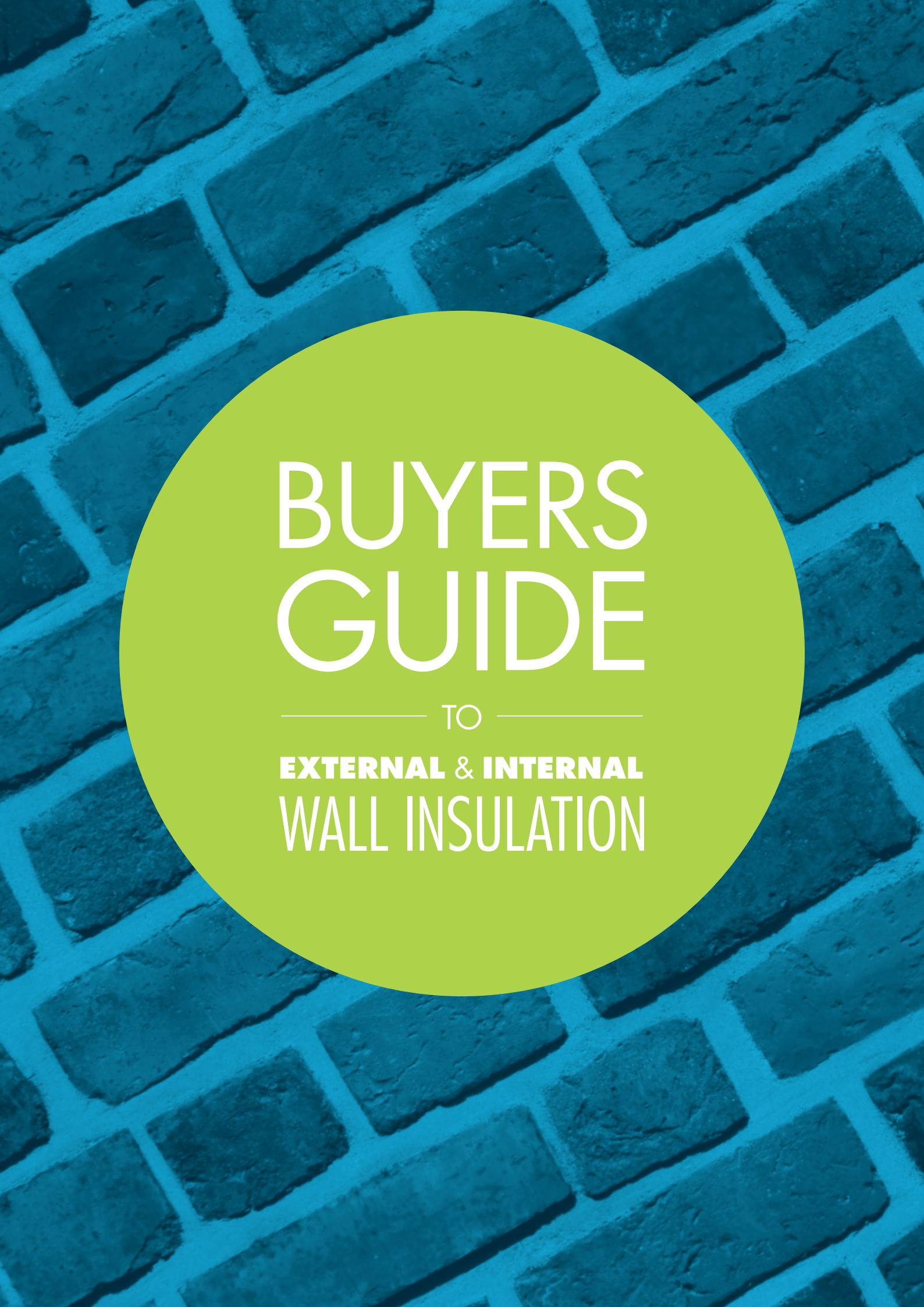


BUYERS GUIDE

TO

EXTERNAL & INTERNAL WALL INSULATION

Create a **Greener Home**

Investing in major renovations to your home requires some serious thought, so we have written this guide to help you make an informed decision about external and internal wall insulation. This guide covers:

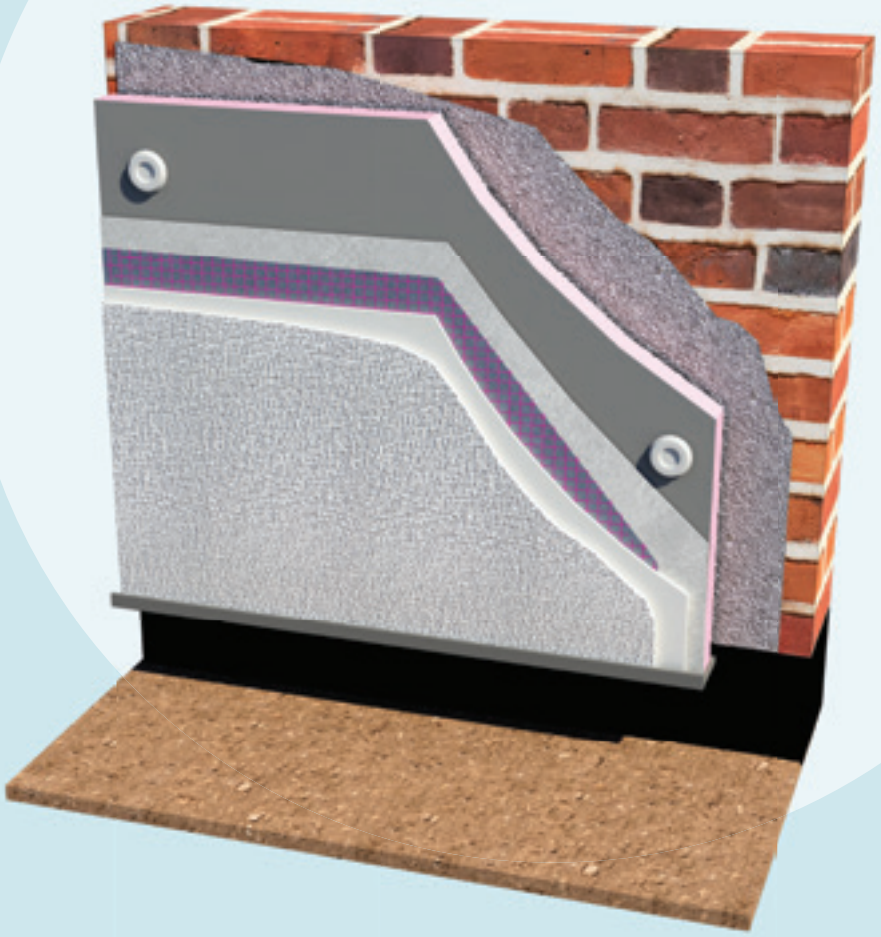
- Different types of Wall Insulation
- External Wall Insulation (EWI)
- Internal Wall Insulation (IWI)
- Finance for your Home Insulation Project
- Finding and Choosing a Supplier
- Glossary

External and Internal **Wall Insulation**

If your home was built before 1920, it probably has solid walls with no gap between. This means that the cavity cannot be filled with insulation, and your house will lose a lot more heat than modern homes. Even if your house was built later than 1920, it may have a reduced cavity or solid walls, so you may need to consider how to best insulate it. There are two alternatives for insulating solid walls – fitting insulation to the outside of the walls, or fitting it internally. There are advantages and disadvantages to both systems.

How do I tell if I have Solid Walls?

A building surveyor or Green Deal Assessor will be able to determine if the walls are solid. As a guide, if the walls are brick, the pattern of bricks may indicate that the walls are solid – look for alternating long and short brick faces (see photo). The thickness of the walls is another indication – if you measure at a window or door frame, and the wall is less than 300mm thick, then the wall is probably solid. If your walls are stone, however, they will be a lot thicker than this, and may still be solid.



External
Wall Insulation

External wall insulation is particularly suited to rendered or painted properties, as it can be installed and covered with rendering. However, homes with exposed bricks can also be insulated externally as a simulated brick face can be used to cover the insulation.

Why Choose External Insulation?

The benefits of External Insulation include:

- solving problems with your existing render
- improving the look of your home
- increasing the value of your home by an estimated £16,000 to £38,000 (source: DECC study)
- virtually eliminating condensation, removing the chilly damp atmosphere
- low maintenance
- keeping the house warm in winter and cool in summer
- giving total weather protection from rain, cold and heat
- no disruption inside your home while it is installed
- no reduction in internal floor area

Homes with exposed bricks can also be insulated externally as a simulated brick face can be used to cover the insulation.

Each type of External Insulation has different properties, so a good installer will help you decide which is most appropriate for your home.

What problems are there with External Insulation?

- External insulation can be more expensive than internal insulation, but not always
- It can be difficult to get planning permission in a Conservation Area
- Brick houses will need a simulated brick facing if rendering is not appropriate
- It needs a specialist to design the system and install it properly
- It must be correctly fixed so that it does not bridge the Damp Proof Course or crack
- Rising damp must be rectified before fixing the insulation so that damp is not trapped inside

Is all External Insulation the same?

There are a wide variety of external wall insulation materials and fixing systems available. Each type has different properties, so a good installer will help you decide which is most appropriate for your home.

The key factors you need to take into account for each type of insulation are:

- Fire rating
- Thermal performance (how well it insulates relative to its thickness)
- Durability
- Biodegradability and environmental impact
- Moisture resistance
- The breathability or vapour permeability (particularly for solid walls)
- Cost

Using insulation with a high degree of vapour permeability ensures your house can breathe, reducing condensation and preventing mould from forming.

Some of the most commonly used insulation materials are:

Expanded Polystyrene Boards
While these are suitable for insulating floors, they do not insulate as effectively as other materials when used for external wall insulation, so a greater thickness is required to insulate an external wall. This type of insulation material can give off toxic gases in the event of a fire, so particular care must be taken to ensure it is sealed in correctly, which is difficult around door and window frames.

Phenolic Foam Boards

Phenolic foam boards offer better insulation than expanded polystyrene, so a thinner layer of insulation can be used to offer the same amount of insulation which is particularly important when retro-fitting homes.

Insulation	Thickness to achieve 0.28 u value Wm2K (mm)	Thermal Conductivity Lambda value (λ)*	Vapour Permeability (μ min)	Vapour Permeability (μ max)
Mineral Wool (Rockwool)	110	0.036	1	1
White EPS	120	0.038	0.015	0.03
Lambdatherm Grey EPS	100	0.032	0.015	0.03
Phenolic (Kingspan)	60	0.02	20	20
Polyisocyanurate	80	0.027	0.3	0.3

Note: * For thermal conductivity, lower numbers indicate better thermal performance

Source: British Board of Agrément (BBA) and Kingspan

Polyisocyanurate and Phenolic Foam both offer excellent insulation, so a thinner layer of insulation can be used. Phenolic foam also offers exceptionally high vapour permeability, which can help reduce condensation and prevent mould from forming.

Mineral wool

This material is rather like the fibreglass roll in your loft, but compressed into hard workable pads or panels. Mineral wool has a similar thermal rating to polystyrene but has much better fire proofing qualities.

Polyisocyanurate Panels

Polyisocyanurate, also referred to as PIR, polyiso, or ISO, is a thermo set plastic typically produced as a foam and used as rigid thermal insulation. It has a high thermal efficiency, so the panels are relatively thin.

Fixing External Wall Insulation

On level walls, the boards can be fixed using plastic plugs and anchor bolts. On walls which are not even and level, a bonding adhesion coat is used to level the boards. Once the bonding has been left to set for 24 hours, plugs and pins are used to further secure the boards.

Internal
Wall Insulation

Why Choose Internal Insulation?

The benefits of Internal Insulation include:

- no problems with changes to the exterior of your home
- no planning permission required
- convenient to install if already refurbishing the interior of your home
- suitable for flats and apartments where the exterior cannot be changed

What problems are there with Internal Insulation?

- Internal insulation does not solve problems with condensation
- It can actually cause condensation and mould to form between the brickwork and the insulation panels if not properly ventilated
- Internal insulation does reduce the internal space of your rooms
- External surfaces of your home will still need work to reduce water ingress into your home
- Does not provide any added protection from weather or temperature change

Composite insulation boards take up less floor space, and are generally thinner than framed dry lining systems, so are great when space is at a premium.

Is all Internal Insulation the same?

No, there are different types of internal insulation.

Bonded composite insulation boards

These are fitted and bonded directly to your wall in sections. Composite insulation boards take up less floor space, and are generally thinner than framed dry lining systems, so are great when space is at a premium.

Foil Quilt Insulation

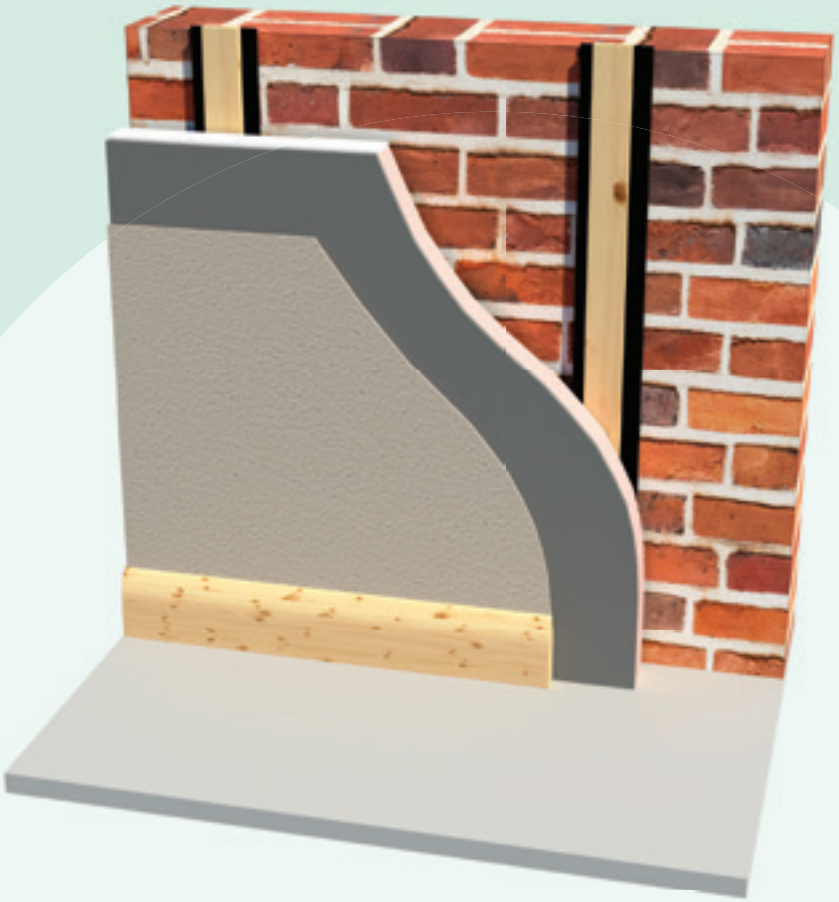
Also called Super Quilt, this was designed by NASA for the space programme, and is used in lofts and on wall framed systems.

Framed dry lining wall insulation

This can be fitted to a wooden, metal or composite framework on your wall and either insulation fitted onto the framework or to the inside between the vertical timbers forming the wall frame. In all cases it is advisable to use a special damp-proof insulation panel. This overcomes the challenges of dealing with walls that are in very poor condition, where composite boards just wouldn't be effective and there is a high risk of condensation forming.

How Can I get the Advantages of both External and Internal Insulation?

External and internal insulation can be combined in one property – known as a "Hybrid System". This works well for terraced houses, where the front of the property must fit in with the rest of the row. Internal insulation can be used on the street facing walls, and external insulation on the rear of the property, leaving more internal space in those rooms and retaining the original architectural features of the property.



Finance
for your Home Insulation Project

There are a number of government backed schemes which may help towards the cost of your home insulation project, or you may choose to use savings or a personal loan to fund the project or a mix of all of these financing options. Here are some of the advantages and disadvantages of each funding method.

Green Deal

You have probably heard of the government backed initiative, Green Deal, to help home owners to become more energy efficient. The funding for external insulation is complicated, but a Green Deal Adviser will be able to advise you the best way to access funding.

You will need to have your property assessed by an independent, accredited Green Deal Advisor. This will give you information about the current energy performance of your home, and the specific measures you would have access to under Green Deal to improve this performance.

The Golden Rule

The Green Deal Advisor's assessment will determine whether the predicted savings will be equal to or greater than the cost of finance to implement the energy saving improvements – the "Golden Rule" of Green Deal. The improvements must be carried out by a Green Deal approved installer, and you will repay the cost in instalments through your electricity bill. The additional cost of the repayments should be offset by the savings in energy usage, so your total bill should not be more than it was before the improvements were made.

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Certified Green Deal providers, such as Cobalt Carbon Free, are identified by the Green Deal quality mark.

ECO Scheme

ECO stands for the Energy Company Obligation, and consists of three different obligations for the 6 big energy companies:

Affordable Warmth Obligation

To provide heating and insulation improvements for low-income and vulnerable households (but social housing tenants are not eligible for affordable warmth).

There are complex eligibility criteria for this means-tested scheme. Call the Energy Saving Advice Service on 0300 123 1234 to check whether you might be eligible, and to apply if you are.

Carbon Saving Communities Obligation (CSCO)
This is for people living in the bottom 15% of the UK's most deprived areas. It is expected that this element of ECO will particularly benefit the social housing sector.

Carbon Energy Saving Obligation (CERO)
This is of particular relevance if you are looking to improve the insulation of your solid-walled property, as it is to provide funding to insulate properties with solid walls (internal and external wall insulation). It can also be used to fund the insulation of 'hard-to-treat' cavity walls, where the cavity is too small or obstructed to use cavity fill insulation. This is not means-tested but can be used in conjunction with the Green Deal. (Source: Energy Saving Trust)

Unlike Green Deal, the ECO funding doesn't have to be paid back. As a result of the home energy efficiency improvements you make, not only will your energy bills reduce but so will the CO_2 created by your family and in the home. Carbon savings are measured in tonnes and are traded on the open market to raise funds through energy companies to help pay for home improvement measures.

For both Green Deal and ECO support, you will have to use PAS 2030 and Green Deal Approved suppliers such as Cobalt Carbon Free to do the work.

Your Savings or a Personal Loan

As interest rates are currently very low, the energy savings gained from insulating your home can exceed the amount of interest you lose by using your savings. A personal loan can also be a quick and effective means of paying for home insulation. Either of these will give you complete control of who does the work on your home, and the whole process can be a lot quicker than waiting for Green Deal or ECO approval.

Remember, you are not only going to save on fuel bills, but are also increasing the value of your property, improving its appearance and its appeal to buyers. A good investment all round because you will reap the rewards for a lifetime!

Please note that this information does not constitute financial advice.

As interest rates are currently very low, the energy savings gained from insulating your home can exceed the amount of interest you will be losing by using your savings.

Finding and Choosing a **Supplier**

Have they worked on your type of property before?

Trusting somebody to do major work on your home is a difficult decision. Here are some of the factors you need to consider:

- Does the company have accreditations such as Green Deal?
- Do they share your environmental values?
- What references do they have?
- Have they worked on your type of property before?
- How long have they been trading?
- What kind of guarantee or warranty do they offer?
- Do they employ their own installers or are they using subcontractors?
- Have they worked on local properties that you can view?
- Can they work within any Conservation guidelines? e.g. offer lime rendering
- What do they offer in terms of after care and maintenance?
- Do you feel confident they care about your property and the environment?

Glossary

Energy Performance Certificate (EPC) – required for building, selling or letting a property. It contains information about a property's energy use and typical energy costs and recommendations about how to reduce energy use and save money. (Source: www.gov.uk)

Green Deal – a financing mechanism that allows people to pay for energy-efficiency improvements through savings on their energy bills. (Source: Energy Saving Trust)

Green Deal Advice Organisations – are responsible for ensuring that the Green Deal Assessors that are contracted to them are suitably qualified, have valid insurance and facilitate CPD for their Green Deal Assessors. Importantly they must also have robust and well documented management systems in place, undertake audits (both on the work of the GDA and on internal processes) and deal with customer complaints. (Source: National Energy Service).

Green Deal Advisor (GDA) – an individual employed or contracted by an authorised Green Deal Assessor who visits the property to undertake a Green Deal assessment and make recommendations for energy saving improvements.
(Source: Green Deal Oversight and Registration Body)

Green Deal Assessor – only an authorised Green Deal Assessor can carry out an Green Deal Assessment and produce a Green Deal Advice Report which outlines the energy efficiency measures that can form a basis for the Green Deal Improvement Package.
(Source: Green Deal Oversight and Registration Body)

Green Deal Installer – only an authorised Green Deal Installer can install energy efficiency improvements under the Green Deal finance mechanism. Installers may specialise in one or multiple measures.
(Source: Green Deal Oversight and Registration Body)

The Green Deal Oversight and Registration Body – authorises and approves all Green Deal Assessors, Advisors, Installers and Providers and certifying bodies.

Green Deal Provider – Green Deal Providers arrange Green Deal Plans, provide finance, and arrange for the installation of the agreed energy efficiency improvements through an authorised Installer.
(Source: Green Deal Oversight and Registration Body)

PAS 2030:2012 is a Publicly Available Specification for the installation of energy efficiency measures in existing buildings. It also recommends best practice for managing the installation process and providing services to the customer before, during and after installation.
(Source www.gov.uk)

PAS 2031:2012 is applicable to certification bodies that are providing conformity evaluation services in respect of PAS 2030.
(Source www.gov.uk)

Thermal Conductivity – the measure of the ability of a material to transmit heat. Good insulators have lower values.

U Value – a measure of heat loss in a building element such as a wall, floor or roof. It can also be referred to as an 'overall heat transfer co-efficient' and measures how well parts of a building transfer heat. This means that the higher the U value the worse the thermal performance of the building envelope. A low U value usually indicates high levels of insulation. (Source; Royal Institute of British Architects)

Vapour Permeability – the ability of a material to allow water vapour to pass through it.

Further information and Sources:

Energy Saving Trust
www.energysavingtrust.org.uk

National Energy Service
www.nesltd.co.uk

The Green Deal Oversight and Registration Body
http://gdorb.decc.gov.uk

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