Introduction to:
National Buildings Database & Overheating Risk Maps

Paul Ruyssevelt
p.ruyssevelt@ucl.ac.uk

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Department for Energy Security & Net Zero

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National Buildings Database

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WINNING MOVES

National Buildings Database

Why do we need one?

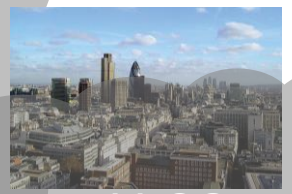
UK Building Stock in Context

UK emissions: ~400MtCO2e

UK railway infrastructure value: £332bn
Number of railways companies: **28**

UK water infrastructure value: £90bn
Number of water companies: **11**

UK energy infrastructure value: £196bn
Number of energy companies: **37**



UK non-domestic buildings value: **£1.0 trillion** (**2m premises**)
Number owners: **1m** (individual: **950k**, landlords: **~50k**)

UK homes value: **£8.7 trillion** (**30m homes**)
Number owners: **23m** (private individuals: **21m**, landlords: **~2m)**

UK Building Stock in Context

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32 million units / value £10 trillion / 24m owners

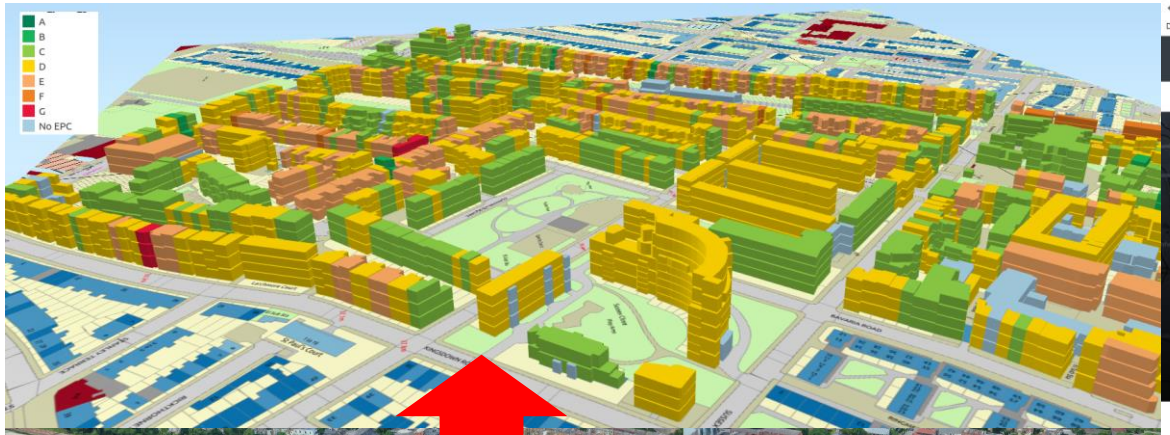
More diverse / more valuable / more owners

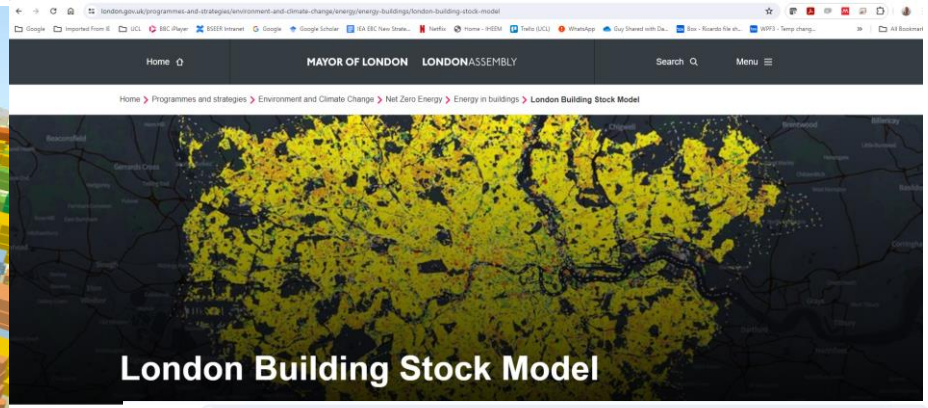
More in need of a national digital twin!

National Buildings Database

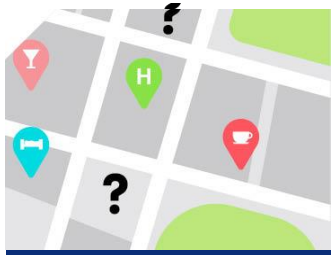
Composition

3DStock:
10 years of underpinning research at UCL





Project purpose



Addressing gaps in non-domestic building stock data

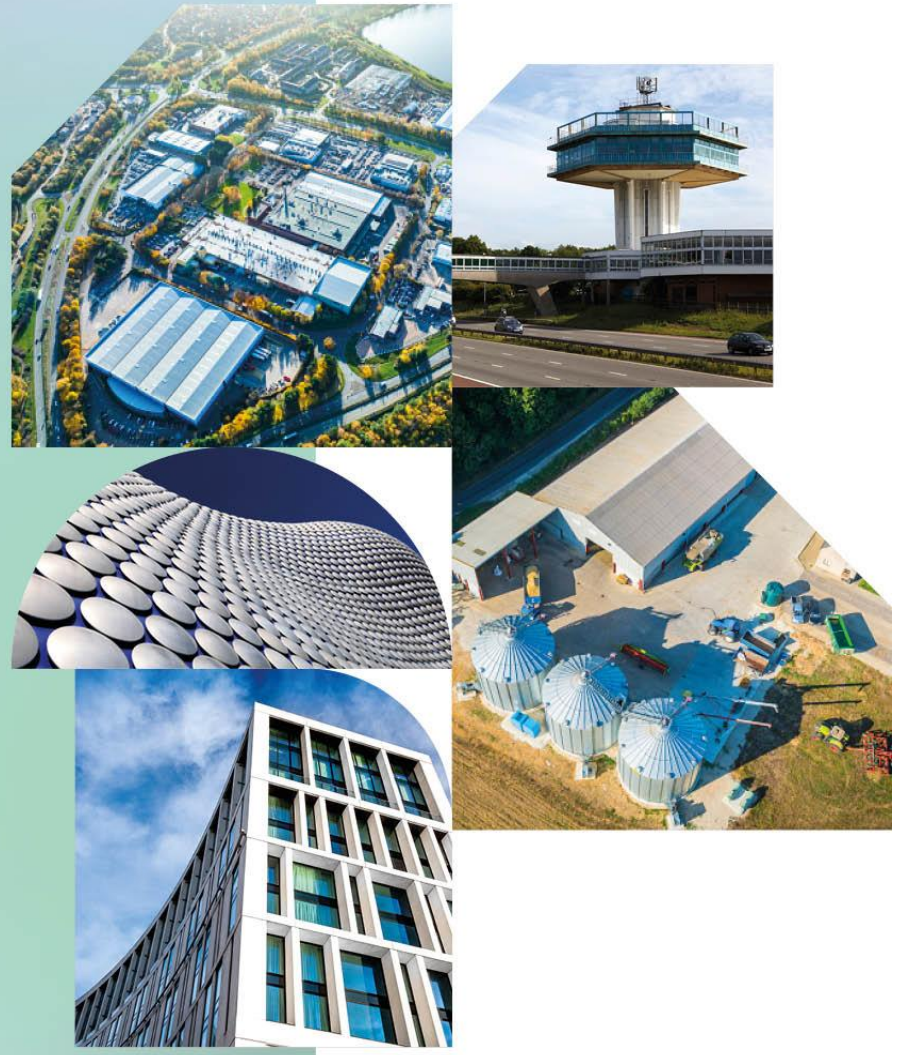
Comprehensive database of the UK building stock

More impactful decarbonisation / net zero strategies and policy

1. Create a record of every building in the Great Britain (England, Wales and Scotland).
2. Characterise key features (e.g. construction, geometry, and categorisation), energy consumption and end uses for every building in the database.
3. Examine the validity of energy performance data and characteristics using targeted surveys and data collection.
4. Develop method for ongoing updates to database, and sampling synthetic shareable datasets from the database.
5. Make outputs that are accessible to other government departments and external researchers.

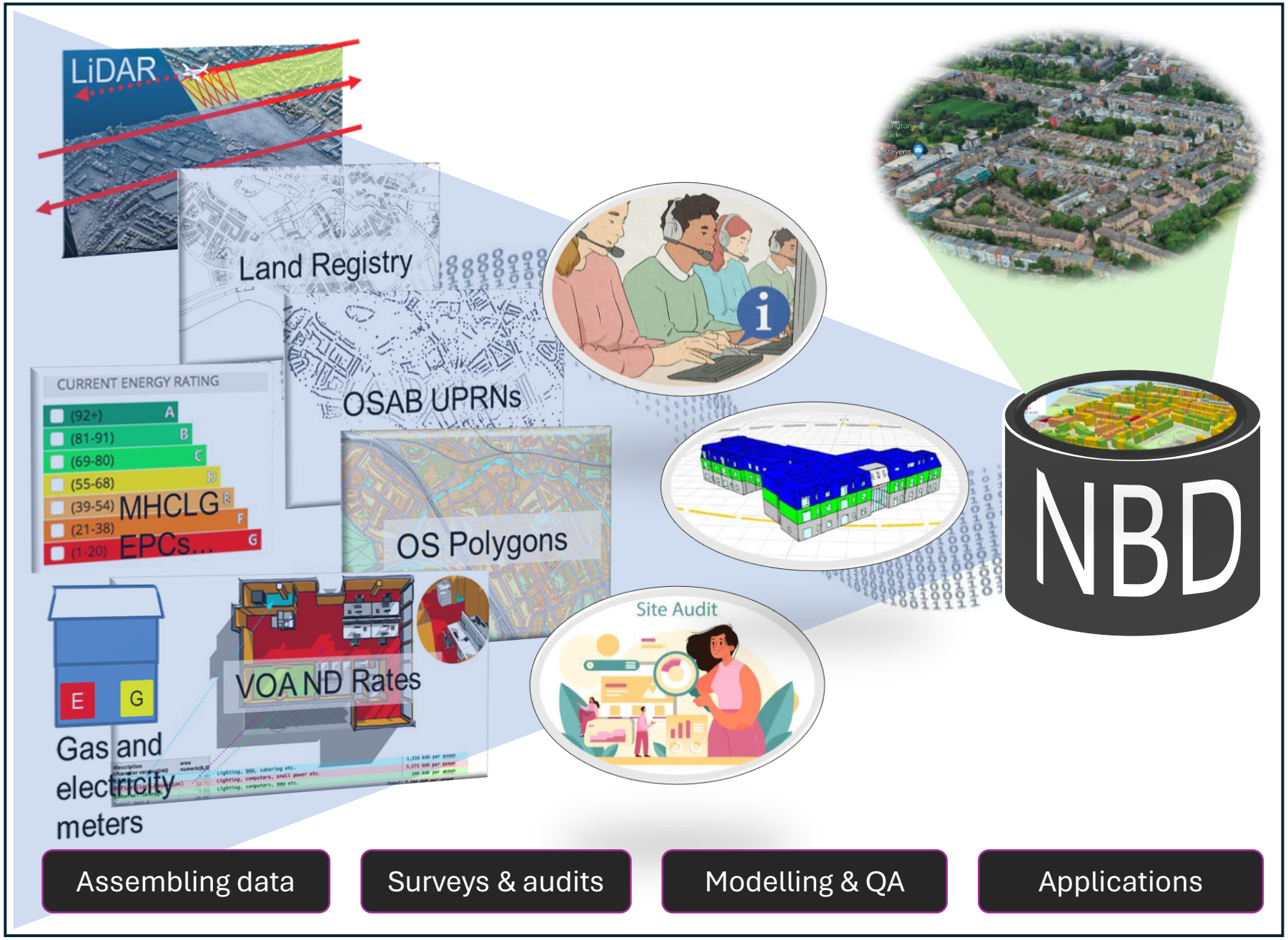
Commissioned by:

Department for Energy Security & Net Zero



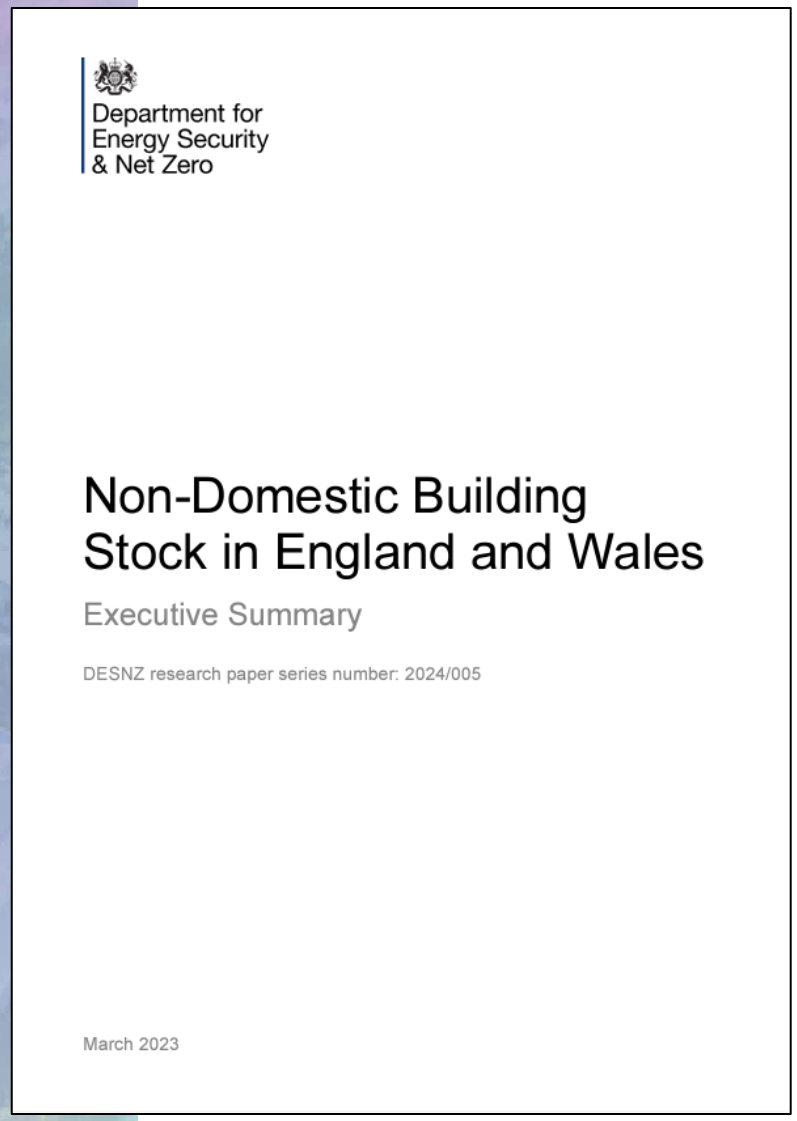
Activity Classses of interest

- Offices
- Shops
- Warehouses
- Factories
- Education
- Emergency
- Health
- Hospitality
- Agriculture
- Arts & Leisure
- Community
- Defence
- Sport
- Transport
- Utilities
- Domestic *(light touch)*


LiDAR
Land Registry
OSAB UPRNs
CURRENT ENERGY RATING
(92+) A
(81-91) B
(69-80) C
(55-68) D
(39-54) E
(21-38) F
(1-20) G
MHCLG EPCs...
OS Polygons
VOA ND Rates
E
G
Gas and electricity meters
Site Audit
NBD
Assembling data
Surveys & audits
Modelling & QA
Applications

National Buildings Database

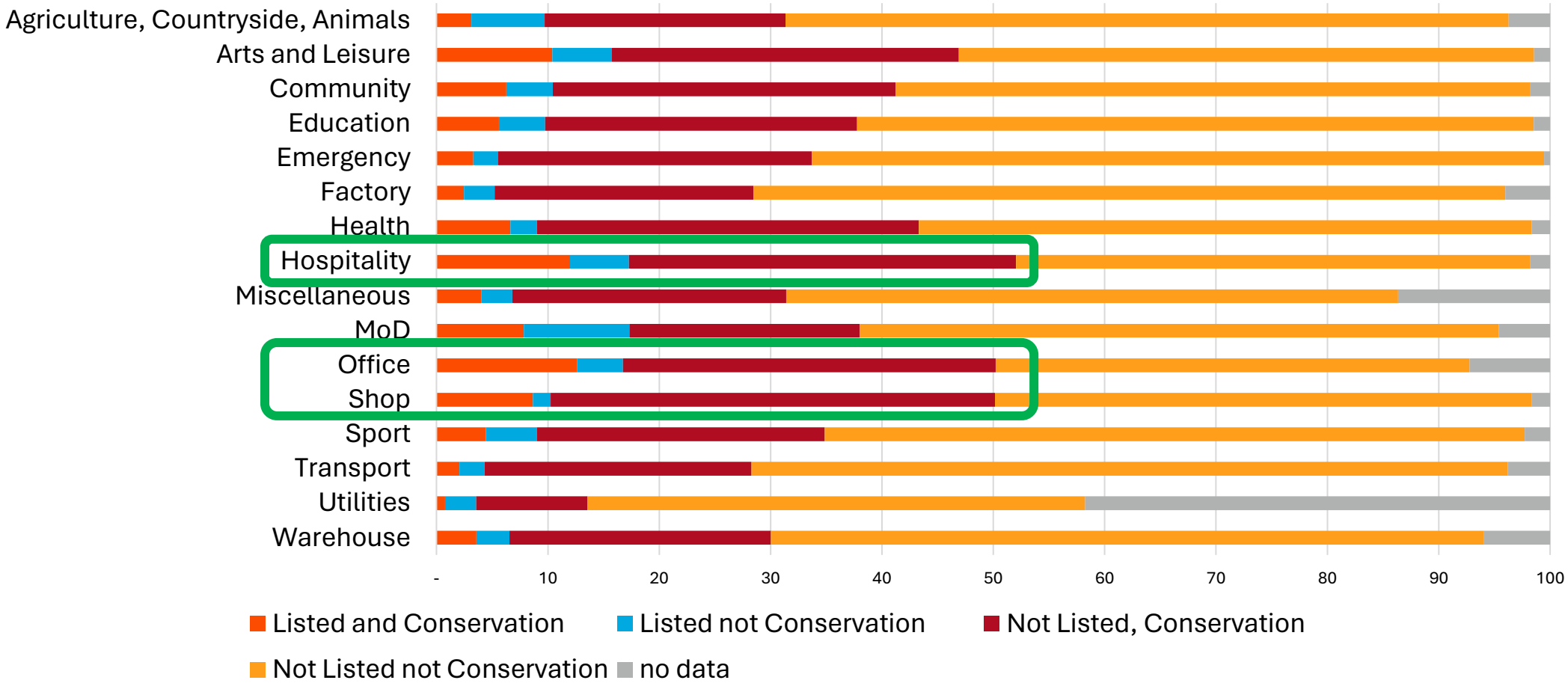
Phase 1: some findings



https://www.gov.uk/government/publications/national-buildings-database-phase-1-non-domestic-building-stock-in-england-and-wales

Or search for:
“DESNZ National Buildings Database phase 1”

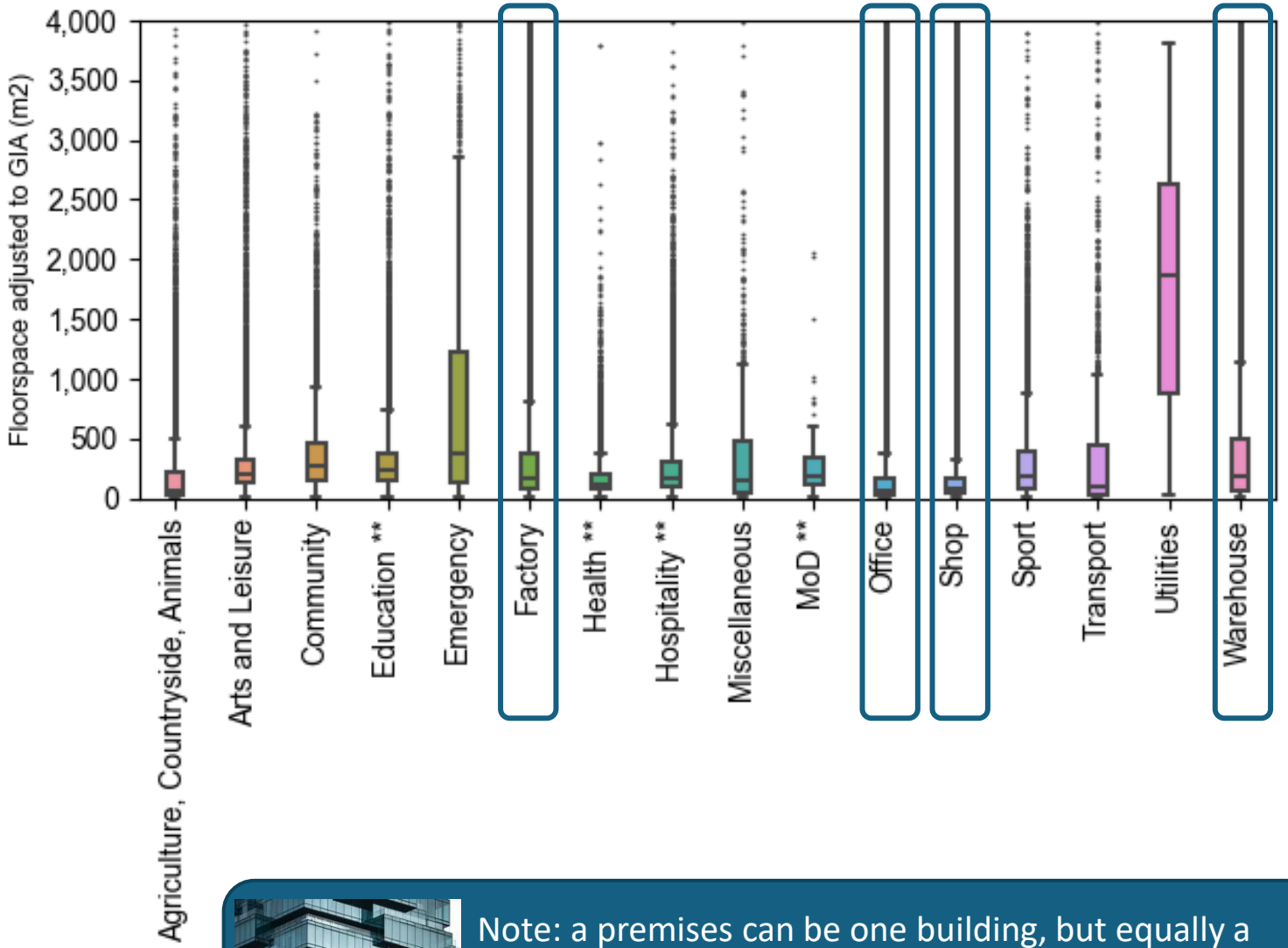
In office, shop and hospitality activity classes, 50% of premises have a heritage status



Percentage distribution of premises by CaRB3 class, using the Listed building status and Conservation areas, combined to classify the premises, 2020

94% of premises are smaller than 1000m^2

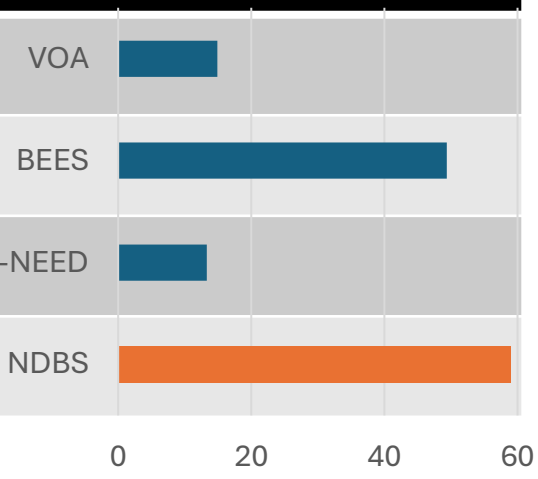
However, in the largest classes the largest 10% of premises contain over 60% of area



Note: a premises can be one building, but equally a building can contain several premises, and sometimes a premises can contain several buildings.

Valuation Office Agency data only includes 25% of floor area for the hospitality sector

Source	million m^2 of floorspace (Hospitality)
VOA (sub-set)	14.9
BEES (extrapolated)	49.4
ND-NEED (sub-set)	13.3
NDBS (multi-method)	59.0



NB: ND-NEED based on VOA

Non-domestic premises are not typically standalone

- 48% of non-domestic premises share a building with other non-domestic premises
- A further 23% share a building with domestic premises

- From a buildings perspective:
  - 40% of buildings have just one non-domestic premises
  - 9% have more than one non-domestic premises
  - 20% of buildings have a mix of non-domestic and domestic premises

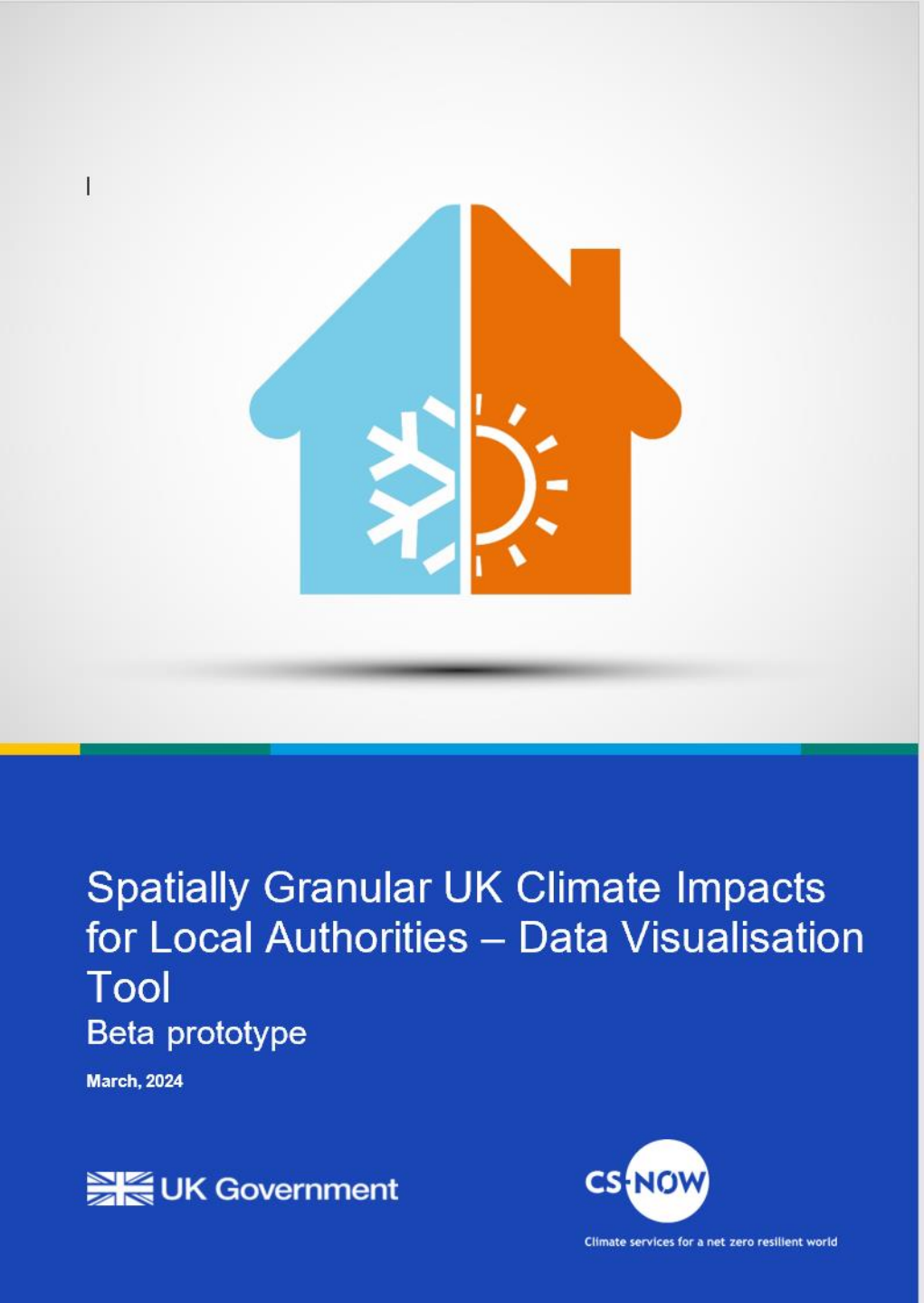
Image from UCL image library

NBD Phase 2: Programme and Timeline

1	**Method design and data collation**	• *From existing sources / secondary data*
2	**Remote surveys**	• *To QA existing data - 1400 across sectors* • *Insights / addressing data gaps – 900*
3	**Site audits**	• *Test and qualify existing data with site-based audits and modelling of energy use*
4	**Data analysis**	• *Further data modelling and reporting* • *Produce statistics and synthetic data*

Mapping the Risk Future Overheating in Homes

(mapped onto 3DStock data)



CS-N0W Research Programme

Commissioned by **DESNZ**

Climate Services for a Net Zero Resilient World (**CS-N0W**) is a 4-year, £5 million research programme, to inform UK climate policy and help UK meet its global decarbonisation ambitions.

CS-N0W aims to enhance the scientific understanding of climate impacts, decarbonisation and climate action, and improve accessibility to the UK's climate data.

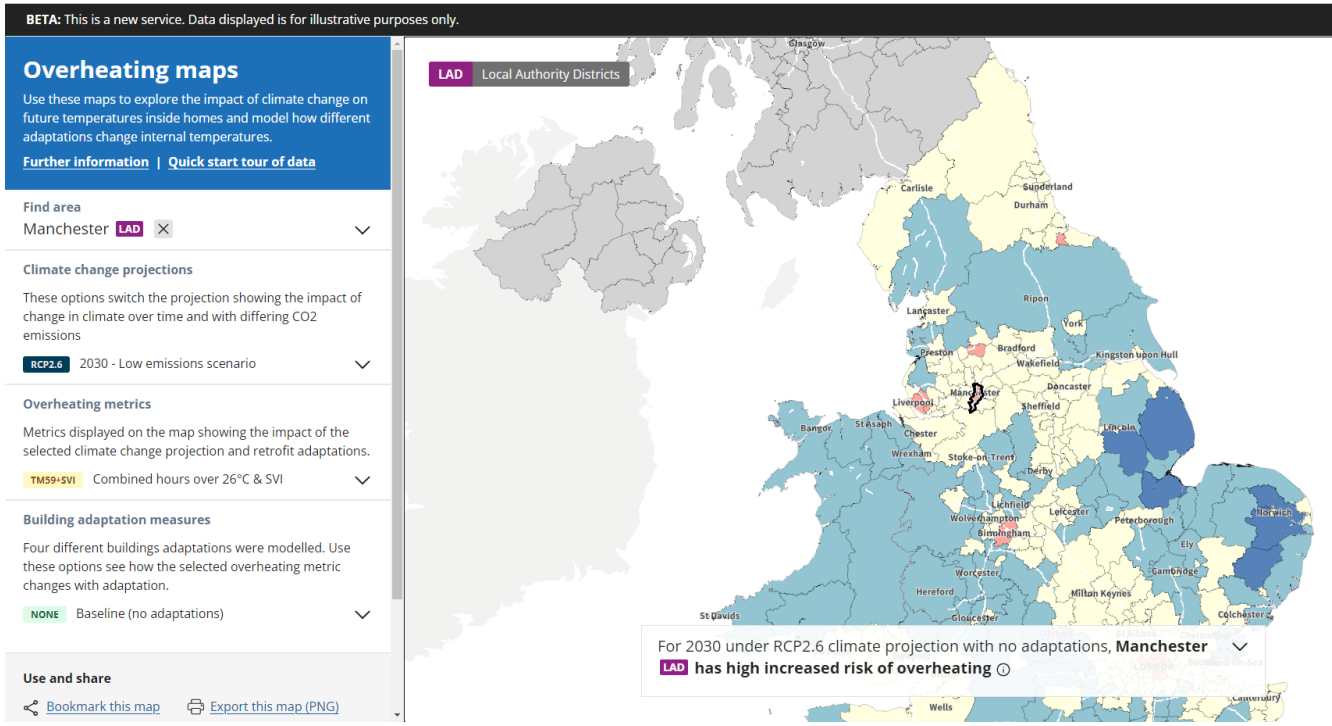
RICARDO Tyndall Centre for Climate Change Research UKRI Natural Environment Research Council UCL

Supporting research and analysis
Final report to be published soon

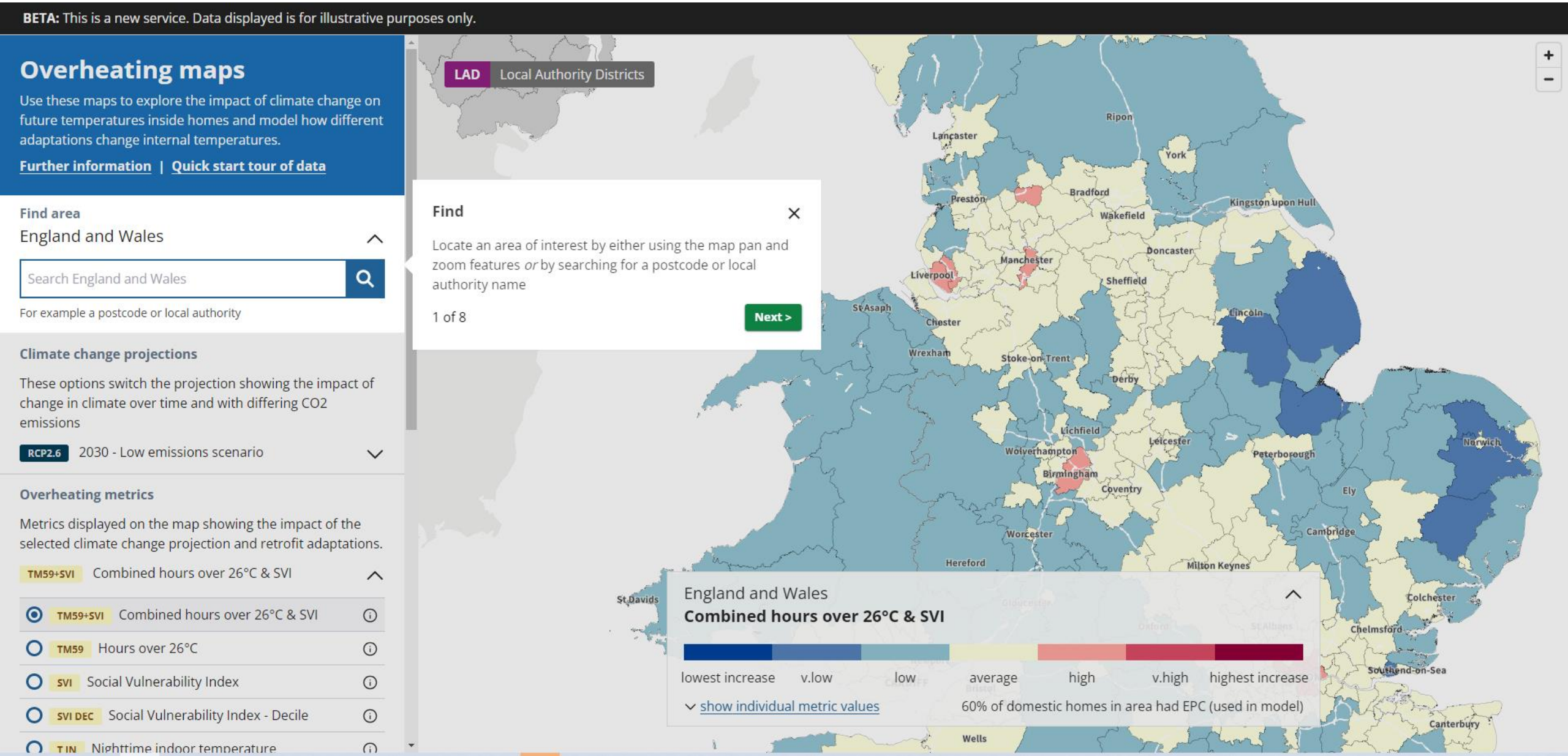
Mapping the Risk Future Overheating in Homes

(Online tool soon to be launched on Defra's Data Services Platform)

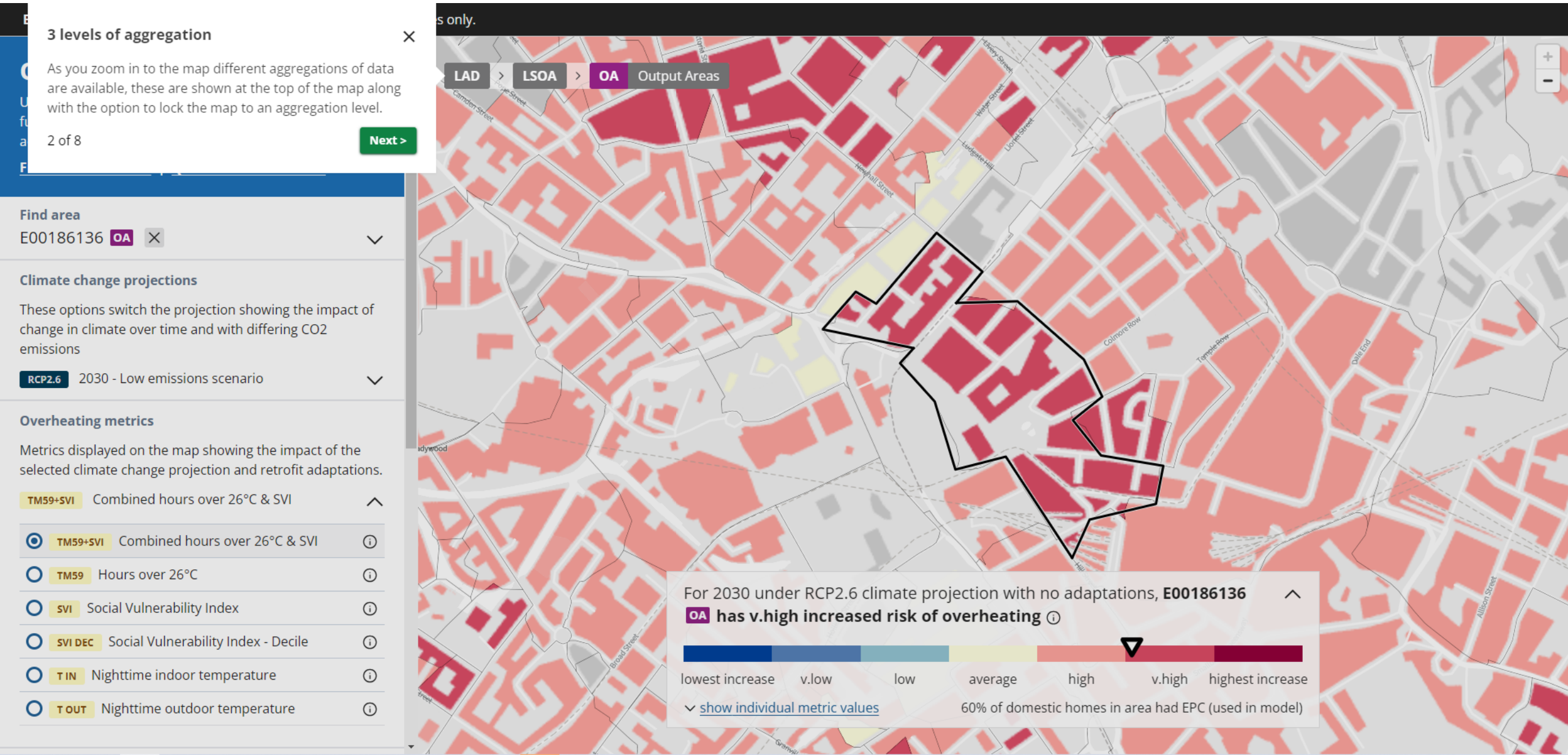
- Overheating risk modelled for housing stock in England & Wales
- Mapped onto 3DStock (which underpins the NBD)
- Future overheating risk mapped onto individual homes
- Risks presented at LAD, LSOA and OA levels
- Examine different climate scenarios and adaptation measures



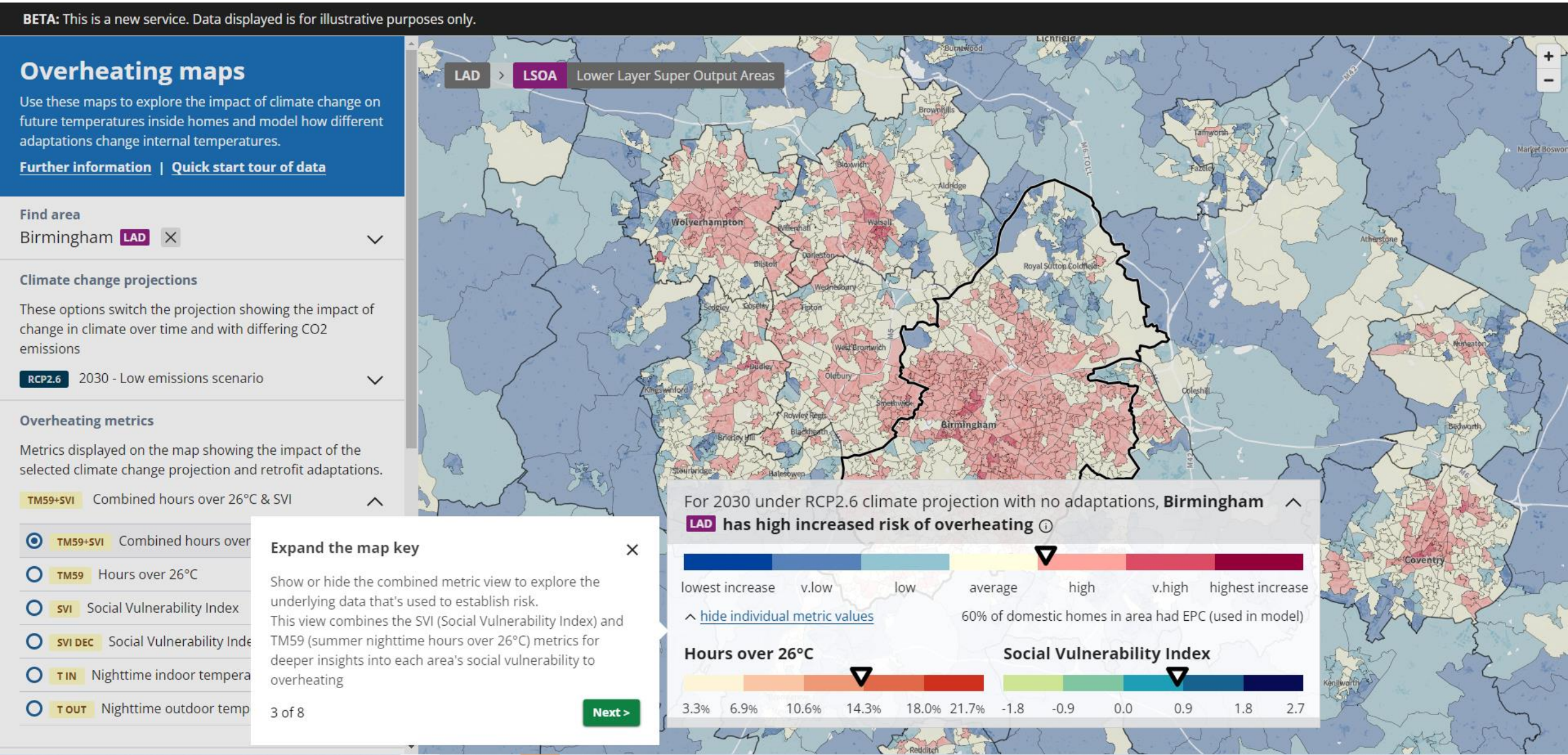
Search or pan to location



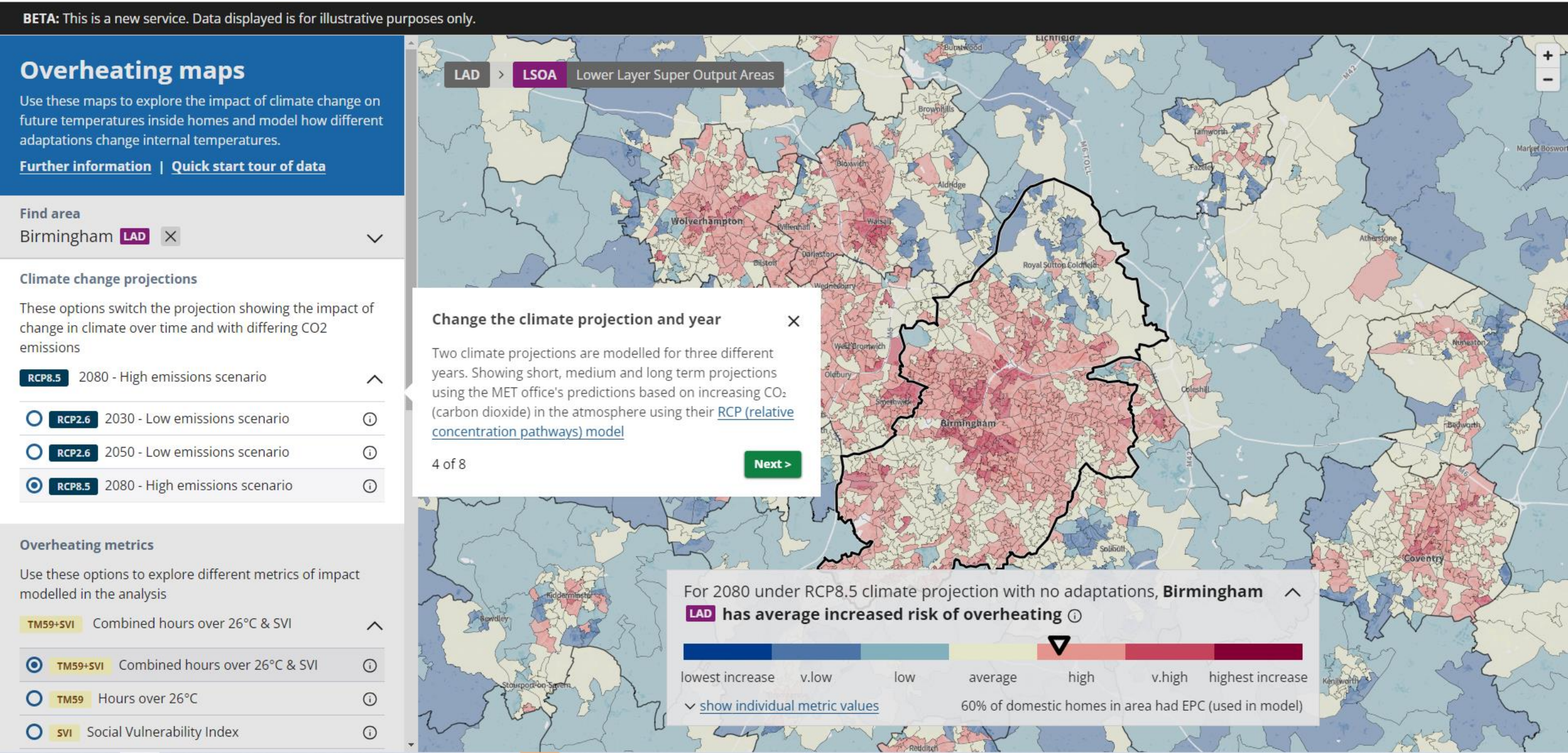
Zoom in: LAD > LSOA > OA



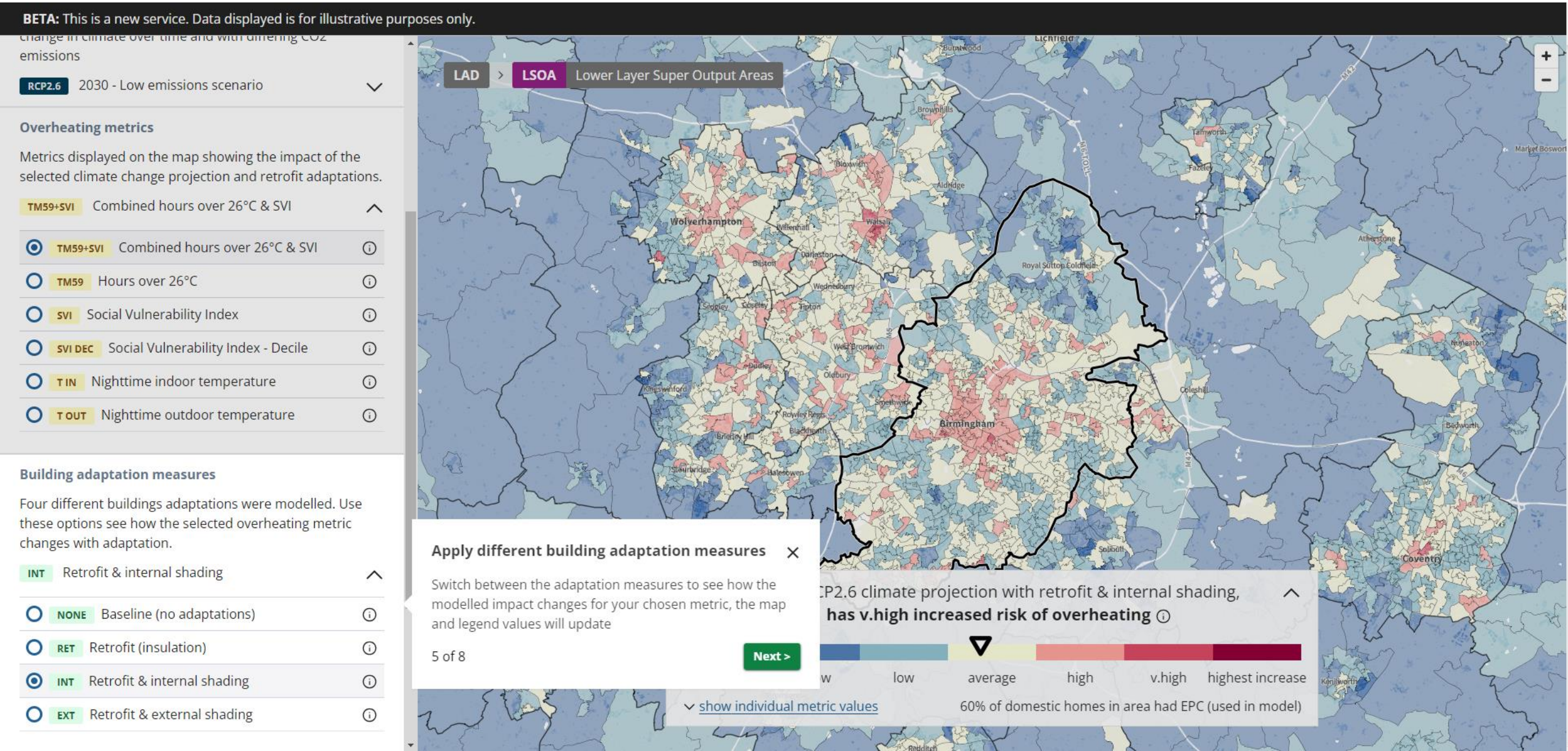
Map key expands to display metrics (here TM54 & SVI)



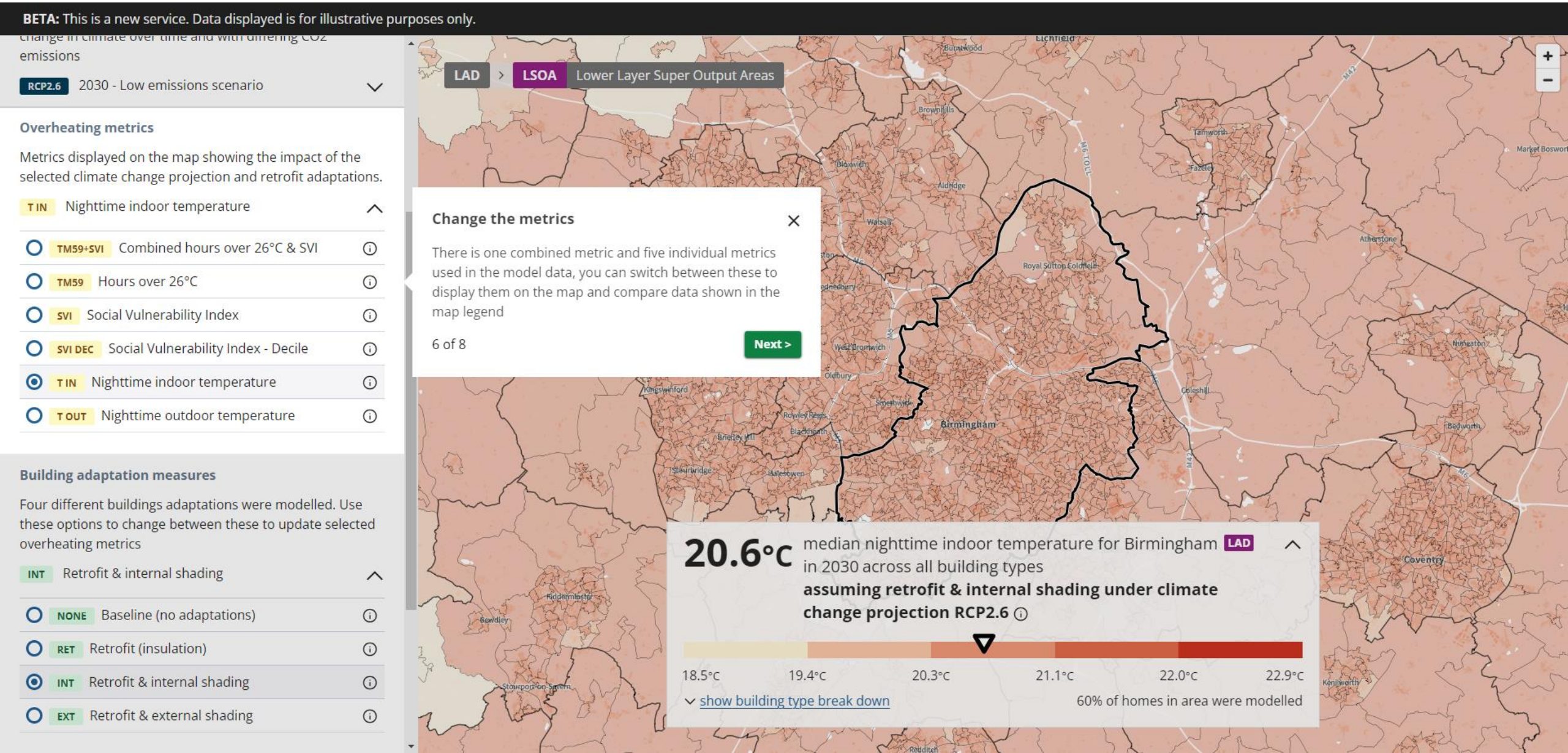
Change future climate projections



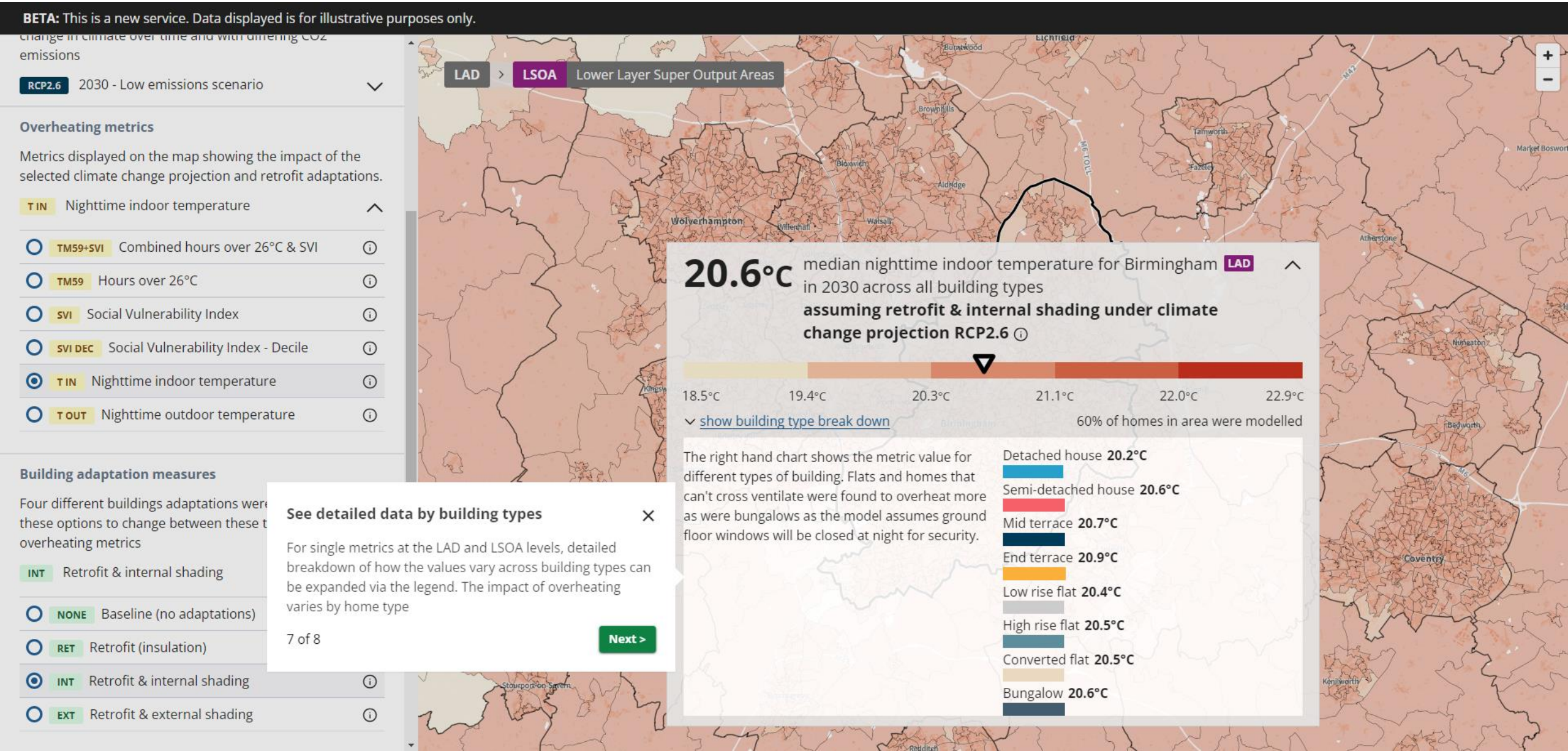
Apply different mitigation and adaptation measures



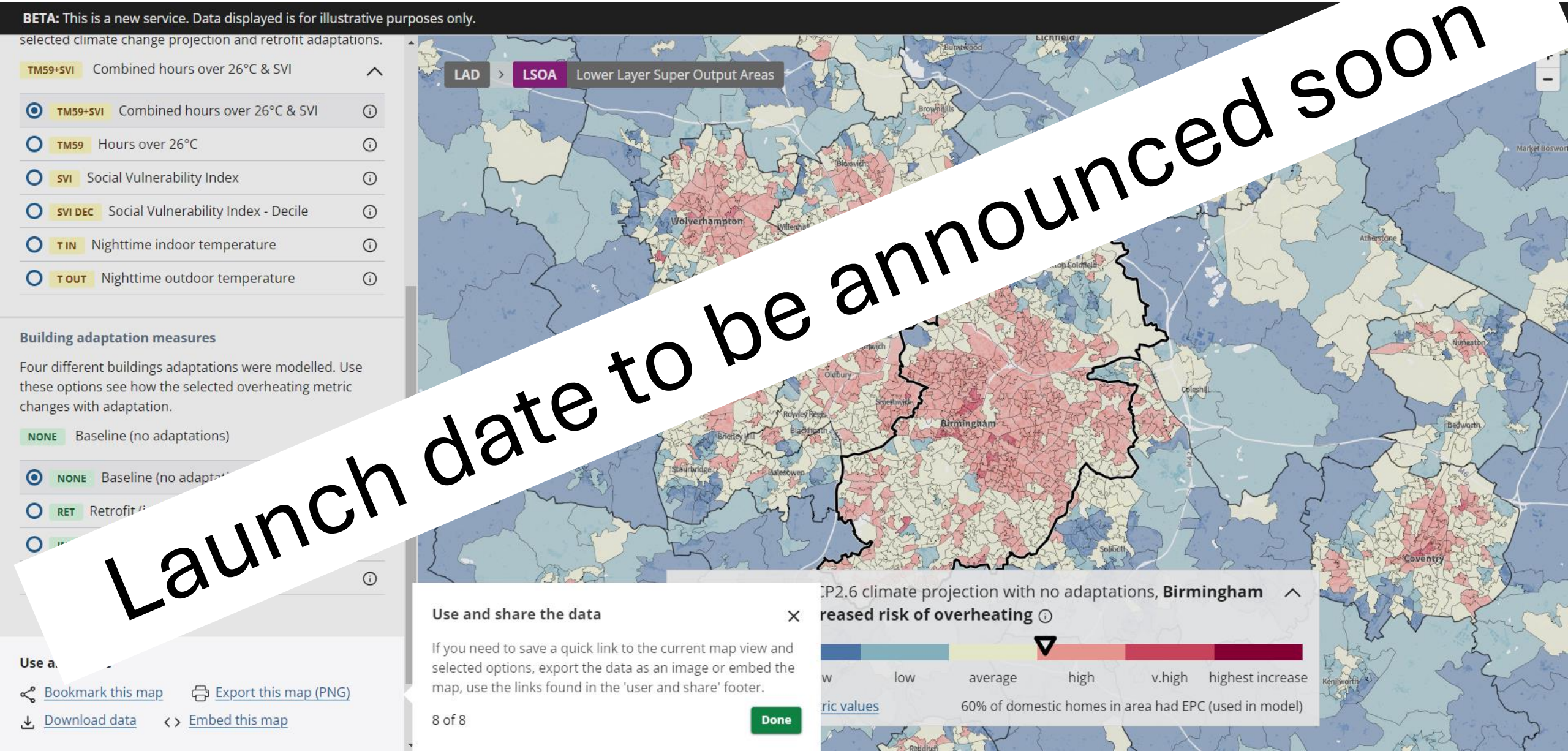
Select from a range of metrics



Investigate impact in different types of home



Save data views and export data to GIS via API



Launch date to be announced soon

Many thanks!

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