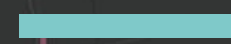


# LAEP Onboarding



June 2024



# What is a LAEP?





A **whole energy system** approach led by local government, with key stakeholders.

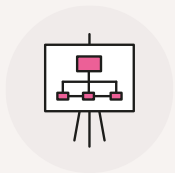
It **identifies a cost-optimal integrated plan** for the local area to contribute to timebound national and local net zero targets.



Each local area is different - its people, geography, building stock, energy networks, ambitions and priorities



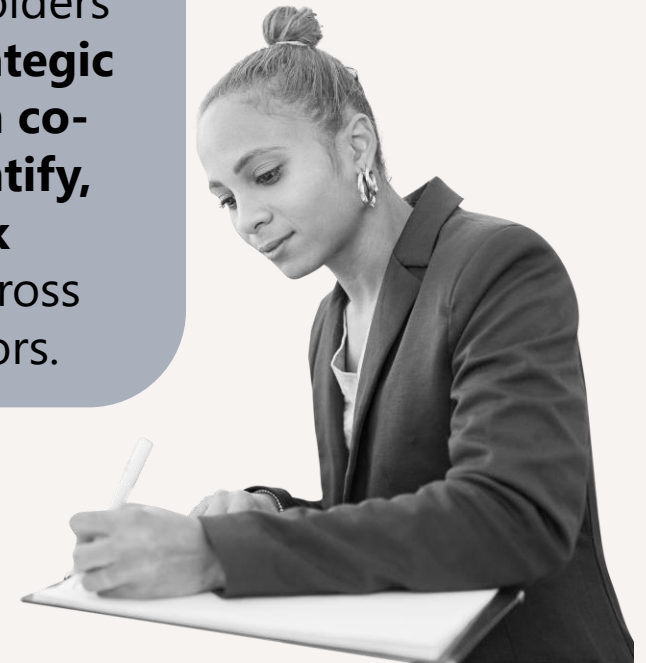
Local Area Energy Planning provides a **data driven, spatial and collaborative means** of exploring a range of possible Net Zero future local energy scenarios



Helps **unlock investment** and delivery of **Net Zero local energy projects**.

Local area energy planning provides the '**what, where, when, how (many), how (much), and by who**'.

It considers the views and objectives of a wide range of stakeholders to provide a **strategic case**, which can **co-ordinate, quantify, and de-risk investment** across separate sectors.



# What is a Local Area Energy Plan (LAEP)?

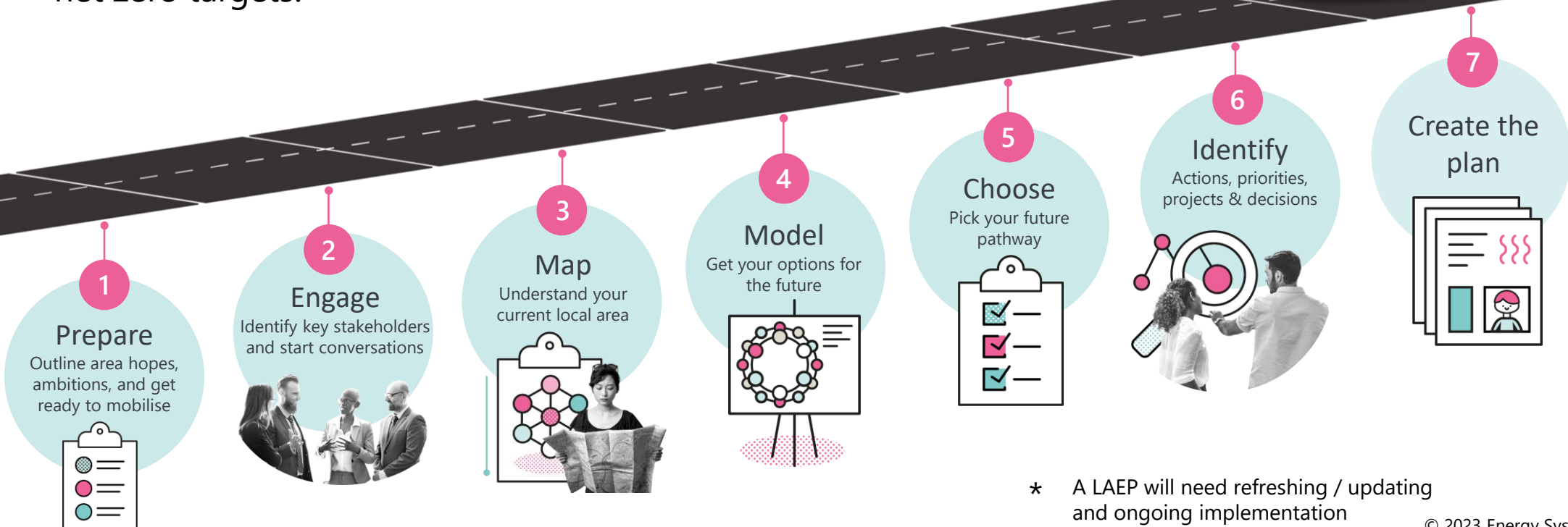


A **whole energy system** approach led by local government, with key stakeholders.

It **identifies the most cost-effective integrated plan** for the local area to contribute to timebound national and local net zero targets.



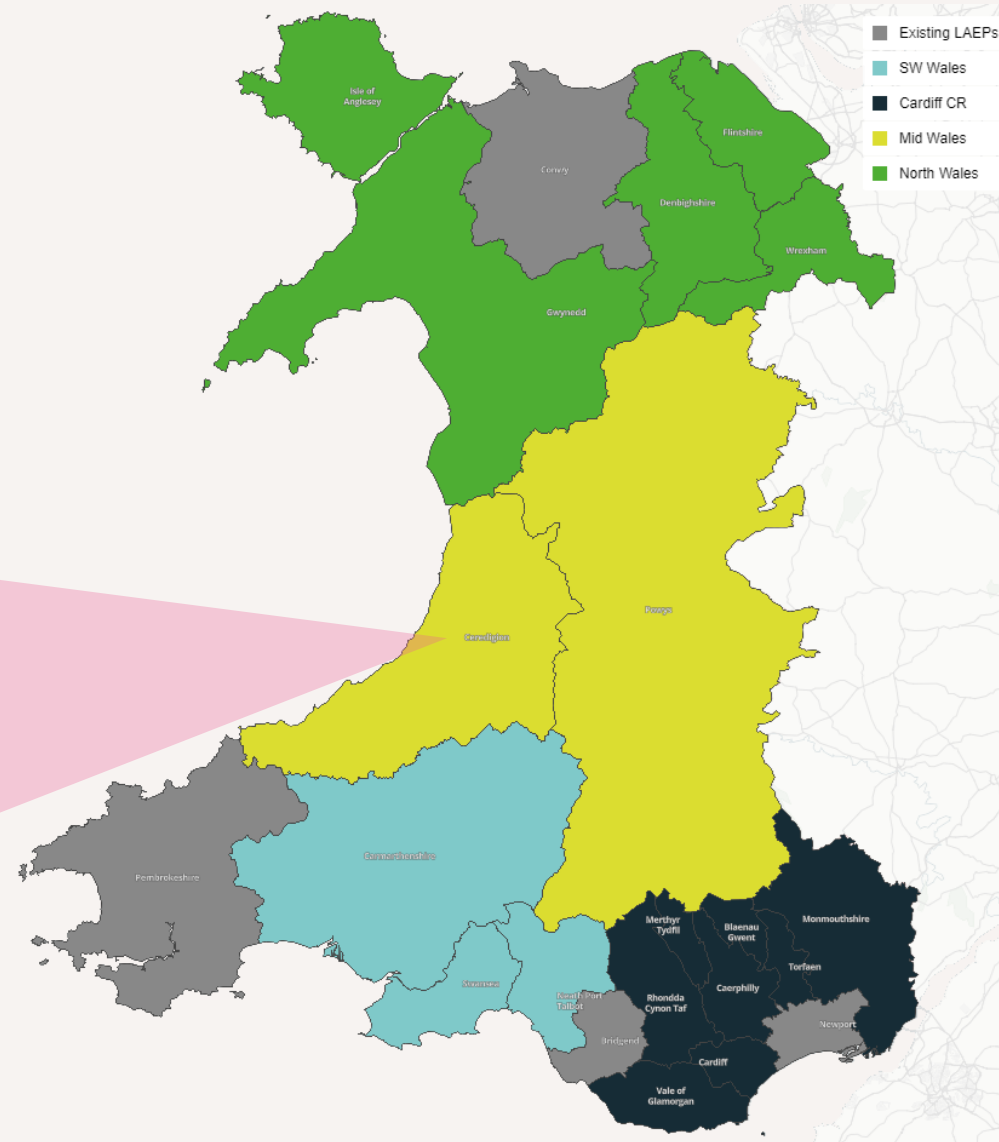
The road to Net Zero continues\*



\* A LAEP will need refreshing / updating and ongoing implementation

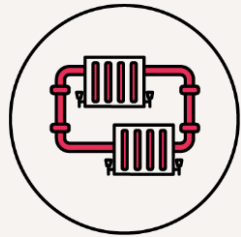
# Geographic Scope

- UK Local Authority boundaries
- Focus zones identified for action
- Lower Super Output Area (LSOA) or building level granularity



# Technical & Emissions Scope

## LAEP Technology & Intervention Areas



Heat Networks



Generation, Storage & Flexibility



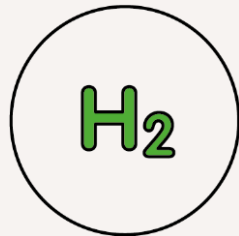
Gas & Electricity Networks



Electric Vehicles & Infrastructure

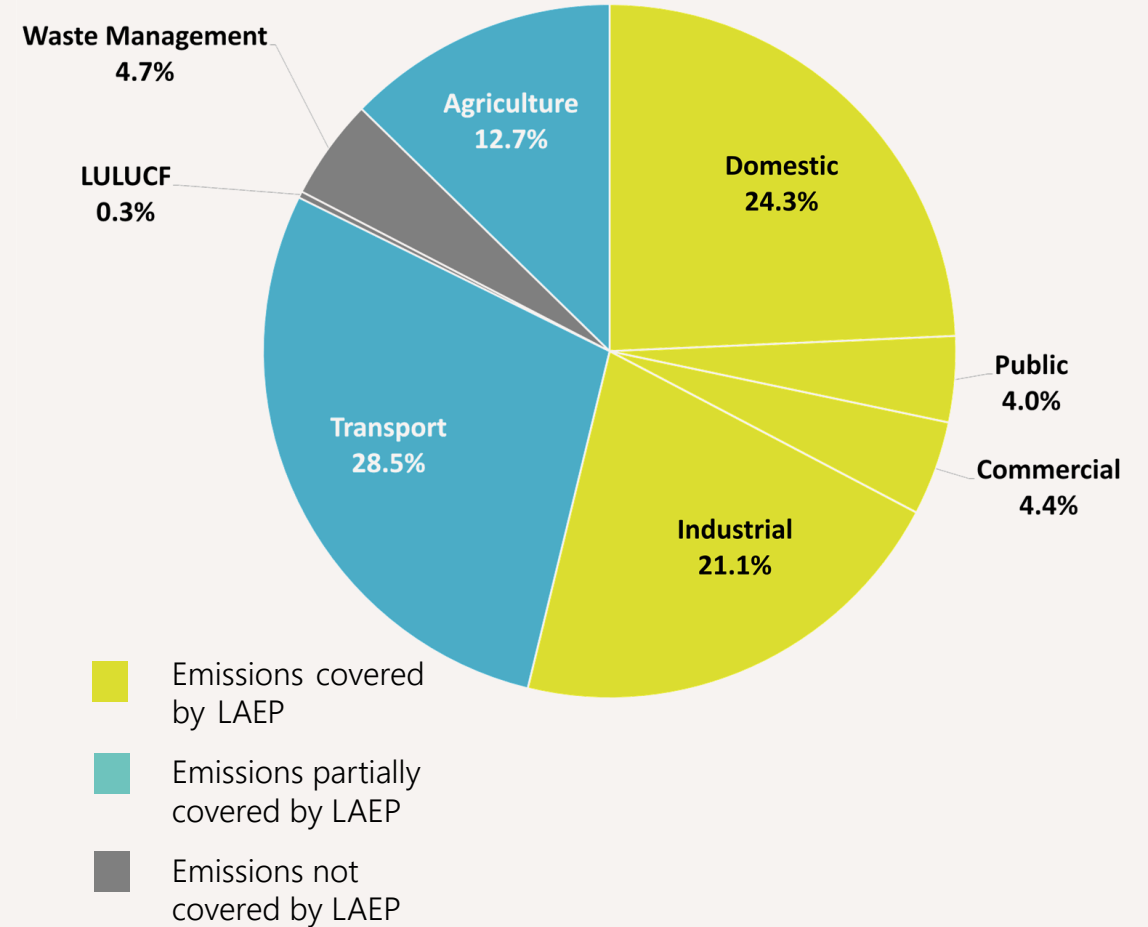


Buildings & Fabric



Hydrogen & Clean Gas

## UK LA GHG Emissions Estimates by Sector (2021)\*



\*<https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2021>

# A “whole systems” lens on Local Planning

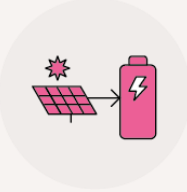
Technology & infrastructure



+



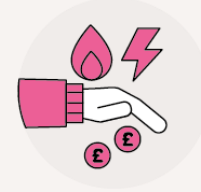
+



+



+



Generation

Pipes &  
Wires

Storage

Buildings

Demand

Types of energy



+



+



+



Electricity

Heat

Transport  
fuels

Hydrogen

Enabling ecosystems



+



+



+

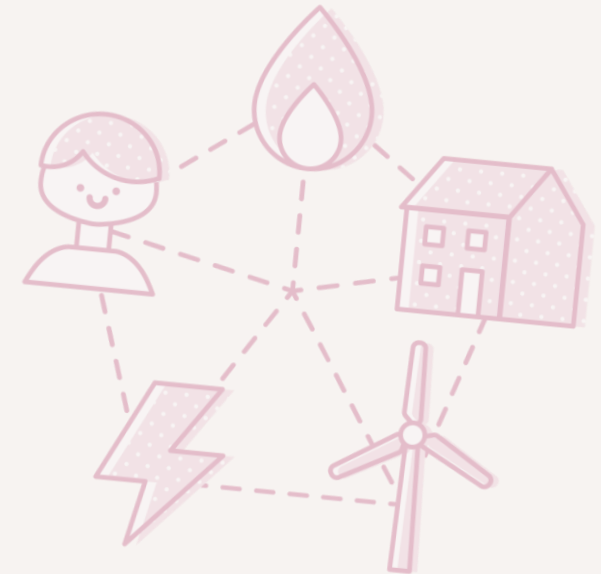


Physical  
assets

Digital  
infrastructure

Market, policy  
and regulatory  
environment

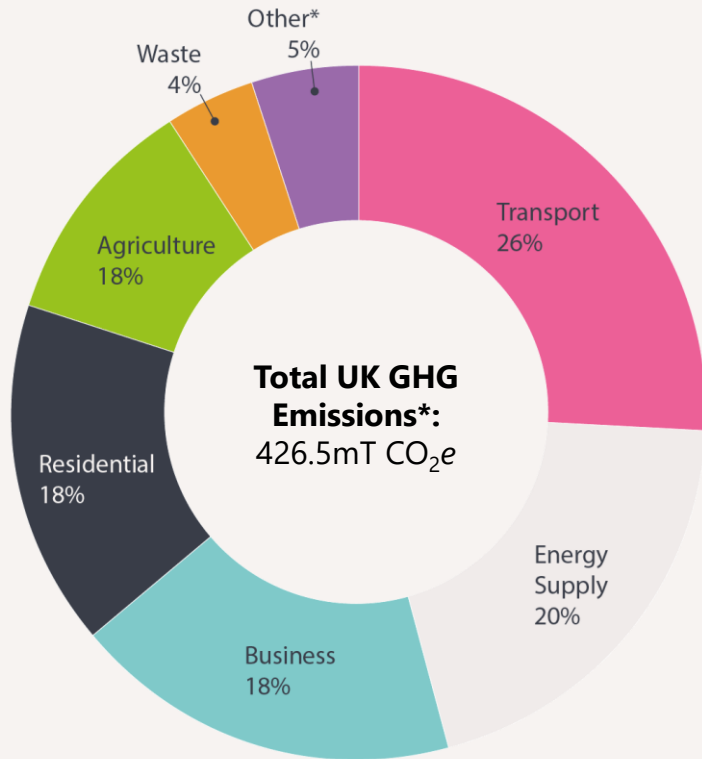
Consumer  
Insights



# Why is it needed?



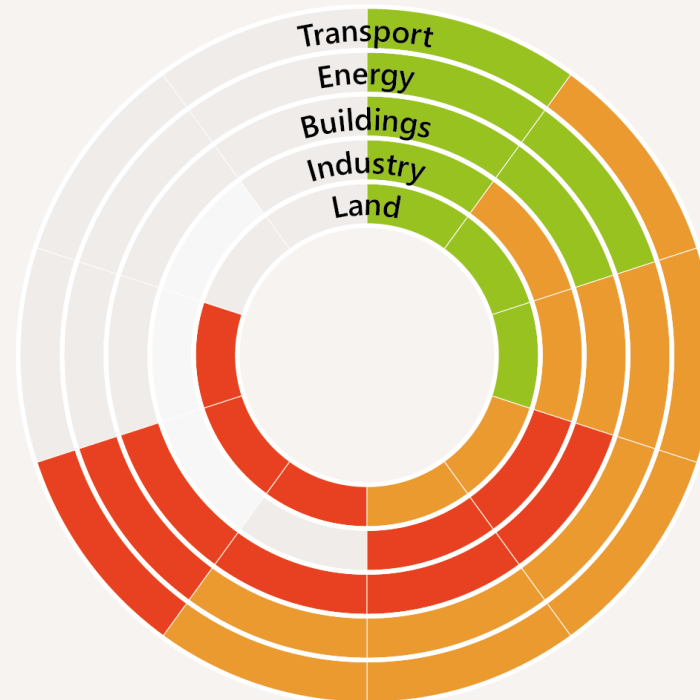
## Climate Drivers



**\* Other – 5 %**

(includes: Industrial processes 2%, Public sector 2%, Land use, land use change and forestry 1%)  
Total GHG emissions for year 2021, BEIS 2021

## Mitigation Progress



**\* CCC report to Parliament June 2023**

<https://www.theccc.org.uk/publication/2023-progress-report-to-parliament/>

## Place Based Drivers

- Lack of skills and capability to deliver Net Zero locally
- Fragmented and short-term funding opportunities inhibiting planning
- Lack of clarity on roles and responsibility on Local Authorities
- Declared climate emergency – no idea how to deliver.

# What is the purpose of a LAEP?





**ofgem**

“Local/regional government would remain responsible for local spatial planning activities and **Local Area Energy Planning** activities.”



**MISSION  
ZERO**

“Local Area Energy Planning is an area where **more precise UK government guidance** would be helpful.”



“BEIS and DLUHC should **formally adopt** local area energy planning, providing clear guidance on who should be responsible...and involved in producing plans, along with **support and funding** for doing this.”



**UK:  
100**

Is calling for a new Net Zero Local Powers Bill and Net Zero Delivery Framework that incorporates **Local Area Energy Planning to unlock investment** in low carbon decentralised energy.

# Local Authorities are seeing the impact...



““To help catalyse action we are the first city in country to develop and adopt Local Area Energy Plans. These plans provide a clear roadmap for everyone to support the net zero carbon transition and help us make a greener and fairer Greater Manchester. The plans *have* identified a £12 million investment opportunity in our wider public estate including heat networks, social housing retrofit, renewable energy generation and public sector retrofit. The time to act is now!”.

**Andy Burnham – GM Mayor**

“The York Local Area Energy Plan has served an important role in articulating the scale of the net zero challenge and setting specific targets against some of our most pressing actions. It has provided a robust evidence base for external funding applications and has resulted in the Council accessing funding several times greater than the original cost of the plan.”

**Shaun Gibbons -Head of Carbon Reduction – York City Council**



## **A LAEP helps places plan and mobilise their net zero ambition into action, across the energy system.**


- Empowering councils to deliver Net Zero action through an evidence-led approach, helping to turn plans into action
- Supporting network operators making low cost, no-regret investment decisions on local energy infrastructure.
- Informing government's decision-making on policy, infrastructure and tracking national progress towards Net Zero.





## As a government policy lead...

“ I want to understand the costs associated with achieving net zero across the UK. From this we can deliver impactful programmes, based on robust evidence that align with local needs and priorities, ensuring government funding is well spent leading to economic growth, and skills, as well as net zero.



## As a manager at Ofgem...

“ I want to ensure changes to our energy infrastructure offer the best value to customers, while supporting the transition to net zero.



## As a local borough councillor...

“ I want to identify how we best decarbonise our area while ensuring the community can benefit. Its important I have evidence to develop business cases for further investment and project development.



## As a combined authority leader...

“ I want to attract investment to the region by demonstrating our commitment and providing certainty to net zero opportunities across housing, buildings, renewable generation, and transport.



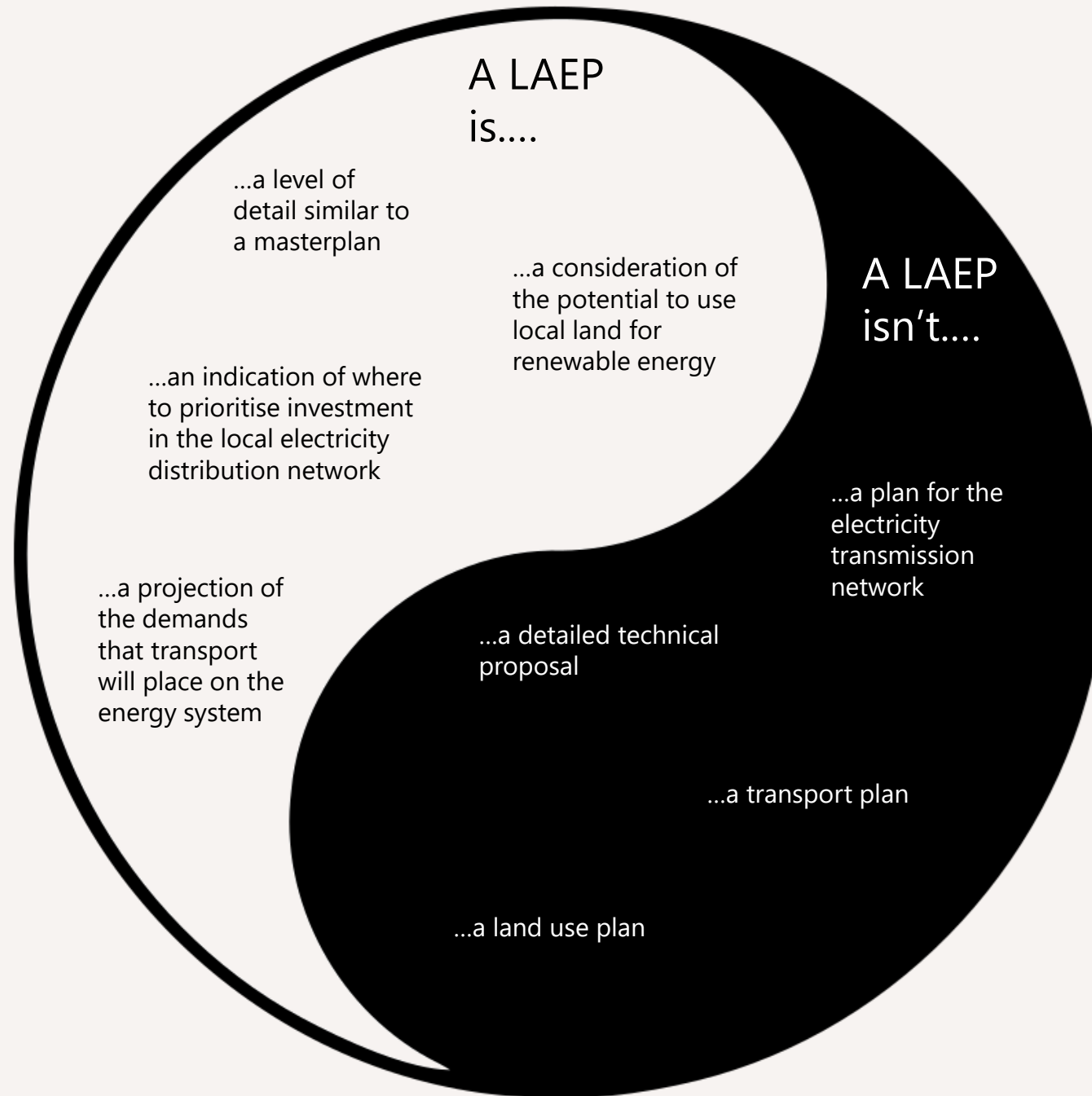
## As an energy network operator...

“ I want to be able to make the case to invest in upgrading the network to ensure local areas can develop and decarbonise in the most effective way.



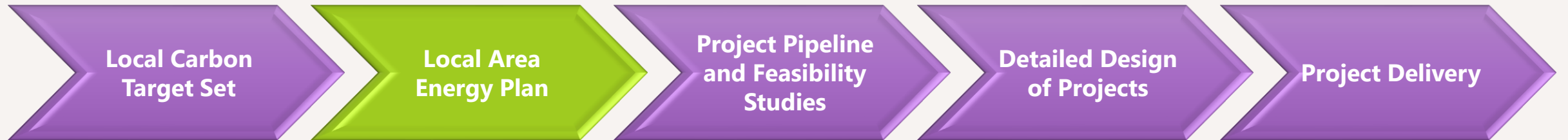
## As a project developer...

“ I want to have certainty of the commercial returns for our project investments while ensuring they are suitable for the area and will meet the needs of the community



# Where does LAEP fit in the Net Zero journey?





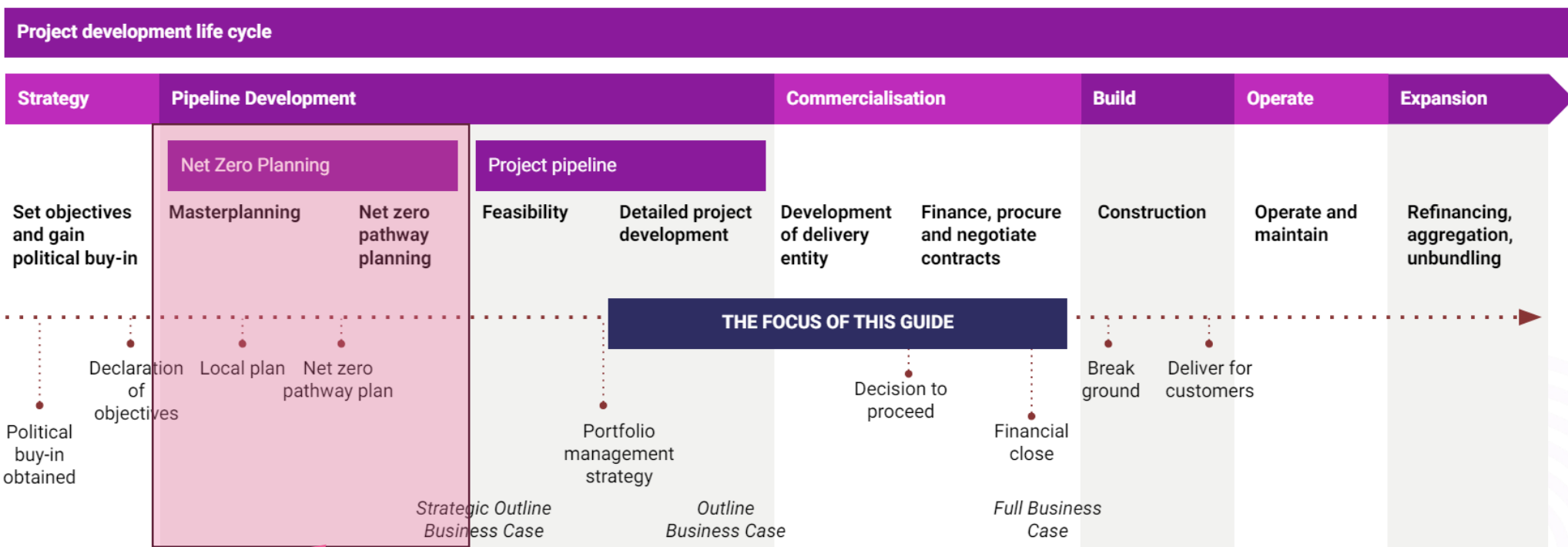


Fig.1 project development life cycle diagram



# How value does a LAEP bring?



# Value Added by LAEP

Creating a Local Area Energy Plan brings the benefits of:



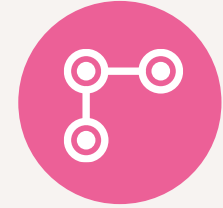
A localised whole energy systems roadmap to decarbonisation.



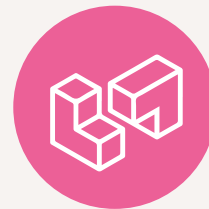
Visual plan highlighting suitable technologies.



An evidence-based investment plan.



Joined up current plans and policies.



Engaged political and community buy in.



Identify and enable wider area benefits.

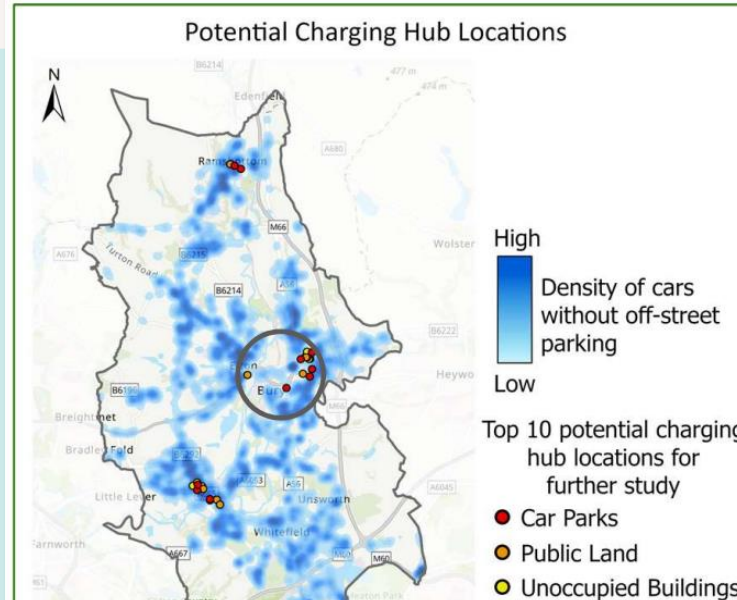
# Providing Greater Manchester with a plan to deliver Net Zero Energy



*"The LAEP work undertaken is powerful because it identifies not just the type of technologies that will be needed for this transition, but their scale, indicative locations, and costs."*

Mark Atherton, Director of Environment, GMCA

Potential priority areas to demonstrate publicly accessible EV charging infrastructure



Current Fabric Retrofit Zone Opportunity in Whitefield

Insulation Focus: 1914-1944 Dwellings

- Semi-detached (2,067)
- Terraced (1,685)
- Other Dwellings (10,454)



- **10 plans** GMCA boroughs for 2038 carbon neutrality
- **Near term opportunities;** 140,000 domestic retrofits; 4.5GW solar, EV charging, heat networks...
- Visibility of **total investment**, e.g. £5.1bn in Bolton across all technologies and the network by 2038
- Catalysing **private sector** funder and developer interest, and political traction
- Informing the **trailblazer devolution** deal and creation of in-house capacity

# Helping shape a Welsh national Net Zero energy plan

- LAEPs across 22 local councils
  - 4 existing
  - 18 in-progress
- Helping Wales produce a National Energy plan informed by the 22 LAEPs

*"It has been very helpful to draw on the breadth of whole energy system expertise... we aim to be the first nation to have complete coverage of Local area energy plans."*

Huw Lewis Welsh Government  
Lead for LAEP



## Feedback from Local Authorities

"We have used LAEP to inform applications and business cases for other funding streams such as Home Upgrade Grants and LAD scheme applications."



"Having a trusted voice to demonstrate the extent of the work needed to reach Net Zero and having numbers on investment required has really helped the council put it into perspective".



"To prepare for a new council structure, the LAEP outputs have been used to provide evidence and scope near term activities relating to Net Zero with specific projects identified".



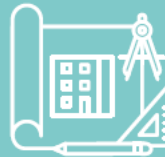
"Being able to demonstrate how well we understand our area has been vital to securing further funding from both UK government programmes and commercial partners".



"We used the LAEP outputs to identify and accelerate our feasibility studies for EV infrastructure and solar project development across a local area and found that 80% were commercially viable opportunities for us."

80%

"We are defining project pipeline for the pilot scheme with UK Infrastructure Bank (UKIB) and building programmes of work based around the LAEP outputs."



"The LAEP has been a key piece of strategic evidence and has been used across the council. No cabinet report hasn't mentioned it!"



"The plan has been identified as a key piece of evidence in the preparation of the Council's forthcoming strategic Local Plan, alongside a Green Infrastructure Strategy."

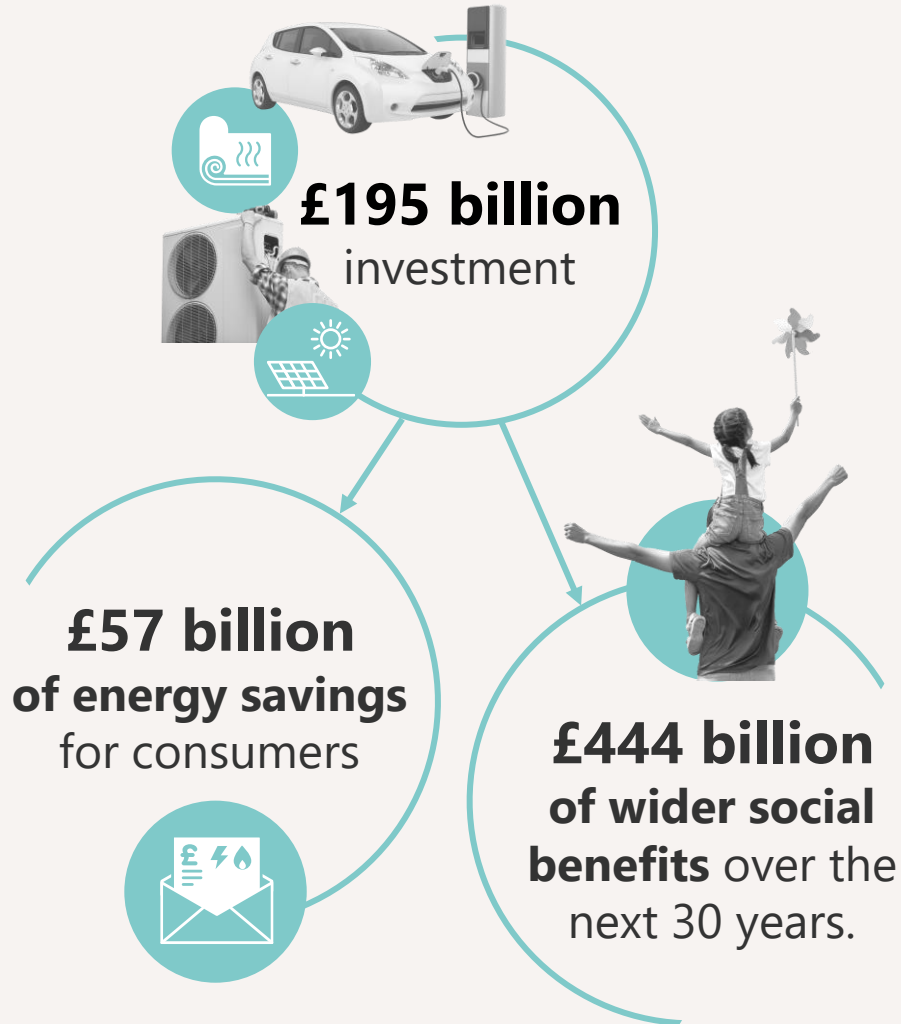


"Coordinating climate targets across a region is challenging and a portfolio of LAEPs will enable us to see where there is flexibility in the system for some areas to accelerate".

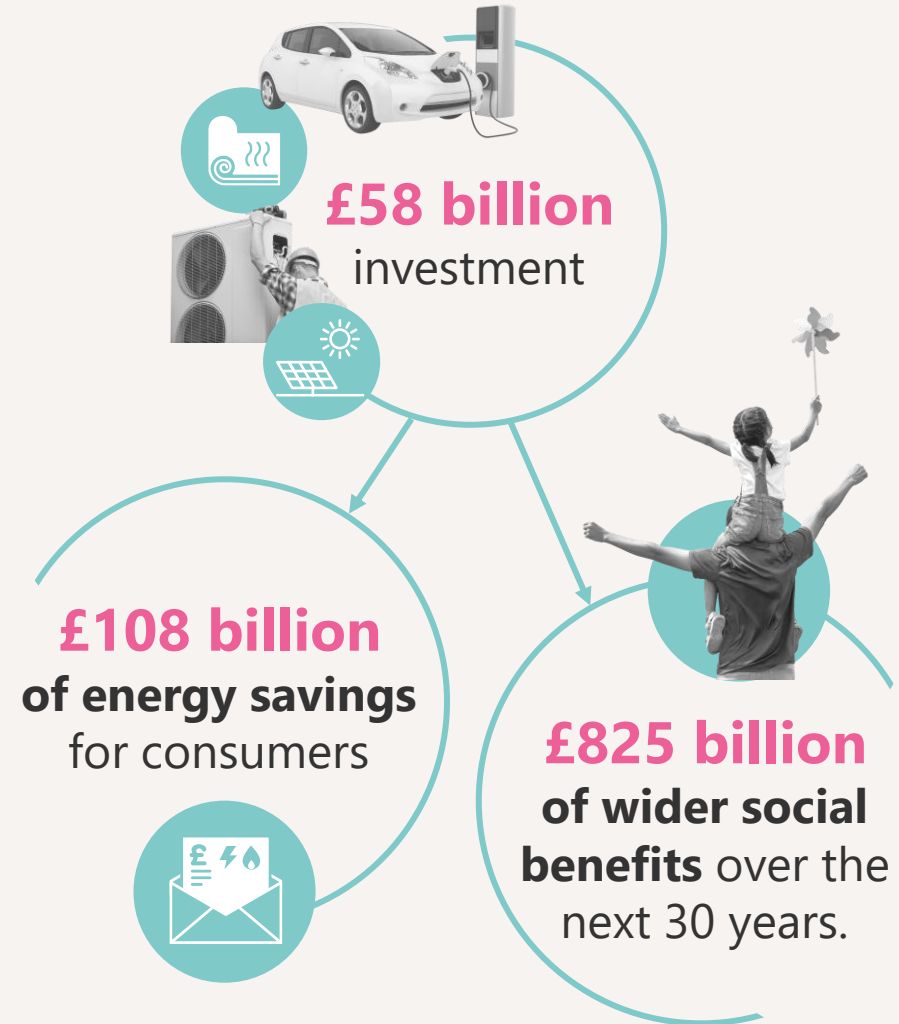


# Place-based savings

## Not place-specific approach



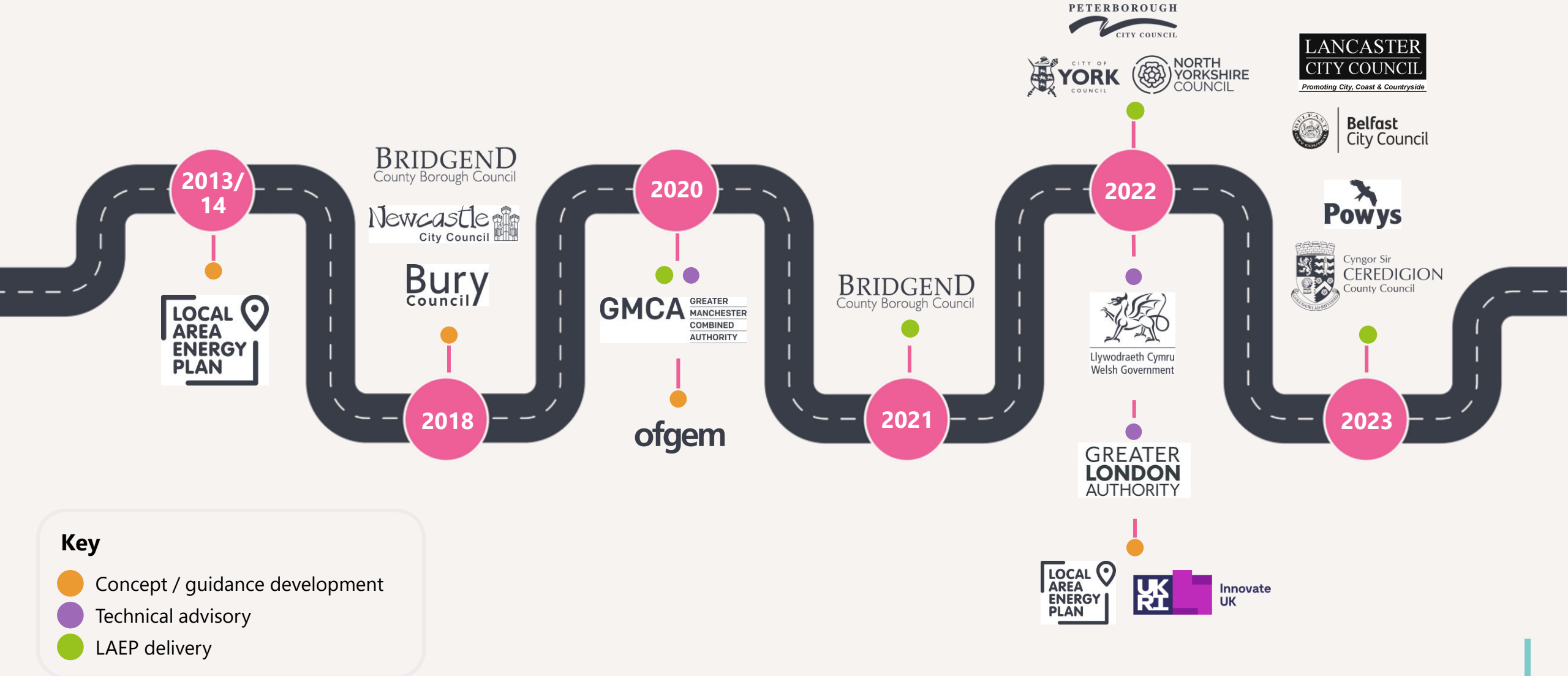
## A place-specific approach



# How has LAEP evolved?

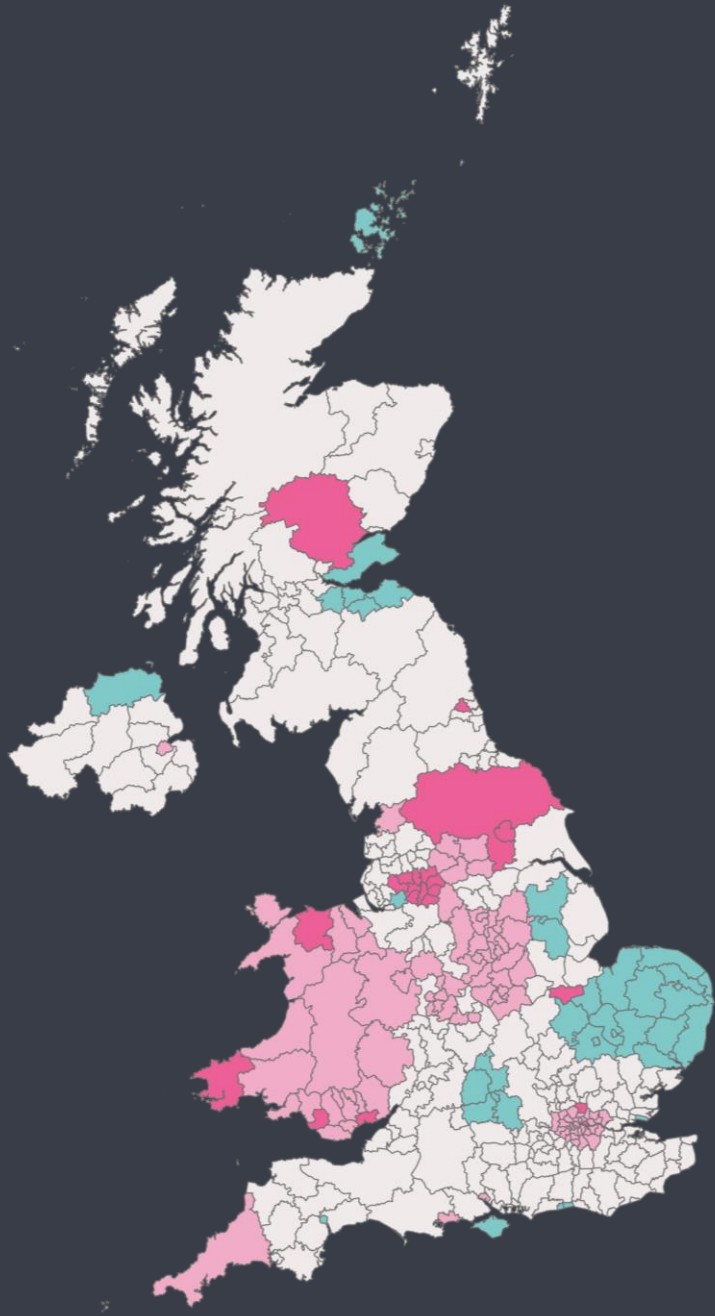


# History of LAEP (at Energy Systems Catapult)



80% of local authorities in the UK have declared a climate emergency.

Over 30 % of local authorities in the UK have, or are developing, a Local Area Energy Plan\*.



- Local Area Energy Plan - Completed
- Local Area Energy Plan – Working towards
- Local Energy Asset Representation (a LAEP building block) - Completed

# What makes a good LAEP?



# Expected Outputs and Outcomes

**Cost estimates, carbon savings, and recommended interventions** to reach a local Net Zero energy system from **robust scenario modelling**.

Consideration of wider factors to reveal local **co-benefits, such as jobs and health**, and compatibility with local **policies, strategies, and ambitions**.

A **preferred pathway** to Net Zero showing the sequence of **near-term and long-term interventions, delivery rates, key decision points**, and **enabling actions**.

A **Plan on a Page** showing the what, where, and how many of the future local energy system.

**Focus zones:** areas with a geographic concentration of interventions.

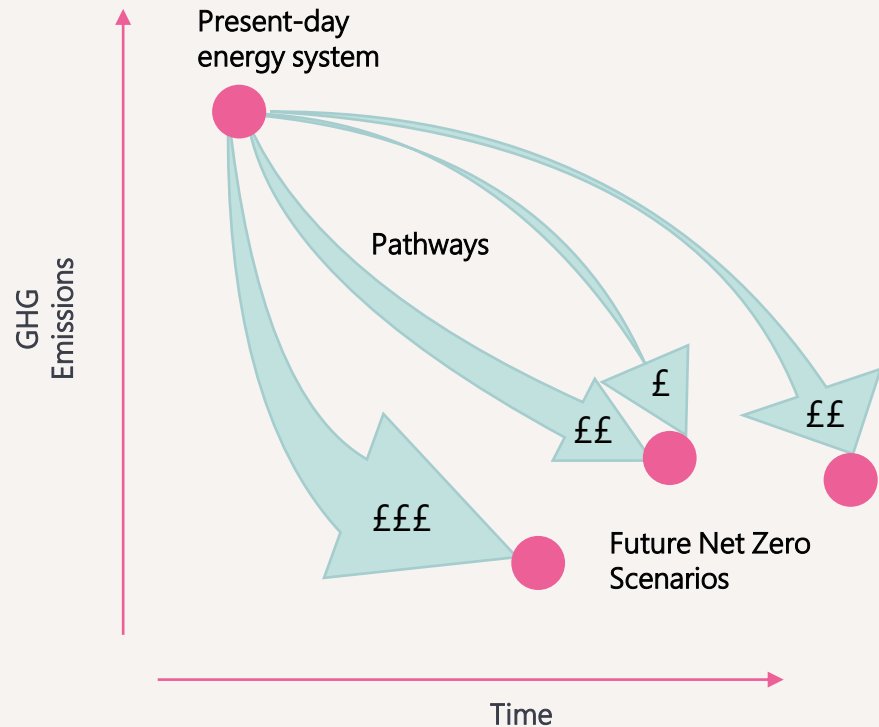
**Priority projects:** High-level concept for near-term, deliverable, high impact projects.

**Investment Breakdown:** Across time, technologies, and geographic areas.

**Actions:** Relating to identified **risks, barriers, and enablers**.



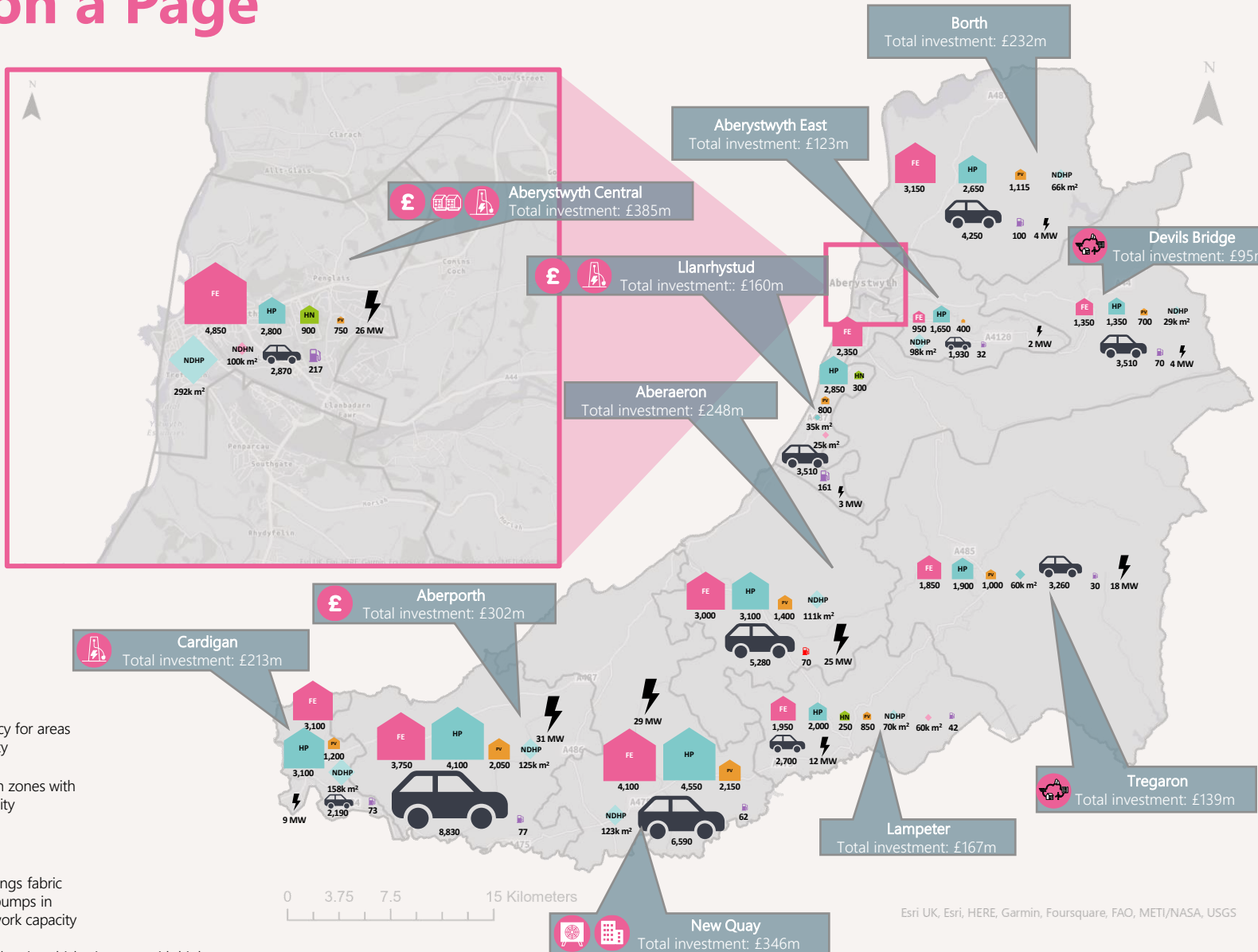
# Robust Scenario Modelling



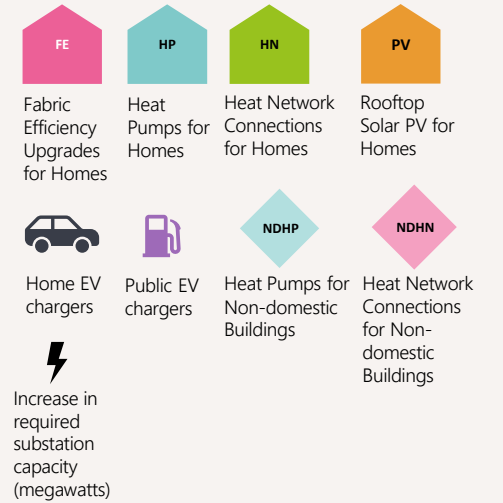
There are many pathways to reach a Net Zero energy system and intermediate carbon target with uncertainties around future factors, such as technology, policy, and public preferences.

Modelling multiple scenarios leaves flexibility in the plan to accommodate choices and uncertainties.

# Plan on a Page



## Quantities of Technology Deployment



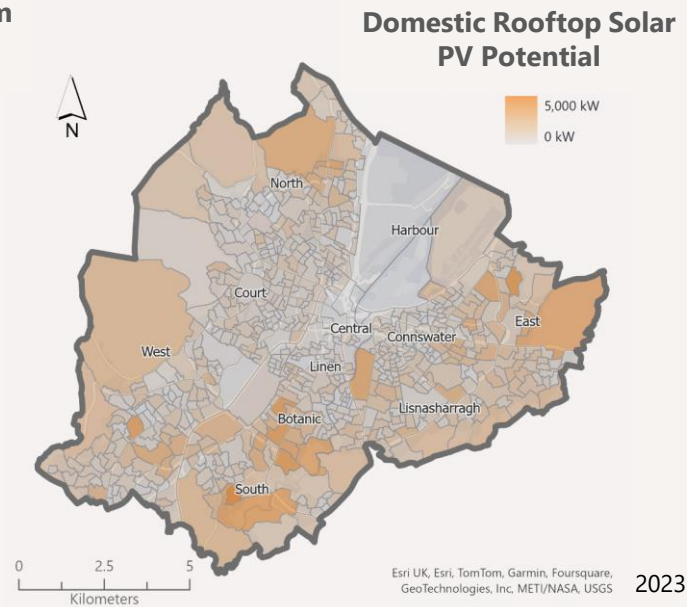
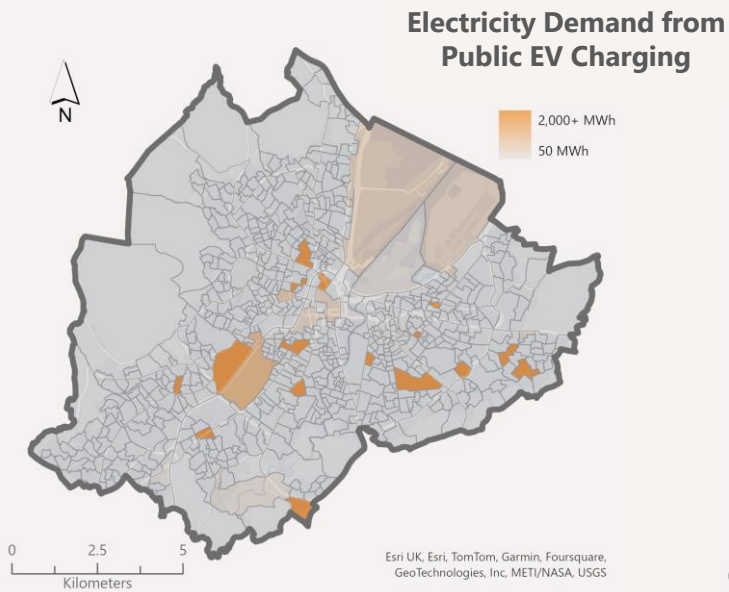
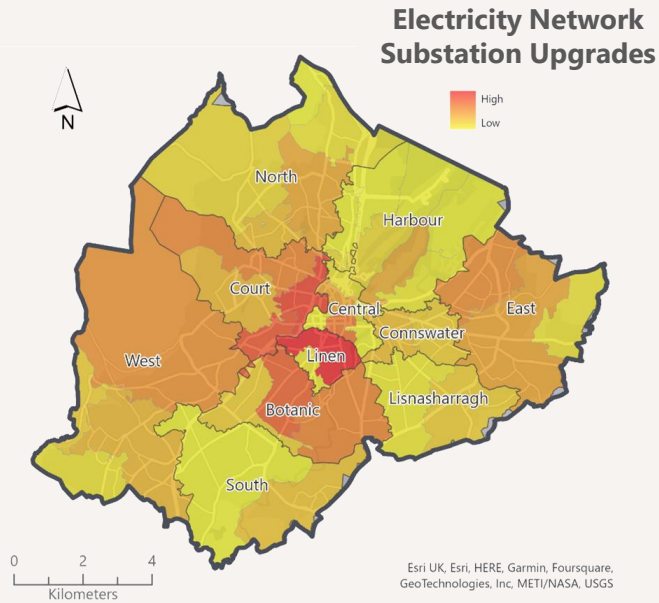
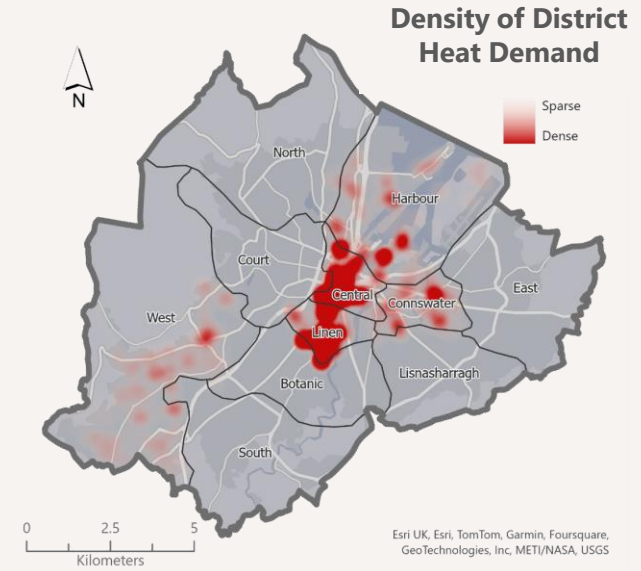
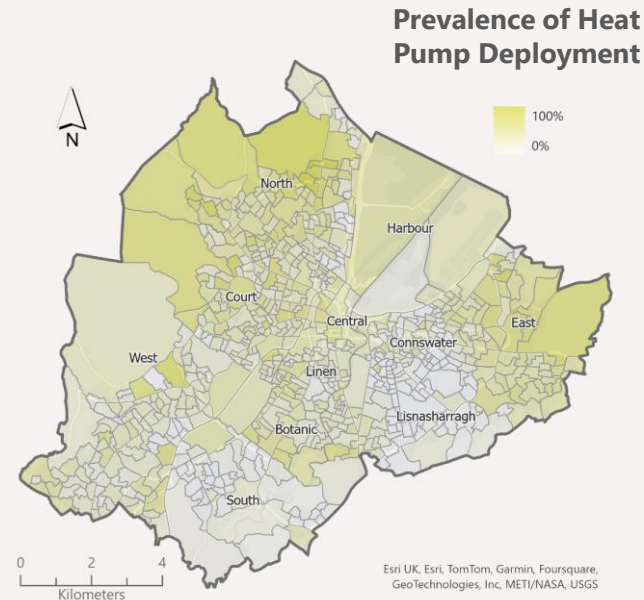
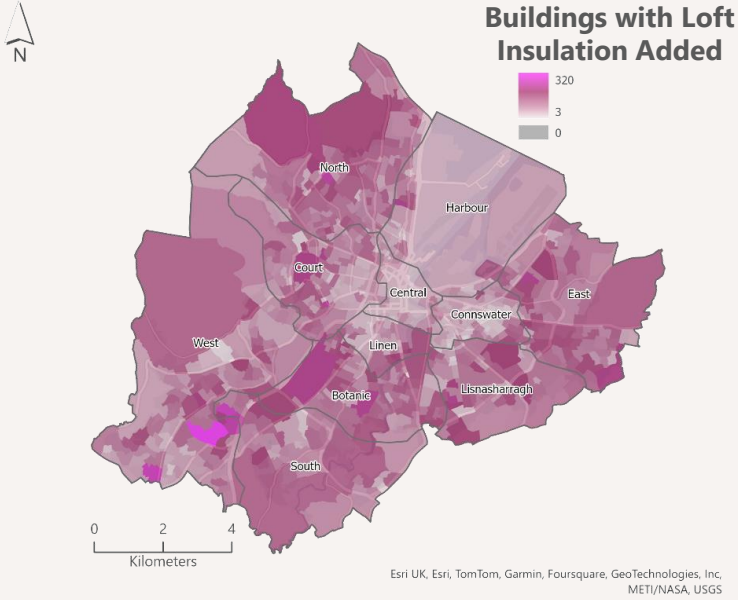
## Focus Zones

- Home fabric efficiency for areas with high fuel poverty
- Home heat pumps in zones with spare network capacity
- Heat networks
- Non-domestic buildings fabric efficiency and heat pumps in area with spare network capacity
- Public chargers for electric vehicles in areas with high anticipated charging requirements
- Smart Local Energy Systems to Overcome Network Constraints

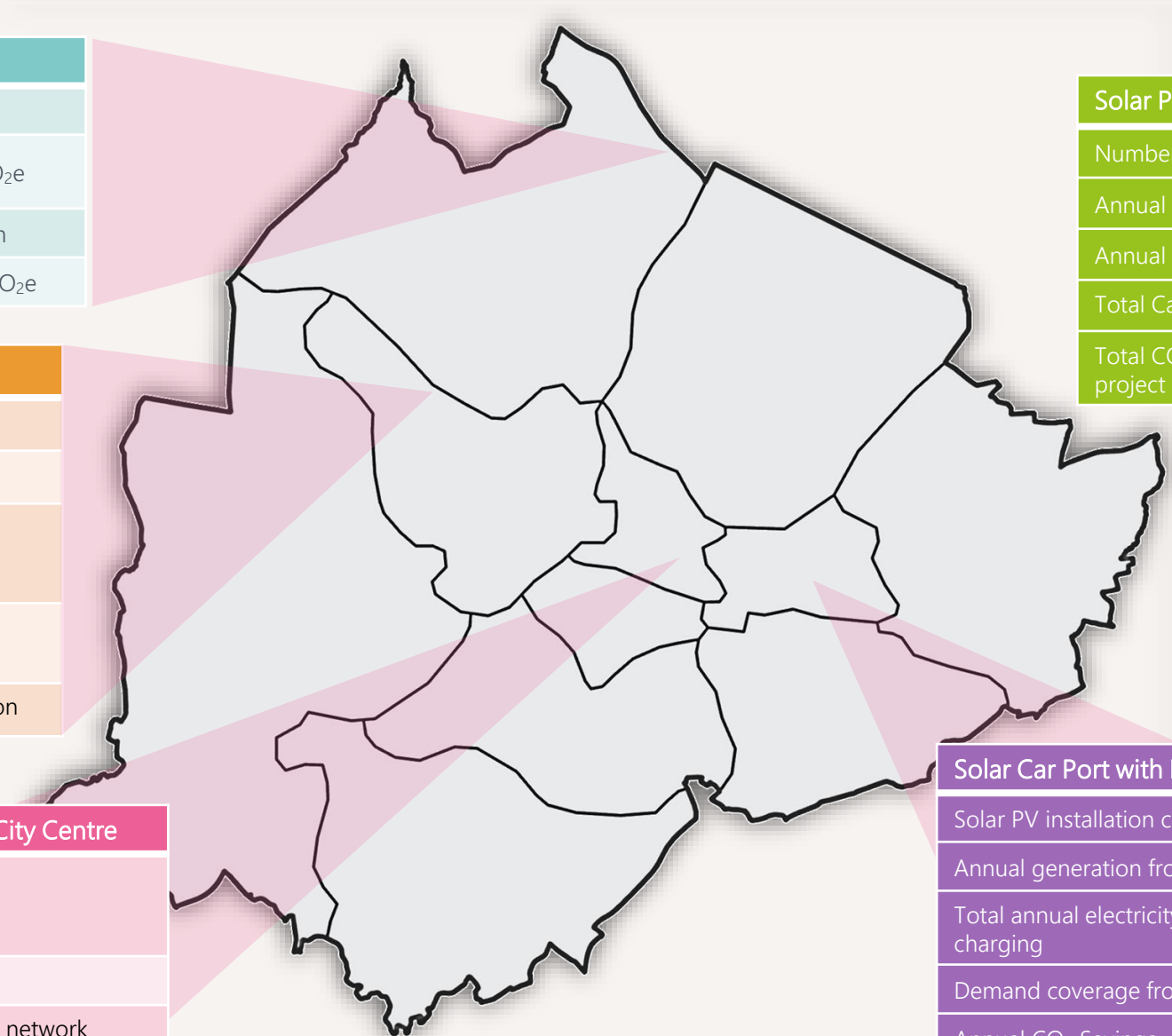


Esri UK, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS

# Focus Zones



# Priority Projects



Oil to Low Carbon Heating Transition	
Number of homes transitioning	500
Annual CO <sub>2</sub> Savings (per household)	4.4 tCO <sub>2</sub> e
Total Capex Cost for project	£7.0m
Total CO <sub>2</sub> saved from project	2,200 tCO <sub>2</sub> e

Domestic Retrofit Measures	
Number of Dwellings	Up to 2,000
Capital Investment	£2.7m – £5.6m
Annual bill savings per dwelling	£123 – £520
Annual carbon savings per dwelling	0.38 – 1.5 tCO <sub>2</sub> e
Additional benefit	Fuel poverty reduction

High Temperature District Heat Network in City Centre	
Potential annual energy demand (phase 1: Non-Domestic Buildings only)	2.8 GWh
Capital Investment	£4.2m
Additional benefit	Creates a viable network offering pathway to expansion to connect domestic properties in future

Solar PV on Public Buildings	
Number of buildings	20
Annual energy generated	903 MWh
Annual CO <sub>2</sub> Savings	40 tCO <sub>2</sub> e
Total Capex Cost for project	£1.0m
Total CO <sub>2</sub> saved across project lifetime	606 tCO <sub>2</sub> e

Solar Car Port with EV Charging	
Solar PV installation cost	£21,100
Annual generation from solar PV	47,800 kWh
Total annual electricity demand from EV charging	3,432 MWh
Demand coverage from installed solar PV	1.4%
Annual CO <sub>2</sub> Savings	2.14 tCO <sub>2</sub> e

# Investment Breakdown

