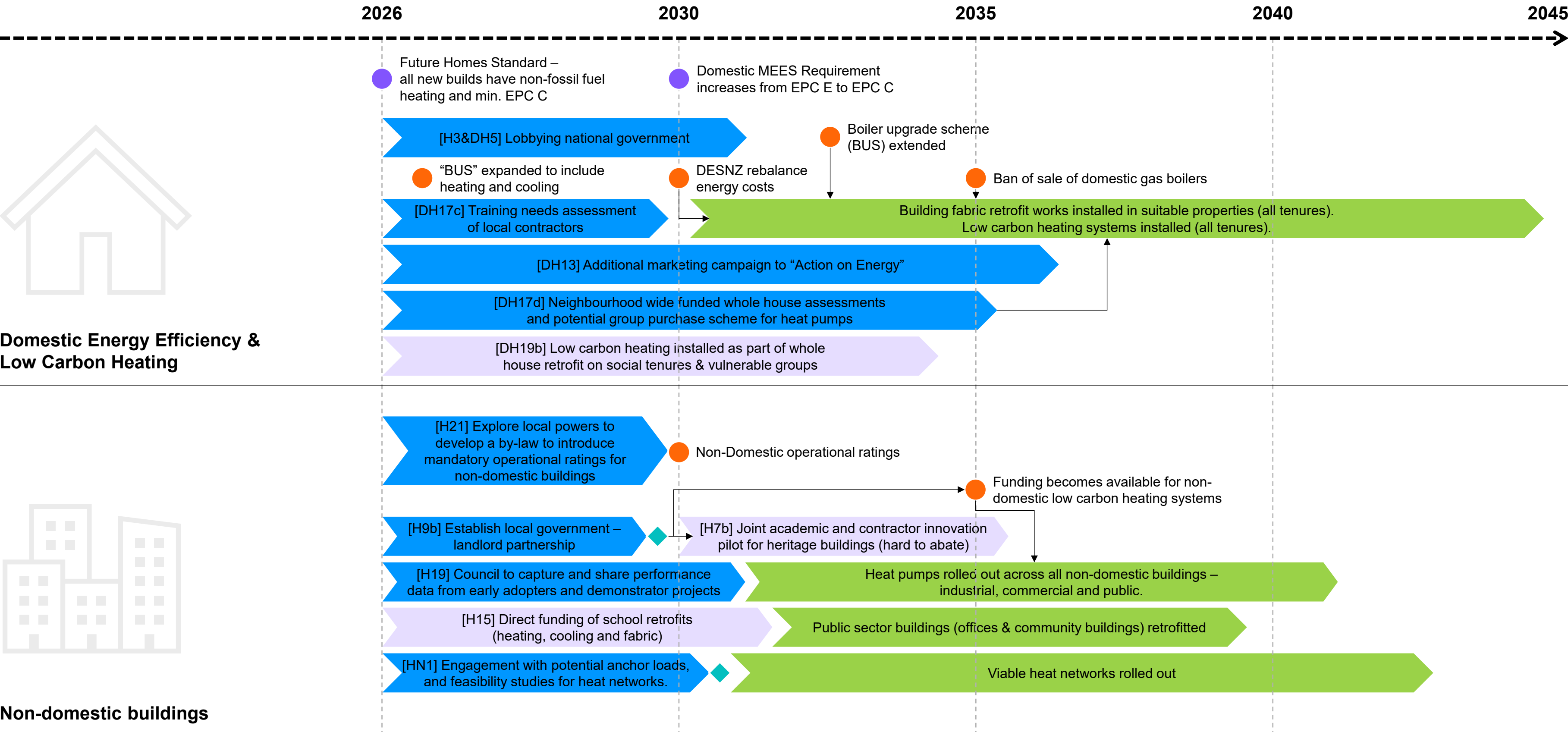
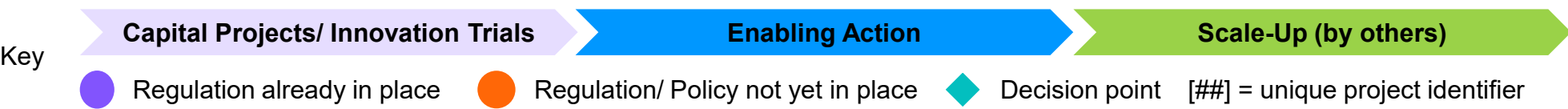
Finally, key risks to delivering the LAEP are identified, along with mitigating actions.

Note that in producing the LAEP stakeholder input has informed both the barriers and solutions considered, fully detailed in the Technical Report. Furthermore, the LAEP is only a plan at a snapshot in time, and what may appear as priority project/ intervention now will change in the future.

In addition to the above activity types, the illustration includes three essential enablers:

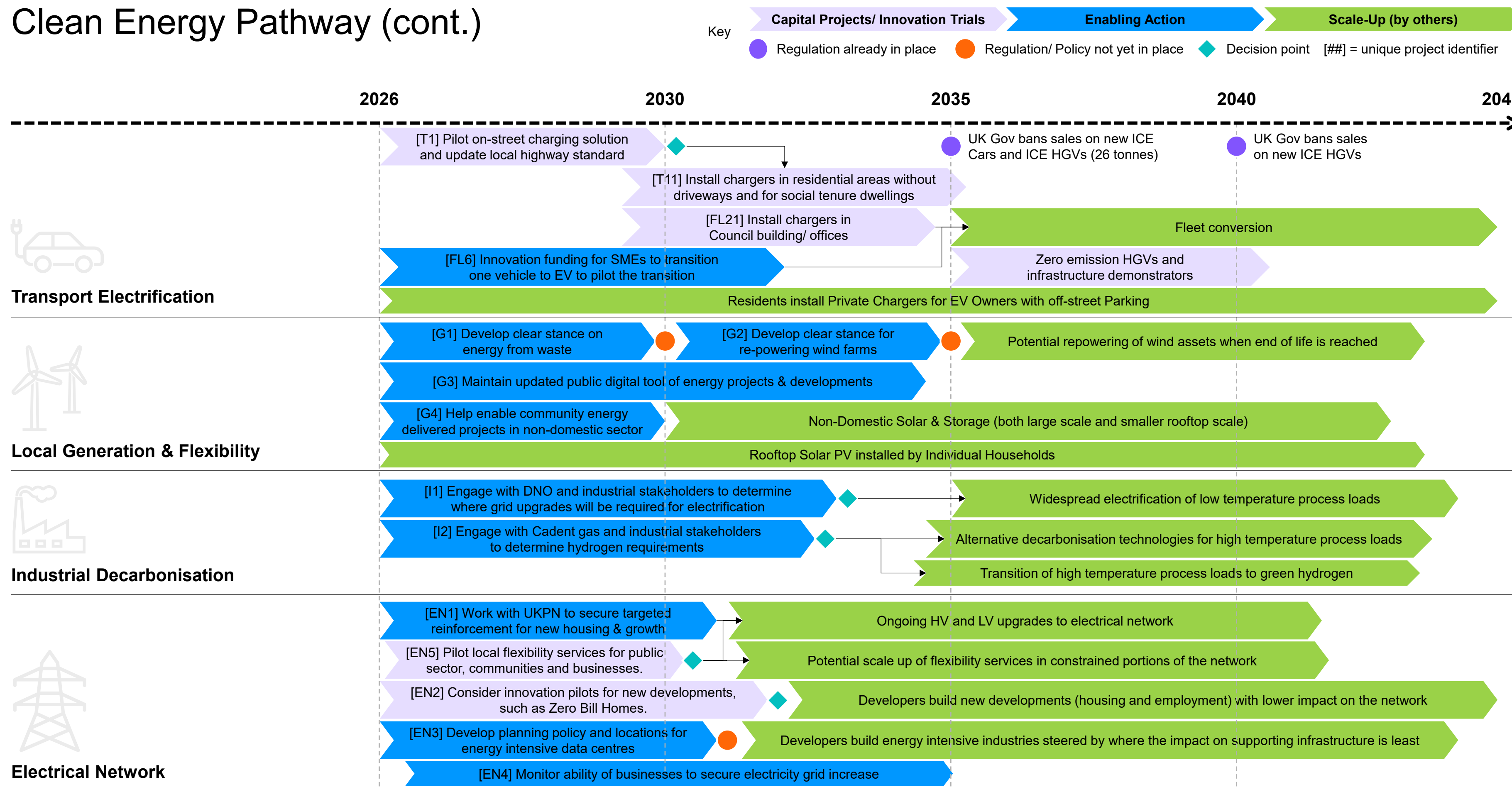


Clean Energy Pathway



Note: These activities were generated through a detailed barrier analysis and solution screening exercise, detailed in the Technical Report. The above shows only the shortlisted solutions selected, while the Technical Report contains the full list of solutions considered. Barriers to getting to net zero, and the potential solutions to overcome them, have been informed extensively through stakeholder engagement captured in the CAG report (separate document)

Clean Energy Pathway (cont.)



Note: These activities were generated through a detailed barrier analysis and solution screening exercise, detailed in the Technical Report. The above shows only the shortlisted solutions selected, while the Technical Report contains the full list of solutions considered. Barriers to getting to net zero, and the potential solutions to overcome them, have been informed extensively through stakeholder engagement captured in the CAG report (separate document)

Heating: Domestic Sector

Action 1: [DH17c] Assess training needs of local contractors, and support during accreditation.		
Collaborative approach with local installers, assessing their gaps and training needs, providing funding for them to take on apprentices and upskill, as necessary. Supporting local contractors specifically, to gain national accreditation. It was recognised that local supply chains are important, because for the domestic sector, the work is often too small for competent installers to travel long distances for work. Reference: (CISL, 2025, p8)	Convening Lead Combined Authority	Collaborators Local installers, academic institutions, industry groups.
	Risks & Dependencies Limited engagement from local contractors due to time constraints. Shortage of apprentices and skilled workers.	Co-Benefits Creates opportunities to increase local employment.
Action 2: [DH13] Additional marketing campaign to “Action on Energy”		
Leverage the work done to date on Action on Energy. Further engage residents through further awareness campaigns to access the information there. Enhance and supplement the information already on the platform as needed. Reference: (CISL, 2025, p7)	Convening Lead County Council	Collaborators Combined Authority, City and District Councils
	Risks & Dependencies Limited engagement from the public. Public awareness remains low.	Co-Benefits Stimulates demand for local contractors.
Action 3: [DH19b] Low carbon heating installed as part of whole house retrofit on social tenures & vulnerable groups		
Council directly intervenes and installs fabric upgrades and ASHP (via a delivery partner), to vulnerable groups. Specifically target people who are lower income, suffer from medical conditions, or would generally disproportionately benefit from improved indoor temperature comfort. Fund could be eligibility based, allowing the Council to decide who to fund, and direct others to the range of other incentives available.	Convening Lead City and District Councils & Housing Associations	Collaborators Local installers
	Risks & Dependencies Insufficient funding availability. Shortage of competent and accredited installers.	Co-Benefits Reduces fuel poverty and improves health outcomes.

Heating: Non-domestic Sector

Action 1: [H9b] Establish local government – landlord partnership

Create a partnership with the landlords of business parks, research parks, industrial estates, etc. Many of the office buildings, and industrial businesses, likely fall into this category, and targeting the commercial landlord for open discussions on what is needed to transition whole estates will help accelerate the change.

Convening Lead

County, City or District Councils.

Collaborators

Commercial landlords, property developers.

Risks & Dependencies

Low engagement from large business park owners and landlords, reducing the effectiveness and uptake of proposed solutions and incentives.

Co-Benefits

Creates a platform to address grid constraints, expand EV charging, and support fabric upgrades.

Action 2: [H15] Direct funding of school retrofits (heating, cooling and fabric)

Capital programme of work from public sector specifically aimed at decarbonising public sector buildings – schools.

Convening Lead

County Council

Collaborators

Education sector, community energy groups.

Risks & Dependencies

Insufficient funding availability, particularly where older buildings or constrained sites require high-cost interventions.

Co-Benefits

Improves thermal comfort and learning outcomes during hot summer months while delivering reduced operational costs for schools.

Action 3: [H21] Explore local powers to develop a by-law to introduce mandatory operational ratings for non-domestic buildings

Explore the powers to introduce a local by-law which requires this on non-domestic buildings. A rating system like this would mean that better performing buildings, will fetch higher rents from tenants and therefore incentivise landlords to invest. In parallel tenants will be able to know this before leasing a space and will therefore increase demand for these spaces. Example cited is the NABERS scheme in Australia.

Reference: (UKGBC, 2020, p5)

Convening Lead

Combined Authority, City and District Councils

Collaborators

Industry Groups (e.g. UKGBC), Academic institutions, Building regulations, landlords.

Risks & Dependencies

May require national-level action rather than delivery by a combined authority. Local bylaw may be needed to enforce phase-out of gas boilers in non-domestic properties. Market signals may remain too weak to create a premium for higher-performing buildings. Landlords may still be unwilling to invest.

Co-Benefits

Incentivises higher-performing non-domestic buildings without transferring costs to the public sector.

Non-Domestic Heating, Heat Networks, Industrial Decarbonisation

Action 4: [DH20b] Joint academic and contractor funding for heritage listed homes and non-domestic buildings		
A partnership approach for heritage domestic buildings. Utilising industry and academia to generate innovative solutions for this hard to abate proportion of the domestic and non-domestic property stock. Could also help train local contractors on how to work on these specific building types. Reference: (CISL, 2025, p7)	Convening Lead County Council	Collaborators City and District Councils, Historic England, academic institutions, contractors, industry groups (UKGBC), residents.
	Risks & Dependencies Limited availability of skilled contractors. Insufficient funding. Businesses or residents may be unwilling to decant operations or tolerate disruption.	Co-Benefits Enables sustainable retrofit of heritage buildings and reduces future retrofit costs through shared standards, case studies, and lessons learned.
Action 1: [HN1] Engagement with potential anchor loads, and feasibility studies for heat networks.		
Launch feasibility study and district heating zoning review in high heat-density clusters such as Cambridge and other urban centres, anchored by public sector buildings and major employers/ energy users. Feasibility studies and engagement with anchor loads will inform future expansion, with consideration for integrating cooling systems to enhance climate resilience. This work should be undertaken in collaboration with the area’s Heat Network Coordinator(s) to ensure alignment with emerging zoning responsibilities and local delivery structures.	Convening Lead Combined Authority, County Council, District or City Councils	Collaborators , Developers, Large businesses/ industries, DESNZ.
	Risks & Dependencies Lack of available finance or upfront capital. Reluctance of parties to enter into long-term agreements.	Co-Benefits Reduced pressure on the supply chain for individual ASHP installations. Lower heating costs for connected businesses and residents. Opportunities to pilot heat-as-a-service models.
Action 1: [I1] Engage with DNO and industrial stakeholders to determine where grid upgrades will be required		
The facilitation of communication between these key stakeholders will enable the transition away from fossil fuels by ensuring that local infrastructure is ready for the required fuel switching. The local gas network operator, and other hydrogen providers operating locally, can ensure that there is enough supply for high temperature process loads moving away from natural gas. This initial action is likely facilitating discussions so that plans can be shared early and connections made between relevant stakeholders.	Convening Lead County Council or Combined Authority	Collaborators UKPN, National Grid Electricity Distribution (NGED), Large businesses, landlords of non-domestic estates, developers.
	Risks & Dependencies Without forward planning to shift large industrial low-temperature loads to electric heating, businesses may face higher costs and longer lead times when attempting to transition.	Co-Benefits Ability to coordinate network upgrades with nearby developments, potentially reducing overall costs. Opportunities for new or expanded heat network solutions.

Transport

Action 1: [T1] Pilot on-street charging solution and update local highway standard		
The Council could select a neighbourhood to trial a number of the on-street parking solutions for residents as part of a trial. This could then inform the preferred solution to be deployed more broadly and inform highway authority policy updates.	Convening Lead County Council	Collaborators Combined Authority, District and City Councils, Local Contractors.
	Risks & Dependencies Must align with the CPCA EV strategy. Potential liability for cross-pavement charging solutions. Unclear accountability for ongoing maintenance. Risk of increased on-street clutter.	Co-Benefits Reduces barrier to EV adoption for certain user groups.
Action 2: [T11] Install chargers in residential areas without driveways and for social tenure dwellings		
Capital project for housing associations - providing EV charger provision to social tenures. Could explore DBO arrangement although would require price control to ensure lower operating costs are passed onto tenants.	Convening Lead County Council	Collaborators City and District Councils, Housing Associations, Local contractors.
	Risks & Dependencies A design–build–operate model would require a public procurement process. Tariff setting must be carefully managed to ensure consumer protection.	Co-Benefits Delivers positive outcomes for lower-income households. Can act as a replicable model for private rented flat complexes and housing estates.
Action 3: [FL6] Innovation funding for SMEs to transition one vehicle to EV to pilot the transition		
For a business who is unsure how switching to an EV would impact their business model (e.g. delivery staff having to charge on route), grant/ innovation funding provided to allow them to trial one vehicle or part of the fleet, before transitioning the whole fleet.	Convening Lead Combined Authority/ County Council	Collaborators Funding avenues through central government
	Risks & Dependencies Limited risk, as support is primarily financial. Minimal dependency on wider decarbonisation activities.	Co-Benefits Supports small and medium enterprises who often face greater barriers to accessing capital in transitioning their fleets.

Generation

Action 1: [G2] Develop clear stance on re-powering of wind		
This could include issuing guidelines to developers on its approach to assessing change of hub height or change of number of turbines; or actively allocating land areas for new wind projects assuming existing sites will not be repowered. Community Energy led schemes, or providing direct community benefit to those near future windfarms will also be important considerations if existing wind farms are re-powered.	Convening Lead District and City Councils	Collaborators Combined Authority and County Council
	Risks & Dependencies Without a clear preference/ endorsement from the planning authority, existing wind sites may be decommissioned and re purposed to another land use type that can utilise the grid connection.	Co-Benefits May encourage repowering of existing wind sites, increasing locally generated renewable energy. Could help ensure EfW development is permitted in a balanced and appropriate way.
Action 2: [G3] Maintain updated public digital tool of energy projects & developments		
During the stakeholder engagement workshops as part of the LAEP, one key idea recommended was the concept of a visible map or digital tool, where businesses and residents can see proposed energy projects in their area. This might allow synergies and partnerships to organically develop, or for more coordinated engagement and capacity requests to UK Power Networks. By providing access to this information, independent actors can collaborate directly without the need for the local authorities to manage centrally. Reference: (CAG, 2025)	Convening Lead Combined Authority, County Council	Collaborators Developers, large businesses, District and City Councils, DNO.
	Risks & Dependencies Risks this becoming an administrative burden, or that without a significant awareness campaign the tool is not used.	Co-Benefits Enables new private developments and generation projects to integrate more effectively with existing communities.
Action 3: [G4] Help enable community energy delivered projects in non-domestic sector		
Realising the rooftop solar estimates in the net zero scenarios does require mobilisation of both domestic and non-domestic sector, which community energy projects can help deliver. As batteries become more affordable, and flexible electricity tariffs expand, it is likely that community energy projects that combine interventions – solar, battery, heat – may become more attractive. Reference: (CAG, 2025)	Convening Lead County Council	Collaborators Combined Authority, City and District Councils, Existing Community Energy Groups (e.g. Big Solar Coop), Developers, Existing businesses.
	Risks & Dependencies Risk supply chain capacity becomes constrained and prices rise. Unable to get sufficient participation from residents (cost of living rises, lack of affordability, lack of awareness of schemes or ability to participate).	Co-Benefits Residents feel more engaged and can benefit financially from the net zero transition. Reduced electrical demand at the point of connection, resulting in lower energy bills.

Network

Action 1: [EN1] Work with UKPN to secure targeted reinforcement for new housing & growth		
Public sector seed funds the necessary grid connections to provide certainty to developers. Examples of Warrington Borough Council, Sunderland City Council, Ebbsfleet Development Corporation playing this role. Alternatively, the local authorities can work collaboratively with UKPN to develop the evidence required to secure full Ofgem funding for infrastructure investment, as the Greater Cambridge Partnership did locally for Cambridge East and Trumpington.	Convening Lead Combined Authority	Collaborators UKPN, NGED, Developers.
	Risks & Dependencies Without proactive planning and investment in the network, new developments may face increased wait times and higher costs for grid connections.	Co-Benefits Network reinforcement can be delivered more efficiently, as the DNO gains clearer visibility of upcoming demand and can optimise upgrades accordingly.
Action 2: [EN2] Consider innovation pilots for new developments, such as Zero Bill Homes.		
Pilots could be encouraged between energy suppliers and developers to deliver innovative new homes as part of future development. Octopus Energy is trialling this approach with their Zero Bill Homes initiative, with a “130 home development in Bedfordshire planned for Zero Bills” . Demonstrators like this, delivered in the next 10 years, could prove to be important local case studies for the potentially large amount of growth in 2035 onwards. Reference: (Octopus, 2024)	Convening Lead City and District Councils	Collaborators Energy suppliers, Developers, Cambridge Growth Company.
	Risks & Dependencies Dependent on energy suppliers or prospective home buyers being willing to enter into the agreement.	Co-Benefits Helps mitigate pressure on the electrical network, particularly in high-growth scenarios beyond 2035.

Network (cont.)

Action 3: [EN3] Develop planning policy and locations for energy intensive data centres		
The local authorities could help steer new energy intensive industries and commercial space to locations conducive with the supporting infrastructure (primarily water and energy). One approach could be starting with a call for sites for data centres, to understand what developers are currently planning. These sites could then be reviewed against an established set of criteria (including availability of grid connection and adequate water supply), so that sites may possibly be allocated for this use. This should be a coordinated effort with UKPN and NESO, so that developers may be incentivised to develop sites where they best suit the underlying infrastructure.	Convening Lead Combined Authority, City and District Councils	Collaborators UKPN, NGED, NESO, Developers, Water Companies, Academic institutions.
	Risks & Dependencies Data centres may be proposed in locations where energy or water infrastructure is insufficient, creating a dependency on extensive and costly off-site reinforcement. Proposals may be constrained by emerging national planning policy requirements.	Co-Benefits Creates opportunities for power purchase agreements with nearby solar arrays
Action 4: [EN4] Monitor ability of businesses to secure electricity grid increase		
Actively participate in existing business fora or convene a dedicated forum focussed on infrastructure which allows Local Authorities to hear directly from both businesses and from UK Power Networks about how smaller demand increases and new connections are being served and any blockages in the system	Convening Lead Combined Authority	Collaborators County Council, City and District Councils, UKPN, Business owners, Developers.
	Risks & Dependencies Relies on parties being willing to share information, which may be challenging.	Co-Benefits Enables collaborative problem-solving across all parties to address network capacity constraints
Action 5: [EN5] Pilot local flexibility services for public sector, communities and businesses		
Explore potential pilots aimed at, developing and promoting local flexibility opportunities across public sector buildings, community energy groups and businesses, by identifying suitable assets for demand-side response, peak-shifting and participation in local flexibility markets. Work with UKPN to define flexibility zones and support the deployment of enabling technologies such as smart controls, metering and battery storage.	Convening Lead Combined Authority, County Council, City and District Councils	Collaborators UKPN, NGED, Community Energy Groups, Large employers, SMEs, Flexibility Service Providers.
	Risks & Dependencies Capital costs of batteries, smart meters, and intelligent Building management systems (BMS) may require external funding. Will require participation with an energy supplier with a suitable tariff. Could be paired with Action EN2.	Co-Benefits Dependent on availability of enabling technologies and smart metering, willingness of building operators to participate, evolving DNO procurement processes, and the wider market framework for flexibility services.

Spatial Focus

Spatial analysis has identified priority zones where targeted interventions can deliver the greatest impact for clean energy, social equity, and system efficiency.

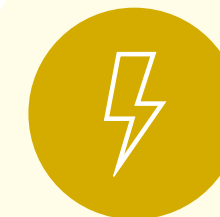
These areas should be reviewed in further detail and prioritised where appropriate by City and District Councils during implementation. As stated throughout the LAEP, interventions (public chargers, air sourced heat pumps, building fabric upgrades) are needed across all districts.

The spatial focus indicates areas where there is a concentration, or a higher need, for a particular intervention. Prioritising these areas can lead to more impactful outcomes earlier and serve as potential demonstrations/ pilots for other areas.



Industrial Decarbonisation

Industrial clusters in Whittlesey, Wisbech, Fordham & Chippenham, Huntingdon, and St Neots are priorities for electrification and preparation for hydrogen transition.



Grid Constraints and Electricity Headroom

Across the county, primary substations including those in Cambridge City (St Anthony St), Fenland (Wisbech Railway, March, Guyhirn), and East Cambridgeshire (Chatteris, Exning, Aldreth) face early constraints, requiring proactive reinforcement and potentially some demand-side response.



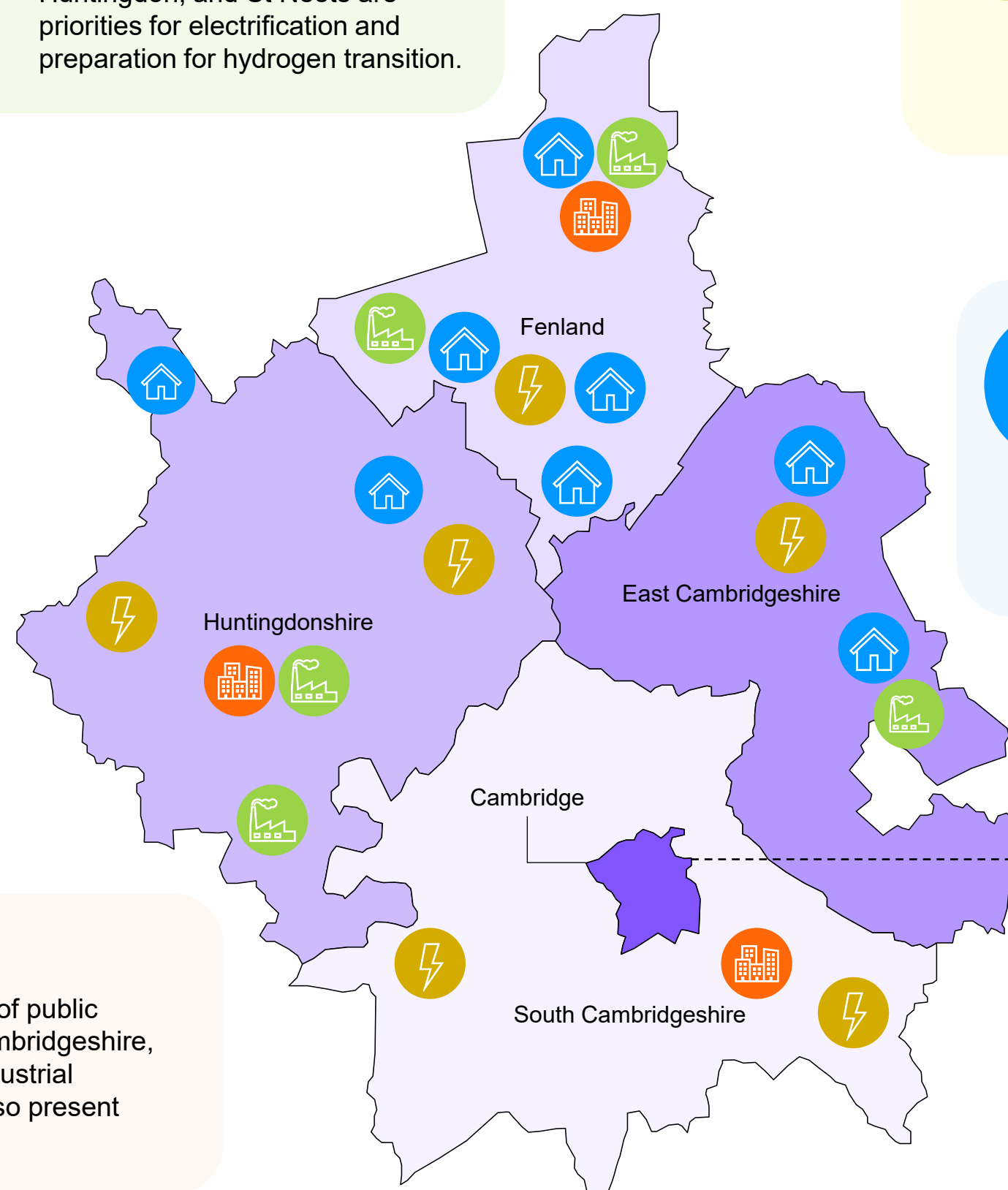
Fuel Poverty and Low EPC Ratings

Priority areas include parts of Fenland (e.g. Wisbech, March, Chatteris, Whittlesey), East Cambridgeshire (e.g. Soham, Littleport, Ely outskirts), North and East Cambridge City (e.g. Arbury, East Chesterton, King's Hedges), and Huntingdonshire (North of Ramsey, Elton).

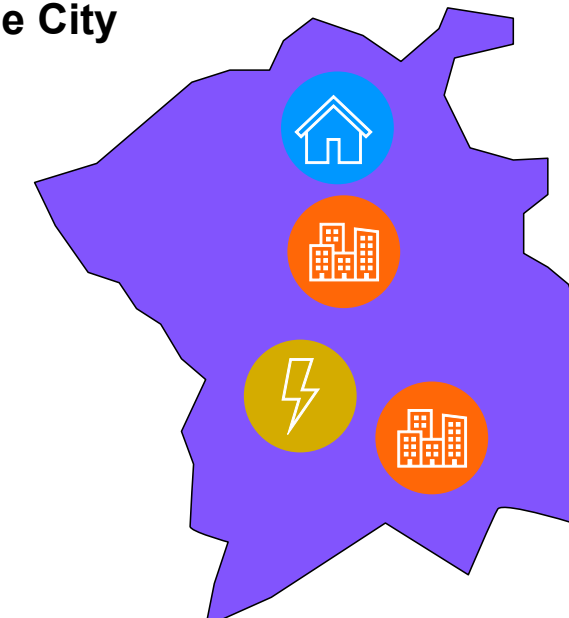


District Heating Potential

High-density urban areas and clusters of public buildings in Cambridge City, South Cambridgeshire, Fenland, and Huntingdonshire. The industrial decarbonisation hotspots listed may also present opportunities for district heating.



Cambridge City





Risks

Key Risks And Assumptions

Cambridgeshire’s LAEP sets out a range of technologies and transition options, each associated with specific risks and uncertainties.

These may influence the county’s actual decarbonisation pathway, and significant decisions will require careful evaluation of technical feasibility, infrastructure readiness, societal acceptance and financial implications. The key risks identified are outlined here, and ongoing monitoring will be essential as changing market, policy and regulatory conditions may require updates to the LAEP.

No.	Sector	Risk	Impact	Mitigation
1	Heating	DESNZ fail to re-balance energy costs, and/ or the government fails to put a ban on sale of new fossil fuel boilers by 2035.	One or both of these measures are required to decarbonise heating. All net zero scenarios assume a ban on fossil fuel boilers by 2035, and then the transition to net zero happens as existing gas boilers are naturally replaced with ASHP.	H3 and DH5: Changing market, policy, growth and regulatory conditions may require updates to the LAEP.
2	Heating	The Government removes or ends early the Boiler Upgrade Scheme subsidies, and other subsidies for fabric upgrades.	As shown in the economic modelling section, switching to low carbon heating systems relies on grant funding given where prices currently are. Removal of these subsidies would leave to a slow down on low carbon heating uptake and fabric upgrades.	H3 and DH5: Changing market, policy, growth and regulatory conditions may require updates to the LAEP.
3	Network	Electrical network upgrades fail to keep pace with development or the net zero transition	Businesses, looking to switch large loads – such as gas heating for estates to electric, or industrial loads – would face barriers to their projects and potentially large costs rendering business case justification difficult. Developers face long delays and wait times, before being able to build houses or connect new generation to the network.	EN1 and EN4: Continued work with DNO to keep growth forecasts up to date, as well continued discussion with businesses to monitor their ability to secure electricity grid increases.
4	Heating/ Network	New Build housing and non-domestic buildings are not built to net zero standards or a high level of efficiency	All net zero scenarios assume new homes after 2025 are built with low carbon heating and will not require future fabric upgrades. If standards are not enforced and new builds have gas boilers, it will put pressure on an already constrained supply chain for the existing housing stock. It also might lead to larger impact on the electrical network.	Ensure high building standards for new builds, and relevant policy is in place to prevent retrofits being required later.
5	Heating	Supply chain is unable to meet the increased demand for fabric upgrades and ASHP installation	Residents face increased costs for new heating systems or fabric upgrades, and difficulty in finding competent contractors and advice. This could de-motivate residents and delay the net zero transition.	DH17c: Training needs assessment of local contractors
6	Heating	Non-domestic landlords do not cooperate with the change	Gas consumption from the non-domestic sector is significant and often requires landlords to invest in assets they do not occupy. Without landlord cooperation, the nondomestic sector is unlikely to transition at the pace required.	H12: Local government regulation for phase out of gas heating H21: Mandatory operational ratings for non-domestic sector

Key Risks And Assumptions (cont.)

No.	Sector	Risk	Impact	Mitigation
7	Heating	Residents are unwilling to thermally improve their houses	These include affordability and funding availability, supply chain limitations, lack of engagement from some landlords, high levels of disruption for some measures, and high technical complexity in some homes which need a specific tailored approach. The impact is paying more for heating, likely not switching to ASHP, or installing higher powered low carbon heating creating greater pressure on the network.	DH13: additional marketing campaign to “Action on Energy” DH17d: Neighbourhood wide funded whole house assessments and potential group purchase schemes
8	Transport	Government cancels or delays ban to ICE vehicle sales	All net zero scenarios assume 100% of car sales are BEH or PHEV by 2030, and for vans 2035. A delay to this would increase the cumulative carbon emissions (carbon budget) but is still likely to achieve net zero assuming a 10-year average replacement rate on cars and vans.	Deliver transportation interventions listed earlier, to remove the barriers to EV adoption, thus reducing reliance on the regulatory mandate.
9	Transport	Certain residents are left out of the EV transition – lower income residents or those living in flats or without off-street parking	This could arise from the Highway authority not approving cross pavement charging solutions, due to safety liability, maintenance, on-street clutter, etc. Also, no targeted grants for low-income individuals to purchase EVs over ICE equivalents. The impact would be those with financial means and off-street parking will naturally make the shift, but it will lead to an inequitable net zero transition.	T8 and T12: Introduce financial mechanisms and supportive policies that reduce cost barriers for residents without off-street parking or on lower incomes, helping to ensure an equitable shift to electric vehicles.
10	Heating	Heat network pilot is delayed, due to delay in securing anchor load agreements and financing.	Larger cost burden placed on businesses or households to bear the full cost of transitioning to net zero	HN1: Engagement with potential anchor loads, and feasibility studies for heat networks.



Conclusion

Conclusion

The LAEP demonstrates that transitioning to clean energy by 2045 is technically feasible for Cambridgeshire, and that the changing energy needs of residents and businesses alongside economic growth and the rising requirement for clean energy can be met. However, this is only achievable with coordinated action across all sectors and sustained investment.

Net zero-compliant scenarios reduce county-wide emissions by approximately 93.7% by 2045 compared to 2023, with the largest contributions from electrification of transport and heating, supported by energy efficiency improvements and local renewable generation.

Critically, coordinated effort between the local authorities and UKPN will be required, as well as proactive investment in the electrical network to keep pace with growth and the transition away from fossil fuels. Flexibility pilots should also be considered, which could help defer network investments and provide benefits at a local level for businesses, residents and public buildings.

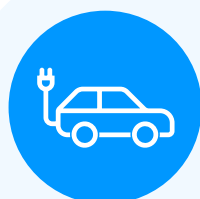
The transition requires substantial investment. Under any scenario, there is a probable £3.43 billion of baseline capital expenditure (CAPEX), the majority of which relates to £2.9 billion for ground mount solar and EV infrastructure that will likely be paid for by private organisations. Additional spend is required on top of this, to achieve net zero. In present value terms, this ranges between £2.7 billion and £3.4 billion (excluding the possible Core growth scenario). These investments are offset by benefits including carbon savings, air quality improvements, and bill savings, improved health outcomes, job creation, and reduced fuel poverty.

By maintaining an agile approach and engaging continually with stakeholders, Cambridgeshire can lead the way in local energy transformation, delivering environmental, economic, and social benefits for current and future generations.



Building Efficiency

Improving the energy efficiency of buildings, particularly through fabric upgrades, is a key enabler for cost-effective heat decarbonisation and grid stability.



Transport

Transport decarbonisation is critical, with electric vehicles delivering the largest emissions reduction of around 35%; improved public charging infrastructure, innovation in low-carbon freight, and support for modal shift and active travel remain necessary.



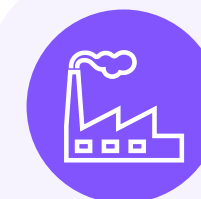
Renewable Generation

Local renewable generation is expanding rapidly, and by 2050 Cambridgeshire is projected to generate 65% of its energy locally; planning authorities must also decide whether to re-power existing wind farms as they reach the end of their design life.



Low Carbon Heating

A rapid and sustained increase in low-carbon heating technologies, such as air source heat pumps, ground source heat pumps, and district heating networks, is required to meet net zero targets, alongside addressing barriers like upfront costs, supply chain capacity, and public awareness.



Industry

Industrial decarbonisation is achievable, with an expected 90% reduction in emissions by 2050 through electrification and green hydrogen, but all industrial companies must have a decarbonisation plan and receive support for fuel switching and innovation.



Energy Networks

Network constraints will become a critical barrier, as all net zero scenarios result in negative substation headroom by the late 2030s, making proactive upgrades and flexibility solutions essential.



References

References

1. Cambridgeshire & Peterborough Combined Authority. (2025). State of the Region 2025 report sets out opportunities and challenges for Cambridgeshire & Peterborough. <https://cambridgeshirepeterborough-ca.gov.uk/news/state-of-the-region-2025-report-sets-out-opportunities-and-challenges-for-cambridgeshire-peterborough/>
2. Cambridgeshire & Peterborough Combined Authority. (2025). Ambitious economic growth plan for Cambridgeshire and Peterborough gets backing. <https://cambridgeshirepeterborough-ca.gov.uk/news/ambitious-economic-growth-plan-for-cambridgeshire-and-peterborough-gets-backing/>
3. Office for National Statistics. (n.d.). Local indicators for Cambridgeshire (E10000003). <https://www.ons.gov.uk/explore-local-statistics/areas/E10000003-cambridgeshire/indicators#select-an-indicator>
4. Office for National Statistics. (n.d.). Business Register and Employment Survey. <https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey>
5. Department for Business, Energy & Industrial Strategy. (2023). Lower and Middle Super Output Areas electricity consumption. <https://www.gov.uk/government/statistics/lower-and-middle-super-output-areas-electricity-consumption>
6. Department for Energy Security and Net Zero. (2023). Digest of UK Energy Statistics (DUKES). <https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes>
7. HM Government. (2025). UK's Modern Industrial Strategy. <https://www.gov.uk/government/collections/the-uks-modern-industrial-strategy-2025>
8. HM Government. (2025). Future Homes and Buildings Standard. <https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation/the-future-homes-and-buildings-standards-2023-consultation>
9. HM Government. (2025). Integrated National Transport Strategy. <https://www.gov.uk/government/speeches/integrated-national-transport-strategy-for-england>
10. Climate Change Committee. (2025). The seventh carbon budget: Advice to the UK government (2038–2042). <https://www.theccc.org.uk/publication/the-seventh-carbon-budget/>
11. HM Government. (2024). [Clean Power 2030 Action Plan: connections reform annex \(updated April 2025\)](#)
12. HM Government. (2025). Planning & Infrastructure Bill. <https://www.gov.uk/government/publications/the-planning-and-infrastructure-bill/guide-to-the-planning-and-infrastructure-bill#background>
13. National Energy System Operator. (2025). Future Energy Senarios: Pathways to Net Zero. <https://www.neso.energy/document/364541/download>
14. National Energy System Operator. (2024). Electricity Ten Year Statement. <https://www.neso.energy/publications/electricity-ten-year-statement-etys>
15. Cambridge Institute for Sustainability Leadership. (2025). Delivering Retrofit at Scale Together: Better homes for healthier, resilient and stronger communities. <https://www.cisl.cam.ac.uk/news-and-resources/publications/delivering-retrofit-scale-together-better-homes-healthier-resilient>
16. UK Green Building Council. (2020). Unlocking the Barriers to Low-Carbon Heat: An Industry View. <https://ukgbc.org/wp-content/uploads/2020/09/UKGBC-Industry-Paper-on-Low-Carbon-Heat-FINAL.docx>
17. CAG Consultants. (2025). Stakeholder engagement as part of the production of this LAEP.
18. Octopus Energy, 2024. 100,000 Zero Bills homes by 2030. <https://octopus.energy/blog/100k-zero-bills-homes-by-2030/>
19. Department for Transport (DfT). (2022). Public Electric Vehicle Charging Infrastructure: Deliberative and quantitative research with drivers without access to off-street parking. https://assets.publishing.service.gov.uk/media/6234a51f8fa8f540e_dba36f1/public-ev-charging-infrastructure-research-report.pdf
20. HM Government. (2024). Cross-pavement solutions for charging electric vehicles: Guidance (published 24 December 2024). <https://www.gov.uk/government/publications/cross-pavement-solutions-for-charging-electric-vehicles/cross-pavement-solutions-for-charging-electric-vehicles>

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