

Renewable energy

Adapting your building to minimise its energy consumption is the most effective way to reduce the CO₂ emissions it produces. Generating your own energy from renewable sources should only be considered once all of these options have been exhausted.

There are a number of different types of renewable energy, each with pros and cons of installation and usage. With historic buildings it is very important to assess carefully what the most appropriate type of renewable energy will be.

The table below offers a brief outline of some of the most popular types of renewable energy but is by no means exhaustive and only offers a broad outline. Price and savings can vary considerably dependent on individual circumstances and Government incentives for adopting these technologies also need to be considered.

Source	Cost	Savings/year	Notes
Solar Photovoltaic (Electricity)	For example: £11,500 (2.9 kWp domestic system)	£581* (including Feed-In Tariffs).	Can provide up to 40% electricity used by a typical household.
Solar Thermal (Hot Water)	£4,000 - £6,000	Around £50 (Renewable Heat Incentive will also be available from autumn 2012).	Can provide at least 50% of domestic hot water needs for the average house.
Micro Combined Heat and Power	From £5,500	£158 (including Feed-In Tariffs) assuming a large house with annual heat demand of 20,000kWh.	Can be installed instead of a conventional boiler – potential for total household CO ₂ emissions to be reduced by displacing grid electricity.
Hydroelectricity	Highly variable, depending on the location. A typical 5kW scheme suitable for an average home: £20,000 - £25,000	System and site specific. Feed-In Tariffs support available.	Highly dependent on appropriate location.
Biomass	£11,500 for a complete domestic pellet boiler system (but £3,000 for a simple stove)	Up to £275 (depending on fuel replaced). Renewable Heat Incentive to be available from autumn 2012.	Requires sufficient space for boiler and fuel storage.

Source: Source: Energy Savings Trust (figures correct at the time of publication).

*These figures are calculated using the revised rates for Solar PV Feed-In Tariffs proposed by the Government for consultation on 31 October 2011.

If confirmed these rates would apply to PV installed after 12 December 2011 and will come into operation from 31 March 2012.

Renewable energy requires high initial investment and often low levels of savings. However, as referenced in the table above, a rebate can be obtained on investment in renewable technology through the Feed-In Tariff (FIT) scheme which pays homeowners for every kilowatt of electricity they produce, whether they use it themselves or export it to the National Grid. From October 2012 the Renewable Heat Incentive will also encourage the installation of renewable heat equipment such as solar thermal technologies, biomass boilers and heat pumps. In-depth information on these schemes can be found by visiting the Department of Energy and Climate Change website: www.decc.gov.uk

Additional help and information:

English Heritage, Climate change and your home
www.climatechangeandyourhome.org.uk

Energy Saving Trust
www.energysavingtrust.org.uk

The Prince's Regeneration Trust,
The Green Guide for Historic Buildings
www.princes-regeneration.org/publications.php

Acknowledgements

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Saving energy:

A guide for owners of historic homes

This guide aims to help owners of historic, or traditionally constructed buildings, who wish to improve the carbon footprint of their home.

Reducing energy demand

The Government is committed to reducing carbon dioxide (CO₂) emissions by at least 80% on 1990 levels by 2050. 27% of the UK's total CO₂ emissions come from homes, and with 70% of the dwellings which will be in use in 2050 estimated to already be in existence, there is a strong environmental case for people to make their homes more energy efficient. However, for owners of historic homes, this can sometimes seem like a complicated, expensive and time-consuming process. But a few small changes can significantly reduce energy consumption, increase energy efficiency, save you money and make your home a more comfortable place to live.

Remember: planning constraints for historic buildings

Any alterations to an historic building must abide by planning constraints. This is to ensure that the special character of listed buildings is preserved. The same is also true in relation to buildings inside Conservation Areas. Consult your local planning authority right at the beginning of the process, before the start of any work. A conservation officer will be able to advise you on the permissions you will be required to obtain.

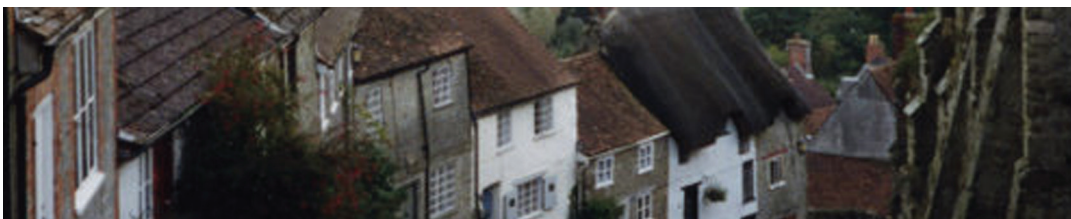
Fact: More than three quarters of the energy we use in our homes is for heating rooms and water.

Fact: It is possible to lose 15% or more heat through inadequately insulated pipes!

Top 10 quick tips to reduce energy consumption in an historic home:

Changes which you can make to reduce the energy consumption in your historic home:

1. Ensure all windows and doors fit correctly.
2. Draught proof all windows and doors.
3. Hang heavy curtains in front of windows.
4. Use, repair or reinstate historic shutters.
5. Close doors in draughty buildings.
6. Maintain a constant temperature. This requires much less energy than cooling and then heating. You can then bring heating up to a more comfortable level in the inhabited rooms.
7. If fireplaces are not in use, reduce heat loss up chimneys with a chimney balloon or damper.
8. Replace a boiler, if over 15 years old, with a new condensing model.
9. Insulate your hot water tank. A £10 jacket could reduce the energy required to keep it at the specified temperature.
10. Insulate all your hot water pipes.



Maintenance

One of the most energy efficient ways to preserve historic buildings is to ensure that continued, regular maintenance is carried out to safeguard its historic fabric.

Top maintenance tips:

1. Ensure that timber windows are repainted with appropriate paint to prevent paint cracking over time and letting in damp, resulting in the wood rotting. If regularly maintained, timber windows can have an almost infinite life span.
2. Fixing slipped roof tiles or slates will help prevent damp or leaks penetrating through the building.
3. Clear out gutters and gullies and check downpipes. Water leaks can penetrate the building fabric over time and cause damp.
4. Get your boiler serviced annually to ensure it is working as efficiently as it can.



Fact: Up to one third of a household's heat will escape through an un-insulated loft.

Fact: Adaptation and changing behaviour reduces CO₂ emissions quicker and more efficiently than adaptation alone.

Tip: Always check that any proposed alterations will receive planning and listed building consent and, if in doubt, seek advice from a conservation architect!

Further reducing the demand for energy resources

If you would like to take your energy efficiency drive beyond our quick tips and maintenance advice, you may find the process below useful to identify where you can make the most difference.

Identify - Areas where energy wastage could be avoided. Areas of the building to which repair or alteration will be most cost effective and reduce CO₂ the most.

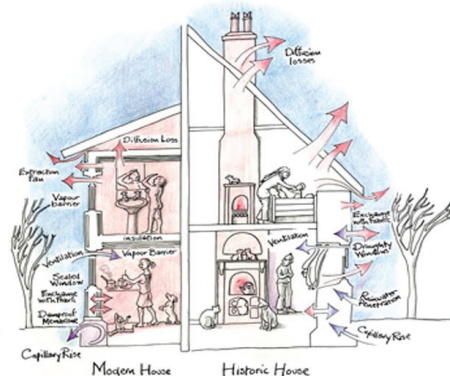
Check - With your local planning authority and conservation officer if the works you propose will need permissions and are suitable for your building.

Assess - Cost vs Efficiency. The payback time of proposed works. How much CO₂ it will save.

Fund - If you need to identify potential sources for funding and grant support.

Confirm - The best solutions for the tasks proposed.

Complete - The works.



Heat loss from a modern and historic building - English Heritage

We outline below a number of areas that you may want to consider looking into further. By applying the process opposite you will be able to properly assess how these alterations could help you.

In the future, making these adaptations will become more affordable through the government Green Deal initiative. The Green Deal is part of the recent Energy Act and is due to roll out in autumn 2012. It is a scheme allowing householders to make their homes more energy efficient, up to the value of £10,000, at no upfront cost. The cost will be offset by the savings made and repaid in instalments through energy bills. The cost will also be linked to the building rather than the owner.

For more information go to the website of the Department of Energy and Climate Change: www.decc.gov.uk

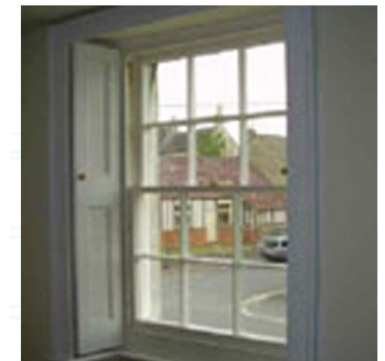
Roof - Insulating your loft can reduce CO₂ emissions by nearly one quarter. The most effective way to insulate roofs in historic buildings is to do so at attic level, creating a cold roof. If the attic space is used for accommodation then a warm roof will instead be needed, insulating between the rafters. Insulation can be inserted between the ceiling joists. Natural insulation materials such as cotton, hemp or sheep wool are advised for use in older buildings, although the latter is best avoided where the building in question contains historic collections that could be affected by moths. These materials can absorb moisture and let it evaporate while still remaining thermally efficient. This is highly important in these historic buildings as they were designed to 'breathe' and need to do so to prevent moisture build up.

Floors - Suspended floors can be insulated by carefully lifting the floorboards and laying natural insulation between the floor joists. Under floor vents should not be covered up and insulation should not completely fill the void underneath the floor, still allowing the floor to 'breathe'. Some historic buildings may have original sound and fire proofing under the floors; and before replacing this you may want to consider its historic relevance.

Windows - Discreet brush strips can be carefully installed into sash frame windows to help prevent draughts from getting into a building.

Walls - The majority of traditionally constructed buildings will have solid walls. This is when there is no internal cavity between the two skins. Technically there are only two options to insulate this type of construction; external or internal insulation. Both options can substantially alter the appearance and character of an historic building. This type of wall needs to 'breathe'; covering one of the skins with a non-permeable insulation can cause moisture build up which will lead to damp problems. Solid walls have a high thermal mass quality - they can absorb vast amounts of heat and release it back into a room slowly over the course of a day or evening. There is usually a strong case to avoid altering these types of walls if combined with effective insulation in other parts of the building.

Water - The amount of water we consume has an associated energy cost due to the amount of energy used to purify water and pump it to homes. Minimising our water consumption is another vital step in becoming more energy efficient and reducing our carbon footprint. Rainwater harvesting is also a sustainable way to water your garden or clean your car. It requires a water butt, or other means of collection, to be installed.



Historic window shutters - English Heritage