Scottish Rural Fuel Poverty Task Force

1. Short Description of issue

- The heating of traditional homes is inefficient, allowing too much warmed air to escape. At a pressure of 50 Pa, approximating conditions on a windy day, the required ventilation rate is around 5 air changes per hour but traditional houses often allow 2 – 4 times this amount, or more.
- Reducing uncontrolled ventilation will reduce heating costs, and make rural homes more comfortable.
- This is an issue of particular relevance to the rural sector as homes are more exposed to wind induced ventilation, heating fuel is often more expensive and there is a greater reliance on open fires for radiant heating.
- Whilst everyone is aware of draught-proofing and can understand the benefits, there is a general lack of awareness of the scale of the issue, and the need for attention to detail, by the building trades as well as homeowners, both in renovation work and maintenance of traditional homes.

2. Analysis of the root cause of the issue

These bullet points summarise the paragraph in the appendix:

- Traditional homes struggle to provide the high air temperature now desired by their occupants.
- Air leakage is a major source of energy wastage but this is often given insufficient attention.
- Improved awareness of the balance of ventilation and moisture control is needed.
- Improved awareness of renovators to the need to seal the building structure is required.
- Providing controllable ventilation (automated or operated by aware occupants - opening and closing windows may be all that is needed) in draught-free homes should be the aim.

3. Evidence

Measurements from a recently refurbished traditional home showed that whilst in this case the renovations were well sealed, in the remaining house air leakage could be reduced by 40% by controlling air leakage. This was not primarily from windows/doors. Draught detection and air leakage services offered by FEC-Home have not been easy to sell but those that have used them have been delighted with the results.

4. Possible Future Solutions

Research (for example that done by RGU, near Aberdeen) has shown that homeowners are good at adjusting controls to minimise energy use if they are given feedback. There is a need to provide better feedback on acceptable levels of humidity, and simplified feedback on the relevance of this to normal house usage especially for homes with low wall surface temperatures.
With adequate, controllable, ventilation ensured renovation work on traditional buildings should be covered by similar building standards to new-builds. This would improve insulation and require air tightness to be tested, encouraging the building trades to take more care to seal their work.

5. Resource Implications

There may not need to be massive resource implications as home energy advice is currently provided. However there is a need to make the source of the advice more transparent, and to have a system that allows this to be altered. Training courses for tradespeople and DIY homeowners should be offered, ensuring that air leakage is given a high priority. There a number of ways this could be done effectively. Making homeowners aware of how to best live in traditional homes will require publicity. Assisting with technological solutions should be considered as part of eco-funding from government.

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Annexes

Traditional homes were designed to be freely ventilated to adequately remove moisture. Warmth was gained from thick clothing and radiant heat from open fires. The draw of the open fires helped to remove moisture laden air and circulated air through the house.

Nowadays there is an expectation that the air temperature inside will be higher, and heating is now usually provided by central heating. Unfortunately it is common that central heating is left on as warmed air from the house is drawn up the chimney, which is clearly inefficient. The draw of fires is commonly underestimated: SAP uses a figure of 40 m^3/hr, when a simple calculation would indicate 4 – 5 times this amount may occur even when the fire is not lit. In operation the draw is massively increased.

The value of draught-proofing is generally underestimated by the organisations guiding home-owners. The Energy Saving Trust imply that the majority of draughts occur around the edges of doors and windows, and that draught proofing will not save homeowners more than £50 per year. Most rural properties could save considerably more than this, if only they knew where the air was coming in.

There is a fear that sealing up a house will restrict ventilation to a level that there is insufficient moisture removal, but this is resolved by providing sufficient controllable ventilation. Everyone wants a well ventilated house, but no-one wants more ventilation when it is windy! Ventilation should be controllable and set to a level that adequately reduces internal humidity levels. This will depend on the type of house but clearly the more that can be done to reduce the amount of moisture released in the house, the better.

Occupants of “hard to heat” buildings generally focus on elevating the temperature, to improve comfort. They will block draughts where they are obvious but are often unaware of the negative consequences of allowing humidity levels to stay high. Providing education, advice and support to allow homeowners to get the balance right, for their type of house, is the way to reduce energy costs, reduce health implications of damp homes and reduce structural damage from moist air leaking into the building structure.

As an example FEC-Home offers a range of relevant services in North of Scotland. These are described on the website: www.fec-home.co.uk. They include:

- Draught detection
- Airtightness testing
- Monitoring
- Renovations advice
- Training courses for renovators