



24/09/24 – PEPA Conference

ENABLING RETROFIT AT SCALE:

EPC REFORM AND MORE





THE COST OF POORLY PERFORMING BUILDINGS

In the UK, there 28 million homes. The vast majority need to be improved to protect residents from:

- **Fuel poverty**
- Threats from **climate change**
- **Health & well-being problems** from damp, mould, cold and overheating
- **Energy insecurity**

With the recent rise in energy prices and the climate emergency, it's imperative to **tackle the issue now.**



INTRODUCING THE NATIONAL RETROFIT HUB

The National Retrofit Hub is a **nonprofit collaborative organisation** that brings together all those involved in the retrofit sector to share their expertise and work together to **enable the local delivery of retrofit at scale in line with a National Retrofit Strategy.**

As a nonprofit, we rely on **support from our partners and sponsors.** Find out what you could be a part of and how to get involved...





THE PURPOSE OF THE HUB

THE HUB HAS BEEN ESTABLISHED TO:



COLLABORATE

Engage with all retrofit stakeholders to gather information and identify gaps in activity.



EMPOWER

Provide access to, and share, knowledge to boost industry efforts and enable application of best practice.



FACILITATE

Enable collective leadership, good governance and policy engagement.

THE HUB'S ROLE

THE CHANGES WE MAKE WILL BRING MEANINGFUL BENEFITS:



REDUCED GRID LOAD
+ ENERGY SECURITY



INNOVATION
AND GROWTH



NEW JOBS



REDUCED
ENERGY BILLS



COMFORTABLE,
HEALTHY HOMES



REDUCED
EMISSIONS

By working together across the **whole retrofit community** and bringing our shared expertise together, we can start to enable the delivery of **housing retrofit at scale.**



NATIONAL
RETROFIT HUB



THE HUB'S WORKING GROUPS



WG1

WARM, HEALTHY, NET ZERO

Access to data, tools
and design guidance

Digital whole house
plan

Quality assurance &
monitoring uptake



WG2

SUPPLY CHAIN, PRODUCTS & SOLUTIONS

Delivering a solution
agnostic approach to pr
oducts, technologies
and services

Overcoming barriers
to supply chain and
innovation



WG3

WORKFORCE GROWTH & SKILLS DEVELOPMENT

Embedding baseline
retrofit skills
in all construction training

Agreeing occupational
standards

Role of procurement and
support for SMEs



WG4

FINANCE

Financial solutions for
all people,
tenures and buildings

Policy to incentivise
and support

Role of banks / building
societies to engage



WG5

DELIVERY APPROACHES

Resident journey and
defining
successful delivery

Just delivery models for
all buildings and tenures

Delivery support and
community advocacy



WG6

DRIVING UPTAKE

Retrofit knowledge
embedded in
all home interactions

Access to information
and advice

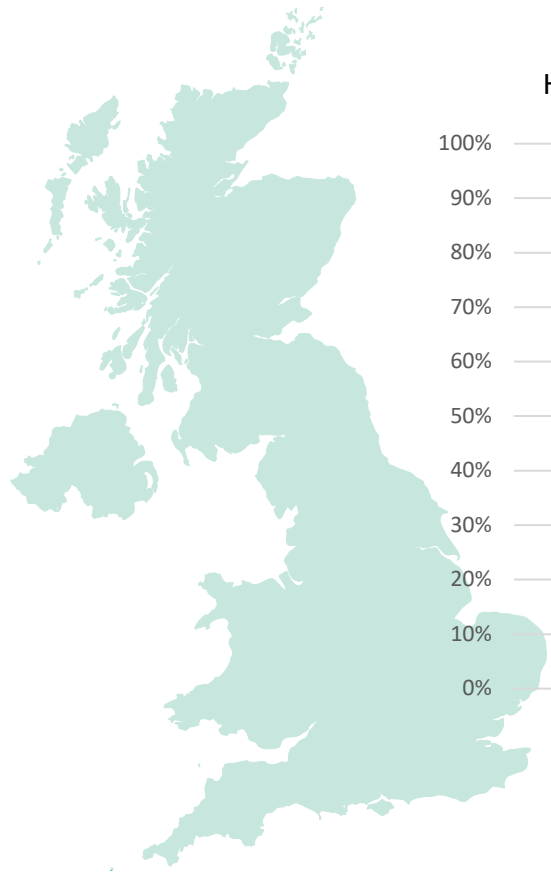
Incentives, engagement
and trust



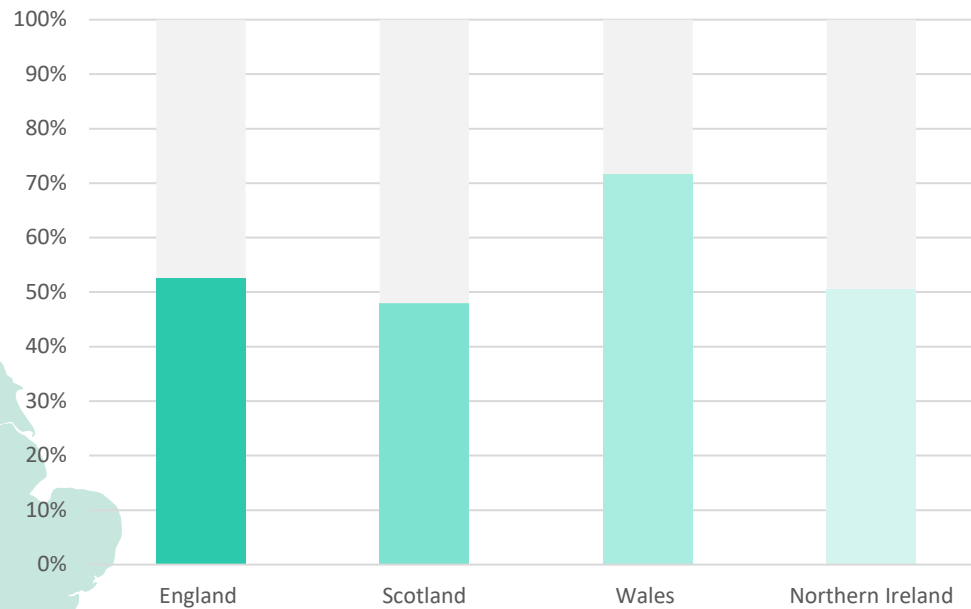
DELIVERY TARGETS

To reach EPC C for all domestic properties by 2035, **14,300,000** households require retrofit in the UK.

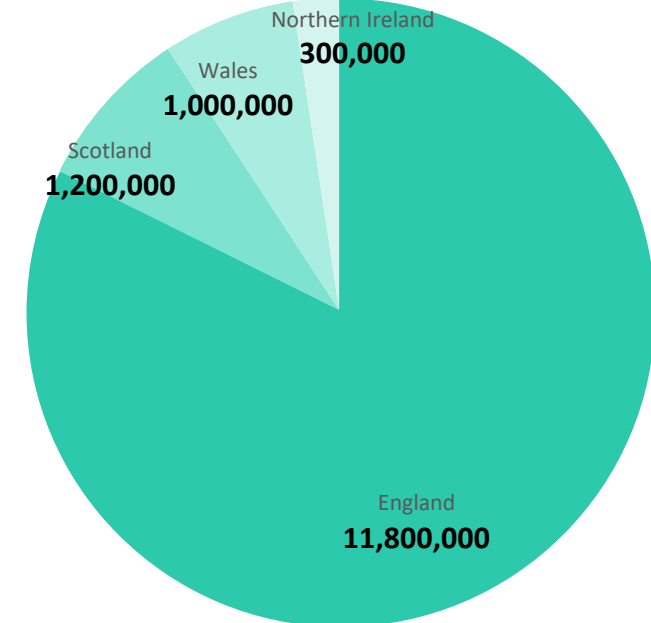
CCC, Sixth Carbon Budget



Homes below EPC C as a proportion of total housing stock



Number of homes requiring retrofit



Source: [Housing tenures](#); [Statistical data energy performance, England](#); [Condition surveys, Scotland](#); [Condition surveys, Wales](#); [Condition surveys, Northern Ireland](#).

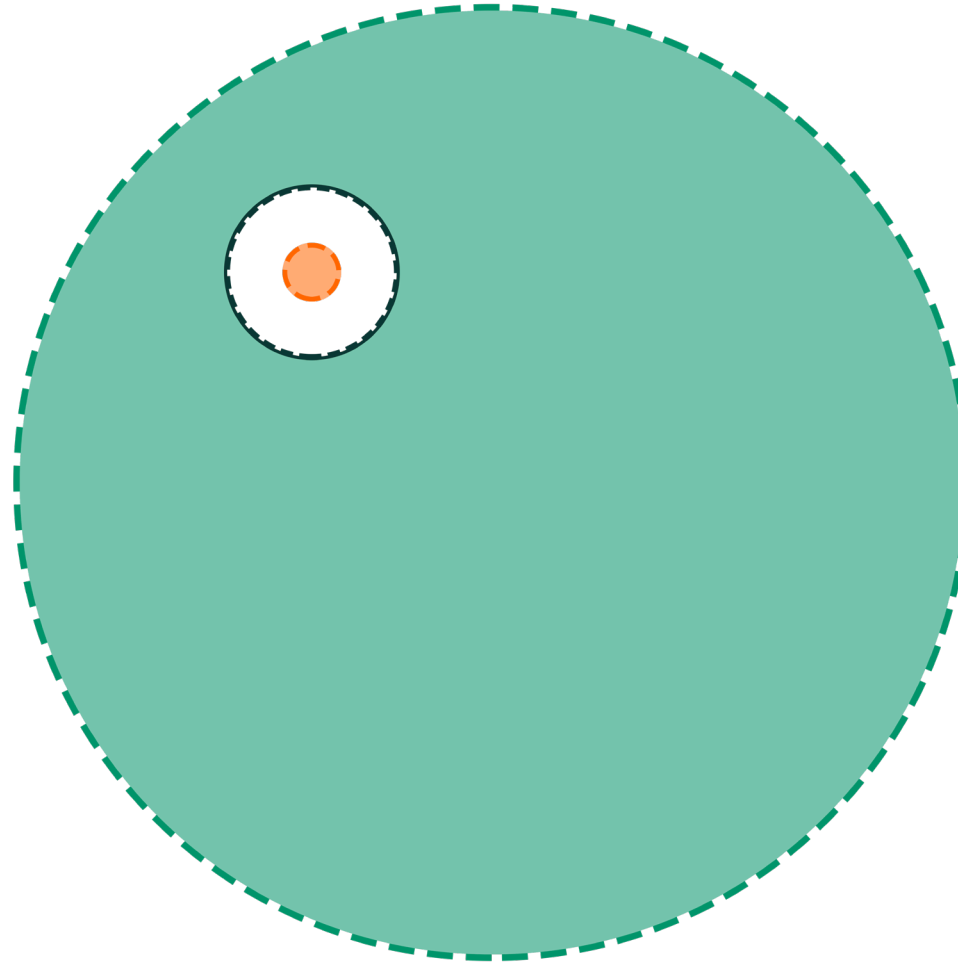
SCALE OF DELIVERY - ENGLAND

11,800,000 homes below **EPC C**

2,170,000 Retrofit measures delivered since 2013

2,100,000 of those delivered by **ECO**

725,000* **ECO** measures were boiler replacements

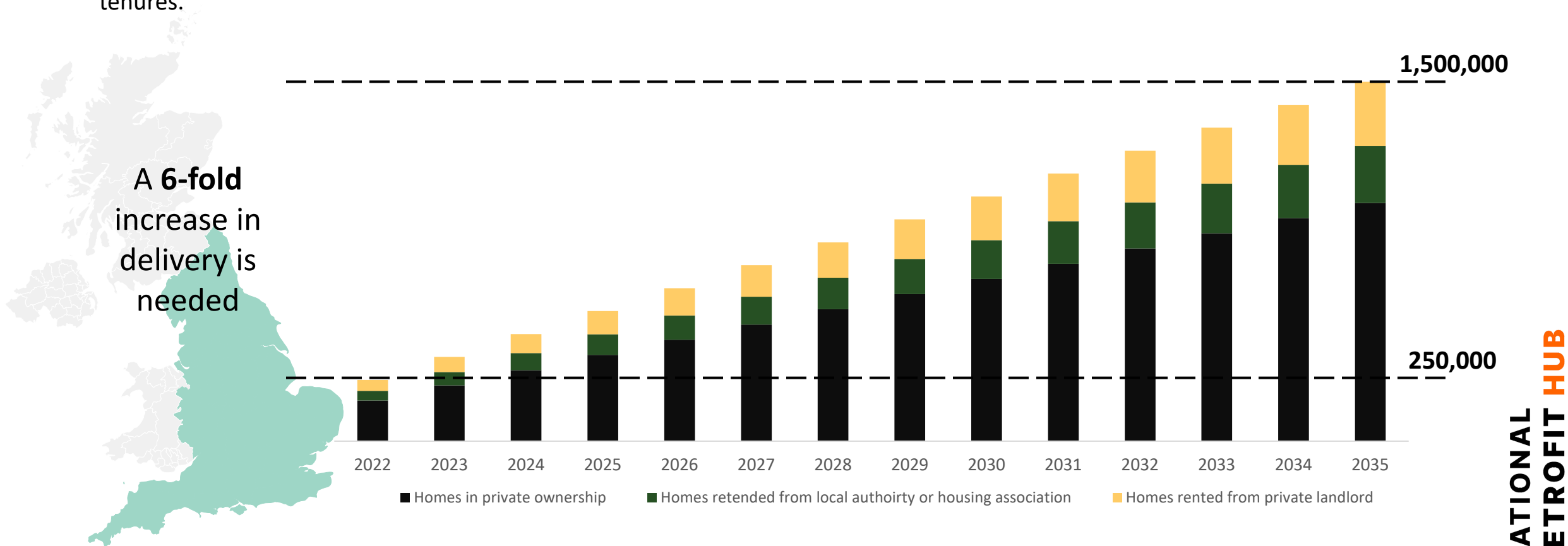


*Ratio of boiler measures based on national breakdown for England



INCREASING DELIVERY RATES

To deliver retrofit proportionally across tenures in England, the current rate of **250,000** homes per year must rise to **1,500,000** by 2035, totalling **11,800,000** retrofits. This graph shows the necessary ramp-up rate to meet targets, ensuring equitable delivery across tenures.



Source: [SHDF1 Release February 2024](#); [HULA Release February 2024](#); [ECO energy efficiency statistics detailed report](#); [BUS delivery statistics](#).



OUR WORK ON EPC REFORM IS SUPPORTED BY

KNAUFINSULATION

lendology.cic

mixergy®

All work of the National Retrofit Hub is supported by Innovate UK, The MCS Foundation, our partners and sponsors.



OUR METHODOLOGY

WHAT HAS BEEN PUBLISHED

- Literature review
- Making it visible

BROAD ENGAGEMENT

- 100 people convened on standards, technical design and project planning
- 30 financial specialists convened with Bankers 4 Net Zero
- 60 people convened on citizen engagement and customer need



RECOMMENDATIONS BY OTHERS

AVAILABLE ON THE NRH WEBSITE

Department for Energy ...

A TITLE
EPC Action Plan

STATUS
Work ongoing

OVERVIEW
The government's plans for reforming EPCs, published in 2020, with updates on progress to date.

TALKS ABOUT:
Assessor competence EPC d

LINK
<https://www.gov.uk/governme...>

Scottish Government

A TITLE
Energy Performance Certificat...

STATUS
Work ongoing

OVERVIEW
Consolation in July on proposals to reform domestic and non-domestic Energy Performance Certificates.

TALKS ABOUT:
Metrics Presentation / acces

LINK
<https://www.gov.scot/publicati...>

The CCC

A TITLE
Reform of domestic EPC ratin...

STATUS
Published

OVERVIEW
This paper focuses on the metrics used within EPCs, outlines current metrics, issues with these and gives ...

TALKS ABOUT:
Metrics Issues with current t

LINK
<https://www.theccc.org.uk/pu...>

Which?

A TITLE
Reforming EPCs to support ho...

STATUS
Published

OVERVIEW
Identifies key issues with EPCs and makes recommendations that would support consumers to improve the energy ...

TALKS ABOUT:
Metrics Presentation / acces

LINK
<https://www.which.co.uk/polic...>

Historic England

A TITLE
Energy Efficiency and Historic...

STATUS
Published

OVERVIEW
A series of case studies that provide evidence of the issues with EPC assessments for traditionally constructed ...

TALKS ABOUT:
Metrics Issues with current t

LINK
<https://historicengland.org.uk/...>

Energy Systems Catapult

A TITLE
Making Energy Performance C...

STATUS
Published

OVERVIEW
A detailed report on the main functions of EPCs, issues and impact of the current system, and recommendations for ...

TALKS ABOUT:
Metrics SAP / RdSAP / HEM

LINK
<https://es.catapult.org.uk/repo...>

Building Research Estab...

A TITLE
Energy Performance Certificat...

STATUS
Published

OVERVIEW
A description of the current EPC and SAP system and recommendations for changes.

TALKS ABOUT:
Metrics Assessor competen

LINK
<https://files.bregroup.com/cor...>

UCL Energy Institute

A TITLE
The over-prediction of energy...

STATUS
Published

OVERVIEW
This study shows that, for homes with an EPC of C or below, EPCs predict significantly more energy use ...

TALKS ABOUT:
Issues with current EPC sys...

LINK
<https://www.sciencedirect.co...>

BEUC

A TITLE
Introducing the Heat Pump Re...

STATUS
Published

OVERVIEW
An EU study that defines an approach to, and proposes the inclusion of, a Heat Pump Readiness Indicator within ...

TALKS ABOUT:
Metrics Scope / Purpose of f

LINK
<https://www.beuc.eu/sites/def...>

Energy Systems Catapult

A TITLE
Energy Performance Certificat...

STATUS
Published

OVERVIEW
A short overview of what EPCs are and opportunities for their improvement.

TALKS ABOUT:
Issues with current EPC sys...

LINK
<https://es.catapult.org.uk/insi...>

Energy Systems Catapult

A TITLE
EPCs Undermining Decarboni...

STATUS
Published

OVERVIEW
Introduces a proposal to overcome barriers to decarbonisation currently created by EPC metrics.

TALKS ABOUT:
Metrics Issues with current t

LINK
<https://es.catapult.org.uk/new...>

Santander

A TITLE
Buying into the Green Homes ...

STATUS
Published

OVERVIEW
Survey of consumers on attitudes and awareness of home energy efficiency, particularly when considering ...

TALKS ABOUT:
Presentation / accessibility

LINK
<https://www.santander.co.uk/a...>

OakNorth

A TITLE
TCFD Report

STATUS
Published

OVERVIEW
Pages 42 and 43 of this report give an overview of the role of EPCs in regulation and financing.

TALKS ABOUT:
Finance Validity period

LINK
<https://oaknorth.co.uk/sustain...>

UK Finance

A TITLE
Net Zero Homes: Time for a R...

STATUS
Published

OVERVIEW
Chapter 6 within this report looks at the current EPC system, how this influences policy, finance and investment...

TALKS ABOUT:
Finance Metrics EPC data

LINK
<https://www.ukfinance.org.uk/...>

PCAF - Partnership for ...

A TITLE
Actual emission measurement...

STATUS
Published

OVERVIEW
Looks at key initiatives in Europe that bridge the gap between estimated and actual building emissions data.

TALKS ABOUT:
Metrics EPC data access

LINK
<https://carbonaccountingfinan...>

Natwest

A TITLE
Home is where the heat is

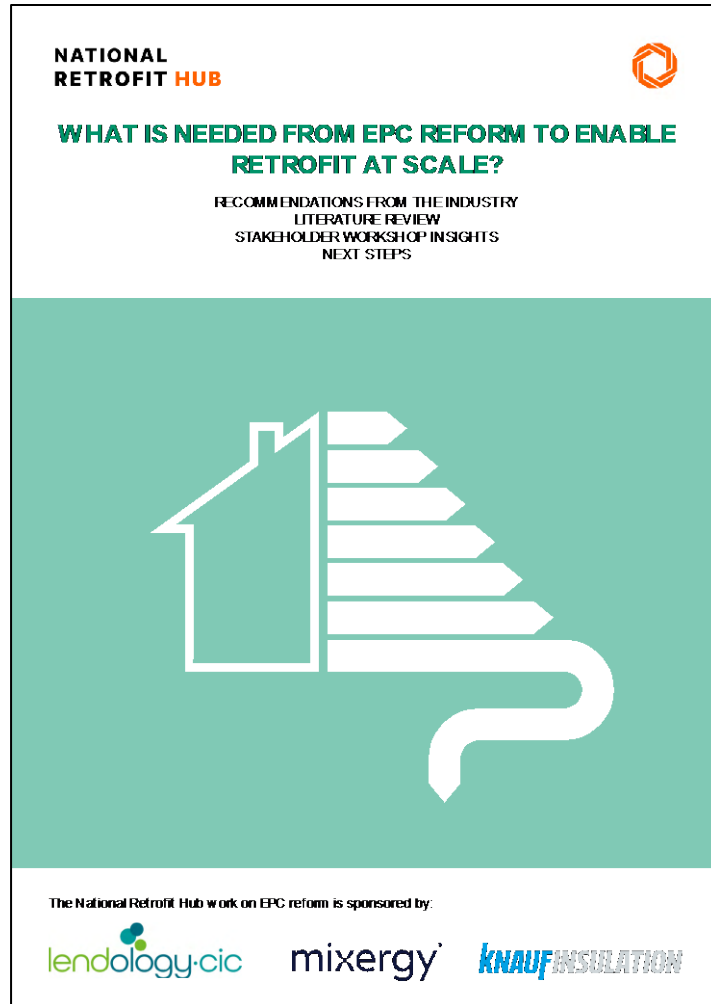
STATUS
Published

OVERVIEW
This report explores policies to improve the energy efficiency of the UK's homes and highlights some current issue...

TALKS ABOUT:
Metrics Presentation / acces

LINK
<https://www.natwestgroup.co...>

OUR WORK TO DATE



INTERIM REPORT

- Literature review of industry recommendation
- Feedback from our first workshop

ENGAGEMENT WITH

- Working groups 1 and 2
- Bankers 4 Net Zero and the finance industry
- Working Group 6 – Citizen Engagement



KEY THEMES

KEY TOPICS COVERED BY EXISTING REPORTS

Presentation &
Accessibility

Consumer Awareness

Upgrade
Recommendations

Metrics

Validity Period

Scope & Purpose of
EPCs

EPC Data Access

Assessor Training &
Competence

Finance



PRESENTATION & ACCESSIBILITY

CURRENT FORMAT

Online website page

Limited interactivity and signposting

One graphic and the rest text

EPCs should:

- Be clearer to understand
- Better convey the impacts of potential improvements
- Use simpler language

Energy performance certificate (EPC)

Certificate contents

- Rules on letting this property
- Energy rating and score
- Breakdown of property's energy performance
- How this affects your energy bills
- Impact on the environment
- Changes you could make
- Who to contact about this certificate
- Other certificates for this property

Share this certificate

- ✉ Email
- 📄 Copy link to clipboard
- 🖨 Print

16 Streatham Close	Energy rating
	C
Valid until	Certificate number
12 May 2033	

Property type	Ground-floor flat
Total floor area	49 square metres

Rules on letting this property

Properties can be let if they have an energy rating from A to E.

You can read [guidance for landlords on the regulations and exemptions](#).

Energy rating and score

This property's energy rating is C. It has the potential to be C.

[See how to improve this property's energy efficiency.](#)

Score	Energy rating	Current	Potential
92+	A		
81-91	B		
69-80	C	79 C	79 C
55-68	D		
39-54	E		
21-38	F		
1-20	G		

The graph shows this property's current and potential energy rating.

Properties get a rating from A (best) to G (worst) and a score. The better the rating and score, the lower your energy bills are likely to be.

For properties in England and Wales:

- the average energy rating is D
- the average energy score is 60

Breakdown of property's energy performance

Features in this property

Features get a rating from very good to very poor, based on how energy efficient they are. Ratings are not based on how well features work or their condition.

Assumed ratings are based on the property's age and type. They are used for features the assessor could not inspect.

Feature	Description	Rating
Wall	Solid brick, as built, no insulation (assumed)	Very poor
Window	Fully double glazed	Average
Main heating	Boiler and radiators, mains gas	Good
Main heating control	Programmer, room thermostat and TRVs	Good
Hot water	From main system	Good
Lighting	Low energy lighting in all fixed outlets	Very good
Roof	(another dwelling above)	N/A
Floor	Solid, no insulation (assumed)	N/A
Secondary heating	None	N/A

Primary energy use

The primary energy use for this property per year is 227 kilowatt hours per square metre (kWh/m²).

▼ About primary energy use

Primary energy use is a measure of the energy required for lighting, heating and hot water in a property. The calculation includes:

- the efficiency of the property's heating system
- power station efficiency for electricity
- the energy used to produce the fuel and deliver it to the property

How this affects your energy bills

An average household would need to spend **£1,042 per year on heating, hot water and lighting** in this property. These costs usually make up the majority of your energy bills.

You could **save £332 per year** if you complete the suggested steps for improving this property's energy rating.

This is **based on average costs in 2023** when this EPC was created. People living at the property may use different amounts of energy for heating, hot water and lighting.

Heating this property

Estimated energy needed in this property is:

- 5,573 kWh per year for heating
- 1,754 kWh per year for hot water

Impact on the environment

This property's environmental impact rating is D. It has the potential to be C.

Properties get a rating from A (best) to G (worst) on how much carbon dioxide (CO₂) they produce each year.

Carbon emissions

An average household produces	6 tonnes of CO ₂
This property produces	2.0 tonnes of CO ₂
This property's potential production	1.2 tonnes of CO ₂

You could improve this property's CO₂ emissions by making the suggested changes. This will help to protect the environment.

These ratings are based on assumptions about average occupancy and energy use. People living at the property may use different amounts of energy.

Changes you could make

▼ Do I need to follow these steps in order?

Yes. Each step builds on the one before it so you can save the most energy.

For example, it's more energy efficient to insulate your home before you buy a new boiler. A well insulated home will lose less heat so you do not have to run your boiler as often.

Step 1: Internal or external wall insulation

Typical installation cost	£4,000 - £14,000
Typical yearly saving	£247
Potential rating after completing step 1	79 C

Step 2: Floor insulation (solid floor)

Typical installation cost	£4,000 - £6,000
Typical yearly saving	£85
Potential rating after completing steps 1 and 2	79 C



PRESENTATION & ACCESSIBILITY

HOW COULD THIS BE ACHIEVED

Find a balance between
'at a glance' ratings

*(which are quick to see, but
often more difficult to
understand the basis of)*

and more specific
information on the level
of insulation or heating
type.

(Which?)

A web-based interface
containing EPC
information, linking
seamlessly with
advice, tools and
services that allow
householders to act
on recommendations.

(BRE & Scottish Gov)

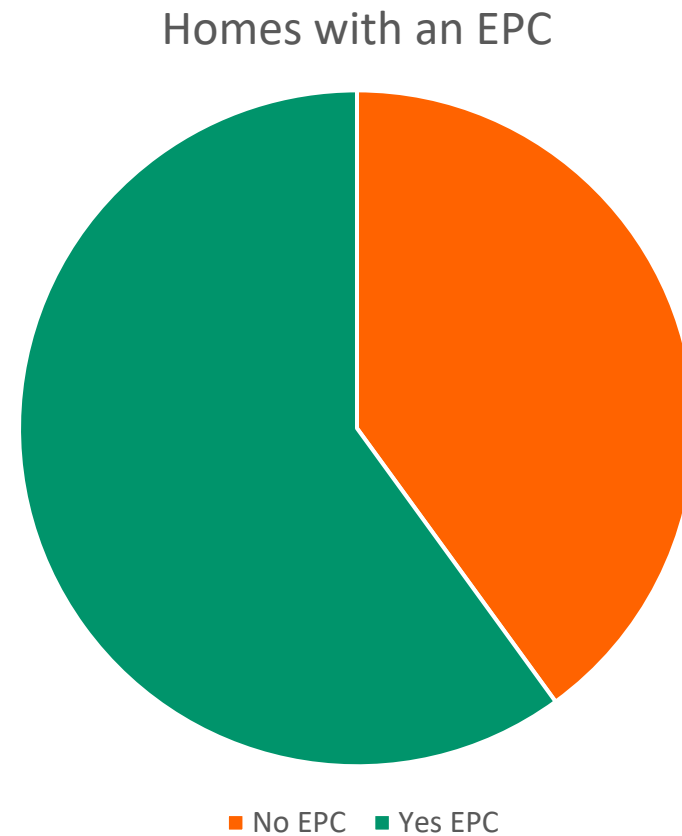
An interactive /
digitised EPC, which
clear explanations on
what different aspects
mean

(BRE, The CCC, Natwest)



ACCESSIBILITY

40% OF HOMES DO NOT HAVE AN EPC





METRICS

CURRENT METRICS

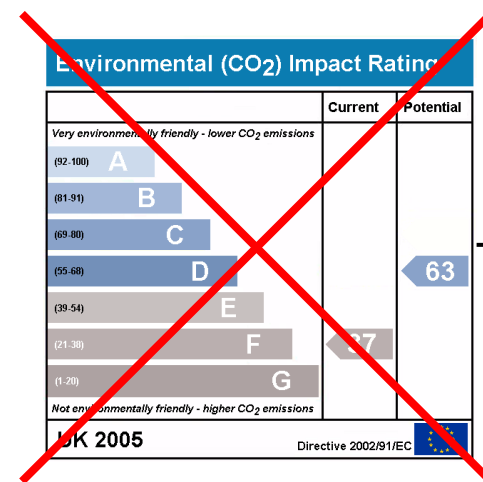
Energy Efficiency Rating:

Predicted energy costs per square meter per year.

Score	Energy rating	Current	Potential
92+	A		
81-91	B		
69-80	C	69 C	78 C
55-68	D		
39-54	E		
21-38	F		
1-20	G		

Environmental Impact Rating:

Predicted greenhouse gas emissions per square meter per year.



Impact on the environment

This property's environmental impact rating is D. It has the potential to be C.

Properties get a rating from A (best) to G (worst) on how much carbon dioxide (CO₂) they produce each year.

Carbon emissions

An average household produces	6 tonnes of CO ₂
This property produces	2.0 tonnes of CO ₂
This property's potential production	1.2 tonnes of CO ₂

You could improve this property's CO₂ emissions by making the suggested changes. This will help to protect the environment.

These ratings are based on assumptions about average occupancy and energy use. People living at the property may use different amounts of energy.



M E T R I C S

ISSUES ASSOCIATED WITH CURRENT METRICS

- Metrics are confusing, eg: Energy Efficiency Rating is actually a measure of energy cost rather than efficiency
- EER incentivises cheaper gas over more expensive, but lower carbon, electricity.
- Current metrics are poorly suited to informing government policy, as they do not incentivise the optimum changes to homes to improve efficiency and reduce carbon emissions.
- Measures that enable low carbon heating, such as fabric upgrades, are not incentivised by the EER metric.
- The 1 to 100 scale is opaque and does not relate to actual units of energy.
- EPC ratings cannot be easily compared with real-world energy use, and ratings do not include all energy consumed within a dwelling.



M E T R I C S

SUGGESTED METRICS

Most recommendations are for a series of metrics, eg:

- Fabric Rating - Space heat demand intensity in kWh/m²/yr. (The CCC)
- Cost Rating - similar to the current EER, energy cost intensity in £/m²/yr. (The CCC)
- Heating System Type - the system type within a defined hierarchy. (The CCC)
- Energy – Total energy use intensity in kWh/m²/yr (The CCC)

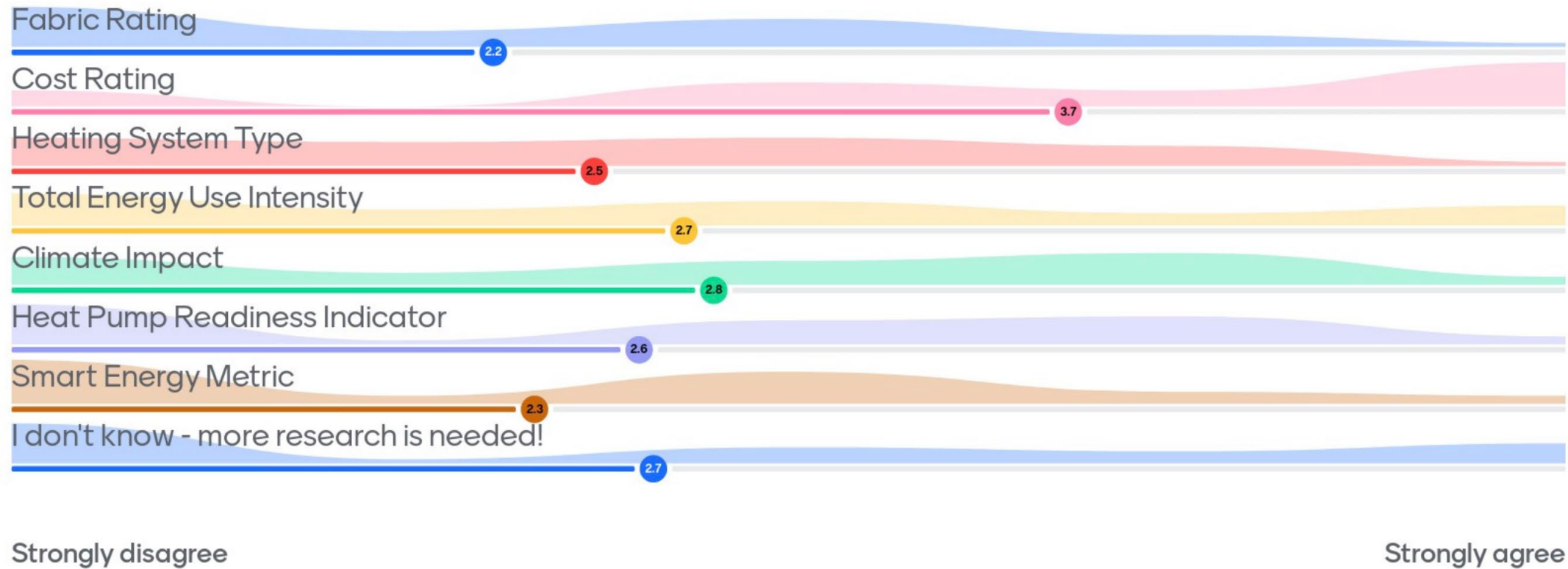
Others that could be included:

- Climate Impact Metric - the emissions associated with the energy use. (ESC)
- Heat Pump Readiness Indicator – based on building fabric, heat distribution system and local climate. (BEUC)
- Smart Energy Metric - the home's capacity to use energy flexibly, considering batteries, controls and PVs. (BRE)

Plus some metrics could be for stakeholder use, eg:

- Emissions Rating - emissions directly from the dwelling and emissions from other places, such as electricity generation. (Scottish Government)

Which of these metrics might best motivate consumers?





UPGRADE RECOMMENDATIONS

SUGGESTED IMPROVEMENTS

- Include repair & maintenance (Historic England)
- More accurate costs, based on up-to date information (Historic England, Which?)
- Align recommendations with decarbonization goals (BRE)
- Include signposting to expert advice (ESC)
- Incorporate insights from Local Area Energy Plans (ESC)
- Rather than recommendations, provide more information on the existing building and it's impact, with options (ESC)
- Include better information on the potential effects of energy efficiency measures on ventilation, damp, and overheating, as well as the suitability of recommendations for older properties or those in conservation areas. (EPC Action Plan)
- Allow householders to input or change data to personalize recommendations (Which?)



SOMETHING MORE?

A NUMBER OF REPORTS RECOMMEND THE ADDITION OF DIGITAL BUILDING LOGBOOKS

EPC Action Plan

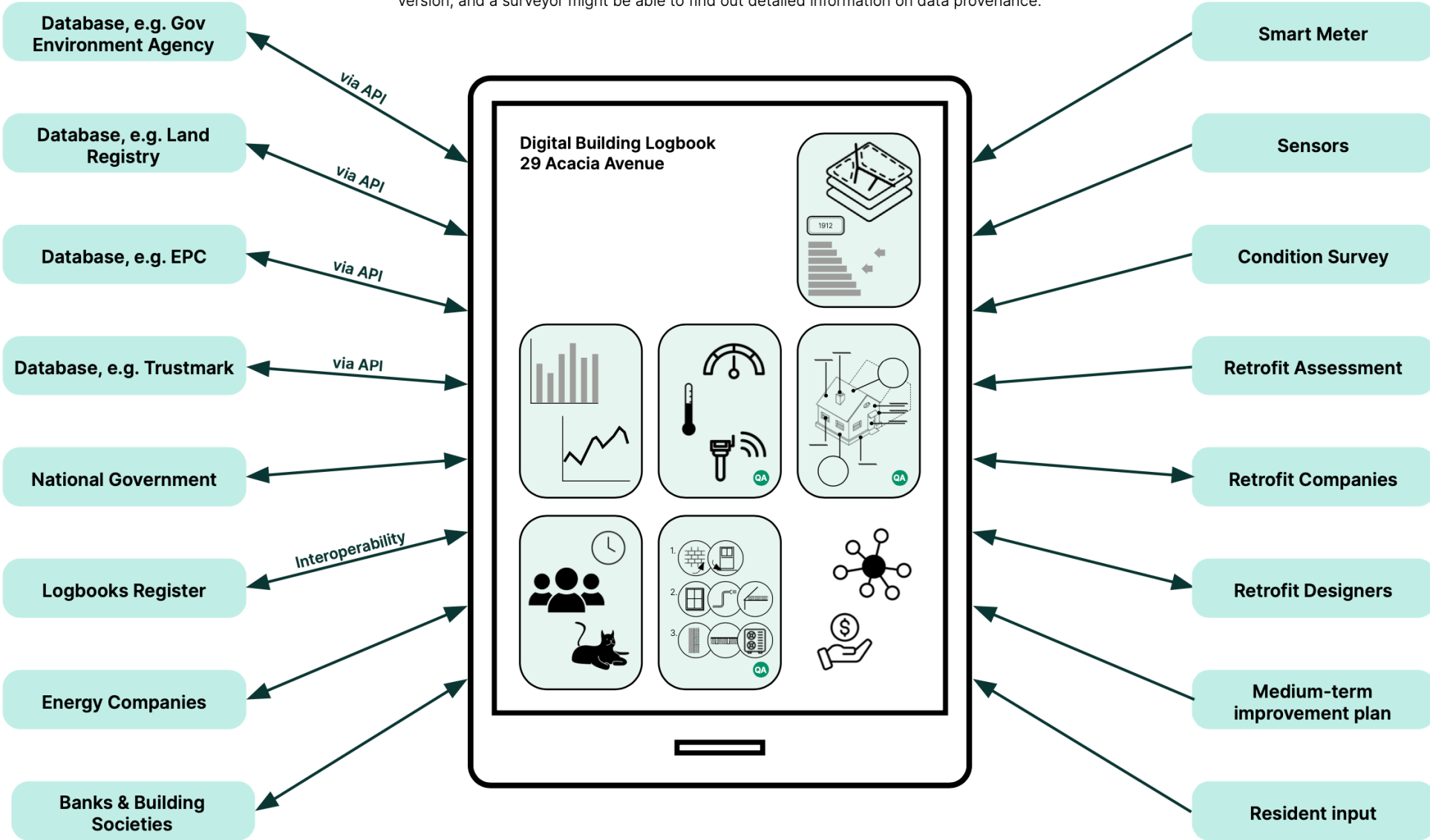
Scottish Government

Which?

Energy Systems Catapult

DIGITAL BUILDING LOGBOOKS: THE ASPIRATION

The logbook is a secure, online tool providing access to building information. The aspiration is for these to be connected to various data sources, organisations and stakeholders, drawing live information in, and providing information back out. The interface might look different depending on the user, for example, a homeowner might see a streamlined, more user friendly version, and a surveyor might be able to find out detailed information on data provenance.





DIGITAL BUILDING LOGBOOKS

AN INTRODUCTION TO LOGBOOKS AND RETROFIT

This is an introductory document on digital building logbooks for the retrofit industry. It sets the scene for why the National Retrofit Hub is engaging in logbooks, and how we think that they could play an important role in scaling up good quality, locally delivered retrofit across the UK. Read on to find out about: work already done on digital building logbooks within the industry, how logbooks could be expanded to facilitate retrofit and their potential to overcome barriers to retrofit at scale.

A Digital Building Logbook is a secure online tool, that brings together information on a building. Data is integrated, added and updated through a variety of sources. The logbook aims to make everything you might need to know about a building accessible in one place.

DOCUMENT CONTENTS

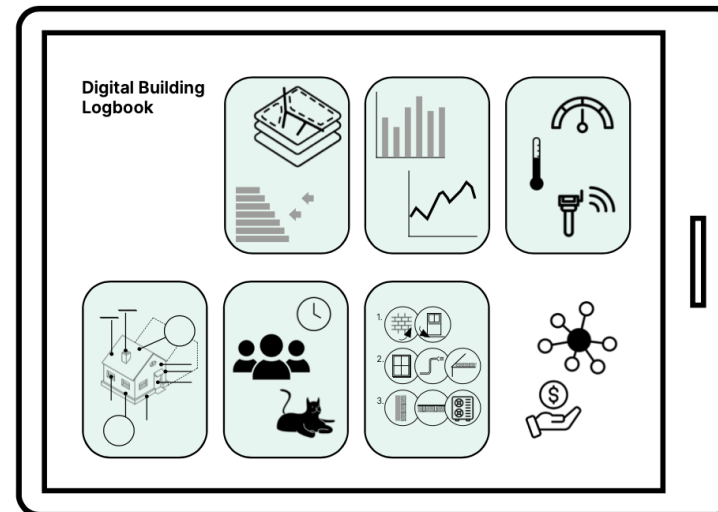
Data:

Informing Effective Retrofit Plans	2
Dynamic, Interoperable and Accessible	3

Digital Building Logbooks:

UK Industry Progress to Date	4
Potential Use in Retrofit	5
The Aspiration	6
Helping Overcome Barriers to Retrofit at Scale	7
Use in Other Sectors	8

Key Questions	9
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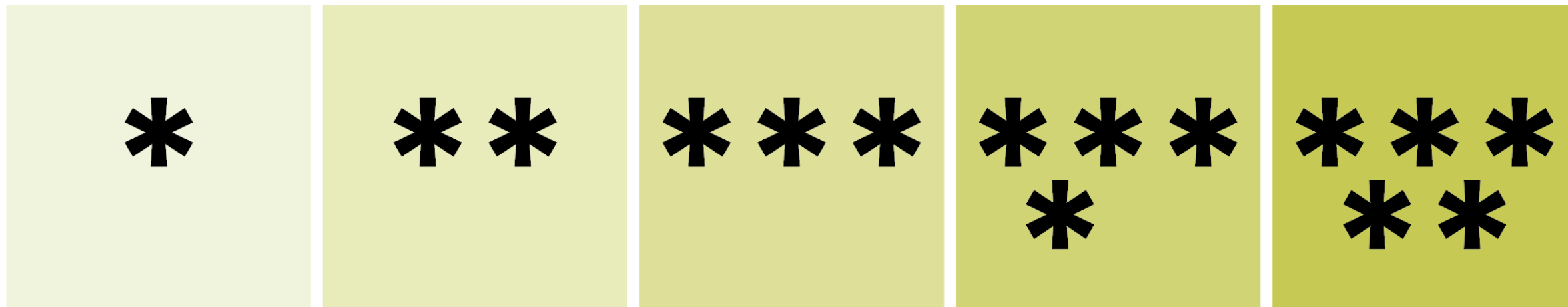


ROADMAP FOR IMPROVEMENT



- EPC metrics are accurate, reliable and trusted.
- The right metrics are used to set targets and measure progress.
- Health and comfort are embedded.
- Better information and more detailed recommendations.

CONFIDENCE RATING



1*

A new provisional EPC, generated using stock model data. Providing a low cost or free EPC to the 40% of homes that do not currently have one.

2*

A calculation using the Home Energy Model, but with default assumptions.

3*

A calculation using the Home Energy Model, with validated build-ups and systems, recorded within a digital building logbook.

4*

A calculation using the Home Energy Model, with validated build-ups and systems, recorded within a digital building logbook. Plus an airtightness test.

5*

Ratings based on real world data measurements, including the measured heat transfer coefficient, and incorporating information from Smart Meter data.

IMPROVE EXISTING METRICS



COST METRIC

B

£1,250

typical energy
cost per year

March 2024
energy prices



CARBON METRIC

**Nearly
Net
Zero**

2.5

tonnes of
greenhouse gas
emissions per
year

Make available to the industry:

- **Estimated EUI based on standard occupancy**
- **Peak energy demand**
- **Fabric efficiency**

NEW OPTIONAL METRICS



75%

75%
flexibility of
energy use

SMART ENERGY METRIC



OK

Your home
might present
a health risk
to those with
underlying
conditions.

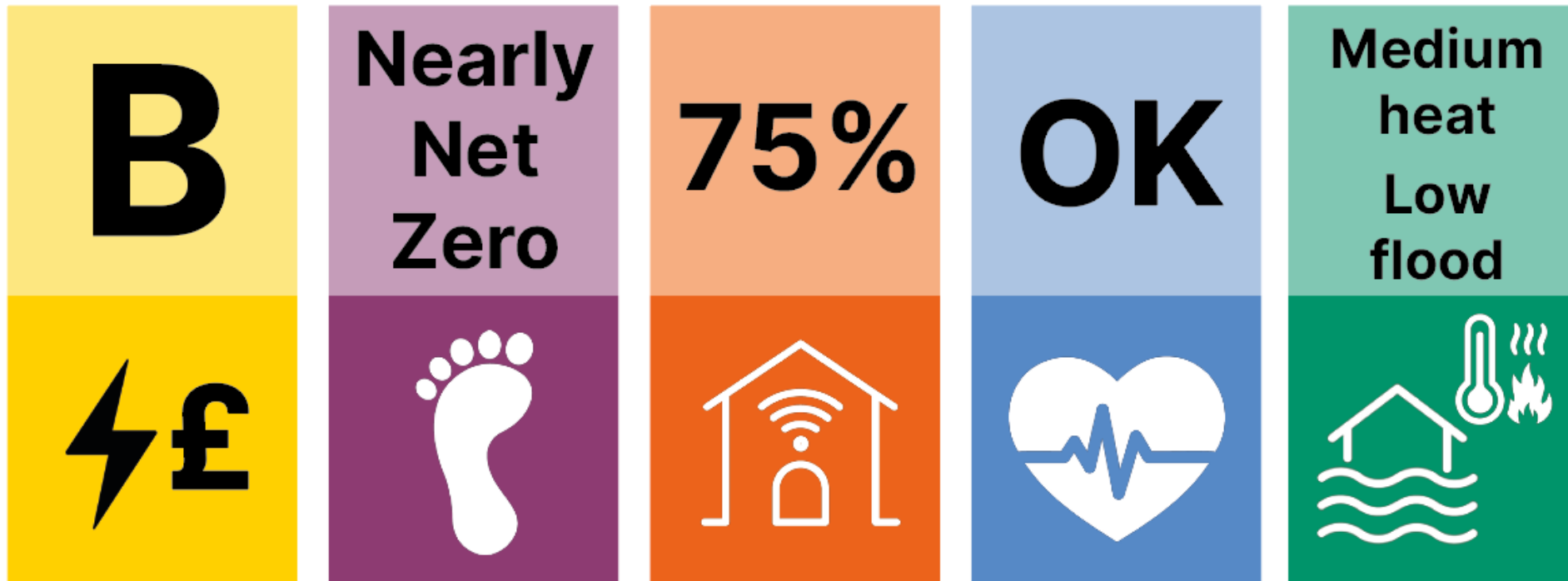
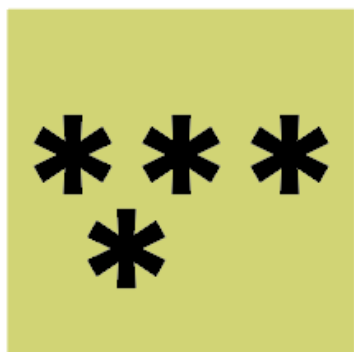
HEALTH INDICATOR



**Medium
heat
risk**

**Low
flood
risk**

RESILIENCE INDICATOR



Recommendations linked to metrics.

Clear, easy to navigate.

Links and signposting.

Dynamic input and more triggers for updates.



GET INVOLVED IN SHAPING THE VISION

WE WORK WITH NONPROFIT PARTNERS AND COMMERCIAL SPONSORS

Strategic Partners

Devolved Governments & national bodies

- UK Government
- Devolved national govts
- Local / Regional Authorities
- Health Service
- Government agencies
- Centres of Excellence (BE-ST Scotland, Welsh ZCH)

Partners

Nonprofit organisations

- Housing Associations
- Consumer groups
- Communities, Community Energy
- Training / Skills bodies
- Trade Associations
- Impact investors
- Professional Institutions

Sponsors

Commercial organisations

- Finance / Insurance
- Housing clients
- Designers / engineers / architects
- Consultants
- Manufacturers / suppliers
- Contractors / installers (SME inc.)
- Energy supply / DNOs
- Retailers

BECOME A SPONSOR



INFLUENCE PROGRESS

Join our Advisory Panel to shape the Hub's priorities, drive meaningful progress to delivering retrofit at scale, and gain instant access to working group outcomes.



ACCESS EXPERTISE

Share your expertise and knowledge, receive it back ten-fold through collaboration, and enable faster retrofit delivery for all.



MAXIMISE IMPACT

Be part of the future of retrofit standards in the UK, get listed on our website and communications to further strengthen your brand.



HUB SPONSORS

ARUP

HEM
ARCHITECTS

CoreLogic

installer
SHOW
24
NEC Birmingham 25-27 June 2024

installer
Heat, energy, water and air in practice
elemental
Advancing technologies in heat, energy, water & air

 **ecological**
BUILDING SYSTEMS


SAINT-GOBAIN

 **Ecology**
Building Society

Reed Environment

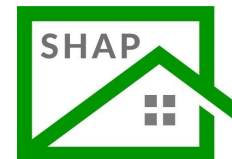
Travis Perkins 



HUB PARTNERS



HUB PARTNERS





CONTACT US

To become a National Retrofit Hub partner, or sponsor, to **stay up to date** with our progress or to speak to one of the team, **get in touch**:



www.nationalretrofithub.org.uk



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Follow us:



**NATIONAL
RETROFIT HUB**



THANK YOU