

What can we learn from six years of deep retrofit innovation projects in the UK?

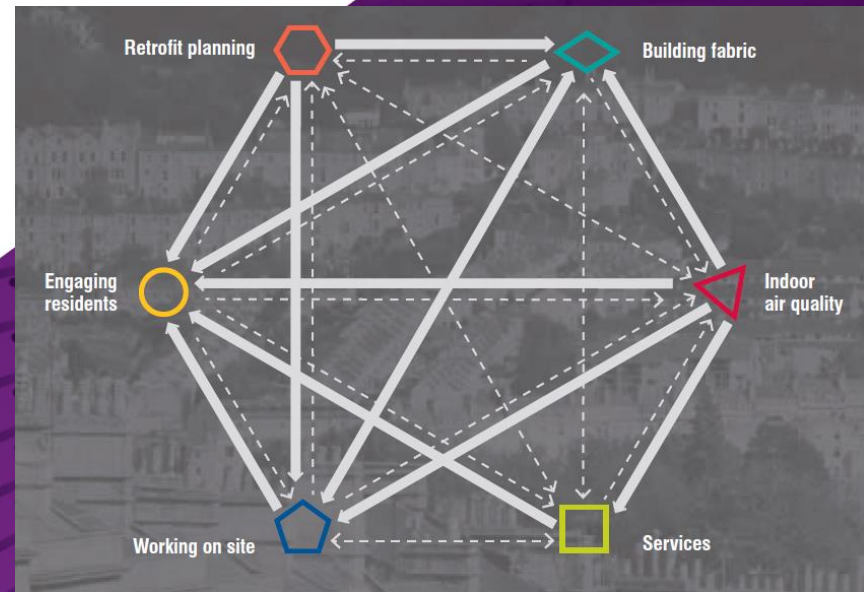
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12/11/2015



Agenda

- Intro to Innovate UK and our contribution to Deep Energy Retrofit (DER) innovation
- Does DER work?
- A framework for DER?
- How to unlock the market for DER?
- Looking ahead



**2007
start**

**Over 6,000
companies**

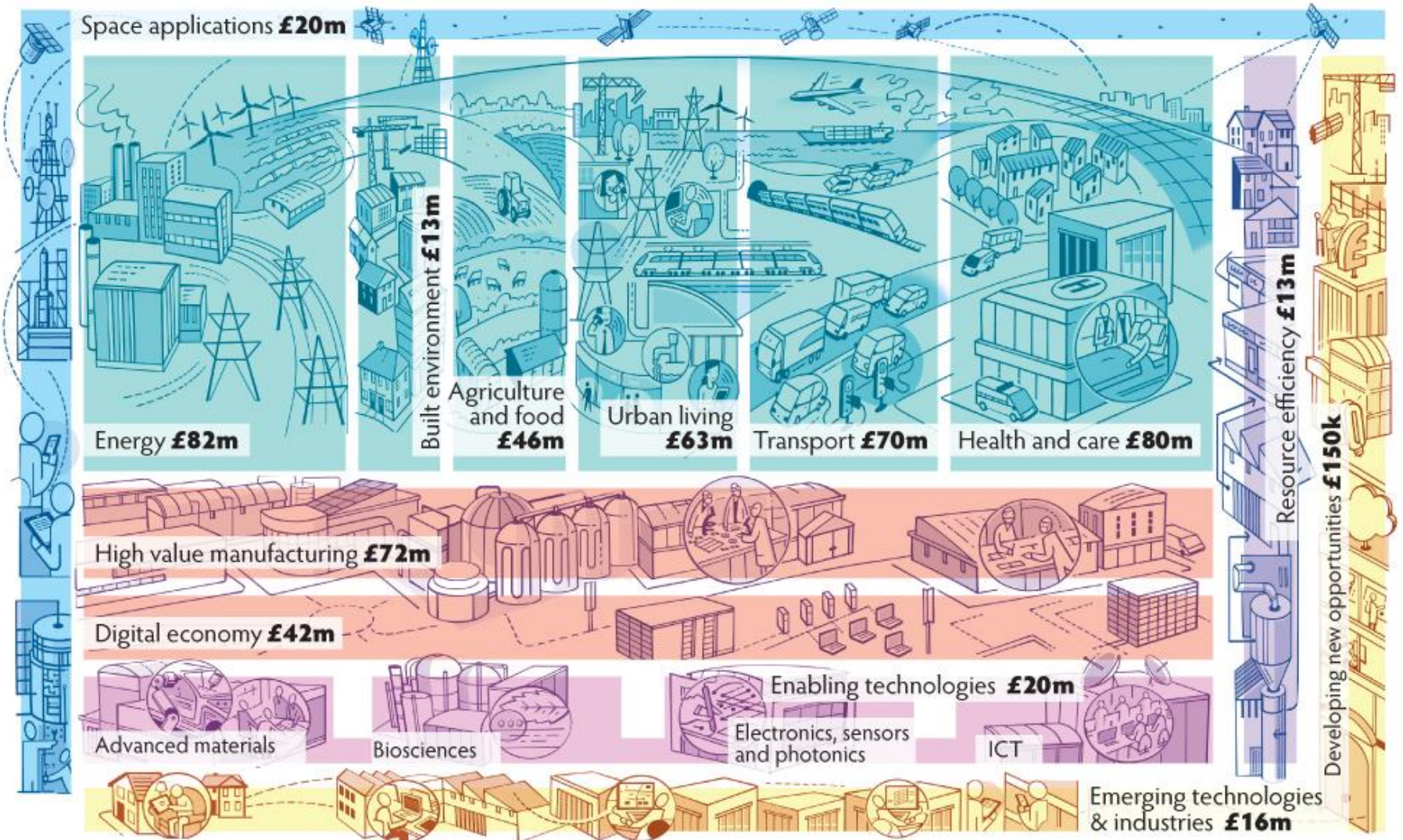
**£1.5bn
invested**

**RD&D
collabora-
tions**

35,000 jobs

**£7.5bn
returned**

Funding RD&D projects for new products & services within thematic areas



DER programmes (£41m, involving 100s of companies)

2009

- [Retrofit for the Future](#) [86pr, £17m]
- [Design and Decision Tools](#) [14pr, £4m]
- [Energy Efficient Whitehall](#) [10pr, £2m]
- [Building Performance Evaluation](#) [3pr*]
- Eracobuild (FP7) [Pr [1](#), [2](#), [3](#), [4](#), £1m]
- [Invest in Innovative Refurb](#) [10pr, £6m]
- [Scaling Up Retrofit of Homes](#) [9pr, £3m]
- [Future Energy Management](#) [10pr, £4m]
- [Building Whole-Life Performance](#) [£4m]

2015



Plus: [Knowledge Transfer Partnerships](#) and [Smart](#)

* 3 refurb; over 100 new-builds

Does DER work?

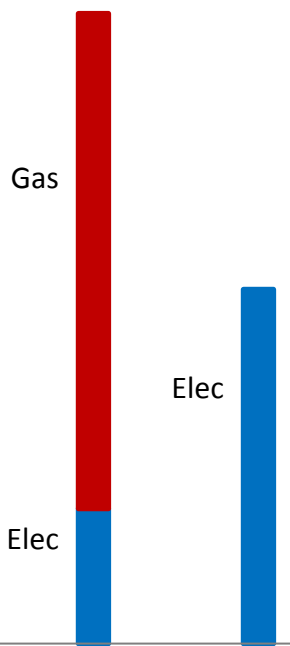


An absence of data holds back the market

- Policymakers cannot accurately value the benefits
- Long-term finance is limited to leveraging the energy savings

Housing:

kWh/m²/yr



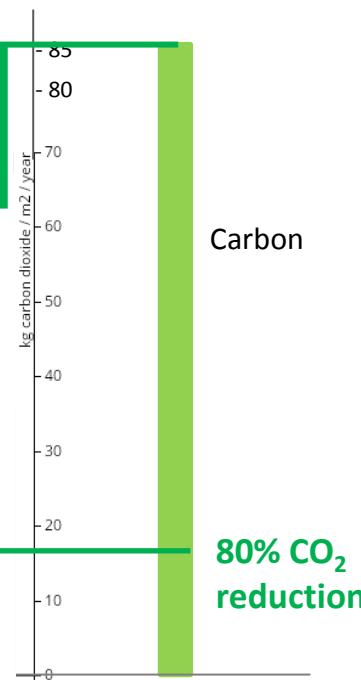
Typical home
(1990 data)

80% less

300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0.0

100% 100%

40%



Carbon

80% CO₂
reduction

kgCO₂/m²/yr

Typical home
(1990 data)

Energy bills and disposable income



Sam's energy bills... "About a pound a day."

➤ ***70% less than the UK average of £3.50 a day***



Economy, health & wellbeing, crime reduction



HOME >> IMPROVING YOUR HOME >> DECENT HOMES IMPACT STUDY

NCH and Nottingham Trent University Decent Homes impact study

What we've found out

Our 2012 report summarises everything we've found about the impact of the Secure, Warm, Modern programme:

- [Download the 2012 report](#)
- [Download a summary leaflet](#)

Our 2012-13 Update summarises the work that we've carried out since completing the KTP project.



[Download the 2012-13 update report](#)

For more detail on the following impacts, click on the links below:

<p>Final report</p>	<p>Crime</p>	<p>Energy efficiency and fuel poverty</p>	<p>Health and wellbeing</p>	<p>Employment and the local economy</p>
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What about non-domestic?



Non-domestic, building fabric



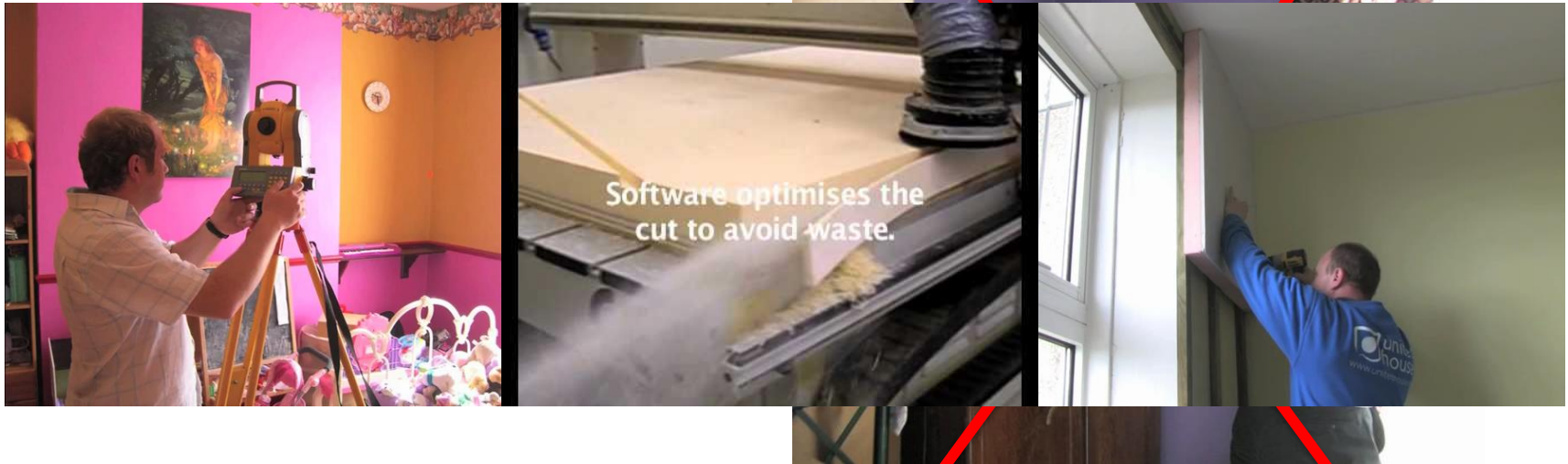
Dynamic EWI

- External Wall Insulation with positive heat recovery via a vacuum



www.jablite.co.uk/news/2013/oct/22/work-starts-on-first-jablite-decc-tsb-trial

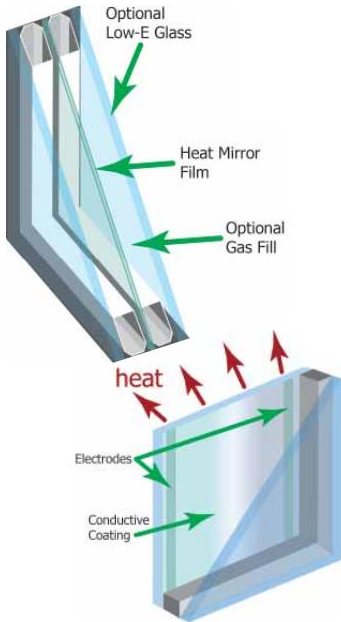
Non-domestic, building fabric



WHISCERS

- Internal Wall Insulation, using laser scanning and CNC manufacturing techniques. Reduces total install from five days to three.

Non-domestic, building services



Ridge & Partners, Oxford Brookes and Bristol University

- **‘Heated Glass’** and **‘Heat Mirror’** secondary windows, to improve thermal efficiency through radiant heating

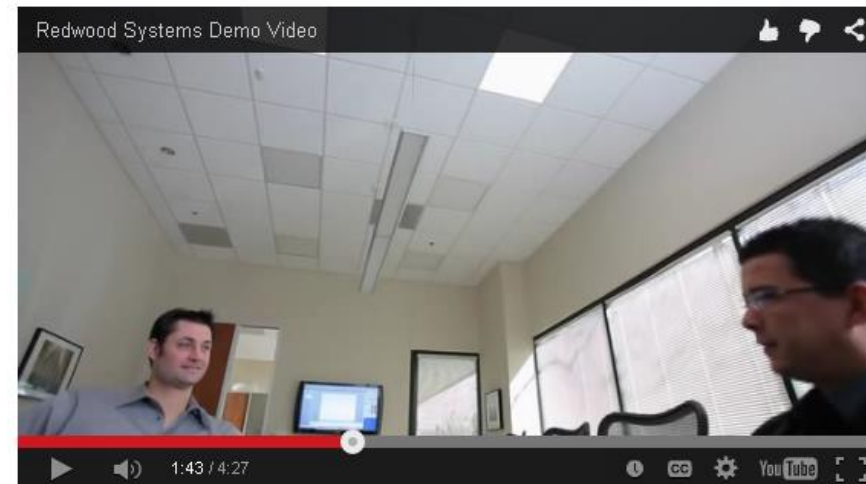
www.ridge.co.uk/RidgeDownloads/RidgeReview-2013Issue1.pdf

Kedington NI



- LED lighting with advanced controls

www.kedington.com/index.php?id=18



Non-domestic, specialist process energy

alquist[™]

- 37% of energy demand at typical data centres is for cooling.
- Using fibre-optic monitoring technology to sense temperature variation at 2m intervals to accuracy of 0.1 °C allowing for fine tuning.
- Savings of 20% cooling load and payback within a year

www.alquist.com/

A thousand points of light

Alquist has pioneered the use of fibre-optic based temperature sensing for data centres



How might we unlock the market for DER?



How might we unlock the market for DER?

1. Motivate the innovators to continue

- Clarify the future market
- Report to policymakers on the impact they have

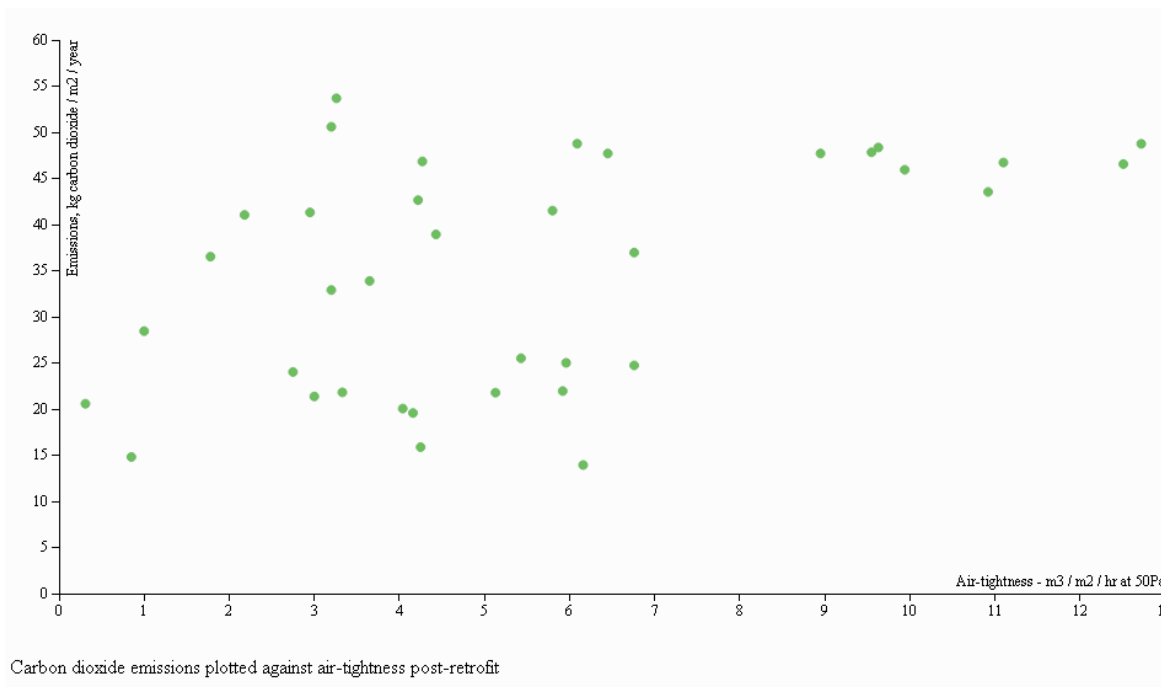
UK retrofit is a £200bn future market

Only if our leaders put clear
business incentives into place



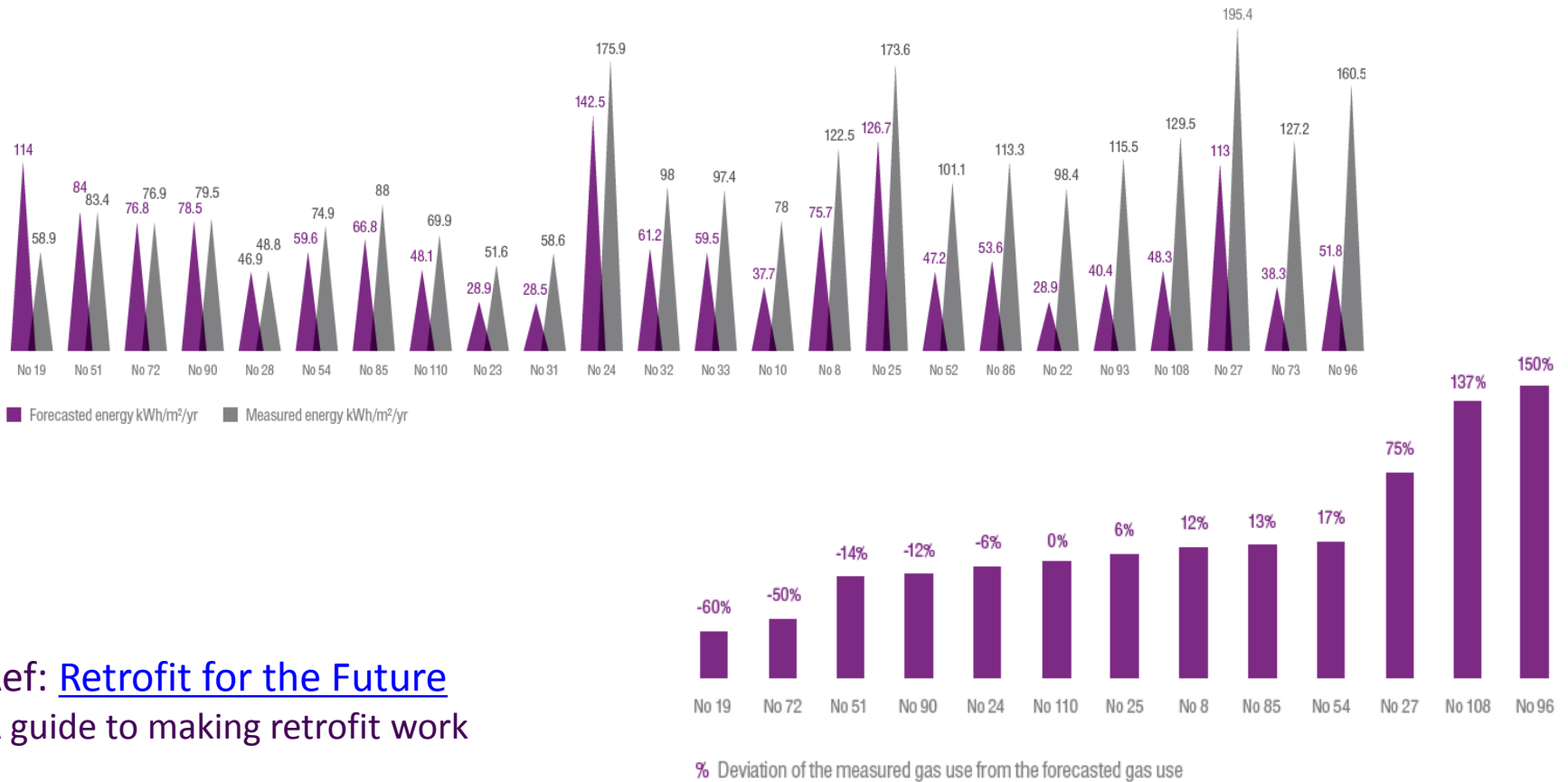
How might we unlock the market for DER?

2. Improve accessibility to the latest research outcomes



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Ref: [Retrofit for the Future](#)
A guide to making retrofit work

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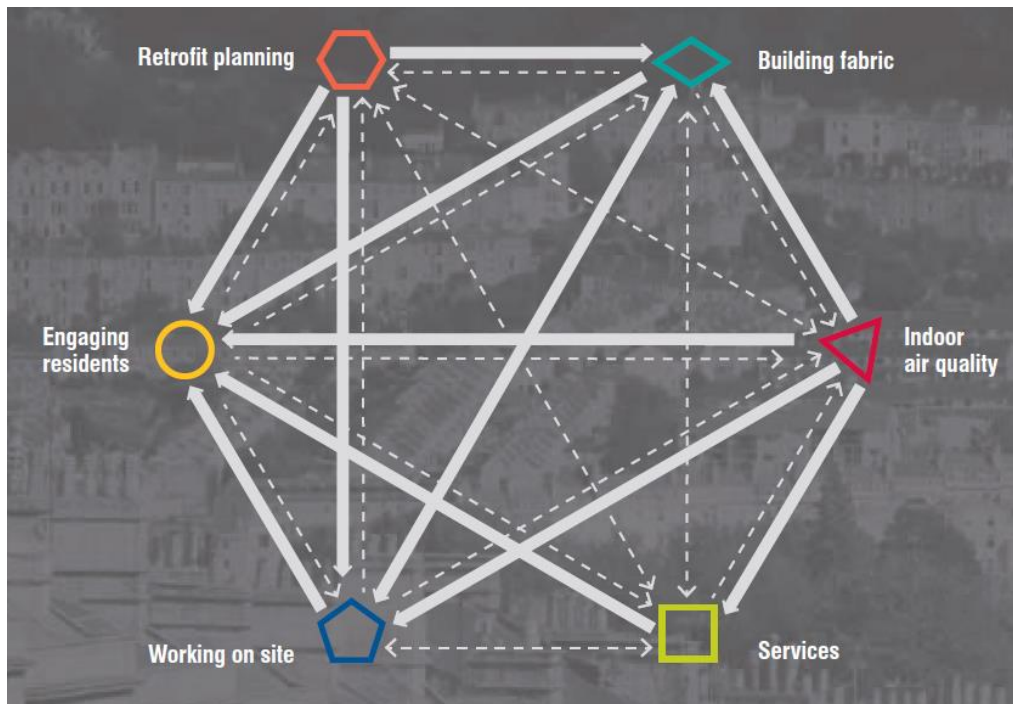


“The additional build costs of 3 – 8% will be repaid by energy savings in as little as three years.”

Ref: Mayville Community Centre, London

How might we unlock the market for DER?

2. Improve accessibility to the latest research outcomes

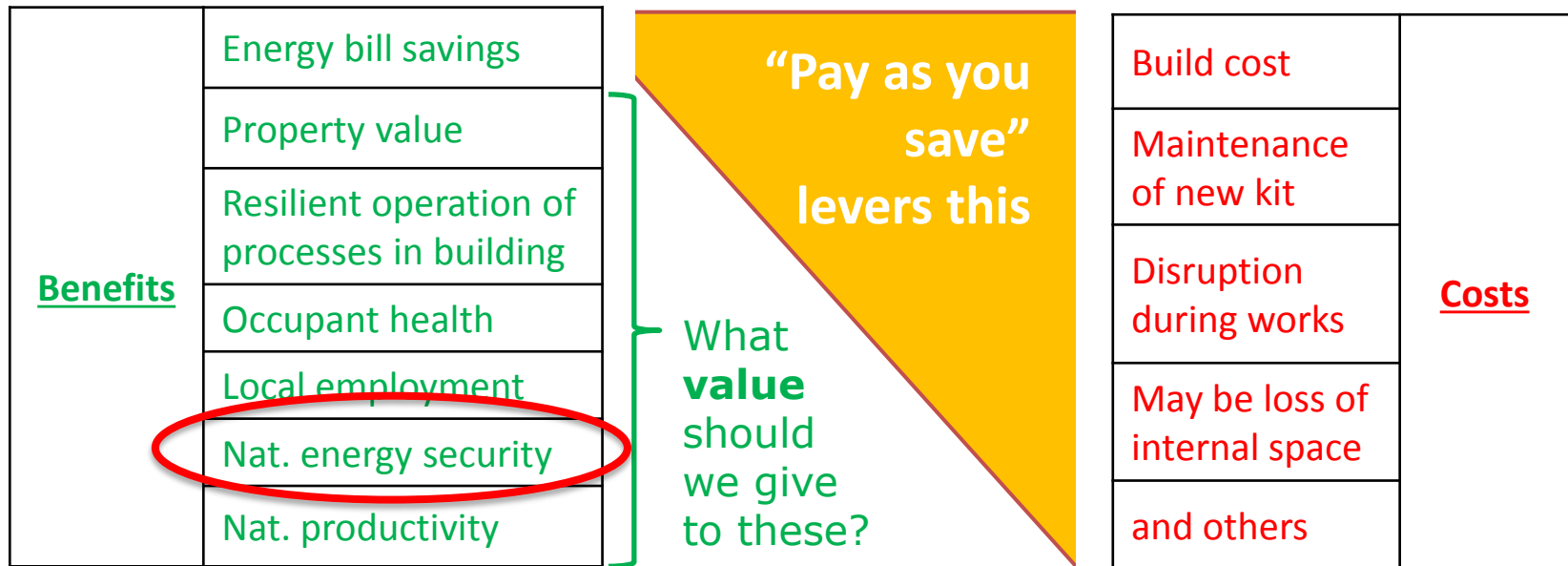


Ref: [Retrofit for the Future](#)
A guide to making retrofit work

How might we unlock the market for DER?

3. Motivate the commissioners of DER

- This is more than a technical and financial challenge



DECC’s Energy Efficiency Strategy reported that by 2020, socially cost-effective investment in energy efficiency could save the equivalent of 22 power stations

Looking ahead

- Making our DER research more accessible
 - www.retrofitanalysis.org - is just the start
- Integrated energy systems: i.e. DER alongside generation, supply, harvesting, storage, sharing, etc
 - [Energy Systems Catapult](#)
- Partnering with similar-minded organisations



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