





Scottish Government
Riaghaltas na h-Alba
gov.scot

Energy Performance Certificate Reform

Ross Loveridge
Patrick Mason



Scottish Government
Riaghaltas na h-Alba
gov.scot



- 1. What are EPCs and what are the issues?**
- 2. What is SG doing to address these issues?**
- 3. Making the change happen**
- 4. Timetable for reform**



What are EPCs and what are the issues?



What EPCs are:

- ✓ Vital, established part of the Scottish property market since 2009
- ✓ Required when building is advertised for sale or rent, or constructed.
- ✓ Central part of Home Report.
- ✓ Principal tool to provide basic, standardised consumer information around the heating and fabric elements of a building.
- ✓ The basis for government funding schemes (ECO, WHS, HES, ABS, RHI, etc.).
- ✓ Widely used by LAs, RSLs (EESSE, Fuel Poverty Strategy and – increasingly – mortgage providers to understand the performance of their stock).
- ✓ Important legacy from EU membership, retained across UK.
- ✓ Currently around **1.5 million** valid EPCs in Scotland.
- ✓ Roughly **60%** of the housing stock has an EPC.
- ✓ Approx. **200k domestic, 5k non-domestic p.a.**
- ✓ **3,350 assessors**; accredited by 6 'Approved Organisations'

What EPCs are not:

- ✗ An accurate predictor of future energy costs.
- ✗ A substitute for a detailed, bespoke technical assessment of the most appropriate heating and fabric measures for a building.



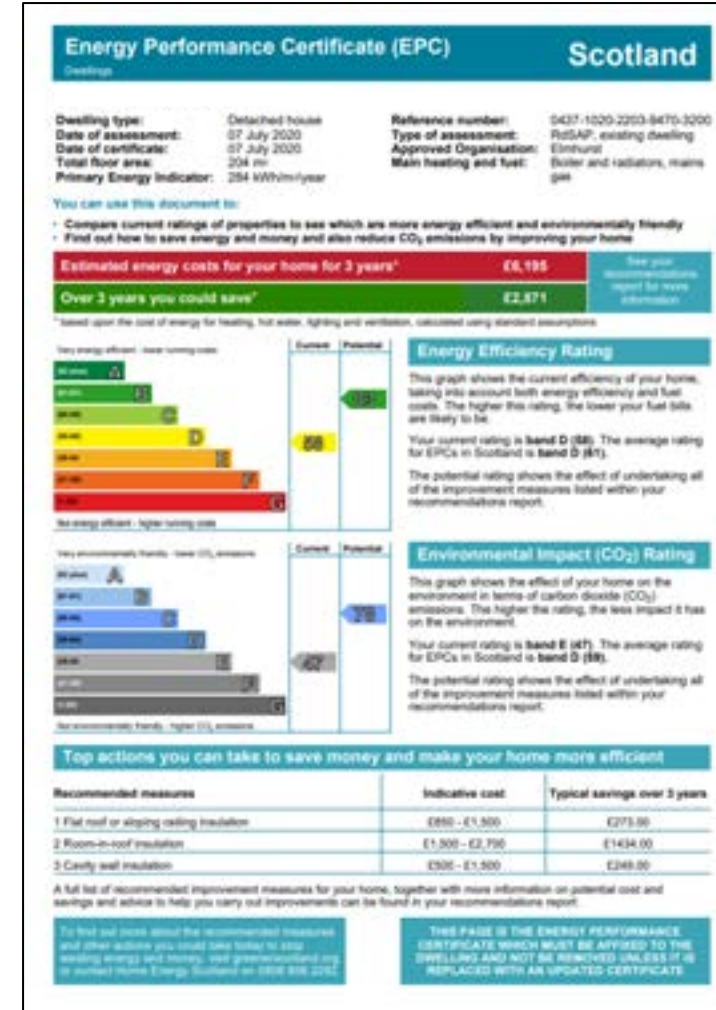
How are EPCs currently calculated and what needs to change?

Current calculation approach

- EPCs are a standardised assessment – they make modelled assumptions about a building
- Based on the *Standard Assessment Procedure* – used since 2008 across UK (updated)
- Assessors must visit the building in-person to record information on:
 - Building construction and age
 - Presence of energy efficiency features (in walls, windows, roof, floors)
 - Type of heating system (and cooling system) and controls
 - Lighting
- Two main domestic ratings: 'Energy Efficiency Rating' and 'Environmental Impact Rating'

What needs to change? – consultation respondents and experts in bodies like CCC and Which? have told us

1. EPCs do not currently measure and incentivise the most useful thing
2. EPCs aren't easy to understand
3. EPCs aren't always of good enough quality



Existing EPC Design

What is SG doing to address these issues?



EPC Reform – one page summary

What SG has committed to doing:

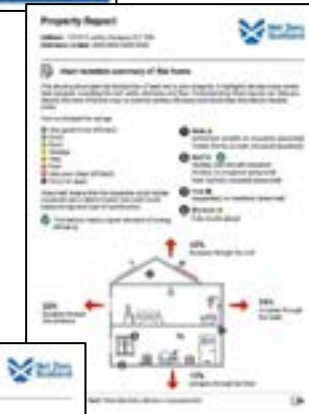
- Government Response sets out final decisions on reform
- We will introduce new EPC regulations in the Scottish Parliament during 2025 and bring them into force in 2026.
- adopt a new EPC rating system for domestic buildings:
 - Heat Retention Rating (fabric energy efficiency);
 - Heating System Rating (type, emissions, efficiency, running costs)
 - Energy Cost Rating (retaining the existing SAP-based EE Rating)
- adopt a new EPC rating system for non-domestic buildings;
- adopt a redesigned EPC certificate;
- reduction of the validity period of EPCs from 10 to five years
- development of a new dynamic EPC user interface to sit alongside the published EPC;
- introduce strengthened operational governance arrangements for EPC assessors and Approved Organisations to enhance quality assurance for consumers;
- establishing a new technical infrastructure: replacing Standard Assessment Procedure (SAP) with the new UK Home Energy Model (HEM) calculation methodology; a new EPC Register;
- continuing to work with the UK Government and devolved administrations where we share elements of the EPC regulatory system across the UK internal market

What SG has consulted upon:

- Public consultation on overall reforms – summer 2023
- Technical consultation on EPC lodgement fees – early 2025 (to fund the technical infrastructure of HEM and Register and to fund new onsite audit and inspection of EPCs; and on penalty charges)

Timeline:

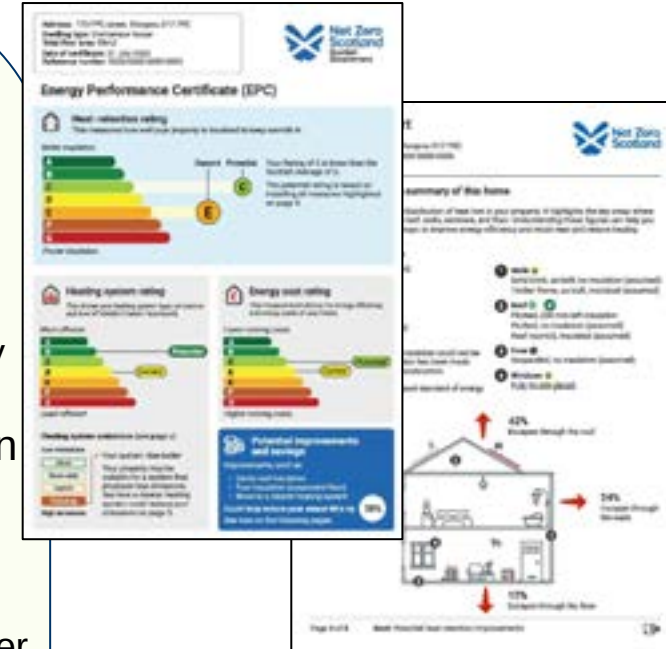
- We will **lay regulations Sept 2025 to bring these changes into force autumn 2026.**
- We intend to align with the timeline for the UKG bringing in HEM to support new regulations in E&W, given we will share technical infrastructure across the UK



The reforms we will make – new Rating system DOMESTIC

We Will Do (domestic EPC):

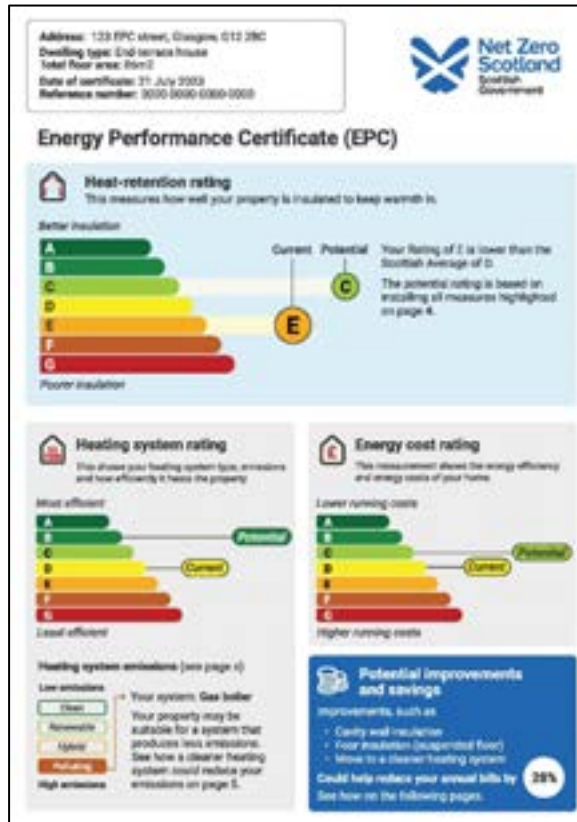
1. Introduce a **reformed set of three domestic EPC ratings**:
 - Heat Retention Rating, based on how well the building retains heat – i.e. its heat demand / fabric efficiency
 - Heating System Type Rating, comprising ratings for the emissions category, thermal efficiency and running cost
 - Energy Cost Rating, based on the total cost to run the property (in line with the current Energy Efficiency Rating / EPC Rating)
2. Introduce a set of **secondary metrics** to provide information for those interested in particular aspects of the building's performance.
3. Reform the approach to '**recommendations**' by:
 - Renaming them to 'potential improvement options' (to be clearer about their purpose and nature)
 - Changing the logic used to display potential improvement measures to focus on improving the building's Heat Retention Rating (i.e. its fabric)
 - Adopting a technology neutral approach to highlighting and providing basic information about potential non-polluting heating systems.
4. **Redesign the EPC** so that the information it displays is accessible, clearer, and more engaging.



EPC Bands	Heat Retention Rating kWh/m ² /year	Level of EE
A	30 or less	Higher
B	31 to 70	Higher
C	71 to 120	Good
D	121 to 215	Lower
E	215 to 301	
F	302 to 350	
G	351 or more	



The reforms we will make – redesigned certificates and user interface

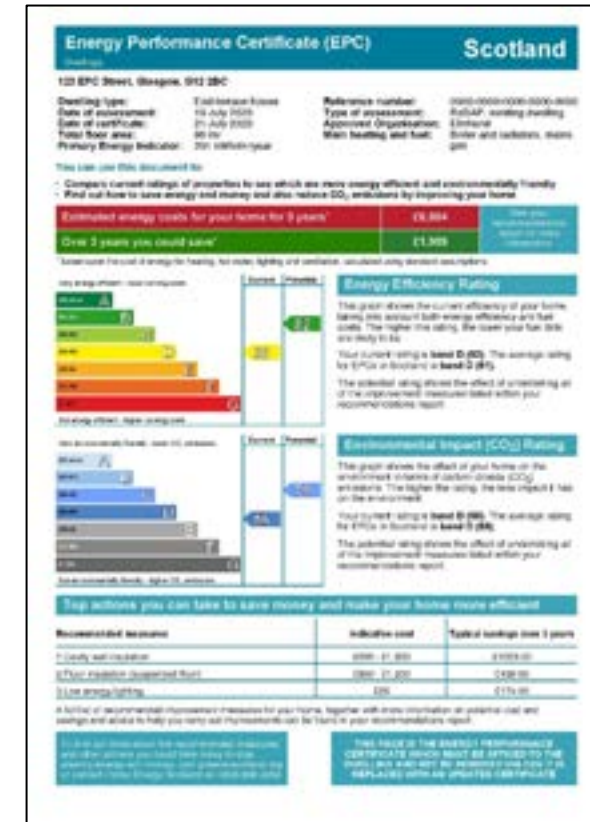


New Design Proposal

New Design Proposals vs Existing EPC

Phase 1

- Informed by user research and testing
- Existing described as text-heavy, dated, crowded and unengaging
- New design feedback:
 - “It's more modern looking”
 - “It's easy to digest”
 - “It tells you what you need to know pretty quickly”
- Testing to date involved over 60 individuals:
 - Recent home buyers/sellers
 - Mortgage advisors
 - Landlords
 - Private tenants
 - Business owners
 - Local authority housing staff
- New ratings incorporated
- Existing A to G scales well-understood
- “Fabric” Rating not understood, so changed to “Heat Retention Rating”



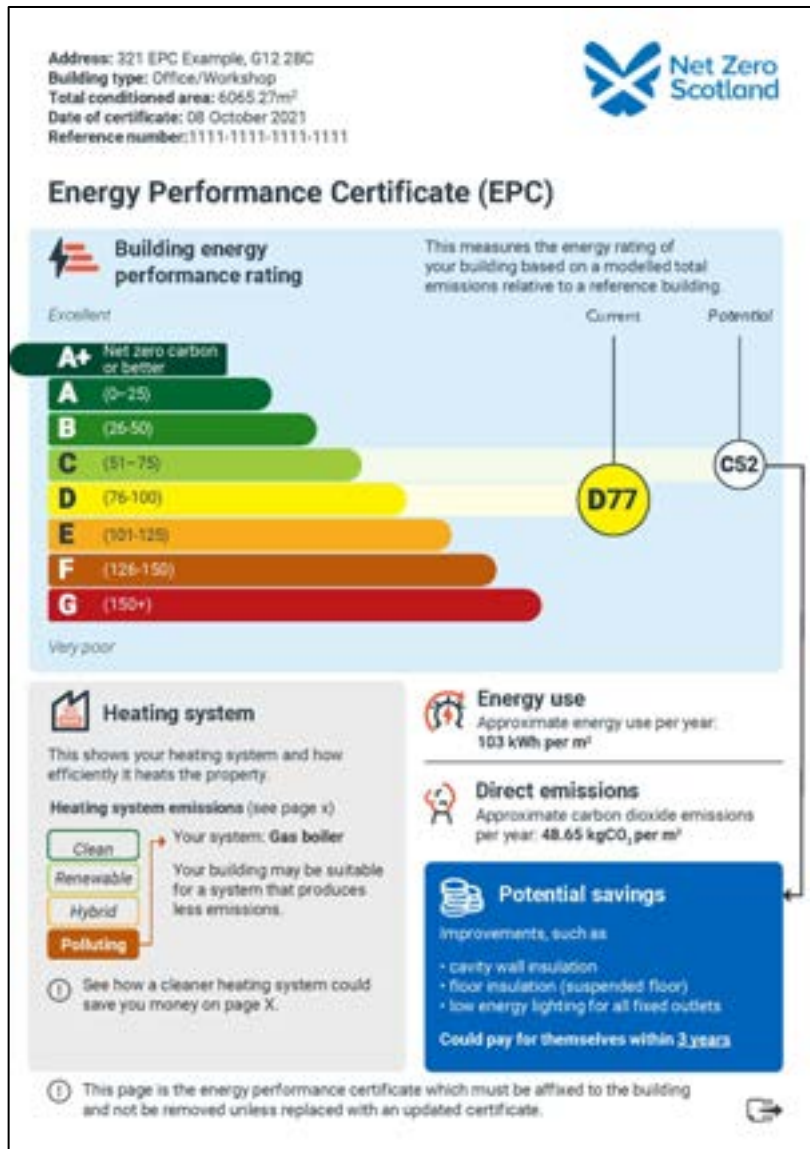
Existing EPC Design

Phase 2 of user testing will review moving to digital certificate, the new EPC Register and potential interactive tools to help inform users and drive retrofit.

Officials will engage with consumer groups, the UK Government and the CCC among others.



The reforms we will make – new Rating system NON-DOMESTIC



We Will Do (non-domestic EPC):

- Introduce a **reformed set of three non-domestic EPC ratings**:
 - Energy Efficiency Rating (kgCo2e/m2/year), based on modelled emissions from regulated energy use relative to a reference building to align with the rating system used across the UK;
 - Direct Emissions Rating (kgCO2e/m2/year), based on the building's modelled direct emissions from regulated energy use to allow a focus on the decarbonisation of individual buildings. For buildings which only use grid electricity this will be zero;
 - Energy Demand Rating (kWh/m2/year) - the building's modelled regulated energy use under standardised conditions to allow comparisons between buildings.
- Clearly show the **main heating system** of the building and whether it is a polluting system or not.
- **Redesign the EPC** so that the information it displays is accessible, clearer, and more engaging.



Making the Change Happen



Making the change happen – Technical Infrastructure & Operational Governance

Technical consultation on lodgement fees and penalty charges

Technical Infrastructure design and build – maximum sharing with UKG

- new **EPC Register** – using UKG cloud calculation service
- new **Calculation Methodology** using UK Home Energy Model – adapted to Scotland

Operational Governance

- new **Operational Framework** – strengthen oversight of market:
 - **Accreditation** – (re)-appointment of Approved Organisations and new market entrants
 - **Skills:**
 - review National Occupational Standards with UKG
 - ensuring assessors trained in new HEM methodology and new ratings
 - **Enforcement** – support LAs through toolkit working with COSLA
 - **Quality assurance:**
 - enhance desk-based audit with new onsite Audit & Inspection of certificates – to ensure reliability and accuracy of assessors' work; drive up the quality of assessments for consumers; align with EU (work with Ireland and Denmark)
 - **Consumer protection:**
 - Work with UKG to consider Ombudsman
 - **Comms and engagement with market**
 - engage estate and lettings agents and conveyancing solicitors; input to Home Report Review
 - engage general public on changes to rating system
 - engage government delivery programmes



Longer term reforms – technical suitability assessment (HEETSA)

Heat & Energy Efficiency Technical Suitability Assessment (HEETSA)

We think that an additional form of bespoke, technical assessment, which goes *beyond the EPC*, is needed, and are scoping how to address a range of situations surrounding:

- a. how to ensure that the correct energy efficiency measures and heating systems are installed in buildings which are complex (like tenements) or more challenging to retrofit (such as traditional and protected buildings)
- b. how to ensure owners are aware of communal energy efficiency and clean heating options which would not be included on an individual EPC

Development of the retrofit assessment market

Growth in recent years in industry-led initiatives to develop more detailed retrofit assessments:

- PAS 2035 and PAS 2038; RICS Retrofit Standard; BS40104; Enerphit/PassivHaus; Historic Scotland Guide to Energy Retrofit of Traditional Buildings

Role of HEETSA?

- identify any gaps within the market (e.g. around ‘whole building’ assessment of communal vs individual heating in tenements)
- set out in regulations and guidance, clear standards for the methodology and tools used to assess technical suitability of measures
- set out in regulations and / or guidance, clear standards of skills, qualification and quality assurance which assessors offering advice on technical suitability of measures need to meet, in order to be allowed to operate within the market
 - initial independent scoping research completed – move to scoping consultation



Timetable for reform



Timetable for reform

Legislative

- Feb-Mar 2025 – technical consultation; BRIA interviews
- Apr-May 2025 – consultation analysis
- Jun-Aug 2025 – regulations drafting, finalisation of BRIA
- Sep-Nov 2025 – regulations laid and scrutinised in Parliament
- Dec-Jun 2026 – comms and engagement with public and market actors
- Autumn 2026 – regulations in force

Technical infrastructure

- Feb 25-Jun 2026 – design, build, test new EPC Register
- Feb 25-Jun 2026 – design, build, test new EPC Calculation Methodology and software
- Autumn 2026 – new infrastructure goes live

Operational governance

- Feb-Mar 2025 – finalise Operational Framework review and Approved Org engagement
- Summer 2025 – agree key objectives and performance indicators for new Framework
- Winter 25-2026 – notify market and (re-)appoint AOs and new entrants
- Spring 2027 – establishment of onsite audit and inspection function



Scottish Building Regulations Update

Daniel Foulds, Building Standards Division, The Scottish Government



Building (Scotland) Act 2003



Scottish Ministers may for purposes of:

- (a) securing the health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings or matters connected with buildings,
- (b) furthering the conservation of fuel and power, and
- (c) furthering the achievement of sustainable development,

Make regulations (“building regulations”) with respect to the design, construction, demolition and conversion of buildings and the provision of services, fittings and equipment in or in connection with buildings.

Building Standards Division



- Changes, updates and additions to the Building Standards and associated Technical Handbook guidance
- Changes, updates and additions to the procedural and fees regulations and associated guidance (Procedural and Certification Handbooks etc.)
- Ministerial views and relaxations
- Building Standards system development – the Futures Board
- Building Standards Verifier performance
- Local Authority liaison and joint working, workforce development and competence
- Building Standards Stakeholder Group

February 2023 – Energy Standards



- Adoption of the revised UK calculation methodologies, SAP 10 and SBEM v6
- New delivered energy target for newbuild with a focus on solutions that are effective in reducing energy demand
- Emissions target no longer applies to any new building that uses zero direct emission heating system
- Aggregate emissions reductions – new homes 32%, new non-domestic buildings 20%
- Credit for onsite generation of power excludes the export component
- Connections to heat networks simplified with a focus on the performance of the building, not the network
- Guidance on airtightness testing of new homes moves from sample testing to testing of all completed dwellings with reduced exemptions for non-domestic buildings

February 2023 – Ventilation and overheating



- Revision of Domestic ventilation guidance to clarify solutions and approaches for low infiltration dwellings, revision of guidance on openable ventilators (purge ventilation) and background ventilations, changes to guidance of commissioning and written information on systems
- Incorporation of separate 'Domestic Ventilation Guide' as an Annex to Section 3
- Revision of Non-domestic ventilation guidance to identify specific provisions around commissioning and written information on systems
- Introduction of new standard 3.28 and supporting guidance on mitigating summer overheating risk in new homes and new non-domestic residential buildings of a similar form. Demonstrating compliance by simple approach or thermal modelling

April 2024 – New Build Heat Standard



- The New Build Heat Standard requires new buildings to install climate-friendly heating systems instead of oil and gas boilers
- Direct emission heating systems excluded through the introduction of standard 6.11 within Building Regulations

January 2025 – New Build Heat Standard Addendum



- Following review, proposed changes were made introducing exemptions for bioenergy heating systems, peat-burning systems and secondary heating

Onward Review – Scottish equivalent to the Passivhaus standard



- Review in response to Alex Rowley MSP member's bill seeking to set “new minimum environmental design standards for all new-build housing to meet a Scottish equivalent to the Passivhaus standard, in order to improve energy efficiency and thermal performance”
- Review has focused on two outcomes:
 1. Improvements to the setting of energy and environmental (ventilation) performance standards for new buildings, leading to lower energy demand (and reduced running costs) and a healthy indoor environment; and
 2. Improvements to the design and construction process to give greater assurance that compliance, and therefore the performance sought, is delivered in practice

Onward Review – Scottish equivalent to the Passivhaus standard



- **July 2024 Part 1 Consultation** ran from 31 July to October 2024 with 350 responses
- To determine the principles for a Scottish equivalent to the Passivhaus standard to enable confirmation of amendments to regulations in December 2024
- High support for ‘equivalent’ meaning Passivhaus is not adopted for all new development, however, the new standard should set a similar level of prescription on key energy related elements
- Higher support for absolute targets rather than the proposal to retain current approach of setting relative performance targets for new buildings
- Support for further consideration of the introduction of a prescriptive space heating demand limit for new buildings

Onward Review – Scottish equivalent to the Passivhaus standard



- Most prevalent view how effective ventilation of new buildings is best achieved was that MVHR is most effective
- Support to apply regional climate data within approved calculation methodologies
- Strong support for Passivhaus certification offering a feasible alternative means of compliance with standard 6.1
- Agreement on why there is a need for improvement in compliance processes to deliver very low energy buildings
- Over half of respondents apply in-house or third-party compliance management processes to their projects that address energy and environmental elements
- Three quarters of respondents in favour of the proposal to mandate the standards in 2028

Onward Review – Scottish equivalent to the Passivhaus standard



- The Building (Procedure) **Amendment Regulations** 2024 were laid in Parliament on 12 December 2024
- Requirement to provide an ‘energy and environmental design statement’ with applications for a building warrant or applications to amend a warrant
- Requirement to provide an ‘energy and environmental construction statement’ with each completion certificate
- These statements describe how the design and construction of the building complies with standards 3.13, 3.14, 3.28, 6.1 to 6.7, 6.10, 7.1 and 7.2

Onward Review – Scottish equivalent to the Passivhaus standard



- **Research and procurement continues**
- Production of consultation domestic standard 6.1 compliance tools
 - Scottish Homes Wrapper linked to the UK Government Home Energy Model. Delivered for testing summer 2025
- Production of consultation non-domestic standard 6.1 compliance tools
 - Updates to SBEM v7. Delivered for testing summer 2025
- Production of final standard 6.1 compliance tools
 - Delivered for testing spring 2026

Onward Review – Scottish equivalent to the Passivhaus standard



- Consultation 2 on the detail of the proposed changes – **Summer 2025**
- Publication of guidance and compliance tools – **Early 2026**
- Revised standards come into force – **31 March 2026**

Latest Developments in Retrofit

Simon Flint, Elmhurst Energy



Introduction

‘If you start with wobbly foundations you will end up with a wobbly house’



Introduction



- Retrofitting a home means carrying out improvements to improve its energy efficiency, such as installing better insulation and glazing, or installing a renewable energy system like a heat pump.
- Homes in Scotland account for around 13% of Scotland's total greenhouse gas emissions.
- Therefore, to meet the target of reducing emissions by 70% by 2030, and the net zero target by 2045, Scotland's homes will need to become significantly more energy efficient and use zero or almost zero carbon heating sources



Introduction



- PAS 2035 (2023)
- BS 40104
- Current Funding Opportunities
- Retrofit Roles: Retrofit Assessor & Coordinator
- Retrofit Coordinator Training

PAS 2035 (2023)



- New standard was fully adopted from 30th March 2025 PAS 2035 (2023)
- All new projects must follow that new revised standard.
- A number of important changes that you must be aware of for both for Retrofit Assessors, in particular in the collection of ventilation evidence and significant changes in process for Retrofit Coordinators



PAS 2035 (2023)

Retrofit Assessor:

- Additional data collection particularly around existing ventilation and the measurement of background ventilation
- Not directly linked but RdSAP 10 will also change/increase the data collection.
- ABBE Level 3 Award in Energy Efficiency for Older and Traditional Buildings now required to assess all Traditional buildings.

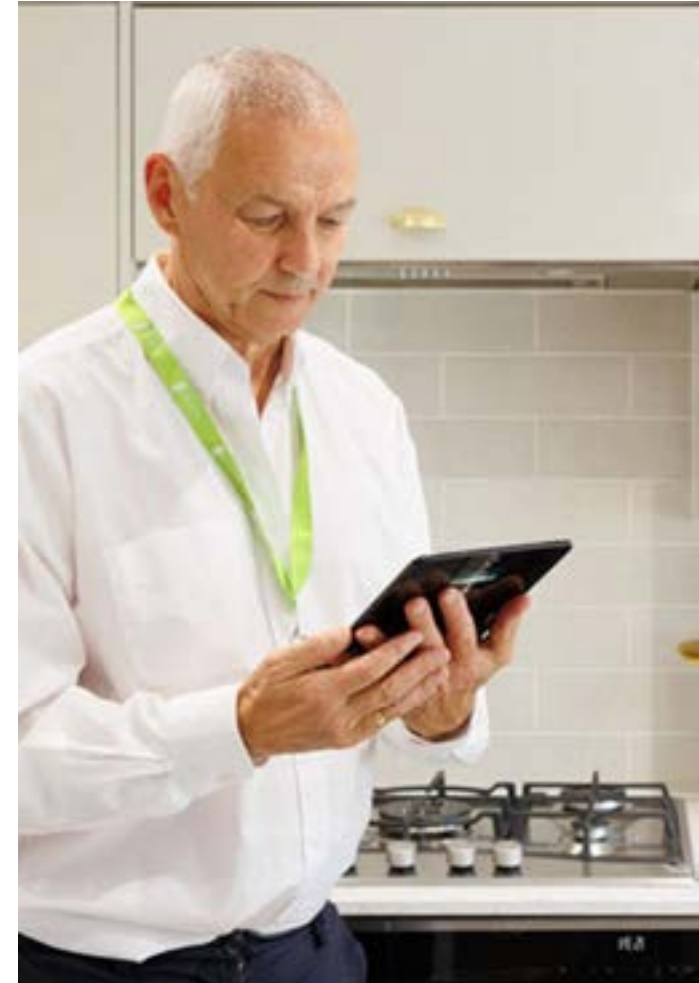


PAS 2035 (2023)



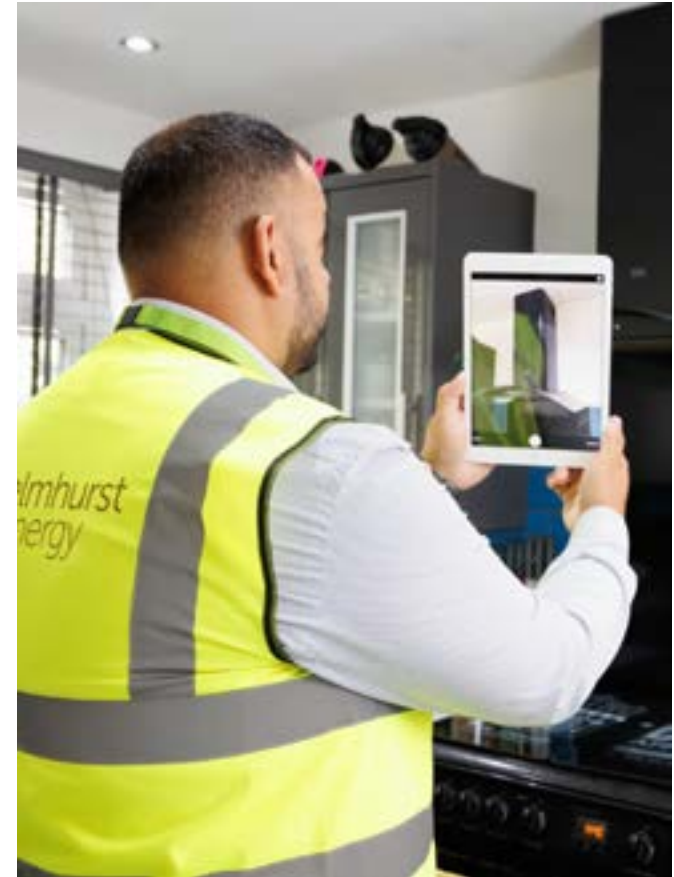
Retrofit Coordinator:

- Risk Paths removed
- I.O.E & Medium Term Plan for all projects
- ABBE Level 3 Award in Energy Efficiency for Older and Traditional Buildings
- Increased details around ventilation and a requirement to take previously installed EEM into consideration.
- Design role now requires additional qualifications
- Site visits requirements
- Increased emphasis on monitoring & evaluation



BS40104: Retrofit Assessor Standard

- The Retrofit Assessor Standard provides the processes and recommendations for retrofit assessments based on a whole-dwelling approach, covering context assessment, on-site assessment, reporting and lodgement and competencies.
- July 2024 published for consultation.
- September 2024 consultation closed.
- Over 400 responses were received.
- Publication of the finalised version likely later this year with implementation & adoption timescales to be agreed after publication.



BS40104: Retrofit Assessor Standard

Elmhurst Response:

- As a standalone document, BS 40104 is a good standard and offers clear guidance on how to complete a thorough Retrofit Assessment for a property in readiness for whole house retrofit.
- Significant amount of additional competency training and skill development to cover many of the enhanced requirements in this standard.



BS40104: Retrofit Assessor Standard

Elmhurst Response:

- Concerns about its adoption and the potential impact on large-scale projects and widespread implementation. The standard could significantly hinder the progress of PAS 2035 and lead to substantial cost increases in delivering retrofit projects, potentially harming the industry.
- Our full response can be seen online [here >](#)



Current Funding Opportunities



- Manifesto of the Labour Government committed to a Warm Homes Plan to upgrade five million homes over next five years with the aim of cut bills for families and deliver warmer homes and to significantly reduce fuel poverty.
- The devolved Scottish Government have responsibility for a number of funding schemes .
- PAS 2035 must be used for most publicly funded work delivered under government energy efficiency schemes. Currently these include:

Current Funding Opportunities



- **ECO4:** The ECO scheme supports energy efficiency measures in the homes of those considered to be in fuel poverty, low income or vulnerable households with the aim of reduced energy usage, by installing insulation or upgrading a heating system.
- Will run until March 2026 and by then will have been worth £4 billion
- Aim to install multiple measures per property (whole house approach)
- Target properties are in the lower EPC bands

Current Funding Opportunities



- **GBIS:** The scheme complements the Energy Company Obligation ECO4 scheme, yet unlike ECO4's 'whole house' approach, this scheme will mostly deliver single insulation measures.
- Scheme initially introduced in April 2023 will run till March 2026 and in total is worth £1 billion.
- As well as supporting low-income and vulnerable households, it is also available to those living in homes with an EPC rating of D-G, and within Council Tax bands A-E in Scotland.
- Very slow initial take up of the scheme but has now delivered over 70,000 measures to over 55,000 homes.
- Recent published changes may well increase the uptake and will allow for both CWI & loft insulation in some circumstances.

Current Funding Opportunities



- **Home Energy Scotland Grant and Loan Scheme:** Provides homeowners in Scotland a grant, interest free loan or a combination of both to install clean heating systems and energy efficiency measures.
- The amount of funding you can apply for depends on which improvements (energy saving, renewables systems or secondary improvements) you wish to make but could be as much as £7500 as a grant and the same amount as an interest free loan. This could increase for those in a rural or island homes.
- Available to homeowners who live in the property, and it is their only or primary private residence.
- Does not require full PAS compliance but will need Energy report showing recommendations and EPC upon completion

Current Funding Opportunities



- **Warmer Homes Scotland:** A Scottish Government funded scheme. It offers energy efficiency improvements to make homes warmer and, in most cases, these improvements are free to the occupier.
- Eligible households can receive energy-saving home improvements worth up to £10,000.
- Available to homeowners and private sector tenants who satisfy a range of eligibility criteria.
- Scheme is delivered by Warmworks on behalf of Scottish government.
- Since its introduction it has delivered improvements to nearly 45,000 homes

Current Funding Opportunities



- **Energy Efficient Scotland: Area Based Schemes (EES:ABS):** Uses government funding to improve the energy efficiency of homes.
- As the title implies the funding is targeted in specific locations which currently include Edinburgh, Aberdeen, Fife & South Lanarkshire.
- Measures depend on eligibility and the relevant local authority.
- **Private Sector Landlord Loan:** Registered private sector landlords can access the Private Rented Sector Landlord Loan for various energy efficiency improvements to their properties. Funding is available up to £15,000 per property for energy efficiency improvements although there are conditions attached.

Retrofit Roles



- Retrofit Assessor, current over 2000 accredited with Elmhurst but still fantastic opportunities as that is only one in four of our DEA accredited members.
- Retrofit Coordinator, now over 500 members and they are responsible for completing up to 8000 retrofit projects a month.
- Each one of those projects results in a warmer, more efficient, cheaper to run home for the occupiers

Retrofit Roles



- Over the last two years we have seen significant growth in both the number of members, the volume of work they are submitting, and these opportunities are increasing all the time.
- I have already spoken about the current funding options that require PAS 2035 compliance.
- We are committed to not only providing support to our members but leading the way in developing innovative software and further training, for example:

Retrofit CPD & Training

- Retrofit Assessor Training
- Retrofit Assessor Virtual Walkthrough
- Energy Efficiency for Older & Traditional Buildings Level 3
- Retrofit Coordination in Practice
- Design SAP for Retrofit Coordinators
- U Value Competency
- Background Ventilation & L1 Airtightness Training



Retrofit Coordination Training



I would like to take a few moments to introduce you to the recent launched Elmhurst's in house **Retrofit Coordination Training Course**

- Combines accessible on-demand, theory training allowing flexibility to learn at your own pace and a practical comprehensive 3-day classroom course that integrates theory with real case study work and hands-on software practice.
- ABBE Level 5 Diploma in Retrofit Coordination and Risk Management

Retrofit Coordination Training



The course is developed based on insights from the last few years of support calls and auditing as an approved TrustMark Retrofit Coordinator PAS 2035 Scheme Provider.

- Industry Software Training
- Trustmark Portals & Compliance
- Focus on site based Retrofit Coordinator
- First year of accreditation following successful completion of our course for only £99 + vat Saving £350

Summary



- Formal adoption of PAS 2035 (2023)
- Both UK and devolved government, investing heavily in funding schemes with the aim of reduce fuel poverty, carbon emissions and improve insulation and heating in thousands of homes every month.
- Massive opportunities for our members both current and those who are still to explore retrofit.
- Highlighted by the introduction of our Retrofit Coordination training course.
- Elmhurst will continue to lead the way in this exciting, developing and challenging area.



20/05/25

NATIONAL RETROFIT HUB: ELMHURST IN GLASGOW





TALKING POINTS

Who are the NRH?

Retrofit Context

Existing and Emerging
Finance Options

Policy Landscape

The Private Rental Sector

A final thought on EPCs



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.**



THE PURPOSE OF THE HUB

OUR ROLE IS TO:



CONVENE

Drive scalable solutions and lasting impact by uniting stakeholders, fostering collaboration, with diverse partnerships we build the connections and shared understanding necessary for collective progress



EVIDENCE

Gather, distil, and build on evidence ensuring it is robust and actionable. Synthesising complex information, we provide insights to inform decisions and meaningful action



ACT

Enable action by stimulating growth and building resilience. Support the development of a skilled and adaptable supply chain, shape leadership and policy, assist government, local authorities, and organisations



THE ROLE AND PURPOSE OF THE NATIONAL RETROFIT HUB

How are we enabling change?



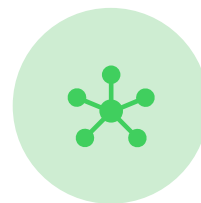
CONVENE
STAKEHOLDERS TO
TACKLE BARRIERS



ADVANCE RESEARCH
TO ADDRESS CRITICAL
GAPS



PROVIDE
INDEPENDENT
INSIGHTS AND TOOLS



CONNECT AND
AMPLIFY SECTOR



COORDINATE EFFORTS
TO OPTIMISE
INVESTMENT



SUPPORT
GOVERNMENT
DELIVERY



OUR KEY MESSAGES

What does our work with the industry tell us?



Retrofit is a lever for economic growth and prosperity



Spend on retrofit should deliver better value



The low carbon heat transition must be considered holistically



Government must work together with existing retrofit organisations to develop, implement, and deliver and National Retrofit Strategy



WHY RETROFIT?

The BRE estimates that it costs the NHS
£1.4 billion
per year to treat people impacted
by poor quality housing.

28% of young people
living in cold homes were found to
have four or more negative
mental health symptoms,
compared with 4% of young
people who had always lived in
warm homes.

In 2022, there were approximately
3,000 excess deaths
due to heatwaves.

The wider societal costs, of poor
quality housing including care,
loss of economic potential, and
poor mental health is around
£18.5 billion per year.

The social benefits of the transition to
Net Zero are even greater than the
financial and carbon benefits, with
**79% of the benefits being
social or co-benefits.**

THE BENEFITS OF RETROFIT



**REDUCED GRID LOAD
+ ENERGY SECURITY**



**INNOVATION
AND GROWTH**



NEW JOBS



**REDUCED
ENERGY BILLS**



**COMFORTABLE,
HEALTHY HOMES**



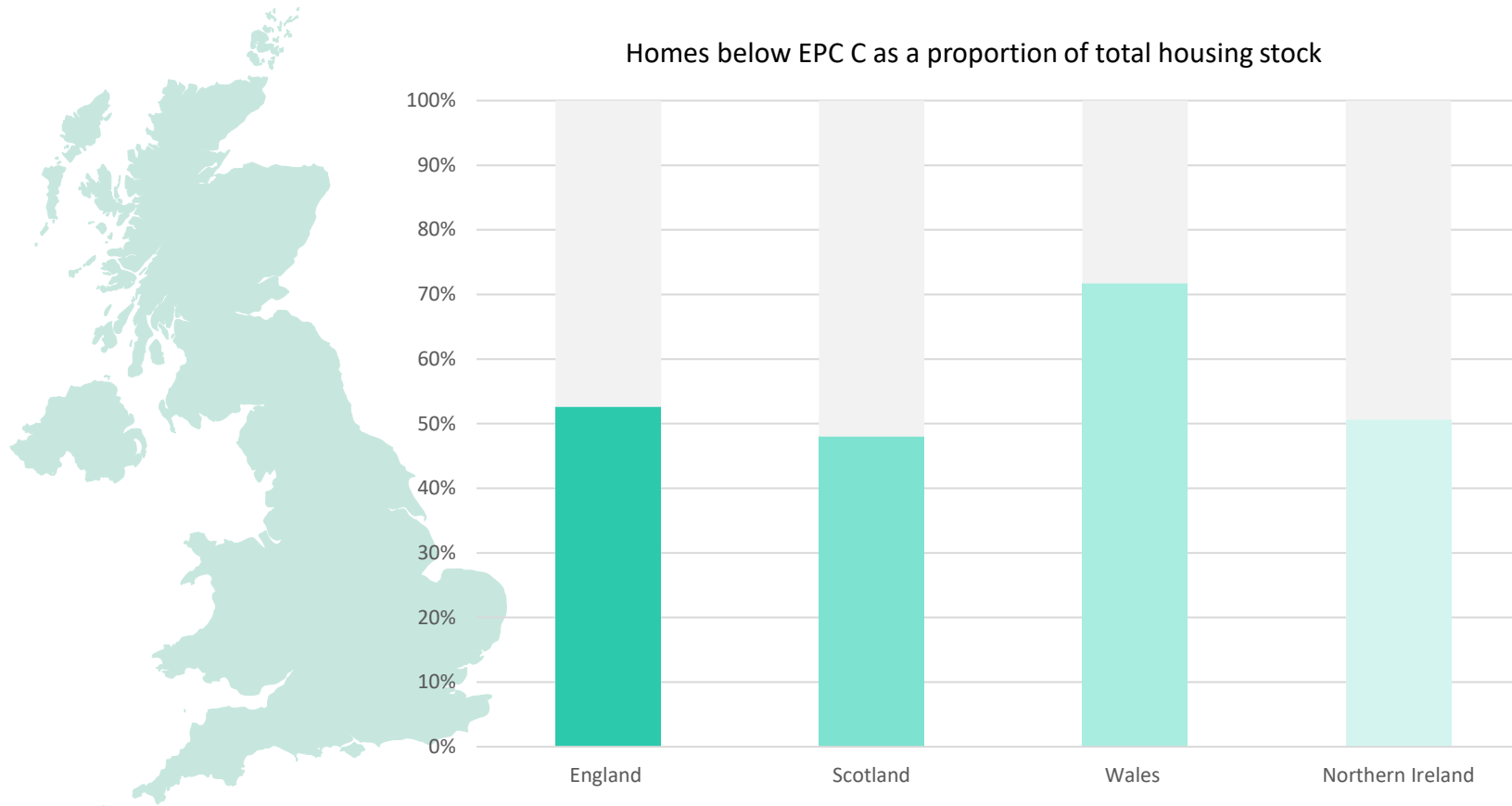
**REDUCED
EMISSIONS**



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



1,200,000 homes
in Scotland requiring
retrofit

+ more to meet
decarbonisation goals.

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



GREEN FINANCE INSIGHTS

PRIVATE FINANCE

The CCC's 7th Carbon Budget makes clear the role for private finance in retrofit:

- "... Uptake will need to be incentivised through a combination of regulations and financial support. Loans and grant funding will be necessary for some households to meet the upfront costs..."

DEMAND

Once Social Housing Net Zero Standard introduced in Scotland, and MEES applies to the Social Rented Sector in England there will be more demand for finance from Housing Providers.

GHFT

Scottish Government convening a 'Green Heat Finance Taskforce', asked to provide solutions to increase private finance into retrofit.

Report 2 considers:

- Place based approaches (aggregation for financiers)
- Heat Networks
- Social Housing – blending public and private finance



EMERGING GREEN FINANCE OPTIONS

Loan Guarantees & Interest Reductions

- National Wealth Fund guaranteeing loans provided by private finance to registered providers
- Government exploring opportunities to buy-down the rate of interest for green loans

As a Service / On Bills

- Heat or efficiency - service provide covers upfront cost, and householder repays as a 'subscription'
- Concept under development to enable scale
- Operational in Denmark

Raising funds through Carbon Credits

- Retrofit Credits scheme developed by HACT
- Snugg trialling a Carbon Cashback scheme

Community Municipal Investment (CMI)

- Also known as Local Climate Bond
- Council raise private finance to support citizen borrowing
- 14 councils have raised over £11million in private finance

Property Linked Finance

- Ties the finance to the property, rather than the owner
- Terms of payment aligned with lifetime of improvements
- Examples include PACE in the US

Demand Aggregation Financing

- Multiple projects into a collective investment pipeline
- Economies of scale and reduced transition costs
- Examples in EU, including Belgium's iChoosr's partnership with KBC offers financing for homeowners in group buying schemes.

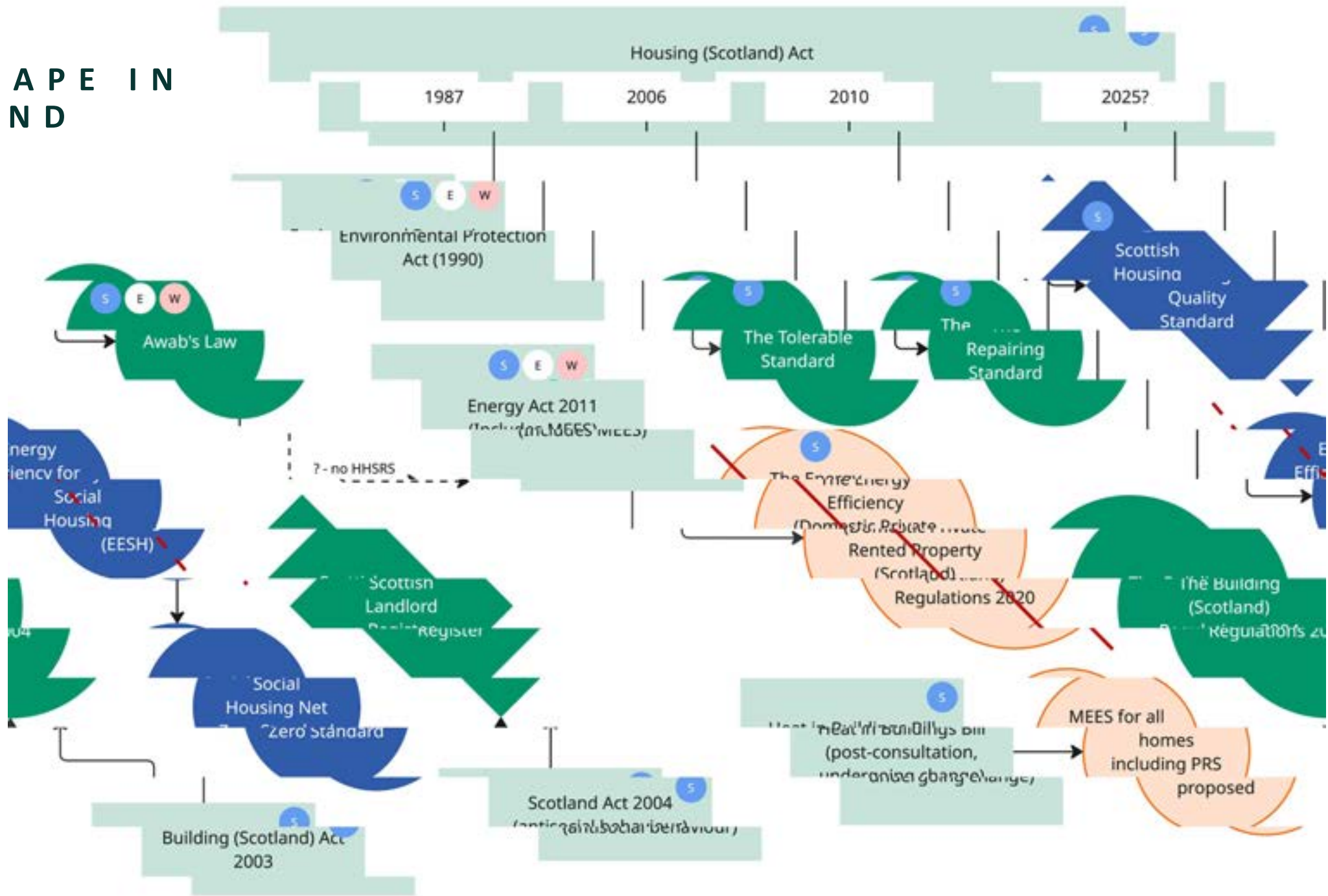
Credit Unions

- Already support home improvement - maintenance and amenity upgrade
- People Powered Retrofit leading a GHFA project on this, with partners including Loco Home.
- Examples in Ireland

Salary Sacrifice

- Feasibility stage, led by CREDS (Marina Topouzi)

POLICY
LANDSCAPE IN
SCOTLAND





HEAT IN BUILDINGS BILL

WAS...

Consulted on in 2023

WILL (ACCORDING TO MAY 2025 PROGRAMME FOR GOVERNMENT)..

Set long-term direction of travel on heating and energy efficiency

Set targets for installing clean heating systems by 2045

COULD (INCLUDED IN THE CONSULATATION)...

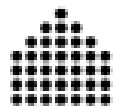
Introduce minimum energy efficiency standards for owner occupiers and in the PRS

Prohibit the installation of fossil fuel heating after a certain date (currently not planned)



S U P P O R T E D B Y :

EPC REFORM



THE MCS
FOUNDATION

KNAUFINSULATION

lendology.cic

mixergy®

PRIVATE RENTAL SECTOR + MEES

Impact
on **Urban
Health**

+ COLLABORATORS



Bankers for Net**Zero**

futurebuild
the future of the built environment

**NATIONAL
RETROFIT HUB**

FEBRUARY 2025

**NATIONAL
RETROFIT HUB**

**RAISING STANDARDS IN THE
PRIVATE RENTAL SECTOR:**
A PATHWAY TO EQUITABLE AND EFFECTIVE
RETROFIT

FEBRUARY 2025

In partnership with
**Impact
on Urban
Health**

**NATIONAL
RETROFIT HUB**

NATIONAL
RETROFIT HUB





PRS CONTEXT

700,000 people whose home is in the private rented sector in Scotland.

Over 1 in 3 homes are privately rented but tenants are facing urgent challenges:

Over 1 in 3 privately renting households can't heat their homes to a comfortable temperature

Even in warmer months 2 in 5 private tenants are living with damp or mould

1 in 4 private renters are living in fuel poverty

Many of these issues are exacerbated by poor energy efficiency with over half of privately rented homes having an EPC of D or lower.



PRS CONTEXT

Meanwhile rising interest rates and an uncertain policy environment have reduced landlord willingness to invest in energy efficiency and retrofit measures:

1 in 4 landlords have cut the amount they planned to invest in home upgrades

1 in 5 have abandoned their plans for investment all together



RAISING STANDARDS IN THE PRIVATE RENTAL SECTOR

OUR METHODOLOGY

2no. half-day
exploratory
stakeholder
workshops

Data analysis of
the English Private
Landlord survey

Landlord persona
'pen-portraits'

Creating pathways
and proposing
interventions

Local and national
government
engagement
workshops

Landlord
interviews

Revising and
refining
interventions



LANDLORD PERSONAS

SINGLE PROPERTY

- Over 2 in 5 landlords own one property
- A significant proportion have interest only mortgages
- Lower levels of rental income
- Most likely to want to leave the market
- A significant minority not aware of their EPC. Those that are are most likely to have an EPC of C or above

LARGE PORTFOLIO

- Almost 1 in 5 landlords own 5 or more properties
- Many own under 10 properties
- Higher levels of interest only mortgages
- Lower property values
- Least likely to have properties of EPC C and above

DEBT FREE

- Over 1 in 3 landlords are debt-free
- Most likely to be over 65 - many are retired
- Lower levels of rental income
- Least likely to want to change the size of their portfolio
- Significant minority have a property rated EPC C or above



POLICY	RATIONALE			
Compulsory Registration	Requiring all landlords to register provides opportunities to disseminate information and streamline compliance and enforcement			
Minimum Energy Efficiency Standards	Given the imbalance of supply and demand in the PRS, without raising minimum energy efficiency standards it’s unlikely that market forces alone will be sufficient to drive up standards			
Advice Provision	Landlords will need advice on how best to meet new efficiency standards. This advice service should provide clear pathways to compliance			
Finance Options	Market-based financial products Green mortgages and loans will provide access to capital for those who wish to build retrofit works into their existing maintenance schedule	On-bill or Heat as a Service schemes Works are carried out by a third party and repayment costs are minimal, potentially covered entirely by bill savings	Local Authority buy-out or long lease schemes Local Authorities should have the option to buy back properties that enter the market or retrofit them and rent them out using long-term leasing schemes	Fuel poverty schemes For landlords who rent properties to eligible tenants, existing fuel poverty schemes provide a fully funded route to retrofit
Outcomes Assessment	When the works are complete, it is important to have an appropriate mechanism in place to measure outcomes			
Ongoing Compliance	There must be mechanisms to ensure that properties remain compliant. Enforcement bodies must be adequately funded			



POLICY	RATIONALE			
Compulsory Registration	Requiring all landlords to register provides opportunities to disseminate information and streamline compliance and enforcement			
Minimum Energy Efficiency Standards	Given the imbalance of supply and demand in the PRS, without raising minimum energy efficiency standards it's unlikely that market forces alone will be sufficient to drive up standards			
Advice Provision	Landlords will need advice on how best to meet new efficiency standards. This advice service should provide clear pathways to compliance			
Finance Options	Market-based financial products Green mortgages and loans will provide access to capital for those who wish to build retrofit works into their existing maintenance schedule	On-bill or Heat as a Service schemes Works are carried out by a third party and repayment costs are minimal, potentially covered entirely by bill savings	Local Authority buy-out or long lease schemes Local Authorities should have the option to buy back properties that enter the market or retrofit them and rent them out using long-term leasing schemes	Fuel poverty schemes For landlords who rent properties to eligible tenants, existing fuel poverty schemes provide a fully funded route to retrofit
Outcomes Assessment	When the works are complete, it is important to have an appropriate mechanism in place to measure outcomes			
Ongoing Compliance	There must be mechanisms to ensure that properties remain compliant. Enforcement bodies must be adequately funded			



MINIMUM ENERGY EFFICIENCY STANDARDS

- All landlords we spoke to were aware of, and complaint with, existing regulations.
- Some viewed increased MEES as a positive step towards reducing emissions and improving tenant comfort
- Others felt that increased energy efficiency was a 'nice to have' or a regulatory tick box exercise
- Most said that if regulations changed they would update their properties to meet (but not exceed) them



[MEES] is a great idea, because it makes everything run more efficiently but it's just jumping two or three levels, what that looks like I'm not sure at the moment and the costs associated with that as well.

- Diana, 5 properties



MARKET BASED FINANCE

- Many of the landlords we spoke to prefer to use cash to fund retrofit works
- For those who would consider borrowing there was concern about terms and affordability
- Landlords were concerned about repayment levels. With increased costs elsewhere they felt they had no choice but to pass these costs on to tenants
- Most were generally reluctant to pay for retrofit works about wanted to meet regulations with the smallest investment possible



I don't have a mortgage, so extending it isn't an option. If I couldn't cover the costs with cash, I'd get a loan from the bank. The issue would be interest rates and over how many years.

- Philip, 1 property, debt free



ON BILL SCHEMES

- Landlords generally unfamiliar with innovative financing models
- Most found on-bill schemes appealing in principle but felt it would be a difficult concept to sell to tenants
- Most landlords weren't comfortable having conversations of this kind with tenants, even via an agent
- Some landlords felt uncomfortable with the idea of tenants paying for upgrades



Adding [retrofit costs] on to the tenant's energy bill, particularly if that's done before a new lease is signed and a tenant is fully aware of it when they sign the lease might be a way of getting round landlords disinterest or unwillingness to do these works.

- Robert, 5 properties



EXISTING FUNDING

- Most landlords we spoke to were unaware of existing funding for retrofit
- Many unsure if they would qualify as they don't know much about their tenants
- Landlords generally uncomfortable about asking their tenants what they perceived as intrusive or personal questions and rely heavily on agents for tenant selection
- Landlords indicated that if increased MEES were in place they would be more incentivised to look for funding



I knew there was funding available because I was looking for funding for solar panels when I bought a new house.

I've had a discussion with the estate agent listing my property that I'm looking for someone on benefits so I can qualify for funding [for retrofit works].

- Sarah, 1 property



LOCAL AUTHORITY SCHEMES

- Long leasing schemes more attractive to those who didn't have significant mortgages on their properties and weren't relying on monthly yields for income
- Landlords viewed schemes of this kind as a way to upgrade their properties without paying the upfront cost
- Local authorities were worried about the financial viability of schemes of this kind as landlords most interested in selling or leasing schemes are most likely to have 'hard to treat' properties



We did think of leasing to the council, but the rates weren't competitive. When you've got a mortgage to pay as well as increased costs it's not affordable to have Local Housing Allowance rent.

- Patrick, 18 properties

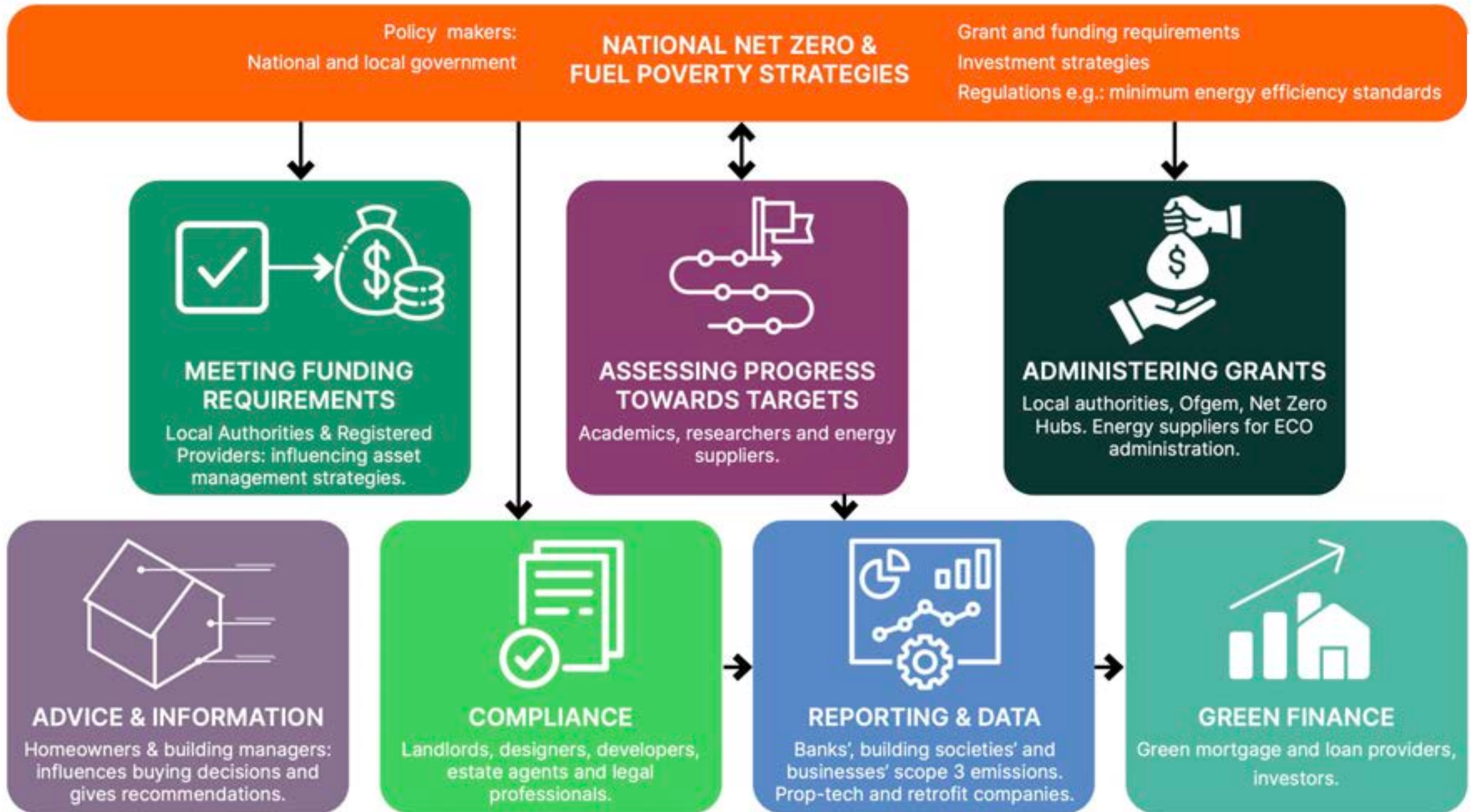
NOVEMBER 2024

THE FUTURE OF ENERGY PERFORMANCE CERTIFICATES: A ROADMAP FOR CHANGE



Energy Performance Certificates (EPCs) play a crucial role in retrofitting the UK's buildings: informing policy, finance and household decision making. The National Retrofit Hub has conducted an in-depth exploration into how EPCs could be reformed to enable the local delivery of good quality retrofit at scale. We conducted cross-sectoral engagement to build a consensus on the change needed, presented here in an eight-stage roadmap.

EPCs AND THE RETROFIT SYSTEM





PRIMARY AIMS

The information within EPCs is accurate, reliable and trusted.

The right metrics are used to set targets and measure progress.

Health and comfort are embedded.

The opportunity to use EPCs as a portal building performance upgrade is fully utilised.

1. SET CLEAR TARGETS
for the improvement and uptake of EPCs

2. IMPROVE COST AND CARBON METRICS
and use carbon metric to set Net Zero targets

3. INTRODUCE CONFIDENCE RATINGS
with options for both virtual EPC, and real-word data incorporation

4. INTRODUCE OPTIONAL METRICS
with improved user interface

5. IMPROVE RECOMMENDATIONS
and clearly link to outcomes

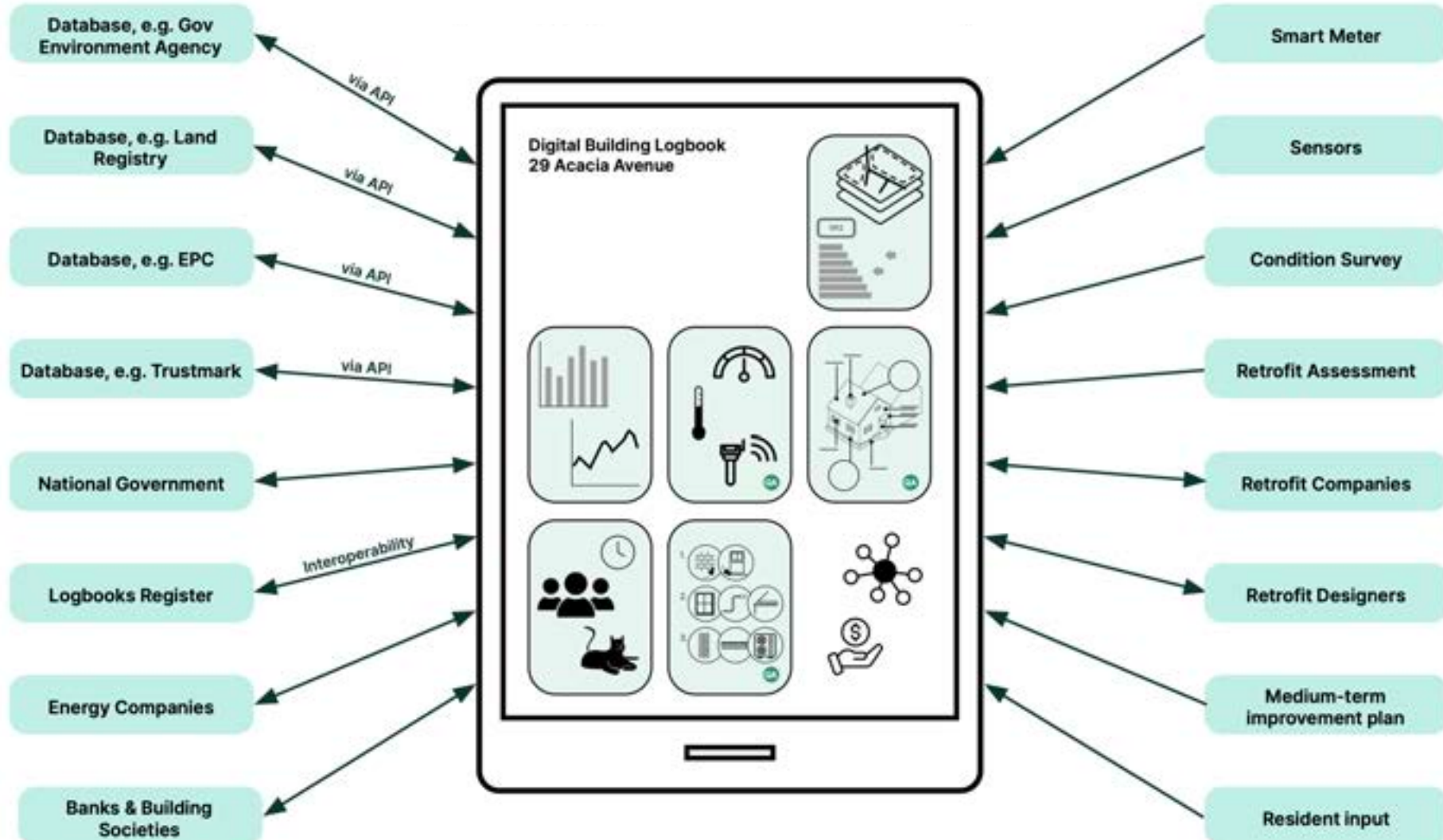
6. ENDORSE DIGITAL BUILDING LOGBOOKS
and create mechanism to allow them to link with EPCs

7. INTRODUCE MORE 'TRIGGER POINTS'
for when an EPC is required to be updated

8. NATIONAL CAMPAIGN AND RE-BRAND
EPCs provide a holistic view of building performance and health



CONNECT WITH DIGITAL BUILDING LOGBOOKS

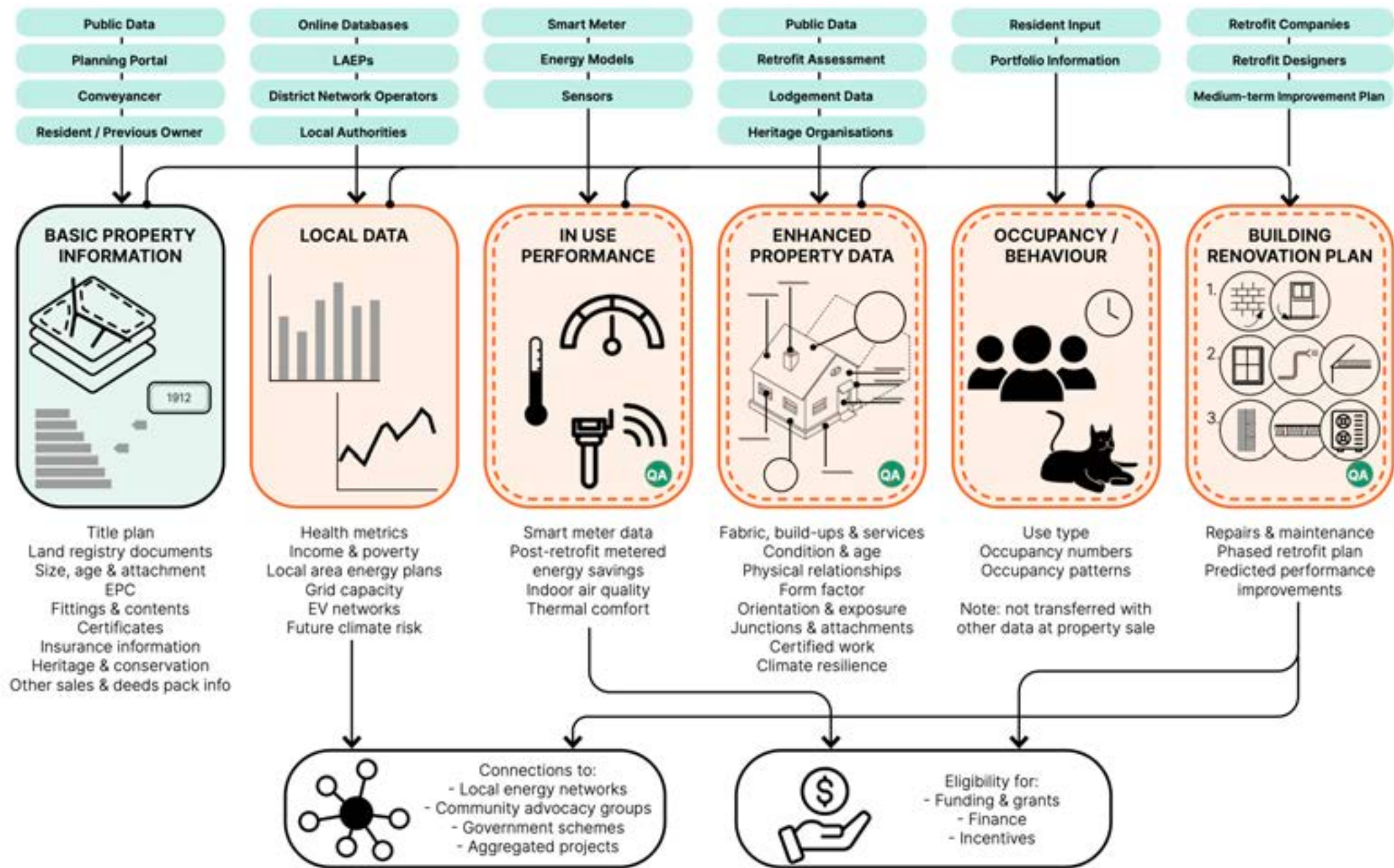


INPUT DATA

LOGBOOKS SECTIONS

SECTION CONTENTS

CONNECTIONS & EXTERNAL USES





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



info@nationalretrofitHub.org.uk

Follow us:





THANK YOU

The Importance of Airtightness Testing in Homes

Guy Fowler, Elmhurst Energy



The Importance of Airtightness Testing



- **Changes in Airtightness Since 1st February 2023.**
 - Types of Test.
 - Regime.
- **Section 6 requirements.**
- **Standard Changes.**
 - ATTMA TSL1.
 - CIBSE TM23.
 - Preparation alterations.
 - Photographic Evidence.
- **Implications of the Test result in SAP and Ventilation designs.**
- **Testing in the RdSAP, Retrofit & Heat Pump installations.**



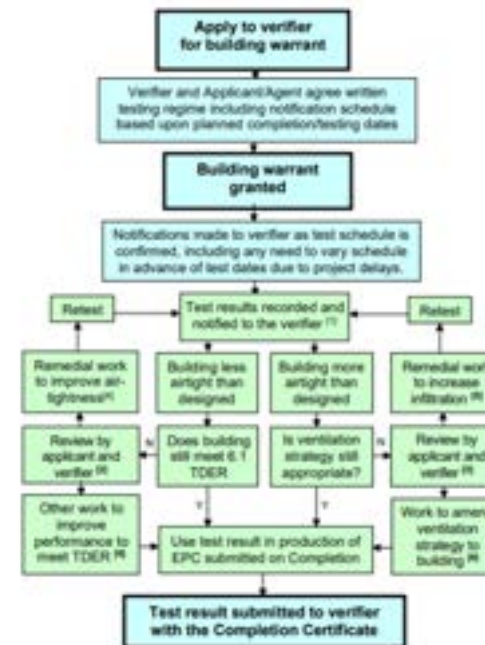
The Importance of Airtightness Testing

- **Changes in Airtightness Since 1st February 2023.**
 - Types of Test.
 - Blower Door at 50pa / **High Pressure Testing** – Retrotec or The Energy Conservatory.
 - Pulse at 4pa / **Low Pressure Testing** – Build Test Solutions.



The Importance of Airtightness Testing

- **Changes in Airtightness Since 1st February 2023.**
 - Types of Test.
 - Annex 6.D & 6.D.10 gives us some good guidance on when to test and the implications as well as what type of test.



6.D.10 What does an airtightness test involve?

Air pressure tests should be performed following a recognised test method and process, as detailed in CIBSE TM23: 'Testing buildings for air leakage' and carried out by a registered person with relevant professional experience.

There are two methods of testing the airtightness of buildings described in some detail in CIBSE TM23. Accordingly, only summary notes are provided below.

• The fan pressurisation 'blower door' method

Pressurisation or depressurisation tests using the fan method are a long-established test method. BS EN ISO 9972:2015: 'Thermal performance of buildings. Determination of air permeability of buildings. Fan pressurisation method' (BSI, 2015) is the internationally adopted standard for air leakage testing using fan pressurisation of a building.

This method will pressurise or depressurise the envelope to 50 Pascals, a pressure greater than the normal interzonal pressure differential. Used alongside other techniques, this method also provides opportunities for the diagnosis of air leakage.

Further information on the practical application of this test method can be found in following ATTMA publications:

- TSL1: Simple Buildings
- TSL2: Non-simple Buildings
- TSL3: Complex Buildings

ATTMA TSL4 which sets out the methodology for testing and reporting against the Passivhaus standard is not suitable for the purpose of building regulations compliance.

• The low-pressure pulse (LPP) method

The Low-pressure pulse method is recognised within CIBSE TM23 as a supplementary means of testing and reporting on envelope airtightness. This method uses a release of a measured amount of air (a pulse) to give a lower level of pressurisation (4 pascals). This level of pressurisation is closer to, but not the same as, typical ambient conditions in a dwelling. Testing will generally require at least two pulses.

It is a more recent development and no national or international standard is currently available for this method. Accordingly, implementation should follow the methodology set out in CIBSE TM23.

It is important that developers and designers have an early discussion with their registered airtightness tester to understand which of the test methods would be most appropriate for their project. And to understand any limitations inherent in the airtightness testing process or in either of the methods.

The Importance of Airtightness Testing



- **Changes in Airtightness Since 1st February 2023.**

- Regime – Section 6.2.5
 - We have now moved to 100% testing.

EPC data indicates that around one third of new dwellings have been subject to an air tightness test in recent years and are achieving an average air infiltration rate below 5 m³/(h.m²)@50Pa. As this level of airtightness needs a different ventilation strategy than less airtight buildings, all new homes should be tested. This will provide greater assurance that the infiltration rate declared at the design stage is achieved on completion and that issues of both energy performance and ventilation are addressed.

- Section 6 indicates that 1/3 of buildings were tested and achieving a rate of below 5.0 m³/(hr.m²)@50pa
- This then requires us to look at the ventilation systems for those buildings and if appropriate.
- This change to 100% testing helps us to address the Performance gap.

The Importance of Airtightness Testing

- **Section 6 requirements.**
 - A recommended figure of $7.0 \text{ m}^3/(\text{hr.m}^2)@50\text{pa}$.

The infiltration rate used to set the target for emissions and delivered energy calculation is set out in Table 6. In clause 6.1.2. Whilst no minimum value is set for uncontrolled infiltration, it is recommended that buildings are designed to achieve a value of $7 \text{ m}^3/(\text{h.m}^2)@50\text{Pa}$ or better to allow a balanced approach to managing building heat loss. Where the designer specifies a higher infiltration rate they should set out their justification for this to the verifier.



- Section 6 has no figure here for Pulse and low-pressure testing.
- English regulations has a minimum of $8.0 \text{ m}^3/(\text{hr.m}^2)@50\text{pa}$ or $1.57 \text{ m}^3/(\text{hr.m}^2)@4\text{pa}$.
- To use a similar comparison then a figure of $1.37 \text{ m}^3/(\text{hr.m}^2)@4\text{pa}$ could be used.
- All Pulse tests will extrapolate their results to the 50pa equivalent.
- The notional building uses a figure of $5.0 \text{ m}^3/(\text{hr.m}^2)@50\text{pa}$

The Importance of Airtightness Testing

- **Standard Changes / TSL1 > CIBSE TM23.**

Scotland

Building Warrant Application Period	Section 6 Version	Epc&SAP Version
07.08.2007 > 02.10.2011	2007	SAP 2005
03.10.2011 > 30.09.2015	2010	SAP 2009
01.10.2015 > 31.01.23	2015	SAP 2012
01.02.23 > onwards	2022	SAP 10



- Prior to 01.02.23 we used the ATTMA TSL1 Standard for Level 1 Tests.
- Post 01.02.23 we have now moved to the CIBSE TM23 standard.

The Importance of Airtightness Testing



- **Standard Changes / TSL1 > CIBSE TM23.**

- CIBSE TM23 recommends (Blower Door) that we both pressurise and de-pressurise to create an average.
- Building preparation slightly changed and we now only close trickle Vents and no tape.
- Photographs are now required of the building, test equipment and Preparation made.
- Blower door flow reads must range at least 30.0pa and baseline Pre and post reads to be an average of 10 over 30 seconds.



The Importance of Airtightness Testing

- **Implications of the Test result in SAP and Ventilation designs.**
 - We have 3 categories of infiltration.
 - Very Low Infiltration – $3.0 \text{ m}^3/(\text{h}.\text{m}^2)@50\text{pa}$ or below.
 - Low Infiltration – Between $3.0 > 5.0 \text{ m}^3/(\text{h}.\text{m}^2)@50\text{pa}$.
 - Higher Infiltration – Above $5.0 \text{ m}^3/(\text{h}.\text{m}^2)@50\text{pa}$

It is essential that the basic ventilation strategy is determined at early design stage. There are three routes to follow, depending on the design intent for the fabric infiltration level of the proposed dwelling. The intended design infiltration rate will therefore fall into one of three categories:

- 'very low infiltration' - $3 \text{ m}^3/(\text{h}.\text{m}^2)@50\text{Pa}$ or tighter,
- 'low infiltration' - between 3 and $5 \text{ m}^3/(\text{h}.\text{m}^2)@50\text{Pa}$ and
- 'higher infiltration' - $5 \text{ m}^3/(\text{h}.\text{m}^2)@50\text{Pa}$ or more.



The Importance of Airtightness Testing

- Implications of the Test result in SAP and Ventilation designs.
 - We have 3 categories of infiltration.
 - Very Low Infiltration – $3.0 \text{ m}^3/(\text{h.m}^2)@50\text{pa}$ or below
> **Continuous Supply and Extract.**
 - Low Infiltration – Between $3.0 > 5.0 \text{ m}^3/(\text{h.m}^2)@50\text{pa}$
> **Continuous extract.**
 - Higher Infiltration – Above $5.0 \text{ m}^3/(\text{h.m}^2)@50\text{pa}$
> **Natural Ventilation with Intermittent extract.**

Table 3.5a – Ventilation solutions for design infiltration levels.

Ventilation type	Suitable for infiltration rate:
Natural ventilation (with intermittent mechanical extract)	$\geq 5 \text{ m}^3/(\text{h.m}^2)@50\text{Pa}$
Continuous mechanical extract ventilation	$\geq 3 \text{ m}^3/(\text{h.m}^2)@50\text{Pa}$
Continuous mechanical supply & extract ventilation	Any

Designer may choose to provide evidence of the suitability of another option for any of the above categories.



The Importance of Airtightness Testing



- **Testing in RdSAP, Retrofit & Heat Pumps.**

- With RdSAP changing in June 2025, we will now have the ability to override the current default figure of 15.0 m³/(h.m²)@50pa.
- All though not mandatory, this could be the difference between achieving a better rating and moving from a 'D' to 'C' or 'B'
- Within Retrofit we have seen the use of Pulse and 'Background Ventilation Testing' – BVT for short.
- This type of test gives an Air Change (ach) result and can implicate the need to add additional background ventilation or to confirm that what is present is adequate.
- In addition, we may then undertake an Air Permeability Test to ensure we have the right ventilation strategy for the dwelling.
- Within the heat pump installation market, the ability to accurately enter an ACH rate into the sizing tool, can aid the size and cost of that installation.

The Importance of Airtightness Testing



- **To Summarise**

- Within the new regulations we should be testing all new builds.
- Blower Door and Pulse are now acceptable methods of testing.
- We should be achieving a figure of under 7.0 m³/(h.m²)@50pa at the 'as built' stage.
- The as built final figure should then be checked and used to validate the ventilation strategy used in the design.
- Air testing will be used in other aspects of the industry as we want to understand the relationship between insulation upgrades, improved airtightness and ventilation.

Build Tight & Ventilate Right

Heat Loss Assessor

The importance of competency

Chris Ricketts, Elmhurst Energy



Policy Landscape



- Decarbonisation pathways to net zero by 2050
- Electrification of heat- decarbonised grid
- Ambition to install 600,000 heat pumps per year by 2028 to decarbonise the heat from buildings
- The Heat and Buildings Strategy makes significant funding commitments to support and upgrade the building stock
- Lower Flow temperature in heating systems design.

Projects and Research



- Accredited Domestic Energy Assessors have existing skills of RdSAP assessments and site surveys which we could build on.
- We developed with MCS and their installers a new heat load calculator and training to conduct space heating requirements to allow design and sizing of Low Carbon technology.

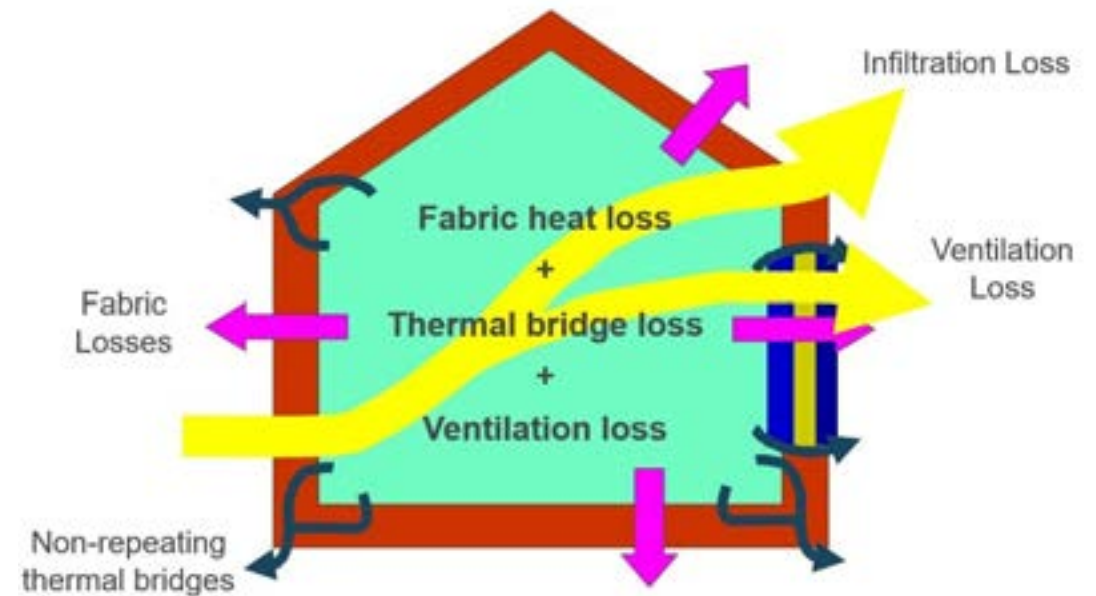
Understanding Heat Loss in Dwellings

- It is essential that the heat load of a building is calculated correctly
- Heat loss calculations must be applied on a room-by-room basis
- Systems specified in this way will be cheaper to run, ensure the homeowner is comfortable and will be more energy efficient.



Understanding Heat Loss In Dwellings

- The basics
- Building fabric – walls, floors, roof insulation, windows and doors
- Room size
- Air change rates
- Expected comfort temperatures
- Lowest temperature (on average) during winter

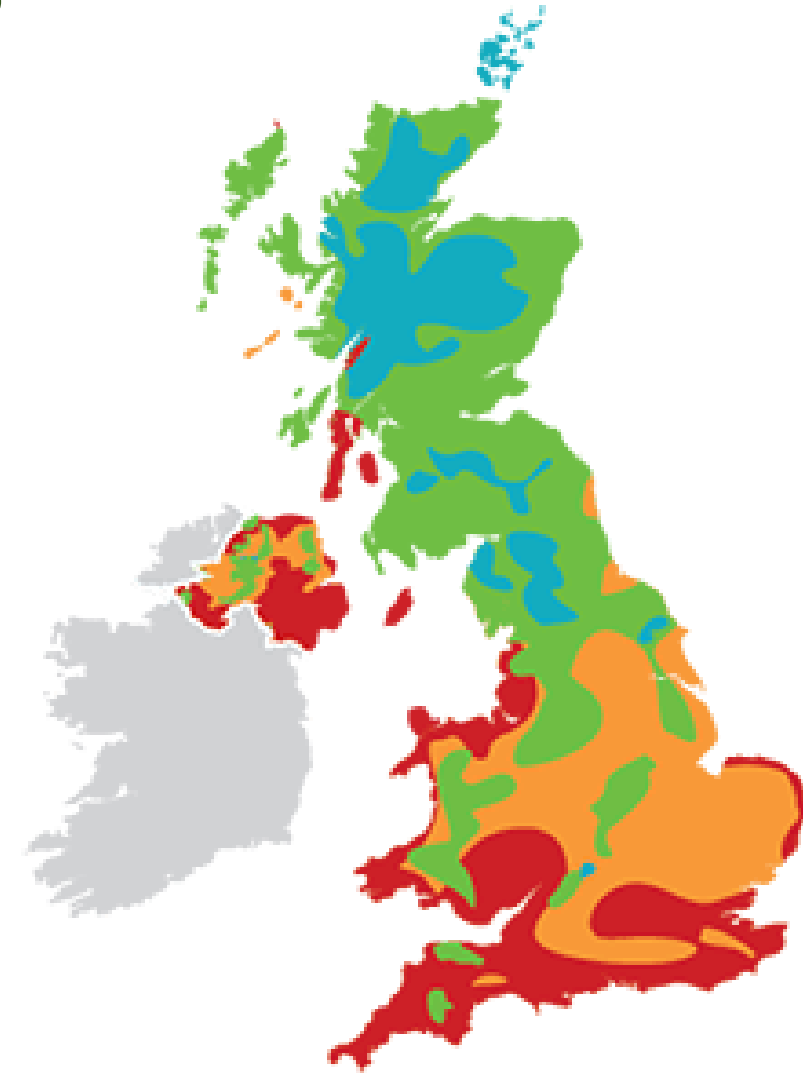


Modelling the impacts

Housing Type	Bedrooms	Floor Area (m ²)	Number of Storeys	Percentage of Scotland Housing stock
Semi Detached	3	90	2	19.5 %
Detached	4	154	2	22.5 %
End Terrace	2-3	83	2	21.7 %
Mid Terrace	2-3	79	2	

Modelling the impacts

Age Band
A: Before 1919
C: 1930-1949
E: 1965-1975
G: 1984-1991
I: 1999-2002
J: 2003-2007
K: 2008-2011
L: 2012 onwards
SAP 10



Modelling the impacts

- Kept consistent Building fabric – walls, floors, roof insulation, windows and doors remained the same
- Kept the location the same, so same weather profile and hence Lowest temperature (on average) during winter constant
- Kept the expected comfort temperatures

Property attachment type has an impact

Impact on Baseline of 1	
Archetype	
Mid Terrace	1.00
End Terrace/ Semi	1.12
Extd End Terrace	1.26
Detached	1.51

Modelling the impacts

Location	Factor on average W/m ²
Aviemore PH22	1.21
Roughburn PH31	1.22
Glasgow G1	1.20
Manchester M1	1.14
Peterborough PE2	1.15
Bristol BS1	1.08
Plymouth PL1	1.00
Campbeltown PA28	1.19



Modelling the impacts

Fabric Impact Wall		
Age Band	Assumed U-Value	Factor
A: Before 1900	1.7	1.69
C: 1930-1949	1.7	1.69
E: 1967-1975	1.7	1.69
G: 1983-1990	0.6	1.13
I: 1996-2002	0.45	1.05
J: 2003-2006	0.35	1.00
K: 2007-2011	0.3	1.00
L: 2012-2022	0.28	1.00
SAP 10	0.18	1.00

Fabric Impact Roof		
	Assumed U-Value	Factor
Pitch no insulation	2.3	1.50
100mm insulation	0.4	1.06
150mm Insulation	0.26	1.02
270mm Insulation	0.16	1.00
Notional Spec Part L	0.13	1.00
Notional Spec Part L	0.11	1.00

Elmhurst Heat Loss Calculator

- All space heating systems should be correctly sized, following assessment - current standards (BS 12831:2017)
- Incorrectly sized systems will not work at the correct efficiency
- Will cost more to run if oversized or undersized

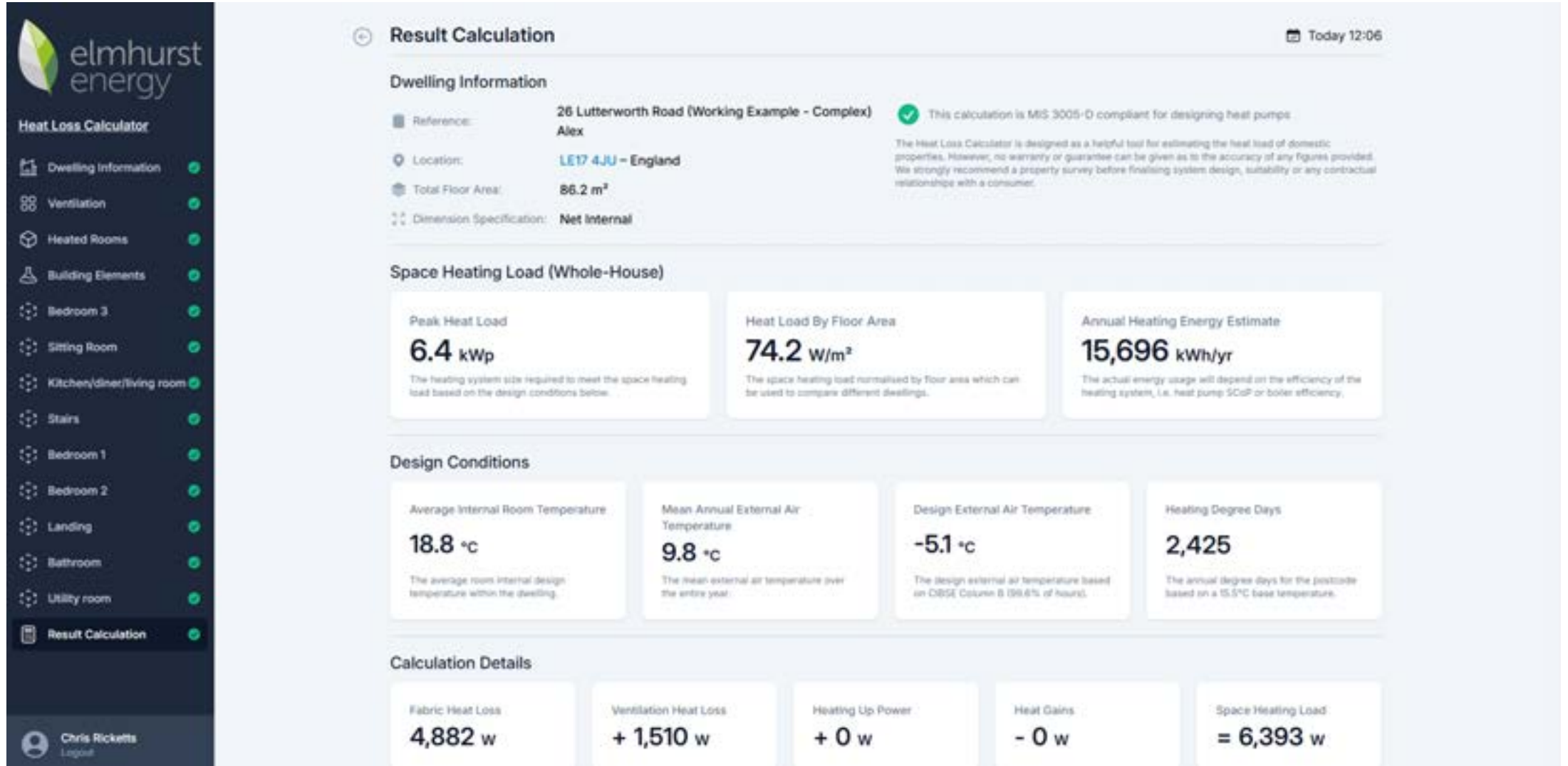


MCS compliant Results



- Following a correct set of data entry the Heat Loss Calculator Software will display a comprehensive result Calculation.
 - Dwelling Information
 - Space Heating Load
 - Design Conditions
 - Calculation Details
 - Heat Emitter Sizing By Room
 - Fabric Heat Loss By Adjacent Space
 - Ventilation Heat Loss By Zone

Software Screen Shots



The screenshot displays the Elmhurst Energy Heat Loss Calculator interface. On the left is a dark sidebar with the 'elmhurst energy' logo and a 'Heat Loss Calculator' title. Below this is a list of navigation items: Dwelling Information, Ventilation, Heated Rooms, Building Elements, and a list of rooms (Bedroom 3, Sitting Room, Kitchen/diner/living room, Stairs, Bedroom 1, Bedroom 2, Landing, Bathroom, Utility room). The 'Result Calculation' item is highlighted. At the bottom of the sidebar is a user profile for 'Chris Ricketts' with a 'Logout' link.

The main content area is titled 'Result Calculation' and includes a clock showing 'Today 12:06'. It is divided into several sections:

- Dwelling Information:** Reference: 26 Lutterworth Road (Working Example - Complex) Alex; Location: LE17 4JU - England; Total Floor Area: 86.2 m²; Dimension Specification: Net Internal. A green checkmark icon indicates compliance with MIS 3005-D for designing heat pumps. A disclaimer states: 'The Heat Loss Calculator is designed as a helpful tool for estimating the heat load of domestic properties. However, no warranty or guarantee can be given as to the accuracy of any figures provided. We strongly recommend a property survey before finalising system design, suitability or any contractual relationship with a consumer.'
- Space Heating Load (Whole-House):** Three white boxes show: Peak Heat Load of 6.4 kWp (with a note on heating system size), Heat Load By Floor Area of 74.2 W/m² (with a note on normalized load), and Annual Heating Energy Estimate of 15,696 kWh/yr (with a note on efficiency).
- Design Conditions:** Four white boxes show: Average Internal Room Temperature of 18.8 °C, Mean Annual External Air Temperature of 9.8 °C, Design External Air Temperature of -5.1 °C, and Heating Degree Days of 2,425.
- Calculation Details:** Five white boxes show: Fabric Heat Loss of 4,882 w, Ventilation Heat Loss of + 1,510 w, Heating Up Power of + 0 w, Heat Gains of - 0 w, and Space Heating Load of = 6,393 w.

Example – Space Heating Load



Heat Loss Calculator

- Dwelling Information ☒
- Ventilation ☒
- Heated Rooms ☒
- Building Elements ☒
- Bedroom 3 ☒
- Sitting Room ☒
- Kitchen/diner/living room ☒
- Stairs ☒
- Bedroom 1 ☒
- Bedroom 2 ☒
- Landing ☒
- Bathroom ☒
- Utility room ☒
- Result Calculation ☒

Chris Ricketts
Logout

Space Heating Load By Room

Radiators (or other heat emitters) need to be appropriately sized to handle the peak heat load in each room. For wet systems, the heat output should correspond to the given figures at the intended flow temperature for optimum efficiency.

Room Name	Floor Area (m ²)	Design Temp (°C)	Peak Heat Load (W)	By Floor Area (W/m ²)	Annual Energy (kWh/yr)	
Bedroom 3	6.4	18.0	757	117.6	1,813	30%
Sitting Room	13.6	21.0	1,196	88.1	1,791	15%
Kitchen/diner/living room	27.0	18.0	2,182	80.7	4,024	28%
Stairs	3.3	18.0	-9	-2.6	-96	0%
Bedroom 1	13.6	18.0	1,319	96.9	3,209	17%
Bedroom 2	6.4	18.0	663	78.8	1,357	8%
Landing	6.4	18.0	765	119.6	1,764	30%
Bathroom	3.4	22.0	678	196.0	1,022	9%
Utility room	3.9	18.0	352	89.5	621	4%

Fabric Heat Loss By Adjacent Space

Adjacent Space	Description	Adjacent Temp (°C)	Fabric Heat Loss (W)	
Exterior Air	Heat transfer through walls, roofs and suspended floors.	-5.1	3,137	64%

Competency & schemes



- Create consistency of approach and quality of output
- Have good and open governance
- Adhere to a code of conduct and a defined set of rules
- Use approved software
- Random audits to ensure standards and conventions followed

Opening up opportunities



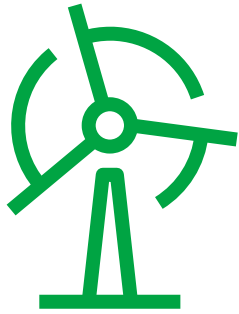
- Provision of an intuitive industry compliant heat loss calculation tool for use by DEAs, RAs, Air Testers, Surveyors, Renewable Installers, Low Temp Heating Designers.
- Developing network of Renewable assessors servicing Retrofit Industries, Heat Pump Designers, Boiler Installers and Surveyors using these tools
- Measure peak heat demand to determine heat pump readiness and potential sizing using measured results

Energy Company Obligations:

How does energy efficiency & fuel poverty funding work?

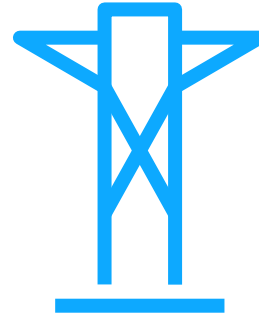
Paul Slater, ScottishPower





Renewables

- | Develops, constructs and operates onshore and offshore windfarms, battery storage and solar
- | ~3GW total installed capacity
- | Community benefits fund >£64M



Energy Networks

- | Responsible for regulated electricity network businesses across three nations in the UK
- | 3.6M customers
- | Priority services register
- | Net Zero Fund



Customer Business

- | Supply electricity and gas to our customers and provides solutions to help support and decarbonize their homes
- | 4.5M UK supply customers
- | Energy Company Obligation (ECO)
- | Great British Insulation Scheme (GBIS)
- | Warm Home Discount

30+ years of funding



Energy Efficiency Standards of Performance (**EESoP**)

1994 – 1998 – 2000 – 2002



Energy Efficiency Commitment (**EEC**)

2002 – 2005 – 2008



Carbon Emissions Reduction Target (**CERT**)

2008 – 2012



Community Energy Saving Programme (**CESP**)

2009 – 2012



Energy Company Obligation (**ECO**)

2013 – 2015 – 2017 – 2018 – 2022 – 2026



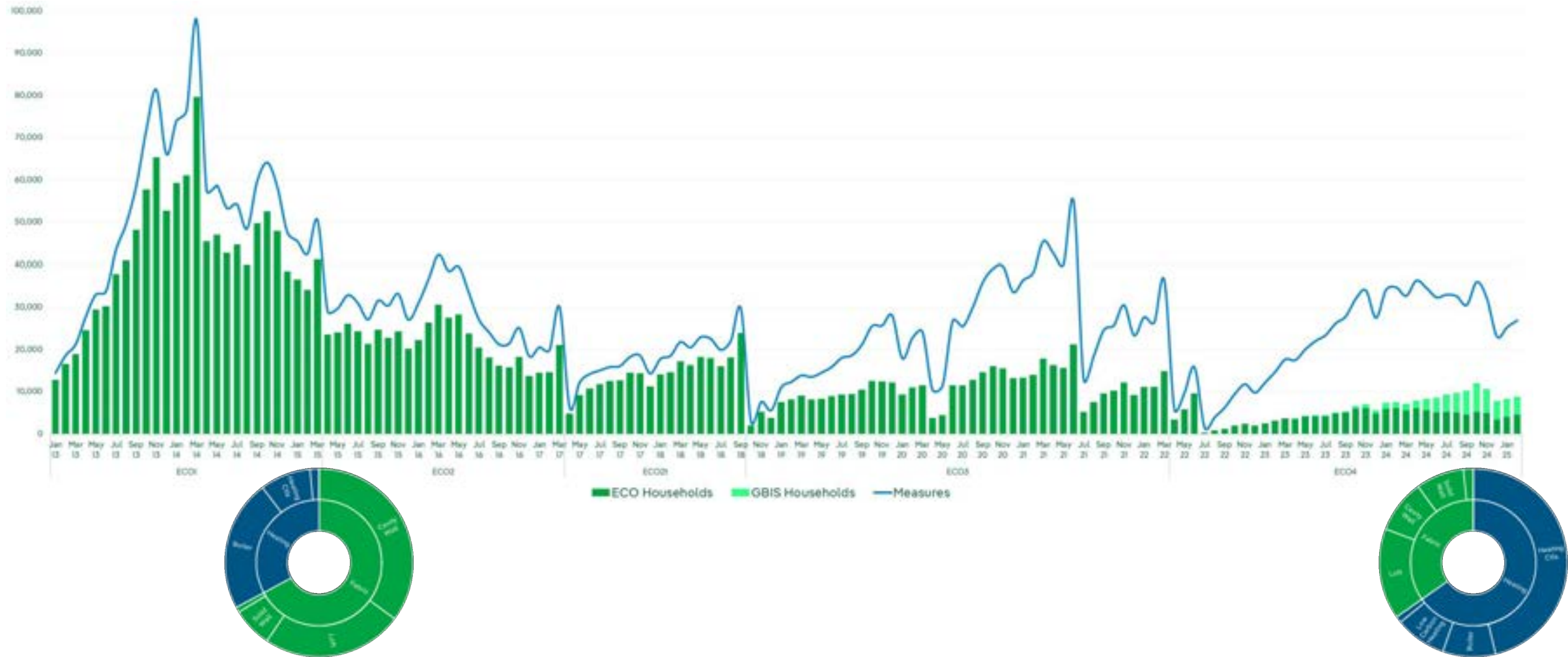
Great British Insulation scheme (**GBIS**)

2023 – 2026



.....

Energy Company Obligation



What is ECO4?

ECO4 1st Apr 2022 – 31st Mar 2026

Support the most vulnerable households in the least efficient homes

Funding for fabric first, whole house retrofit

Improve energy performance on households by 2 x EPC bands
F&G - D
D&E - C

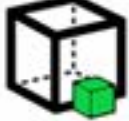
- | Households in or at risk of fuel poverty
- | **EPC Band of D-G**
- | Alignment with PAS2035
- | Work carried out to PAS2030 / MCS
- | Trustmark accredited supply chain
- | Minimum requirements and caps
- | Expectation of landlord contributions

What is ECO4?

Fabric Improvements

Wall Insulation		• External wall • Cavity wall • Internal wall • Hybrid wall • Party wall
Roof Insulation		• Loft • Flat roof • Pitched roof • Room-in-roof
Floor Insulation		• Solid floor • Underfloor
Windows / Doors		• Window glazing • High performance external doors
Draughtproofing		
Ventilation		• PAS 2030:2019 • PAS 2035:2019

Heating Improvements

Non-renewable heating		• Upgrades • Replacements • First Time Central Heating
Renewable heating		• Upgrades • Replacements • First Time Central Heating
District heating		• District Heating Connection
Controls		• Programmer & room thermostat • Smart thermostat • TRV • Time and temperature zone control • Compensation
Solar		

What is ECO4?

- | Energy Performance Certificate
- | Energy Performance Report
- | Starting SAP Score / Band
- | Eligibility
- | Retrofit project = A + B + C
- | EPC / EPR
- | Final SAP Score / Band
- | Variance = Full Project Score
- | Annual Bill Savings (ABS)



What is GBIS?

ECO4 1st Apr 2022 – 31st Mar 2026

GBIS / ECO+

| Cost effective insulation measures at scale

Low Income Group
20% of target

| ECO4 qualification criteria

| **EPC Band D-G**

| No Cost

General Group
80% of target

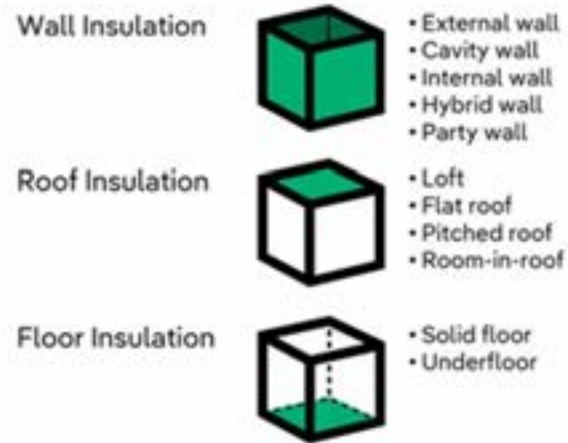
| **EPC Band D-G**

| Council Tax Band A-E (Scotland)

| Contributions may be required

What is GBIS?

Fabric Improvements



Heating Improvements



- | Energy Performance Certificate / Energy Performance Report
- | Starting SAP Score / Band / Eligibility
- | Retrofit Measures
- | Variance = Partial Project Score
- | Annual Bill Savings (ABS)

Funding landscape



	Scotland	England	Wales
Energy Companies	ECO / GBIS	ECO / GBIS	ECO / GBIS
Area Based	ABS	HUG / LAD	HUG / LAD
Vulnerable	Warmer Homes Scotland	Warm Homes	NEST
Low Carbon Heat	Home Energy Scotland	Boiler Upgrade Scheme	Boiler Upgrade Scheme
Social Housing	Net Zero	SHDF	SHDF
Community	CARES	Community Energy Fund	WcVA
Heat Networks	Energy Efficiency Grant Scheme / Heat Network Fund	Green Heat Network Fund	Green Heat Network Fund

ALL Assessors In the Public Eye

Stuart Fairlie
Managing Director, Elmhurst Energy



Elmhurst promoting you



- 95 pieces of media coverage last year alone
- 8 million views online
- 766,000 readers
- 111,000 social media shares



The Daily Telegraph



PROFESSIONAL
HOUSEBUILDER
& PROPERTY DEVELOPER





Assessor competency shortfalls undermine credibility

Call for improved training for Energy Performance Certificate assessors

Government suspends 39
installation businesses for
substandard solid wall
insulation work

The problem with Energy Performance Certificates

A Which? investigation has found that EPCs can be riddled with inaccuracies and unhelpful advice that could cost homeowners a fortune

18 Jul 2024



Which?

Money > Property

The energy ratings 'guesswork' corrupting Britain's house prices

As Labour scrambles to overhaul EPCs, The Telegraph can reveal:

- “Guesswork” by inspectors with just three days of training can knock thousands off a home’s value.
- Near-identical homes can receive wildly different ratings, yet potential errors are reviewed by staff working from home.
- The ratings system is being “gamed” to access government grants or manipulate property prices.



Anatomy of a crisis

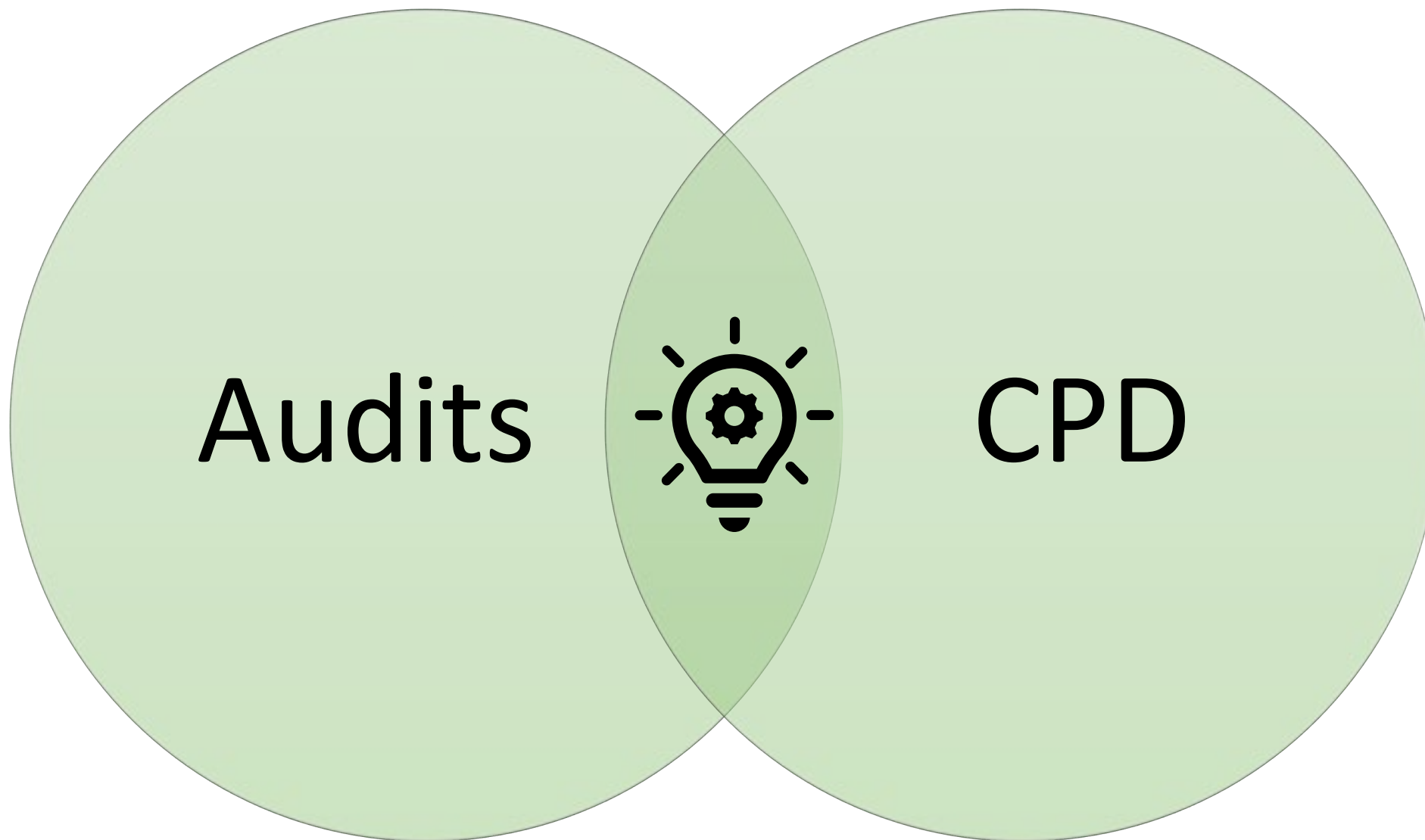
- **Media feeds on media...**
- Product doesn't work (anymore)
- Experts who are prepared to criticise the product
- Victims who relied on the product
- Collateral damage arising from the product
- People who sell the product

How to avoid the crisis

“Mistakes are costly and somebody must pay. The time to correct a mistake is before it is made.

The **causes of mistakes** are, first, I didn't know; second, I didn't think; third, I didn't care.”

Henry H. Buckley







How to deal with the crisis



1st Class = Victims

Pilot = Media

Business Class =
Top Tier Pundits

Economy =
Everyone & Their
Mother with a
point of view

Baggage
Hold = Us

If a complaint gets to the media

- Don't ignore it
- Ask lots of questions
- Know the media's deadline – and stick to it
- Get help from the Elmhurst team
- Never diss the customer
- Keep comment as simple as possible
- Put it in writing
- Review afterwards – what could have avoided this?

“To make no mistakes is not in the power of man. But from their errors and mistakes the **wise and good** learn wisdom for the future.”

Plutarch

