

Traditional Cotswold Buildings – Saving Energy

**Guidance for householders on energy efficiency
and generation measures suitable for traditionally
constructed buildings in the Cotswolds AONB.**



www.cotswoldsaonb.org.uk

Traditional Cotswold Buildings – Saving Energy

Traditional Cotswold houses are often built with solid walls, large rooms, badly fitting windows/doors and old boilers, and they typically use relatively large amounts of energy. There are many ways they can be improved both sympathetically and cost effectively. This guide provides advice on energy efficiency and generation to help you reduce energy use in your home.

The Cotswolds Conservation Board accepts no liability for the accuracy of this information. It is recommended that you take specialist advice from suitably qualified consultants and contractors, including for technical matters such as project feasibility, planning permission, listed building consent and building regulations.

Important points to consider before carrying out any work

Most traditionally constructed buildings can be made more energy efficient. However, you must ensure that work is carefully specified to avoid any harm to the structural integrity and character of the building.

It's a good idea to begin by identifying effective ways of minimising energy use and carbon emissions by systematically measuring, monitoring and reducing your annual energy consumption – and regularly review your energy tariff.

Will I need –

Planning Permission?

Contact your local authority planning department at an early stage to establish if planning permission or listed building consent is required.

Building Regulations Approval?

The Building Regulations specify how new buildings must be constructed to achieve a minimum level of acceptable performance. They typically cover health, safety, energy performance and accessibility requirements. These regulations usually only apply to new building work. However, certain 'material alterations' can trigger the need to comply with Building Regulations when carrying out work to

existing buildings. Contact your local Building Control Department for further advice before commencing work. An Energy Performance Certificate?

Energy Performance Certificates (EPCs) are required for existing buildings when sold or rented. House sellers need to have received or commissioned a Domestic Energy Performance Certificate before marketing their property. The audit is undertaken by a 'Domestic Energy Assessor' and is valid for ten years. Listed buildings are generally exempt from this requirement.

Installation of energy saving measures

When planning energy efficiency improvements, it is useful to establish how a building was originally constructed. This will help you decide which measures are compatible with the existing structure, fabric and overall character of your property.

Insulation materials based on natural fibres like wool can be very useful because they allow traditional buildings to 'breathe'. Synthetic insulation materials, such as glass fibre and rock wool, do not have this attribute.

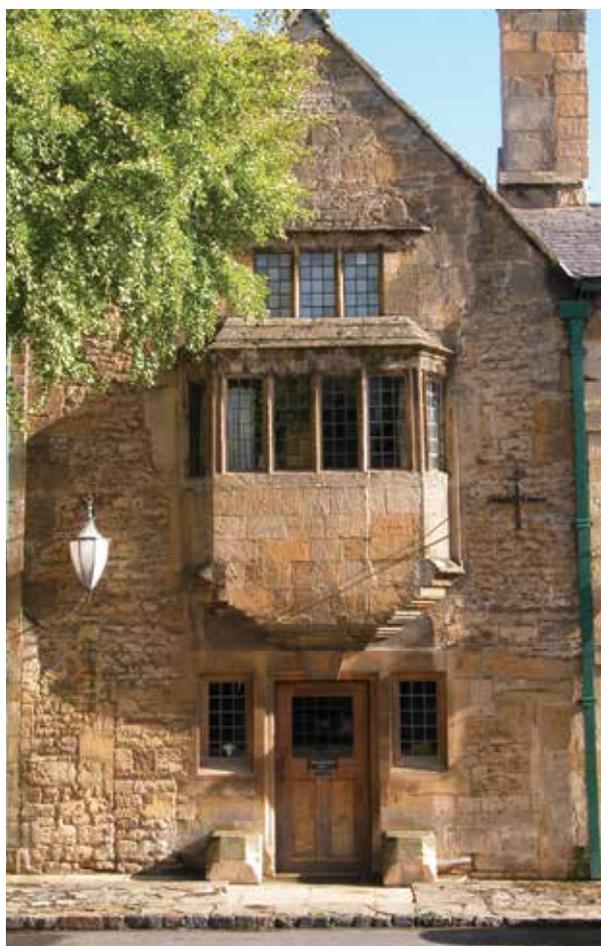
Insulating roofs

Since warm air rises, the roof is a good place to start with insulation; it is also one of the easiest places to add insulation to most buildings.

Typical traditional roofs are steeply pitched and contain insulation will largely depend on the use of the attic space, the depth of the ceiling joists and the required finished floor level(s) within the building.

Simply placing insulation (including natural treated wool insulation) above the ceiling of the top floor can be easily and cheaply achieved, but may not be feasible in many traditional 'habitable' attic rooms. A potential alternative is to consider installing boarded insulation to the underside of the roof rafters.

The complete roof structure must remain well ventilated to prevent the build-up of condensation and trapped moisture. A poorly ventilated roof can create the perfect conditions for timber decay such as wet rot.



Insulating walls

Most traditional properties in the Cotswolds are built with solid masonry walls. Insulation has to be specifically designed and carefully installed to ensure compatibility with each individual building. The cost of such bespoke fitting often makes other measures (e.g. roof insulation, draught-proofing and energy efficient lighting) a more attractive option for reducing energy use.

If the construction and finish of a vernacular building is in poor quality or repair it may be possible to add insulation externally. Slab insulation is generally fixed to the outside of the wall and is protected by a new water-resistant finish, such as render on expanded stainless steel mesh. But this approach is unlikely to be suitable for buildings with significant historic character.

Timber-framed construction provides good opportunities for adding insulation to walls. However, the specification and installation needs to ensure that thermal bridges, damp and timber decay problems within the structure are avoided.

Insulating floors

Solid floors Solid floors can be difficult to insulate, particularly when it is important to retain the height and finish of the existing floor. The process can involve lifting flagstones, excavating the subfloor, and installing a damp-proof membrane, floor insulation and screed before re-laying the flagstones. This can be a difficult and expensive job, and any major disturbance to the foundations and load bearing walls needs to be avoided.

New floors The alternative is to build a new floor on top of the existing floor. To do this, the usual approach is to lay rigid boards of insulation on top of a damp-proof membrane with plywood or chipboard on top. Bear in mind that this can add well over 100mm to the floor height and require adjustments not only to doors but also skirting boards, kitchen units, radiators, bathroom fittings and sockets.

You may be able to avoid some of these problems by using a thinner layer of high performance insulation such as 40mm of phenolic board or 30mm of aerogel.

Whichever approach you take, you should seek professional advice to ensure that any damp problems are addressed rather than exacerbated.

Suspended timber floors If the ground floor is of suspended timber construction, it is highly likely that heat loss through the floor will be significant in the winter. Suspended timber floors are usually ventilated to the outside to remove any moisture and prevent timber joists rotting, which means that the void under the floor can get very cold in winter. Insulation is installed between the floor joists either from above or below. The installation of draught-stripping and a good quality underlay and carpet can also help.

Insulation from below Whether you are able to install insulation from below or from above, it is important to keep the remaining void below the insulation ventilated. The best way to insulate from below is to push flexible, moisture permeable insulation such as sheep's wool into the gaps between the joists, pin a breather membrane under the insulation to hold it in place and then install a breather board (such as a wood fibreboard) to complete the job.

Draught-proofing windows and doors

It need hardly be mentioned that before installing draught-proofing to windows or doors, it makes sense to first identify and carry out any repairs that are needed.

Window openings The proportion of heat lost through the typically small area of window openings in traditional buildings is often much less than that lost through, for example, roof and walls. Nevertheless it can be reduced further.

While the form and appearance of double glazed UPVC windows is seldom appropriate for traditional buildings, secondary glazing is an effective measure. This is particularly so where other solutions are not suitable, for instance when gaps are too large to seal, windows are too significant to alter, or you need to protect stained glass. If secondary glazing is installed, the original

windows should not be draught-proofed, in order to prevent condensation.

Draught sources It is important to identify the extent of draughts and where they enter the building. Most gaps should be fairly obvious around doors and windows, and a more scientific fan pressurisation test could be used.

However, a degree of ventilation is essential to allow the fabric of older buildings to 'breathe'. Care should be taken in rooms with open fires or other combustion appliances, to avoid depriving them of a sufficient air source. Specialist advice should always be sought before draught-proofing any rooms containing open fires, stoves, gas or oil burning appliances.

Draught-proofing seals There are several types of draught-proofing seals that are widely available for doors and windows. Wiper (typically brush pile) seals are the only effective way of sealing the sides and meeting rails of sliding sash windows and sliding doors. These can also be fitted to the edges of casement windows or doors.

The installation of heavy, lined curtains to door and window openings can effectively reduce draughts and heat loss. Also consider window blinds and other bespoke solutions such as the use of suitable household fabrics.

Installation of efficient lighting, heating, hot water and energy generation systems

With the rising cost of energy, more efficient forms of energy use and generation – including renewable technologies – are likely to play an increasing role in the sustainability of traditional buildings. However, the fitting of such equipment can have implications for the historic fabric of a building. The local planning authority is best able to advise on the need for planning and building regulation consent for work.

Energy efficient lighting

Replacing and upgrading lighting appliances can often be a relatively simple and cost effective way of starting to improve energy efficiency in the home. Points to consider include:

- Traditional incandescent light bulbs are being phased out. Although popular, mini incandescent halogen lamps are also not energy efficient.
- Modern fluorescent strip lights and electronic control gear are becoming more efficient, although may not be particularly attractive.
- Compact fluorescent light tubes (ie 'energy saving light bulbs') are five times more energy efficient than incandescent bulbs and should last five times longer.
- LED lighting is starting to find its way into many applications. Although relatively expensive to purchase, it is particularly energy efficient and long lasting. Manufacturers claim that LED lights are 80% more energy efficient than traditional bulbs and generate 50% less carbon dioxide.

Gas and oil

Modern gas or oil fired boilers can give significant energy savings. The best condensing boilers are up to 90% efficient, using 30% or 40% less energy than older models. Remember that the siting of a new flue, if needed, requires careful consideration if not to impact on the historic fabric and character of a building. Planning permission and listed building consent may be needed.

New oil tanks may require planning permission, too, depending on size, position on the site, and location of the building.

It is also important to note that gas or oil fired boilers and their flues and tanks will need to be certified by an appropriately accredited installer. Other types of boiler and their flues may require approval under the building regulations.

Ensure all tanks and pipework are well insulated.

Renewable energy generation

The Board has issued a series of detailed guidance notes regarding renewable energy technologies suitable for use in the Cotswolds AONB.

See <http://www.cotswoldsaonb.org.uk/publications>

These include:

- Ground Source, Water Source, and Air Source Heat Pumps
- Solar Photo-Voltaic Panels
- Solar Thermal Panels
- Biomass
- Micro-hydro power
- Small scale wind power

Energy management and monitoring

Modern electronic thermostats and thermostatic radiator valves provide more effective temperature control within rooms and lower running costs. Reducing the thermostat setting by just 1 degree will typically cut heating costs by around 10%.

Consider replacing older domestic appliances and equipment with modern energy 'A' rated items. Most appliances now include an energy rating sticker which illustrates the relative running costs.

Also consider a home energy audit. Metering and monitoring electricity and gas consumption over time enables you to understand all aspects of your energy use and to compare usage for different periods and seasons as well as types – for example, heating, refrigeration and lighting.



Wool based roof insulation.

For Further Information see:

Energy Saving Trust

<http://www.energysavingtrust.org.uk/>

English Heritage Advice: Climate Change and your Home

<http://www.climatechangeandyourhome.org.uk/live/>

Energy Efficiency and Historic Buildings – Application of Part L of the Building Regulations to historic and traditionally constructed buildings

<http://www.english-heritage.org.uk/publications/energy-efficiency-historic-buildings-ptl/>

English Heritage: Energy Efficiency and Historic Buildings: Draught-proofing Windows and Doors

<http://www.english-heritage.org.uk/publications/eehb-draught-proofing-windows-doors/eehb-draught-proofing-windows-doors.pdf>

Sustainable Traditional Buildings Alliance

<http://www.responsible-retrofit.org/>

Warmer Bath – Improving Energy Efficiency of Traditional Homes, Bath Preservation Trust and Centre for Sustainable Energy (June 2011)

http://www.cse.org.uk/downloads/file/warmer_bath_june2011.pdf

For further information regarding how to contribute to the management of the Cotswolds AONB, please contact

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