

# Reducing heat loss from Walls and Windows

24<sup>th</sup> November 2011

Transition Cambridge Renewable Energy Group



## Quick Facts

<b>What are U values?</b>	U-values for walls, windows, roofs etc. tell you how much heat you can expect to lose through them. The units are watts per unit area per degree temperature difference. Low values are good. A solid brick wall is likely to be around 2.1. After insulation it could be 0.3 or even lower – a reduction of over 80%. A single glazed window will be around 4.8 but a good double glazed window would be around 2, so down by about 60%
<b>How much insulation do I need on my solid brick wall?</b>	That depends on the material. For example, 100mm Celotex or Kingspan type material would reduce the U-value of a solid wall down to around 0.2. Alternatively you could use 170mm Thermafleece (mainly wool) or 60mm aerogel, if you can afford it. If space is at a premium and building regulations allow you could accept a higher U-value e.g. 40mm ThermaLine Plus (for internal insulation, including plasterboard) should get you down to 0.65. Manufacturers (Celotex) will provide U-Values for different wall constructions.
<b>Should I insulate inside or out?</b>	External insulation is usually less disruptive and keeps the walls warm and dry so there is less concern about moisture. However you may need to extend your eaves and it is disruptive to external plants, as well as pipework. You may need planning permission. Internal wall insulation loses some floor space and is disruptive to internal cabling but does not change the external appearance of the house. Moisture problems can be minimised if you use a breathable solution, though it is likely to need more thickness of insulation.
<b>What is Thermal mass/inertia and why does it matter?</b>	If you have external insulation then your heating system will be heating your walls, which takes a lot of energy. This means they have a high thermal inertia and it will take a while for your heating system to heat your house – but the house also will retain that energy for a long time. In summer, the insulation and thermal inertia will help keep your house cool. If you have a low thermal inertia, for example if you insulate on the inside, then your house will heat up quickly in winter, saving on fuel bills. But it will also warm quickly in summer.
<b>What are my options for double/triple glazing?</b>	You should be able to get standard window companies to make up windows to suit existing openings and to provide a list of approved installers. Typical double-glazed windows now have U-value around 1.55. High performance windows to Passiv Haus standards (double- or triple-glazed, U-value 0.8) are made by Internorm (Austria), Green Building Store, and Velfac will be producing a high-performance “Helo” window next year.
<b>What is the Green Deal?</b>	This will allow you to install energy efficiency measures with no up front payment. Up to 100% of the costs will be loaned to you. The loan is attached to your property and paid through your energy bills. The measures installed must be recommended by an accredited assessor and installed by an accredited installer. The loan must be less than the expected savings, over the lifetime of the product installed (the golden rule) The deal should be finalised in Spring 2012 and available that autumn.

## **Links:**

<b>Transition Cambridge Energy Group</b> (including home heat loss model)	<a href="http://www.transitioncambridge.org/energy">http://www.transitioncambridge.org/energy</a>
<b>Energy Saving Trust</b>	<a href="http://www.energysavingtrust.org.uk/Home-improvements-and-products/Home-insulation-glazing">http://www.energysavingtrust.org.uk/Home-improvements-and-products/Home-insulation-glazing</a>
<b>Green Deal</b>	<a href="http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx">http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx</a> (or just go to decc and search for green deal)
<b>Weber (external wall insulation)</b>	<a href="http://www.netweber.co.uk/">http://www.netweber.co.uk/</a>
<b>Cambridge Renewables Infrastructure Framework (CRIF)</b>	<a href="http://www.crif.citizenscape.net/core/">http://www.crif.citizenscape.net/core/</a>
<b>Green Building Store</b> (including Ecoclad aluminium/wood windows and thermafleece insulation)	<a href="http://www.greenbuildingstore.co.uk/">http://www.greenbuildingstore.co.uk/</a>
<b>Thermaline plus</b>	<a href="http://www.british-gypsum.com/products/plasterboard___accessories/gyproc_thermal/gyproc_thermaline_plus.aspx">http://www.british-gypsum.com/products/plasterboard___accessories/gyproc_thermal/gyproc_thermaline_plus.aspx</a>
<b>Low-carbon architecture</b>	AC Architects Cambridge Ltd <a href="http://www.acarchitects.com">www.acarchitects.com</a> Margaret Reynolds < <a href="mailto:mrriba@btinternet.com">mrriba@btinternet.com</a> >
<b>Cambridge Carbon Footprint</b>	<a href="http://cambridgecarbonfootprint.org/">http://cambridgecarbonfootprint.org/</a>
<b>English Heritage guidance on Energy Efficiency in the Historic Environment</b>	<a href="http://www.english-heritage.org.uk/content/publications/docs/part_L_guidance.pdf">http://www.english-heritage.org.uk/content/publications/docs/part_L_guidance.pdf</a>
<b>CCF Climate Friendly Homes surveys / thermal imaging camera training</b>	<a href="http://cambridgecarbonfootprint.org/action/climate-friendly-homes-project/">http://cambridgecarbonfootprint.org/action/climate-friendly-homes-project/</a>

## **Other events you may be interested in:**

**Monday 28th November: *Green Enterprise Community Meeting: Tony Juniper: Working towards sustainability*, 19:30-21:30 Friends meeting house, Jesus Lane**

Having spent a lifetime working towards sustainability, Tony Juniper, has been described as one of top ten environmental figures of the last 30 years. Most well known as former Director of Friends of the Earth, Tony will talk about what he's now doing and why. He will share his views on the strengths and weaknesses of alternative methods of creating a more sustainable society, whether campaigning at FoE, consulting for corporations, in politics or other sectors. We'll have the opportunity to discuss his sense of where progress is being made, or where there are real opportunities for people interested in green enterprise to make a difference. Cost £5 Go to <http://www.green-enterprise.org/> for more information

**Monday 16<sup>th</sup> Jan: *Cambridge Carbon Footprint: Eco-renovation in progress* 7.30-9.30 pm Hills Road Cambridge**

Be guided around a Victorian mid-terrace house with Anne Cooper of AC Architects Cambridge who specialises in sustainable architecture. For more details see [www.cambridgecarbonfootprint.org](http://www.cambridgecarbonfootprint.org)

**Wednesday 15th Feb 2012 *Transition Cambridge Energy group: Wood Stoves***

Our next forum will be next year on the topic of Wood Stoves. Come to this if you are thinking of getting one, or wanting to know where to get fuel for one.