

**Gas Markets Plan:
Regional Differences in
Domestic Heat**



Existing housing stock is hugely varied making the challenge of decarbonisation hard

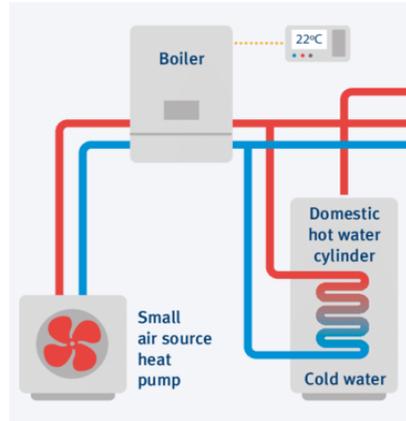
- There is wide variety in our existing housing stock with different types of homes e.g. detached, semi-detached, terraces, flats, bungalows potentially requiring a different low carbon heating solution
- The majority of buildings that exist today (around 80%) will still exist in 2050, which means a huge retrofitting challenge to make homes low carbon.



There are a variety of options for decarbonising heat in homes



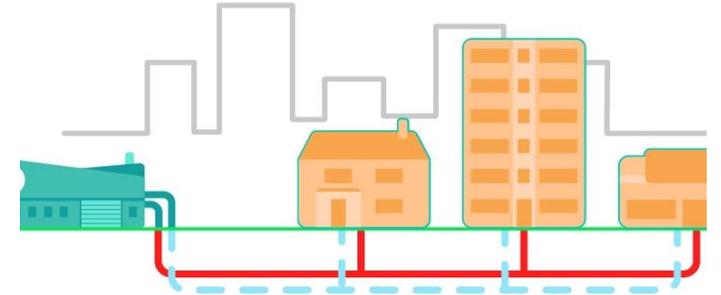
Heat pumps



Hybrid heat pump



Hydrogen boilers



District Heat



Electric resistive heating



Bio LPG

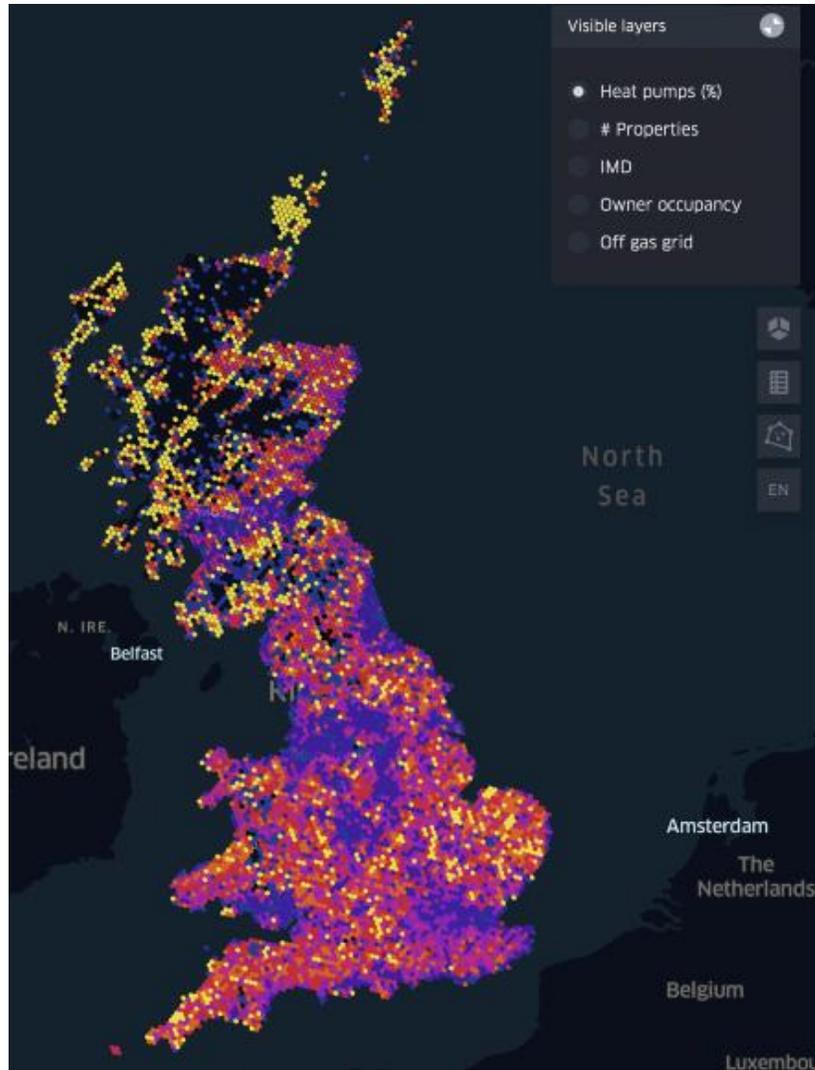


Biomass boiler



Biomethane boiler

Heat pumps are currently being installed in rural areas



[Source: Nesta, 2022.](#) Map to show where heat pumps are installed across GB



[Source: Nesta, 2022.](#) Map to show population density across GB.

There are conflicting views on the suitability of heat pumps to different housing types



Case Study

Electrification of Heat – 1920s detached house heat pump



Case Study

Electrification of Heat – 2000s flat heat pump and heat battery

[Click here for more](#) →

‘There is no property type or architectural era that is unsuitable for a heat pump’

Source: [Energy Systems Catapult: Electrification of Heat UK Demonstration Project \(2021\)](#)

INSTALLING A HEAT PUMP IN EXISTING HOMES

For heat pumps to work effectively as the sole heating source, the buildings need to be thermally efficient. Heat pumps typically require both internal and external space as well as changes to internal systems such as radiators which can cause disruption to consumers.



‘Our analysis shows that it is likely to be impractical to heat many GB homes with heat pumps only.’

Source: [EUA: Decarbonising Heat in Buildings: Putting Consumers First \(2021\)](#)

Regional Differences in housing types

If terraces and flats are not best suited to a heat pump, it is useful to know **how many** of these housing types there are, as well as **where** they are.



How many?

Terraces and flats make up **57% (13.6 million)** of total housing stock across England and Wales



Where?

Of all the terraces and flats, **76% (10.3 million)** are in **7 of the 12 Local Distribution Zones (LDZs)**.



The prevalence of terraces and flats in these 7 Local Distribution Zones require a different solution

North West LDZ:
1.7 million terraces and flats
57% of building stock in LDZ

West Midlands LDZ:
1.2 million terraces and flats
54% of building stock in LDZ

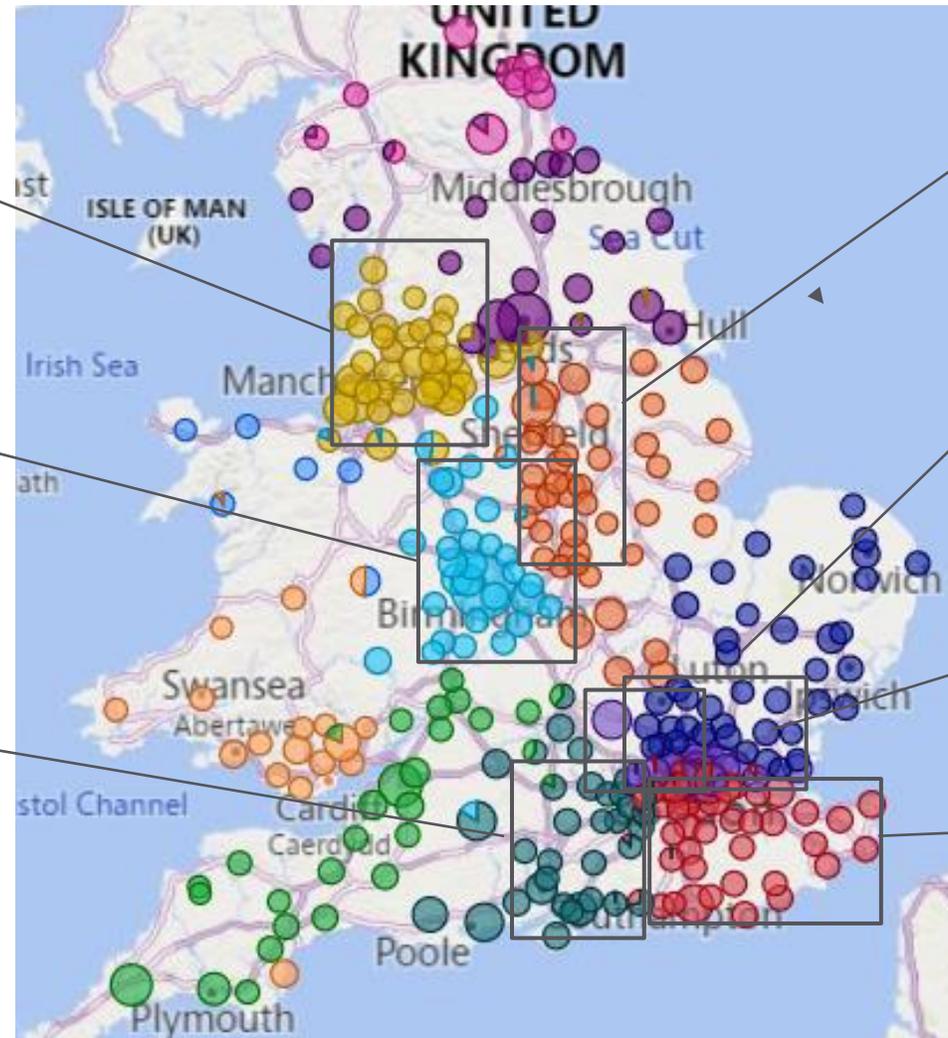
Southern LDZ:
1.1 million terraces and flats
66% of building stock in LDZ

East Midlands LDZ:
1.4 million terraces and flats
51% of building stock in LDZ

Eastern LDZ:
1.1 million terraces and flats
(54% of building stock in LDZ)

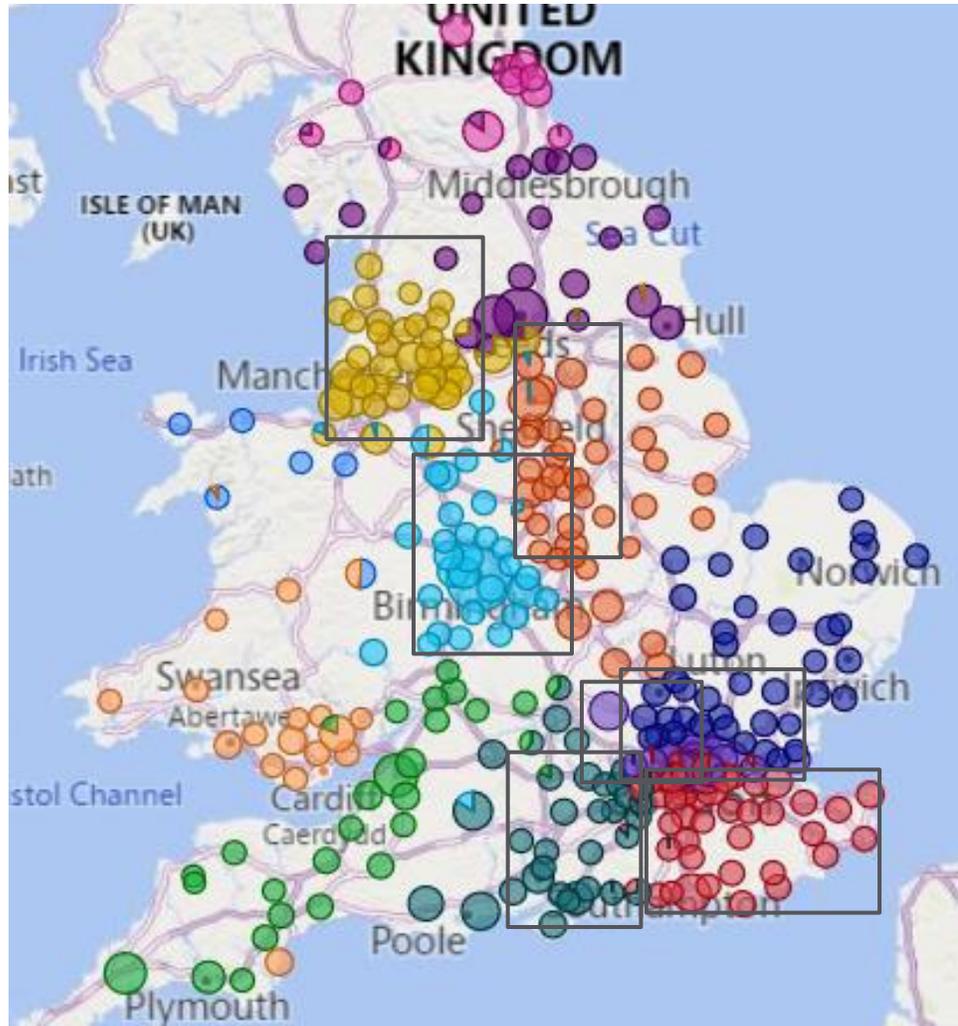
Northern Thames LDZ:
1.9 million terraces and flats
69% of building stock in LDZ

South East LDZ:
1.9 million terraces and flats
62% of building stock in LDZ

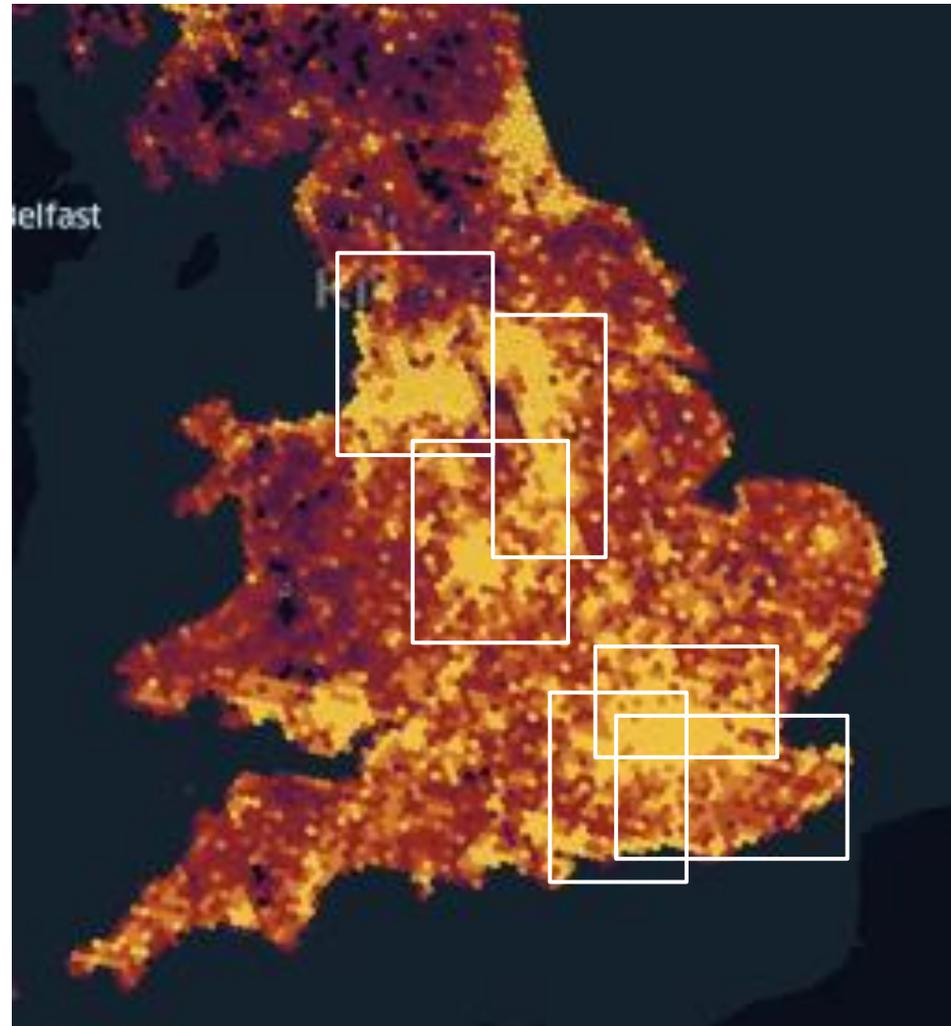


Density of terraces and flats across England and Wales by LDZ

It's the densely populated, urban areas we need to focus on

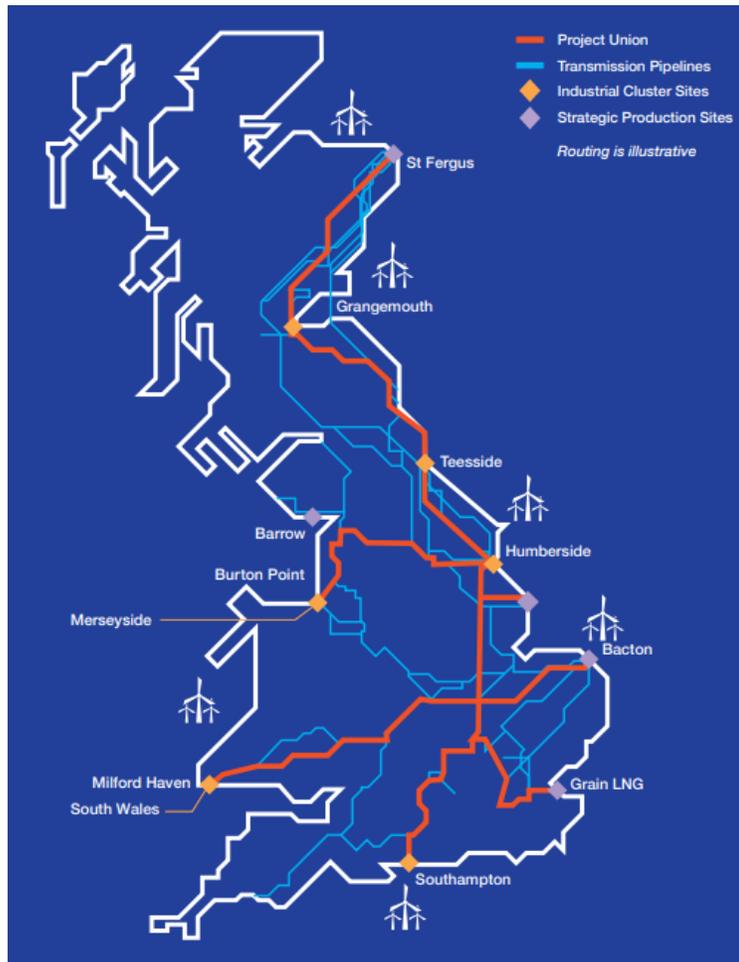


Density of terraces and flats across England and Wales by LDZ

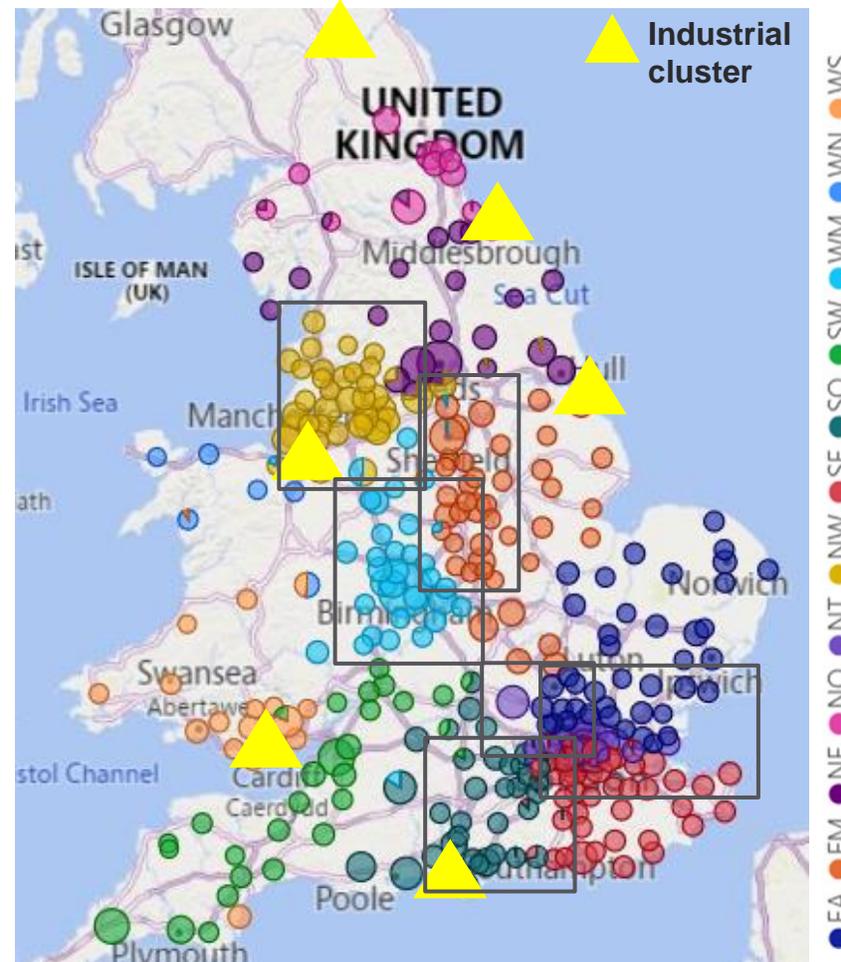


Source: Nesta, 2022. Map to show population density across GB.

Project Union will connect industrial clusters, connecting hydrogen supply with areas of potential heat demand



Routing is illustrative – potential pipeline routes will be identified in the feasibility phase (2023-2025)



Density of terraces and flats across England and Wales by LDZ with industrial cluster locations marked

**Gas
Transmission**

Conclusion

nationalgrid



Key Takeaways



UK housing stock is varied and different housing types will require a different low carbon heat solution. For example, heat pumps require space outside properties and it may be challenging for flats and terraces to find that space



Terraces and flats are prevalent in 7 of the 12 Local Distribution Zones across England and Wales, and their prevalence has a strong crossover with densely populated, urban areas



Its these homes, in urban areas that we need to focus on. They will require a different low carbon heat solution, and hydrogen could be an answer for these homes



Project Union will connect up hydrogen production sites and carry hydrogen to areas of potential heat demand

Next steps: Creating a clearer picture of low carbon heat across England and Wales

This project:

Heat network zones: Overlay map with where heat network zones are planned to be – delineating where heat networks are thought to be the most cost effective option for consumers

Next project:

Analyse and evaluate the total system costs of domestic heat delivery across a range of end use technology profiles from 100% electrification to 100% hydrogen.

nationalgrid