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The need for Local Area Energy Planning:

Geo Spatial Energy Master Planning






We face environmental threats and challenges, but tackling them will present opportunities for Greater Manchester…

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5 environmental threats and challenges to Greater Manchester

Climate change – mitigation	Air Quality	Production and consumption of resources	Natural Environment	Climate change – resilience and adaptation
More radical local and national action to accelerate CO_2 emissions reductions	Health impacts of particulates and nitrogen dioxide – NO_2 levels in breach of legal limits	Throwaway society and particular issues with plastic and food waste	Multiple benefits still yet to be fully realised or accounted for – lack of other sources of investment	Increasing risk of extreme weather events – particularly flood risk but also heat stress

3 opportunities in tackling them

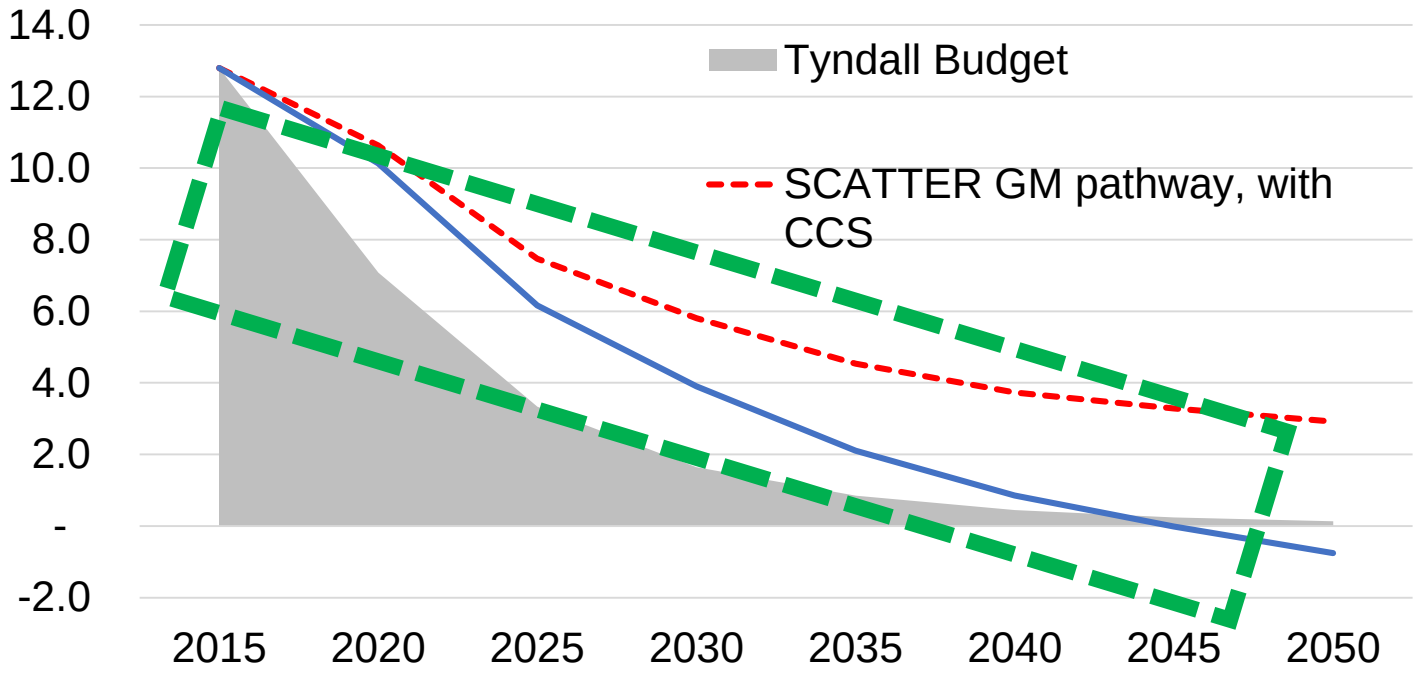
People	Places	Economy
Improve health and quality of life, increase productivity and reduce inequality	Create vibrant and sustainable places and good quality homes	First mover advantage – increase prosperity and productivity

Research & Evidence

An Evidence Based Approach:

- GM spends over £5 bn/pa on energy (all)
- Use of electricity and gas in buildings accounts for 72% of direct CO_2 emissions
- Longer term targets require energy efficiency, low or zero carbon heating
- GM has 140MW of installed renewable electricity & 29MW of heat capacity.
- However, technical potential for 9% of our electricity demand and **68%** of our heat demand to come from renewable sources.
- Significant potential for more:
  - **Energy Efficiency through building retrofit**
  - **Heat networks/heat pumps**
  - **Solar technologies (heat and power)**
  - **Biofuel**

The Challenge



Outstanding Questions

a) How quickly will technology evolve e.g. battery storage and hydrogen to grid?
b) How do we fund building retrofit for energy efficiency/fuel poverty?
c) What is the role of nuclear (SMR) and biomass?
d) What opportunities for negative emission and disruptive technology?
e) Do we have sufficient skilled workers for the task?

Highest Impact Local Actions

- Renewables (Solar PV/Thermal, Heat networks, Heat Pumps)
- Energy efficiency of domestic properties
- Improved efficiency of commercial heating and cooling
- Biomass power generation
- Shift from fossil fuels to battery or fuel cells for transport
- Shifting domestic transport behaviour
- Waste reduction, reuse and recycling

…the scale of the challenge…

Some examples of the assumptions about now to 2040 in the SCATTER GM model

Half of our homes have solar PV plus a further 5.5km^2 commercial/ground-mounted

Gas accounts for less than 35% of heating supply

61,000 homes a year are retrofitted

Commercial heating demand drops by over 20%

All cars on our roads are zero emissions (tailpipe) by 2035

Industrial emissions reduce by 50-75%

3m trees are planted by 2035

Whole System Smart Energy Approach

Proposes a focus on 4 key areas to tackle the current known challenges:

1. Generation and storage
2. Decarbonisation of heat
3. Low carbon transport
4. Diversity and flexibility

These will be delivered by the many.

Why……?

Network and local area understanding

Comprehensive Local Area Energy Planning (LAEP), capable of providing, district and aggregated region scale understanding across;

1. Generation and storage
2. Decarbonised heating (Inc. Hydrogen ingress)
3. Low carbon transport (Inc. Hydrogen ingress)
4. Diversity flexibility (current and future possible network constraints)

Supports the optimised local decisions of the as we transition to the future.

Local Area Energy Planning – Involves building a detailed representation of each local area

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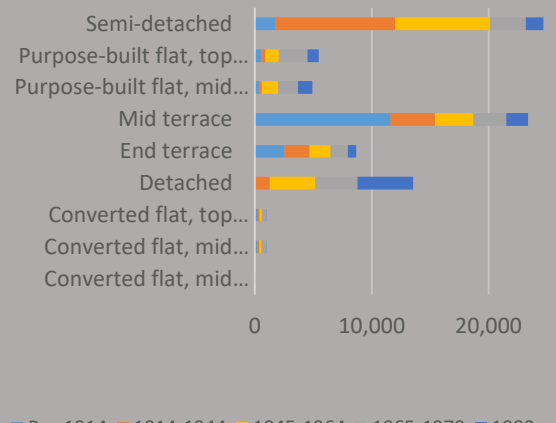
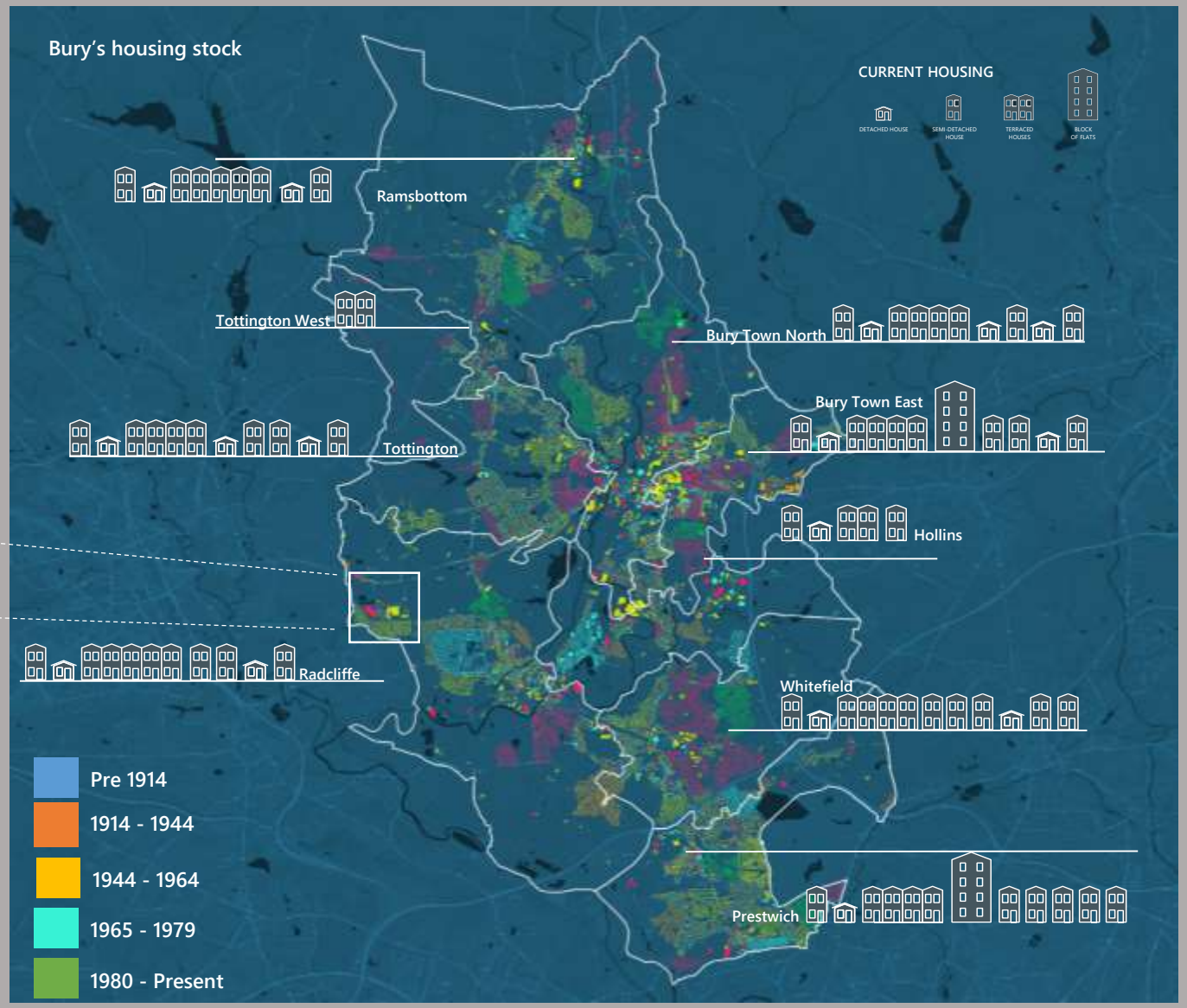
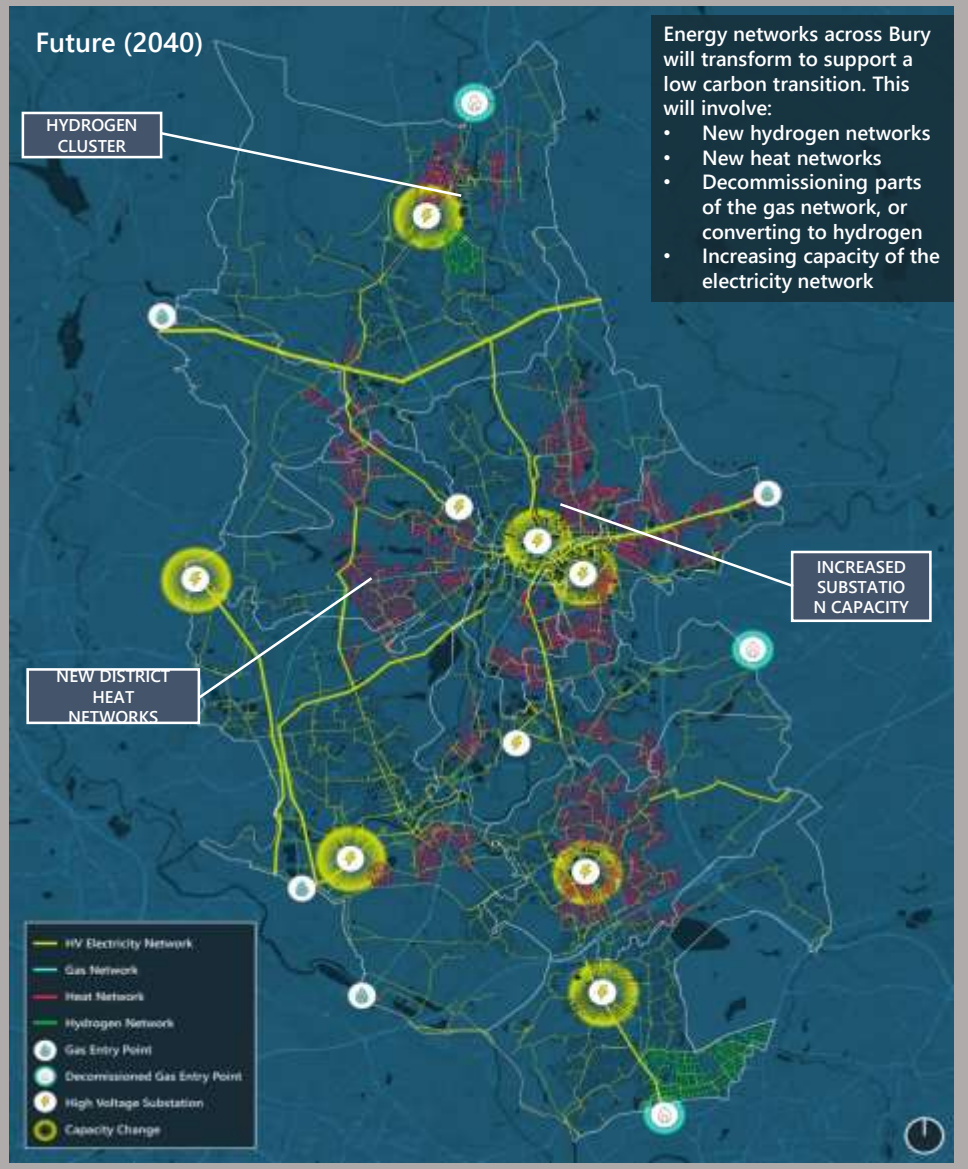
Bury's current housing stock is dominated by semi-detached and terraced housing, much of which was built before 1914. This presents challenges in implementing low carbon technologies. 98% of existing buildings in Bury currently use natural gas boilers for heating.





Exploring a range of possible energy system options



To develop a Local Area Energy Plan for each borough

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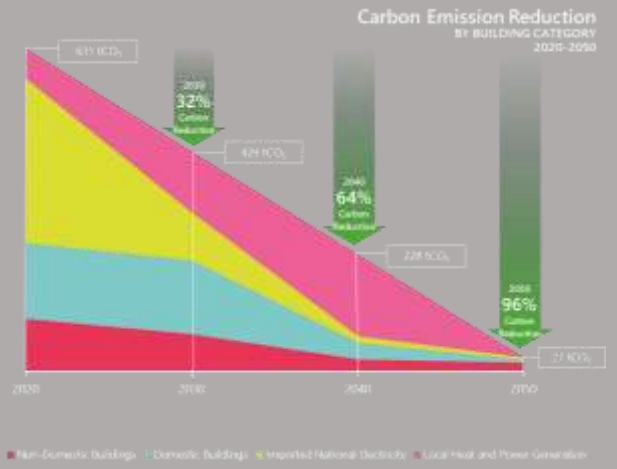
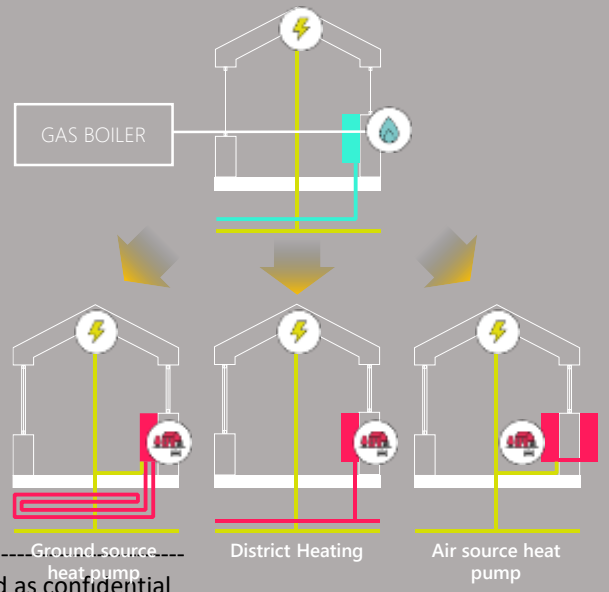
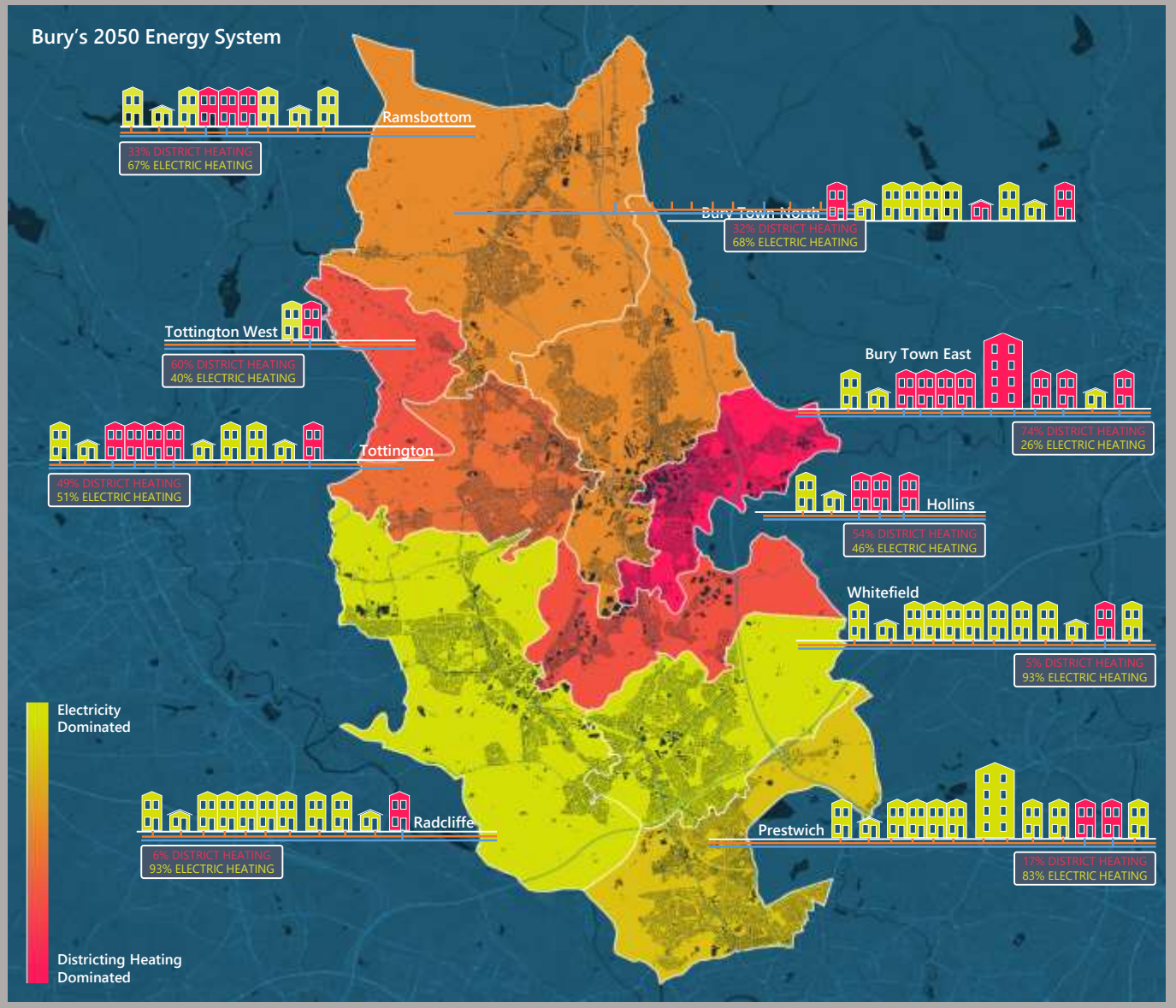
Your local energy system is changing to meet our commitment to reducing carbon emissions. This means installing new low carbon technologies and phasing out the use of gas boilers.

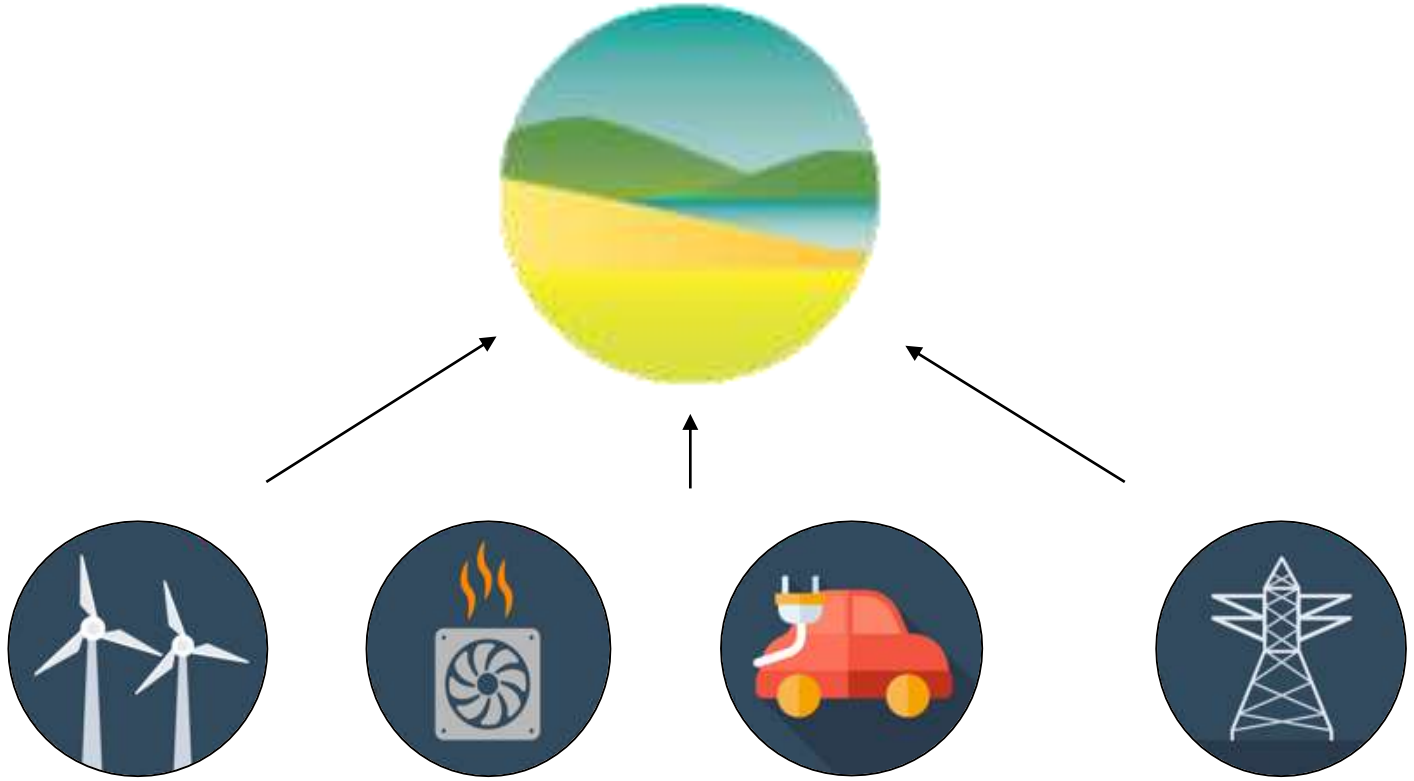


Homes with gas boilers may transition to different heating systems, such as those illustrated below.





LAEP local learning and short term need



Challenges not barriers…….

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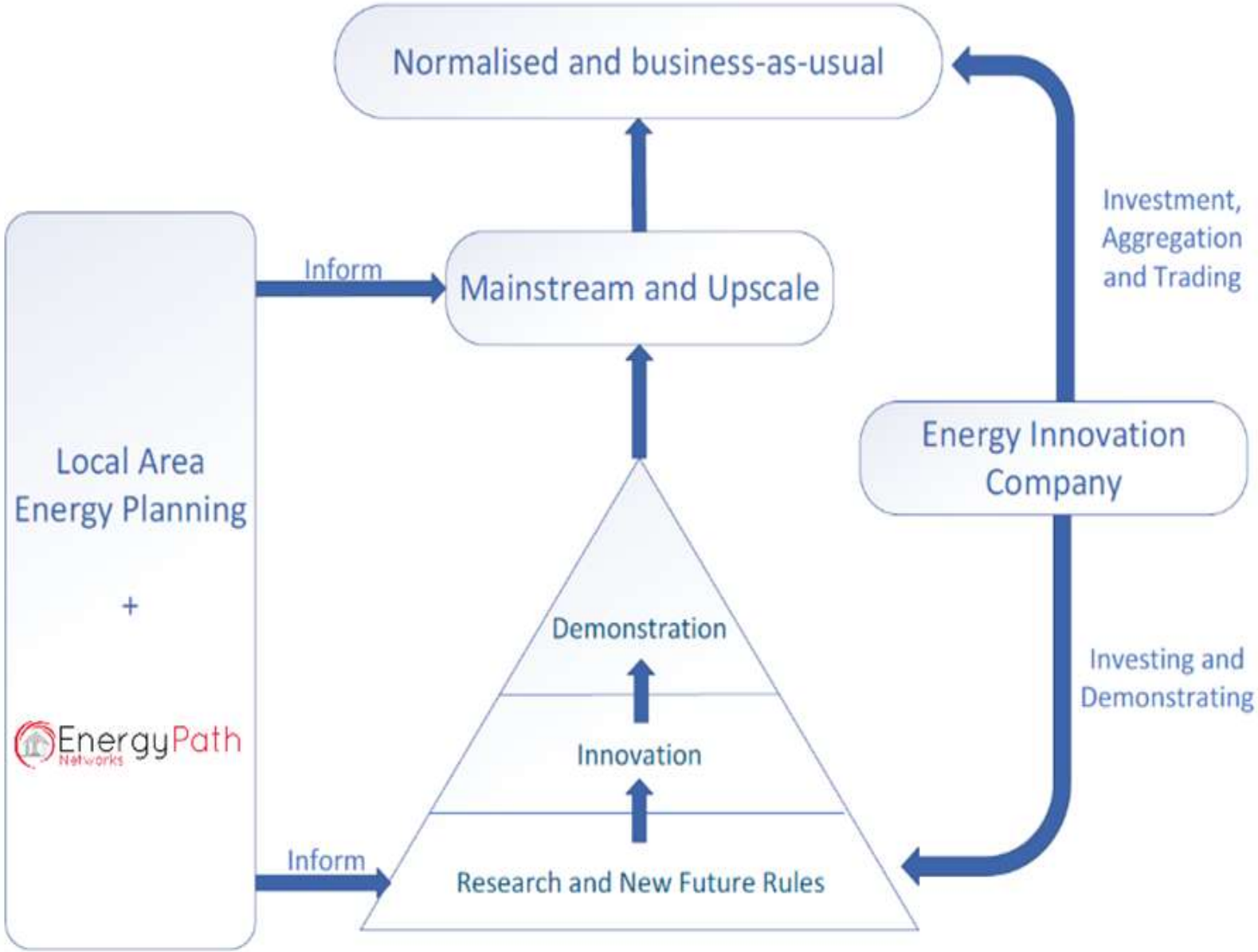
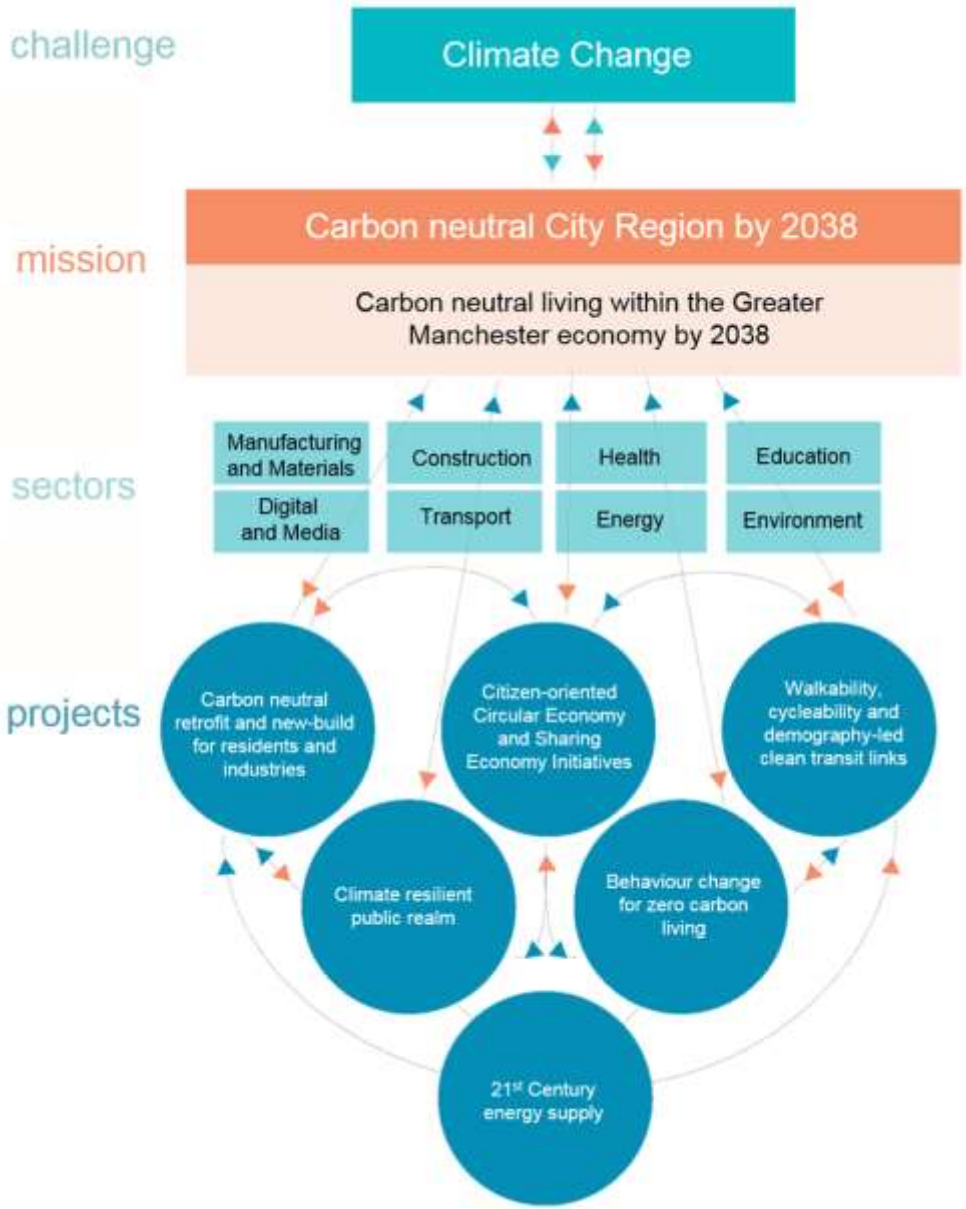
LAEP In practice could support……



…if we all take action together now



We can deliver

5yr Environment Plan/GMLIS	Smart Energy plan
Retrofit Accelerator	Increase Low carbon heat by 10.2TWh by 2024
Energy Transition Region	Increase Generation by 45 MW by 2024
Energy Innovation Company	Provide 30-40MW of diverse and flexible load by 2024

GREATER MANCHESTER LOW CARBON HUB