

*a guide to the  
building regulations*



# Home improvements

*Homeowner's guide to*

## Building an energy efficient extension

The cost of energy is likely to continue to rise. The less we use the more money we save as well as reducing our impact on the environment. Many of the ways of improving energy efficiency also make our home feel more comfortable.

### A Householder's guide to building a sustainable extension

You can do a number of things all of which are best if planned for and built into your scheme rather than just added as after thoughts. Some of the things you can do will increase the cost of the extension but what you need to think about is saving over a period of time. This is called the pay back period after which you are in 'profit'. Some of the things suggested could attract grants from the Government through your energy company who you should contact.

#### Demolition

Sensitive reuse and salvage of demolition materials will save you money and is sustainable.

- Save broken concrete/bricks/blocks/paviors for use as hardcore in floor construction.
- There may be architectural features or salvageable materials (metal, bricks/slates) that can be sold.



## Materials

The correct choice and use of materials can have a massive impact on your carbon footprint and at the same time save you money without necessarily compromising appearance.

- Timber is perhaps the most environmentally acceptable material used in modern construction. However, this only applies if it is from sustainably managed forests, for example carrying Forestry Stewardship Council (FSC) certification.
- Store carefully, only order and bring to site when and what is needed.
- Minimum waste, extra skips are expensive and should be avoided.
- Brick production is energy intensive. Therefore consider using old bricks wherever possible. Existing bricks removed during alteration works can be dressed and cleaned for re-use and may well look better and match the existing property more effectively.
- Cement, as with brick, has an energy intensive production process and should be used sparingly.
- Concrete Blocks, provide good levels of thermal insulation but have an energy intensive production process.

## Insulation

Insulation is the easiest and most cost effective means for improving the energy efficiency of your home.

- Use as much as you can afford, as it will save you money in the long term.
- Maximise the use of insulation in floors, walls and roofs (new and also existing when the opportunity arises) e.g. in a traditional pitched roof 300mm would be appropriate.
- Think about continuity of insulation between walls, floors and roofs, ensure there are no gaps.
- Ensure that hot water vessels/systems and pipework are insulated both in the extension and in the existing dwelling.



## Ventilation

To avoid problems with condensation and to maintain good air quality ventilation needs to be a key consideration.

- Maximise use of natural ventilation.
- Ensure internal drying areas are well ventilated and heated (to avoid use of tumble dryers).
- Dry clothes outside when possible.
- Consider external covered drying areas, perhaps as part of a veranda/conservatory.



## Efficient boiler

Boilers can be amongst the least energy efficient appliances in your home and account for up to a third of all domestic CO<sub>2</sub> emissions. As the current lifespan of a boiler is 10-15 years having an old boiler could waste considerable amounts of your money.

A heating system that uses a high efficiency condensing boiler with the correct heating controls can save you as much as 40% on your heating bills. A high efficiency-condensing boiler is the most efficient boiler available. It converts more than 88% of the fuel it uses into heat, compared with around 72% for conventional boiler types.

## Renewable energy

Solar water heating systems gather energy radiated by the sun and convert it into useful heat in the form of hot water. This technology is well developed, with a large choice of equipment to suit many applications. Solar water heating works alongside conventional water heating systems to provide hot water.

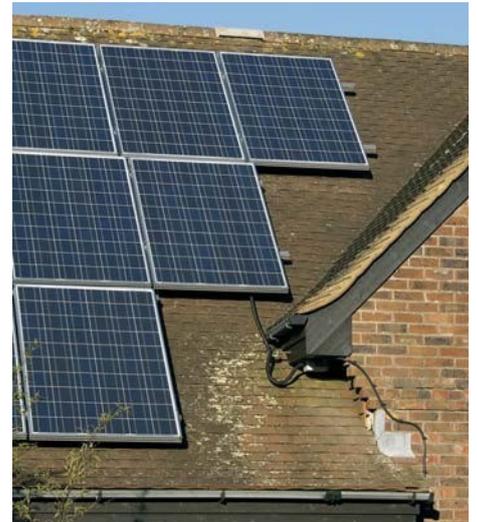
The benefits of solar water heating systems:

- It can provide almost all of your hot water during the summer months and between 50 to 70% year round.
- It will reduce your impact on the environment. The average domestic system can reduce CO<sub>2</sub> emissions by 0.25-0.5 tonne per year, depending on the fuel replaced.

### Different types of system – solar heating or Photo Voltaic voltage (PV) cell

There are two types of solar water heating systems: flat plate systems and evacuated tube systems. Evacuated tube systems are more efficient and therefore can be slightly smaller whilst achieving the same output. The system which best suits your needs depends on a range of factors, including:

- Amount of south-facing roof slopes.
- Existing water heating system (some combination boilers may not be suitable for integration with a solar water heating system).
- Photo Voltaic Cells convert the sun rays to electricity to power your house and if there is surplus this can be fed back to the grid for which you will receive credits. For further information to go [www.cen.org](http://www.cen.org)



## Glazing

The amount of glazing and its position has a dramatic effect on energy use and comfort:

- Glass is thermally inefficient. Triple glazed units or low 'e' glass are six times more efficient than double glazed units.
- Windows placed in a south facing elevation will provide better lighting and some solar gain but care should be taken in the amount of glazing to avoid overheating. Windows with solar reflective film will help.
- Limit the area. Keep this to about 25% of the floor area plus the area of the original glazing covered over by the extension.
- Timber frames offer the best solution. PVC frames are low maintenance but difficult to repair/dispose/recycle.



## Conservatories

These should not be considered as a cheap alternative to a proper extension as they can be a major source of energy loss, particularly if they are used to extend living accommodation in the winter, or if mechanical cooling is required to counteract overheating during the summer months. Research has shown that if a conservatory is heated to the same extent as a normal room, this can double the heating bill of a well-insulated new home.

## Water use

Water is a valuable and limited resource and not to be wasted.

- Use a rainwater butt with an overflow linked to a soakaway (not to combined surfacewater/foulwater drains), rainwater is better for plants as it's chlorine free.
- Minimise use of external hard surfaces due to potential problems with rainwater run off/flooding risk, habitat loss and a visually bleak appearance.
- Save water, toilets account for up to 35% of water use. By fitting a low flush or eco-flush, a device with high and low settings, you could reduce (drinking quality) water used to flush the toilet by up to 75%.



## Fixtures and fittings

- Lighting accounts for 10 - 25% of the electricity bill in most homes. Simple tasks like switching off lights can save energy and money. Energy saving bulbs/ tubes – even though they have a higher initial cost – have a longer life span than equivalent regular bulbs and lower running costs: you can see a payback for your purchase within a year. It is estimated that if every household in the UK used one energy-efficient light bulb, we could switch off a whole power station.



Choose good quality, energy efficient bulbs or appliances (remember to look for the Energy Efficiency Recommended logo when you buy). Poor choice can make a well built extension waste the savings made. Ensure that all external lighting is equipped with controls that turn the lights off in daylight and after a specific period of time or at lower light levels during hours of darkness.

- Before purchasing appliances, always look for their Energy Efficiency Recommended logo (European energy labels). These help you to choose more efficient products which save you money. Most appliances are rated on a scale of 'A' to 'G' with 'A' being most efficient and 'G' the least. Normally these labels will show the energy/water consumed and for washing machines, tumble and spin driers the noise levels also.



## Recycling

- Leave room for storing recyclables in the kitchen layout
- Make space for bin/recycling bins externally
- Compost organic waste



## Who can help me on this?

**Local Authority Building Control:** contact [www.labc.uk.com](http://www.labc.uk.com)

**RIBA – Green Register**

A number of Architects and Surveyors specialise in sustainability and energy efficiency.

## Are these requirements or recommendations and are there regulations I have to comply with?

Yes, you will have to make an application under the Building Regulations which cover certain aspects such as ventilation, insulation and drainage.

Your Local Authority Building Control Team will be happy to help.

Building Control will also be happy to advise as to compliance with the Building Regulations and on the issue of completion certificates at the end of the work. This is necessary should you wish to sell your property in the future.



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