



parity  
projects

24<sup>th</sup> July 2020

## Accelerating retrofit for a carbon neutral future:

Modelling the need and opportunities for housing  
retrofit in Greater Manchester

# Background

- In September 2019, GMCA won £49,980 grant funding from the Local Government Association's Housing Advisers Programme 2019/20
- The GM Low Carbon Team contributed an additional £35k to extend the the project, to enable future scenarios for energy and CO<sub>2</sub> modelling
- GMCA procured and Parity Projects Ltd (with Bays Consulting, ADE Research and Energy Systems Catapult) were appointed in January 2020

# Overview

Project timescale Feb – Oct 2020, four main streams:

## **‘Where are we now?’**

- An energy model of every home in Manchester
- Probability of HHSRS hazards at individual home level

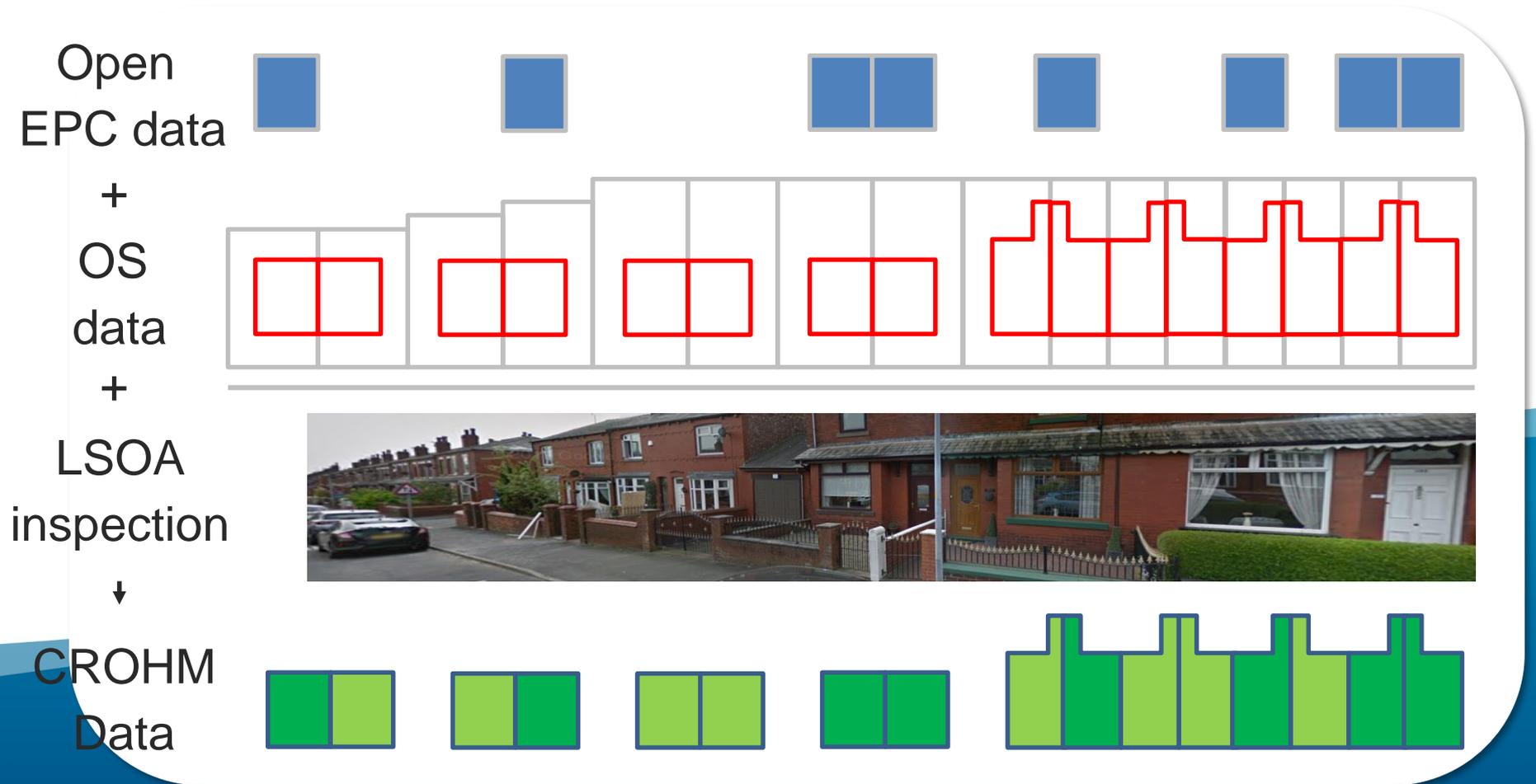
## **‘Where do we want to get to?’**

- the most likely and realistic net zero CO<sub>2</sub> end-result

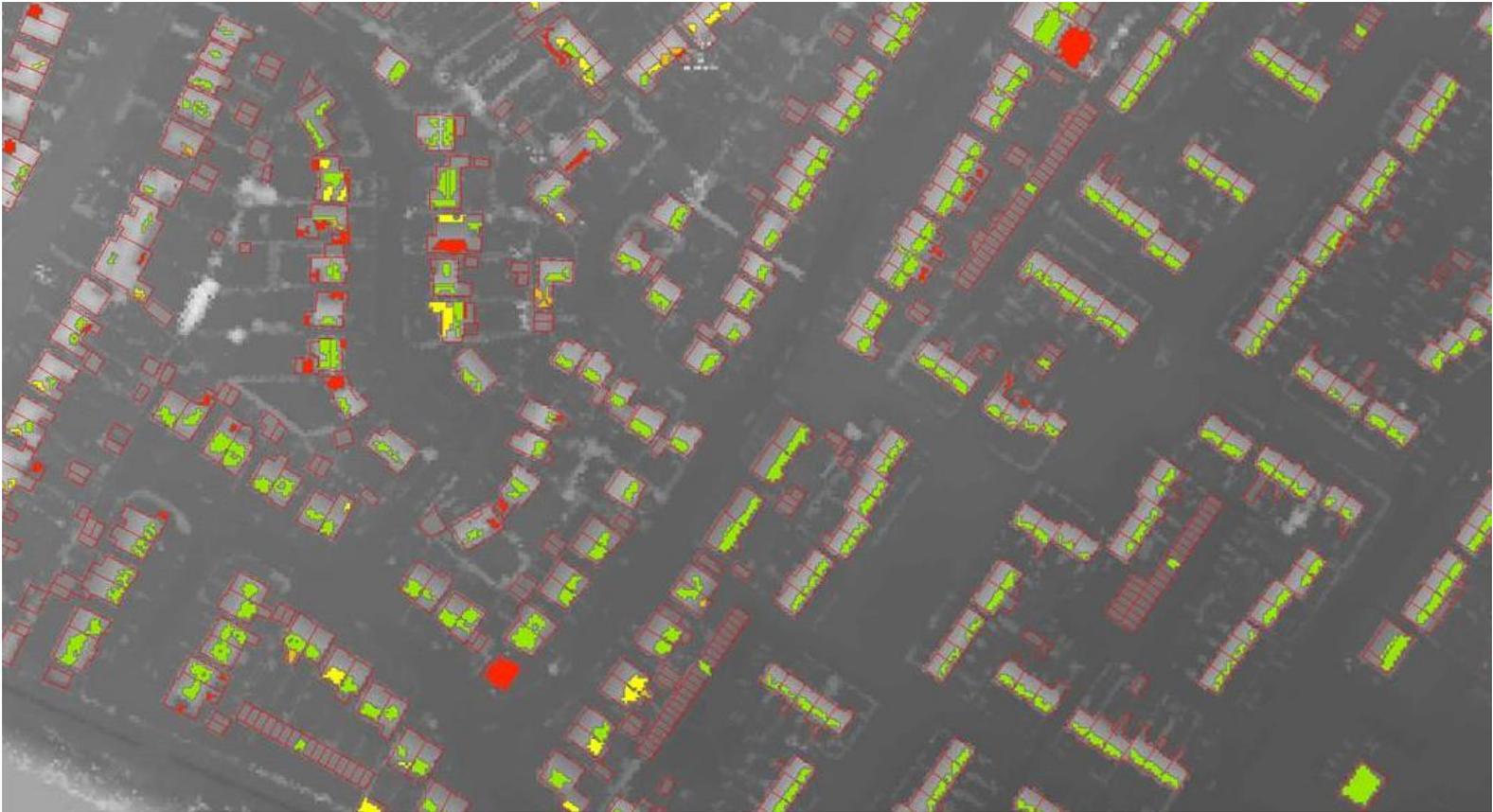
## **‘How do we get there?’**

- Iteratively model a range of possible policy interventions

# Energy model of every home



# Energy model of every home



# HHSRS hazards at individual home level



Ministry of Housing,  
Communities &  
Local Government



English Housing Survey



## Census 2011 Table Links

### Key Statistics (27 tables)

The Key Statistics series provides summary figures covering the full range  
Sort on a column by clicking its heading. The list is currently sorted by Ref

Reference	Name
KS101EW	Usual resident population
KS102EW	Age structure
KS103EW	Marital and civil partnership status
KS104EW	Living arrangements
KS105EW	Household composition



Ministry of Housing,  
Communities &  
Local Government

The English Indices of Deprivation  
2019 (IoD2019)



Small Area Health Statistics Unit

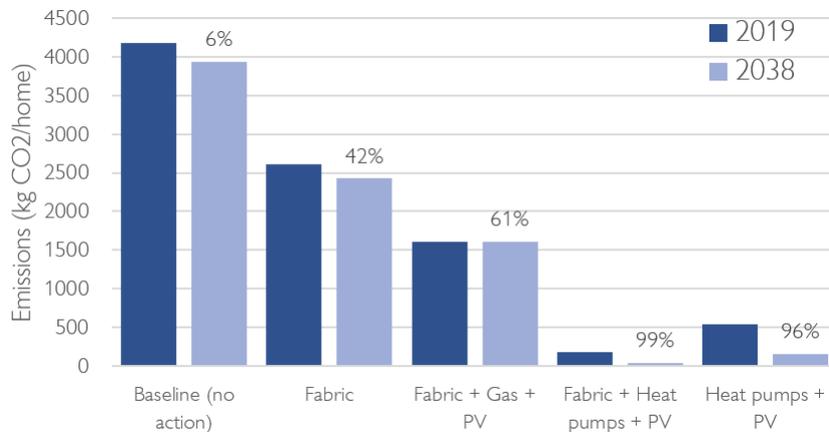
# Where do we want to get to?

More difficult than expected; cannot be determined in isolation from national policy on:

- Decarbonisation, capacity and resilience of future electricity grid
- Building infrastructure for new technology (e.g. Hydrogen)

Our analysis and literature review supports key conclusions in the next few slides

# Future housing key conclusions: Gas vs Electricity



1 – There is no place for mineral gas in net-zero housing by 2038

2 – The electricity grid will decarbonize, but will not generate enough for conventional electrical heating

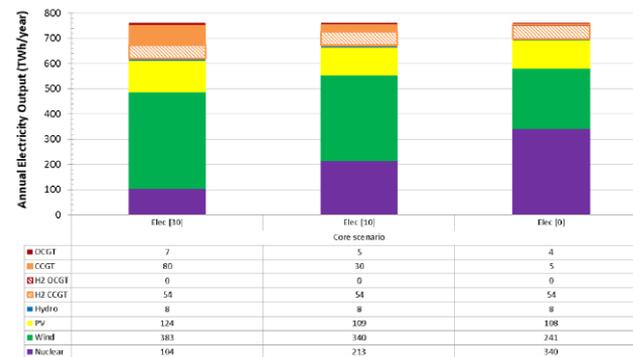


Figure 2-16 Optimised electricity production in Electric pathways

# Future housing key conclusions: Heat Pumps and Insulation

3 – Heat Pumps look likely to be key and their roll out needs to dramatically increase, noting that they may not reduce bills much



4 – we don't need every home to be super-insulated, but high and medium cost-effect measures will be important (and will reduce bills)

# Future housing key conclusions: Heat Networks & Home Renewables



5 – Heat Networks can be better than individual heat pumps where the business case is viable (perhaps 15% of homes). GMCA key

6 – some other offsetting mechanism – e.g. domestic renewables – is needed for net zero



# Future housing key conclusions: Heat Pumps and Insulation

7 – Energy Storage will become important in the longer term as heating from the electricity grid scales up. Distributed?



8 – Hydrogen requires much development, and may be a priority for other sectors before domestic. Fabric and heat pumps are compatible with future hydrogen roll-out.

# How do we get there?

- Key focus of the project July to September
- We are currently modelling the likely effect of different frameworks of policies
- Initial work indicates that decarbonisation will need a radically increased ambition compared to programs to date.

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# David Shewan Parity Projects