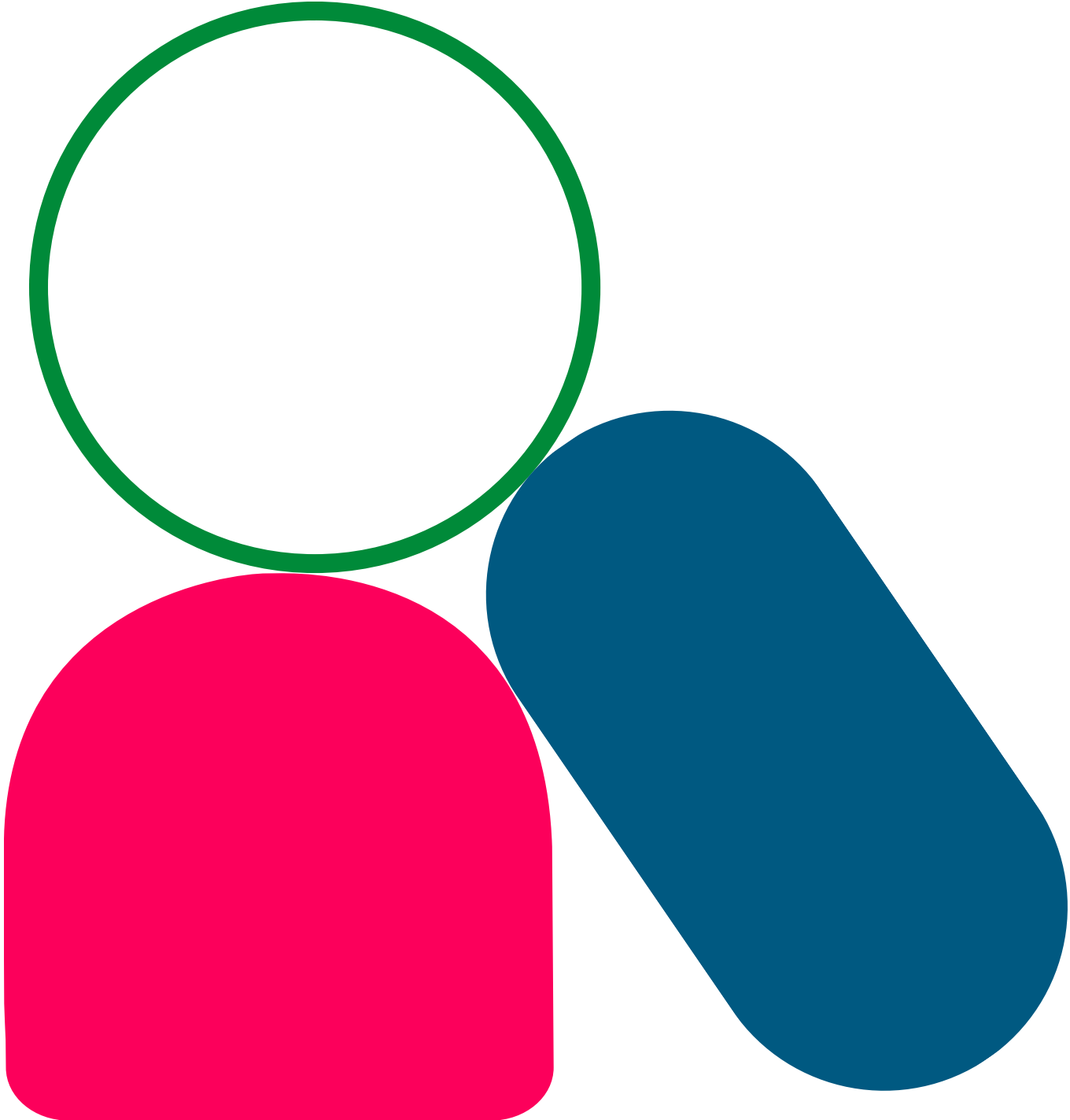


MAYOR OF LONDON

Zero Carbon Accelerator

Retrofit pathways for small social housing providers with traditional stock

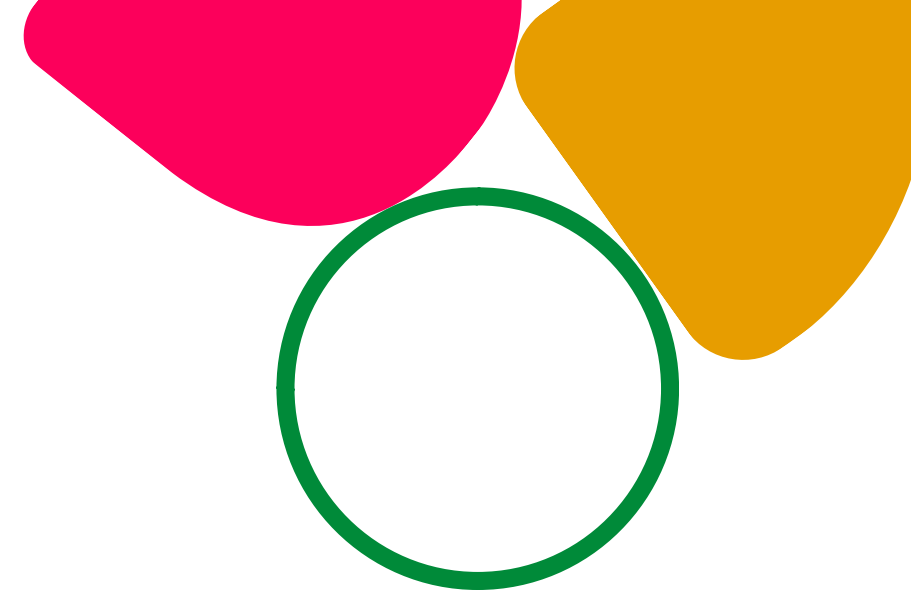
June 2026



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Abbreviations

• A2A (heat pump)	Air-to-Air (heat pump)	• IWI	Internal Wall Insulation
• A2W (heat pump)	Air-to-water (heat pump)	• LBC	Listed Building Consent
• ADF	Approved Document F	• MCS	Microgeneration Certification Scheme
• ASHP	Air source heat pump	• MVHR	Mechanical ventilation with heat recovery
• CA	Conservation Area	• PAS 2035:2023	Publicly Available Specification 2035:2023
• cMEV	Centralised Mechanical Extract Ventilation	• PD	Permitted Development
• DHN	District Heat Network	• PV	Photovoltaics
• dMEV	Decentralised Mechanical Extract Ventilation	• RdSAP	Reduced Standard Assessment Procedure
• DPS	Dynamic Purchasing System	• RICS	Royal Institution of Chartered Surveyors
• EPC	Energy Performance Certificate	• SAP	Standard Assessment Procedure
• ESUK	Energiesprong UK	• SCOP	Seasonal Coefficient of Performance
• EV	Electric Vehicle	• SME	Small and Medium-sized Enterprise
• EWI	External Wall Insulation	• SWI	Solid Wall Insulation
• GSHP	Ground source heat pump	• TOU	Time-Of-Use
• HA	Housing Association	• VfM	Value for Money
• HEM	Home Energy Model	• WHP	Warm Homes Plan
• HHRSH	High Heat Retention Storage Heater	• WH: SHF W3	Warm Homes: Social Housing Fund Wave 3
• HTC	Heat Transfer Coefficient	• WWHR	Waste Water Heat Recovery

Introduction

Zero Carbon Accelerator programme

The Mayor of London's **Zero Carbon Accelerator** programme follows the Mayor's earlier accelerator programmes (local energy, workplaces, homes) and was specifically designed to address key barriers, including lack of capacity, complex procurement, limited funding and supply chain challenges, with the aim of generating a sustainable long-term decarbonisation pipeline across London.

As part of this initiative, eleven small **G320** social housing providers received tailored support to develop retrofit pathways for their heritage building portfolios.

These organisations predominantly manage traditional housing stock, much of it Victorian and Edwardian, characterised by solid wall construction and a high proportion of converted flats and small blocks. Broadly, the portfolios fall into two main categories:

- Converted flats, typically within Victorian properties
- Blocks, including a mix of medium- and larger-scale buildings, often subject to heritage or planning constraints



Drapers building in the London Borough of Tower Hamlets. Heritage property owned by Providence Row Housing Association (PRHA).
Credit: PRHA



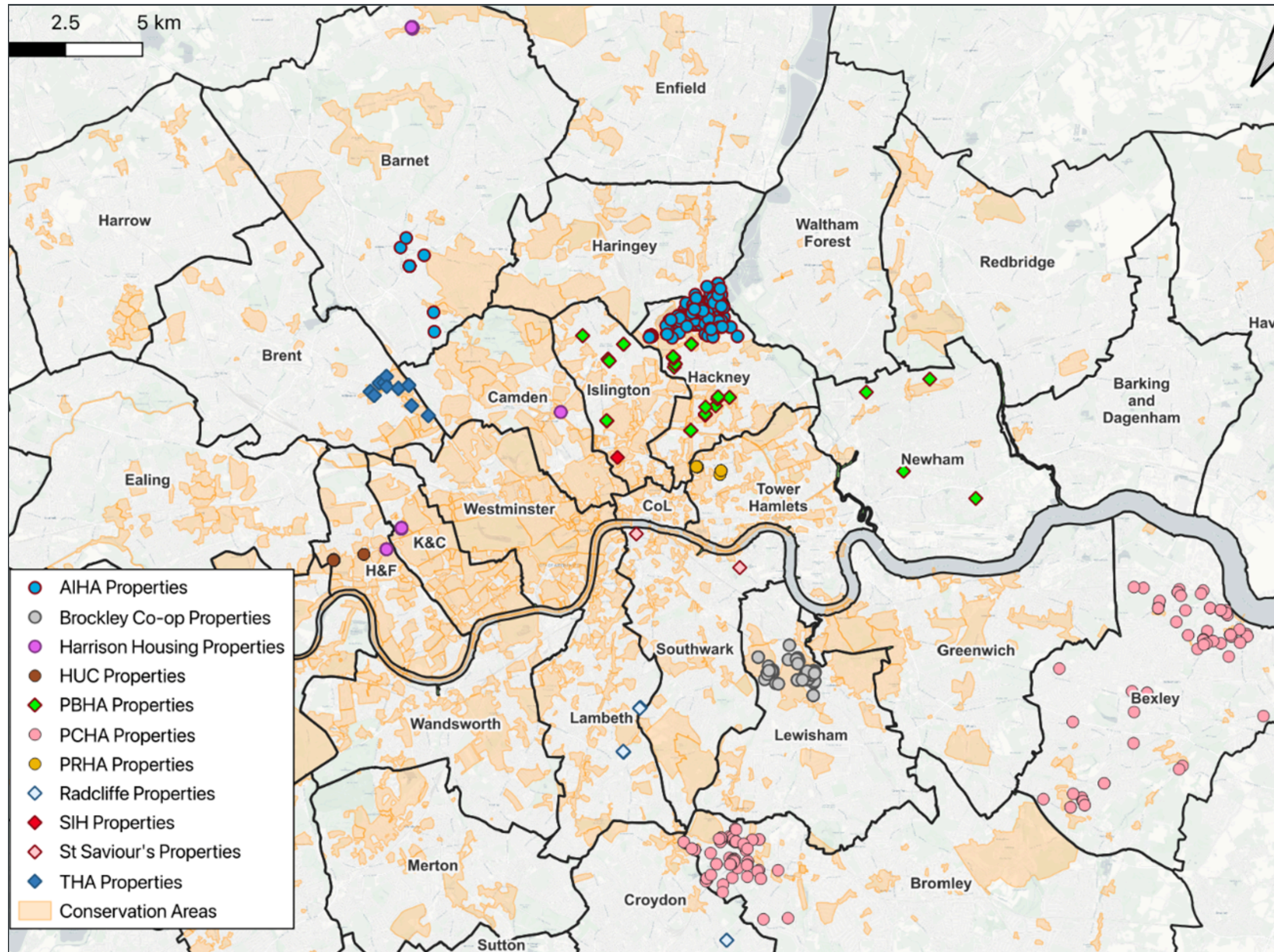


Figure 1: Traditional stock distribution across the eleven G320 consortium members:

1. Agudas Israel Housing Association (AIHA)
2. Brockley Tenants' Co-operative
3. Harrison Housing
4. Hammersmith United Charities (HUC)
5. Peter Bedford Housing Association (PBHA)
6. Penge Churches Housing Association (PCHA)
7. Providence Row Housing Association (PRHA)
8. Radcliffe Housing Society
9. Sapphire Independent Housing (SIH)
10. United St Saviours Charity
11. Teachers' Housing Association (THA)

Visualisations were generated using QGIS and incorporate 2026 spatial datasets. Planning constraints are derived from the [GLA Planning Constraints Map](#). Base mapping contains OS data © Crown Copyright and database rights 2026.



Purpose of this report

This report summarises the findings and recommendations from the individual provider assessments. Its aim is to support other social housing organisations in making informed decisions and developing investment plans that align with energy-efficiency requirements, decarbonisation goals and the evolving regulatory landscape.

This report should be read alongside other useful guidance documents, particularly [Historic England](#) guidance, and with appropriate experts in place for technical support.

Hyperlinks to useful resources appear in pink throughout the report and there is a full list in the [Resources](#) section. There are also checklists and practical resources available in the [Appendix](#).

If you're reading a hard copy of this report, all links are written in full in the [References](#) section.

The navigation bar appears at the bottom of each page to easily access each section, and the 'home' symbol will take you back to the first page of the report.



Aerial view of suburban houses. Credit: Canva stock image



Key considerations, barriers and constraints

A significant number of the homes are located within conservation areas or are locally listed or Grade II listed. These designations place restrictions on alterations to the external fabric and limit the feasibility of standard retrofit measures such as external wall insulation (EWI), replacement windows or changes to architectural features.

Most buildings included in the assessment are classified as traditional buildings, typically constructed with solid walls.

Traditional buildings are **moisture permeable**¹, relying on the movement of air and moisture through the fabric to stay dry. They also offer inherent moisture and heat buffering, which helps regulate internal humidity and moderates temperature fluctuations.

Standard modern insulation methods risk disrupting this balance, potentially creating unintended moisture issues like interstitial condensation. **Interventions**² in traditional buildings require careful, bespoke treatment, such as using permeable materials, and in some cases, solid wall insulation may not be appropriate or beneficial.

Additionally, any solutions selected should be future-proofed for climate adaptation to ensure the building fabric can withstand projected increases in extreme weather, such as heavier rainfall and higher summer temperatures, while maintaining indoor air quality, structural integrity and the natural heat buffering characteristics of traditional construction.

Many providers operate sheltered housing, supporting predominantly older and vulnerable residents. Reducing energy costs for tenants, many of whom face financial hardship and fuel poverty, is a core priority.

Despite varying organisational capacity, providers demonstrated a strong understanding of energy standards, good stock condition knowledge and close relationships with their tenants.

Government policy requires social housing providers to **achieve Energy Performance Certificates (EPCs) Band C by 2030**³. While exemptions are available where improvements are impractical or would require disproportionate investment, providers remain committed to improving energy efficiency, resident comfort and long-term decarbonisation.

Social housing providers can register exemptions⁴ to achieving EPC C, including*:

- A time-limited spend exemption (up to £10,000 per property until April 2030, triggering a 10-year compliance delay)
- Exemptions related to tenant refusal, heritage or structural constraints, demolition or regeneration, and leasehold complications.

*Further guidance on how exemptions will be applied is still awaited.



Transition to the Home Energy Model

Government is replacing the existing EPC calculation method Standard Assessment Procedure and Reduced Standard Assessment Procedure (SAP/RdSAP) with the Home Energy Model (HEM). As landlords are still required to meet EPC Band C by 2030 under the existing system, a transition period will see both methodologies influencing retrofit decisions.

The way EPCs are calculated is changing. From around 2030, homes will be assessed against three separate measures of performance rather than a single rating, meaning some properties that currently just meet EPC C may need further work, and some traditional buildings that struggle with fabric improvements may have alternative routes to compliance through heating or smart readiness improvements:

<p>Fabric metric</p>	<p>Assesses how well the building fabric (walls, roof, floors, windows and doors) reduces heat loss. The target is expected to broadly align with the fabric performance of an EPC C. The metric also includes consideration of overheating risk to ensure efficiency improvements do not compromise summertime resilience. How this aligns with EPC bands in practice is still emerging.</p>	<p>Relevance for heritage buildings: A likely challenge is that, if HEM adopts default U-values and airtightness assumptions similar to current methodologies, traditional buildings may appear to underperform unless supported by in-situ measurements.</p>
<p>Heating metric</p>	<p>Focuses on the efficiency and carbon intensity of the heating and hot water systems.</p>	<p>Relevance for social housing providers: Moving away from fossil fuel boilers towards low-carbon systems (e.g. heat pumps or shared low-carbon heat networks) can significantly improve this score, but may be constrained by space, cost and resident disruption.</p>
<p>Smart readiness metric</p>	<p>Reflects how well a home can interact with the energy system, for example, through smart controls, flexible demand, on-site generation (such as solar photovoltaics (PV)) and energy storage.</p>	<p>Relevance for constrained or heritage sites: Some properties may struggle to accommodate technologies like solar PV or battery storage, limiting their ability to reach Band C on this metric and potentially requiring exemptions. Rural sites with limited grid capacity or poor internet connectivity may also face additional barriers to meeting this metric.</p>

Table 1: Overview of HEM metrics and context specific considerations



Transition to the Home Energy Model

HEM assesses homes against three separate metrics, as seen in Figure 2. The [consultation on HEM⁵](#) has closed and the government has published a partial response which indicates the likely approach, but this is not yet confirmed.

Key proposals include:

- Existing EPCs remain valid until their 10-year expiry
- The 2030 requirement is expected to shift to achieving Band C on at least one HEM metric
- A longer-term requirement to achieve Band C on a second HEM metric by 2039.

Properties with EPCs due to expire before 2030 will need to be reviewed to confirm whether they can be relogged at EPC C under RdSAP, or whether they meet one of the new HEM compliance metrics.

Some properties may be unable to reach Band C on certain HEM metrics. The recent HEM consultation notes that exemptions may apply where improvements are not technically feasible, for example, where solar PV cannot be installed.

However, the consultation does not yet clarify how exemptions will operate in practice, making it difficult to determine which scenarios will qualify.

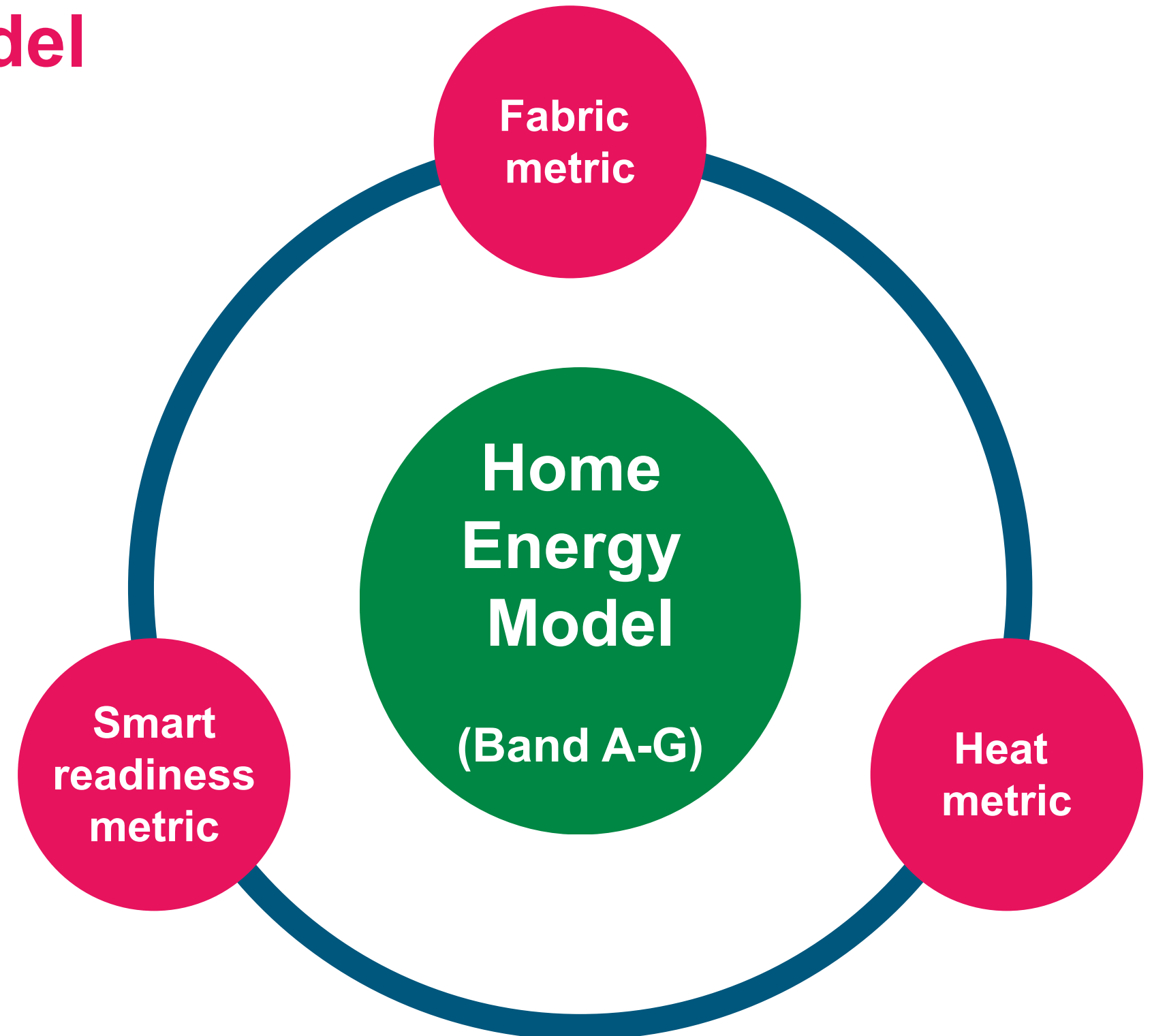


Figure 2: HEM metrics overview

Methodology

Energiesprong UK (ESUK) was appointed to deliver the Support Package under the Zero Carbon Accelerator. Project activities included reviews of each provider's stock profiles and specific needs. Assessments were built on direct consultation and one-to-one discussions with each HA to understand specific management and resident requirements. This was supported by a comprehensive desktop analysis of information supplied by providers, including EPC data, stock condition records, energy consumption data and long-term investment plans.

The reports examined each organisation's position in relation to current EPC Band C requirements and future HEM compliance, based on the latest available understanding of the new methodology. Using this analysis, ESUK developed tailored retrofit pathways for each provider, structured around three complementary approaches:

- Business as usual
- Short-term packages of measures to support EPC C compliance, alongside additional recommended actions
- Longer-term heating decarbonisation options and pathways to HEM compliance.

In line with PAS 2035:2023* (Publicly Available Specification 2035:2023) principles, retrofit often prioritises a fabric-first approach to reduce heating demand before upgrading heating systems. However, ESUK's experience and guidance from [Historic England](#)⁶ show that a fabric-first approach is often neither practicable nor desirable in historic buildings, as it may not be the most technically sound or effective route, can lead to unintended consequences, and requires a careful, thoughtful approach to adding insulation to ensure [good outcomes](#).⁷

Crucially, traditional buildings often perform better thermally than standard EPC software calculates, and they were originally designed to naturally manage moisture and minimise summer overheating. The recommendations therefore adopt a pragmatic approach in line with [Historic England's 'whole building' best practice for traditional building retrofit](#)⁸. This enables providers to make informed decisions that balance resident needs, budgetary pressures, and operational realities with the unique physical behaviour of the property.

It should be noted that this report does not constitute formal technical advice. All recommendations remain subject to verification through detailed measurements, modelling and supplier quotations.

*British Standard for domestic energy retrofit projects.



Data baseline

Data inaccuracies

A consistent theme across the in-depth assessments was the prevalence of data inaccuracies within EPC records, particularly relating to building fabric and insulation levels.

Many EPCs listed multiple wall types, such as cavity wall or timber frame construction, despite the buildings being predominantly solid wall heritage properties, see Figure 3.

While some discrepancies may reflect later rebuilds or extensions (especially in converted flats), many appear to stem from incorrect or assumed data entries during the EPC assessment process.

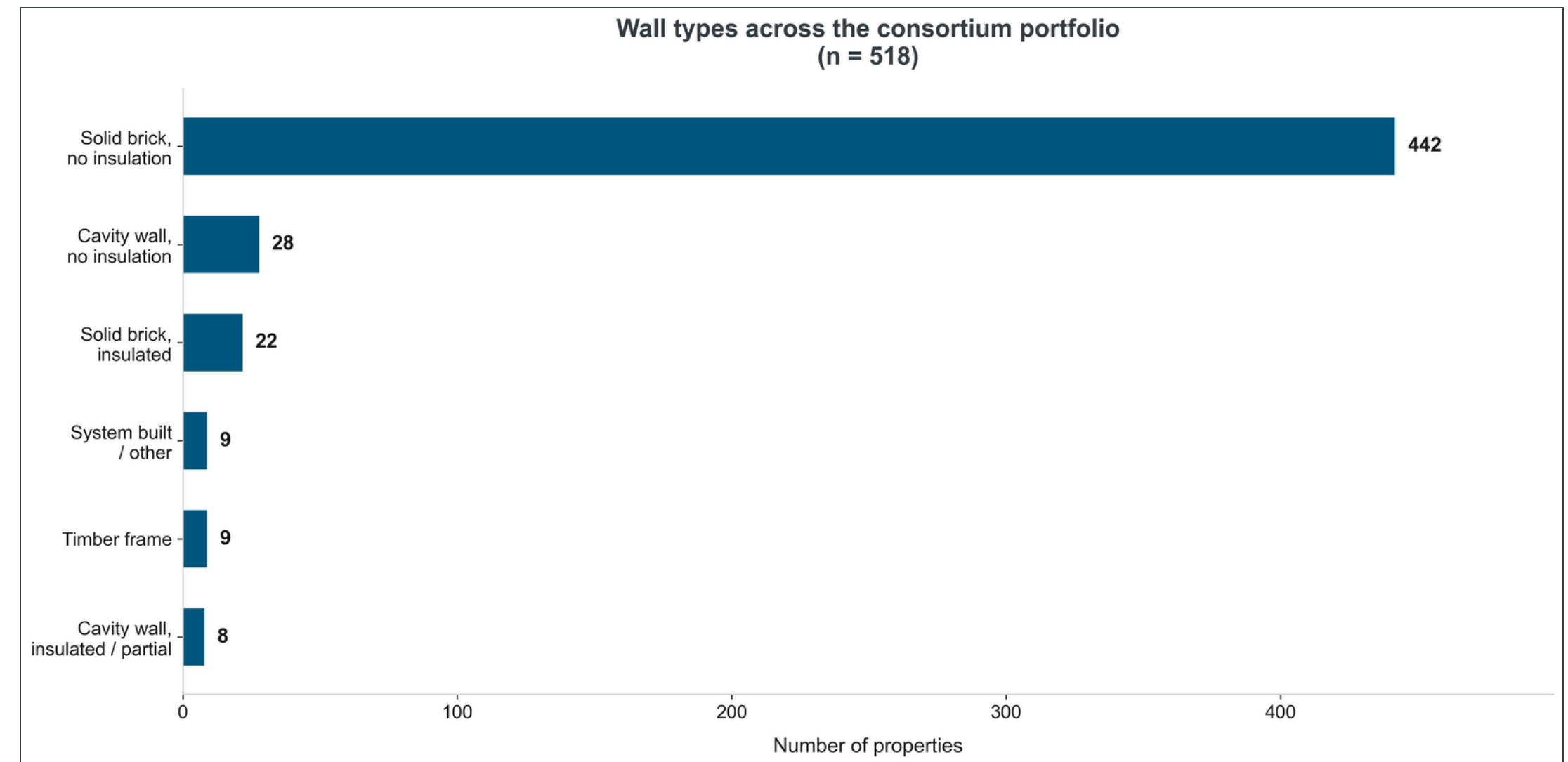


Figure 3: Wall types across the consortium portfolio (excluding one provider with cavity wall construction)

Data inaccuracies

These inaccuracies can materially affect EPC ratings. For example, assumed insulation levels or misidentified wall types can either overstate or understate a property's performance. Correcting these entries may, in some cases, lead to an improved SAP rating.

These issues are common across the EPC system and are not unique to smaller landlords. EPC assessors often have limited access to certain areas (e.g. lofts or concealed building elements) and typically work to tight turnaround times, which increases the likelihood of assumptions being used. For older properties, these default settings routinely overestimate heat loss.

In reality, traditional solid walls often perform much better than the software assumes with better natural airtightness and thermal performance. Where providers hold evidence of insulation or fabric characteristics that were not captured during the assessment, they can challenge the EPC and request that it be updated.

Furthermore, investing in actual on-site performance testing, such as airtightness, is a highly effective way to override more pessimistic software defaults and improve the property's SAP score.

Why this matters

Accurate EPC data is essential for:

- **Identifying the right retrofit measures**
Incorrect wall types or insulation assumptions can lead to inappropriate or unnecessary recommendations.
- **Planning investment**
Overstated performance may mask the need for upgrades, while understated performance may inflate the scale and cost of required works.
- **Assessing compliance risk**
With EPC C and future HEM requirements approaching, inaccurate data can distort a provider's understanding of how far their stock is from compliance.



Performance measurements

Performance measurement techniques can help landlords target retrofit investment more effectively by identifying which homes need fabric upgrades and which already perform better than EPC assumptions suggest.

Methods such as airtightness testing, in-situ U-value measurement and whole building heat loss testing provide real performance data that can guide strategic decisions and avoid unnecessary or ineffective works, as seen in Figure 4.

Using measured performance helps prevent inappropriate measures being installed, necessary measures being omitted, retrofit funding being used inefficiently, and increased risk of damp, condensation and mould.

These techniques also support prioritisation of properties with the greatest heat loss issues and can, in some cases, improve EPC ratings without intrusive interventions.

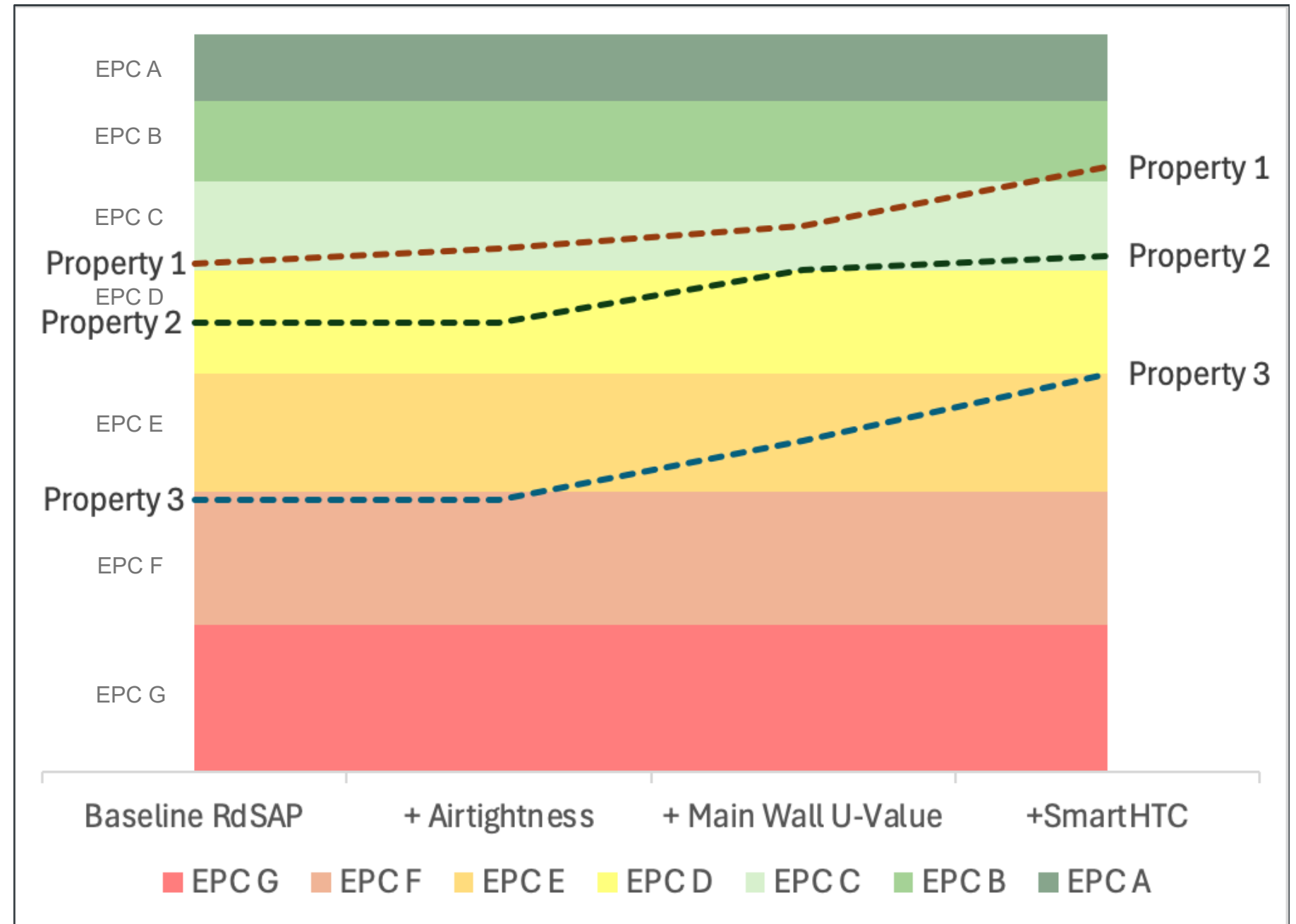


Figure 4: Change in EPC ratings across properties under different in-situ measurement scenarios adapted from [Historic Building Energy Performance Potential \(Historic England\)](#)

Heating systems and EPC performance

Another point worth noting is the effect that heating systems have on EPC ratings. Homes with no fixed heating or older direct electric systems tend to score poorly because the EPC calculation is based on the cost of heating a property. With electricity still priced higher than gas, even relatively modest electric systems can drag the rating down.

Across several properties, heating systems had already been upgraded to more modern electric options or mains gas boilers, but these improvements were not always reflected in the EPC because the certificate had not been updated since the upgrades. This means some EPCs look worse on paper than the homes actually perform in practice.

However, inefficient heating also presents a practical opportunity. Moving to more efficient electric heating, such as high heat retention storage heaters (HHRSH) or air-to-air (A2A) heat pumps can improve EPC scores and reduce running costs without needing to introduce or extend gas infrastructure or connect to heat networks. For heritage buildings, where new gas connections may be restricted or undesirable, this offers a practical route to better performance that also avoids locking in gas use ahead of future HEM requirements.

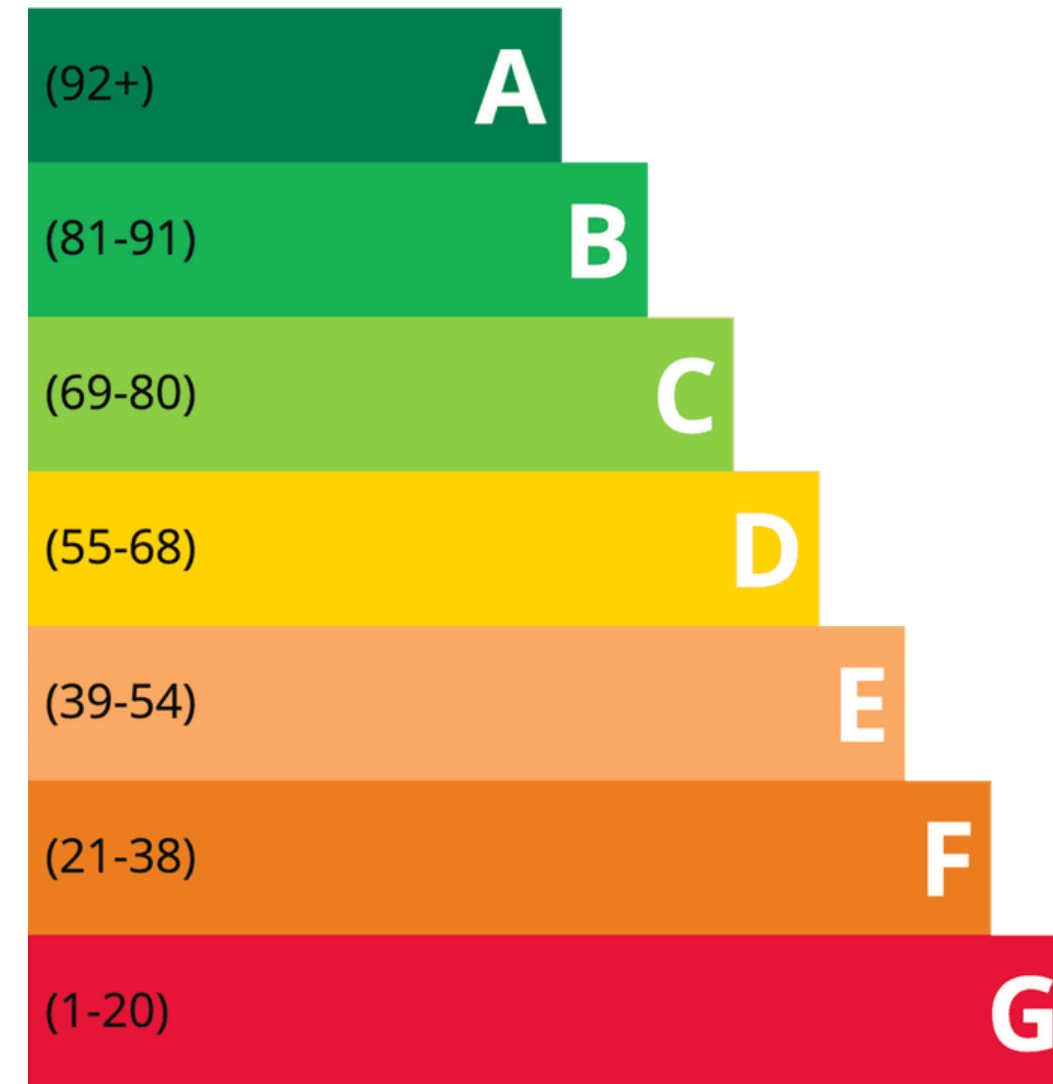


Figure 5: EPC energy efficiency ratings

Business as usual

Across the portfolios reviewed, many properties that have benefited from routine maintenance and heating upgrades already achieve EPC C, with a substantial number sitting at EPC D (see Figure 6). A smaller group falls below this level, generally where investment has been limited over time.

More broadly, most of the stock is not yet aligned with the UK’s longer-term decarbonisation pathway. Common characteristics include:

- Relatively high heat loss.
- Fossil fuel (gas) heating.
- No onsite renewable energy generation or storage.
- Assumed relatively high energy bills for residents due to poor energy performance.
- Higher risk of damp, mould and overheating.

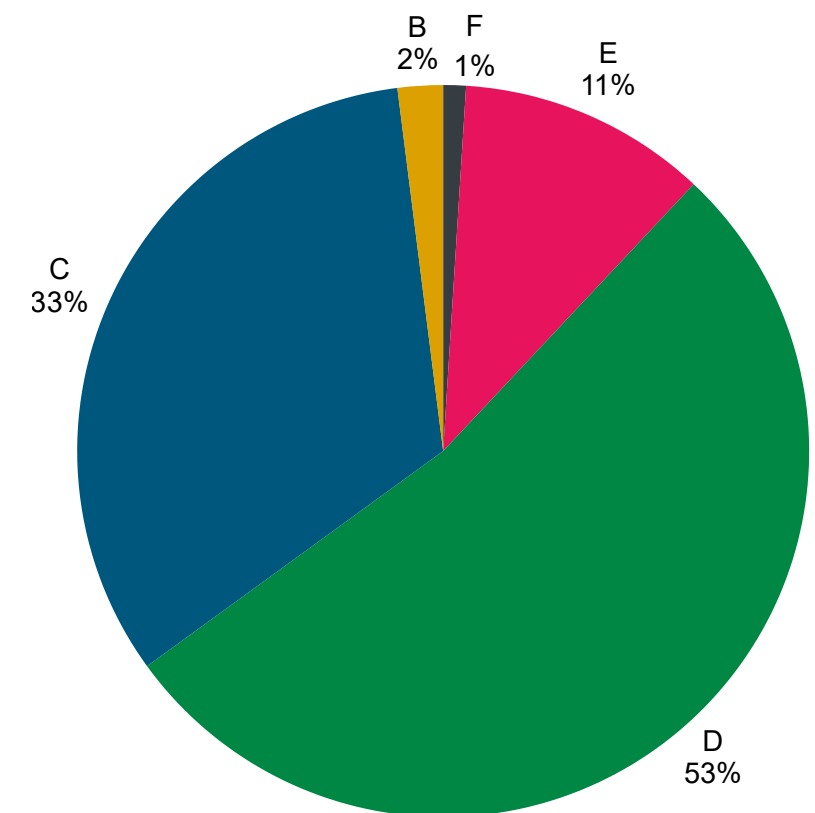
In summary, many traditional social housing properties are not compliant with either current or future energy performance expectations. As EPC methodologies evolve and regulatory standards tighten, there is a risk that even homes currently meeting EPC C could fall below the threshold without further improvement.

If ratings remain at, or drop below EPC C, **providers may face restrictions on letting, additional compliance costs or the need for unplanned remedial works.**⁹

These properties also remain increasingly exposed to climate change and overheating risk. This is particularly challenging for vulnerable tenants in top-floor or single-aspect flats, where building layouts naturally trap heat and lack cross-ventilation, which may lead to severe summer overheating. At the same time, some traditionally constructed buildings may be more inherently resilient to rising temperatures and increased rainfall, meaning that ill-considered or piecemeal interventions under a business as usual approach could inadvertently undermine this resilience and lead to **maladaptation**.¹⁰

Despite these challenges, providers consistently expressed a strong commitment to improving the energy efficiency of their homes, driven by resident wellbeing, fuel poverty concerns and wider sustainability goals.

Figure 6: EPC rating distribution
All properties combined (n = 612)



Menu of options

Practical measures for heritage and traditional stock

Improving the energy performance of traditional and heritage homes often benefits from a different approach compared to more modern buildings.

The following retrofit options bring together a range of practical measures that providers can consider, from low-disruption fabric improvements to heating upgrades and smart-ready technologies.

It is designed to help organisations identify what is feasible within their stock, understand where heritage constraints may apply, and make the most of opportunities that arise during planned maintenance. Notably, the interaction of measures should be considered in all planning to avoid unintended consequences¹¹.

Maintenance plays a central role in this context. Damp buildings waste energy, and unresolved defects reduce the effectiveness of retrofit measures. In traditional stock, issues such as parapet gutters, concealed valleys, failing flashings, basement ventilation and timber window and floor decay are common.

A maintenance-first approach is therefore essential: **no fabric retrofit should proceed unless the building is demonstrably dry, weather tight and managing moisture correctly.**¹²

The menu of options outlines practical, actionable interventions across the three core HEM metrics: fabric performance, heating (and hot water), and smart readiness.



Fabric measures

Traditional buildings often perform better than default RdSAP assumptions suggest¹³.

Verifying fabric performance (airtightness testing) can have a positive impact on SAP scores and inform investment decisions on fabric measures (U-value testing).

When physical interventions are necessary, selecting the correct type of insulation material is critical. Traditional structures rely on permeable materials to maintain their innate capacity to manage moisture and regulate internal fluctuations in humidity and temperature.

Where previous interventions have introduced impermeable materials (e.g. replastering and repointing using cementitious materials), it may be technically possible to retain these layers and apply an impermeable insulation system, but only where they are sound and not trapping moisture. However, doing so further reduces the wall's drying potential and increases sensitivity to internal moisture loads. Best practice remains the removal of inappropriate impermeable materials where they are causing, or are likely to cause, moisture imbalance.

An assessment of the specific construction and condition of the fabric in any heritage building is required to determine the most appropriate and suitable fabric retrofit measures.

Using standard modern impervious materials (such as rigid plastic foam PIR boards or synthetic foil barriers) restricts the natural movement of moisture through traditional fabric. This can lead to liquid moisture becoming trapped within the structure and increase the risk of damp, timber decay and poor indoor air quality.

Any fabric upgrades, whether to walls, lofts or suspended timber floors, should specify appropriate permeable insulation materials such as wood fibre, hemp, cork or sheep's wool. These natural materials also offer added value as circular products with lower embodied carbon compared with insulation made from fossil fuels or energy-intensive processes.

These materials allow safe moisture movement, help maintain the building's natural moisture balance, moderate internal temperatures, and reduce the risk of fabric degradation and summer overheating.

Further resources: [Traditional Buildings and Energy Efficiency](#) and [Insulation Materials Selection for Traditional Buildings](#)



Fabric measures

Core measures

- **Loft insulation**
 - Top-up or full insulation up to 300 - 400mm
- **Airtightness testing**
 - To replace default SAP values, which often increases SAP by 1-3 points*
- **Draughtproofing**
 - Sealing around doors, windows and redundant chimneys
- **Glazing improvements**
 - Repair, refurbishment and/or secondary glazing for listed buildings; vacuum of slim-profile double glazing where window replacements are permitted
- **Ventilation checks and upgrades**
 - Ensure any ventilation system is fully compliant with [Building Regulations Part F](#)¹⁴

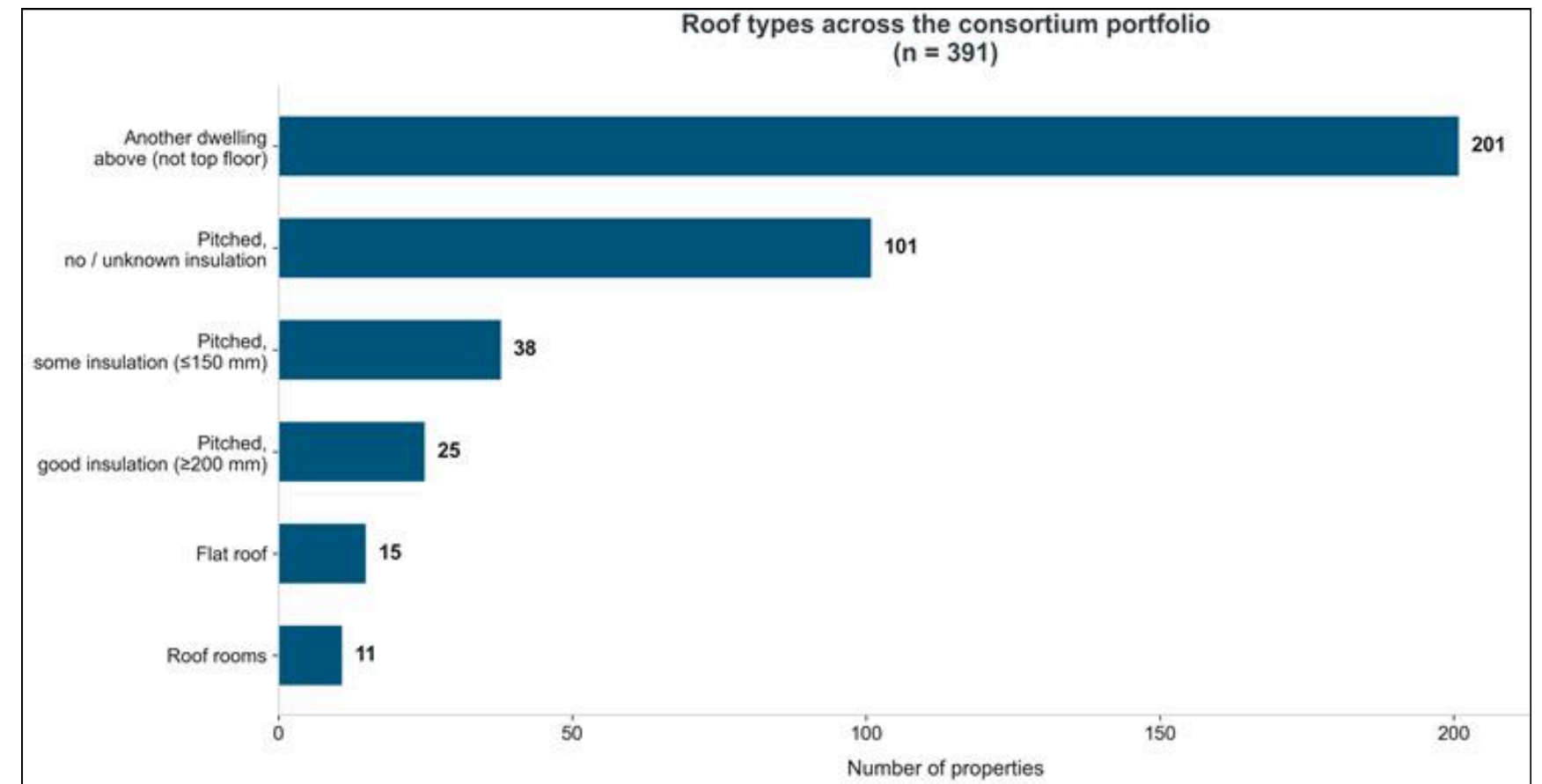


Figure 7: Roof type distribution across the consortium portfolio

*It is recommended that an airtightness/EPC assessor is appointed who understands the properties' needs and the measures taken to achieve an EPC C rating. Many EPC assessors operate on a fast turnaround, low-cost basis and may not be willing to enter measured airtightness values or re-run the assessment should it not produce the expected rating.



Fabric measures

Additional / optional measures (property-specific)

- **Suspended floor insulation**
 - Best carried out during void periods to avoid resident disruption. A remedials budget is important, as hidden joist or floorboard decay is common and timber moisture levels must be tested. Where crawl-space access allows, using robotic systems (e.g., **Q-Bot**)¹⁵ can minimise disruption and avoid lifting floorboards. However, because the spray insulation used for the Q-Bot methodology is moisture-closed, it is **unsuitable for traditional buildings**¹⁶. To prevent moisture build-up and reduce the risk of timber decay, vapour-permeable insulation materials should always be used in these constructions. Robotic surveys can still be useful for identifying existing timber decay, saturated joists, or subfloor moisture issues caused by defects such as bridged damp-proof courses or blocked air bricks.
 - Alternatively, smart air bricks (e.g. AirEx) could be considered on a case by case basis.
- **Solid Wall Insulation (SWI)***
 - Highly property-specific EWI may be viable on unlisted rear elevations and in some cases gable walls. IWI could be considered for void dwellings that are unsuitable for EWI (e.g. due to planning or external space restrictions) if additional airtightness and U-value testing indicate very poor performance. In many cases SWI will not be a cost-effective measure.



AirEx smart ventilation control. Credit: Airex
<https://www.airex.tech/social-housing>

*It should be noted that IWI is challenging to install without creating unintended consequences and increasing overheating risk. It should also be noted that IWI should never be installed over a damp wall, and any moisture ingress should be addressed first to avoid timber rot and structural damage.





Annette, a Nottingham City Homes resident with her Project Liaison Officer, Lexy.
Credit: Nottingham City Homes.

Case study

External ground levels and subfloor damp

Past retrofit projects show that external ground works can inadvertently damage subfloor timbers.

In Nottingham, several properties suffered from saturated floor joists because concrete pathways had been built up over decades.

These paths raised the ground level above the historic damp-proof course, lacked drainage, and sloped towards the walls. This caused rainwater from blocked or leaking gutters to pool against the brickwork and flood the subfloor void.

Key takeaway

Landlords should inspect external ground levels, drainage falls, and rainwater goods as part of their maintenance and before undertaking any internal floor works.

Reference: DESNZ funded whole house retrofit project: [Nottingham City Homes - Destination Zero](#)



Heating and hot water

While traditional stock is not excluded from heating decarbonisation, it can be more challenging to install low-carbon heating systems due to space constraints and the higher costs associated with heat pumps.

Under the current EPC methodology, which is based on energy costs, heat pumps do not always score as well as mains gas boilers because electricity is more expensive than gas. This can make upgrading to heat pumps a more difficult investment decision until the Home Energy Model replaces EPCs. Ensuring that heat pumps operate efficiently is essential for improving their performance and keeping energy bills low, which may require additional work to the building fabric and/or upgrades to radiators and pipework.

The Government’s heat decarbonisation approach is primarily focused on electrification with individual or communal heat pumps for the majority of properties. Although this may change, the evidence suggests that a hydrogen or biogas-led approach is not likely to be cost-effective or practical at a national level.

Most properties across the eleven providers are fitted with individual mains gas boilers, while a large proportion of the portfolio benefits from communal gas heating schemes. As of 2026, UK law requires metered communal heating to improve consumer protection and energy efficiency through fair, consumption-based billing¹⁷.

Although exemptions apply to most providers (due to sheltered housing and almshouse status), adopting metering would still have a positive impact on each dwelling’s SAP rating. Effective heating controls also help to minimise the risk of overheating.

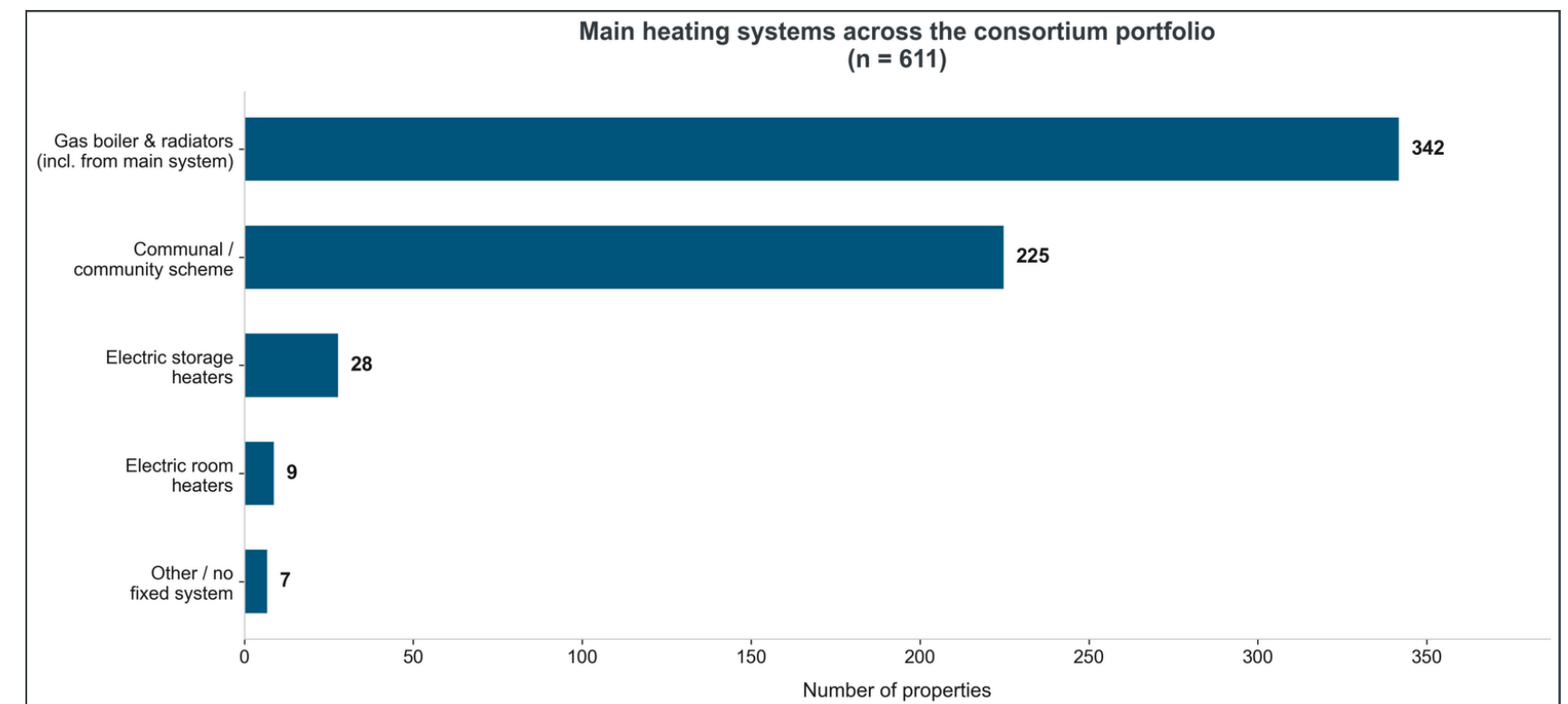


Figure 8: Distribution of recorded heating systems across the consortium portfolio

Heating and hot water

London benefits from several District Heat Network (DHN) opportunities¹⁸ with an increasing number of proposed heat networks. Due to the uncertainty surrounding DHN planning and delivery, this could make investment decisions more difficult for small housing providers, however it is worthwhile contacting the Local Authority to express interest, stay updated and indicate demand for new infrastructure.

Technical viability of ground source heat pumps (GSHPs) is generally low for urban stock. Restricted access to rear gardens and small front curtilages typical for converted Victorian flats usually rule out the boreholes required for individual or shared loops. However, GSHPs remain appropriate for sites with sufficient external space and could be the preferred heating option in some cases because they avoid the visual and noise disruption associated with external air source fans.

Technical viability of air-to-water (A2W) heat pumps is medium to high for most sites with a wet heating distribution system. There are no major technical barriers for properties currently on individual and communal gas systems. However, properties require detailed space assessments to site the external units and internal cylinders.

Air-to-air heat pumps (A2A) are mostly viable and can often be a preferred option, as they also provide **summer cooling**¹⁹. This approach makes the existing wet central heating system redundant. However, it may be more difficult to justify their installation in designated areas or buildings.

Technical viability is high for electric boilers or heaters and smart thermal storage. This is the most practical choice for homes that already rely on direct electric heating and could be a viable option to achieve HEM compliance if other systems are not feasible. Running costs can be higher than gas or heat pumps, but High Heat Retention Storage Heaters (HHRSH), dynamic time-of-use (TOU) tariffs and smart cylinders or heat batteries can help manage tenant bills.

Electric heating without a wet distribution system (e.g. HHRSH or A2A heat pumps) should be combined with an energy efficient solution for hot water. Smart hot water solutions are a rapidly evolving area of technology that housing providers should consider and monitor closely.

Emerging solutions, such as compact phase-change heat batteries (e.g. **Sunamp**²⁰) and smart cylinders (e.g. **Mixergy**²¹), offer efficient thermal storage paired with dynamic TOU tariffs. These technologies allow properties without a traditional gas connection to store heat during the cheapest periods of the day. This lowers electricity costs for tenants and delivers immediate SAP improvements.



Heating and hot water

Core measures

- **Efficient electric heating**
 - e.g., HHRSH, A2A (also provides active cooling)
- **Modern electric immersion heater controls and insulation**
 - With timer and temperature control and high insulation levels
- **Communal heating upgrades**
 - Pipe insulation, controls, individual metering/billing
- **Tenant tariff support and advice**
 - Particularly important for electrically heated homes
- **Wiring, pipework and radiator upgrades**
 - Aligned with cyclical maintenance to support future low-temperature systems

Additional / optional measures (property-specific)

- **Heat pumps**
 - Where space, noise and planning allow
- **Shared low carbon heat networks**
 - Where in development in local proximity to the site. See [London Heat Network Map²²](#) for further details
- **Cylinder replacements**
 - Insulated cylinders, smart heating controls
- **Waste Water Heat Recovery (WWHR)**
 - Aligned with bathroom upgrades



The 'heat pump ready' approach

Capital costs for heat pumps remain higher than for traditional gas boilers. Unless external grant funding supports early deployment, housing providers should adopt a 'heat pump ready' methodology during standard maintenance cycles.

This approach involves the following options:

- Improve the building fabric as far as economically and technically feasible, and practicable within planning constraints.
- Assess U-values and Heat Transfer Coefficient (HTC) to test actual building heat loss.
- Ensure interim wet system upgrades use pipework and low-temperature radiators that are compatible with future heat pump flow temperatures.
- Identify internal and external locations for cylinders and fans during routine void works or external repairs.
- Replace gas cookers to avoid a gas standing charge once the heating system is electrified.

Innovation

Discrete Heat - ThermaSkirt



ThermaSkirt installation. Credit: Discrete Heat

Radiant skirting board heating replaces traditional radiators with a low-profile trim that distributes heat around the room perimeter.

It operates at lower flow temperatures to provide the performance benefits of underfloor heating without the need to lift floors.

Available in both wet and electric options, this system saves valuable wall space and offers a low-disruption alternative for heat pump preparation in smaller heritage properties.



Boiler - heat pump comparison

To inform long-term investment planning, it is important to evaluate how the transition from individual mains gas boilers to air source heat pumps (ASHPs) impacts both building performance and tenant running costs.

Heat pump performance is driven by the building's heat loss, with better fabric efficiency allowing lower flow temperatures, and therefore cheaper running costs.

Fabric efficiency increases the Seasonal Coefficient of Performance (SCOP) and reduces electricity consumption. The comparison matrix on the next page evaluates a typical traditional street property across four scenarios. It maps out how cumulative fabric interventions alter heat demand, determine the required heat pump technology, and ultimately dictate whether the transition will lower or increase tenant energy bills compared to standard mains gas*.

Notably, while a standard, flat-rate electricity tariff requires a higher SCOP to achieve immediate running cost parity with gas, tenant financial outcomes are not solely dictated by fabric performance. Even in properties with a relatively low SCOP, a net saving against mains gas can be achieved when the heat pump is optimised using smart TOU tariffs, solar PV and battery storage to buffer peak electricity costs.

*Modelling based on heat pump models currently available on the UK market and reported manufacturer SCOPs (for example, see [Renewable Energy Hub](#)²³). These figures are intended for comparative strategic planning rather than site-specific system design.



A social home upgraded in the London Borough of Barking & Dagenham.
Credit: Energiesprong UK.



Boiler - heat pump comparison

	Best case	Moderate retrofit	Partial retrofit	Unimproved*
Typical property	Solid wall, fully retrofitted	Solid wall, some insulation, double glazing, loft insulated	Loft + double glazing only, uninsulated solid walls	Original fabric throughout
Annual heat demand	~12,000 kWh	~18,000 kWh	~25,000 kWh	~35,000+ kWh
Max flow temp needed	50 - 55 °C	55 - 65 °C	65 - 70 °C	70°C +
High temperature pump needed?	No - standard pump sufficient	Borderline	Yes	Yes
Typical range of SCOP	3.0 - 3.5	2.6 - 3.2	2.2 - 2.8	1.8 - 2.2
Heat pump running cost (18p blended)	£617 - £720	£1,013 - £1,246	£1,607 - £2,045	£2,864 - £3,500
Gas boiler running cost (5.74p, 80% eff.)	£860	£1,290	£1,794	£2,511
Net saving vs gas inc. standing charge (+ = heat pump wins)	+£246 to +£349	+£150 to +£383	-£145 to +£293	-£247 to -£883
Verdict	Heat pump wins clearly	Heat pump likely wins	Marginal	Gas boiler cheaper

Table 2: Boiler - heat pump comparison

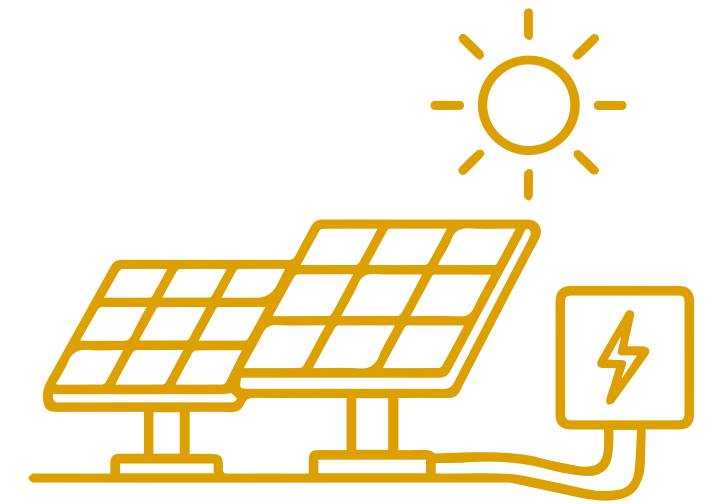
*Heat demand calculations assume a target temperature of 21°C and do not reflect fuel poverty underheating, which is particularly relevant in unimproved homes where residents may heat to much lower levels.



Smart readiness and renewables

Smart readiness measures prepare homes to interact flexibly with the grid. Solar PV is a key measure under this metric to achieve compliance.

The overall objective of smart readiness is to allow tenants to access cheaper, TOU tariffs even when extensive fabric insulation is impossible.



Core measures

- **Efficient lighting upgrades***
- **Smart heating controls**
- **Load-shifting technologies**
 - Timers, smart plugs, demand-flexibility tools
- **Smart meters**

Additional / optional measures (property-specific)

- **Solar PV**
 - Subject to roof structure and planning, PV may be restricted on listed buildings or visible roof slopes
- **Battery storage**
 - Even if PV is unfeasible, when using heat pumps/electric heating, batteries enable better TOU tariff cost reduction
- **Monitoring and metering upgrades**
- **Electric vehicle (EV) charging**

*It is currently unclear how lighting upgrades will be reflected in HEM, but they are included here for simplicity



Enabling measures and planned maintenance upgrades

To optimise capital expenditure, energy efficiency interventions should be integrated into standard cyclical maintenance asset schedules. The table below identifies how routine property renewals can trigger enabling works.

Planned maintenance	Aligned energy / enabling measure
Issuing a new EPC	Airtightness testing
Bathroom replacement	Waste Water Heat Recovery (WWHR), radiator/pipe upgrades (where wet ASHP systems are considered), ventilation upgrades
Kitchen replacement	Electrical upgrades (consumer unit, wiring), efficient appliances, electric hobs, ventilation upgrades
Hot water cylinder replacement	High-efficiency cylinders, improved insulation, smart controls, heat pump compatible cylinder with a large coil, adequate volume, multiple sensor pockets, and layout/pipework that enables future heat pump installation, where relevant
External decoration/repairs and roof works	Loft insulation top up, ventilation improvements, PV window replacements, chimney capping, draughtproofing
Floor repairs/renewal	Suspended floor insulation
Electrical rewiring	Smart controls, metering upgrades, PV-ready wiring
Ventilation works	Extract fans, trickle vents, door undercuts (at least 10 mm), airtightness testing
Voids (see our Void checklist in the Appendix)	Ventilation checks/upgrades, bathroom/kitchen upgrades (see above), suspended floor insulation

Table 3: Enabling measures and planned maintenance upgrades



Retrofit pathways for EPC and HEM compliance

Achieving EPC and future compliance is based on the requirement to achieve a C rating on one metric by 2030 and on a second metric by 2039. Although the future bandings remain unclear, an initial assessment has been provided below.

For most properties, the recommended delivery sequence is as follows: Stage A measures are implemented by 2030 to ensure all fabric-first improvements are completed in line with the EPC C target. This will likely secure compliance with the fabric-energy requirement under HEM.

Following this, heating system replacements and PV installations are programmed for 2035-2039, aligning with the expected timing of HEM Stage B requirements.

Where roof works are already planned or brought forward, the installation of additional PV capacity should be considered. This approach reduces resident energy bills, maximises scaffold efficiency, and positions Housing Associations (HAs) ahead of future regulatory obligations.

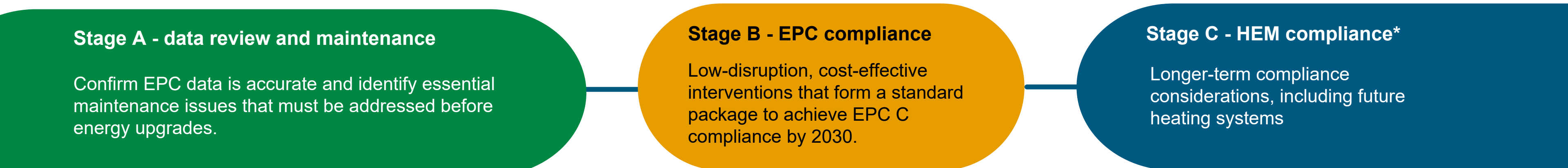


Figure 9: Retrofit pathways for EPC and HEM compliance

*HEM compliance can be achieved by meeting any two of the three defined metrics. Assuming a fabric-first approach is followed in Stage B, achieving EPC C ensures the property has a sufficient level of fabric performance or that the most practical measures have been exhausted. This pathway therefore focuses the remaining HEM compliance requirements on future heating system upgrades and smart readiness.

Retrofit pathways for EPC and HEM compliance

The key risk is that the properties may be non-compliant under the future fabric metric, even if they achieve EPC C under the current system. This will not pose an immediate issue for any post-improvement works, as EPCs would remain valid until at least 2036 if they are issued in 2026. However, it is important to keep this in mind when planning long-term investments.

The latest Government consultation response suggests there will be a solid wall insulation (SWI) exemption, where a property fails to meet fabric C, but it is not practical or economical to install solid wall insulation. It is proposed that landlords will need to declare that their property remains below the fabric standard because they have chosen not to install SWI.

The exemption reflects concerns about damp and mould risks from poorly installed SWI and the potential for more cost-effective measures to be delivered under the secondary standard within the cost cap.

Stage B - core measures for EPC C compliance*	Stage C - HEM compliance
<ul style="list-style-type: none"> • Loft insulation • Airtightness testing • Draughtproofing • Lighting upgrades • Glazing upgrades • Ventilation 	<ul style="list-style-type: none"> • DHN connection or heat pump (A2A, A2W or GSHP) • HHRSH • Smart hot water storage • Solar PV and batteries

Table 4: Core measures for EPC C and longer-term measures for HEM compliance

*Subject to additional modelling. Some dwellings may require additional measures or exemptions where this standard package does not achieve EPC C. Electrically heated properties may need extra fabric measures or upgrades to smart, efficient electric heating to reach EPC C.



Overheating

Many providers reported increased complaints from residents about summer overheating, particularly in top-floor flats and blocks with limited ventilation. Overheating risk now often outweighs heat loss risk in many London dwellings.

Retrofit measures must therefore be evaluated for both winter efficiency and summer comfort. Where a measure increases overheating risk, mitigation such as shading or improved ventilation is required, and in some cases the measure may be downgraded entirely.

For insulation measures, especially in roofs and internal walls, it is also important to consider how well materials can slow down **heat transfer**²⁴ during hot weather. Materials with good heat buffering properties can help **reduce peak internal temperatures**²⁵ when combined with effective and secure night-time purge ventilation.

Common passive cooling measures include:

- Solar control glazing or films
- Improved ventilation (passive or mechanical), including night-time and cross-ventilation
- Shading solutions (blinds, shutters, external shading where permitted)
- Roof and heating distribution pipe insulation.

Active cooling measures should only be considered when all passive options have been exhausted to reduce capital and operational costs, carbon emissions and limit additional strain on the electricity grid. Where A2A heat pumps are installed, active cooling capability is inherently provided.

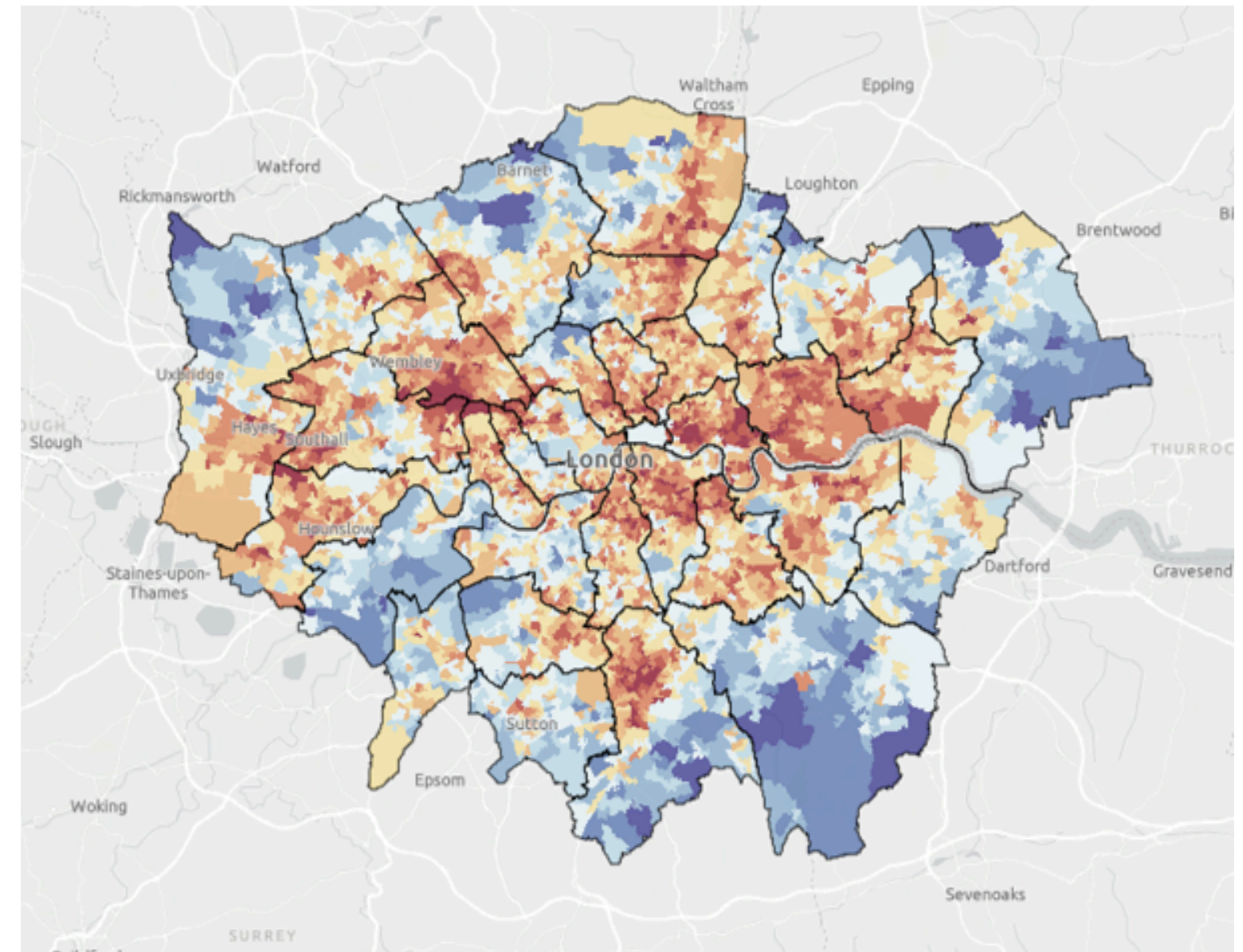


Figure 10: Map of London showing heat risk (red = highest risk).

Credit: [London Climate Risk Maps](#)

Resources:

[Overheating in Historic Buildings | Historic England](#)
[A strategy to reduce the risk of overheating in London's homes](#)
[Independent Assessment of UK Climate Risk](#)



Ventilation

While ventilation may have a neutral effect on the EPC rating, it is a critical component of any retrofit strategy, particularly in London's older housing stock where traditional construction, high occupancy, and constrained layouts can create elevated risks of damp, mould and overheating.

Recent regulatory changes, including Awaab's Law and the strengthened requirements of Approved Document F, mean that ventilation can no longer be treated as an optional add-on to fabric improvements. Instead, it must be integrated into the core retrofit design process, especially where airtightness or insulation upgrades are proposed.

Awaab's Law: Damp and mould as a compliance driver

Awaab's Law²⁶ places a statutory duty on landlords to investigate and remediate damp and mould within strict timeframes, which shifts ventilation from a comfort issue to a legal compliance requirement.

Many traditional flats already exhibit moisture-related vulnerabilities, cold bridges, solid walls, suspended timber floors with blocked vents, and limited extract ventilation. These risks can be exacerbated by retrofit measures that improve airtightness without providing compensatory ventilation.

Under Awaab's Law, landlords must demonstrate that:

- Ventilation provision is adequate for the dwelling type and occupancy
- Moisture risks have been assessed before fabric upgrades
- Any retrofit measure does not increase the likelihood of damp or mould.



Ventilation installation in a home. Credit: Canva stock image



Ventilation

Approved Document F: minimum ventilation requirements

The [Approved Document F \(ADF, or Part F\)](#)²⁷ sets the statutory minimum ventilation requirements for dwellings and is the basis on which building control assesses compliance when building works are carried out. Any measure that affects air permeability, moisture behaviour or extract performance must be checked against ADF to ensure that the dwelling continues to meet the required ventilation rates (see Table 5).

For existing homes, ADF requires that:

- Extract ventilation in kitchens, bathrooms and WCs must meet the minimum intermittent or continuous rates set out in the table opposite.
- Background ventilation (e.g., trickle vents) must be sized according to the number of habitable rooms and the dwelling’s overall ventilation strategy.
- Replacement windows must not reduce background ventilation provision unless alternative means are provided.
- Any works that reduce infiltration (draughtproofing, secondary glazing, internal wall insulation, window upgrades) must be accompanied by an assessment of whether the existing ventilation remains adequate.

Category	Energy efficiency measures	Category of measures
Roof insulation	a. Renewing loft insulation, including effective edge sealing at junctions and penetrations	Minor
	b. Loft conversions or works that include changing a cold loft (insulation at ceiling level) to a warm loft (insulation at roof level)	Minor
Wall insulation	c. Installing cavity wall insulation to any external wall	Minor
	d. Installing external or internal wall insulation to less than or equal to 50% of the external wall area	Minor
	e. Installing external or internal wall insulation to more than 50% of the external wall area	Major
Replacement of windows and doors	f. Replacing less than or equal to 30% of the total existing windows or door units	Minor
	g. Replacing more than 30% of the total existing windows or door units	Major
Draughtproofing (excluding openings)	h. Replacing a loft hatch with a sealed/insulated unit	Minor
	i. Sealing around structural or service penetrations through walls, floors or ceiling/roof	Minor
	j. Sealing and/or insulating a suspended ground floor	Major
	k. Removing chimney or providing another means of sealing over chimney, internally or externally	Major

Table 5: Energy efficiency measures (as defined in Part F)



Ventilation

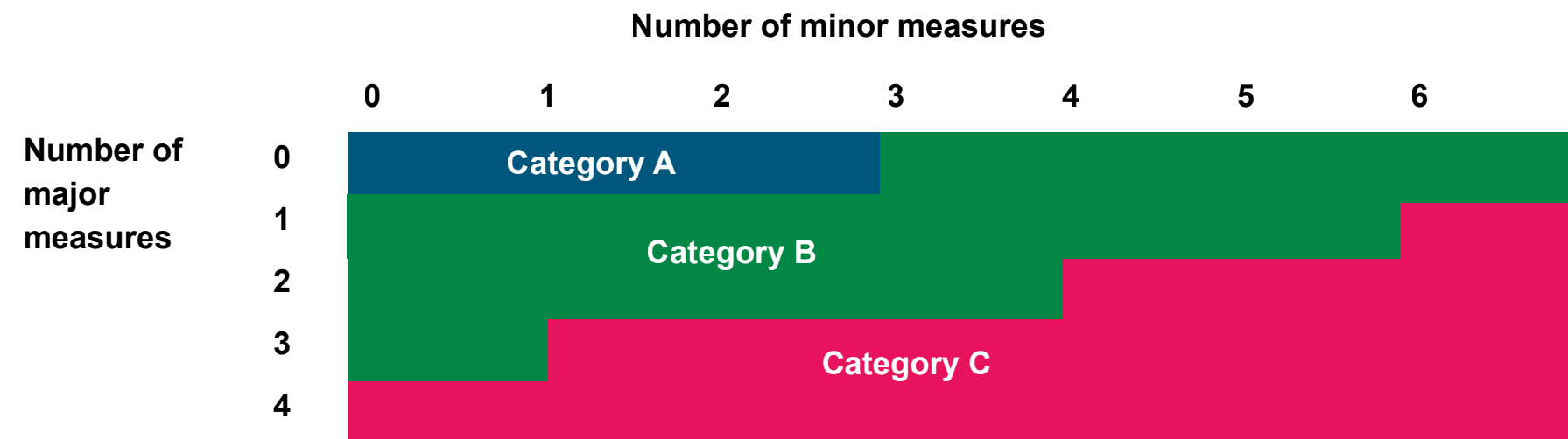


Figure 11: This chart, adapted from Part F, shows how combinations of minor and major energy efficiency measures are used to classify works into Categories A, B or C, which reflect the expected level of impact on a home's ventilation and the scale of ventilation measures that may be required.

In practice, this means that even light fabric measures can trigger the need for ventilation upgrades. For example:

- Draughtproofing historic windows may require additional background ventilation.
- Secondary glazing can reduce infiltration enough to require upgraded extract fans.
- Internal wall insulation increases moisture risk and therefore requires a robust ventilation strategy.
- Bathroom or kitchen refurbishments must meet the current ADF extract rates, which are significantly higher than pre-2021 standards.



Insulation installation. Credit: Canva stock image

PAS 2035 ventilation requirements

PAS 2035 introduces a set of ventilation obligations that operate alongside the statutory requirements of Approved Document F.

While Part F defines the minimum ventilation rates required for building control approval, PAS 2035 governs the retrofit process and sets out how ventilation must be assessed, designed and verified whenever energy efficiency measures are installed.

Under PAS 2035, there is a requirement for ventilation to be reviewed whenever retrofit measures are likely to reduce uncontrolled air infiltration. The standard requires the Retrofit Assessor and Retrofit Designer to:

- assess the dwelling's existing ventilation provision
- evaluate how proposed measures will alter infiltration and moisture behaviour
- design a ventilation strategy that is appropriate for the dwelling's intended post-retrofit airtightness level
- ensure that the final system provides adequate indoor air quality and moisture control
- commission and verify the system on completion.

PAS 2035 recommends a proportionate increase in ventilation capacity whenever airtightness is improved, and places responsibility on the design team to demonstrate that the upgraded ventilation is suitable for the dwelling's new performance characteristics.

In practice, this often results in more substantial ventilation upgrades than those required under Approved Document F alone.

Where airtightness is reduced below 5 m³/m²/hr @ 50 Pa, significant ventilation upgrades are recommended, because reliance on infiltration is no longer acceptable (see Table 6 on the next page).



Ventilation requirements and constraints

Ventilation system	Airtightness target (m ³ /(m ² h)@50pa)	Space requirements	Fabric alterations
Natural ventilation (e.g. air bricks, trickle vents)	5 to 10	Minimal. Relies on existing window vents or air bricks	Low. Usually limited to installing trickle vents in existing joinery or maintaining air bricks
dMEV (Decentralised mechanical extract)	< 5 ²⁶	Small. Single units installed in kitchens and bathrooms (similar size to standard fans).	Moderate. Requires 100 mm or 125 mm penetrations. Can often reuse existing holes or air bricks.
cMEV (Centralised mechanical extract)	< 5	Moderate. Requires a central fan unit (usually in a loft or cupboard) and a network of ducting.	High. Requires internal boxing and potentially new external vent terminals. Vertical ducting between floors can be difficult.
MVHR (Mechanical ventilation with heat recovery)	< 3	Significant. Requires a large central heat exchanger unit and two separate ducting networks (supply and extract).	Very high. Requires significant ducting runs throughout the dwelling and filter maintenance. Higher airtightness is required, necessitating extensive sealing of fabric.

Table 6: Ventilation requirements and constraints

Note: Any of these ventilation systems can still be used when airtightness is above 5 m³/(m²·h)@50 Pa. Best practice increasingly favours MEV (or MVHR) even at higher airtightness levels.



Planning

Retrofitting London's traditional buildings requires a careful balance between improving energy performance and respecting the historic character of the city's built environment.

From a planning perspective, this creates a set of practical constraints. Many traditional buildings sit within conservation areas or are listed²⁹, limiting the range of acceptable interventions. At the same time, national and London-wide climate policies place increasing pressure on reducing operational energy use and closing the performance gap between predicted and actual outcomes.

London Councils has produced useful and comprehensive guides to support housing providers in navigating the planning landscape when evaluating retrofit measures*:

- [01-Retrofit case studies and database](#) ³⁰
- [02-Clearer guidance and requirements](#) ³¹
- [03-Policy mechanisms](#) ³²
- [04-How to assess retrofit measures](#) ³³

*Further guidance and toolkits are included in the [Resources section](#) of this report.

It is advisable to engage with the relevant London borough's planning department through their pre-application advice service, as policy application remains highly localised and may be interpreted differently across planning departments.



Pepys Estate in the London Borough of Lewisham. Credit: Greater London Authority



Planning controls

Permitted Development Rights³⁴

- National rights that allow certain types of building work without needing planning permission.
- Examples include minor extensions, some roof alterations, and changes to windows or doors, though these vary by building type.

Article 4 directions

- A targeted planning control that can be applied within conservation areas (or other areas).
- Removes specific permitted development rights where unrestricted alterations could harm local character.
- Commonly restricts works such as window replacements, roof alterations, cladding, and small extensions.
- Once applied, these works require full planning permission.

Listed buildings

- Buildings placed on the national statutory list due to their architectural or historic significance.
- Any works that affect their character as a building of special interest require Listed Building Consent (LBC), regardless of whether planning permission is normally needed.
- Controls apply to both the exterior and interior, including features not immediately visible.
- Retrofit options are therefore more limited and must demonstrate minimal impact, reversibility, and heritage-led justification.

Conservation Areas

- Designated to protect the overall character and appearance of areas with special architectural or historic interest.
- Planning applications are assessed with greater emphasis on design quality, materials, and impact on the streetscape.
- Many small-scale changes are still allowed under permitted development rights, unless separately restricted.



Heating decarbonisation

Planning requirements have a significant influence on how and where heat pumps can be installed across the housing portfolio.

While some single dwellings can make use of relatively flexible permitted development rights, many other building types, such as converted houses and homes within conservation areas (CAs), face tighter controls and more stringent approval routes. These differences affect the number of external units that can be installed, their allowable size, and their placement on the building.

The table opposite summarises the main planning pathways relevant to heat pump deployment across a range of residential building types.

It highlights the statutory routes, volume limits, and key technical or heritage constraints that need to be considered when developing installation strategies.

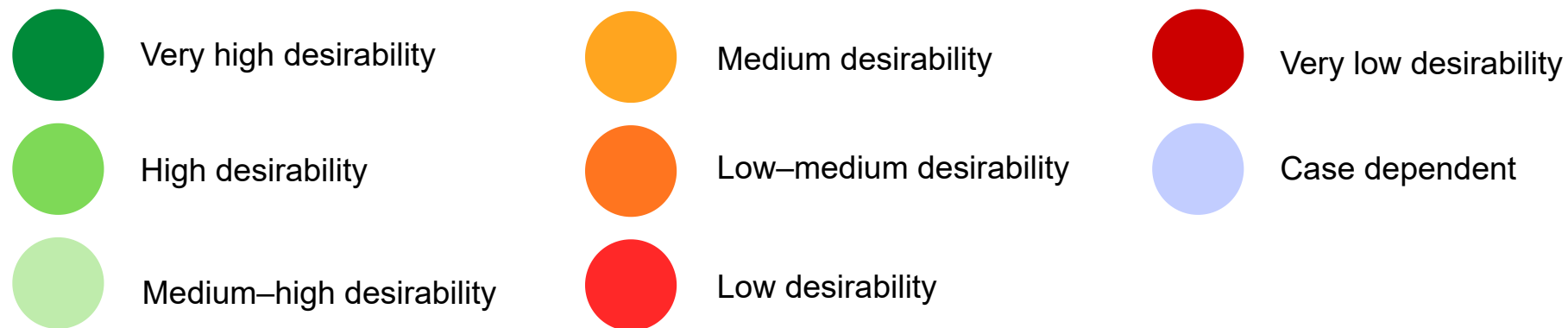
Scenario	Planning route	Key constraints and requirements
Single house (outside CAs)	Permitted development (PD)	Detached houses are permitted up to two external units; semi-detached or terraced houses are limited to one. Maximum volume per unit is 1.5m ³ . The historical 1-metre boundary restriction no longer applies.
Converted house (multiple flats/block)	Full planning application (usually required)	PD rights technically allow a volume limit of 0.6m ³ for a block of flats, but only for the first installation in the building. Because PD is restricted to one single unit per block, multi-unit conversions require a joint full planning application to cover all subsequent external fans.
CA and Article 4 directions	Full planning / heritage restrictions	All units require formal consent if an Article 4 direction is active. In CAs without an Article 4 direction, units are restricted to the rear or side ground level, cannot be wall-hung, and must not be visible from the highway.
Roof mounting (e.g. rear extensions)	Full planning / structural	Installations on pitched roofs are not permitted development. Flat roof installations can use PD but require a 1-metre setback from the external edge. Projects require formal structural, acoustic, and vibration assessments.

Table 7: Planning pathways for heat pump deployment in houses and converted flats



Measures heat map

Measure	Disruption	Cost	SAP impact	HEM impact	Impact on resident bills	Remedial risk	Planning considerations ³⁵
Loft insulation	High desirability	High desirability	High desirability	High desirability	Medium desirability	High desirability	Usually permitted
Airtightness testing	Very high desirability	High desirability	High desirability	High desirability	Very low desirability	High desirability	No planning implications
Draughtproofing	High desirability	High desirability	Low desirability	Low desirability	Medium desirability	High desirability	Generally acceptable for designated buildings. Reversible measures preferred.
Efficient lighting	Very high desirability	High desirability	High desirability	High desirability	Very low desirability	High desirability	No planning implications
Glazing repairs/refurbishment	Medium desirability	Medium desirability	Medium desirability	Medium desirability	Medium desirability	High desirability	Encouraged for listed buildings to retain original frames and profiles.
Secondary glazing	Medium desirability	Low-medium desirability	High desirability	High desirability	Medium desirability	High desirability	Often acceptable in Grade II buildings; usually permitted in CAs. May require LBC subject to detailing and impact on significance.
Window replacements	Medium desirability	Low desirability	High desirability	High desirability	Medium desirability	Medium desirability	Carefully controlled in listed buildings and Article 4 areas. Must match original profiles; slimline double glazing sometimes permitted in Victorian flats but rarely in Grade II blocks.



This heat map evaluates retrofit measures against key delivery risks and benefits to aid the selection of interventions depending on context, budget and strategic objectives. A green indicator represents high desirability, such as low disruption or high bill savings.

Measures heat map

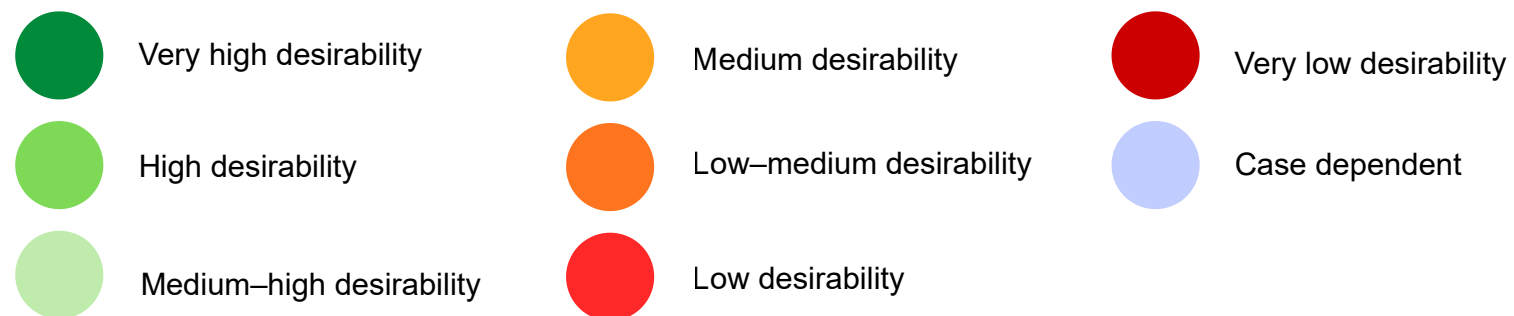
Measure	Disruption	Cost	SAP impact	HEM impact	Impact on resident bills	Remedial risk	Planning considerations
Suspended floor insulation	Very low desirability	Low-medium desirability	Medium desirability	Medium desirability	Medium desirability	Very low desirability	Usually acceptable. Avoid damaging historic floorboards in listed buildings.
Smart air bricks	High desirability	Medium-high desirability	Low desirability	Very low desirability	Very low desirability	Medium-high desirability	Generally acceptable – different colours available
External wall insulation (EWI)	Low-medium desirability	Very low desirability	High desirability	High desirability	High desirability	Very low desirability	Generally unsuitable for listed buildings and Conservation Areas. May be possible on concealed elevations of undesignated buildings. Insulation behind existing cladding/weatherboarding is treated separately and may be acceptable.
Internal wall insulation (IWI)	Very low desirability	Low desirability	High desirability	High desirability	High desirability	Very low desirability	Often possible where moisture and significance risks are managed. May be restricted in listed buildings due to loss of historic fabric.
Chimney blocking/capping	High desirability	Medium-high desirability	Low desirability	Very low desirability	Very low desirability	Medium-high desirability	Usually acceptable if reversible and not visible externally. Capping may require LBC.
Smart electric heating (HHRSH)	Medium desirability*	Low-medium desirability	Medium-high desirability	High desirability	Medium-high desirability	High desirability	No planning constraints; suitable for heritage buildings where heat pumps are restricted.



*For dwellings that are already electrically heated.

Measures heat map

Measure	Disruption	Cost	SAP impact	HEM impact	Impact on resident bills	Remedial risk	Planning considerations
Air-to-air heat pump (A2A)	Medium desirability	Low-medium desirability	Medium desirability	High desirability	Case dependent	Medium desirability	May require permission. Often sensitive on heritage buildings but can be acceptable on discreet rear or concealed elevations.
Air-to-water heat pump (A2W / wet system)	Low desirability	Low desirability	Medium desirability	High desirability	Case dependent	Low-medium desirability	Usually needs consent. Challenging on listed buildings and visible elevations but may be acceptable on discreet rear or concealed elevations.
Communal pipe insulation	High desirability	High desirability	Low desirability	Very low desirability	Very low desirability	High desirability	No planning implications
Immersion heater insulation / controls	High desirability	High desirability	Low-medium desirability	Low-medium desirability	Medium desirability	High desirability	No planning implications
Solar PV and batteries	Medium desirability	Low-medium desirability	High desirability	Very high desirability	Very high desirability	High desirability	Often restricted on listed buildings and visible roof slopes. May be allowed on rear roofs, outbuildings, or communal roofs. Article 4 may remove PD rights.
Smart (heating) controls	High desirability	High desirability	Low-medium desirability	Medium desirability	Medium desirability	High desirability	No planning implications
WWHR (with bathroom works)	High desirability	High desirability	Medium desirability	Low-medium desirability	Medium desirability	High desirability	No planning implications (may require LBC for refurbishments).



*Impacts will vary depending on heating and cooling demand, and on whether systems are combined with PV and battery storage. Cost implications also depend on the existing heating technology. However, switching from direct electric heating to A2A heat pumps would deliver a significant positive impact.

**Variable depending on heating demand, heat pump efficiency, flow temperatures, combination with PV and batteries.

***For easily accessible pipes - some may only be accessible during major works/voids.



Resident engagement

Traditional retrofit, and often engagement, usually focuses narrowly on technical delivery, including surveys, installations and sign-offs. While this ensures work is completed, it frequently fails to address the resident experience, resulting in:

- High dropout or refusal rates
- Resident dissatisfaction or complaints
- Misuse of installed systems (heating, ventilation, smart devices)
- Lack of long-term trust.

Smaller HAs in this project are often better placed to engage effectively given their close relationships with residents and, in some cases, the availability of on-site staff. However, in sheltered housing settings, residents often have additional vulnerabilities that have to be considered when planning energy upgrades. Providers highlighted particular concerns around introducing new heating systems for older residents.

Success in decarbonisation depends on residents feeling confident and supported in using new technologies. Unlike the on/off nature of gas boilers, heat pump systems operate most efficiently at a steady state. Providing intuitive thermostats and clear handovers allows residents to manage their comfort without complexity. Guidance and education should start early, well before installation, by providing residents with clear, accessible resources and education on new systems and how they will benefit them.



A family outside their home. Stock image



Resident engagement

To be effective, providers need to approach resident engagement as a supportive, trust building process and dialogue. This includes:

- Early conversations that explain why works are happening, what will change and how residents will benefit, using clear, jargon-free language.
- Tailored communication, recognising different resident needs and worries.
- Face-to-face engagement, ideally with familiar staff, to build confidence and address concerns before decisions are made.
- Demonstrations and hands-on guidance* for new heating controls, ventilation systems or smart devices to ensure residents feel comfortable using them, supported by summer and winter check-ups to confirm systems are operating and being operated as intended.
- Clear handovers and follow-up visits, especially after installing new heating systems, to reinforce understanding and resolve early issues.
- Staff training, so scheme managers and support workers can help residents use new systems correctly and identify problems early.
- Opportunities for residents to raise concerns easily and ensure providers can respond quickly.

In addition, during or once retrofit assessments are completed, there is an opportunity to engage residents about any choices available to them.

Giving residents meaningful choices can significantly improve their lived experience, satisfaction, and the overall success of retrofit delivery and outcomes.

This may include:

- Participating in an initial survey or engagement process to understand how they use their home, which is particularly valuable for longer-term tenancies.
- Selecting between viable retrofit options where alternatives exist.
- Highlighting maintenance issues or upgrade requests, such as low water pressure, insufficient storage, or other practical improvements, that could be incorporated into the works where feasible and within budget (for example, during heating upgrades or loft insulation combined with loft storage).

*For example:

- [User guides and manuals | Yorkshire Housing](#) ³⁶
- [Using storage heaters and immersion heaters - Citizens Advice](#) ³⁷
- [A guide to using your heating system - Gentoo](#) ³⁸



Resident engagement and messaging

Summer comfort and climate resilience	Accessible heating control	Off-peak tariffs and demand side flexibility
<ul style="list-style-type: none"> • Explain that cross-ventilation helps remove heat and keep the home cooler. • Explain that windows should stay shaded during hot days and opened at night (where possible and not a security risk) to cool the home. • Ensure residents understand that shading + airflow prevents overheating. 	<ul style="list-style-type: none"> • Explain that the system is preset to run efficiently, so only simple adjustments are needed. • Ensure residents understand that lower flow temperatures improve comfort and reduce bills. • Explain that controls are kept simple, with only a few settings to recognise. • Ensure residents know they don't need to keep changing settings. • Ensure residents can heat only the rooms they use. 	<ul style="list-style-type: none"> • Explain that smart cylinders, batteries, or solar can be set up to automatically use cheaper off-peak energy. • Ensure residents understand that once things are scheduled or preset, they can be left to run. • Explain that using energy at cheaper times can reduce bills with little effort. • Provide simple controls if residents want to adjust anything. • Ensure residents are supported to check or switch to a suitable tariff if beneficial.

Table 8: Resident engagement and messaging

This table outlines communication priorities across three key themes to aid the delivery of clear resident support and engagement.



Procurement

Under current government funding rules, any project receiving grant support must be delivered in full compliance with PAS 2035:2023. This introduces defined roles for the retrofit professional team, specific competency requirements for installers and products, and a structured process that must be followed from assessment through to handover.

Where government funding is not being used, PAS 2035:2023 compliance is not mandatory. However, it remains best practice to adopt PAS principles wherever feasible, particularly those relating to ventilation, moisture management, risk assessment and quality assurance.

There are circumstances where landlords may reasonably choose not to follow PAS in full, for example, when upgrading components as part of existing maintenance or repair programmes. In these cases, requiring a PAS-certified installer could necessitate re-procurement and add unnecessary cost or delay. Even so, it is essential that any contractor undertaking works applies the core good practice elements of PAS, such as ensuring adequate ventilation provision and avoiding unintended consequences, such as moisture risks.



Crosswall homes in the London Borough of Hammersmith & Fulham.
Credit: Energiesprong UK



Procurement of the retrofit professional team

In accordance with PAS 2035:2023, several distinct technical roles are required to oversee the retrofit process. For smaller projects, these roles are frequently consolidated within a single consultancy or provided by a multidisciplinary organisation.

The nature of traditional buildings means that technically competent professionals should be procured, particularly those with experience of traditional buildings. Looking for a Royal Institution of Chartered Surveyors (RICS) building surveyor with relevant experience is highly recommended, as many are able to meet the specific PAS 2035 roles alongside their chartered building surveyor status.

Alternatively, social landlords and larger organisations may wish to upskill existing in-house surveyors to become PAS-qualified for routine stock condition assessments to incorporate PAS retrofit assessments. While this builds valuable internal capacity, organisations have to weigh up potential downsides, such as the initial lack of connected software infrastructure required to progress, manage, and officially lodge assessments with TrustMark.

For smaller organisations without dedicated in-house surveying teams, procuring external multidisciplinary specialists remains the most viable route.

Compliance with PAS 2035:2023 extends beyond technical design and forms a critical component of long-term digital asset management. HAs should be aware of how this data integrates with broader regulatory and operational frameworks:

- **Software and TrustMark lodgement**
 - All retrofit assessments, designs, and handovers are processed using approved, PAS-compliant software platforms (e.g., PAS Hub, ECOsurv). Upon completion, the Retrofit Coordinator officially lodges this data within the national TrustMark Data Warehouse. This is a mandatory requirement to unlock grant funding and secure consumer compliance.
- **The Golden Thread of information**
 - Managing this data digitally aligns directly with the 'golden thread' principles established under the Building Safety Act. It ensures that an accurate, unalterable digital record of building alterations, material specifications, and structural impacts is maintained throughout the property's lifecycle.
- **Digital building passports**
 - The comprehensive data captured during the PAS 2035 process, such as baseline airtightness, U-value testing, and post-intervention evaluations, provides the ideal foundation for emerging digital building passports (or logbooks) and future-proofs the organisation's asset data management.



Procurement of the retrofit professional team

The following roles must be appointed to ensure compliance with PAS 2035:2023 and to secure eligibility for grant-funded schemes:

- **Retrofit assessor:** To perform whole-dwelling assessments and condition surveys. Given the age and construction of the heritage stock, it is suggested that the assessor is a qualified surveyor with documented experience in heritage and traditional buildings. This specialist background ensures that the initial condition surveys and whole-dwelling assessments accurately account for moisture movement and breathability. It is also recommended to include airtightness, U-value and HTC testing during the retrofit assessments to have an accurate understanding of the buildings' performance. This also helps with the selection of suitable Value for Money (VfM) designs and measures.
- **Retrofit coordinator:** To act as the mandatory project lead, managing risk and ensuring compliance.
- **Retrofit designer:** To produce technical specifications and design details.
- **Retrofit contractor (installer):** Responsible for the installation of retrofit measures. To satisfy grant funding requirements and maintain PAS 2035 compliance, the delivery contractor is required to hold valid PAS 2030:2023 certification for each specific measure being installed (e.g. insulation, window replacement or ASHP).

Under the PAS 2035:2023 standard, professionals working on pre-1919 or traditionally constructed buildings are required to hold specialist qualifications, such as the Level 3 Award in Energy Efficiency for Older and Traditional Buildings³⁹, or possess formal conservation accreditation.

Furthermore, for these traditional structures, a formal significance assessment is needed in accordance with BS 7913 (Guide to the Conservation of Historic Buildings). This process establishes the cultural, historical, architectural, and socio-economic value of the building before any energy efficiency measures are designed.

The resulting insights directly inform the retrofit design, ensuring that moisture-open (breathable) characteristics are maintained and that the building's historic fabric and character are fully protected.

Historic England's guidance on [Finding the Right Professional Team](#)⁴⁰ and the [Conservation Accreditation for Professionals](#)⁴¹ page can also help providers identify suitably competent specialists for traditional and highly graded buildings. These resources go beyond the minimum PAS 2035 requirements but are valuable for ensuring appropriate expertise in heritage sensitive retrofit projects.



Procuring the right team: strategic brief and risk management

Case studies and industry research consistently highlight that collaborative working is essential for successful retrofit projects. Some of the risks in retrofitting older buildings, for example coming across unexpected defects, or having issues accessing the homes, require effective communication and a problem-solving mindset.

For this reason, having a trusted team is important. Where long-term maintenance, repair, or void contracts are already active, housing providers should evaluate whether retrofit works can be delivered via these existing supply chains. If the incumbent contractors are unsuitable or lack the required regulatory accreditations, a dedicated procurement route should be selected.

To de-risk the delivery phase, the housing provider should establish a clear strategic brief before going to market.

This brief needs to define clear performance targets and limitations (such as target EPC ratings or heat decarbonisation goals and budgets) and map out how these fit within broader asset management budgets and grant fund requirements.

It is helpful to have more information on any existing defects at this stage too, so they can be incorporated into the brief and priced at tender stage. To support this brief, a specialist retrofit assessor or heritage building surveyor should be appointed early.

Undertaking detailed fabric surveys ahead of the main contractor procurement ensures that essential remedial works, including masonry repairs or timber treatment are budgeted for explicitly. Tendering with this complete performance baseline including airtightness and U-values ensures that contractor pricing is built on evidence rather than generic conservative software.

Traditional, highly administrative linear procurement (design-then-tender) frequently introduces flawed designs, material incompatibility, or significant cost variations, especially when applied to older properties, because the installer is isolated from the early design stages. To overcome this, HAs could focus on building long-term relational trust with their delivery partners. By working with established, trusted contractors or smaller specialists via standard, familiar contracts, housing providers can establish a genuine problem-solving culture.

Rather than introducing complex legal frameworks that are difficult to manage, standard contract terms should recognise and support aligning financial incentives around project outcomes.

This protects both parties when unexpected fabric defects are uncovered and creates a secure environment for collaborative upskilling, ensuring that the technical expertise gained on early properties remains embedded within the delivery team.



Procurement options

The choice of procurement route is heavily influenced by public sector procurement regulations, the estimated contract value, and the desired speed of delivery. Under the Procurement Act 2023, public works contracts sitting above the contract value threshold require full statutory notices, while below-threshold projects offer greater procedural flexibility. The table below outlines the strategic options available across different delivery scenarios:

Option	Suitability	Justification
Existing maintenance / voids contract / contract variation	Isolated properties, infill works, or planned upgrades	This is the fastest, most operationally integrated route. However, the buyer needs to verify that the incumbent contractor holds required certifications (e.g. PAS 2030:2023) for the specific measures intended (e.g. air source heat pumps or solid wall insulation) where grant funding is being sought. The client could also support upskilling of their teams delivering other works if these are trusted partners procured for a long period. The original contract must also have sufficient headroom, scope, and modification allowances to absorb these specialist works without breaching public procurement limits.
Direct negotiation / restricted quotation (SMEs)	Small-scale schemes, targeted archetypes, or highly complex heritage properties.	Partnering with a specialist Small and Medium-sized Enterprise (SME) allows for a high degree of technical specificity, which is often required for traditional properties. If the value is low enough, then quotes could be sought from qualified contractors, in line with the client’s internal financial regs, or dispensation from these may be given to direct award for specialist works. For any future long-term scaling, this approach may eventually require a formal tender, or a call-off from a compliant framework to meet public procurement thresholds.
Frameworks and DPS (Dynamic Purchasing Systems)	Mid-to-large scale programmes, or where internal procurement capacity is limited.	Accessing a pre-vetted framework ensures compliance but may incur access fees that are disproportionate to the cost of smaller programmes. Conversely, a framework is often a safe route for a long-term relationship, as it provides the contractual mechanisms to scale projects via an initial mini-competition.
Open tender	Large-scale or high value programmes or bespoke requirements	For major capital works exceeding public works thresholds, a full open tender ensures maximum market testing and compliance with the Procurement Act. Procurement of a large programme is likely to attract tier-one contractors and major consortia capable of managing large delivery pipelines. However, the high administrative burden and extended timelines make it poorly suited for specialist SMEs specialised in traditional buildings. An open tender can also be used when the client is looking for a specialist contractor or a particular programme, or when existing frameworks do not suit the project requirements or the contracting structure.

Table 9: Procurement options

Recommendations for selection and quality assurance

The selection process needs to prioritise contractors capable of delivering the outcomes set out in the strategic brief, rather than focusing purely on lowest-cost tenders.

Bidders should be evaluated on their proactive approach to risk management, specifically their ability to identify risks of unintended consequences at the design stage.

Contractors should also demonstrate competence in navigating building regulations and building control. The appointed partner needs the capability to support projects where dwellings sit within conservation areas, are listed, or are subject to Article 4 directions.

Selecting a partner with these capabilities ensures that the technical details proven during early phases are easily repeatable across more sensitive parts of the housing portfolio.

Finally, risk management remains central to project close-out and grant compliance. The contract needs to stipulate that all handover documentation, including condition surveys, commissioning records, and Microgeneration Certification Scheme (MCS) certificates, are fully compiled and handed over to the Retrofit Coordinator for official lodgement in the TrustMark Data Warehouse for PAS-compliant projects.

The project should include a structured handover to the client, combining comprehensive physical operation manuals with in-person technical demonstrations for the residents to ensure the newly installed systems are operated efficiently.



Building surveyors on site. Credit: Canva stock image



Funding

Funding opportunities remain limited, and the scope of the forthcoming **Warm Homes Plan (WHP)**⁴² has not yet been clearly defined. Early indications suggest that low-interest loans may form part of the WHP, which providers could consider for longer-term measures.

One housing association within the consortium has successfully secured capital funding through **Energy Redress**⁴³, which may also represent a suitable pathway for other HAs, particularly if combined with resident energy advice. Warm Homes: Social Housing Fund Wave 3 (WH: SHF W3) may provide another avenue for HAs to consider if there is an opportunity to join a Strategic Partnership if additional funding becomes available.

Lenders such as Unity Trust Bank also provide loans specifically aimed at decarbonisation, such as their **Green Tariff Lending product**⁴⁴. This could be a suitable route to co-fund measures at scale alongside available grants and enable capital to be deployed now for works originally planned for future years. This is particularly advantageous where it allows decarbonisation measures to be aligned with imminent major repairs, such as roofing or window replacements, to achieve economies of scale.

The process for borrowing against future planned expenditure is relatively straightforward as it integrates with existing long-term financial planning. However, spending against a new revenue stream, such as models where residents contribute a proportion of their energy savings, is more complex. **Although this remains an emerging approach, it is a developing market.**⁴⁵

Verified retrofit credits⁴⁶ are another innovative funding stream for organisations to explore, as they allow social housing providers to monetise the carbon savings and social impact of their retrofit activities (including window upgrades, loft insulation, etc). Carbon savings and wider social benefits such as reduced fuel poverty, generated through HAs' retrofit programmes are independently assessed and converted into credits that can be purchased by UK businesses. The income from these sales can then be used by HAs either as an upfront contribution towards capital works or as a steady revenue stream to help repay retrofit finance.

Heritage specific grants often focus on restoration, but when combined with energy upgrades, they could offer a mechanism to offset the high capital costs of installing sympathetic fabric measures on traditional stock.

Additional funding opportunities are included in Table 10 overleaf.



Available funding routes

Funding stream	Type	Focus and eligibility	Key considerations
Warm Homes: Social Housing Fund	Grant	EPC D and below	Currently closed for applications. 50% match funding required.
Local Power Plan (Great British Energy) ⁴⁷	Grant and loan	Community-led energy projects	Part of a £1bn fund launched in February 2026. Supports local solar, storage, and heat networks. Focuses on community ownership and shared ownership models.
GLA Affordable Homes Programme 2026 - 2036 ⁴⁸	Grant	Delivery of new social and affordable housing in London	Primarily focused on new builds with some funding earmarked for major refurbishments and estate regeneration schemes that can be aligned with energy upgrades.
Warm Homes Plan loans	Government loan	Low/zero-interest loans for solar, heat pumps and batteries	Announced in the WHP. Backed by £15bn government investment. Aimed at covering upfront capital costs. Currently at consultation stage.
National Wealth Fund ⁴⁹	Loan guarantee	De-risking private investment into social housing retrofit	Provides loan guarantees to reduce the cost of private finance ⁵⁰ , with the ability to make direct investments in strategic projects where needed. More suited to large-scale programmes.
The Housing Finance Corporation ⁵¹	Private/institutional loan (via not-for-profit aggregator)	Long-term, low-cost finance for housing associations, including retrofit and energy efficiency programmes	Competitive rates via aggregated borrowing. Loans typically £5m+, long maturities. Not suitable for small organisations unless part of a consortium.

Table 10: Available funding routes



Available funding routes

Funding stream	Type	Focus and eligibility	Key considerations
GLA Green Finance Fund ⁵²	Concessionary loan	Energy efficiency and renewables in London	£1m minimum loan (aggregation allowed). Rates ~20 bps below PWLB. Currently closed. Potentially viable for whole stock programmes or aggregated/joint bids.
Unity Trust Bank ⁵³	Private loan	Energy efficiency or carbon use reduction	Minimum loans from £250k. Green Tariff Lending terms (£100m fund). Potentially suitable if borrowing needs exceed the minimum threshold.
Triodos Bank ⁵⁴	Private loan	Community-led housing and housing associations	Loans from £1m-£20m, up to 25-year terms. May be too large unless part of a joint borrowing arrangement.
Energy Redress Scheme ⁵⁵	Grant	Vulnerable households / fuel poverty and carbon reduction	Suitable for combining retrofit with resident advice.
HACT retrofit credits ⁵⁶	Offset	Verification of carbon and social value savings	Sells verified savings to corporate buyers. 1 retrofit credit = 1 tCO ₂ e reduced, which can generate modest revenue to support additional retrofit measures.
The National Lottery Heritage Fund ⁵⁷	Grant	Heritage assets, listed buildings, and properties within designated Conservation Areas	Funding is available for projects that preserve heritage while delivering environmental resilience. Applications must demonstrate clear community benefit, skills development, or broader social value alongside fabric repairs.
The Historic England Grant ⁵⁸	Grant	Repair, conservation, and care of historic buildings, monuments, and designed landscapes	Targets historic buildings and structures, specifically focusing on works that safeguard the building fabric. Capital can be utilised to fund specialist, sympathetic fabric repairs.





Solar panel installation, Credit: Canva stock image

Appendix

Templates & resources

This section includes practical templates and checklists along with a list of resources, guides and further reading.



Void checklist

Void checklist aligned with energy and heat pump ready upgrades

Core inspection category	Standard items		Energy efficiency and future-proofing upgrades	
1. Electrical and gas compliance	<input type="checkbox"/>	Complete a Landlord Gas Safety Record and cap the supply safely at the meter	<input type="checkbox"/>	Upgrade the consumer unit to ensure it has adequate spare capacity for future low-carbon technologies (e.g., heat pumps and EV chargers).
	<input type="checkbox"/>	Complete an Electrical Installation Condition Report		
	<input type="checkbox"/>	Secure all switches and sockets		
2. Heating and hot water systems	<input type="checkbox"/>	Check the boiler, radiators, and central heating pipework for leaks, corrosion, or pressure drops.	<input type="checkbox"/>	If central heating pipework or radiators require replacement, assess the property for an Air Source Heat Pump (ASHP).
	<input type="checkbox"/>	Bleed radiators and check thermostatic radiator valves.	<input type="checkbox"/>	If suitable, during routine replacements upsize the pipework to a wider diameter and upsize the radiators to accommodate lower heat pump flow temperatures (45°C–50°C) or trial innovative solutions such as DiscreteHeat .



Void checklist

Core inspection category	Standard items		Energy efficiency and future-proofing upgrades	
3. Kitchen lifecycle	<input type="checkbox"/>	Inspect kitchen units, hinges, drawers, and worktops.	<input type="checkbox"/>	Remove any existing gas hobs.
	<input type="checkbox"/>	Strip out and replace with a standard modular kitchen if it is past its lifecycle or damaged beyond economical repair.	<input type="checkbox"/>	Install an energy efficient electric induction hob (or standard ceramic hob if grid constraints dictate).
			<input type="checkbox"/>	Upgrade the kitchen electrical feed to handle the new electric cooking load.
			<input type="checkbox"/>	Upgrade ventilation systems.
4. Bathroom lifecycle	<input type="checkbox"/>	Assess the sanitaryware (bath, toilet, basin) for cracks, hygiene issues, or leaks.	<input type="checkbox"/>	When a full bath or shower replacement is triggered, install a Waste Water Heat Recovery (WWHR) unit.
	<input type="checkbox"/>	Strip out old silicone seals and replace with fresh anti-fungal compound.	<input type="checkbox"/>	Ensure the WWHR unit is integrated into the greywater pipework to pre-heat the incoming cold mains supply.
	<input type="checkbox"/>	Replace the entire suite if past its structural lifecycle.	<input type="checkbox"/>	Upgrade ventilation systems.



Void checklist

Core inspection category	Standard items		Energy efficiency and future-proofing upgrades	
5. Windows, glazing and fabric	<input type="checkbox"/>	Check that windows and doors are structurally sound, draught-sealed, and lock smoothly.	<input type="checkbox"/>	If window frames/doors or whole units are scheduled for replacement due to deterioration, upgrade them to high-performance glazing to maximise the fabric efficiency of the home.
	<input type="checkbox"/>	Replace cracked panes, broken restrictors, or blown double-glazing units.	<input type="checkbox"/>	Draughtproof around windows and doors.
6. Floors and subfloors	<input type="checkbox"/>	Remove unauthorised tenant-installed laminate flooring.	<input type="checkbox"/>	While flooring is lifted in ground-floor rooms, inspect the subfloor voids for draughts and install underfloor insulation where accessible.
	<input type="checkbox"/>	Secure loose or squeaking structural floorboards.		
	<input type="checkbox"/>	Lay down fresh, non-slip vinyl flooring in wet zones (kitchens and bathrooms).		
7. External and gardens	<input type="checkbox"/>	Clear the garden of debris and cut lawns to a manageable height.	<input type="checkbox"/>	Where relevant, ensure garden clearance leaves a suitable, unobstructed footprint against the external structural wall for the future installation of an ASHP external unit.
	<input type="checkbox"/>	Cut back overgrown bushes, trees, or hedges.		
	<input type="checkbox"/>	Repair boundary fencing and secure external gates.		



Procurement checklist

1. Define strategic objectives	<ul style="list-style-type: none"> • Clarify project goals, outcomes, and success measures. • Confirm legal, governance, and procurement compliance requirements. • Identify organisational priorities (e.g. social value, local employment targets, SME participation)
2. Appoint an Employer's Agent (where relevant)	<ul style="list-style-type: none"> • Appoint an experienced Employer's Agent early in the process with relevant experience.
3. Select procurement route and contract strategy	<ul style="list-style-type: none"> • Allow sufficient time to go through the procurement exercise and contract finalisation and signing. • Consider which risks you can genuinely pass over as part of a tender, and which you must retain.
4. Prepare tender documentation	<ul style="list-style-type: none"> • Use standard Employer's Requirements where appropriate and adapt for specific retrofit needs. • Ensure documentation clearly states objectives, quality expectations, resident engagement requirements, social value outcomes, reporting obligations, health & safety and sustainability requirements - as well as behavioural and collaboration expectations. • Ensure evaluation criteria reflects long-term outcomes, not just lowest cost.
5. Gain internal approval	<ul style="list-style-type: none"> • Ensure legal and finance personnel review documentation early. • Secure approval for procurement route, contract terms, evaluation methodology, budget and contingencies.
6. Create comprehensive contracts	<ul style="list-style-type: none"> • Ensure all required services and obligations are contractually defined. • Confirm procedures for variations, delays, risk management, dispute resolution and Early Warning Notices
7. Review and mobilise	<ul style="list-style-type: none"> • Present the requirements to your team and ensure you are all familiar with how the contract works and what you expect the contractor to deliver. Have a briefing document which helps any new team members to understand the contract and where to find relevant information.
8. Embed collaborative working	<ul style="list-style-type: none"> • Structure the contract to focus on problem-solving and build that into processes to tackle and resolve issues. • Establish regular risk review and progress meetings, resident engagement reviews and lessons sharing sessions.



Are you heat pump ready?

● = Ready
 ● = Needs minor work
 ● = Not ready / major intervention required

Theme/requirement	A2W	A2A	Status	Notes
1. Strategic considerations				
DHN connection viability assessed	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Low carbon options compared (A2W vs A2A vs communal)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Property archetype suitable (fabric, layout, space)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
2. Fabric measures				
Loft insulation ≥ 300 mm	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Draughtproofing	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Windows/doors upgraded (airtightness acceptable)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Ventilation measures	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
U-value and/or HTC tests confirm further insulation is not required	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	



Are you heat pump ready?

Theme/requirement	A2W	A2A	Status	Notes
3. Electrical readiness				
Main fuse capacity suitable (60-100A typical)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Consumer unit has space for new circuits	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Smart meter installed	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
4. Internal and external space requirement				
External unit location meets MCS noise and airflow rules	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Planning constraints checked (flats, conservation areas, listed)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Internal space for hot water cylinder	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Internal space for buffer/controls	✓	✗	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Suitable wall/ceiling locations for indoor fan coil units	✗	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Condensate drainage route for indoor units	✗	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	



Are you heat pump ready?

Theme/requirement	A2W	A2A	Status	Notes
5. Heating distribution systems				
Radiators sized for low-flow temps if upgrades are due	✓	✗	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Pipework diameter/condition suitable	✓	✗	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Airflow paths suitable for heating/cooling	✗	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Noise impact acceptable in occupied rooms	✗	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
6. Domestic Hot Water (DHW)				
Cylinder space confirmed (unvented or heat pump ready)	✓	✗	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Separate DHW system suitable (may require cylinder)	✗	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	



Are you heat pump ready?

Theme/requirement	A2W	A2A	Status	Notes
7. Controls and monitoring				
Smart controls possible (weather/load comp for A2W; room controls for A2A)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Remote monitoring capability available	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Resident-friendly interface	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	
Internet connection (to enable smart systems)	✓	✓	<input type="checkbox"/> ● <input type="checkbox"/> ● <input type="checkbox"/> ●	

A2W: Air-to-water heat pump

A2A: Air-to-air heat pump

Note: The checklist is also relevant to GSHPs, though these are likely to be out of scope for most properties.

Landlords can complete some preliminary checks themselves, but several items (such as external unit siting and technical suitability) require a formal heat pump survey.

Heat pump installations are required to be carried out by a certified [MCS installer](#).



Resources

Historic England

- HEAN 18 Adapting Historic Buildings for Energy and Carbon Efficiency
- Energy Efficiency and Retrofit in Historic Buildings
- How to Find the Right Professional Help
- Conservation Accreditation for Professionals
- Overheating in Historic Buildings
- Modifying Historic Windows as Part of Retrofitting Energy Saving Measures
- HEAG014 Energy Efficiency and Historic Buildings - Application of Part L of the Building Regulations to Historic and Traditionally Constructed Buildings
- Historic Building Energy Performance Potential: Demonstrator project
- Heritage and the Environment
- Modifying Windows and Doors in Historic Buildings

Planning & policy guidance

- Planning portal
- London Councils:
 - 01-Retrofit case studies and database
 - 02-Clearer guidance and requirements
 - 03-Policy mechanisms
 - 04-How to assess retrofit measures

The Sustainable Traditional Buildings Alliance

- Planning responsible retrofit of traditional buildings
- Insulation Materials Selection for Traditional Buildings



Resources

Examples from London boroughs

- ESSA local conservation association (Kensington and Chelsea)
- Heat decarbonisation study | Lambeth Council
- Heritage Building Retrofit Toolkit (City of London)
- ESPD Retrofitting and Sustainable Design (Westminster)
- Final Retrofit SPD (Hackney)
- Islington Retrofit Handbook Guidance
- Energy efficiency planning guidance for conservation areas (Camden)

PAS 2035 framework / compliance

- PAS 2035:2023
- PAS 2030:2023
- Approved Documents

Guides and toolkits

- Heritage Planning Toolkit - RISE
- Heritage-Buildings-Toolkit-for-the-Public-Sector - GSENZH
- LETI Climate Emergency Retrofit Guide
- NRH Archetypes Best Practice
- NRH Retrofit Pattern Book
- Design methodology for the assessment of overheating risk in homes | CIBSE
- New toolkit for Social Housing: Resident Liaison Officer | Carbon Co-op
- Tenant Engagement Toolkit
- Toolkits Archive - RISE App
- Guide to Energy Retrofit of Traditional Buildings (Scotland focus but relevant details on measures and designs)
- Flats Retrofit Toolkit | London City Hall



References

1 Historic England: Properties of Traditional Construction

<https://historicengland.org.uk/advice/technical-advice/retrofit-and-energy-efficiency-in-historic-buildings/traditional-buildings-and-energy-efficiency/properties-of-traditional-building-construction/> (Accessed: 26 May 2026).

2 Historic England: Traditional Buildings and Energy Efficiency

<https://historicengland.org.uk/advice/technical-advice/retrofit-and-energy-efficiency-in-historic-buildings/traditional-buildings-and-energy-efficiency/> (Accessed: 26 May 2026).

3 Gov.uk: Consultation outcome - Improving the energy efficiency of socially rented homes in England: Summary of consultation responses

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Zero Carbon Accelerator

Retrofit pathways for small social housing providers with traditional stock

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