



Deep Green Retrofit: 17C Suffolk Timber Framed House

An Open Eco Homes online tour



Mole



Ecology
Building Society



DEEP GREEN RETROFIT

A case study showing the retrofit of a typical 17th century timber framed house in Suffolk

Anticipated completion date –
December 2022



This is a climate emergency

We urgently need to retrofit our existing buildings to reduce energy consumption and carbon emissions. All too often, poor retrofits can result in damage to the building fabric and a worsening of the living environment, with perhaps even damp and mould.

But with deep retrofitting of the building fabric and the inclusion of a heat pump the average energy demand of a home can be reduced by up to 75%.

LETI have developed this Climate Emergency Retrofit Guide to provide practical solutions for the built environment - setting out best practice and exemplar targets for retrofit, which we believe are achievable in the vast majority of UK dwellings.

Experts believe a serious energy-efficiency programme could have a real impact within a year. The institute pointed to Germany as a success story, where grants, low-interest loans, tax rebates and free expert advice have all been used, resulting in high take-up figures.



📷 Britain's housing stock is among the oldest in Europe. Photograph: Tim Goode/PA

“Energy efficiency is a giant hole in Liz Truss’s energy plan,” said Tom Sasse, associate director at the IfG. “Bills have gone through the roof - and show little sign of coming down soon - yet the government has no plan to tackle the fact that we have the draughtiest homes in Europe.”

had taken a step towards incentivising green financial products for improving energy efficiency but found that the amount was “woefully inadequate” for the scale of the challenge, totalling less than 1 per cent of the required public investment.¹⁰⁶

In 2016, the German system of combining public subsidies and low interest loans lead to

276,000

energy renovations, dwarfing the

14,000

cumulative total supported by the Green Deal.

The Government's Green Home Finance Innovation Fund is a welcome development, but at £5 million it is incommensurate with the scale of the need for accessible and competitive green financing solutions, which have a key role to play in stimulating consistent demand across the entire market. As part of a National Retrofit Strategy, the Government should commit to providing guarantees on innovative green finance products for a limited period. It should clearly outline the length of time this policy intervention will be in place, to enable the providers of these financial products clarity about when the Government expects the market to be capable of existing without state support.

More widely for the able to pay sector, the Government has said it is committed to an energy efficiency strategy. If such a strategy is to be successful, it needs to avoid the pitfalls of previous efforts to drive improvements in this area. These efforts were characterised by stop-start funding that led to boom-and-bust cycles, ultimately leaving the largely SME suppliers of construction for retrofit with unsustainable business models. If these poor outcomes are to be avoided moving forward, the Government will need to bring forward a plan to ensure that consumer demand is built up and is sustainable. The Green Homes Grant will create a much welcome boost to demand, but the Government needs to bring forward a long-term National Retrofit Strategy.

LETI Climate Emergency Retrofit Guide

How existing homes can be adapted to meet UK climate targets











5b LETI retrofit fabric and system targets (constituent element method)

This constituent method can be used where detailed energy modelling is not possible or financially feasible on a small project.

The fabric and system components of the retrofit works should achieve the target parameters set out below.

► SIGNPOST Chapter 4 - LETI home retrofit targets
- 4.3 Constituent element method

Building element	Retrofit actions	LETI best practice		LETI exemplar	
		Constrained retrofit	Unconstrained retrofit (cool temperate climate)	All retrofit types	
 Walls	Cavity	External, cavity or internal insulation	0.24 W/m ² ·K	0.18 W/m ² ·K	0.15 W/m ² ·K
	Solid uninsulated	External or internal insulation	0.32 W/m ² ·K	0.18 W/m ² ·K	0.15 W/m ² ·K
	Timber frame	External or internal insulation	0.23 W/m ² ·K	0.18 W/m ² ·K	0.15 W/m ² ·K
 Roofs	Cold	Insulate	0.12 W/m ² ·K	0.12 W/m ² ·K	0.12 W/m ² ·K
	Warm/flat	Insulate	0.22 W/m ² ·K	0.12 W/m ² ·K	0.12 W/m ² ·K
 Floors	Suspended timber	Insulate between joists	0.20 W/m ² ·K	0.18 W/m ² ·K	0.15 W/m ² ·K
	Solid uninsulated	Excavate and insulate below	0.80 W/m ² ·K	0.15 W/m ² ·K	0.15 W/m ² ·K
 Windows and doors	Windows	Replace	1.30 W/m ² ·K	1.00 W/m ² ·K	0.80 W/m ² ·K
	Doors	Replace	1.00 W/m ² ·K	0.80 W/m ² ·K	0.80 W/m ² ·K
 General envelope	Thermal bridging	Mitigate where possible	0.10 W/m ² ·K	0.10 W/m ² ·K	0.08 W/m ² ·K
	Airtightness	Draught proofing, sealing of chimneys and vents	3.0 acm@50Pa	2.0 acm@50Pa	1.0 acm@50Pa
 Systems	Systems and appliances	Fossil fuel free home	Fossil fuel free	Fossil fuel free	Fossil fuel free
	Ventilation type	Install and remove extract fans	MVHR*	MVHR	MVHR
	Lighting power	Replace lamps and fittings	50 mW	100 mW	100 mW
 Hot water	Hot water tank	Increase insulation or replace	1.5 W/K	1.5 W/K	1.5 W/K
	Primary pipework	Insulate all pipework	90% of pipework insulated	90% of pipework insulated	90% of pipework insulated
	Shower demands	Low flow fittings	16 litres per day	16 litres per day	16 litres per day
	Other demands	Low flow fittings	9 litres per day	9 litres per day	9 litres per day
 Renewables	Photovoltaic generation	Rooftop installation	0% of roof area covered in PV panels	40% of roof area covered in PV panels	40% of roof area covered in PV panels

* If not possible use demand control dMEV or demand control cMEV

6 Case studies



► SIGNPOST Chapter 6 - Case studies



Emphasise Bldg Regs is new build
kWh/m².year delivered - inc unregulated

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3.3. LETI home retrofit specification

Owner: JP/Will?

Length: 1 page per archetype

Content type: Infographic like CEDG archetypes

Content Summary:

- From the previous section, present the supporting parameter values



John Palmer



FLIR



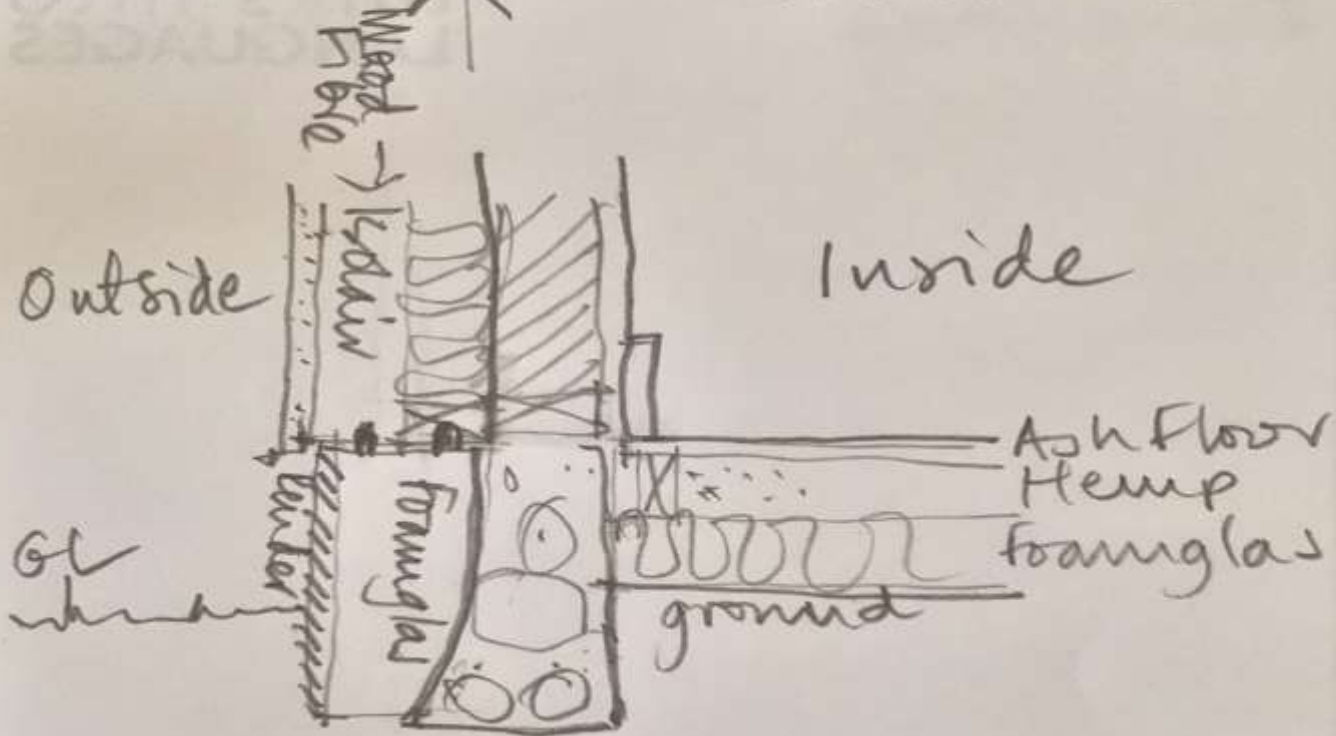
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EXISTING









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Any Questions?





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SOPREMA



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