Improving energy efficiency in owner-occupied homes in Scotland

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A report to the Existing Homes Alliance Scotland

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1. Preface

The research and preparation of this report, along with a seminar for stakeholders to inform the report, were completed before the onset of the COVID-19 crisis. Given the impact of the crisis on Scottish Government programmes, there will need to be some consideration of how policies and programmes to invest in energy efficiency of buildings can form part of a green recovery plan. The proposals in this consultation are an important part of supporting and planning for that investment, with appropriate timescales to take account of the impact of the epidemic on people’s lives and livelihoods.

2. Introduction

This report was commissioned by the Existing Homes Alliance Scotland to help it prepare its response to the Scottish Government consultation released in December 2019, which sets out what a standard for owner occupied homes might look like, as part of the Energy Efficient Scotland Route Map, and how they plan to help homeowners to achieve this standard. The report provides recommendations for the consultation response, and the reasoning behind them. This report was developed through a process of dialogue with stakeholders, with a discussion paper and draft recommendations discussed at a seminar held in Edinburgh on March 12th, following which the Alliance’s consultation response was finalised.

The consultation consists of 32 questions (included as an appendix), ranging from whether there should be a legally-binding minimum standard for owner-occupied housing, through the assessments and metrics to use, the trigger points at which standards might be enforced and by whom, the definition of cost-effectiveness, exemptions and abeyances, the supply chain and financial support. These issues have been grouped below into three categories: driving action, enabling action and enforcing action.

The Existing Homes Alliance Scotland is a coalition of 10 founding member organisations and 10 supporters representing housing, environment, anti-poverty, industry, and consumer groups arguing for greater investment in Scotland’s existing housing stock to make it fit for the 21st century.

3. Driving Action

A legally binding standard

The climate emergency and the potential consequences of inaction mean that improvements in energy performance across all housing sectors are required. Without a legally binding standard in the owner occupied sector, in addition to those already established for social and private rented housing, it is highly unlikely that this can be achieved. The Existing Homes Alliance report ‘Pathway
to zero carbon homes by 2045’ recommends there should be a legal-binding minimum energy performance standard for owner-occupied housing of EPC band C, to be introduced in 2020 and be implemented from 2025, providing for a five year foreshadow period.

**Recommendation 1:** There should be a legally-binding minimum standard for owner-occupied housing, with implementation from 2025 with a five year foreshadow period. This should start at C and increase over time – with a clear future plan put in place now, with a standard set in 2020.

While it will not be easy to achieve, the level will also have to be raised over time, to achieve the carbon emission reductions needed. This staged increase needs to be set out now, and not left to a later stage, so that homeowners and the supply chain can plan ahead, and avoid ‘lock-in’ effects (where measures are taken that make it more difficult or costly to go to the next level of efficiency) as far as possible. Studies have shown that it is more cost-effective to do a deep renovation in one go, than step by step\(^1\) – and although this is not always possible in practice, property owners need to be made aware of the options and future requirements. A recent study indicated that shallow retrofit can make deeper more difficult if the messaging is not right – in that people think they have done all that is necessary already\(^2\).

For this to succeed, it is essential that engagement, enabling and supporting mechanisms are in place, as well as compliance and enforcement, and in order to minimise the resources required for the latter. Some of these requirements may take considerable time to develop and put in place, which means that preparations must commence well in advance of the first implementation date of 2024. The Home Energy Efficiency Programmes for Scotland provide a good basis for this, but will need to be scaled up.

**Recommendation 2:** In order to implement the standard effectively from 2024, enabling mechanisms must be in place in addition to those for enforcement and compliance. This requires preparations to be made well in advance.

The step change in building renovation that is needed will inevitably have social and economic impacts, and these may not all be fully understood in advance. In addition to mitigation of climate change, positive impacts include reduced energy costs, improved comfort, reduction in health risks associated with cold or damp homes, and increased economic activity through renovation works. Of particular note are the positive impacts in relation to fuel poverty, for which the Scottish Government has set statutory targets. Less easy to predict are impacts such as changes in the value of individual homes, and increased or reduced saleability.

Long term regulatory certainty is needed, to enable planning and investment, but at the same time short term flexibility must be possible to allow learning\(^3\). This means that effective monitoring and evaluation processes must be built into programmes from the outset\(^4\). This must be supported by an effective communications plan\(^5\), between government, citizens and industry, so that this is

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\(^3\) Schwarz, Nakhlé and Knoeri. *Innovative designs of building energy codes for building decarbonisation and their implementation challenges*. Journal of Cleaner Production 248 (2020).


\(^5\) Infrastructure Commission for Scotland. *Phase 1: Key findings Report – a blueprint for Scotland*. January 2020
understood, and problems are seen as reasons to make improvements, rather than to abandon programmes and direction of travel\(^6\).

 Recommendation 3: Core principles in developing the programme should be:

- to seek mechanisms to address and ameliorate any negative impacts, rather than to soften targets;
- to build effective monitoring and evaluation into the programme from the outset, to maximise learning opportunities;
- to build sufficient flexibility into enabling mechanisms, so that learning may be translated into programme adjustment, where necessary, with the minimum of delay.

A long-term integrated strategy and programme

The need to have good quality and affordable housing provision for all are powerful reasons for energy renovations to be part of an integrated housing and spatial planning strategy, rather than considered in isolation. The application of minimum standards across all housing tenures is welcomed, as differentials between tenures may result in lack of supply, for example in long term private rental properties. With this in mind, it is necessary also to ensure that all types of rental properties are covered and do not fall outside of such regulation, including sort-term lets, holiday homes and Airbnb.

Public awareness of climate change, and the urgency of action both to mitigate and to adapt, is increasing. However, minimum energy efficiency standards may be better understood and publicly acceptable if seen also as part of a wider set of housing quality standards, with an emphasis on health, safety and well-being, as is enshrined in the Scottish Housing Quality Standard for social housing.

The programme of work towards zero carbon homes, as indicated by the Energy Efficiency Scotland Route Map (2018), is one that will extend across the life of several governments. It is crucially important that continuity is assured and that it is not subject to uncertainty as a result of changes of administration, and as such it requires an independent system of oversight and governance to coordinate activities, drive efficiencies and maximise benefits to the supply chain\(^7\).

 Recommendation 4: An independent system of oversight and governance should be established to ensure continuity across successive administrations over an extended period of time.

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Assessments and metrics

*The Energy Performance Certificate and the Energy Efficiency Rating*

It is proposed that the standard for domestic properties should be based on the Energy Efficiency Rating (EER) as provided by an EPC (Energy Performance Certificate).

The EER, as provided by the EPC is based on a reduced data set version of the Standard Assessment Procedure (SAP/RDSAP), which can be described as ‘an expression of the cost to achieve a specific space heating regime, and provide adequate hot water and sufficient lighting, divided by the dwelling’s total floor area (i.e. £/m²)’ (Alembic Research, 2019). This is a model that was adopted by the UK government, and is the basis for how EPCs are delivered across the UK.

The proposals set out in the consultation regarding assessment are that these should be two levels: a mandatory Standard Assessment, and an optional Full Assessment (including occupancy and local climate data), both based on the current EPC /RdSAP methodology, with an enhanced role for assessors in collating data on building defects, building designations, local measures costings, the Local Heat and Energy Efficiency Strategy, and owner preferences.

It is noted that a full development of the approach was part of the work of the Short Life Working Group on Assessment, and is ongoing through the newly formed follow-on Industry Focus Group. Some key points and recommendations are set out below to support this activity.

The EPC was designed as an asset rating – related to the property and not the specific occupants or their energy usage behaviour. However, it is now clear that we require several different outcomes from the core activity of a site survey and energy assessment of the home:

- An asset rating to inform prospective buyers and tenants about the comparable running costs and environmental impact of a home;
- Evidence of compliance with a legally-binding standard;
- An advisory tool indicating which improvement measures are relevant, and their potential impact on energy consumption, energy costs and carbon emissions.

The development with the Home Energy Scotland programme of a separate ‘Home Energy Improvements Report’, which provides more detailed advice on improvements, in parallel with the EPC, is perhaps an indication of the need for a more comprehensive approach. As both are based on the same core methodology, the results should be consistent, and it would be more streamlined to provide both in a single report, avoiding the need for two separate surveys and reducing possible confusion for the homeowner.

*Recommendation 5: Consideration should be given to creating a single, comprehensive home energy assessment and report which can deliver each of the requirements: a rating robust enough to be used as evidence of compliance with the new legally-binding standard and advice on the improvements required both to meet the standard and to go further towards zero carbon.*

*The Energy Efficiency Rating and the Environmental Impact Rating*

The EPC in its current form produces both an EER and an EIR (Environmental Impact Rating). The latter is an indicator of carbon dioxide emissions related to energy use in the home. Focussing only on the EER only for the standard is problematic, as it implies that running costs are the target – when in fact this legal obligation is in place to achieve a reduction in carbon emissions.
The argument for the use of the EER as the mandatory standard is based on the relatively low cost and (public) familiarity of this approach. It is arguable, however, that this familiarity is based on the banding approach (using an A to G rating, with a visual bar graph presentation), rather than the underlying methodology, or the metrics used. This is highlighted by the review of EPCs carried out for Scottish Government, which noted that ‘...members of the public thought the A-G scale was a ‘key strength’ of the EPC as it is ‘easily understandable...’’, but that ‘As a tool for the mass market RdSAP/EPC is not a good product. At the moment it is a product that can only be understood by trained assessors and even then they often cannot explain the output’.

As the EIR uses the same familiar bar chart and A to G rating, the public understanding of the standard should not be reduced by using the EIR instead of, or as well as the EER. The consultation document acknowledges that the two ratings are not always fully aligned (because reduction in carbon emissions do not always reduce energy costs and vice versa) and suggests exemptions in such cases – however this seems unnecessarily confusing for the public. The EER is nevertheless important, not least in the light of fuel poverty concerns – but the emphasis is the wrong way round, with the EIR the most important rating with regard to carbon targets.

**Recommendation 6: Consideration should be given to using the EIR as the target rating, as it refers specifically to carbon dioxide emissions – with the EER as the additional information, rather than the other way round.**

**Level of data and recommendations for improvements**

The EPC is based on a reduced data set, rather than the full ‘SAP’. The consultation proposals are that both the Standard and the Full Assessment should use the RdSAP. This has the advantage of reducing the time taken for a survey, but it limits the accuracy and relevance of the report, the ratings and the recommendations. Limiting the data that has to be collected means that default values and assumptions are made instead of certain measurements and observations. The default data is based on data about buildings across the UK, and does not allow for the variations that are found in many existing buildings, due to lack of exact homogeneity in how they were built in the first place, and what changes have been made to them over time. Using a reduced data set means that the ratings are less accurate than they might be. It also makes it difficult to provide a full and practically relevant set of recommendations, as you cannot recommend changes to features that you have not recorded.

In moving towards zero carbon, the inadequacies of this approach are likely, however, to become more, not less problematic, and as such it would be better to make the necessary improvements to the assessment approach at this relatively early stage, to avoid further cost and confusion later. Using this type of assessment as the basis for a legal requirement, which may trigger a requirement for relatively costly building works warrants as robust an approach as possible, based on best practice, rather than the lowest cost.

**Recommendation 7: Assessments should move to use of the full data set SAP (Standard Assessment Procedure), to provide a more robust rating and more useful recommendations.**

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The recommendation in the EPC are listed in terms of costs and savings. This can be misleading, for several reasons. The costs it is based on are a very rough estimate as they are for the whole of the UK, and based on a sample building – not adjusted for the size of the property in question. The running costs and savings are based on a standardised occupancy model, which may not be understood – nor whether they are presented cumulatively (in that the order in which measures are applied affects what can be saved from each one). The logic for the selection and order is not made clear to the reader of the EPC, and does not to spell out how the home might be taken to near zero carbon. Recommendations are also based on more limited information about the property than is obvious from the report – such as the potential to join a heat network, or orientation and over-shading in relation to solar.

It is clear that the improvements required to achieve the level of carbon savings we need for homes go beyond those that can be justified on cost grounds alone. As such the EPC in its current form appears to consolidate the failure of the market to deliver the depth and scale of energy improvements needed. The cost implications are, of course, important in socio-economic terms, particularly in the light of our understanding of the impacts of fuel poverty – however the emphasis here is wrong: the minimum standard applied should be a carbon one. The cost implications should also be clear as far as possible, but considered in relation to the need for additional support in particular circumstances, as well as in meeting targets for fuel poverty.

**Recommendation 8:** The listing of recommendations for improvements should be presented in terms of carbon dioxide emissions, and steps towards achievement of the minimum standards being applied, as well as costs and savings. The order of listing should be fully explained on the report.

The consultation raises the question of the ‘fabric first’ principle. This is important in that the fabric improvements have the most significant long term impact, and will be essential at some point, while reducing the need for heating, potentially to zero. This should be applied intelligently, however, in that in a staged improvement, the early opportunities for low carbon technologies should not be dismissed, where major fabric works are delayed due to costs and disruption. There could, for example, be situations where a solar (thermal or PV) panel on a suitably oriented and un-shaded roof might be installed at once, while a household prepares for more major works such as solid wall insulation or window replacements – and that fits within a longer term plan to reach zero carbon, without creating a ‘lock-in’ for the building in question. Similarly, low energy lighting might be installed without delay and minimal disruption.

**Recommendation 9:** The ‘fabric first’ principle is endorsed, and should allow for the possibility that low carbon technologies that do not reduce future opportunities for fabric improvements might be installed earlier for practical reasons – such as PV and low energy lighting.

The consultation document describes the proposal that an optional ‘Full Assessment’ is offered to homeowners, to enhance the advisory element for existing occupants, by basing results on actual occupancy and consumption – as opposed to the standardised model (number of occupants, heating and hot water usage pattern and so on) that is used in order to compare buildings in an asset rating. It is important that the same basic model is used (as proposed) to avoid confusing results, and that both the written and the verbal advice given clearly explains why the results are different. The occupancy-based behavioural advice should be clearly identified as such and separately listed from the building fabric and technology recommendations.
Providing a long term route map to zero for each home

A further consideration is the practical usability of the assessment for the home owner in the longer term. It is recognised that a building may undergo a deep retrofit to a high standard in one go, or it may be subject to a staged approach, to fit in with other works needed or wanted, the life of the household, availability of finance and so on. An assessment that can be updated and is easily accessible to home owners and building trades they engage to do the work, could support the longer term ambition by indicating what it would take to achieve zero carbon for the specific home – and help to avoid the creation of ‘lock-in’ effects. This general concept has been named a ‘Building Renovation Passport’ and is being developed in varying forms in Flanders, France, Germany9. This approach was recommended in the EXHA report in September 2019 ‘Pathway to zero carbon homes by 2045: warm, climate friendly and affordable to heat’, and is being piloted as a potentially suitable approach in Ireland, linked to the iBRoad project (https://ibroad-project.eu/). This is a flexible concept, thus far, rather than a single standardised model.

Such an approach might be enhanced further by linking in to the Registers for Scotland, and a single data point developed for property information. Practical information might be added such as electrical and gas safety checks, damp proofing, details of water supply and switching points – creating a digital home logbook.

This approach would also help to address another limitation of the EPC: the need to evidence improvements that have been made but are not possible to check in a purely visual, non-intrusive survey. These could be certified by the installer and added to the digital log.

Ideally the development of such a Building Renovation Passport for Scotland would be an enhancement of the improved EPC Assessment – as the use of different models could cause further confusion.

Recommendation 10: Consideration should be given to development of an enhanced energy assessment and advice report approach, incorporating the improved EPC into a ‘Building Renovation Passport’ route map for the building to reach near zero as well as the interim target set. This should be updatable and accessible, and form part of a digital home logbook. Consideration should be given to linking it to the Registers for Scotland.

Assessors and assessment costs

The original design of the EPC was as an asset rating and an information tool for prospective home buyers and tenants, with the aim of transforming the market positively to favour more energy efficient homes. The system that has evolved is one of low cost reports, based on surveys that are done as quickly as possible. The reputation of the assessment is highly dependent on its reliability and perceived fairness, as is public acceptance of the enforcement of minimum standards - but concerns have been raised regarding the EPC in terms of surveyor skills/competence, quality assurance, consistency and procedures, and assessor integrity and independence10. This is not an

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issue only in the UK: a review of EPCs across Europe concluded that the competence of the certifier (assessor) was the most significant factor for quality – and that there were significant variations in training, qualifications, CPD, and quality checks\textsuperscript{11}.

If the EPC and its current implementation has already been seen to be inconsistent, the greater demand on it in terms of technical robustness and consistency as we move to very low carbon renovation raises concerns regarding the adequacy of the level of qualification currently in place. Added to this is the enhanced role the assessment will play in generating a requirement for costly renovation works. Application of the minimum standard across all tenures means that the full range of building types and forms will be addressed, requiring detailed knowledge and experience of existing buildings of all ages. A further consideration is the opportunity that the assessor may have to advise the homeowner on options and priorities – requiring communication skills, which cannot be assumed.

In view of these responsibilities, and the liabilities that they bring, there is strong argument for a considerably higher level qualification for assessors than is currently required or suggested by the proposals in the consultation, together with obligatory CPD as part of a licence to operate. This might be in the form of an additional element (or embedded within) training and qualifications for relevant building professionals, such as surveyors, building control personnel or building engineers.

**Recommendation 11:** The qualification to be an Assessor should be at a higher level than currently, including a relevant professional building qualification, and with obligatory CPD as part of a licence to operate.

Public concerns about assessor integrity and independence highlighted in the research might be further alleviated if assessments were to be arranged, and even paid for, through a recognised body – such as the Scottish Government, Local Authorities, or Home Energy Scotland regional advice centres. It could potentially be a service provided by Building Control, using their own person, which could be backed up by a list of independent assessors to call on when needed.

To avoid undercutting of costs and quality, the fee should be set at a standard rate, with a sliding scale depending on the size of the property. It should be set at a rate that is commensurate with the time it should take for a building professional to carry out a high quality and thorough assessment, not fixed at an artificially low rate.

Whichever route is taken, it is crucial that adequate resources are provided to manage the delivery, and a consistent approach applied across Scotland.

**Recommendation 12:** Assessments could be arranged through a recognised body, such as Local Authorities, Scottish Government or Home Energy Scotland regional advice centres. Fees should be set at a standard rate, possibly with a sliding scale according to property size, and at a level commensurate with the time required for a building professional to carry out a high quality and thorough assessment.

Trigger points

The point of sale is a necessary trigger point as it is a uniquely powerful opportunity for intervention, as a legal transaction involving a degree of contact with statutory authorities. However, the rate of turnover of ownership is not enough for this to be the sole trigger, and major renovations are an important practical opportunity for inclusion of energy improvements and as such are a logical additional trigger point. The definition of a major renovation is a sensitive one: ideally this should be as inclusive as possible to ensure maximum activity is triggered. The definition offered as one option in the consultation document, based on costs compared to property value, is inappropriate, as location is a primary factor in building value, so it would mean that homes in high value areas would be less likely to have to comply. The other definition suggested, based on percentage of ‘surface of the building’ is open to misunderstanding, and appears a somewhat random figure.

A more comprehensive range of trigger points related to repair, maintenance and improvement (RMI) works is preferable, rather than relying only on the definition of major renovation. The RMI market in the UK is generally consumer-led, in that it is work that homeowners want or need, and seek to have done – rather than responding to government incentives – and it is substantial. This market provides practical opportunities daily for the inclusion of energy improvements alongside other works, ranging from extensions and loft conversions, through kitchen and bathroom refurbishments, re-roofing, window replacements, re-plastering and redecorating, to boiler replacements and general repairs. The opportunities to include energy improvements should be maximised, through a thorough system of requirements for inclusion of fabric improvements and technology upgrades relating to both fabric and building services. These should be clearly set out in building standards guidance and reported via notification to building control.

With such a system in place maximising the opportunities to make improvements to for individual elements, a more significant requirement can still be placed upon major renovations and improvements – particularly those that create a potential additional energy consumption through increased heated space, such as extensions, loft conversions and conservatories. These might trigger a different level of requirement, for a higher overall energy performance standard for the home (known as a consequential improvement).

Specific arrangement will be needed to deal with the complex practicalities in tenement and flatted buildings, in particular with regard to communal areas and where there must be shared responsibility such as for external walls.

**Recommendation 13:** Trigger points at point of sale and major renovation for achieving the specified overall performance are not enough. Everyday RMI activity should trigger energy improvements at every level, including both fabric and building services, through an enhanced system of notifications to building control, in addition to consequential improvements for major works.

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13 Killip, G. *Beyond the Green Deal: market transformation for low-carbon housing refurbishment in the UK.* Retrofit 2012, University of Salford, UK.
Definitions of cost effectiveness

The use of the term ‘cost-effectiveness’ as a condition for enacting the obligation to improve energy efficiency is inappropriate. The focus on financial payback for any works is misleading. The government targets that have been set require that the vast majority of buildings are brought to a very low carbon emission standard, and that this is achieved as soon as possible, with the next decade emphasised in current understanding of the climate emergency. The question to be addressed is not ‘if’ but how quickly we are able to do this, and how to pay for it. In particular, the use of the ‘payback’ calculation built into the EPC model as the basis for whether a measure is required is inappropriate, for several reasons:

- it is a calculation based only on energy costs whereas the aim of the legislation is carbon saving, in addition to the fuel poverty targets, for which energy costs are highly relevant;
- it assumes that all the benefits of an improvement are taken in energy saving, whereas some might be in improved comfort, if the home was previously under-heated;
- it does not take into account multiple co-benefits of improvements, such as more usable space, health, reduced risk of damp, as well as improved comfort;
- it does not take into account future energy costs, or changes in retrofit costs;
- it does not take into account local variation in costs of works;
- it does not take account of the avoided costs of climate change, or of adaptation.

While the use of a net present value approach is a little more sophisticated, it does not address most of these weaknesses, and has the additional weakness of being less familiar or easily understood.

A cost cap is the simplest of these approaches, but makes little sense as a random figure out of context – if a figure is to be set, it would need to be at a sufficiently high level to trigger deep renovation where possible. Where costs are more than the current value of the building, however, this poses particular problems for the owner. Rather than use this as a caveat for no action, it might be used as a trigger for additional support\(^\text{14}\), set against property value and the economic position of the owner. In some situations there may be a case for demolition.

**Recommendation 14:** Cost-effectiveness should not be used as a condition for the obligation to achieve a minimum energy efficiency standard – rather as a trigger for additional support, where relevant.

Assessing technical feasibility

Technical feasibility should be assessed by expertise available at local level, with knowledge of the local vernacular, and without commercial bias. This indicates the best solution to be through the Local Authority. Building Control Officers may be best placed to provide this – but will need a firm consistency of approach, to be ensured through clear guidance and CPD training, backed up with a Q&A support facility to the relevant Government department. **It is essential that the Local Authority is adequately resourced to provide this role.**

In general there should be as few caveats and abeyance as possible to future-proofing Scotland’s homes, including historic buildings – but a general policy to enable and support appropriate action, using the right materials and techniques, to protect building fabric and historic character, while improving living conditions and reducing environmental impact. This is discussed further below

Recommendation 15: Technical feasibility should be assessed by the Local Authority, supported by additional training, resources and a Government help facility to ensure consistency.

4. Enabling action

There are several elements related to ensuring that home owners are able to comply with the new minimum standards. They need to know what works to get done, who can do them and how they can pay for them.

Advice and information

The energy assessment and report are useful tools that form part of advice provision, in addition to being the document which evidences the standard achieved for a particular building. However, this is not enough on its own – expert advice is required to help people to understand the options, prioritise next steps, and to get the works done. An important consideration is to ensure that the customer is not passed on from one service provider to another, risking losing them along the way – hence the concept of the ‘one-stop-shop’, where they can be supported through the whole ‘journey’ from awareness-raising through initial enquiry to installation and post installation user behaviour.

The Home Energy Scotland programme delivered by regional advice centres forms a strong basis for this.

From this perspective it is also necessary for the data about the building that has been collected for the assessment to be available to advisers, installers and the customer themselves, and for it to be easily updated as changes are made, as in the Building Renovation Passport concept highlighted above.

Experience gained in EES transition projects highlights the value of bespoke advice and ‘handholding support’ through complex renovations, and need for tailored approach for communities based on local housing archetypes\(^\text{15}\). The benefits of a trusted installer list are also highlighted. These pilots are good illustrations of the one-stop-shop approach. Experienced advice providers also emphasise the importance of continuity of service, in that it takes time to get known and build trust within a community, and for referral systems to develop. This continuity makes it important to resource advice provision consistently over the long term, building upon the expertise that has developed within the local and regional advice networks, which also play an important role in generating demand. To enable this will require both a scaling up of resources and continuity.

Recommendation 16: Homeowners are best supported through a ‘one-stop-shop’ approach that helps them through the whole retrofit journey, with continuity of approach through long term resourcing of advice provision, building on Home Energy Scotland regional advice centres.

Engagement and communications

The transition required is a very challenging one, not least because of the need to mobilise individual home owners to make big changes to their homes, mainly at their own expense, and in some cases with significant disruption. The public communications aspects of this cannot be underestimated.

Research indicates that generating enthusiasm for home energy improvements depends on raising awareness of multiple benefits, as well as the urgency of climate change.

In addition to consistent and positive government messaging, several studies indicate the importance of community networks, maximising the range of ‘touch points’ to reach people, and the advantages of ‘trusted intermediaries’\(^\text{16}\).

It is also crucial to engage at an early stage the building tradespeople and installers who will deliver the work. They are in contact with home-owners on a regular basis, and can be the front line in promoting as well as delivering home energy improvements\(^\text{17}\). The supply chain is discussed further below.

**Supply chain engagement, skills and support**

The large scale funding programmes to date have tended to be delivered by large companies with the capacity to tender for works at such a scale. These companies are not best-placed to deliver deep retrofit solutions tailored to individual homes. Such work is closer to the market delivered to by the very small businesses and sole traders that characterise the home repair, maintenance and improvement (RMI) market, who generally deliver within a limited locality. For the Energy Efficient Scotland programme to succeed it will be essential to engage the RMI industry, and to establish effective communications with this fragmented industry. To do so requires understanding of its localised and microbusiness nature.

The RMI building trades do have to adapt to and learn to use new technologies, as a standard part of their everyday work, but this learning generally takes place on a relatively informal basis\(^\text{18}\) (Wade et al, 2016). While the core skills required are likely to be present within existing trades, low carbon renovation carries with it particular sensitivities around ventilation and moisture movement, and it will be important to ensure that these RMI trades access the relevant skills and knowledge, and that learning is effectively shared, as work progresses.

These building tradespeople tend to operate within informal local networks, and their main point of contact with statutory authorities is through Local Authority Building Control, and to a lesser extent, Planning\(^\text{19}\). As such the role of Building Control in communicating new standards and regulations,


and advising and supporting the RMI trades could be built upon. This would complement the role of the regional advice centres in advising homeowners.

**Recommendation 17: Establish effective communications with local RMI building trades, building upon Local Authority Building Control as key contact point. Resource Building Control to provide updates, guidance and site-specific advice.**

Given the lack of homogeneity in the existing housing stock – particularly older homes where additions have been made over time – the availability of site-specific advice would be of particular benefit. The role of Building Control as a key contact point within the system is emphasised. In addition to the building trades, consideration must be given to updating knowledge in parallel with other parts of the supply chain, such as builder’s merchants and architects.

A supporting regime should also provide accessible written and online guidance on techniques and technologies to take existing homes to the required standard. While the lack of homogeneity is noted, this could usefully be developed in the form of examples linked to some standard archetypes of Scottish housing. The case studies and technical guides produced by Historic Environment Scotland illustrate what is possible even on the buildings of special historic character, and are a good starting point for working on traditional construction more generally. 20. The guidance highlights importance of understanding how air and vapour move in traditional building structures, and the need to be careful about how this is restricted or changed, by ensuring adequate ventilation and using vapour open finishes. Guidance is also produced by the Scottish Ecological Association Design Association (https://www.seda.uk.net/products/sustainable-renovation-guide Sustainable Renovation).

**Recommendation 18: Promote guidance from Historic Environment Scotland and other relevant bodies on renovation of buildings of traditional construction. Build upon this to produce further guidance to illustrate how a range of Scottish housing archetypes could be raised to the required minimum standards, and where appropriate beyond them.**

The Scottish Government Short Life Working Group on Quality, Skills and Consumer Protection sets out recommendations for building the workforce, recognising the role of small businesses in delivering home energy improvements21. The recommendation for a skills and qualifications matrix is an important step, including the proposed mapping of what is currently available in terms of construction and building services education and qualifications. It is understood that this is under development.

Recent research has indicated that there is a lack of a clear educational pathway and qualification for the role of the ‘general builder’ who may carry out a very significant and multi-faceted role in practice, including specifying the work, advising and with the homeowner, pulling together a team for a job, and coordinating the work on site. Architects are often not involved in domestic renovations, or only at a relatively superficial level – such as providing a general design for planning

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purposes. In clarifying the suitable qualifications for this role, there is an opportunity to ensure that the skills and knowledge for low carbon renovation are embedded in it.  

Other educational areas to review are the inclusion of sustainability as a core element across all trade training, and the level to which trainees such as heating engineers are trained before exiting formal education, and whether this meets the needs of low carbon heating systems, such as heat pumps.

The Retrofit Coordinator role is identified as a specific role in the new PAS2035 (BSI, 2019), as are the Retrofit Designer and Adviser (however, it is understood that the level of application of PAS2035 in Scotland is not yet decided). In practice, these roles may be taken by the general builder in a small domestic renovation project, and it may be possible to devise a CPD training for existing experienced builders to support them in this, in parallel with ensuring that the relevant skills and knowledge are included in a new educational pathway and qualification for the general builder, delivering domestic RMI. The proposal for a new qualification for the general builder is being promoted by the Federation of Master Builders, alongside a proposal to move towards a licensing system for builders. PAS 2035 is described in section 4 below, in relation to quality assurance.

**Recommendation 19:** Review construction and building services education and qualifications, to ensure sustainability and low carbon building are built into all trade training, and that RMI trades are qualified to the appropriate level to deliver low carbon renovation. Clarify (or create) educational pathway for RMI general builder and ensure it covers the multiple roles in a single home domestic renovation project, including Design and Coordination.

A further training consideration is in relation to the role of building tradespeople as influencers and advisers, not only on works to be done, but also on user behaviour – such as on ventilation, air quality and the use of heating and hot water controls, including choice of heat settings. This is noted by the Short Life Working Group on Assessment, with the Home Energy Scotland specialist advisors highlighted as the level of skills (including softer skills) required. This training should ensure that advice given by installers and building trades is consistent with that given by energy advisers. This does not replace the need for independent energy advice and support as provided by Home Energy Scotland, but is complementary to it.

**Recommendation 20:** Establish CPD for RMI trades, to include new standards, guidance on how to achieve them, and advising homeowners on ventilation, use of heat and hot water controls, and heat settings.

**Financial support**

A study of thermal retrofit programmes in the US concluded that sustained demand for retrofit services is essential for any market-based solution, and that while simply providing grant funding is a

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cost-effective way of driving demand, it will create ‘fits and starts’ as funding levels vary over time\textsuperscript{25}. The market instability that this creates is also problematic for the industry. This emphasises the importance of designing a programme to maintain activity over time. The introduction of a minimum standard will go a long way to addressing this problem, however the need for stability within the funding regime remains crucially important.

There is a clear need to focus grant aid on the most vulnerable, but also to be aware that this can be bounded too narrowly – leaving a gap in provision for those that fall just outside of eligibility criteria. Household in fuel poverty must be assisted to get works done, and with no, or minimal, own contribution required. This may be either in the form of grant aid, or in the case of those with substantial equity in their homes, it might be as an interest free bridging loan.

It should also be noted that there is no ‘one-size-fits-all’ solution in terms of finance. Buyers and sellers have different requirements, as do different age and income groups. The availability of zero interest loans is valuable, but there may also be a need for ‘on-bill’ finance, that remains with the property and does not feature as personal debt.

In particular, research has indicated that the Scottish Government budget for financial support will need to be doubled (from £119m in 2020/2021 to £256m), to achieve the necessary scale of activity\textsuperscript{26}. The Capital Spending Review is opportunity to indicate this multi-year support.

Another issue is the ease of access to finance: streamlining of processes and administration.

A key point raised by advice providers is that finance should be inclusive/comprehensive in terms of measures, so that a whole house approach is encouraged and homeowners do not have to go to different sources of assistance for different measures. Where repairs are needed, before energy improvements can be made, it can also create an artificial barrier to exclude these from finance.

\textit{Recommendation 21: Grants should be focussed on the most vulnerable, but a range of finance options available to suit a range of potential situations and needs, including on-bill finance avoiding adding to personal debt. Accessibility to be streamlined. Budgets doubled}

\textbf{Tenement and flatted buildings and mixed tenure}

Specific arrangements are required to enable works to be done (including energy efficiency) in apartment buildings, such as the traditional tenements, particularly where these may be of mixed tenure. Tenements make up 24\% of Scotland’s housing stock and require legislative measures to enable energy upgrades in common areas. The Scottish Parliament Working Group on Tenement Maintenance has produced a report with recommendations on this issue, including requirements for owners associations, building reserve funds and five yearly inspections. It is understood that this has been referred to the Scottish Law Commission. It is important that this is progressed as soon as possible, to avoid delay in making improvements to this sector.


\textsuperscript{26} Citizens’ Advice Scotland. \textit{The estimated cost of improving the energy efficiency of Scotland’s homes}. December 2019.
5. Enforcing action

Responsibilities and penalties

Responsibility for carrying out works at point of sale sit initially with the seller, but it seems reasonable to allow for the responsibility to be passed to buyer, with a strictly limited time-frame, of up to two years.

Compliance would be best checked by the Local Authority – highlighting again the importance of Building Control as a key point of contact within the programme. As previously pointed out, this means that they must be given adequate training and personnel resources to carry out this role.

Penalties for non-compliance should be high enough to make sure that it is real deterrent. Ideally it should be more expensive not to comply, than to comply – however, the building costs that may arise in some cases would make this difficult. Fines should be recurring on an annual basis, and might be collected by the Local Authority along with Council Tax, to avoid creating an additional administrative burden. However, Citizen’s’ Advice casework indicates that Council Tax is already a huge source of debt, and that when water and sewage arrears are collected with council tax consumers tend to be unaware of what the charge is for. As such, it is recommended that these fines should be clearly identified as separate from the Council Tax bill.

Recommendation 22: Penalties for non-compliance should be recurring annually, and could be collected by Local Authorities.

Quality assurance and consumer protection

A robust system for quality checks and monitoring, including site visits, is essential. In mobilising the industry to deliver good quality energy improvements, it must be recognised that there will be a learning curve, and that systems for quality checking should be backed up by guidance and advice to operatives, as discussed above. Where things go wrong it is important that the installer is advised, in the first instance, on how to put it right and to avoid repeating the mistake. This offers both better consumer protection and potential for capacity development, than a purely punitive regime. This might link into an enhanced role for Building Control, as suggested above.

Recommendation 23: A robust system for quality checks and monitoring, including site visits, is essential, and should be backed up by guidance and advice, recognising the learning curve in mobilising the industry to deliver low carbon renovation. An enhanced role for Building Control is highlighted – but must be adequately resourced.

The Scottish Government Short Life Working Group on Quality Assurance has proposed establishment of a set of mandatory Quality Assurance criteria and a Quality Mark for work done under Energy Efficiency Scotland, with robust vetting and verification processes and operative ID cards. While recognising that this should build on existing schemes, and avoid creating additional administrative burdens, any kind of additional accreditations will inevitably necessitate some additional administration. This could be a serious deterrent to micro businesses that will be needed to deliver the work at the scale envisaged. It is crucial therefore that this approach is indeed based on systems that are required across the trade work for other purposes, and that no extra costs for carrying out energy efficiency work is passed on to smaller enterprises.

There is a practical problem underlying this. Amongst the existing building trades, the only ones that currently require registration are electricians and those that work on combustion appliances. Micro renewables installations are covered by the Microgeneration Certification Scheme, which covers both products and installers, but is not legally obligatory. To move forward from this will require the
development of systems for registration and checking for each trade, which in turn depends on a comprehensive, coherent and up-to-date system of education and qualifications for the trades, linking to the supply chain points made in section 3 above. While this could be very beneficial, it will take time to develop. Without it a Quality Mark would not have a sound basis to build upon.

**Recommendation 24:** A mandatory Quality Assurance Scheme and Energy Efficient Scotland Quality Mark must avoid incurring additional costs or administrative burdens to small and micro businesses, to engage effectively with the RMI industry.

A compromise, at least in the short term could be to develop a checklist of qualifications and accreditations for homeowners, which clearly sets out what is legally obligatory, what is required for public financial assistance, and what might be a desirable extra, and why.

In any case, the level of actual quality checks on work should be made very clear to homeowners and the industry – to avoid the risk that accreditations are ‘bought’ rather than earned.

**Recommendation 25:** An Energy Efficient Scotland Quality Mark can only be effective if based on a comprehensive, coherent and up to date system of building trade education and qualifications, and development needs to link to review and gap analysis of these.

It is recommended that, in devising a Quality Mark for Scotland, the progress of the Trustmark scheme in England be carefully reviewed to assess what is working and not working. Other relevant considerations are the use of the BSI’s ‘Publicly Available Standards’ (PAS), which are used for UK programmes such as ECO. These are the PAS 2035, which sets a framework for the assessment, identification, design, specification and monitoring of energy efficiency measures, and the PAS2030 which covers installation, commissioning and handover of retrofit projects. The full application of PAS2035 may require adaptation for the small individual domestic renovation, both to make it accessible to RMI building trades and to avoid creating a significant additional cost burden.
Bibliography


Cré et al. *Developing an integrated offer for Sustainable Renovations*. Retrofit 2012 University of Salford, UK.


Galvin, R. *Why German homeowners are reluctant to retrofit*. Building Research and Information 42:4 (2014) 398-408.


Historic Environment Scotland. Short Guide 1: *Fabric improvements for energy efficiency in traditional buildings.*


Kerr and Winskel, *Private household investment in home energy retrofit: reviewing the evidence and designing effective public policy,* Climatexchange, University of Edinburgh, June 2018.

F. Killip, G. *Beyond the Green Deal: market transformation for low-carbon housing refurbishment in the UK.* Retrofit 2012, University of Salford, UK.


Leighton, E. *Putting energy savings within reach: why some home energy efficiency programmes work.* Churchill Memorial Trust Fellowship to US state and city home energy efficiency programmes, Scotland, 2011.


Appendix A: Summary of consultation questions

1. Do you agree or disagree that there should be a legally-binding energy efficiency standard for owner-occupied housing?

2. Do you agree or disagree that EPC Energy Efficiency Rating band C is the appropriate standard to use? Please explain.

3. What are your views on the “fabric first” approach as described section 1.1?

4. In your view, how can we ensure that when EPCs are used to determine compliance with the standard they are robust and not easily open to misuse?

5. Do you think the standard should be fixed, or should it be subject to periodic review and change over time? Please explain your view.

6. Do you agree or disagree that 2024 is the right start date for the mandatory standard to start operating? Please give your reasons, whether you agree or disagree.

7. Do you agree or disagree with point of sale as an appropriate trigger point for a property to meet the legally-binding standard?

8. Do you agree or disagree that responsibility for meeting the standard should pass to the buyer if the standard is not already met at point of sale, as described above? Please explain your views and give any evidence you have, whether you agree or disagree.

9. What, if any, unintended consequences do you think could happen as a result of these proposals? For example, any positive or negative effects on the house sales market.

10. Do you agree or disagree with point of major renovation as an appropriate trigger point for a property to meet the legally-binding standard?

11. What is your view on how “major renovation” should be defined? Should the Energy Performance of Buildings Directive definition, as described in Annex B, be used? Please explain.

12. How could a requirement to meet the energy efficiency standard at point of major renovation be checked and enforced? Who should be responsible for this?

13. What do you think would be a fair and appropriate method to ensure compliance, if the legally-binding standard is not met? What type of penalty system would be appropriate? Please explain.

14. Should a penalty for failing to comply with the standard be one-off or recurring?

15. At what level, approximately, should any penalty be set?

16. Are there any particular groups of people who could be adversely affected, more than others, by enforcement processes and charges?

17. Which body or bodies should check if the standard has been complied with at the trigger point, and should be responsible for levying any penalty?

18. Considering the information above and in Annex D, what are your views on the best way to approach cost effectiveness, taking into account the trade-offs between how easy to understand and how sophisticated different definitions are, and how the different definitions might affect the number of homes that actually achieve the EPC C standard?
19. Other than technical feasibility and cost effectiveness, are there any other reasons why a homeowner may not be able to bring their property up to EPC C at point of sale or renovation, and would need to be given an exemption or abeyance? (For example, difficulties of getting permission from other owners for common parts of buildings.) Please explain.

20. Do you agree or disagree that, even if a property can’t fully meet the standard, it should be required to get as close as possible to it?

21. Do you agree or disagree that any exemptions or abeyances from the standard should be time-limited?

22. Which body or bodies should take decisions about granting abeyances? Should this be done at a local level or centrally at a national level?

23. The SLWG on Assessment propose that any new assessment regime should exist on two levels, comprising both a mandatory asset-based assessment and an optional occupancy-based assessment. What are your views on this approach? Do you agree that an occupancy assessment should be optional? Are there specific inputs that should be included in both? Please explain your answer.

24. The SLWG on Assessment propose that the output of the assessment should be a report with tailored recommendations that set a clear pathway to both regulatory compliance (i.e. EPC band C) and zero carbon. There are conflicts between meeting the EPC rating and zero carbon. What are your views on how this can be handled/mitigated? Please explain your answer.

25. The new assessment proposals from the SLWG on Assessment include more of an advisory role for the assessor. What are your views on the additional skills and training required to deliver this role? Are existing Domestic Energy Assessors best placed to provide the tailored recommendations? What risks and conflicts do you foresee and how would you propose to mitigate them? Please explain your answer.

26. The SLWG on Assessment propose that the tailored recommendations to improve energy efficiency and achieve zero carbon should consider the legal designation of buildings, obvious defects or condition issues, and local costings. Do you foresee any liability issues in this approach and if so, what suggestions do you have to mitigate them? Do you believe the inclusion of local costings to be practical and what are your thoughts on what level should be considered ‘local’? Should the local cost of energy also be considered? Please explain your answer.

27. The SLWG on Assessment propose that the assessment should provide a theoretical indication of whether recommendations are technically feasible. Please provide your views on who should determine actual technical feasibility? Should this be a qualified installer or someone else? Please explain your answer.

28. In your view, what are the most important considerations for homeowners who are required to meet the legally-binding standard, in relation to skills, supply chain, consumer protection and quality assurance?

29. What are your views on how the Quality, Skills and Consumer Protection SLWG recommendations specifically have an impact on the owner occupied sector? Please explain.

30. In your opinion, is this the right range of Scottish Government financial support schemes? Are there any gaps, regarding either types of financial product or groups of people who may be excluded from being able to access products? Please explain your views.
31. Do you agree or disagree that grant funding from the public purse should be focused on households who are vulnerable or in fuel poverty? Please explain if you disagree.

32. In your opinion, what sources of non-government, private sector support are people most likely to want to access? (eg from banks, building societies, credit unions, mortgage providers)