

› Home

› Commit now

› Why commit

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I commit

Want to do something about climate change? Want to help preserve the places that matter to you? Then join the energy saving movement and make a personal commitment to save 20% of the energy you use. Together our actions will have a real impact by helping to fight climate change.

You can also create your own "commitment widget" to add to your webpage or network site and tell all your friends about your commitment.

Latest commitment:



Gloria Burke committed to help preserve sherwood forest



photographer zoreil

› Commit now

**SAVE
YOUR
20%**

Too busy to commit now? You can still join the energy saving movement by leaving your email address below.

Energy in the Home

Trying to save my 20%

Julian Paren

- Nearly 50% of the UK's CO₂ emissions are caused by building, maintaining and occupying buildings
- Electrical appliances becoming rapidly more efficient
- A third of all buildings around in 2050 have yet to be built
- Building Regulations get tougher, and only zero-carbon homes to be built after 2016
- Over 90% of buildings standing today in Scotland will be standing in 2050

Energy in the home

with 2050 and Climate Act in view



Scotland Housing Expo - 52 homes



- Predicted annual heating costs - Average £210
- House size - Average 125 m²
- Heating Energy required - Average 87 kWh m⁻²



Theoretical heat requirement of houses of different ages and design criteria

- Average UK Dwelling Stock 239 kWh/m²
- UK Building Regulations ADL1 2006 146 kWh/m²
- **Average for Scotland's Housing EXPO 87 kWh/m²**
- AECB Silver Standard 40 kWh/m²
- AECB Gold (Passiv House Standard) 15 kWh/m²

Total homes in location: 21,696,796 Total homes in HEED for location: 2,201,813 Data Density: 10.1%

Property Type		
Fiat	192,853	9.2%
Mid Terraced House	470,969	22.4%
End Terraced House	200,671	9.6%
Semi Detached Bungalow	16,467	0.8%
Detached Bungalow	20,570	1.0%
Semi Detached House	774,361	36.9%
Detached House	417,761	19.9%
Other	7,126	0.3%
Unknown	0	0.0%
Total :	2,100,780	100%

Tenure		
Owner Occupier	1,215,831	74.2%
Privately Rented	91,822	5.6%
Rented from Local Authority	238,419	14.5%
Rented from Housing Association	78,617	4.8%
Other	14,825	0.9%
Unknown	0	0.0%
Total :	1,639,514	100%

Loft Insulation		
Properties with no loft insulation	168,043	9.1%
- less than 25mm	22,376	1.2%
- with 25 - 49mm	99,643	5.4%
- with 50 - 74mm	248,904	13.5%
- with 75 - 99mm	224,477	12.2%
- with 100 - 149mm	354,953	19.3%
- with 150 - 199mm	222,081	12.1%
- with 200mm - 249mm	119,947	6.5%
- with 250mm and Over	21,053	1.1%
Unknown	357,255	19.4%
Total :	1,838,534	100%

Property Age		
Properties built before 1900	202,565	9.7%
Properties built between 1900 - 1929	303,860	14.5%
Properties built between 1930 - 1949	459,340	22.0%
Properties built between 1950 - 1965	459,140	22.0%
Properties built between 1966 - 1976	267,141	12.8%
Properties built between 1977 - 1981	163,502	7.8%
Properties built between 1982 - 1990	120,594	5.8%
Properties built between 1991 - 1995	56,015	2.7%
Properties built after 1995	51,825	2.5%
Unknown	5,216	0.2%
Total :	2,083,216	100%

External Wall Type		
Solid Walls	661,968	32.3%
Stone Walls	92,348	4.5%
Timber Framed	30,131	1.5%
Cavity Walls with No Filled Cavity	619,414	30.2%
Cavity Walls with Filled Cavity	422,934	20.6%
Other Construction	77,611	3.8%
Unknown	144,803	7.1%
Total :	2,045,209	100%

Glazing Type		
Single Glazing	429,438	21.7%
1 - 50% Double Glazing (Some)	155,217	7.8%
51 - 99% Double Glazing (Part)	166,314	8.4%
Double Glazing (Full)	974,333	49.2%
Unknown	256,255	12.9%
Total :	1,981,557	100%

Main Heating Fuel		
Gas Heating	1,481,659	85.6%
Oil Heating	48,359	2.6%
Paraffin Heating	0	0.0%
Electric Heating	133,278	7.7%
Solid Fuel	37,144	2.2%
LPG	17,173	1.0%
Unknown	8,809	0.5%
Total :	1,726,422	100%

Main Heating System		
Condensing Boiler with radiators	242,677	13.2%
Boiler with radiators	943,449	51.2%
Combi Boiler with radiators	146,015	7.9%
Back Boiler with radiators	97,011	5.3%
Electric Storage Heaters	111,332	6.0%
Warm Air	48,325	2.6%
Room Heaters	203,757	11.1%
Open/Flame Effect Fires	20,895	1.1%
Unknown	28,402	1.5%
Total :	1,841,866	100%

Electricity Consumption in 2004:	<input type="text" value="n/a"/>	per household:	<input type="text" value="n/a"/>
Gas Consumption in 2004: (DTI Estimates)	<input type="text" value="n/a"/>	per household:	<input type="text" value="n/a"/>
Estimated CO2 Emissions: (Defra Estimates)	<input type="text" value="n/a"/>	per household:	<input type="text" value="n/a"/>

England's houses

- Average house
 - Floor area 80 m²
 - Semi-detached
 - 20% only detached
 - 65 years old
- 11% homes built since 1982
- 90% heated by mains gas
- 1% with loft insulation thicker than 250 mm
- 50% full double glazing



Heat gained

Four components

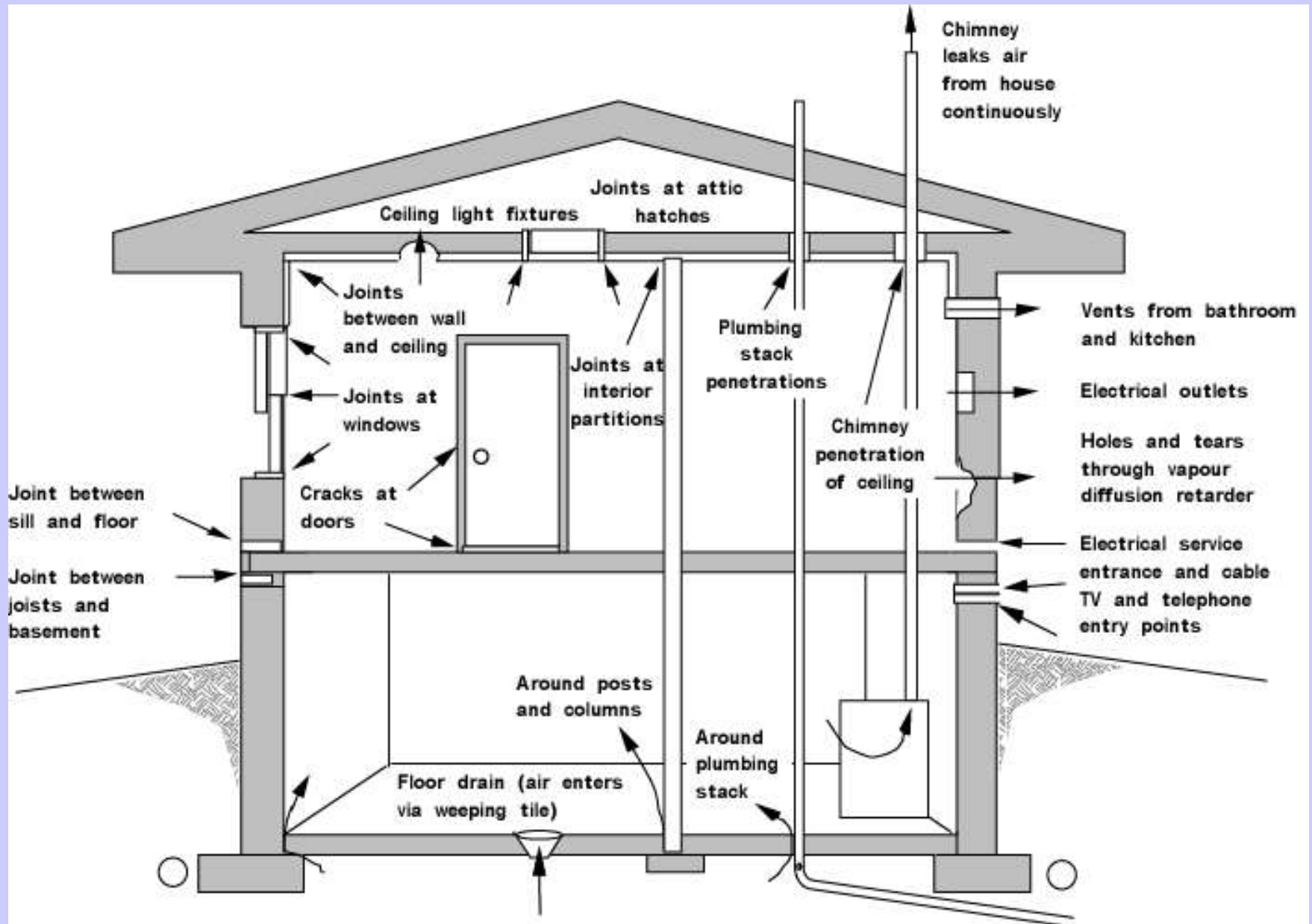
- Electricity used in house for appliances and cooking
- Solar radiation heating house (passive solar gain)
- House occupants
- Central heating and domestic hot water boiler
 - Programmed on a thermostat to provide the heat necessary to balance the fabric and ventilation losses to maintain a steady house temperature during the winter



Heat loss in
houses
**Both are
significant**
**In the hands of the
builder**

- Fabric heat loss
 - Conduction through house envelope
 - roof, floor, walls, windows etc
 - May be **estimated** from **U values** of structural components
- Ventilation heat loss
 - Air movement through structural envelope
 - draughts, air extractor fans, open windows and doors etc
 - May be **estimated if number of air changes per hour is known**

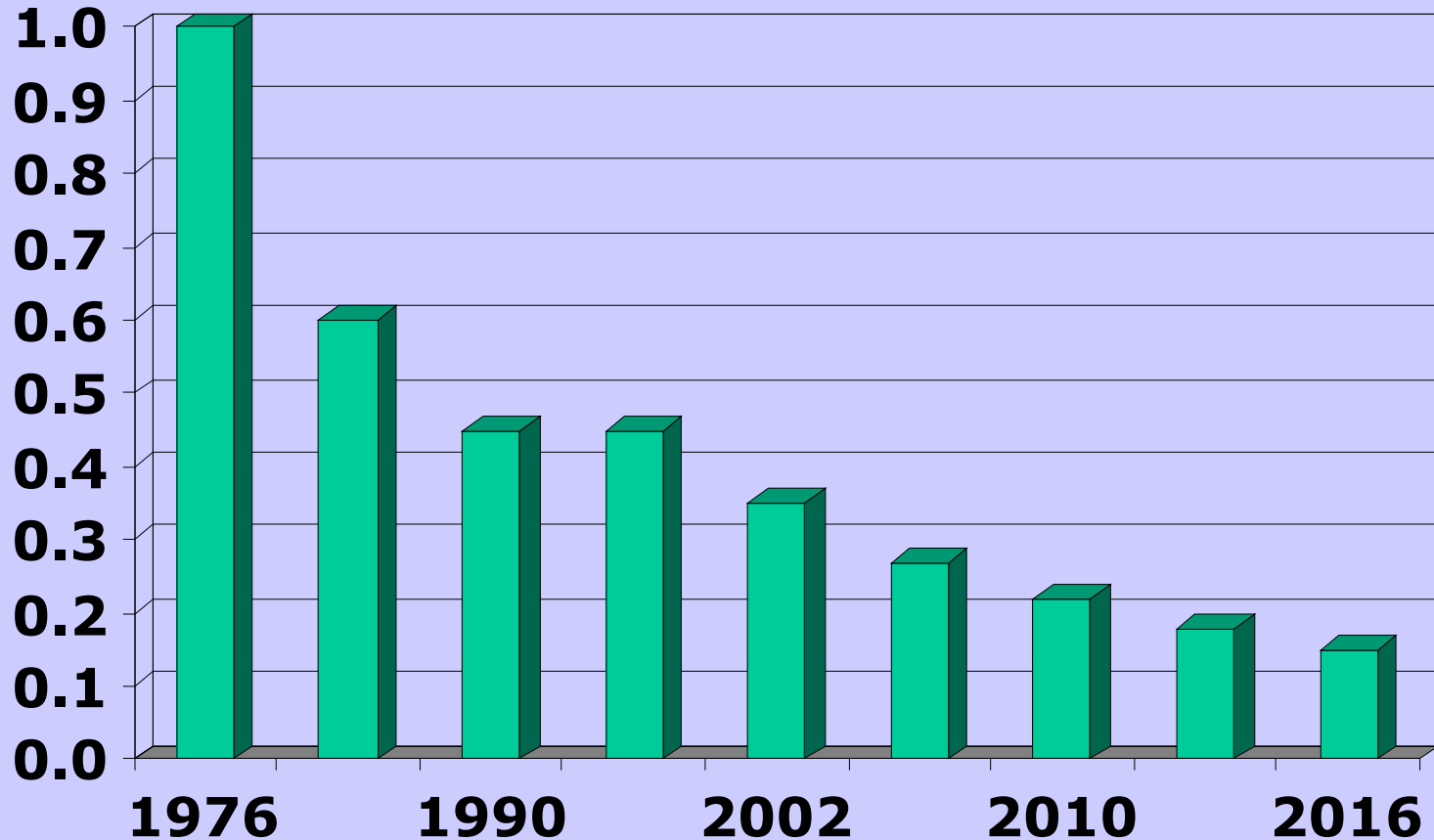
Ventilation intentional and unintentional



Fabric heat loss

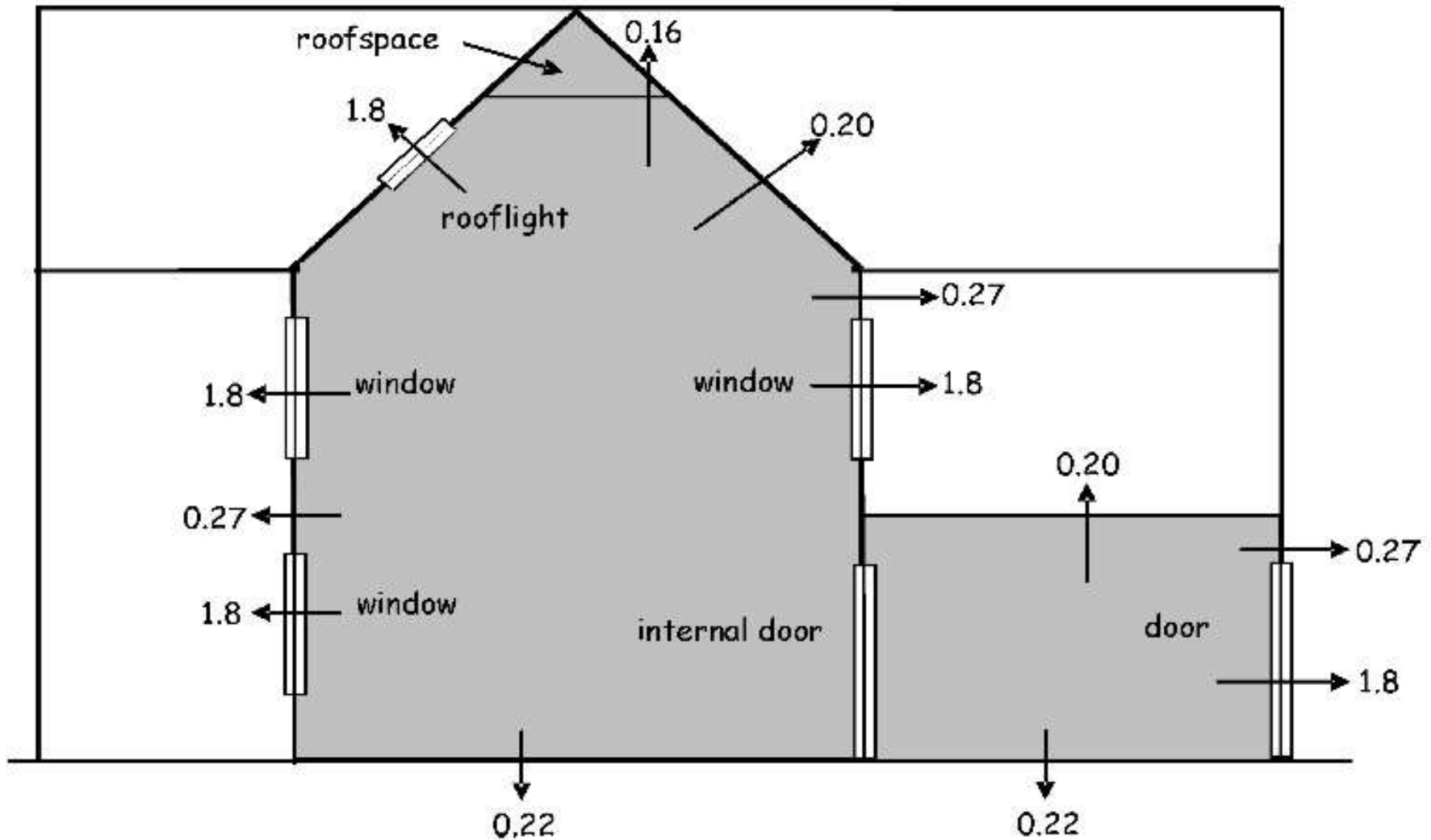
U values for outside walls

Watts per square metre per °C temperature difference



A traditional stone built Scottish house could have a U value of 2.1. Sempatap, an insulating product recommended by Energy Savings Trust, Scotland could reduce U to 1.49. Payback 4 years.

Fabric Heat loss U values- 2006



- Ideals missed by builders “cutting corners”

I commit to save my 20% and will do the following things to help me do this:

Please cross all the applicable boxes:

When making hot drinks only boil as much water as I need.

Replace 3 lightbulbs with Energy Saving Recommended ones.

Turn down my thermostat by 1°C.

Install a condensing boiler.

Turn appliances off standby.

Buy Energy Saving Recommended appliances.

Install cavity wall insulation.

Wash my laundry at 30°C.

Top up my loft insulation to 270mm (10.5 inches).

Not use the car for short journeys.



Costs/benefits

Dr Brenda Boardman

Lower Carbon futures, Environmental Change Inst
University of Oxford

	<u>Approx. Cost</u>	<u>Approx. Annual Savings</u>	<u>Payback</u>
Double Glazing	£5000	£40	125+ years
Secondary Glazing	£3000	£30	100+ years
Draught-proofing (DIY)	£40	£10-15	3-4 years
Cavity Wall Insulation	£125-140	£70-100	2-3 years
Hot Water Tank Jacket (DIY)	£10	£20	6 months
Thermostatic Radiator Valves	£75-100	£10-15	5-10 years
Room Thermostat	£110-140	£20-25	4-7 years
Full heating controls	£125-250	£50-60	2-5 years

All figures are averages based on a 3-bedroom 1930s semi.

From Local Government handbook in 2005

costs and savings for existing dwellings

Box 1: Domestic Efficiency Measures – estimated costs & savings

<i>Measures</i>	Average cost (£)	Cost saved (£/yr)	Carbon saved (kgC/yr)	Pay-back (yrs)	Potential homes ('000) †	Potential total carbon saving (MtC/yr)
Hot water cylinder insulation	14	29	53	0.5	1,137	0.1
Cavity wall insulation	342	133	242	2.6	8,500	2.1
Loft insulation (full and top-up)	284	104	190	2.7	6,186	1.2
Improved heating controls	147	43	77	3.4	2,102	0.2
Draught proofing	100	23	43	4.3	9,793	0.4
Micro CHP	1,571	230	508	6.8	12,000 ⁴	6.1
Solid wall insulation	3150	380	694	7.5	7,479	5.2
A-rated boiler	1,500 ¹	168	177	8.9	17,128	3.0
Micro wind	2,363	224	263	10.5	- ²	-
Ground source heat pump ³	4,725	368	990	12.8	17,000	16.8
Photovoltaic (PV) electricity	9,844	212	249	46.4	9,892	2.5
Solar water heating	2,625	48	88	54.7	19,330	1.7
Windows (Single to Double Glazing)	4,000 ¹	41	26	97.6	10,746	1.7

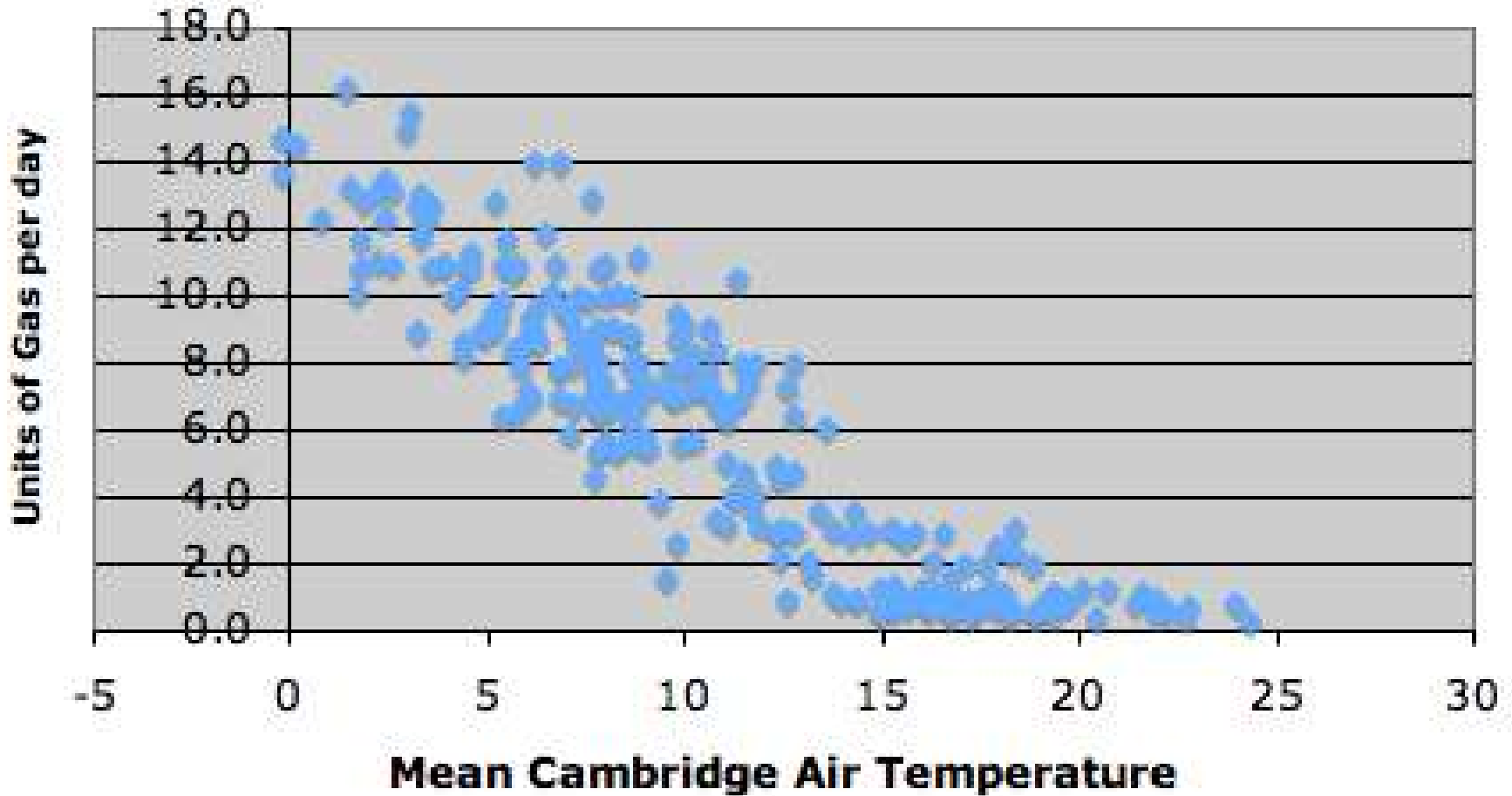


Monitor your home

- Electricity
 - Read your meter regularly and make sense of the figures
 - Use a TBI Smart Meter and investigate your use of power
- Heating fuel
 - Monitor your consumption at different times of the year.
- Do you know how much energy you use for
 - Central Heating
 - Domestic Hot Water
- Monitor room temperatures
 - Do you keep your bedrooms cooler than other rooms?
 - In our Cambridge house reducing all room temperatures by 1°C would have reduced heating demand by 7%

Gas usage and temperature 11/07 - 11/08

Colder outside - the more gas is burned



Scatter understood: Baths, Sunshine, Visitors, Start of cold or warm spells. In summer gas supplies DHW only.

Temperature in the home

The temperature at home

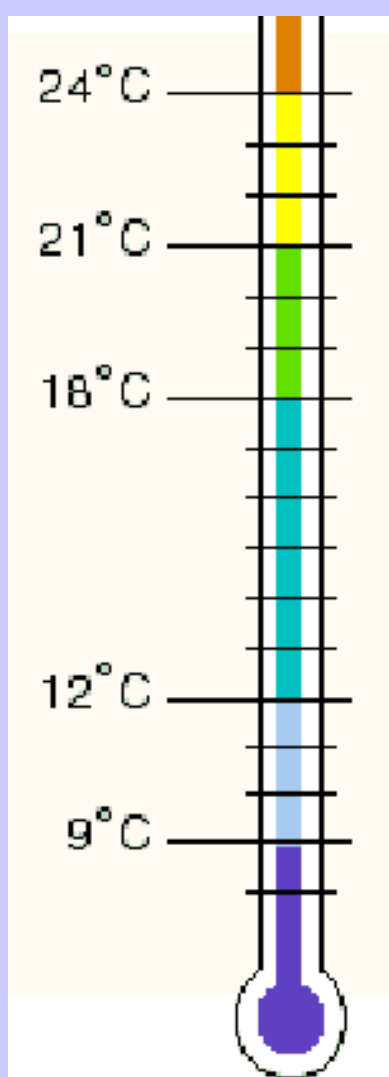


According to some building design regulations, the temperature at home during the cold months of the year should not be less than the following:

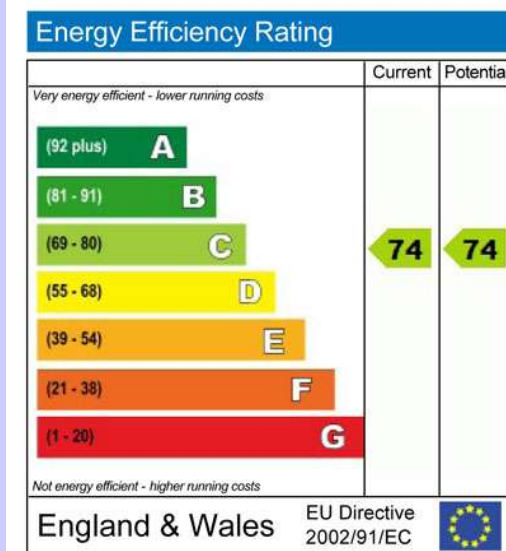
Living Room	21°C
Bedroom	18°C
Kitchen	18°C
Bathroom	20°C
Toilet	16°C
Corridor	18°C
Entrance Hall	14°C

Doctors recommend that homes be kept at 16°C or above, with 18°C the recommended temperature for bedrooms, and 21°C for living rooms. UK law requires offices to be above 16°C.

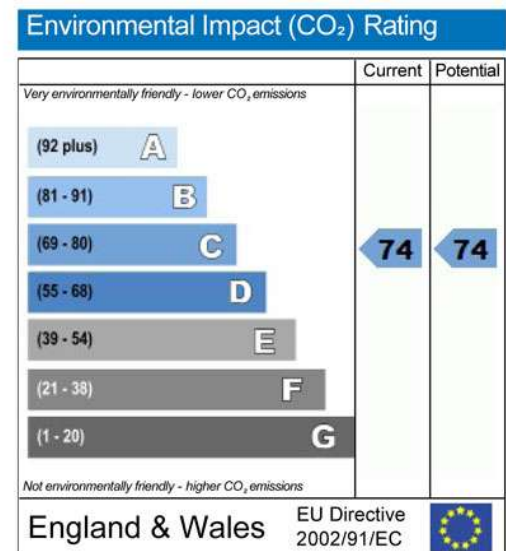
Homeowners who improve their home insulation most often decide to increase home temperature levels and nullify energy savings.



Energy Performance Certificate



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating, the more energy efficient the home is and the lower the fuel bills are likely to be.



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating, the less impact it has on the environment.

Estimated energy use, carbon dioxide (CO₂) emissions and fuel costs of this home

	Current	Potential
Energy use	155 kWh/m ² per year	155 kWh/m ² per year
Carbon dioxide emissions	5.0 tonnes per year	5.0 tonnes per year
Lighting	£130 per year	£130 per year
Heating	£808 per year	£808 per year
Hot water	£151 per year	£151 per year

- Achieved the best possible for the age of the house
- Reduced energy use by 16% with new A* boiler and controls
- Reduced energy use by 2.5% by increasing loft insulation to 270 mm
- Achieved 100 kWh/m² heat demand in practice

Our done and to do list



- ✓ Added loft insulation to 27 cm
- ✓ Installed wood burning stove in living room
- ✓ Replaced laminate floor with wool carpet and underlay
- Will replace LPG boiler with wood-fuelled alternative
- Will install PV on south facing roof

Price of fuels in S England May 2010

Thanks to John Willoughby

FUEL	PRICE		p/kWh	£/GJ	Quarterly Stand. Chg	Relative to Gas	Rank	kg CO2 / kWh
GAS	6.95	p/kWh \$	6.95	19.33				
	3.20	p/kWh \$\$	3.20	8.90	£ 25.12++	1.00	1	0.198
ELECTRICITY (on-peak)	14.68	p/kWh**	14.68	40.81		4.58		
	13.61	p/kWh***	13.61	37.83	£ 1.95++	4.25	11	0.517
ELECTRICITY (Economy 7) night rate	23.10	p/kWh**	23.10	64.22		7.21		
	16.11	p/kWh***	16.11	44.78	£ 12.73++	5.03	12	0.517
	4.57	p/kWh	4.57	12.70		1.43	6	0.517
OIL (35 sec)	53.47	p/litre*	5.08	14.12		1.59	8	0.274
OIL (28 sec)	40.75	p/litre*	4.24	11.78		1.32	4	0.274
COAL	£ 280.00	/tonne +	3.36	9.34		1.05	2	0.301
ANTHRACITE	£ 312.00	/tonne +	3.43	9.54		1.07	3	0.318
LPG	44.16	p/litre*	6.18	17.19	£ 17.62	1.93	10	0.245
Wood Pellets	£ 260.00	/tonne@	4.92	13.68		1.54	7	0.028
Wood Pellets	£ 222.00	/tonne	4.20	11.68		1.31	4	0.028
Logs (B'leaf)	£ 77.50	/load@@	5.16	14.35		1.61	9	0.080

Black Isle choice



- Wood logs are available at £70 a tonne locally. Coal costs £260 a tonne but has twice the heat value

Cold loft insulation

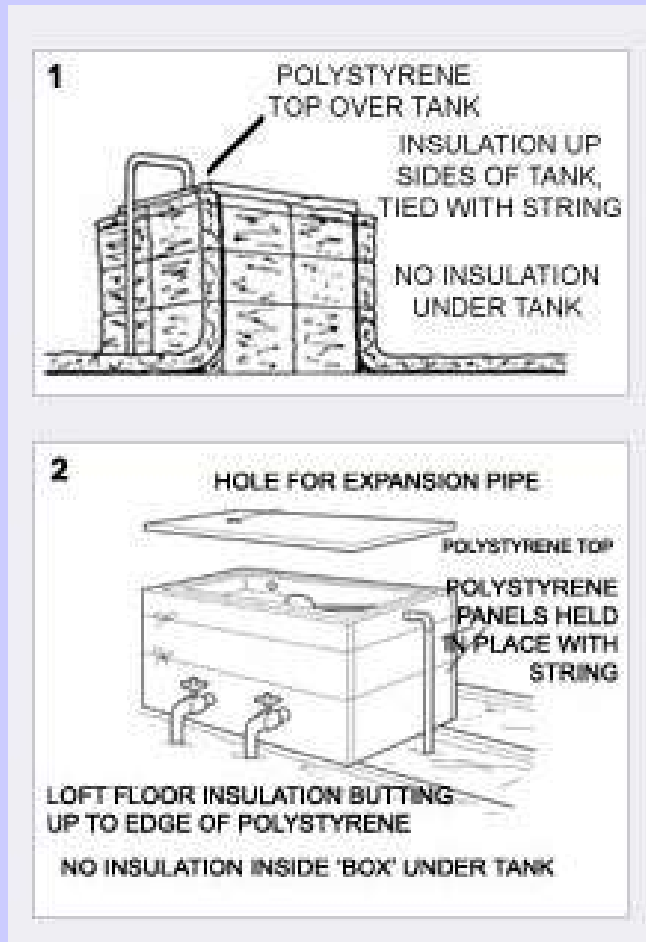


- Insulation between rafters and over them to 27 cm
- Easy fold up rolls best for walkways needed for access to tanks and electrical wiring

Insulating pipes



Cold water tank



- Keep warm by having no insulation underneath

Recessed lighting



- Impermeable ceiling membrane cut for fitting
- Loftcaps needed to seal and insulate



Different reasons for wishing to save energy in the home

- To save money in the long term
 - Capital investment then reduced heating bills for 10, 15, 20 years
 - Choose option with a fast payback time that you can afford today
- To reduce your personal carbon footprint
 - Consider the options and make the best choice for you
- To reduce Man's impact on the Planet
 - Invest in Practical Action schemes in Developing Countries
- To anticipate Peak Oil and its implications

Energy Performance Certificate

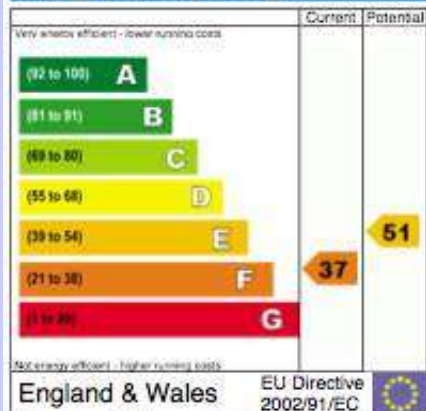


54, Blenheim Crescent
SOUTH CROYDON
CR2 6BP

Dwelling type: Semi-detached house
Date of assessment: 3 August 2007
Date of certificate: 7 August 2007
Reference number: 8583-6128-4980-8297-2006
Total floor area: 194 m²

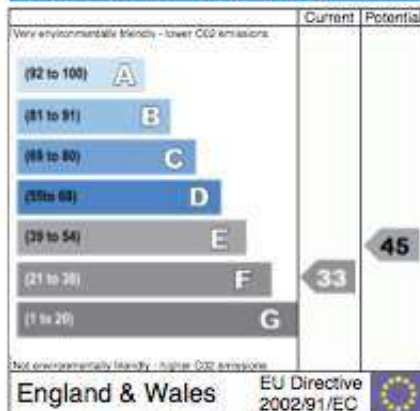
This home's performance is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating, the more energy efficient the home is and the lower the fuel bills will be.

Environmental Impact Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating, the less impact it has on the environment.

Estimated energy use, carbon dioxide (CO₂) emissions and fuel costs of this home

	Current	Potential
Energy use	425 kWh/m ² per year	318 kWh/m ² per year
Carbon dioxide emissions	14 tonnes per year	10 tonnes per year
Lighting	£148 per year	£89 per year
Heating	£1484 per year	£1129 per year
Hot water	£161 per year	£131 per year

Based on standardised assumptions about occupancy, heating patterns and geographical location, the above table provides an indication of how much it will cost to provide lighting, heating and hot water to this home. The fuel costs only take into account the cost of fuel and not any associated service, maintenance or safety inspection. This certificate has been provided for comparative purposes only and enables one home to be compared with another. Always check the date the certificate was issued, because fuel prices can increase over time and energy saving recommendations will evolve.

Adding value to your home

- Energy Performance Certificate
 - Attain your house's potential, but to do more may not be cost-effective
- Who talks about a payback from a new kitchen or a make-over?
- What's the payback of flying to Prague?

Personal Carbon Footprint



- Energy used in the home for our well being and personal satisfaction
- Energy used for the travel we choose to take
- Energy required for the “stuff” we choose to buy
- Energy required to provide food we choose to eat

- ONLY energy used in the home requires a capital investment to save energy, so saving energy outside the home is often the easiest option



Carbon Footprint of average Brit

Energy in the home and personal travel only
Footprint in tonnes of CO₂

- Energy use in the home 2.35
- Energy use by car travel 1.05
- Energy use by train travel 0.90
- Energy use by bus travel 0.10
- Energy use by air travel 1.83

- Total for home and travel 5.42

- Where can the footprint best be reduced?

Saving carbon

	Tonnes saved	Comments
Upgrade gas 1980s boiler to a modern gas condensing boiler. Over 20 years save 15 tonnes - cost of £220 per tonne	0.75	Results from 1 Searles Meadow Costs £3300
Don't fly solo to New York and back each year	4.0*	Saves airfare *Includes indirect climatic effects
Reduce your car mileage by 3000 miles a year (average consumption for UK car fleet 2005)	1.0	Saves £400 or so a year
Drive 14,000 miles a year in a medium petrol hybrid car rather than a medium petrol car	2.0	Capital required for new car purchase

Reductions: home or away...



	2 kWh solar system for UK home	Treadle pumps in North India
Cost	£12,000 average cost (buy and install)	£12,000
	1 house	300 plus treadle pumps
CO2 saved per year	0.8 tonnes	230 tonnes
Comparison		200 times the CO2 per pound spent.
		300 Indian families helped out of poverty, nearly 2000 people.
Time taken for solar to get the same savings:		2000 years.

energy saving trust

Commitments so far
106,509

Home Commit now Why commit Who's committed Spread the word

I commit

Want to do something about climate change? Want to help preserve the places that matter to you? Then join the energy saving movement and make a personal commitment to save 20% of the energy you use. Together our actions will have a real impact by helping to fight climate change.

You can also create your own "commitment widget" to add to your webpage or network site and tell all your friends about your commitment.

Latest commitment:
Gloria Burke committed to help preserve siberwood forest

photographer_zoreil

Commit now **SAVE YOUR 20%**

Too busy to commit now? You can still join the energy saving movement by leaving your email address below.



Transition
Black
Isle

Building strength in our communities to face the challenges of peak oil and climate change

Take home messages

- There are many ways to reduce your carbon footprint
- The return of investment in energy saving in the home is higher than depositing the equivalent money in a bank
- The value of your home increases and fuel bills fall
- Lifestyle change could be a surer way to save 20%
- Investing in appropriate technology in the third world is very cost-effective
- Anticipating higher and higher fossil fuel prices by heating your home by renewables makes economic sense and is a good insurance policy