Bathford Energy Group

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Common issues identified in a thermal imaging Project, March 2014

This project was made possible by training, support, and the loan of a thermal imaging camera provided by **Transition Bath.**
http://www.transitionbath.org/

Introduction

This report aims to provide some illustrations of common sources of heat loss from the homes we surveyed in Bathford. We hope it will provide some ideas of what to consider in trying to improve your own home, and provide some ideas of what you can do to resolve them. The photos were taken by an amateur (!) so are far from perfect—please note that the temperature scale may differ between shots, so take care when comparing images.

We surveyed 15 houses in total, including a number of modern homes in Dovers Park and Mountain Wood, some older, stone walled cottages, and homes with a mix of old and new sections. The photos were taken as the best examples from all of the surveys. Where home owners have implemented their own solutions, we have tried to reflect these here too, to inspire you to come up with your own!

In general, the first step to saving heat in the home comes through preventing draughts—this is because it is relatively easy and non-disruptive to do, costs little, and as draught–free rooms are more comfortable to live in whatever the temperature. However, the step that will make the greatest difference will differ from home to home. It is also worth bearing in mind that the biggest differences to energy bills may still come from changing your behaviour; closing doors and curtains to keep the heat in, turning down heating when not in use or when a jumper would do the same job, replacing light bulbs (e.g., swapping halogen bulbs for LEDs) and other such measures.

Most common issues spotted;

- Draughts through poorly fitting doors and windows (old and new homes)
- Loft insulation failing to span the full length of the roof (particularly new homes, e.g., in Dovers Park and Mountain Wood)
- Heat loss through uninsulated garage walls (Dovers Park and Mountain Wood)
- Heat loss through thin panelling in doors and porches (old and new homes)
- Heat loss from single glazed windows, old sash frames, or leaky old double glazed windows (particularly older stone cottages)

Links to further sites and information:

Transition Bath: http://transitionbath.org/energygroup/

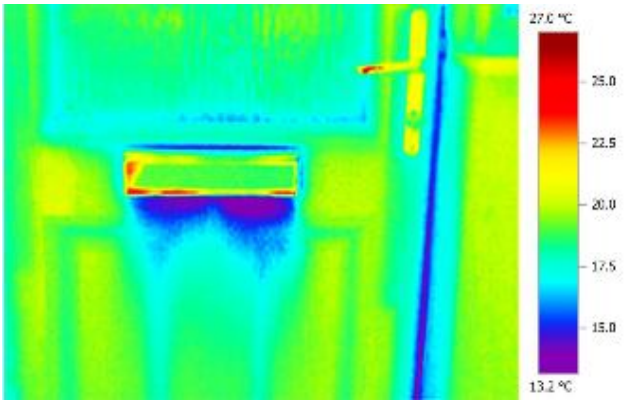
Bath Green Homes: http://www.bathgreenhomes.co.uk/

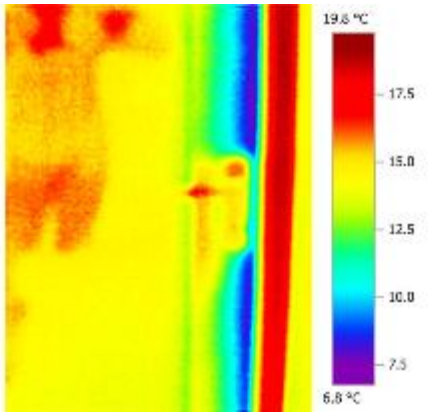
Energy Saving Trust: http://www.energysavingtrust.org.uk

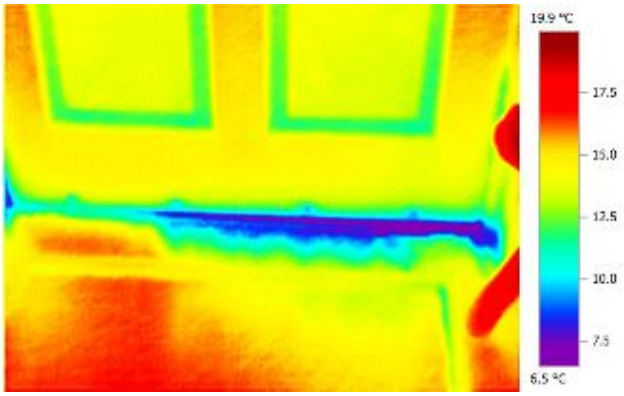
LED lighting: http://www.energysavingtrust.org.uk/Electricity/Lighting/Lighting-FAQ

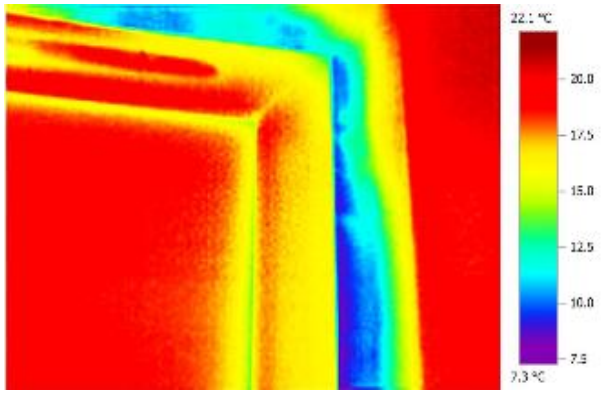
Heat loss through doors.

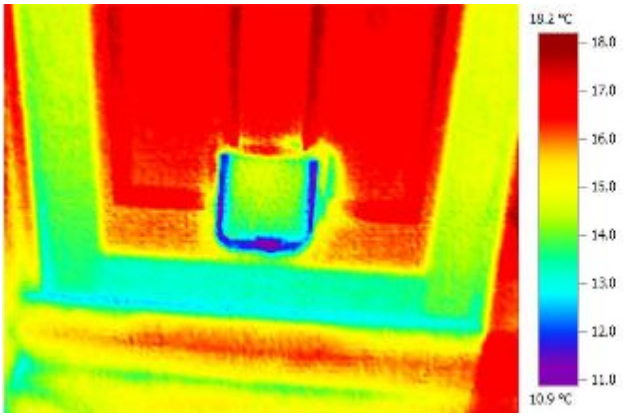
Most homes surveyed lost heat through the front door. This was through holes around cat flaps and letter boxes, or as a result of poor fit with the frame; the dark blue fronds in the pictures below show where cold air is being sucked in:









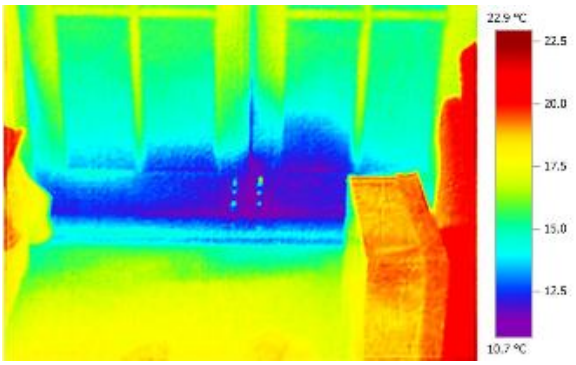


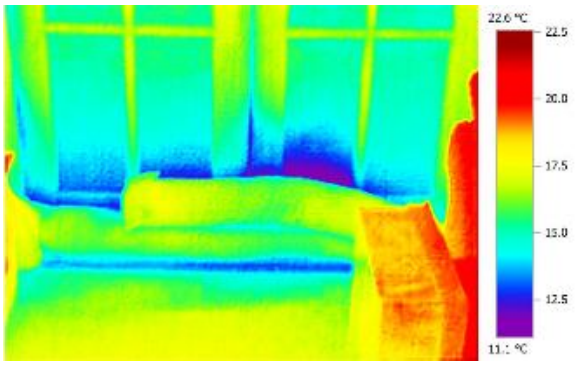
While some heat loss may be inevitable, some of these issues could be improved through checking door fittings are fully sealed into place, that letter boxes are fitted with a draught excluding strip, and that door frames fit well, with the seal strips still in good working order.

Heat loss through doors.....

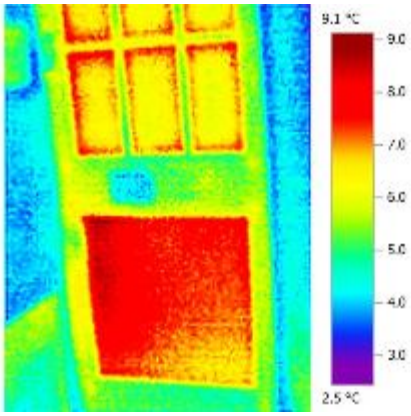
Simple solutions….

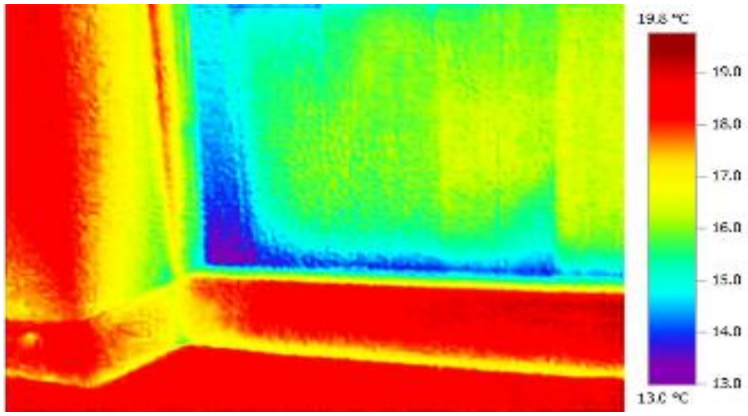
Using draught excluding filled bags (e.g., sausage dogs) can prevent some draughts, but as seen in the patio doors below pictured with and without the draught excluding bags, these don't always totally solve the problem:





Some external doors showed big differences in temperature due to thinner (wooden) panels with poorer insulating properties. An additional insulating layer may be beneficial.





Draught excluding strips are worth adding around door frames if they not already present - this is an example fitted to an internal door:

Heat loss from windows.....

These three images show the internal view of a single glazed sash window. Figure 1 is the window as it stands, with glass temperature below 12 degrees. In Figure 2, the same window has been fitted with a sheet of secondary glazing (3mm polycarbonate), and the temperature is 5 or so degrees higher. Finally, the same window was photographed with secondary glazing and the curtains closed, and is another 5 or so degrees warmer. The curtain effectively keeps the warm air from direct contact with the polycarbonate, preventing some further heat exchange.

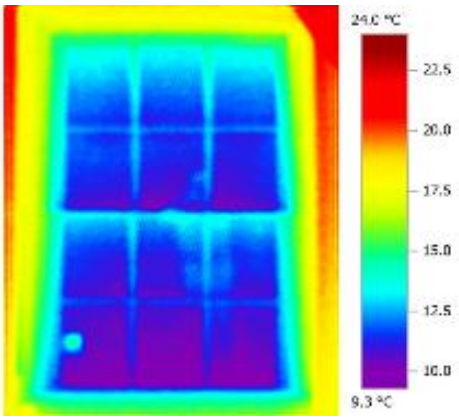


Figure 1.

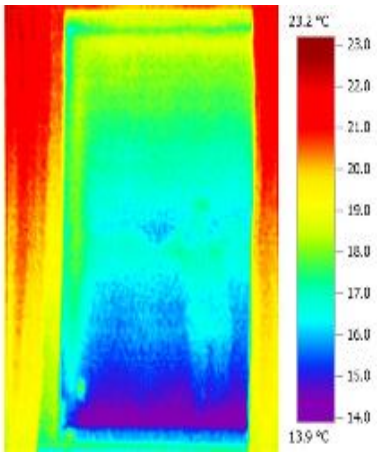


Figure 2.

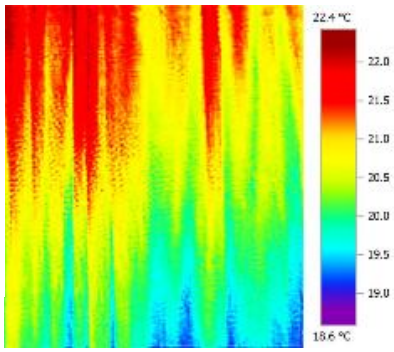


Figure 3.

Secondary glazing.....

Secondary glazing can be fitted relatively inexpensively (£30-£50 per window, depending on size) through attaching polycarbonate sheets to window frames using magnetic strips (top left photo shows one in place. The magnets can be painted to blend with the window frame and are fairly invisible when in place (bottom right hand photo).

In the home in which these polycarbonate sheets were fitted to all feasible windows, all internal doors were also draught proofed to keep the heat in only those rooms in use. These measures—combined indisputably with a warm winter—resulted in the energy use in this home being halved last winter.

Most heat loss from windows appeared to come from poor fit—this was common in both double and single glazed units. While it can be challenging to seal gaps in sash windows if they are to fully function (Figure 4) some simple ‘stick-on’ draught excluders are available. Other window types could be more easily fitted with standard draught exclusion strips, or adjusted to better fitted to the frames.

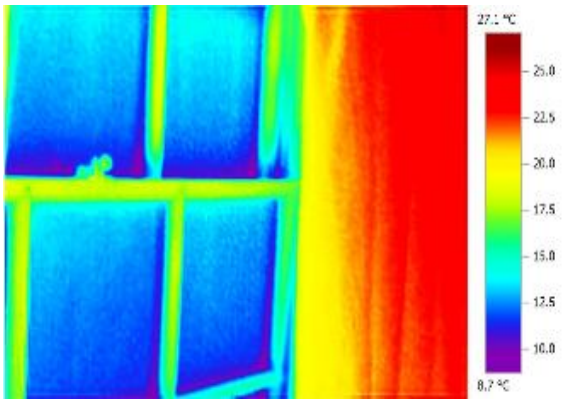


Figure 4. Draughts around the edge of sash windows

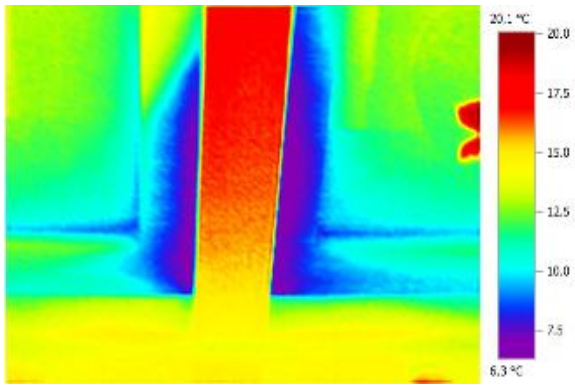
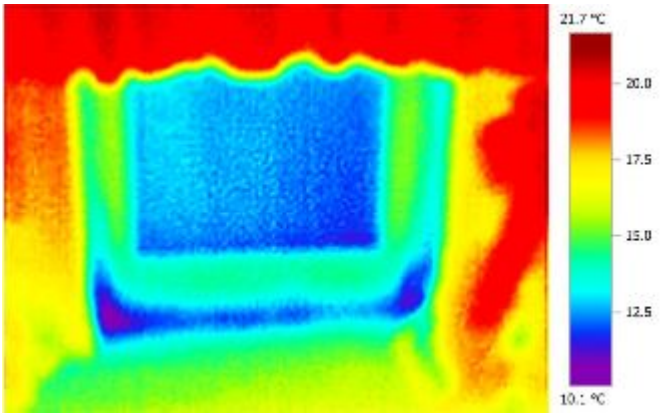


Figure 5. Draughts from poorly fitting double-glazed windows

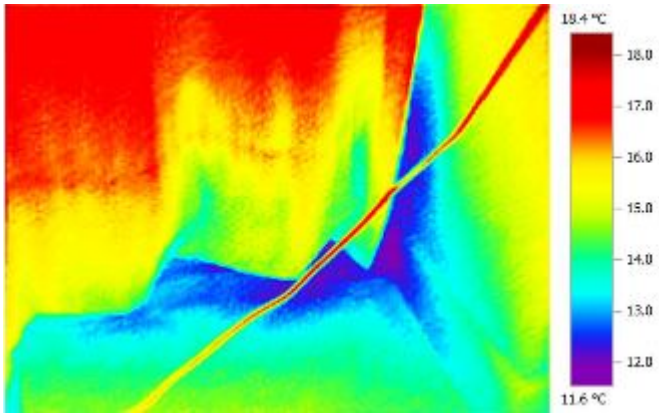
Curtains.....

In a lot of homes, curtains (and particularly those with a thick lining) did a very good job of blocking draughts. These examples show the difference they make as in shielding draughts from leaky doors:



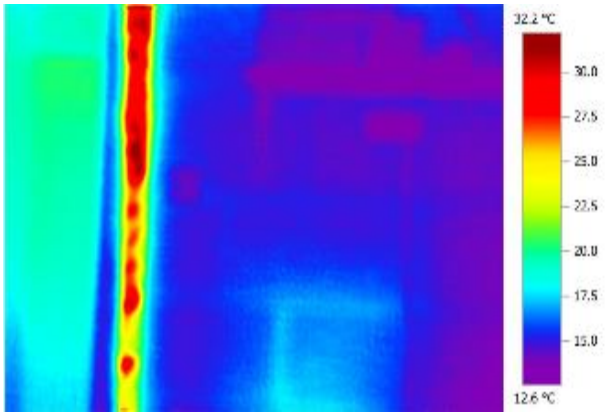
In this external door, the temperature difference is 8 or 9 degrees higher where the curtain covers the door than where it stops (the panel below is thin chipboard, which appears to be a lot less insulating than the surrounding thicker wood). Note also the draughts coming through the bottom corners of the door.

A different external door shows a similar stark difference where the curtain does not quite reach the floor or surrounding walls.



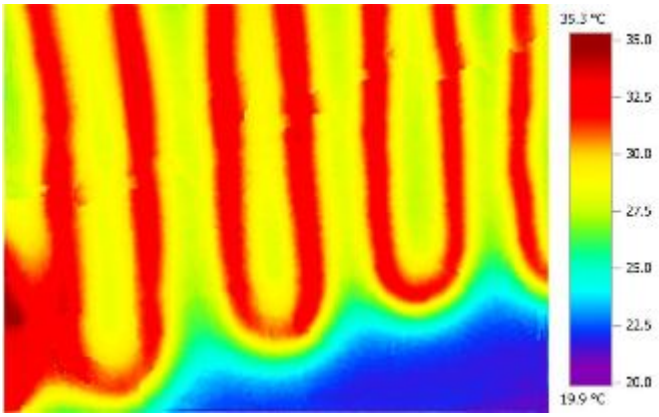
Pipes.....

Hot water pipes were very visible under floors and along/behind walls, demonstrating how few of these are lagged. If these are within the house (e.g., between floors or running up internal walls) this may not be an issue as the heat stays in the house. However, pipes on external walls or underneath the ground floor may be a source of heat loss, so are worth lagging.



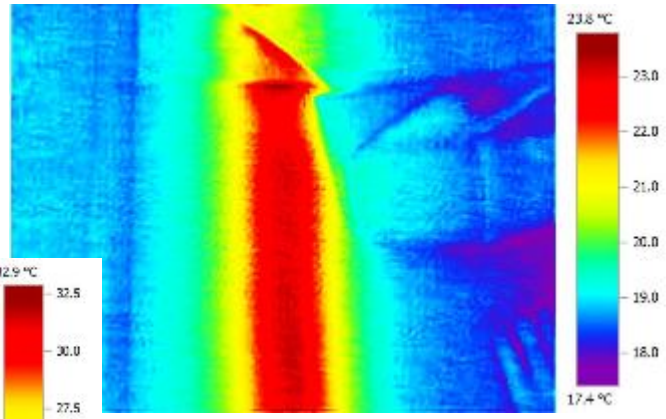
This photo shows a pipe going up the wall of a garage connected to the house. The red pipe is lagged, but shows how the insulation value of this is fairly limited (losing heat into the garage). Note the pale blue shape at the bottom of the shot —this is the outline of a heated towel rail in the bathroom behind. This wall was 4 to 5 degrees warmer than the other, fully insulated external walls, suggesting the heat from the house was escaping into the garage, and insulating this wall may well be beneficial.

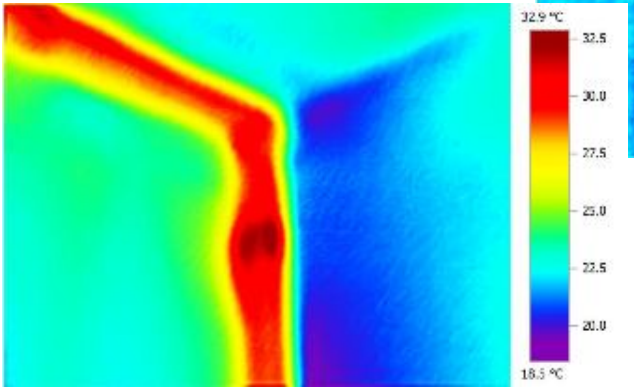
This image shows under floor heating in a bathroom. Even through the floor tiles, the temperature of the heated coils is well over 30 degrees. It may be worth considering if this temperature is necessary to retain a level of comfort.



These two images show other visible pipes. On the right, this pipe is under the floorboard in an extension (i.e. heat lost to the ground).

Below, is a pipe within a plastic 'insulating' casing; while this is not such a big issue as the pipe is effectively heating the house (i.e., it is the pipe to a radiator) it demonstrates how much heat loss can take place with plastic casing but no lagging.





Ceilings.....

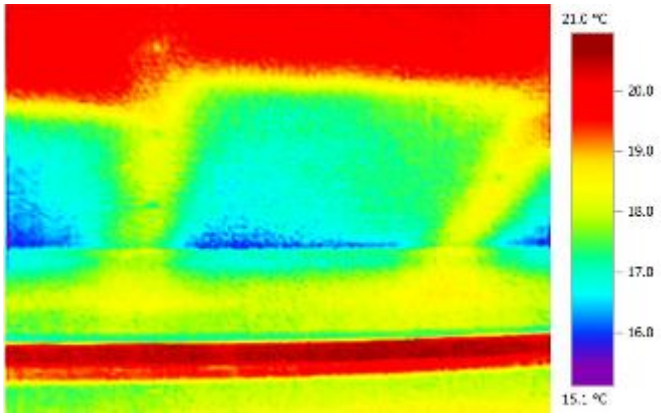


Figure 1.

Even in very well insulated homes, gaps in loft insulation in areas towards the rafters indicated areas where heat was being lost into the loft space (Figures 1 and 2). Sometimes full coverage may not be possible, but certainly worth checking.

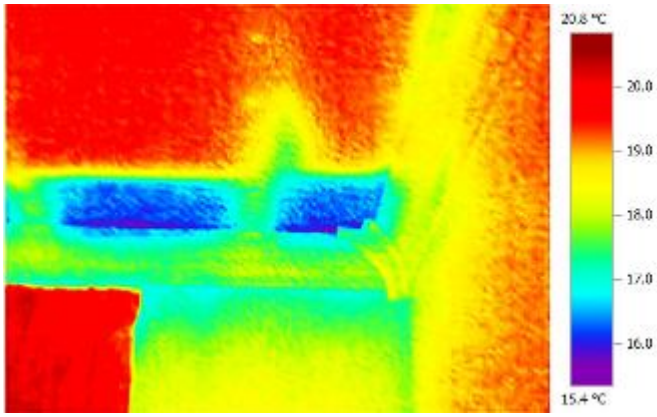


Figure 2.

Another area of heat loss in some homes was through loft hatches. This was especially the case if the fit was poor, or the hatches themselves are made from thin materials as is the case in Figure 3. Figure 4 shows a loft hatch insulated with Kingspan, with a draught excluder fitted to the edges—this hatch shows much less variation in temperature from the surrounding ceiling that the previous figure.

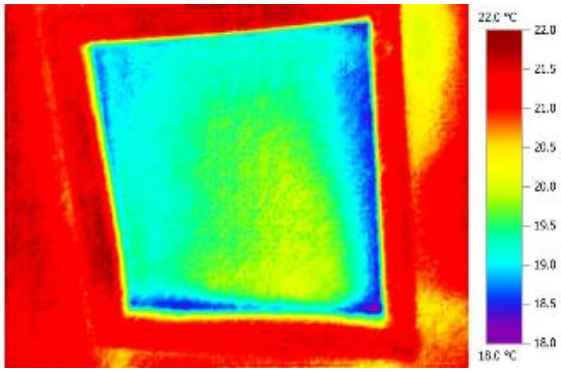


Figure 3.

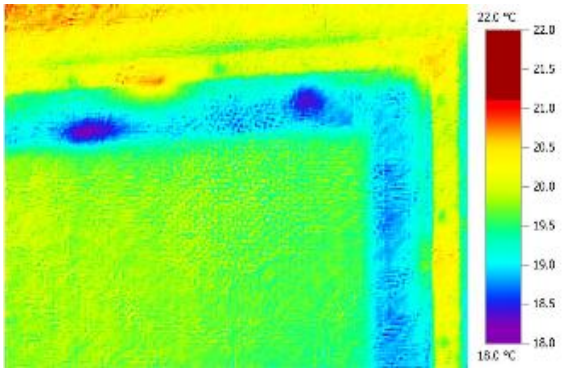
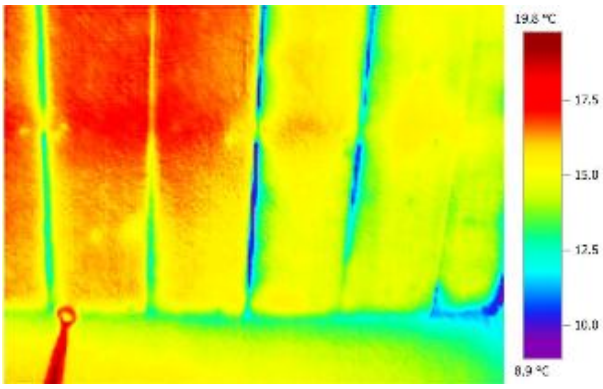
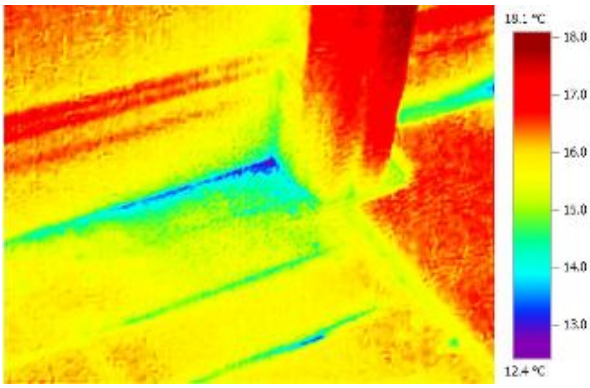


Figure 4.

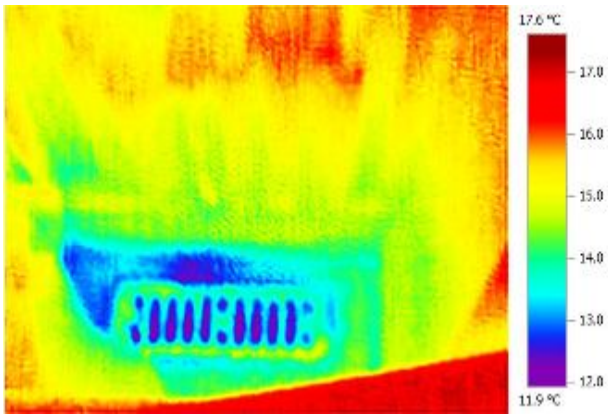
Floors.....

Most floors that we surveyed were carpeted, and fairly warm. However cracks between floor boards can be a source of draughts if not sealed.

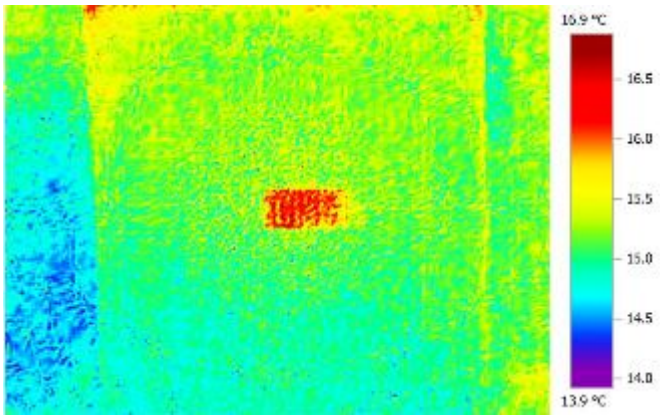




Vents.....



This is an image of a chimney breast in the upstairs bedroom. The chimney is not in use, but the red area of the ventilation grill shows how heat from downstairs is escaping up the chimney. Simply sealing up the chimney with a ceiling balloon could save this heat loss.



This shows an air vent to the left of a fire place. The amount of air to come in is considerable (as is intended and needed for safety when the fire is in use), but demonstrates that this may make quite a difference if closed when the fire is not lit.

DIY fixes…..

The most ingenious DIY fix we found was in insulating a cold water stop-tap. Where the tap came into the house (in a downstairs wash room), it created a cold area (Figure 1a and 1b) attracting condensation in the corner of the room. Through creating an insulated box (Figure 2a), the householder managed to retain this cold area within the box, keeping the room at a more uniform temperature (Figure 2b).

Figure 1b.

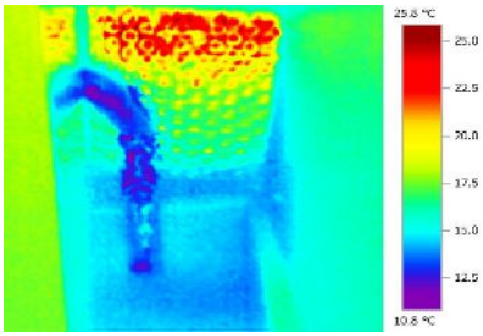


Figure 1a.

Figure 2a.

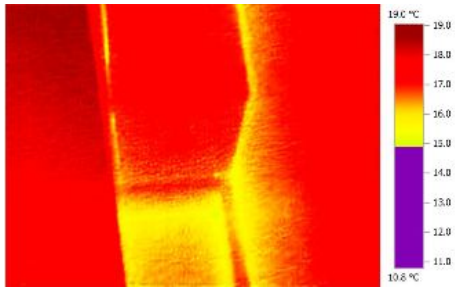
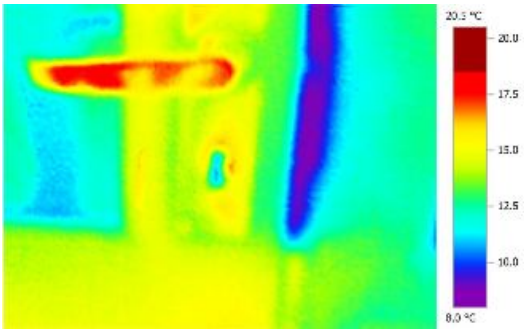
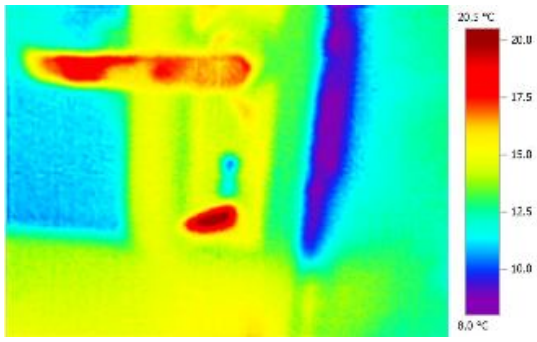


Figure 2b.

Simple solutions?





This is an example of a DIY fix to prevent the draughts coming in through the key-hole in an external door—the picture on the right has been sealed with sellotape when not in use. While this prevents the draught (and we don't want to discourage such innovation!) there is little temperature difference, and note that the draught coming in to the right of the handle (bright blue) suggests a much larger problem is caused by poor fit to the door frame. This may be a worthwhile target for next win-ter…..