

Retrofit at Scale

Solving the System Challenge

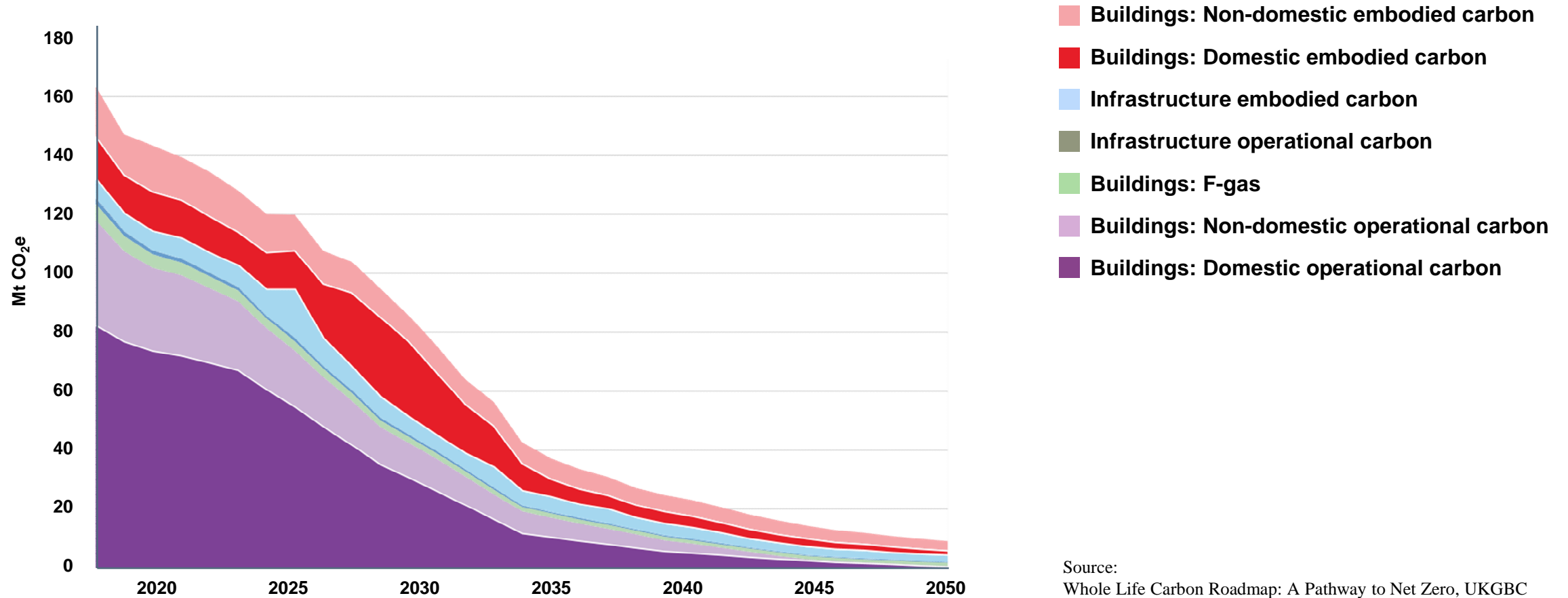
Helene Gosden, Arup

Retrofit at Scale Taskforce Leader

15th November, 2022 for Oxford Energy Network



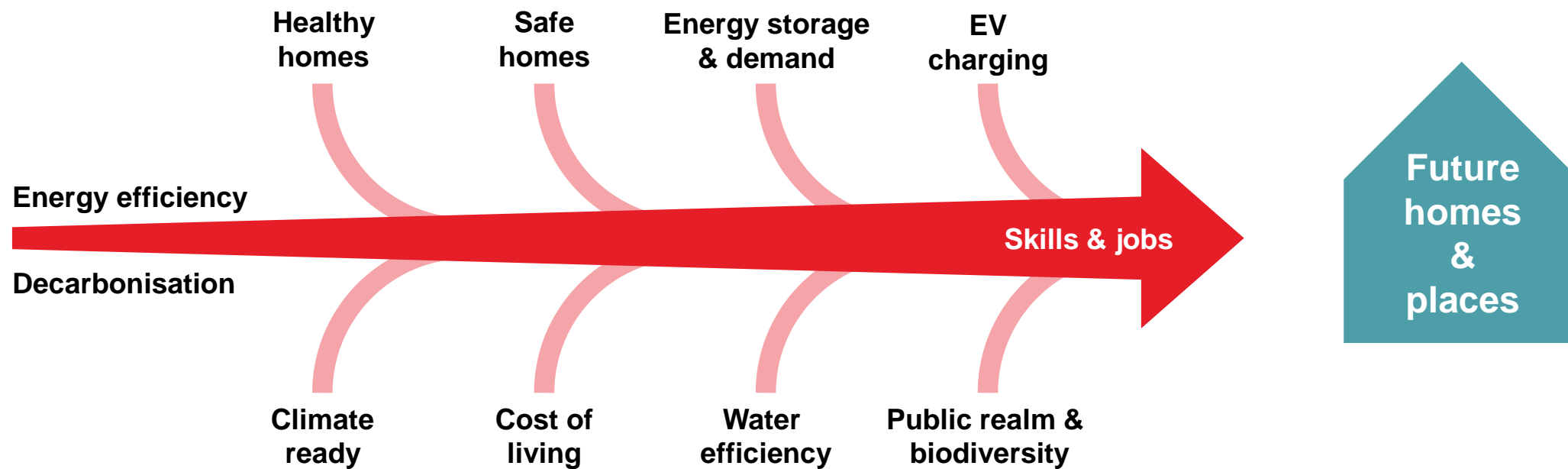
Carbon context



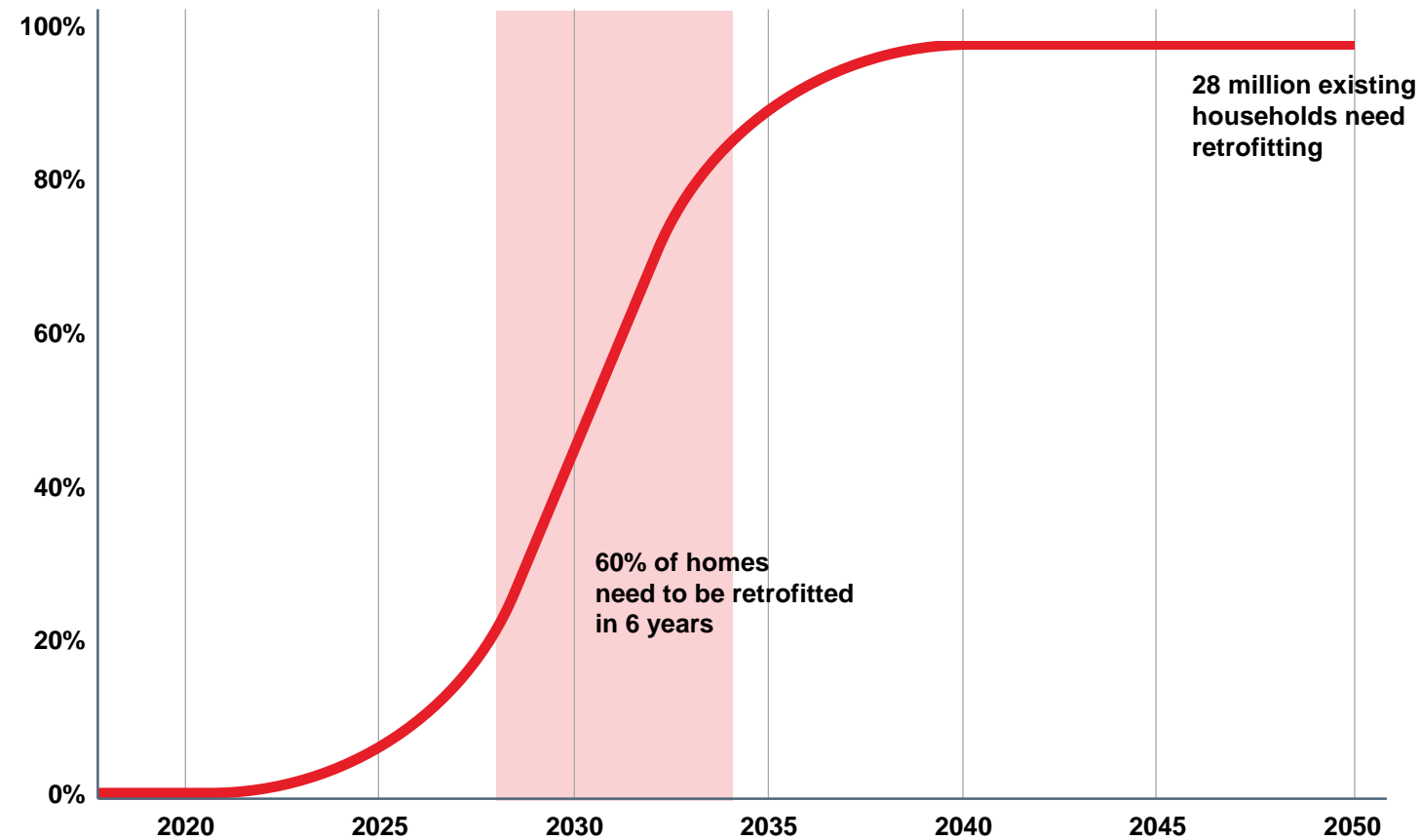
Source:
Whole Life Carbon Roadmap: A Pathway to Net Zero, UKGBC

Future-ready homes

Coordinated transition planning for homes



Proportion of domestic stock retrofit



Source:
Net Zero Whole Life Carbon Roadmap: Technical Report, UKGBC

Headline Numbers

16 million

Homes to be retrofitted in the middle of the S-curve over 6 years to 2035

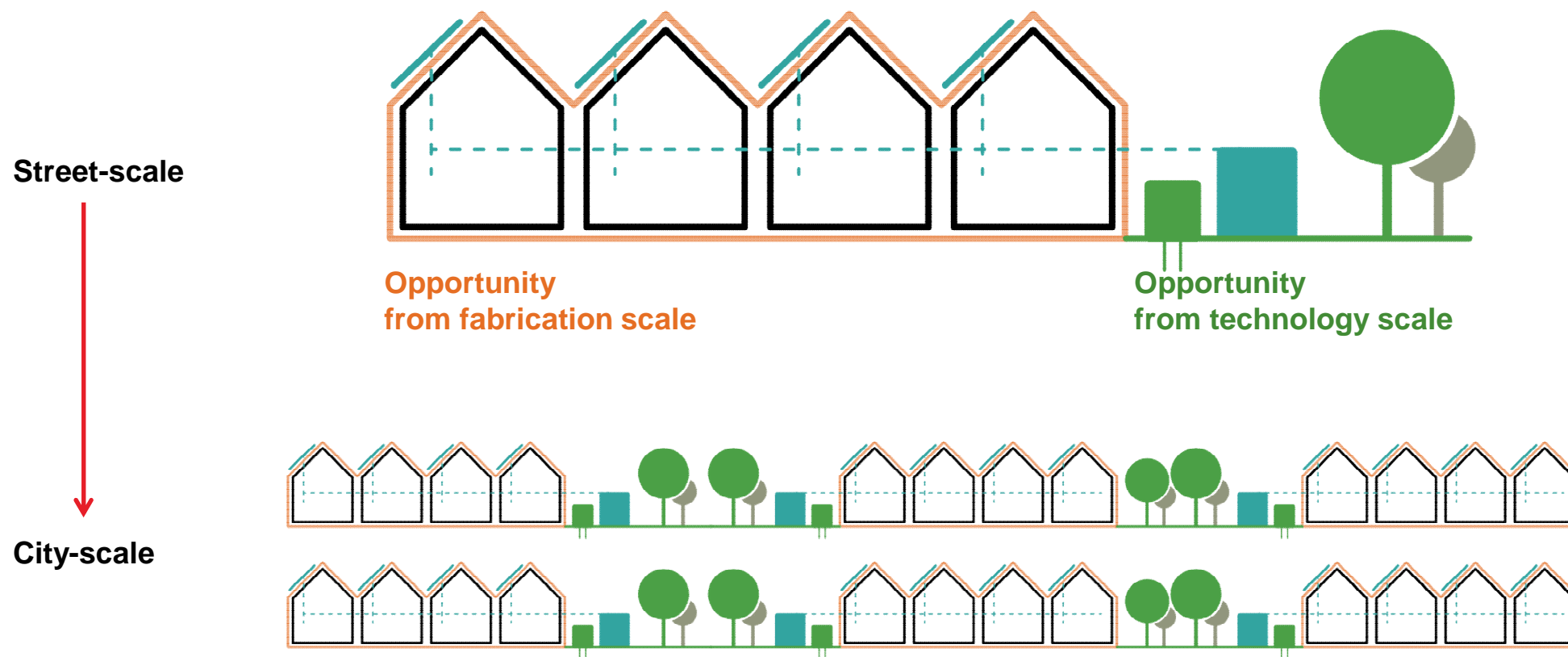
215

Top tier local authorities in the UK

12,500

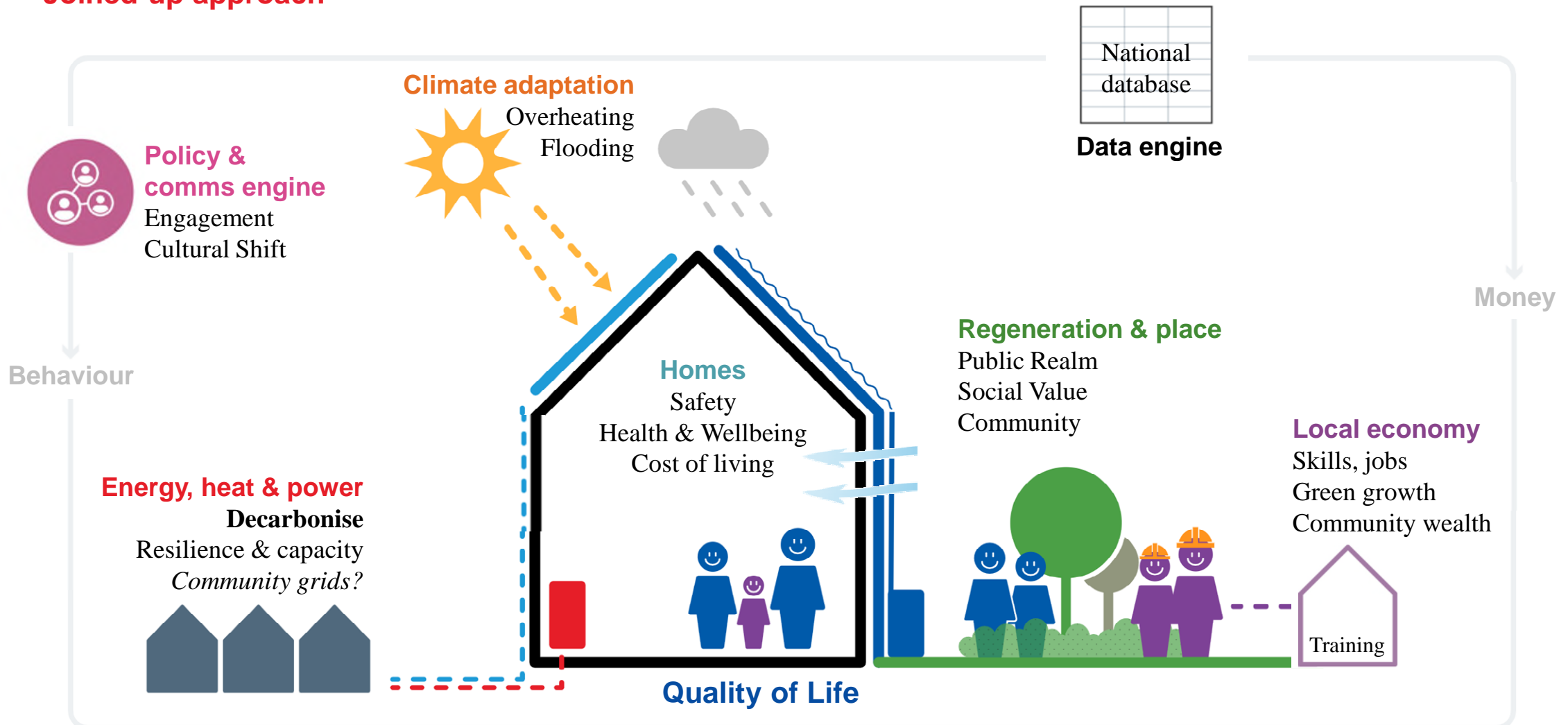
Homes to be retrofitted per LA, per year in that period

Scale enables greater opportunity



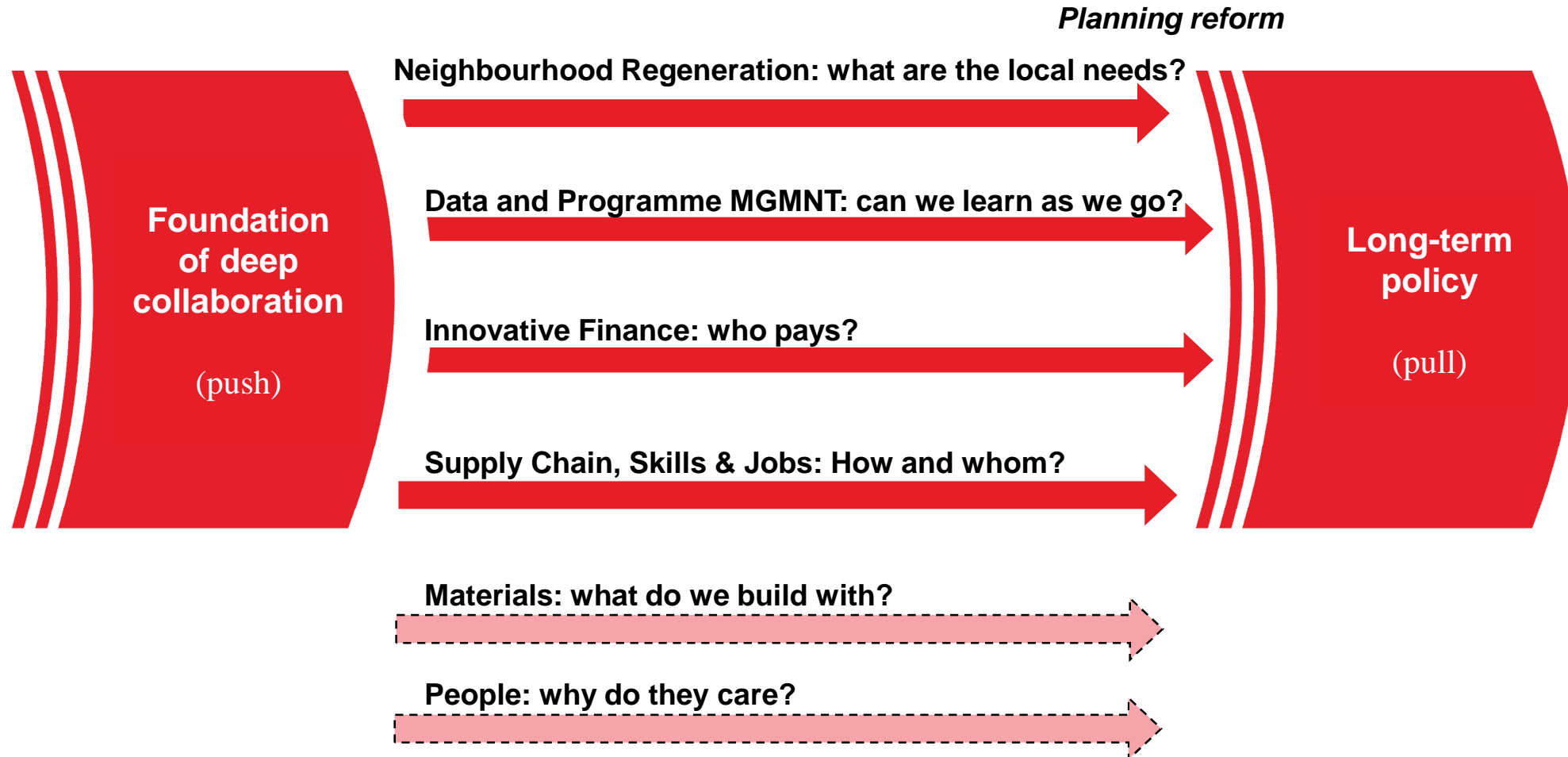
Retrofit at scale: “Whole country” retrofit plan

Joined-up approach



Arup Focus Areas

Towards a successful delivery model



UNSDG 11



Wolverhampton Net Zero Neighbourhood Demonstrator Plan for Graiseley



WMCA - NZN Demonstrator Programme



Net energy needs are reduced through demand reduction measures



Remaining energy needs for vehicles, thermal and electrical energy are met through decarbonised energy sources



Wider measures are taken to create a sustainable place to live

£1.65m available to fund the first phase of a NZN from the 5 areas that expressed an interest.

A ***Delivery Plan*** had to be submitted by the 6th July 2022.

Arup delivering Net Zero Neighbourhoods

Providing the whole package to establish the case for investment

The place you want to create			What you will do		How you will fund it	How you will deliver it
Vision	Neighbourhood Baseline	Community Engagement Plan and Support	Project Options Appraisal	Capital Investment Plan	Funding and Finance	Project Delivery Plan and Support

Why Graiseley

Vision – place based outcomes and principles

To make the Graiseley net zero neighbourhood a healthy, inclusive, resilient and sustainable place to live, being an exemplar for the delivery of net zero neighbourhoods in other Wolverhampton communities, the West Midlands and across the UK



Lime Street Area

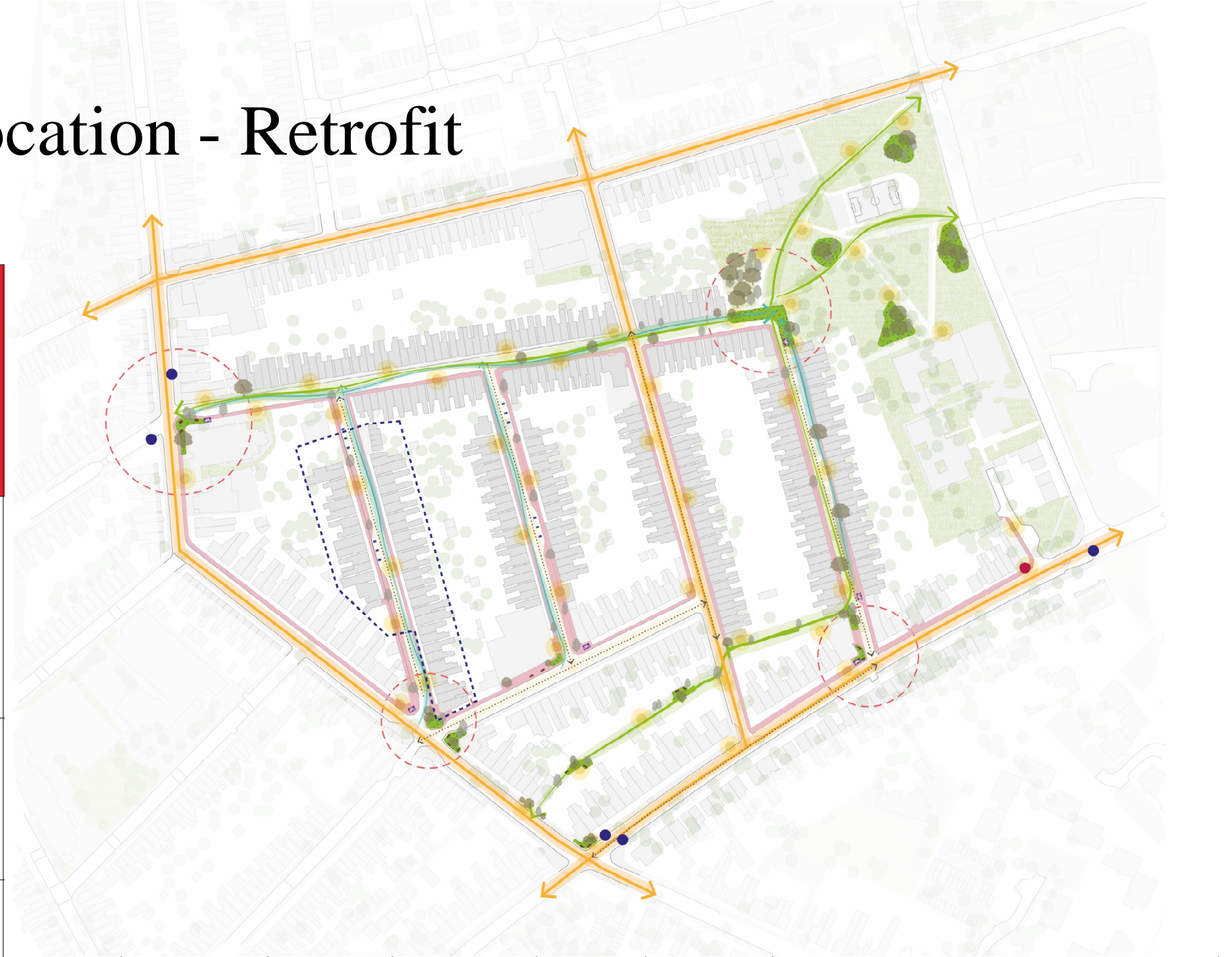
Street-level demonstrator interventions

- Existing Cycle Hire
- Existing Bus Stop
- Existing Tree
- Focus areas
- ➡ Green walking route*
- ➡ SUDs
- ➡ Main route with segregated cycle lanes*
- ➡ One way/ two-way system
- 🚲 Cycle racks
- 🌱 Pocket rewilding
- 🌳 Trees
- 🔌 EV charging
- 🪑 Benches
- 💡 Lighting
- 🛤️ Pavement
- 🔧 Deep retrofit (priority street)
- 🏠 Deep retrofit



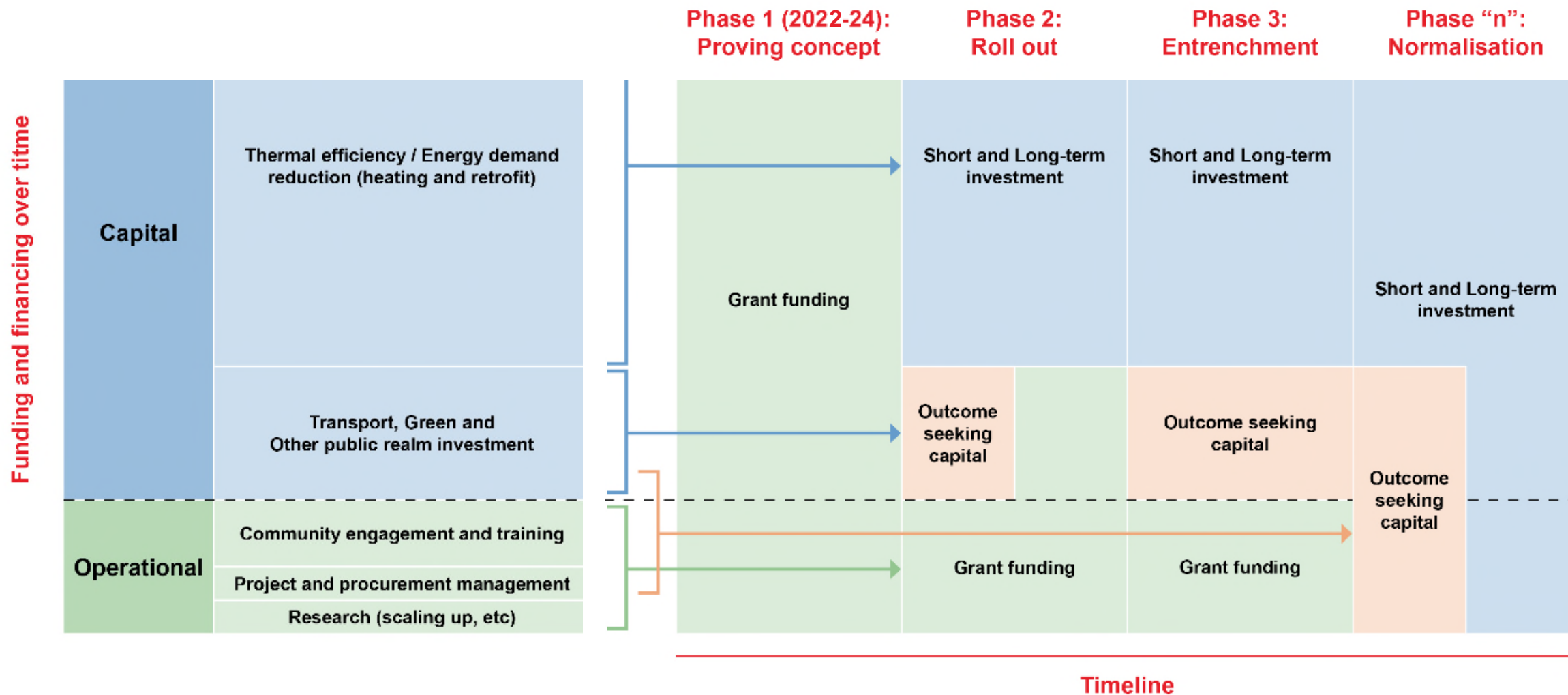
Funding allocation - Retrofit

Intervention	Dwellings
Deep retrofit (Loft + external wall insulation + floor insulation + A+ Double Glazing + ASHP + Solar PV)	15
Targeted, low disruption retrofit (Loft insulation + Solar PV)	114
Total	129



Funding and Financing Options

Blending-finance for a holistic and sustainable programme



Key Takeaways

Not just another capital programme

Driving transformation and raising awareness of the importance of decarbonisation, net zero and shared responsibilities.

Addressing different types of housing

Graiseley is a varied neighbourhood whose urban fabric will benefit from different decarbonisation measures.

A comprehensive plan

That outlines actions under sectoral strategies, including housing retrofit and wider interventions.

Operating at scale

Move 21.5 ktCO₂e towards Net Zero with delivery partners and the community. Data driven monitoring and evaluation.

Place-based approach

Graiseley needs investment, and has many key strengths and assets. Creation of a place-based team for delivery.

Underpinned by engagement

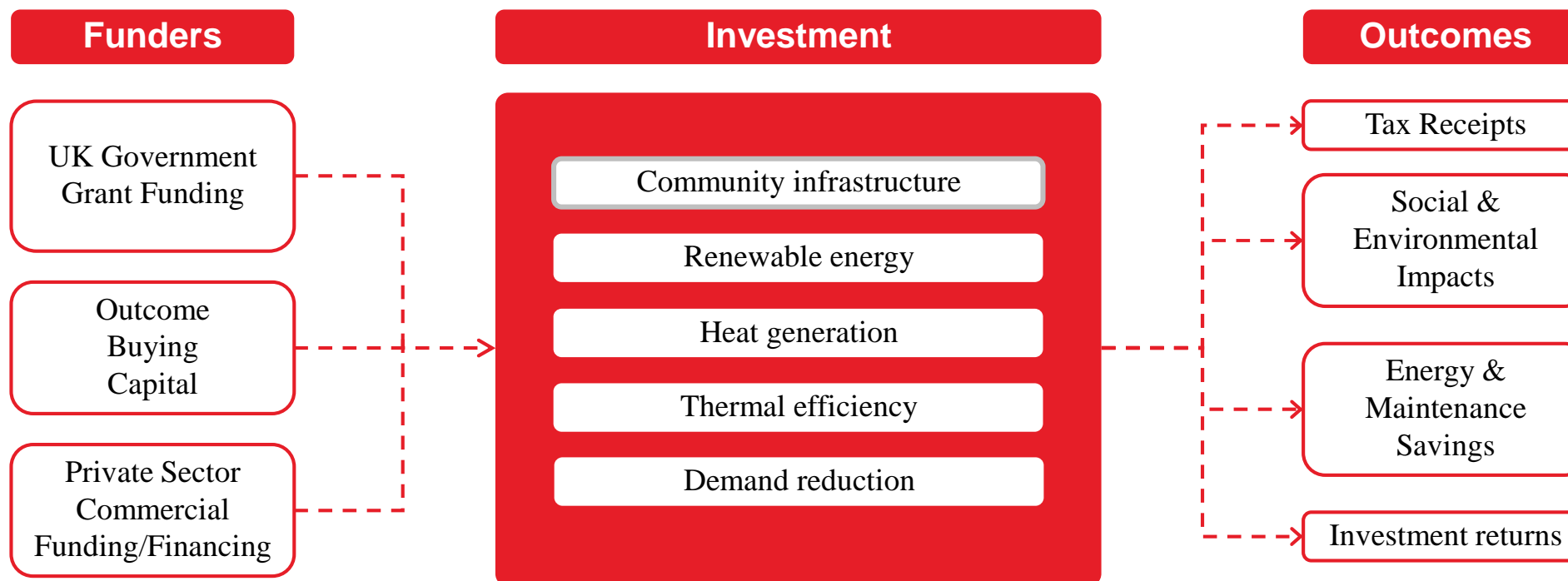
Each sectoral strategy is linked to community and stakeholders, including consultation, training and co-creation and production.

\$3.6 trillion

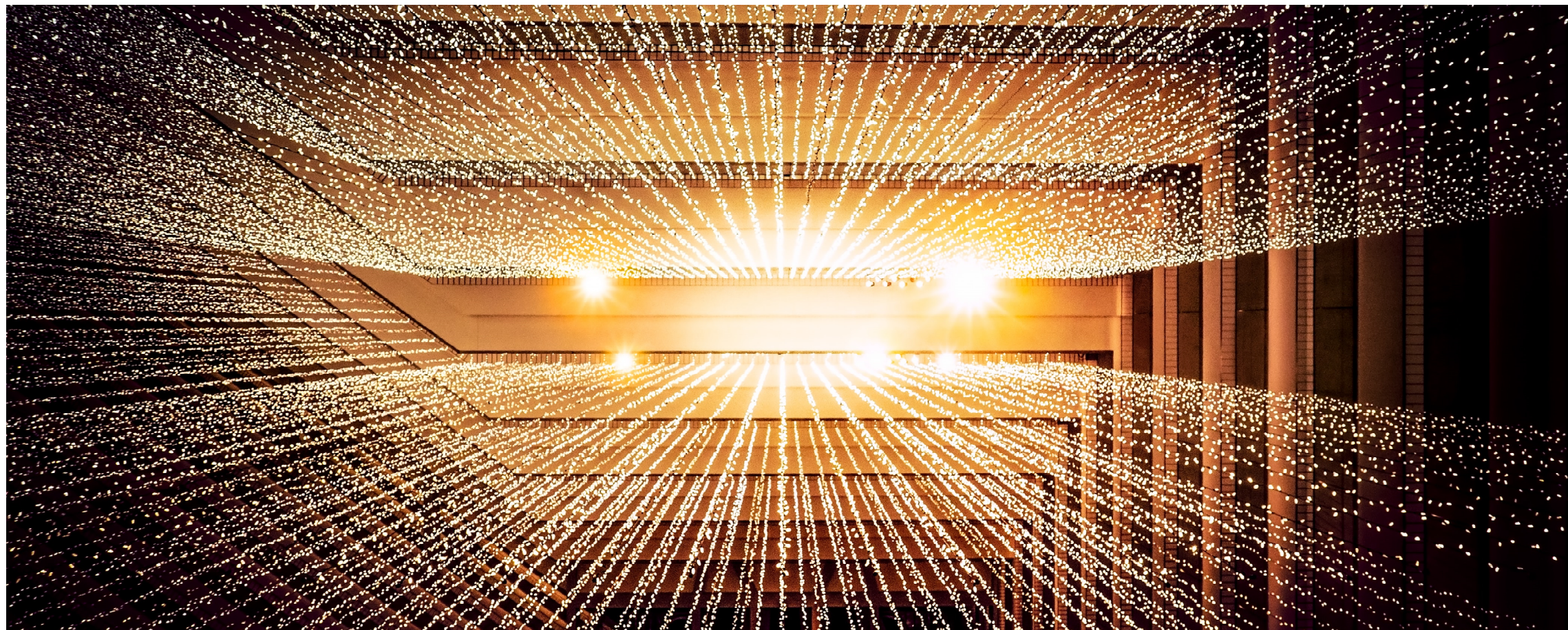


An outline funding/financing model

Combining and bundling funding, investment and value focused outcomes



Data is key

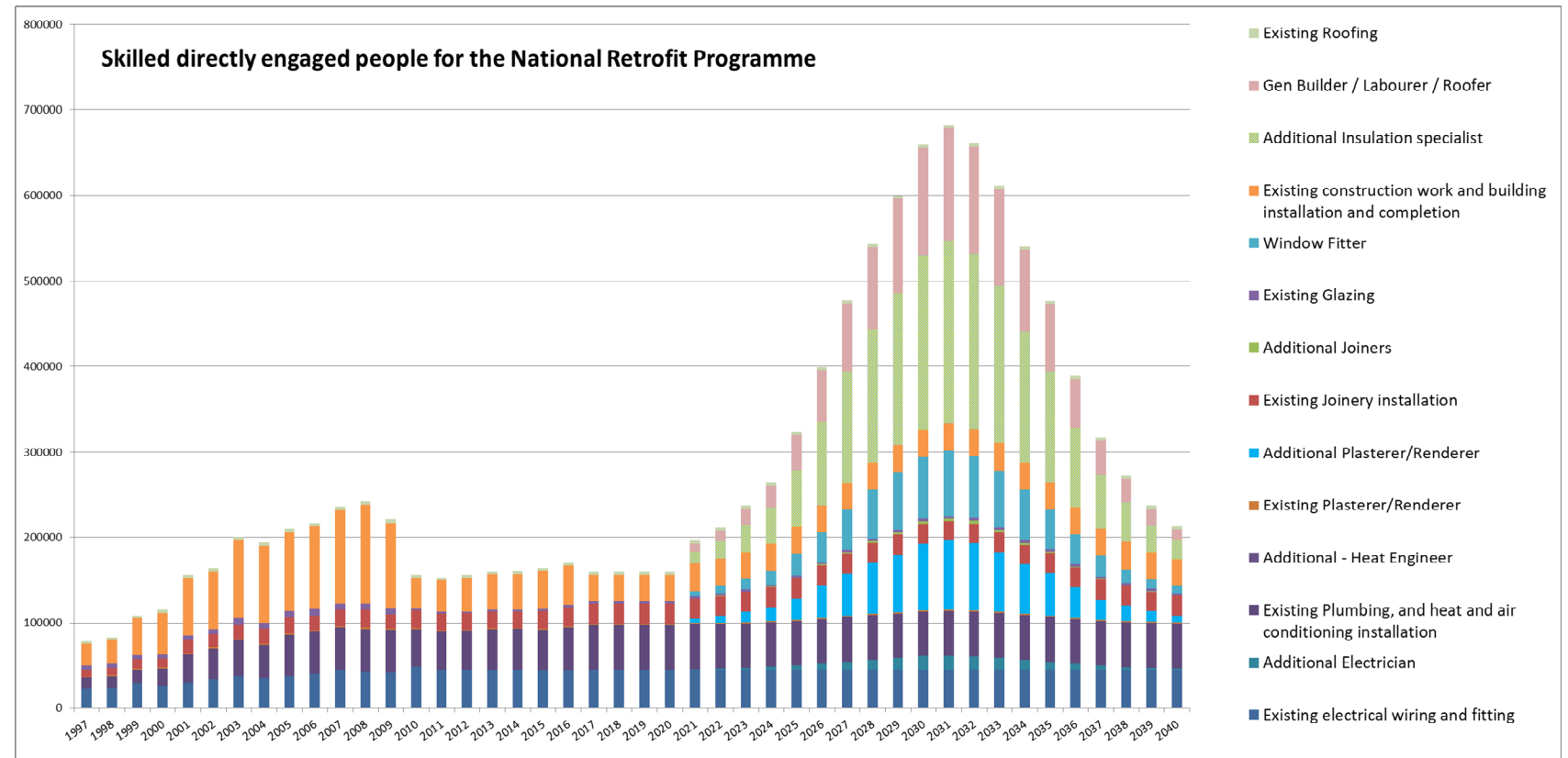


Labour and the Supply Chain

Trust:

- Advice
- Support
- Customer Service

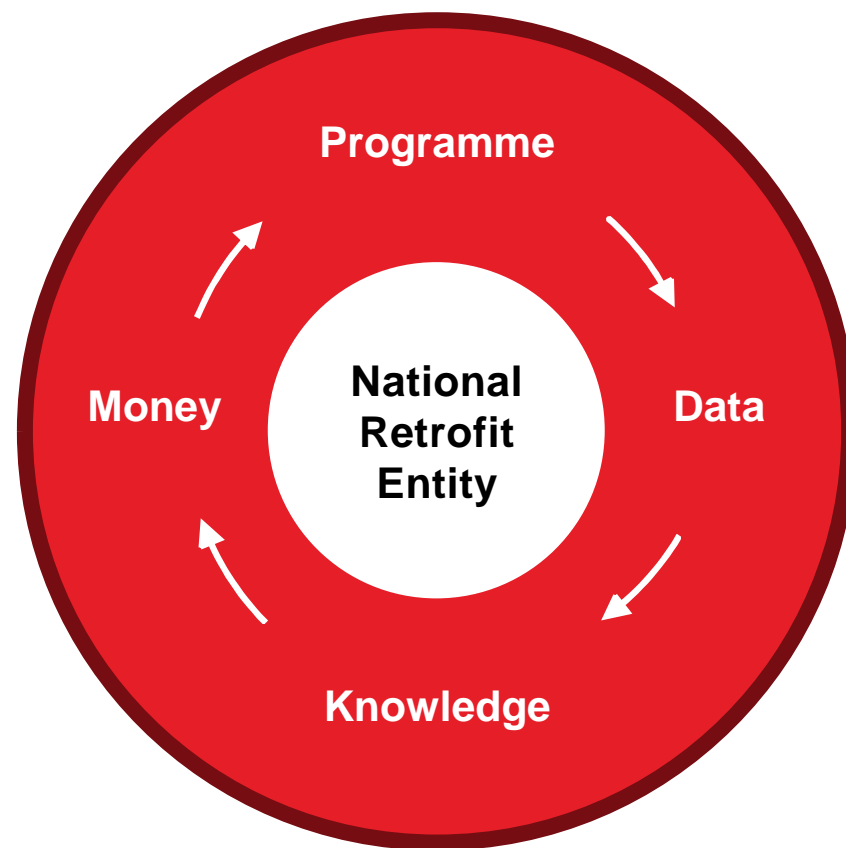
- 35,000 Retrofit Coordinators required



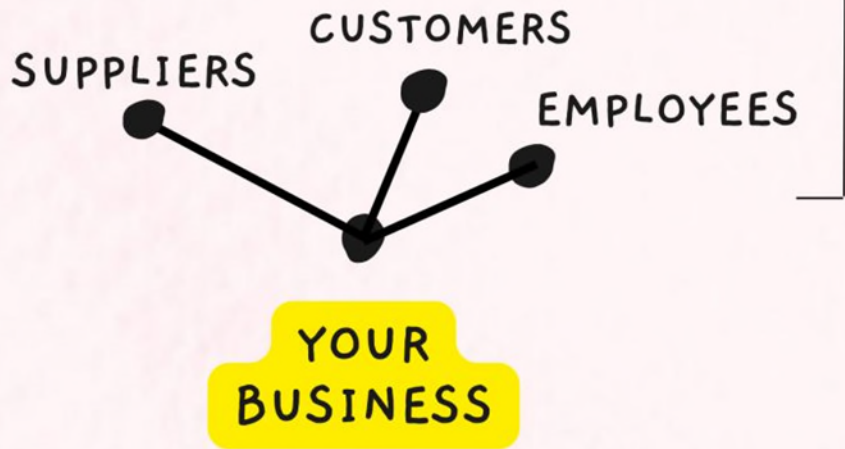
Overcoming Fragmentation



A National Entity



WHAT BUSINESS IS COMFORTABLE DOING

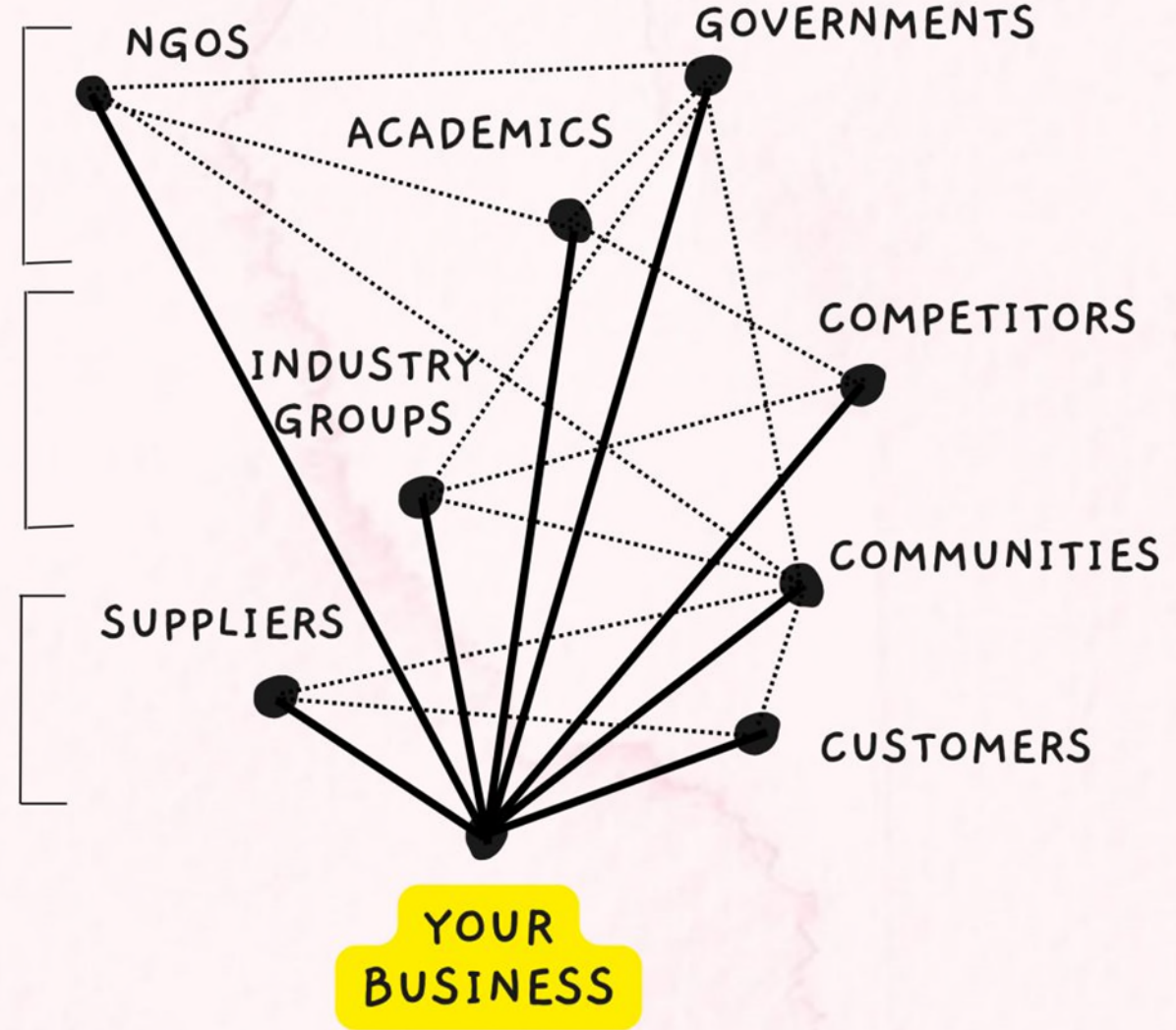


SYSTEM CHANGE

INDUSTRY CHANGE

VALUE CHAINS

WHAT THE EARTH NEEDS BUSINESS TO DO



A Place-based Approach



Q&A

Thank you for attending!

ARUP

Global Policy levers & finance.

Energiesprong (NL, FR, DE, UK) ([link](#))

Retrofit to net zero energy.

Financed by future energy cost savings.

Can be complicated in case of multiple ownership.

*IE

UK

Small scale demonstrators:

- Retrofit/low carbon heat as service (e.g. [link](#)).
- Community Bond/Municipal investments (e.g. [link](#)).
- Capital repayment through capturing long term energy savings.

NL

Government secure loans (Low risk/low yield) (~1.2bn Euros)

Assumption that asset owners will pay for the cost.

IT = 110% EcoBonus

110% fiscal incentive from the government for works that achieve an improvement of 2 classes of energy rating and reduce seismic risks. Paid through tax deductions over a period of 5 years ([link](#)). BUT Retrofit costs doubled due to demand. Supply chain was not ready and not investing due to extensions.

Korea (ROK)

“1M low-carbon buildings” ,focus being mostly on the building maintenance.

Most efforts are led at municipality level.

Loan support through BRP (interest free, 8 yr repayment) ([link](#)).

Singapore (SG)

Focus on repurposing existing assets to optimise GFA and value. There isn't any policy for retrofit. Any buildings retrofit is driven by asset owners.

Kenya (KE)

Testbed for efficient cooling as a service.

Canada (CA)

Rebates on energy efficiency home improvements, renewable energy and energy efficient products ([link](#)).

*

Ireland (IE)

National Retrofitting Scheme:

- Multi-annual grants to homeowners to do retrofits.
- Commitment and certainty to attract investments from supply chains.
- One-stop-shop approach.

Boston & NY (USA)

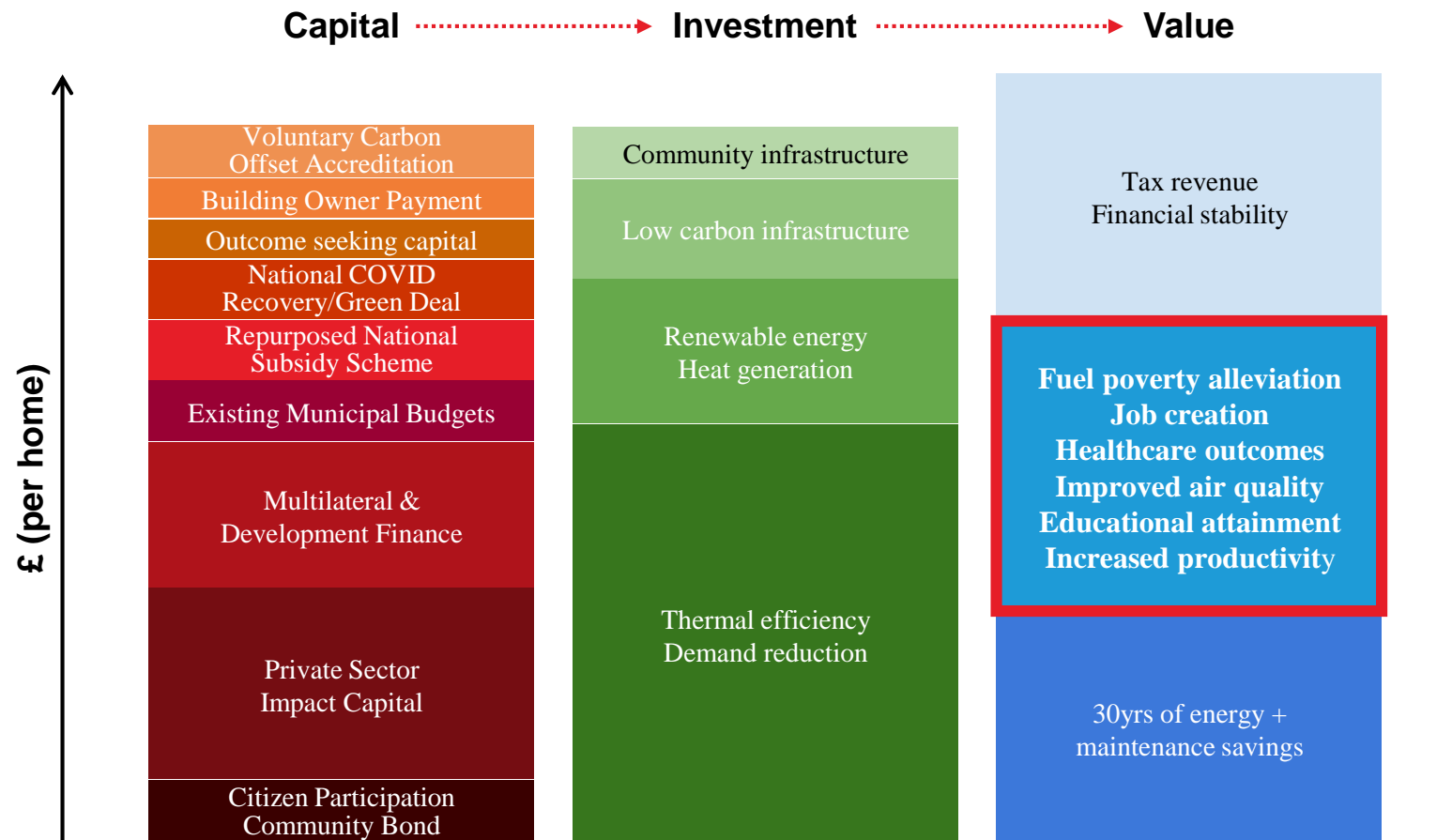
Strict enforcement of buildings' emission limits. Reporting, disclosure and certification.(BERDO, [link](#)).

What do we need to scale?



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Retrofit at Scale Economics



Vision

Why must we act?

What will we do?

How will we do it?

Energy Efficient Buildings

A Place for People not Cars

Consuming Less, Recycling More

A Greener, More Resilient Borough

A Place for People not Cars

2030 Vision: The safe streets and great pedestrian and cycling infrastructure means that most resident journeys are made by walking, cycling or taking zero emissions public transport that is accessible to all. Waltham Forest is a great place to live, with less traffic, less noise, and less pollution. Creating places for people rather than cars will support and strengthen the communities who need it the most.

Key target: At least 80% of journeys in Waltham Forest are made by walking, cycling or other public transport modes.

Climate Actions

Council Leadership

Examples

+ ACTION 9
Expand EV charging across the borough

+ ACTION 7
End the waiting list for cycle hangar spaces

+ ACTION 10
Reclaim streets for people

+ ACTION 12
Develop 15-minute neighbourhoods to ensure the needs of residents and businesses can be met locally

+ ACTION 8
Key Disruption for Climate Justice
Break free from our dependence on the private car

+ ACTION 11
Repurpose borough car parks for other uses

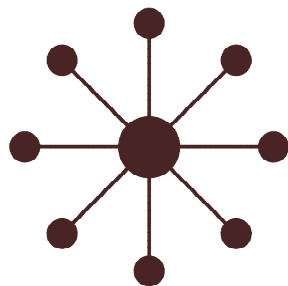
Levers & Finance: Italy



IT – 110% EcoBonus

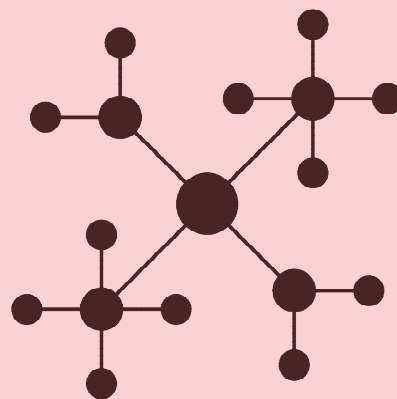
- 110% fiscal incentive from the government for works that achieve an improvement of 2 classes of energy rating and reduce seismic risks. Paid through tax deductions over a period of 5 years ([link](#)).
- Option to pass the tax savings to companies carrying the work or a bank.
- High uptake but uncertainty affected the long-term investment in supply chains and capacity for retrofits at pace and scale.
- Pricing of works according to government list of public works pricing. Detached from real market costs.
- Retrofit costs doubled due to demand. Inflation increased. Issues with materials and equipment availability.

Local 'one-stop shops'



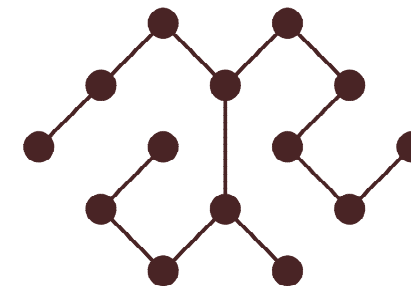
Centralised

One node does everything



Distributed

Nodes distribute to sub-nodes



Decentralised

Nodes are only connected to peers

Levers & Finance: Ireland

IE



Ireland (IE)

Irish Government National Retrofitting Scheme ([link](#))

- Sustainable Energy Authority of Ireland (SEAI)
- Target to retrofit 500,000 dwellings by 2030
- Multi-annual grants (~up to 50% of cost) to homeowners to do retrofits.
- Commitment and certainty to attract investments from supply chains. (8bn Euros)
- One-stop-shop approach (finance + contractors + customer service).
- Big Risks : materials / cost & availability, labour, inflation

The housing crisis

ARUP

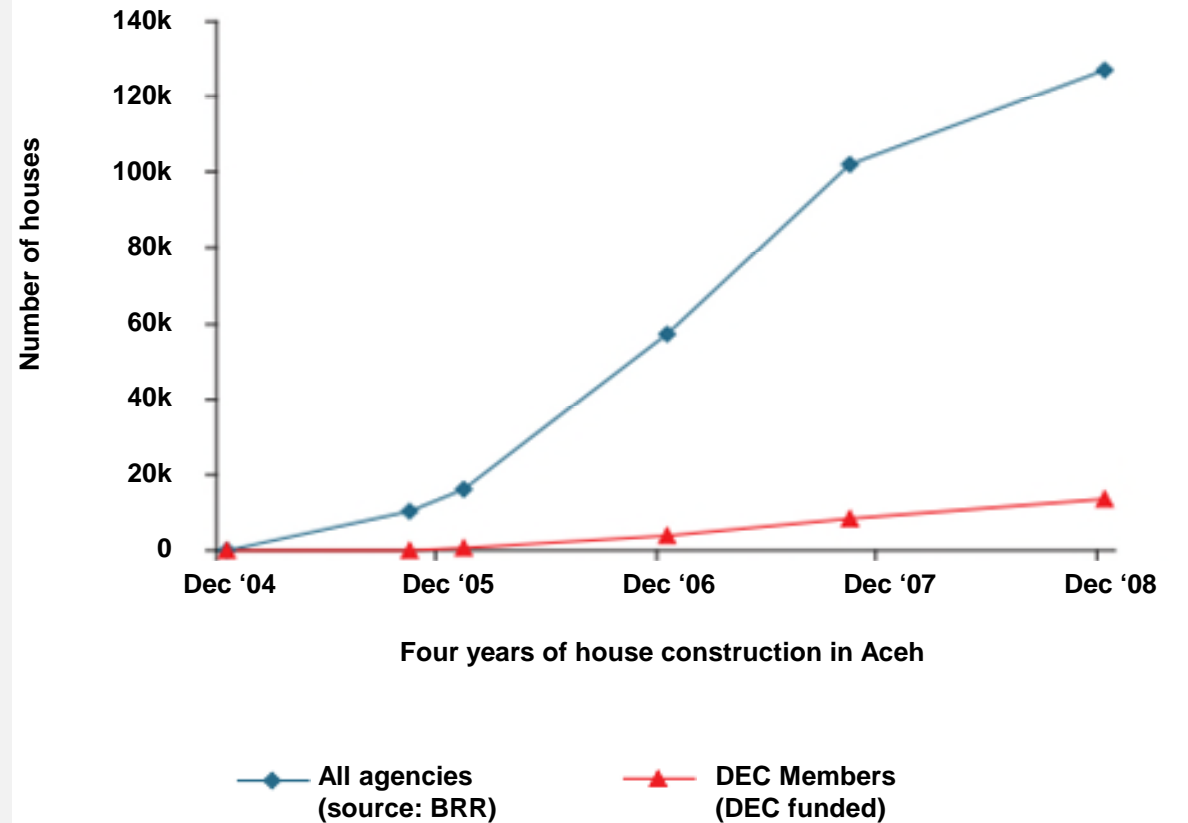
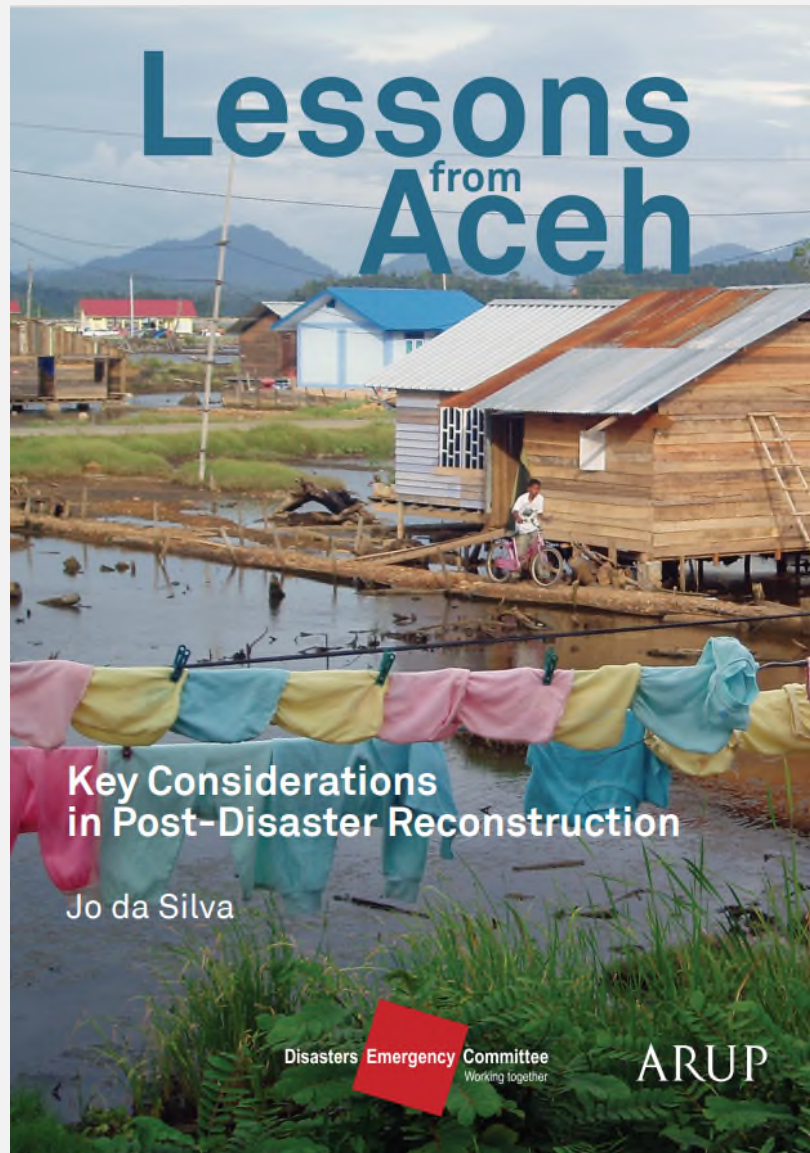


The climate crisis



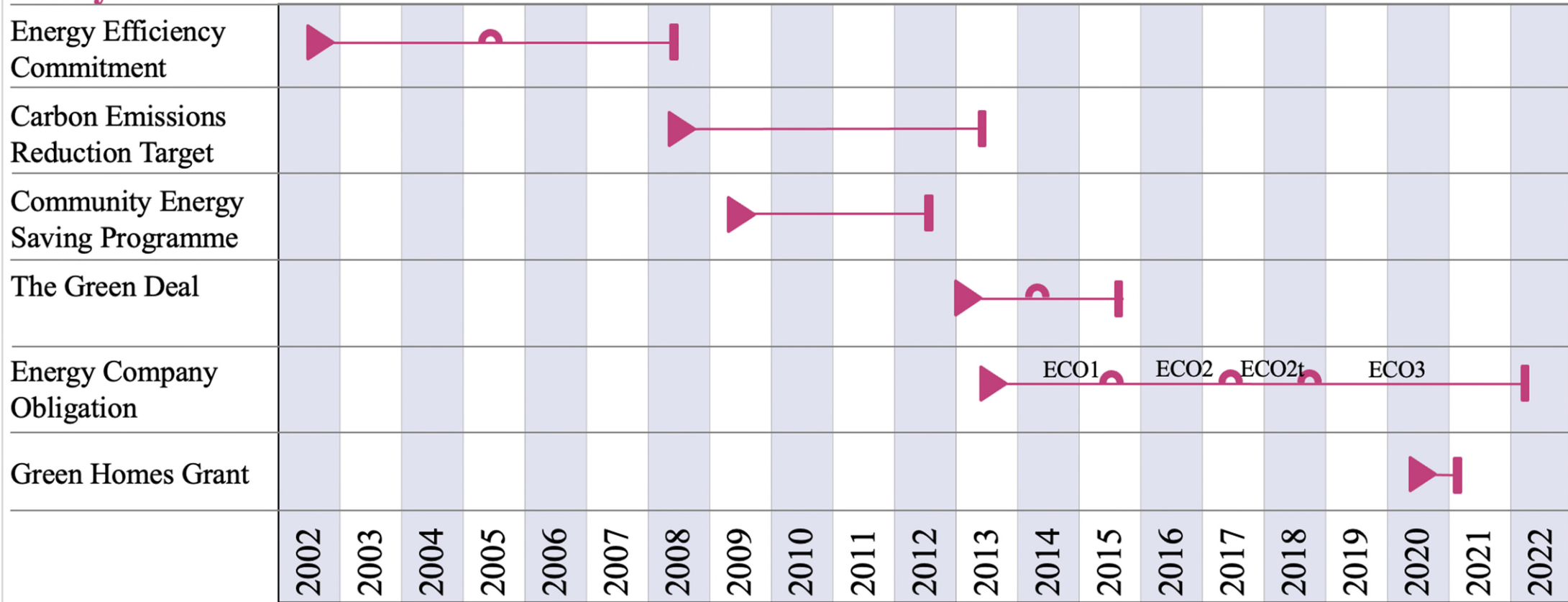
There is a 50:50 chance that the annual global temperature will temporarily reach 1.5°C above the pre-industrial level for at least one of the next five years.

World Meteorological Organization



Unstable Policy Environment

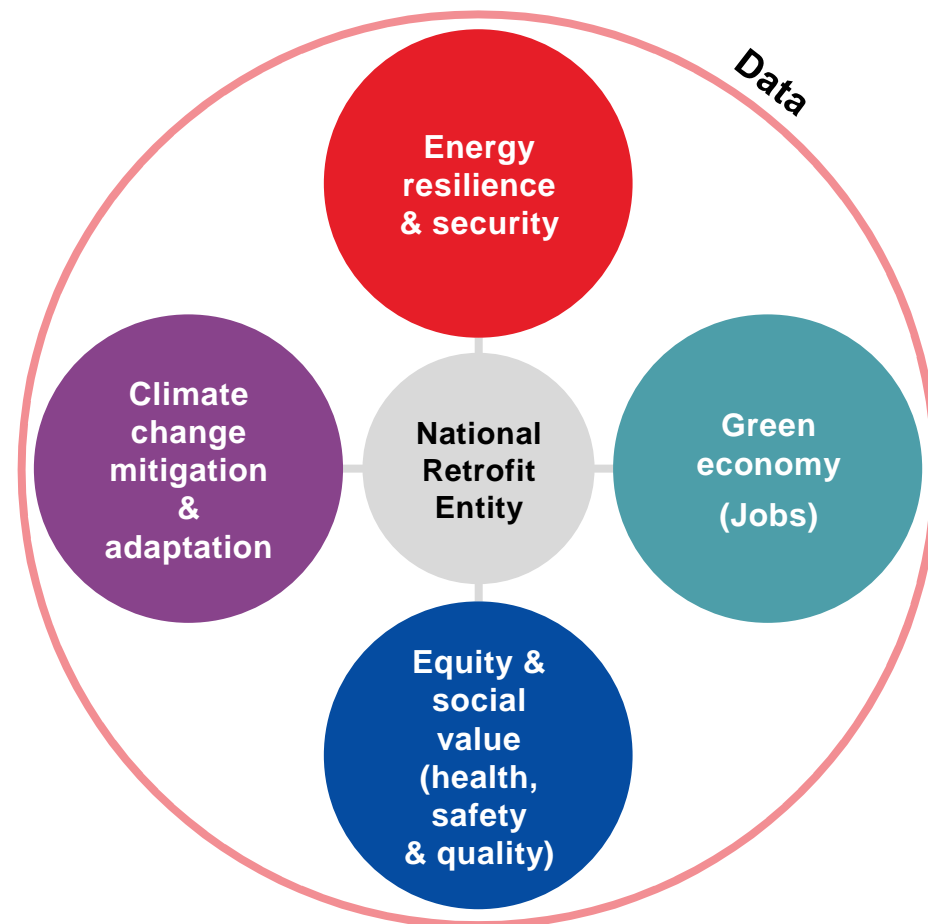
Policy



Key: Introduced Overhauled Withdrawn

System Outcomes

Define widest opportunity to attract investment and political will



Better homes



Any UK City

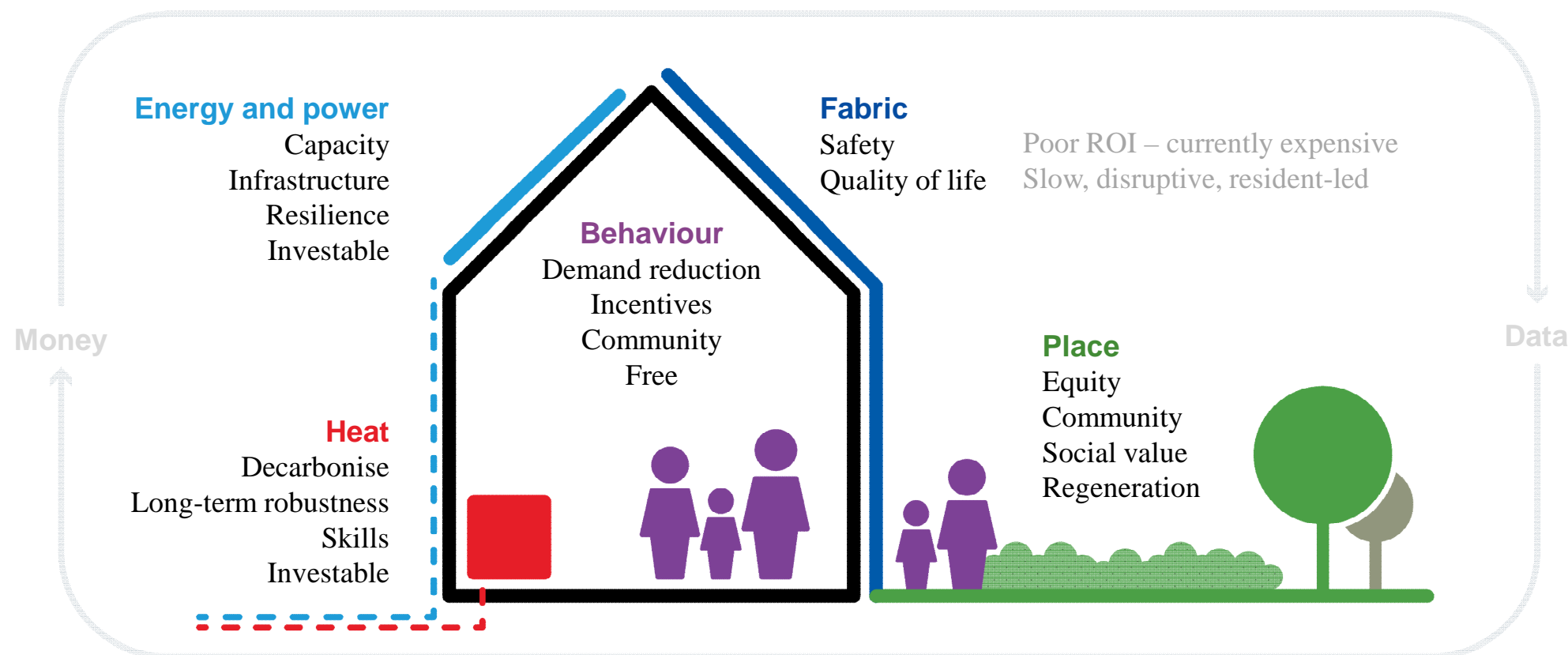


Newmarket Road, Cambridge
(image: Allia)



Goldsmith Street, Norwich City Council
(image: Mikhail Riches)

“Whole country” retrofit plan

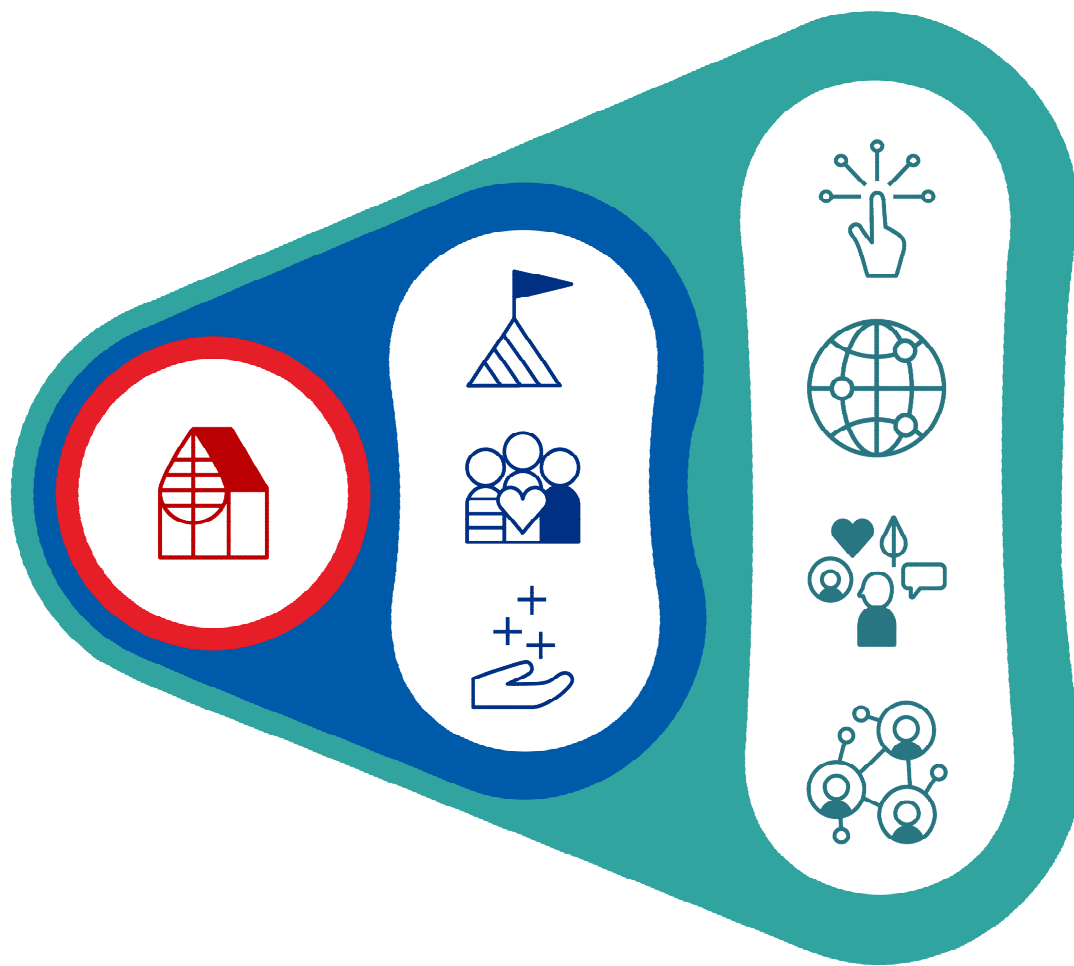


The equity crisis

% of people in social housing in fuel poverty



Better homes



The equity crisis

% of people in social housing in fuel poverty

17th March 2022



46%

1st April 2022



69%

1st October 2022
(if energy price cap hits £3200)



95%

We need a plan...



Retrofit at Scale – addressing the system challenge

Future Homes Consortium