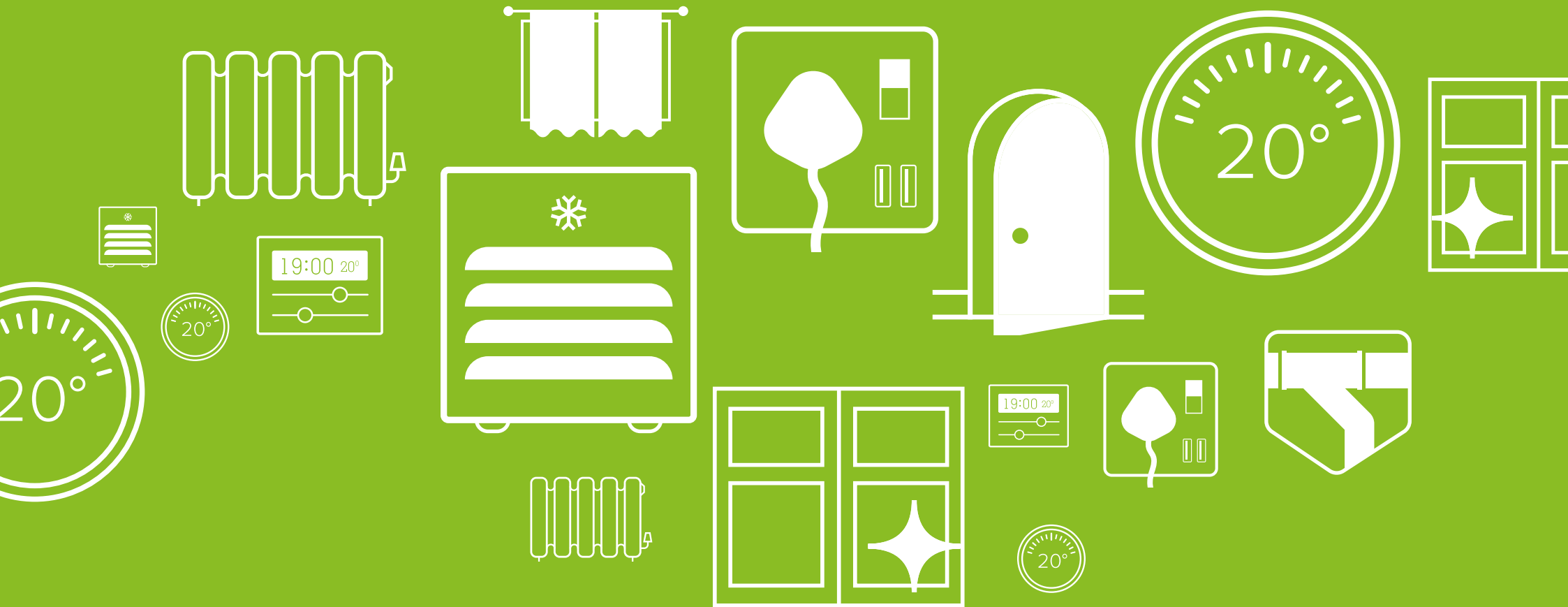


Heritage Foundation

## for Letchworth Garden City residents



Think before you print.

# Improving the Energy Efficiency of Your Home

**Making your home energy efficient can help keep your family comfortable, save money on your fuel bills and slow climate change.**

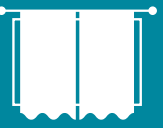
This guide shows improvements which will help you to use less energy and make your home warmer. It covers simple measures you can take today and those that need approval, like installing solar panels.

Remember that making your home more energy efficient, when done properly, can save you money and help the planet. So don't delay, take some action today.



## Free Measures

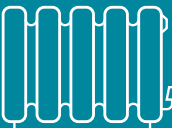
Free ways to save money on energy and to help reduce greenhouse gas emissions.



Close curtains and shutters at night



Turn off appliances and battery chargers when they aren't in use



Turn off radiators in rooms you don't use often



Check that heating controllers and thermostats are set correctly



Try turning down the main thermostat a little



Clean windows to maximise sunlight



Keep gutters and downpipes clear. Damp walls are cold walls.



Keep internal doors closed



Don't use air conditioners



Any external changes you make to your home may require our consent. Please look at our Design Principles for further advice and get in touch with us to find out more. You may also need Planning Permission and/or Listed Building Consent from North Herts Council. See back of guide for planning department contact details.



# Energy Improvements For Your Home

## Draught Proofing

Cutting down on draughts from ill-fitting windows or doors, or down an unused chimney, is a great way to reduce heating bills and improve comfort. Gaps in wooden floors or holes in walls cut for pipes or wires can also be culprits.

Windows and doors don't need to be replaced to make them less draughty – in most cases a combination of repairs and draught-proofing can achieve good results at a lower cost and without any change of appearance.

A competent DIYer can purchase and install draught strips around doors and windows. A good carpenter will be able to repair rotten window frames and fit draught-proofing seals. There are also companies that specialise in the repair and draught-proofing of timber windows and can fit highly effective seals.

Metal framed windows are not unusual in Letchworth buildings. Even very rusty windows can usually be repaired and draught-proofed using a silicone gel.

Chimneys are often the cause of significant draughts. If the chimney is rarely (or never) used, a flue balloon is the quickest way to solve the problem. These thick plastic balloons are available in various sizes. A more permanent solution is to block the flue at the base and to fit a ventilated cap at the top.

If the fireplace is used for open fires, consider fitting a metal damper in the chimney which can be closed when the fire isn't in use. Or fit a wood-burning stove: these are more efficient at turning wood into usable heat and prevent draughts when they are not in use.

## Brick Walls

Most older properties in Letchworth were built with solid brick walls, with a gradual shift to brick walls with uninsulated cavities and then brick walls with insulated cavities by the end of the 20th century.

As a rule, houses with uninsulated cavity walls can have insulation injected into the walls to significantly improve their performance without any change in appearance. Cavity wall insulation should always be carried out by a certified installer.

Houses with solid walls can have insulation boards added to the walls either externally or internally (or both), and then the insulation is covered with render, plaster or boarding to protect and conceal the boards.

External wall insulation achieves the best results, but can contradict the Design Principles, as this often requires alterations to window and door reveals, porches, roof eaves and downpipes. Decorative brick

string courses and brick door arches will also be hidden. Also for attached properties, the insulation of the front of one property but not its neighbour may also not be acceptable in Letchworth on aesthetic grounds.

Internal insulation has the advantage that the external appearance of the building is not altered, but this is at the expense of a loss of internal room space. Professional advice should be taken with internal insulation to ensure that it is well thought through and that the risk from damp in the walls isn't increased.



## Roofs, Ceilings And Loft Spaces

Homes with loft spaces above top floor ceilings can install insulation in the loft. Suitable insulation can be bought at DIY stores; it is relatively straightforward to install and is one of the most cost effective measures that homeowners can take.

Remember that ceilings, particularly old lath and plaster ceilings, are quite weak so boards should be fixed to the joists over the top of the insulation if the loft is used for storage. Also remember that the unheated loft space should be ventilated to avoid condensation, which could trigger mould and decay. Take care not to block the eaves, and if there is no eaves ventilation consider installing vents in gable brickwork or through the roof coverings.

If the space under the roof is used for a habitable room, insulation can be added to the sloping roof. The most successful way to do this is to remove the roof coverings and add insulation between and

above the rafters. However this is only likely to be cost effective if the slates or tiles needed renewal in any case. Instead, insulation can be added from the underside, below and/or between the rafters. All the ceilings will have to be replaced and head height below will be reduced.

Flat roofs can also be insulated from above or below. Care is required, though, to ensure that any spaces around the roof timbers are properly ventilated.

## Windows

The first action to take with draughty windows and doors is to repair them and to draught-proof them. This will greatly reduce their heat loss. Thick curtains and/or thermal blinds, if kept closed, will also have a big impact for reasonable cost.

Secondary glazing, where an additional window system is installed inside the existing windows, is a more expensive option but does allow the original windows to be retained. Single glazed secondary glazing offers only moderate insulation benefits, but is good at draught-proofing and sound insulation. Double-glazed secondary glazing combines good thermal and acoustic performance.

Another alternative for prominent windows is to retro-fit new thin profile double glazed units into the original window frames: double glazed units as thin as 10 or 12mm are now widely

available. Some specialist firms also use such thin units in new timber windows with frame thicknesses made to match old windows which are beyond repair.

Standard PVCu and mass produced double-glazed timber windows are normally acceptable in modern homes, but for older properties are unable to exactly reproduce the dimensions and delicate details of the frames of a single-glazed window.

New, bespoke, PVCu designs are now emerging, which can be more sympathetic to early Garden City Homes.

## Floors

Ground floors can be a significant source of heat loss, particularly those which have suspended timber floors. The simplest solution to this is a thick underlay and fitted carpet. If the floorboards require lifting for repair or replacement, insulation can be added between and below the floor joists as space permits.

Suspended floors stay dry because they are separated from the damp ground below and there is fresh outside air ventilating the sub-floor void. Over time, the wearing of the floorboards and the opening of gaps under the skirting boards allow the cold air to enter the room above. But, however tempting it may seem it is vital that sub-floor vents are not blocked up.

A more radical alternative for a timber floor in poor condition is to replace it with an insulated solid floor. Take care with this as the use of the wrong materials can lead to the dampness from the ground being driven up the walls.

Existing solid floors in Letchworth homes are most likely made of concrete. Only those installed in the last 25 years will have any insulation. Digging out concrete floors to add insulation is a major building project.

Many modern homes and extensions feature under-floor heating. Fitting this can provide a second reason for the excavation of a solid floor or the replacement of a suspended floor. Underfloor heating should only be installed over insulation.



# The Building Blocks of An Efficient Home

## Lighting and appliances

Always try to choose energy efficient lighting and appliances. Most now come with an easy to understand rating of A to G to help comparison.

Energy efficient lighting has improved dramatically over the last few years. LED lamps and light fittings use only a small fraction of the energy of old tungsten and halogen bulbs. LED lamps are now available to fit almost all light fittings, though the

dimmers and transformers of some lights might need to be replaced.

LED lamps and light fittings use only a small fraction of the energy of old tungsten and halogen bulbs, and are even more efficient than fluorescent lamps. LED lamps are now available to fit almost all light fittings, though the dimmers and transformers of some lights might need to be replaced.

## Boilers and controls

Modern boilers, if properly maintained, can achieve efficiencies of above 90% by recapturing some of the heat from the exhaust gasses. Such boilers are known as “condensing” because small amounts of water will condense out of the exhaust that needs to be safely piped away. Many older boilers operate with efficiencies less than 75%.

If you are fitting a new boiler, it’s a good time to update the programmer. In larger houses, consider splitting the radiators into two separately controlled zones to give greater savings.

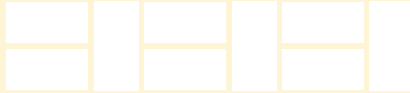
In smaller homes or flats, a “combi” boiler can be a great idea: these boilers make hot water on demand so a hot water cylinder is not required, saving space and avoiding heat loss from the cylinder.

## Cavity walls or solid walls?

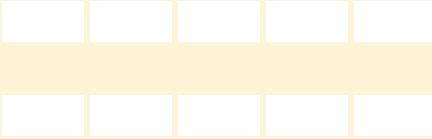
It’s not always easy to tell if the walls of your house contain a cavity, particularly if the walls are covered externally by render. If the bricks are visible externally, the absence of what appear to be half bricks in a repeated pattern over the wall, suggests that it has a cavity.

However, the presence of such half bricks is not a conclusive indication of a solid wall as some modern cavity-walled buildings in Letchworth were built with half bricks to give the appearance of a solid wall! It is important that you know what type of wall you have before installing any wall insulation. If you are in any doubt consult a surveyor.

Solid Wall



Cavity Wall



## Building regulations

The building regulations set standards for many items of building work. Buildings do not have to be upgraded to meet the targets within the regulations, but any new work must meet the standards currently in force.

Part L of the regulations deals with the energy efficiency in new and existing buildings. “Approved Document L1B” contains targets for insulation, airtightness, efficiency of appliances

etc. that existing buildings should meet when work is done to them. The regulations do contain exemptions and relaxations of the rules for Listed Buildings, buildings in Conservation Areas and other buildings with heritage value which will give most buildings in Letchworth some flexibility. Building Regulations compliance is managed across the county by Hertfordshire Building Control.

## Solar power, wind power and heat pumps

These technologies take advantage of natural sources of energy to reduce your fuel bills.

Solar water heating has been around for quite a while and is well-proven. It comes into its own in the summer when the sun can heat all the hot water so that the boiler doesn’t need to run at all. Using the sun to generate electricity using photovoltaic (PV) cells is a newer technology that has been subsidised by the government to encourage its uptake. There are several local and national installers of PV panels that can calculate the costs and the likely income for your property.

Solar and PV panels change the appearance of a roof and require our prior approval. Please contact us or refer to the Design Principles for further advice on siting these panels and when they are acceptable.

Turbines designed to turn wind into electricity are particularly prominent. In Letchworth, where the average winds are not strong, wind turbines are not justifiable, so we will not generally permit them.

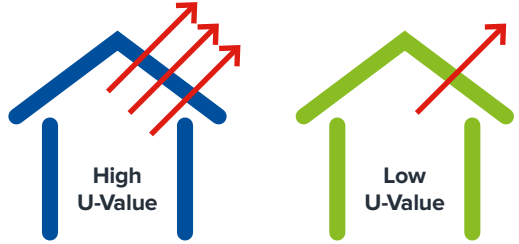
Heat pumps work a bit like refrigerators and can take heat from outside a building and release it inside, even if the temperature outside is colder. Heat pumps that take heat from the ground are the most efficient but will require either digging up a large area of garden or drilling a deep borehole. Heat pumps that take heat from the air are easier to install and can be positioned discreetly.

## Ventilation and ‘breathing buildings’

Most traditional buildings are made of permeable materials such as lime and/or earth based mortars, renders, plasters and limewash. They do not incorporate the barriers to external moisture (cavities, rainscreens, damp-proof courses, vapour barriers and membranes) which are standard in modern construction. As a result, walls of older buildings tend to absorb more moisture, which is then released by internal and external evaporation. When traditional buildings are working as intended, the evaporation will keep dampness at safe levels. This is often referred to as a ‘breathing’ building.

In contrast, modern construction relies on mechanical extraction to remove water vapour formed by the activities of occupants.

As traditional buildings need to “breathe”, care should be taken when using vapour barriers and many materials commonly found in modern buildings when making changes to improve energy efficiency, as these materials can trap and hold moisture in the fabric without proper ventilation. In time such moisture can cause staining, mould, and the decay of timbers (such as floor joists and window lintels) in contact with the wall.



## ‘U-values’ explained

U-values measure how quickly heat will pass through walls, windows, roofs etc. U-values are expressed in units of Watts per square metre per degree of temperature difference (W/m²K). Lower U-Values are better than higher!



Less Common Building Elements

Although many of the houses in Letchworth were built in the first half of the 20th century using similar methods, there are plenty of older and more unusual properties which add to the richness of the town. These may have some of the following building materials:



**Thatch:** is naturally a good thermal insulator so it is rarely necessary to add any insulation beneath the thatch. It is extremely important not to put impermeable insulations (or plasters) under the thatch as that could lead to rapid decay of the lower levels of thatch. A bigger challenge in a thatched building is often stopping draughts entering through gaps between the wall heads and the thatched eaves – use permeable membranes and lime-based mortars to do this.

Also take care if making any changes to the boiler or fires in the building: the most common cause of thatch fires is heat transfer through chimneys. Chimneys should be well maintained, with all joints fully pointed, and swept at least twice a year. Chimneys should be lined especially if the heat source is a wood burning stove.



**Timber Frames:** Buildings that contain elements of a structural timber frame need very careful treatment. The timbers are susceptible to decay if they are subject to prolonged dampness. The panels within the timber frame are often quite thin, of poor insulation value, and draughty. Insulating such walls requires specialist advice on methods and materials.

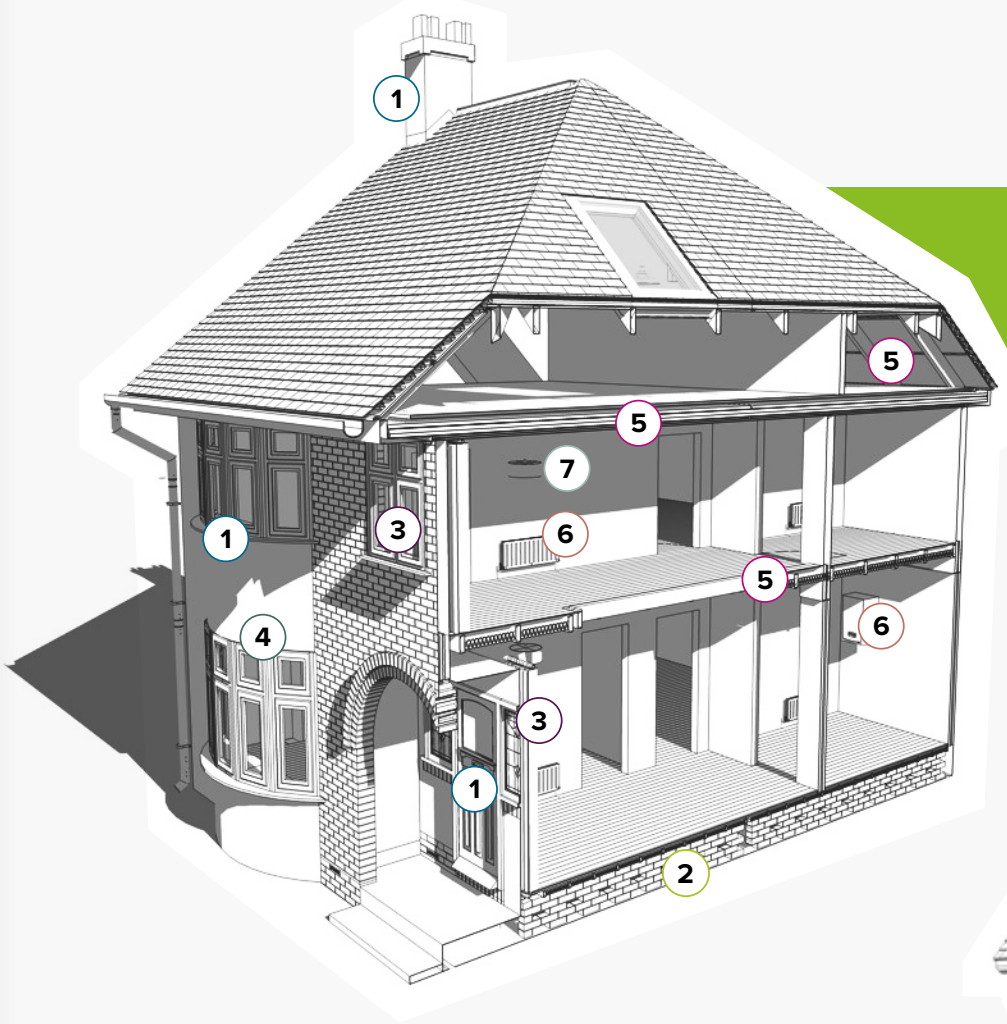
**Flat Roofs:** are actually quite difficult to insulate unless the roof covering is to be renewed. If insulation is added from below it is important that there is a well ventilated cavity between the insulation and the roof deck. Otherwise, water vapour will condense against the (cold) underside of the roof deck and dampen the roof joists and the insulation.

**Weatherboarding and Tile Hanging:** are not unusual in Letchworth on brick and timber-framed buildings. Insulation can normally be added behind these claddings, though window reveals, eaves and downpipes may require adjustment.

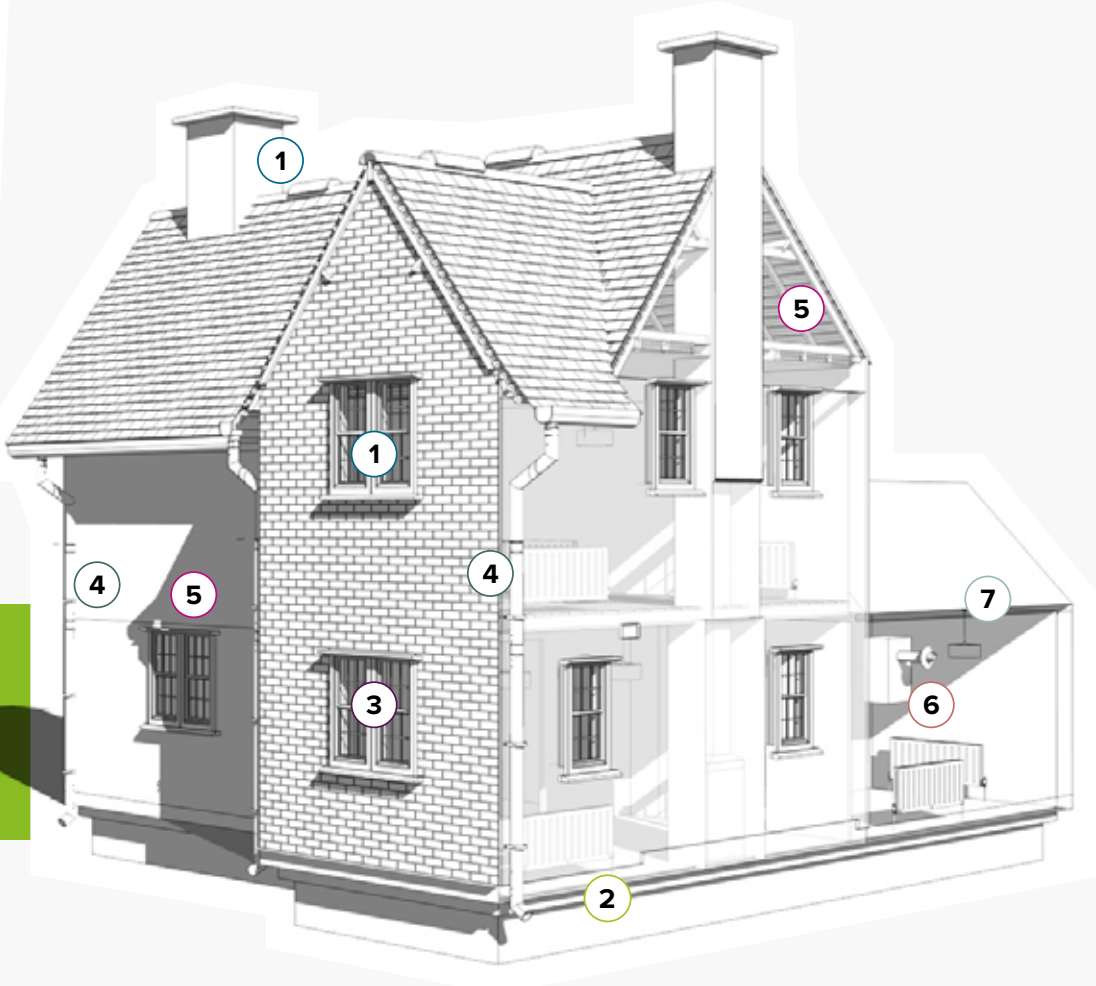
House Anatomy

- 1 Draught proofing**
  - Chimney balloon installed instead of fireplace £ ➤ \
  - Brush seals to doors and windows ££ ➤ \
- 2 Floors**
  - Insulate suspended timber ground floors £££ ➤ \
  - Replace suspended floor with insulated solid floor £££ ➤ \
- 3 Windows & Doors**
  - Draught excluders £ ➤ \
  - Thick curtains and thermal blinds ££ ➤ \
  - Secondary glazing £££ ➤ \
  - Well proportioned replacement double glazing £££ ➤ \
- 4 Brick Walls**
  - Cavity wall insulation ££ ➤ \
  - External insulation and rendering of solid brick walls £££ ➤ \
- 5 Roofs, Ceilings and Loft Spaces**
  - Add (more) insulation to loft between or over ceiling joists £ ➤ \
  - Add insulation between and above rafters when roof coverings are being replaced £££ ➤ \
- 6 Heating**
  - Upgrade gas boiler £££ ➤ \
  - Renew hot water cylinder ££ ➤ \
  - Improve heating controls ££ ➤ \
- 7 Lighting**
  - Switch all light bulbs to LED ££ ➤ \

Key to coded ratings		
Up-front cost	Payback period	Difficulty
The cost of installation in a typical three bedroom Letchworth semi	The length of time to recoup the cost of the installation in a typical three bedroom Letchworth semi	The level of expertise required to design and install the measure so it works well
£ - up to £100	➤ - up to 5 years	\ - A competent householder
££ - £100 to £1000	➤➤ - 6 to 15 years	\ \ - A general builder
£££ - £1000 and above	➤➤➤ - 15 years or longer	\ \ \ - A specialist installer



Modern House



Older House



# Find Out More About Energy Efficiency

There's plenty of other online resources you might find useful when considering home energy improvements. See our favourite web links to the right.

## Planning Permission

Unless your house is in the Conservation Area, Planning Permission from North Hertfordshire District Council will probably not be required for alterations to improve energy efficiency. However, if you are in any doubt call North Hertfordshire District Council's Planning Team on **01462 474000** to check.

## Listed Building Consent

It's best to assume that any works to change a Listed Building will require Listed Building Consent, even alterations that only affect the inside of a property. Call North Hertfordshire District Council's Planning Team on **01462 474000** to check. Applying for Listed Building Consent is free.



**Letchworth  
Garden City  
Heritage Foundation**

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Letchworth Garden City, SG6 3BF

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