

One thing we have learnt this week – too well insulated?

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Are homes getting too well insulated? I've just heard an

interesting report on the radio about this. There has been a step change in energy efficiency regulations in the UK over the last 10 years or so*. This is good and it could be argued that they don't go far enough. There are problems though which has been flagged by research at Loughborough University in their model house. This house is not passive but has lots of roof insulation and very efficient double glazing. The researchers think this house is too well insulated and is too hot for any inhabitants, especially an ageing population. There are also air quality issues in well insulated houses. Heat generated in kitchens and bathrooms is in theory dissipated by extractor fans but in practice these are very noisy and the inhabitants are reluctant to use them. (This is true we recently had a new fan put in the bathroom its extremely noisy and does not seem to do anything.) In cities people are also reluctant to use and open windows. One person contacted the programme to say that they lived in a flat with a huge wall of glass on the southside. This reached temperatures of 38 degrees and made them ill. In response to all this a representative from the building trade stated that they were aware of the problem and that they had spent £100,000 trying to sort out overheating due to a north facing glass wall and failing. One thing I would say about the research is that they used fans in the house to move the heat around to even out the temperatures (and bulbs to mimic body heat). This former point seems a bit unrealistic at the moment different parts of my house are at very different temperatures (without the heat on). Whilst the Zeroth law of thermodynamics says that heat should flow from a high to low temperature zone until it evens out in my experience this does not seem to happen. We just have to live with this. Thus some areas might be cooler than others. The solutions are, dare I say it, technological. In principle a well insulated house should be warm in winter and cool in summer. The way to achieve this is by the right choice of building materials and energy efficiency measures. Glass areas like above should be formed of glass that absorbs minimal amounts of radiation in summer and maximum amounts in winter. Another solution that someone who contacted the programme said had worked for them was the use of heat recovery ventilation systems. These exchange stale air in the house with the outside. In summer these would act as a very low energy aircon. Overheating buildings that are too well insulated is a problem that is only going to get worse with climate change and builders need to think very carefully about the design of newbuild. Neil *Apparently local authorities in England also have the powers to increase energy efficiency by 20% for a development.

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