Appendix D Borough profiles

CONTENTS

South Boroughs

Page to be read in parallel with main report chapters 1 and 2

SOUTHWARK

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

71% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 81,700 properties out of the 100,100 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
45	10,600	254m

Fabric retrofit (social domestic)

For social housing 81% of properties are flagged for needing some retrofit - with 32,900 being flats and 3,900 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
11	2,600	50m

Heat network and communal

Heat networks and communal systems are key - with 84,200 and 15,500 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
1,500	279,400	1,112m

Heat pump

Heat pumps focus in less heat dense areas, with 45,800 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
484	100,900	447m

Rooftop PV

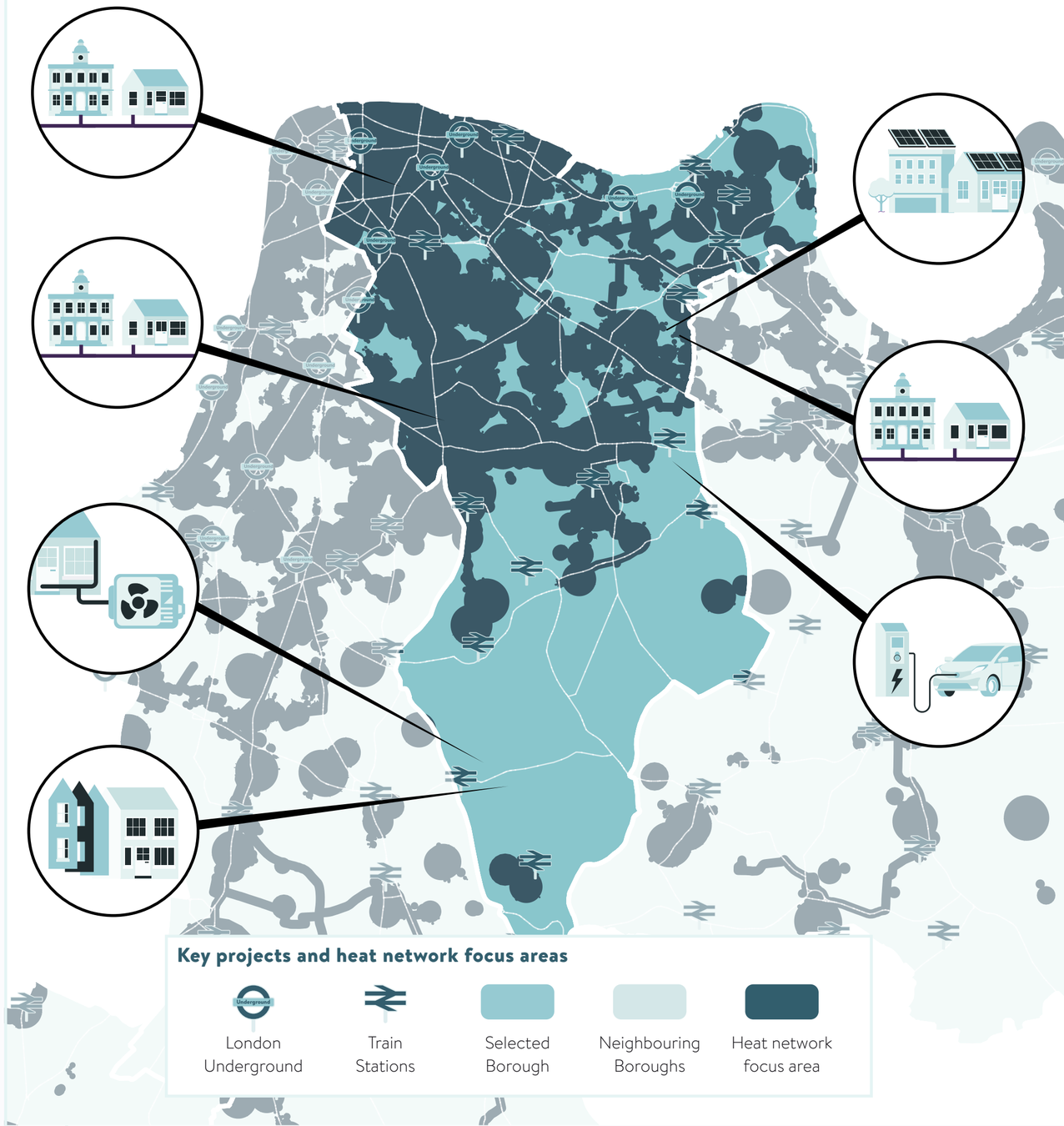
There is 430 MW of rooftop PV potential of this 105 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
96	1,500	171m

EV charging

9,400 domestic properties have access to off street charging. 5,900 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
276	84,100	44m



SOUTHWARK

Borough Key Projects*

Heat network

Large opportunity for heat networks, Phase 2 to explore the cross-borough context for heat transmission as well as within borough opportunities. This should link to the ongoing AZP work in Southwark. Lambeth, Lewisham and Greenwich would be the most relevant for joint consideration of heat networks. SELCHP is a key source of heat for cen-tral boroughs and is a focus for heat networks in Southwark in particular.

Fabric retrofit (domestic)

Good opportunity for demand reduction – this should be linked to typologies and council owned assets (to provide an initial pipeline). Greatest potential in the south of the borough for fabric retrofit. Dulwich Village is an area showing a high concentration of fabric efficiency saving.

On street EV charging

On-street charging opportunity in the central borough area, where there is more network headroom. The north also requires on street charging but has more near-term capacity constraint.

Rooftop PV

Moderate development of rooftop solar PV needed across all the borough – with a greater concentration in the south where houses rather than flats become more widespread. Another focus is seen to the south of South Bermondsey station, due to the concentration of large non-domestic roofs.

Domestic heat pump

Individual domestic heat pumps present more potential in the south, with Dulwich Village showing a high potential concentration.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. For inner boroughs, like Southwark, the subregional decarbonisation strategy has a focus on large scale heat networks. There is potential for cross borough heat networks, generally tracking along the Thames. Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler. The Phase 1 and future Phase 2 plan can also form a lobbying document to focus long term central support.

  At a subregional level Bexley also has substantial waste heat sources, which along with SELCHP could create a heat spine along the river.

- Like many central boroughs Southwark has a high prevalence of flats, which require shallow fabric improvement and connection to central heat sources **(either communal or heat networks).**

- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. New communal systems outside of the primary heat network areas are low regrets, allowing earlier decarbonisation than heat network connection. Communal systems also future proofs buildings, making them suitable for connection if heat networks expand.
- The north of the borough focuses on multi property solutions like communal systems and heat networks, which is beneficial given the lower network headroom in the area.
- Electricity network flexibility opportunities explored in Phase 2, focused on north part of borough where heat networks are less of a priority. Enablers such as more suitable typologies of domestic properties and off-street charging are present.
- The south of the borough has greatest focus on property level solutions. This includes solar, property level heat pumps and off-street charging opportunities.

Borough recommendations

Subregion recommendations

MERTON

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

63% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 21,900 properties out of the 53,000 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
41	9,400	307m

Fabric retrofit (social domestic)

For social housing 51% of properties are flagged for needing some retrofit - with 4,100 being flats and 2,300 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
3	700	18m

Heat network and communal

Heat networks and communal systems are key - with 14,900 and 6,100 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
464	72,600	340m

Heat pump

Heat pumps focus in less heat dense areas, with 63,400 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
695	146,100	605m

Rooftop PV

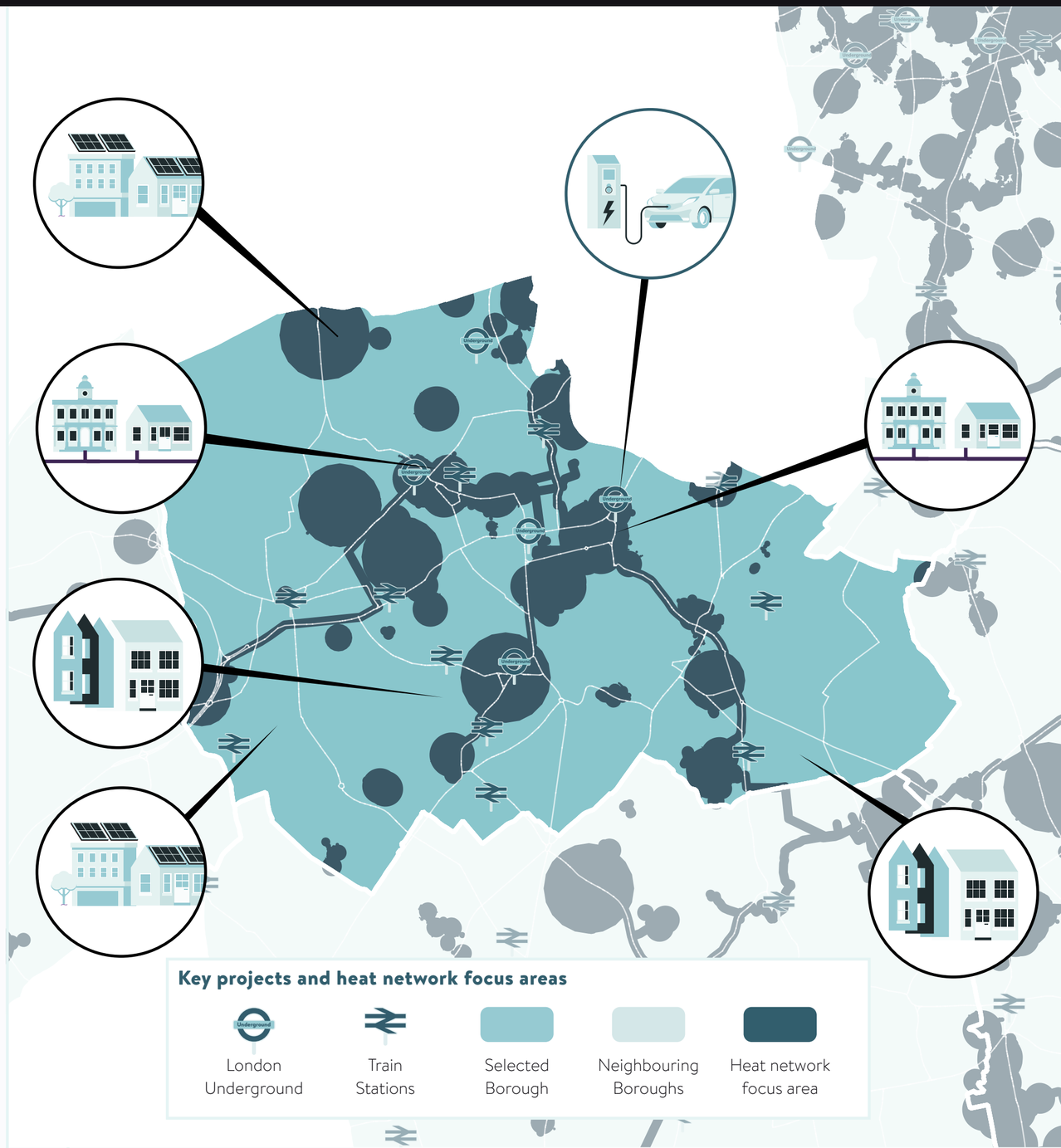
There is 398 MW of rooftop PV potential of this 131 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
121	1,900	237m

EV charging

19,100 domestic properties have access to off street charging. 3,700 onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
279	78,900	44m



MERTON

Borough Key Projects*

Heat network

Most opportunities are focused in the densest areas of the borough such as Colliers Wood and Wimbledon (in the area around Wimbledon train station).

Fabric retrofit (domestic)

Should examine fabric retrofit schemes for owner occupied flats and houses in the south east of the borough – which is where there is the highest likelihood of fuel poverty. This tenure, with the right support mechanisms, are often easier to reach than private rented properties.

On street EV charging

On-street charging requirement is focused on the centre and east of the borough.

Rooftop PV

PV opportunities are spread throughout the borough with a focus in the west. Wimbledon is an area with a high level of deployment.

Domestic heat pump

Property level heat pumps are common throughout the borough, the south west is a focused area for these with some areas also requiring fabric retrofit to allow the heat pumps to function efficiently.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. For outer boroughs, like Merton, network headroom is of particular importance at lower voltages. This is due to a higher number of property level solutions required. Heat network opportunities are more discrete than other boroughs in the subregion, however, there is still need for cross borough collaboration – given potential for heat network transmission mains. Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler.
- Many of the outer boroughs have similar typologies and challenges to Merton **(e.g. Kingston, Sutton and parts of Croydon)** and would benefit from the economies of scale from a subregional approach to tackling these issues **(such as large heat pump deployment and shallow retrofit in houses)**. The Phase 1 and **Phase 2 LAEP** can also form a lobbying document to focus on long term central support.

- Heat networks - Phase 2 to explore the opportunities for cross borough opportunities. Includes linking to opportunities in Wandsworth **(e.g. St Georges Hospital)** which is near waste heat sources in Merton and a heat network opportunity. Croydon and Sutton are also of interest – due to heat from the Beddington waste water treatment works. However, the natural route for this is towards Croydon town centre.
- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. New communal systems outside of the primary heat network areas are low regrets, allowing earlier decarbonisation than heat network connection **(the north west and south east of the borough are areas that could be explored for this)**. Communal systems also future proofs buildings, making them suitable for connection if heat networks expand.
- Electricity network flexibility opportunities should be explored in Phase 2 alongside property level decarbonisation solutions. This should be focused on northwest part of borough where heat networks are less of a priority. Enablers such as more suitable typologies of domestic properties and off-street charging are present. For council owned properties there is some flexibility in the west and south west of the borough, but the building typology means this is not as extensive as the private sector. Good headroom in the borough and few UKPN flexibility offerings indicates in the short-term network headroom is not a major bottleneck for decarbonisation.
- Off street charging opportunities are more focused on the perimeter, particularly the south and west.

Borough recommendations

Subregion recommendations

LEWISHAM

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

59% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 46,500 properties out of the 75,200 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
51	11,900	364m

Fabric retrofit (social domestic)

For social housing 55% of properties are flagged for needing some retrofit - with 14,900 being flats and 3,000 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
8	1,900	40m

Heat network and communal

Heat networks and communal systems are key - with 26,500 and 14,300 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
489	95,300	347m

Heat pump

Heat pumps focus in less heat dense areas, with 85,700 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
841	178,400	815m

Rooftop PV

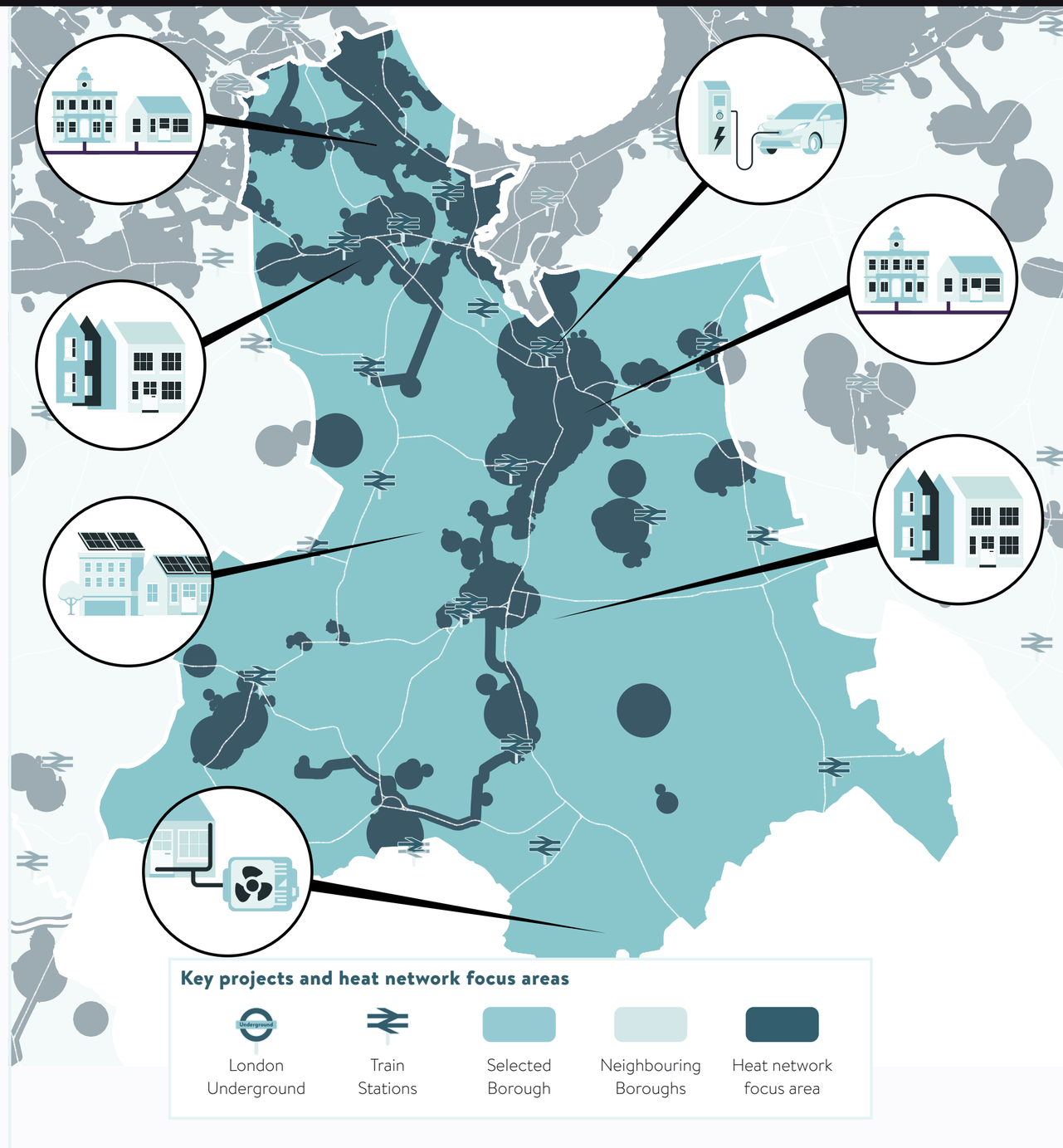
There is 480 MW of rooftop PV potential of this 139 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
128	2,000	255m

EV charging

16,200 domestic properties have access to off street charging. 5,300 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
271	90,000	41m



LEWISHAM

Borough Key Projects*

Heat network

Greenwich being most important for joint consideration of heat networks in the short term. Bexley could also be key as a source of waste heat via Greenwich. Lambeth and Southwark are also relevant for a joint heat network strategy. In the case of Southwark options for connecting to north Lewisham are to be explored and align to the outputs of the subregional modelling – making it a low regrets focus.

Fabric retrofit (domestic)

The area to the north east of Bellingham station is a focus area for energy efficiency, to ensure properties are suitable for heat pumps.

On street EV charging

On-street charging is required throughout the borough – an example focus area is near Lewisham station. On the high voltage network there is generally good headroom for short term deployment (i.e. before 2028, which the end point for UKPNs immediate reinforcement plans).

Rooftop PV

Focus area around Ladywell Fields – this includes large blocks of flats and public sector buildings like schools and a hospital with large suitable roofs.

Domestic heat pump

Property level heat pumps are focused in the south of the borough – the area to the east of Beckenham Place Park is an example of a strong focus.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network.

  Like many central boroughs Lewisham has a high prevalence of flats. The decarbonisation pathway for these is predominantly shallow fabric improvement and connection to central heat sources **(either communal or heat networks)**.

- For inner boroughs, like Lewisham, the subregional decarbonisation strategy has a focus on large scale heat networks. With potential for cross borough heat networks generally tracking along the Thames.

  Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler. The plan can also form a lobbying document to focus long term central support.

- Large opportunity for heat networks, Phase 2 to explore the cross-borough context for heat transmission as well as within borough opportunities.
- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. New communal systems outside of the primary heat network areas are low regrets, allowing earlier decarbonisation than heat network connection. Communal systems also future proofs buildings, making them suitable for connection if heat networks expand.
- Electricity network flexibility opportunities at a property level should be explored in Phase 2. These should be focused on south part of borough where heat networks are less of a priority. Enablers such as more suitable typologies of domestic properties and off-street charging are present. The south of the borough has greatest focus on property level electrification solutions. This includes solar, property level heat pumps and off-street charging opportunities.
- Good opportunity for demand reduction through fabric improvement spread throughout the borough. From a fuel poverty perspective this would focus on owner occupied properties in the middle to south of the borough.
- For total savings via electrification solutions, the focus should be between New Cross Gate and Brockley stations, an area which is characterised by older terraced flats and houses.

Borough recommendations

Subregion recommendations

KINGSTON UPON THAMES

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

66% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 17,900 properties out of the 44,500 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
38	8,700	277m

Fabric retrofit (social domestic)

For social housing 53% of properties are flagged for needing some retrofit - with 2,500 being flats and 800 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
2	0.3	7m

Heat network and communal

Heat networks and communal systems are key - with 12,800 and 4,800 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
241	41,800	178m

Heat pump

Heat pumps focus in less heat dense areas, with 50,000 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
582	123,200	479m

Rooftop PV

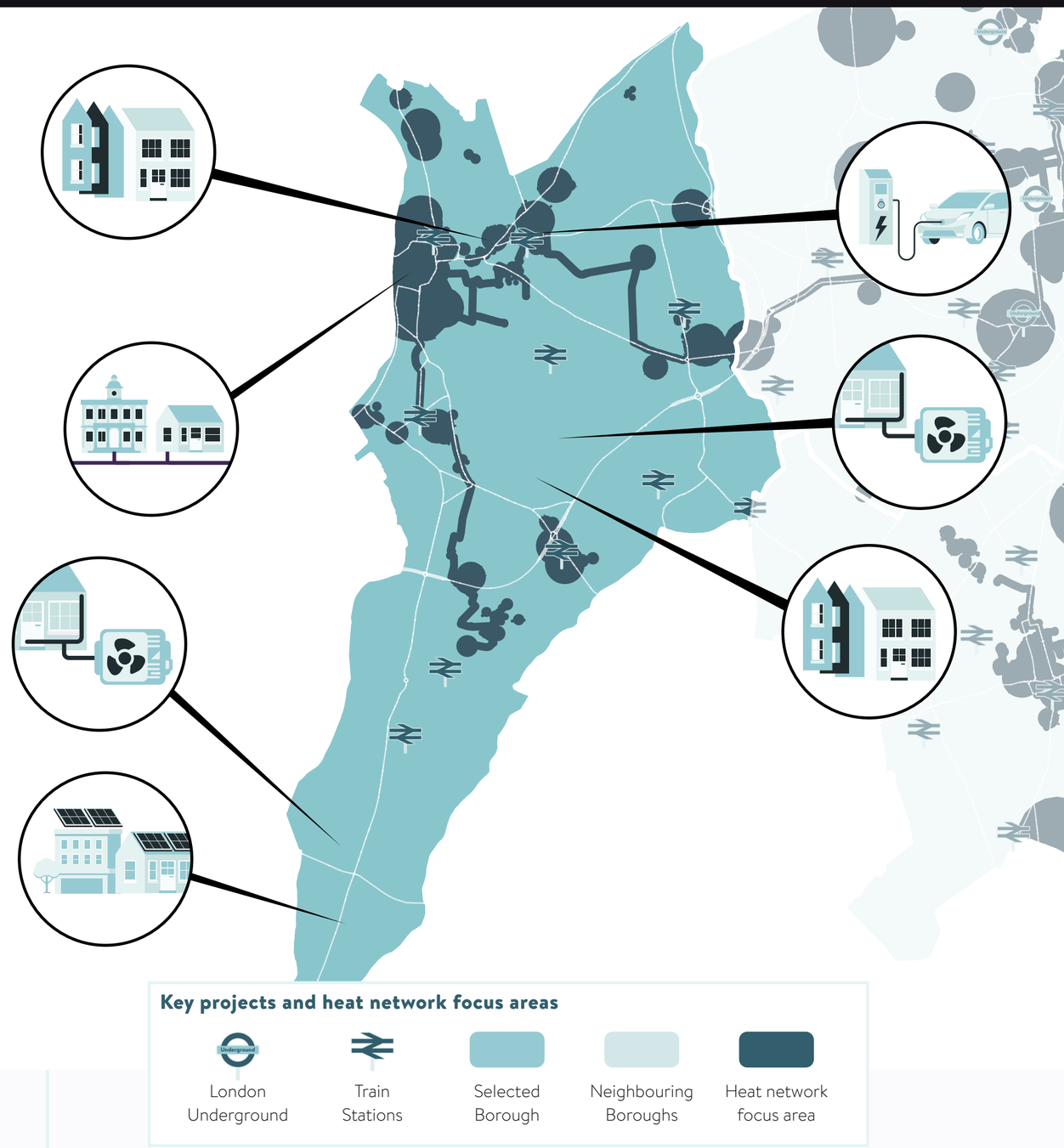
There is 311 MW of rooftop PV potential of this 132 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
121.1	1,900	241m

EV charging

24,700 domestic properties have access to off street charging. 2,400 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
374	118,300	75m



KINGSTON UPON THAMES

Borough Key Projects*

Heat network

Potential for extracting heat from the Hogsmill Sewage Treatment works has already been explored and is progressing. Expansion south and east (into Merton) is important to consider longer term alongside this core network.

Fabric retrofit (domestic)

Examine fabric retrofit schemes for owner occupied houses. Focus areas based on fuel poverty are in the northern part of the borough (to the centre and east).

Some social flat retrofit opportunities are identified in the borough (Kingsnympton Park and Hobill Walk areas). These flat retrofits should be considered alongside heating system decarbonisation – either heat network connection or decarbonised communal systems.

On street EV charging

On-street charging is required throughout the borough – an example focus area is near Lewisham station. On the high voltage network there is generally good headroom for short term deployment (i.e. before 2028, which the end point for UKPNs immediate reinforcement plans).

Rooftop PV

Opportunities are spread throughout the borough, generally focusing in more suburban areas where houses dominate rather than flats (such as in the south).

Domestic heat pump

Heat pumps are the most frequently identified low carbon technology – opportunities. These are well spread throughout the borough (outside the town of Kingston Upon Thames) with similar heat pump suitability in terms of current building fabric.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

Electrification requirement is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. For outer boroughs, like Kingston, network headroom is of particular importance at lower voltages. This is due to a higher number of property level solutions required – such as heat pumps and home based EV chargers. UKPN engagement will become increasingly important, as projects develop, to stop bottlenecks. Many of the outer boroughs have similar typologies and challenges to Kingston **(e.g. Merton, Sutton and parts of Croydon)** and would benefit from the economies of scale from a subregional approach to tackling these issues **(e.g. centralised heat pump procurement)**. The plan can also form a lobbying document to focus long term central support.

Heat network opportunities are more discrete than other boroughs in the subregion, however, there is still need for cross borough collaboration – with Merton being the most immediate partnership.Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler.

- Heat networks - Phase 2 should explore the opportunities for cross borough heat networks, with Merton being the most important to consider. However, the early focus is likely to be on within borough opportunities. With the best opportunity being the town of Kingston Upon Thames.
- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. These are clustered in the Kingston Upon Thames town area and along potential expansion routes of the network south and east. New communal systems outside of the primary heat network areas are low regrets, allowing earlier decarbonisation than heat network connection.
- Electricity network flexibility opportunities should be explored in Phase 2 alongside property level decarbonisation solutions. This is focused on northeast and southern part of borough where heat networks are less of a priority. Enablers such as more suitable typologies of domestic properties and off-street charging are present. There are flexibility opportunities in the northwest and south west of the borough. Good headroom in the borough and few UKPN flexibility offerings indicates the need for flexibility is not required immediately but should be considered alongside wider electrification.
- A key focus area for EV charging in the south – based around Chessington. There is currently headroom on the substation but with national EV roll out there could be significant capacity issues in the area.
- Off street charging opportunities are widely spread outside the urban centres, and large numbers of detached and semi-detached indicate the opportunity for household level off street charging. This makes smart charging approaches key for long term EV adoption without high impact on the grid.

Borough recommendations

Subregion recommendations

LAMBETH

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

71% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 78,800 properties out of the 102,000 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
85	21,600	421m

Fabric retrofit (social domestic)

For social housing 84% of properties are flagged for needing some retrofit - with 30,900 being flats and 3,900 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
18	7,800	57m

Heat network and communal

Heat networks and communal systems are key - with 63,400 and 11,800 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
1,221	236,000	886m

Heat pump

Heat pumps focus in less heat dense areas, with 72,400 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
807	171,900	677m

Rooftop PV

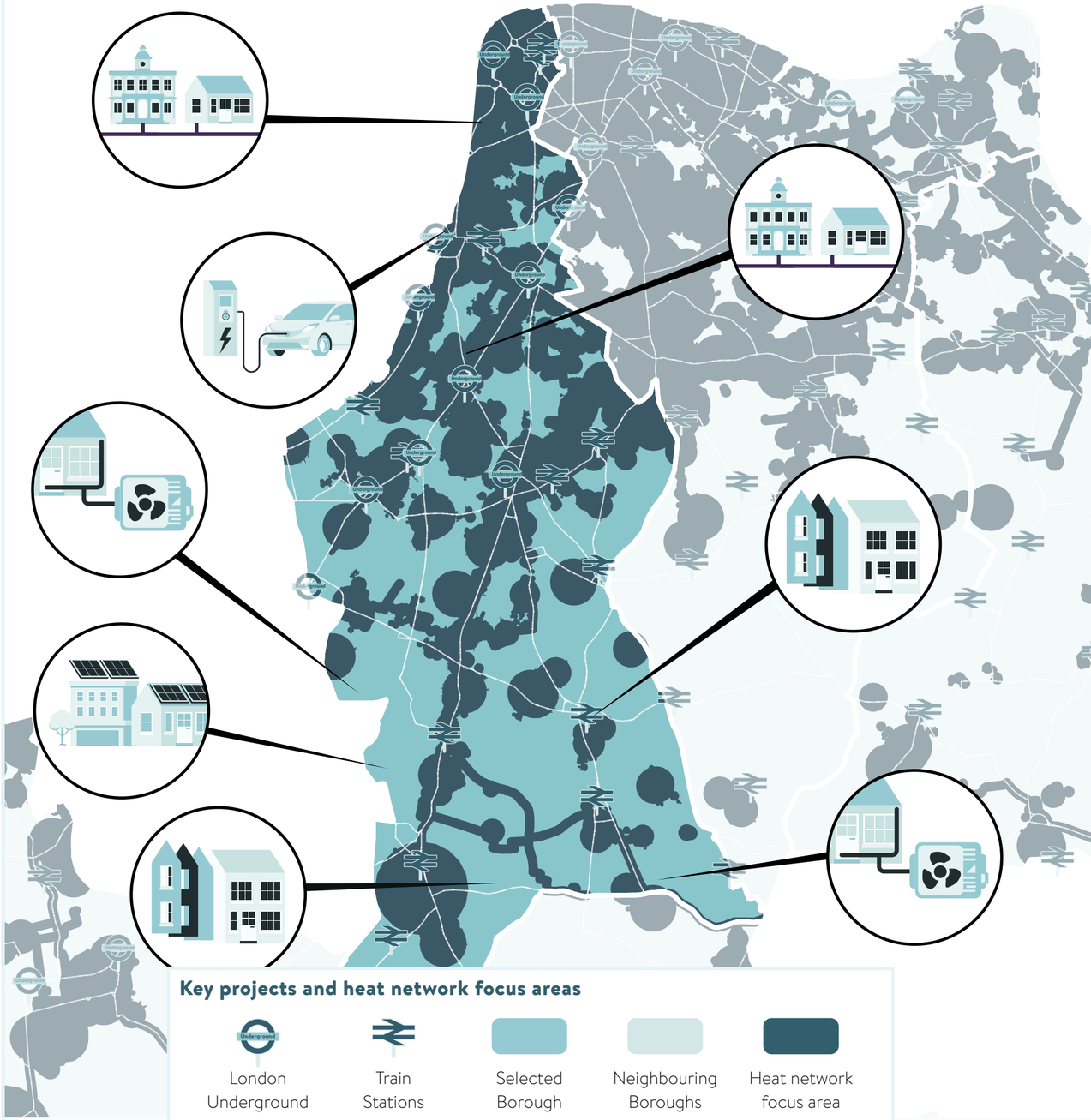
There is 462 MW of rooftop PV potential of this 108 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
99	1,600	186m

EV charging

10,900 domestic properties have access to off street charging. 5,600 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
239	91,600	35m



LAMBETH

Borough Key Projects*

Heat network

Lambeth's location means that is part of a four-borough cluster identified along the river (from Greenwich to Lambeth) as well as with potential links to Wandsworth (along Wandsworth Rd) and Croydon to the south.

Fabric retrofit (domestic)

Demand reduction through fabric improvement, in the domestic sector, is also focused in the south of the borough. This will be enabler of ensuring heat pumps function effectively for these buildings. Non-domestic properties are focused in the north and this where the greatest improvement in fabric for the sector is also concentrated.

On street EV charging

On-street charging is required throughout the borough, with particular focus in the north. At the high voltage there is generally good headroom for short term deployment.

Rooftop PV

PV opportunities are spread throughout the borough. The greatest focus is to the south of the Stretham Hill depot – due to the large houses in the area (which have the greatest potential for both generation and using electricity on site)

Domestic heat pump

Heat pumps are focused in the southern half of the borough, where heat density is lower and there more houses rather than flats.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. For inner boroughs, like Lambeth, the subregional decarbonisation strategy has a focus on large scale heat networks. With potential for cross borough heat networks generally tracking along the Thames.

  Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler. The Phase 1 LAEP and any future **Phase 2 LAEP** can also form a lobbying document to focus long term central support.

- Like many central boroughs Lambeth has a high prevalence of flats, which require shallow fabric improvement and connection to central heat sources **(either communal or heat networks)**.

- Large opportunity for heat networks, Phase 2 to explore the cross-borough context for heat transmission as well as within borough opportunities. The north of the borough has substantial heat network opportunities that are already being explored and would form a strong basis for early heat network actions in a **Phase 2 LAEP**.
- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. Those in the north will focus on heat network connection, whilst those in the south will be more of a mix.
- New communal systems outside of the primary heat network areas are low regrets, allowing earlier decarbonisation than heat network connection.
- Electricity network flexibility opportunities at a property level should be explored in Phase 2. These should be focused on south part of borough where heat networks are less of a priority.
- The south of the borough has greatest focus on property level electrification solutions. This includes solar, property level heat pumps and off-street charging opportunities.
- In the Peabody Hill area, there is an opportunity identified for fabric improvement in social flats. This improvement could be considered alongside low carbon communal systems – with the area being suited to ground source heat pumps.

Borough recommendations

Subregion recommendations

SUTTON

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

62% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 20,100 properties out of the 52,300 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
42	9,700	307m

Fabric retrofit (social domestic)

For social housing 53% of properties are flagged for needing some retrofit - with 4,300 being flats and 1,400 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
2	400	8m

Heat network and communal

Heat networks and communal systems are key - with 7,100 and 6,600 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
169	33,700	126m

Heat pump

Heat pumps focus in less heat dense areas, with 65,400 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
727	154,400	625m

Rooftop PV

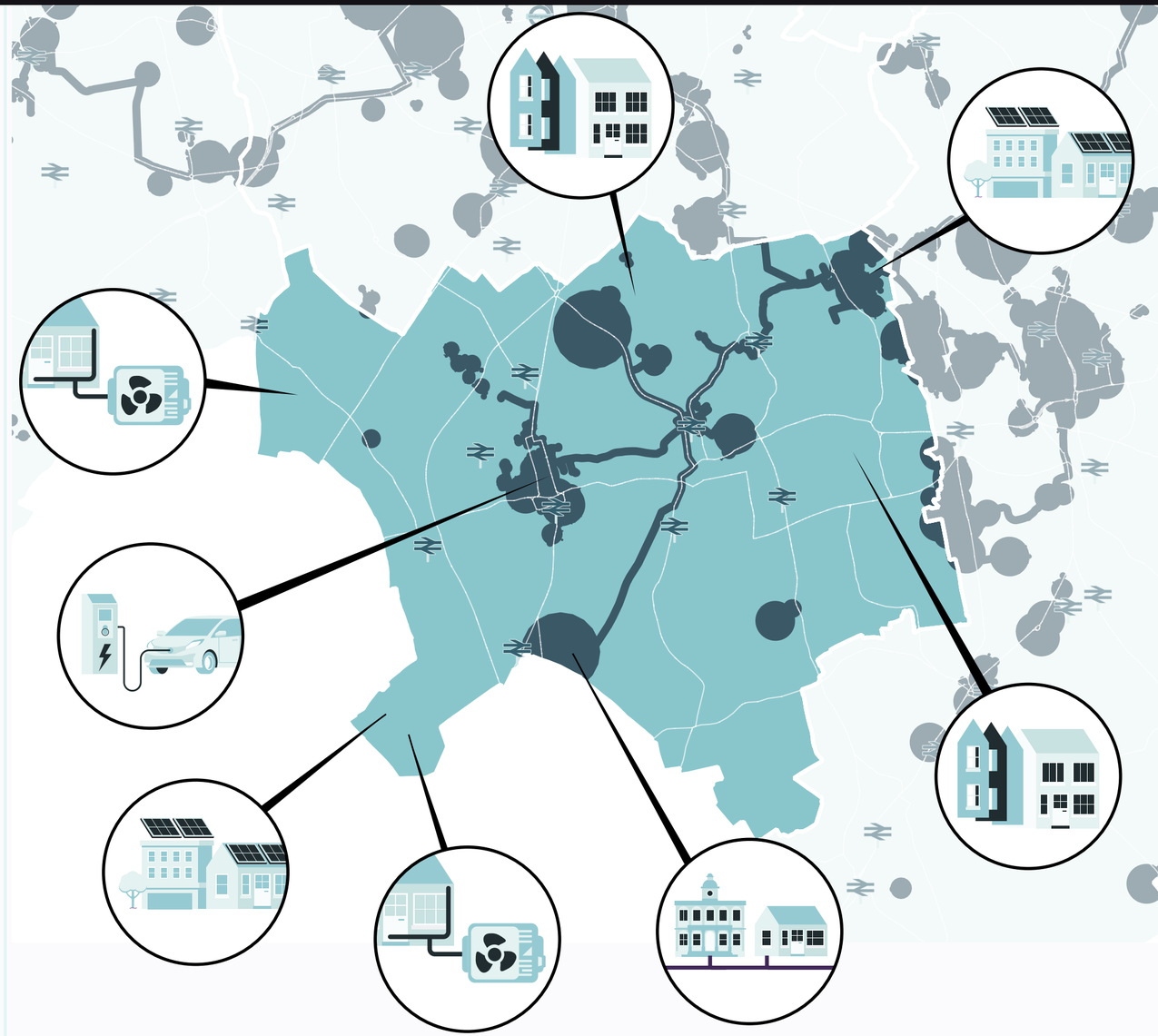
There is 403 MW of rooftop PV potential of this 163 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
150	2,400	291m

EV charging

27,400 domestic properties have access to off street charging. 3,500 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
383	92,500	64m



Key projects and heat network focus areas

London Underground | Train Stations | Selected Borough | Neighbouring Boroughs | Heat network focus area

SUTTON

Borough Key Projects*

Heat network

The Beddington site is in Sutton but would be best suited to providing heat to Croydon town centre and Croydon University Hospital – as the main focal points in the area for high heat density.

Fabric retrofit (domestic)

As an initial examine fabric retrofit schemes for owner occupied houses and flats (both social and owner occupied) in the area around Sutton Common to Thomas Wall Park. This area has a high level of fuel poverty and poor fabric performance. Also, the lack of headroom in the area makes other early decarbonisation options (apart from flexibility services) challenging.

On street EV charging

On-street charging requirement is focused on the denser more urban areas (such as Sutton town centre). The lack of headroom between St Anthony's and St Helier hospitals will create shorty term challenges to deployment in this area – despite it being flagged as requiring on street charging.

Rooftop PV

Good opportunities across the borough, with a focus in the south west and south east (domestic) as well as the north east (non-domestic) of the borough.

Domestic heat pump

Common across the borough, with a particular focus in the south and north west of the borough.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. For outer boroughs, like Sutton, network headroom is of particular importance at lower voltages. This is due to a higher number of property level solutions – such as heat pumps and home based EV chargers. UKPN engagement will become increasingly important, as projects develop, to stop bottlenecks.

  Many of the outer boroughs have similar typologies and challenges to Sutton **(e.g. Merton, Kingston and parts of Croydon)** and would benefit from the economies of scale from a subregional approach to tackling these issues. The plan can also form a lobbying document to focus long term central support.

- Heat network opportunities are more discrete than other boroughs in the subregion, however, there is still need for cross borough collaboration – with Croydon being the most immediate partnership.Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler.

Borough recommendations

Subregion recommendations

- Phase 2 should explore the opportunities for cross borough heat networks, with Croydon being the most important to consider but also Merton and Kingston **(all of which are in the SLWP)**.
- The Royal Marsden and surrounding buildings presents a good heat network opportunity. This could connect to wider transmission routes and potential over the borough boundary to HMP High Down.
- There are also opportunities extending from Beddington through Hackbridge to Carshalton and potentially connecting to the St Helier Hospital and/or Sutton town centre. The middle sections of the route do not have the high density of mandatable heat loads as other boroughs but the proximity to a waste source makes them an important option to consider in phase 2.
- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. These are clustered in the Sutton town with other focus areas in Dunster Way and Ferndale Crescent. New communal systems are low often low regrets, frequently allowing earlier decarbonisation than heat network connections. Communal systems also future proofs buildings, making them suitable for connection if heat networks expand.
- Heat pumps are the most frequently identified low carbon technology – opportunities. These are well spread throughout the borough with high deployment seen outside of Sutton town centre and Carshalton. Phase 2 should carry out local analysis, in combination with considering funding schemes, to identify priority areas.
- Fabric retrofit opportunities are spread throughout the borough – with a greater focus to the south of the A232.
- Large houses in the south west corner present substantial decarbonisation and flexibility opportunity with off-street parking, roofs suited to solar and space for heat pumps and potentially property level storage. There is also a high density of swimming pools meaning heat demand and carbon footprints are generally higher for these properties. Heat pumps are highly suited to swimming pools making them an efficient technology choice in this context.
- The south west corner is one of the few areas of the subregion where nearly every household has access to off-street parking and multiple cars. This makes smart charging approaches key for long term EV adoption without high impact on the grid. Modal shift is key in driving the borough's transport decarbonisation by encouraging further uptake and better access to public transport.

CROYDON

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

60% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 38,700 properties out of the 96,700 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
78	18,200	551m

Fabric retrofit (social domestic)

For social housing 54% of properties are flagged for needing some retrofit - with 9,300 being flats and 4,000 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
5	1,200	20m

Heat network and communal

Heat networks and communal systems are key - with 19,700 and 12,600 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
504	83,700	375m

Heat pump

Heat pumps focus in less heat dense areas, with 126,300 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
1,400	304,700	1,207m

Rooftop PV

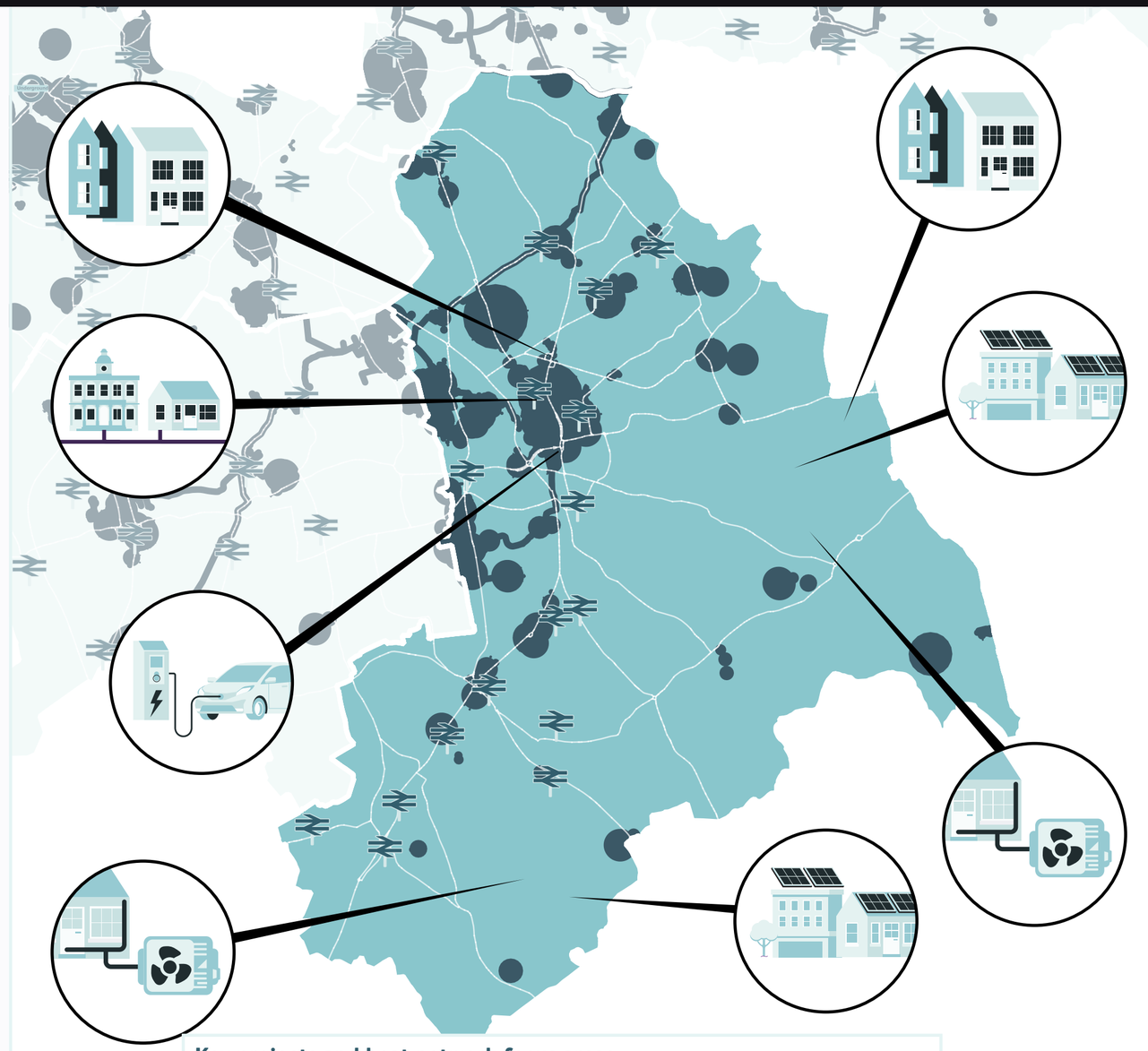
There is 643 MW of rooftop PV potential of this 260 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
239	3,800	459m

EV charging

47,400 domestic properties have access to off street charging. 6,700 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
647	166,000	108m



CROYDON

Borough Key Projects*

Heat network

Heat networks - Phase 2 should explore the opportunities for cross borough heat networks, with Sutton being the most important to consider but also Merton and Kingston (all of which are in the SLWP). The Beddington site is in Sutton but would be best suited to providing heat to Croydon town centre and Croydon University Hospital – as the main focal points in the area for high heat density.

Fabric retrofit (domestic)

The biggest opportunity for fabric retrofit is spread in a band across the north of the borough (the southern part of the band roughly aligns to West Croydon train station and the north Thornton Heath train station). This area has a high level of fuel poverty with a focus of retrofit on flats and terraced properties.

On street EV charging

On-street charging requirement is focused on the denser urban areas where there are more flats. This is in the north of the borough – running north of a line between Purely Oaks and Elmers End.

Rooftop PV

Focus in suburban areas such as Addington and Kenley – in part due to opportunity to link with other decarbonisation actions.

Domestic heat pump

Heat pumps are the most frequently identified low carbon technology – opportunities. These are well spread throughout the borough with high deployment seen outside of Croydon town.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. For outer boroughs, like Croydon, network headroom is of particular importance at lower voltages. This is due to a higher number of property level solutions – such as heat pumps and home based EV chargers. UKPN engagement will become increasingly important, as projects develop, to stop bottlenecks. Many of the outer boroughs have similar typologies and challenges **(e.g. Merton, Kingston and Sutton)** have similar challenges and opportunities as parts of Croydon and would benefit from the economies of scale from a subregional approach to tackling these issues. The plan can also form a lobbying document to focus long term central support.
- Heat network opportunities are more discrete than other boroughs in the subregion, however, there is still need for cross borough collaboration – with Sutton being the most immediate partnership. Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler.

- Potential heat transmission routes for heat networks could also be explored connecting Lambeth or the Crystal palace area of Bromley. Previous studies have examined SDEN extension to Croydon – the analysis indicates these could be re-examined. There are also multiple small heat networks identified, these include public sector buildings **(e.g. schools or leisure centres)** and flats as the core loads.
- Existing communal systems represent an early opportunity for decarbonisation, either through heat networks or building level heat pumps. The majority are clustered in Croydon Town centre – where connection to a heat network is the preferred option in the modelling. New communal systems outside are low regrets, often allowing earlier decarbonisation than heat network connections. Communal systems also future proofs buildings, making them suitable for connection if heat networks expand.
- UKPN substation data indicates there is headroom for heat pumps in the north of Croydon, however, there are a high number of flexibility opportunities in this area. Consequently, engaging UKPN is seen as a key focus for enabling heat pump and other electrification options in the area. Electricity network flexibility opportunities should be explored in Phase 2 alongside property level decarbonisation solutions.
- The area south of Spring Park is a focus for fabric improvement to ensure properties are suitable for heat pumps to function effectively as a decarbonisation route.
- The south and east of the borough has a large number of semi-detached and detached houses. The decarbonisation pathway presents substantial opportunity and need for future flexibility, with off-street parking, roofs suited to solar and space for heat pumps and potentially property level storage.

Borough recommendations

Subregion recommendations

GREENWICH

Decarbonisation Pathway

This page provides a summary of the technologies chosen for the Net Zero 2040 scenario and recommendations. Key projects and recommendations are subject to the information available at the subregional level. Expected to be further evaluated and refined through Phase 2 LAEP and/or future feasibility stages.

Fabric retrofit (all domestic)

56% of total properties having some retrofit. Flats are the most common buildings flagged for fabric improvement - with 35,000 properties out of the 67,200 total retrofits being flats.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
42	9,700	304m

Fabric retrofit (social domestic)

For social housing 56% of properties are flagged for needing some retrofit - with 11,900 being flats and 4,000 houses.

Energy Saving (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
5	1,200	23m

Heat network and communal

Heat networks and communal systems are key - with 31,500 and 14,100 properties connecting respectively.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
680	119,800	489m

Heat pump

Heat pumps focus in less heat dense areas, with 74,000 property level.

Heat Provided (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
745	156,900	713m

Rooftop PV

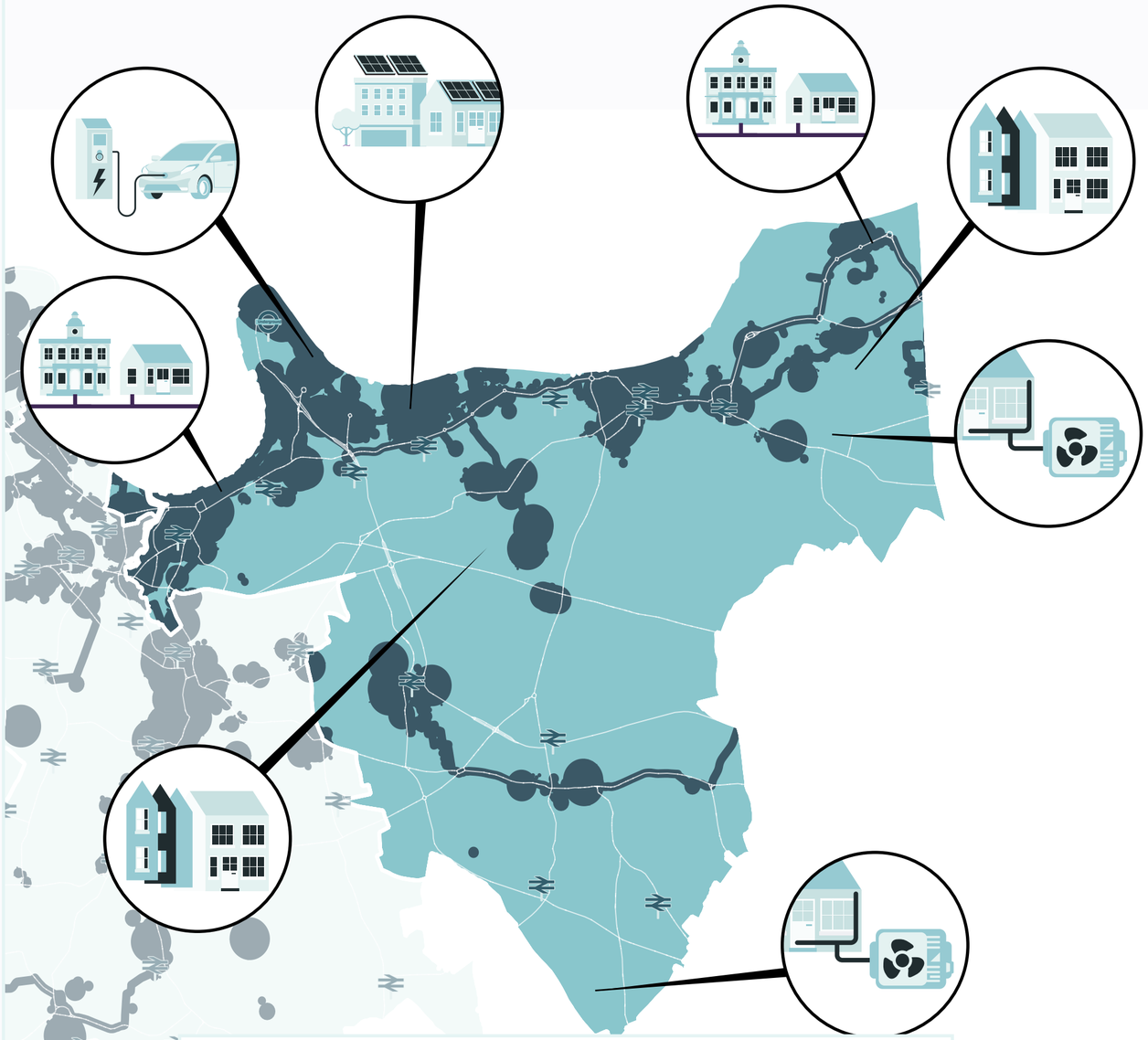
There is 517 MW of rooftop PV potential of this 166 MW is deployed in the scenario.

Electricity Generated (GWh per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
153	2,400	292.6m

EV charging

20,700 domestic properties have access to off street charging. 3,900 onstreet onstreet chargers are required.

Capacity (MW per year)	Carbon Saving (tCO2e for year 2040)	Investment (GBP)
328	148,500	56m



GREENWICH

Borough Key Projects*

Heat network

Bexley is the most important given the waste opportunities it provides. Of boroughs in the subregion Lewisham is the most important partner, given its proximity. Lambeth and Southwark are also relevant for a joint heat network strategy.

Fabric retrofit (domestic)

Plumstead to Charlton Park is an initial focus area – due to elevated fuel poverty levels. Properties in the area are a combination of flats and terraced houses. There is a dominance of owner-occupied properties, meaning a strong engagement strategy is required.

On street EV charging

On-street charging is spread throughout the borough with a focus in the north (particularly the Greenwich Peninsula).

Rooftop PV

Good spread throughout the borough with a focus on the area near the Thames Barrier – where there is a high concentration of large non-domestic properties.

Domestic heat pump

Strong focus in the south of borough in areas such as New Eltham and Middle Park.

*For more on key projects please refer to the map on **Decarbonisation Pathway** and main report chapters 4 and 5.

Further Recommendations

- For inner boroughs, like Greenwich, the subregional decarbonisation strategy has a focus on large scale heat networks. With potential for cross borough heat networks generally tracking along the Thames. Funding will be key to unlock the scale of transition needed, a broader cross-borough approach is required for this with DESNZ grants and funding for the large-scale strategy being an enabler. The plan can also form a lobbying document to focus long term central support.
- Electrification is high in all scenarios, meaning plans should not be considered in isolation – due to the interconnected nature of the electricity network. UKPN engagement will become increasingly important, as projects develop, to stop bottlenecks. This is key for Greenwich as outside of the focus area along the Thames the majority of properties rely on decentralized heat decarbonisation. Like many central boroughs Greenwich has a high prevalence of flats, which require shallow fabric improvement and connection to central heat sources **(either communal or heat networks)** for most scenarios. However, there are also a high number of houses in the borough, which would usually have property level solutions.

- Large opportunity for heat networks, Phase 2 to explore the cross-borough context for heat transmission as well as within borough opportunities.
- A heat network along the is the dominant model output. Outside of this area there is a mix of more localized heat networks and standalone communal system decarbonisation.
- Electricity network flexibility opportunities at a property level should be explored in Phase 2. The area around Plumstead has an early focus – with existing flexibility opportunities being flagged by UKPN.
- In the longer-term flexibility at a property level is more focused in the middle and south. Enablers such as more suitable typologies of domestic properties and off-street charging are present.
- Focus of domestic heat pumps is in the south of the borough away from the Thames but Plumstead also has large potential – the high density of houses also means a shared loop system could be explored.
- Good opportunity for demand reduction through fabric improvement spread throughout the borough – although generally not next to the river.

Borough recommendations

Subregion recommendations

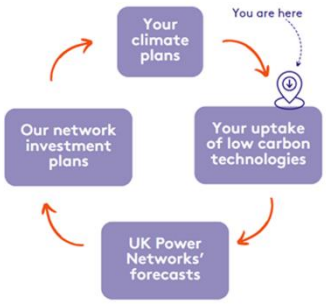
Appendix E UK Power Networks Note

How subregional LAEP informs UK Power Networks' network investment plan

Note that this text has been provided by UK Power Networks Distribution System Operator (DSO)

As London heads towards Net Zero, London Boroughs will do so at different speeds using a range of low carbon technologies (LCTs) such as electric vehicles (EV), heat pumps and solar PV. UK Power Networks DSO is here to facilitate these plans and provide, at lowest cost, enough electricity capacity across London to facilitate local growth and decarbonisation.

To do this our dedicated Local Net Zero team is here to proactively engage and support the Greater London Authority's (GLA) Subregional Local Area Energy Plan (LAEP) programme and each London Borough's LAEP activities. The Local Net Zero team developed new ways for Boroughs to share plans, and manages the three-tiered LAEP framework to process plans to enhance the forecasts used to shape network investments with Boroughs' local intelligence, ensuring sufficient electricity capacity when and where it is needed.



We have collaborated with GLA to ensure a "share once" approach for London Boroughs to share forecasts of low carbon technologies (LCTs) like electric vehicles and heat pumps and for growth like new homes, community facilities and businesses. Using the LAEP framework, we are engaging with London Boroughs to enable these local ambitions by ensuring that we can be confident before any forecast from local authorities are used to adjust our annually updated Distribution Future Energy Scenarios (DFES) and subsequent network planning forecasts. By working together, we are facilitating local Net Zero Plans and investing with confidence.

For example, the Subregional LAEP Phase 1 London plans have been shared and processed through the LAEP Tier 2 assessments, namely the materiality and confidence assessments. Initial analysis shows that the North and South London Subregional LAEPs Phase 1 forecasts are greater than our 2024 DFES forecast, including projected LCTs deployment in heat and power sectors. This means the projected forecasts are greater than our current planning baseline, and we have continued our close conversations with GLA and London Boroughs to understand together the robustness of relevant plans for confidence assessment.

With supplementary information from GLA, it has been determined that the forecast in the Subregional LAEPs has reached a certain level of confidence, and they will be used to inform our annually updated DFES that is scheduled to publish in early 2025. Our DFES is used to inform UK Power Networks' wider network planning activities including load forecasting, network development plans and Distribution Network Options Assessment (DNOA) process. For example, our DNOA reports provide transparency about our decisions to meet future capacity needs with lowest overall cost solutions, including where we expect to need flexible solutions across our network on a site-by-site basis.

In summary, engaging with GLA and London Boroughs enhances our planning forecasts. This helps us to make an informed decision about whether to deploy smart solutions (like flexibility services) to get more capacity out of existing infrastructure or invest strategically in new infrastructure to serve local needs. Working more closely with local authorities means that UK

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