Sustainability *first*

The Government's Heat and Energy Saving Strategy Consultation

Response from Sustainability First

May 2009

Sustainability *First*

Sustainability *First* was set up to develop new approaches to sustainability. Its primary focus is on policy and solutions within the UK, but draws on experiences and initiatives both within and outside the UK.

Sustainability *First* develops implementable ideas in a number of key policy areas – notably, energy, water and waste - where it can make a difference. It undertakes research; publishes policy and discussion papers; organises high level seminars and other events. Sustainability First is a registered charity.

Sustainability *First*'s trustees are : Ted Cantle (Chair); Phil Barton (Secretary); Trevor Pugh (Treasurer); John Hobson; Derek Osborn; David Sigsworth. Its projects are developed by the trustees and a number of consultants.

This response has been primarily written by two of SF's consultants – Gill Owen and Judith Ward – with inputs and comments from the trustees.

Sustainability First is a registered charity number 1078994

Sustainability First
c/o CHPA
Grosvenor Gardens House
35-37 Grosvenor Gardens
London SW1W 0BS

www.sustainabilityfirst.org.uk

E mail : info@sustainabilityfirst.org.uk

Introduction

Sustainability First is pleased to contribute to this consultation on a 'Heat and Energy Saving Strategy'. This document sets out SF's views on what it considers to be some of the key issues for such a strategy, but does not attempt to respond to all the issues or questions raised in the consultation. A more detailed paper on the key issues is currently in preparation and will be on the SF website by early June.

The main issues covered in this response (and which will be addressed in more detail in the forthcoming paper) are :

- The strengths and weaknesses of the present arrangements – including the supplier obligation, grants for low income households, and proposed new incentives for renewable heat and the feed in tariff for renewable electricity.

- The consultation suggests that a new approach is needed to achieve a step change in the types and volumes of measures installed, but also potentially relies on a largely voluntary approach. This approach raises a number of questions : whether delivery can be achieved when no one is clearly obligated ; whether radical upscaling of insulation (particularly solid wall) is sensible given other alternatives for reducing carbon emissions.

- Different options for delivery of energy sector obligations on energy efficiency (including competitive versus single agent)

- Energy suppliers, networks, generators, local authorities – where should obligations be placed ?

- Dealing with environmental (e.g. carbon emissions) and social (e.g. fuel poverty) targets for energy sector obligations

- Relative roles of energy efficiency, renewable heat and renewable electricity

- Dealing with older and "hard to treat properties " – e.g. potential and barriers to solid wall insulation, double glazing etc

1.Objectives of the strategy

1.1 There are two possible objectives for the Heat and Energy Saving Strategy :

- To reduce carbon emissions
- To reduce fuel poverty

These two objectives can be tackled separately or together and there are pros and cons of each approach. However, it is important to have schemes that are designed to meet the main objective they are trying to address. A key weakness of the current CERT programme is its attempt to contribute to both carbon reduction and fuel poverty reduction objectives.

1.2 It is important to recognise that there are different ways of delivering the carbon saving objective :

- improve the thermal performance of the house (insulation)
- reduce the carbon intensity of in-house energy supply (more efficient boiler, microgeneration, heat pumps, solar hot water heating etc)
- change householder behaviour (switch off , turn down thermostats etc)
- de-carbonise remote energy supply (e.g. biogas in the gas supply system; renewable sources of electricity)
- reduce the carbon impact of household appliances (improved standards)

The interactions between these different options for reducing emissions need to be taken into account to avoid unnecessary costs and inefficiencies, particularly over the long term. For example, there may be less need to encourage take up of more expensive and less cost effective insulation measures (e.g. solid wall insulation) if heat sources are becoming lower carbon (e.g. biogas in the gas distribution system, heat pumps with decarbonised electricity). In this example a decision on solid wall insulation could then be left to the household to choose whether to install it (and thus no subsidy would be provided) based on cost and comfort considerations.

It is also important to note the role of the EU ETS as a means to incentivise lower carbon electricity. Further initiatives to reduce carbon emissions from electricity need to be assessed as to whether they will deliver additional savings over and above those incentivised by the EU ETS.

1.3 Is it right to place so much emphasis on households ?

The Consultation mainly concentrates on the household sector, yet it may be easier to get more savings more easily in other sectors. Indeed, even in respect of reducing and/or de-carbonising household energy consumption some savings may be better capable of

realisation upstream in the energy supply system (for example by decarbonising network gas and electricity), than through action at the household level. However, there are reasons why a focus on households has to be part of the solution :

- There are already two major schemes – the EU ETS and the carbon reduction commitment – to address the business sectors
- household energy use is substantial and therefore it is worth reducing emissions in this sector
- many savings would go unrealised without intervention due to costs of measures and a number of barriers
- behavioural change (using less) at the household level could make an important contribution

1.4 Is there a need for a "step change" change to meet the carbon targets ?

Such a step change may be needed in terms of incentives, funding and delivery arrangements for the household sector

The consultation document says the Government's aim is to achieve :

- 7 million whole house retrofits (i.e. wall, floor insulation and double glazing and/or low carbon energy sources) by 2020
- all homes to have had whole house retrofits by 2030

And the Government takes the view that to achieve these whole house retrofits will require new finance mechanisms to allow consumers to spread the costs of measures.

However, the proposed strategy raises a number of issues :

- The need to avoid double funding leading to higher costs than necessary and potential confusion for householders due to the different schemes aimed at reducing carbon emissions in the household sectors – e.g future incentives for insulation and proposed new incentives for renewable heat and the feed in tariff for renewable electricity.

- The paper suggests that a package of external solid wall insulation , floor insulation and double glazing can be provided for £5800. This is a substantial underestimate. New UPVC windows cost at least £500 each ; new wooden ones at least £1000 each (for a house with 8 windows the cost would therefore be at least £4000). Cost estimates for solid wall insulation have been difficult to find because so little work is currently done but some recent work suggests £10,000-15,000 plus is likely

when all preparation and consequential costs are taken into account.[1] The package is thus likely to have a cost more in the £15,000-20,000 range.

- There is likely to be limited consumer interest (and even consumer resistance) in some measures, even if costs are reduced by subsidy or spread over many years. This will apply particularly to those measures that are likely to be disruptive and/or to change the appearance of the property or raise concerns about dampness. Internal solid wall insulation is highly disruptive and thus will probably only be applicable on a whole house basis when major renovation work is being undertaken (room by room work may be possible but clearly this will raise costs). Internal insulation also reduces heat transference to outside walls and thus may cause dampness concerns. External solid wall insulation will change the appearance of the property and thus will be resisted by many consumers for aesthetic reasons and concern about the possible negative impact on property values (it is possible to provide a brick finish with external solid wall insulation but this raises costs further). In conservation areas (at least 1 million properties in England are in conservation areas) external solid wall insulation will probably not get planning permission.[2] The realistic potential for solid wall insulation thus needs to be assessed. (see Appendix on solid wall insulation)

- The consultation suggests that a new approach is needed to achieve a step change in the types and volumes of measures installed, but is radical upscaling of insulation sensible given the costs and other alternatives for reducing carbon emissions ?

- The consultation proposal also potentially relies on a largely voluntary approach – can delivery be achieved when no one is clearly obligated?

1.5 Timescale

There is a need to clarify the point when changes in the present arrangements will be needed . The following assumptions have been made in this response :

- that the main need for new arrangements will be beyond 2015 by when most lofts and cavity walls will have been insulated
- however, although existing mechanisms could continue until 2015 new ones should start at least to be used on a pilot basis from 2012

[1] Energy Efficiency Partnership for Homes and Energy Saving Trust. Solid wall insulation supply chain review. April 2009

[2] Information taken from the English Heritage web site.

2. Obligated parties and their targets

2.1 At present electricity and gas suppliers are obligated to achieve energy saving targets set through CERT (and if they do not meet the targets they could be subject to substantial financial penalties). Major generators are now being similarly obligated under the CESP programme.

The obligations on gas and electricity have been effective in securing delivery of substantial numbers of energy saving measures and suppliers have regularly exceeded their targets allowing subsequent targets to be set at higher levels.

2.2 Some key issues in terms of future obligations are :

- What are the benefits of an obligation as opposed to a voluntary approach – the key benefit is certainty of delivery
- Who should be obligated and to do what – e.g. provide funding, meet targets, delivery ?
- Should the obligation be input (measures) or outcome (actual CO2 reductions) based?
- A very important consideration is that anyone obligated must be able to control delivery if they will be subject to a penalty for non delivery. For example, an obligation on energy suppliers to achieve verified reductions in energy consumption by households (as opposed to the deemed savings attributed to energy saving measures approach adopted under EEC and CERT), would be very difficult for the suppliers to achieve as it would be dependent upon householder behaviour and not just the installation of measures.

2.3 Possible options for obligating funding and or delivery are as follows. Some of these are alternatives whereas others could work in combination. They are outlined in more detail in Section 5 below.

- No obligation – the finance model set out in Chapter 3 of the Consultation paper
- Obligations on electricity and gas suppliers – e..g, a carbon reduction programme and delivery of FIT and RHI incentives to households not eligible for fuel poverty schemes (mostly input, some outcome)
- Obligations on DNOs or National Grid and/or generators to contribute to tackling fuel poverty – for example a levy to raise funds to help tackle fuel poverty area by area (follow on from CESP model) (for the DNOs etc this will be input – funds raised; the levy agency and its contractors could have input or outcome targets)

- Obligations on DNOs or National Grid to help deliver carbon reductions from non fuel poor households – e.g. a levy to fund measures for able to pay households (could be a vouchers scheme)
- Local authorities – no obligation but a delivery option (an alternative to the finance model set out in the Consultation)– e.g. to offer measures to households (owner occupiers and private landlords), the costs of which to be collected with council tax over an extended period
- Local authorities and other social housing landlords to be obliged to achieve higher standards in all their own stock by certain dates (input ?)
- Local authorities obligated target for all housing in their area

3. Role of regulation, penalty, incentivisation on householders

A number of questions arise in relation to the extent to which householders should receive incentives, or be required to take certain actions.

- Both politically and practically there will be a need for adequate consultation if householders are to be obliged to take certain actions or if they are going to face substantial increases in energy bills.

- Should householders be obliged to do more on energy efficiency when renovating their homes ? At present building regulations apply to certain home improvements – for example replacement windows and glazed doors have to meet stringent high standards of double glazing and require building control approval which adds to the costs of these measures – particularly for those households who wish to install replacement wooden rather than UPVC windows and doors. How much further could such regulations go without alienating many consumers ?

- How much subsidy is needed by those on average and higher incomes to get them to act ? For established relatively low cost measures such as loft and cavity wall insulation, more efficient appliances and lightbulbs, there may be a case for substantially reducing levels of subsidy, particularly if householders are required to have some such measures before they can qualify for subsidy for newer and higher cost measures. There is a need for a holistic approach to this between insulation and microgeneration and heat incentives – i.e. households should not qualify for a feed in tariff or renewable heat incentive unless they have adequate loft and cavity wall insulation where applicable.

- For middle and higher income households incentives should only be provided for measures that deliver proven carbon savings - householders may choose to do some measures that save them money or improve comfort or provide other benefits but these should not be subsidised. New technologies should be properly assessed and their savings (in real situations) monitored before being promoted via subsidy schemes. The results of such trials should also be widely disseminated to enable consumers to make informed choices, even where no subsidy is being provided. There is a need to avoid what has happened with micro wind turbines which were extensively promoted (including by stores such as B&Q) without proper evidence based information on their effectiveness. Now that such information has become available it is clear that the micro turbines available on the market today are unsuitable for most urban locations, as the wind regime is not sufficient to produce useful amounts of electricity.[3]

- Low income households will need much higher levels of subsidies than those on middle and higher incomes and in some cases will need 100% grants. This is particularly likely to be the case as lower income households may realise much smaller cash savings on their bills as a result of interventions because many of them underheat their homes and thus may take many of the benefits in increased comfort rather than reduce demand. This is desirable for social welfare reasons even if lower carbon reductions are achieved and thus programmes aimed at low income households should have as their main aim the reduction of fuel poverty rather than carbon emission reductions. However, with limited funds available for subsidies careful targeting on those in the most need becomes all the more important. The area based approach can be an effective way to find households most in need – i.e. those who qualify for means tested benefits, are vulnerable (due to age or infirmity) and who live in properties most in need of improvement (lack of insulation, ineffective or expensive heating)

4. What measures ?

4.1 In choosing which measures to fund there are three important factors to consider, but all too often only the first two of these are examined (and the second is often only partially considered)

- what is technically feasible and technically would produce real benefits
- what is economically sensible – i.e. the costs and benefits (taking account of all costs including transaction and consequential costs – some of these are often

[3] Encraft. Microwind – a catalyst for change in UK energy culture? A report on the social and market aspects of the Warwick Wind Trials Project. March 2008

described as "barriers" to action that is cost effective, but alternatively they can be considered additional costs that may reduce cost effectiveness)

- what is practicably achievable – i.e. what householders will be willing to take up (e.g. for non cost reasons such as aesthetic or level of disruption) and/or is achievable taking into account other constraints (e.g. conservation area status and solid wall insulation and some renewables; access to and delivery of fuel sources - biomass boilers in urban areas)

Basic insulation (lofts and cavity walls) is worth doing on all three factors and should always be done before any renewable technologies are financially supported by the Government or energy sector subsidy. But some forms of renewables will make more sense than solid wall insulation in some circumstances (economically and practicably – i..e for cost and non cost reasons).

4.2 A key question is whether physical measures should continue to get deemed savings scores – i.e. the savings would not have to verified for each installation. Until properties have smart meters where before and after consumption (and possibly emissions) could be measured, it is likely to be too costly to attempt to verify savings for each property. However, more substantial monitoring of actual savings of a robust sample size should be carried out on an annual basis and the results published. This will inform the development of policy, enable provision and level of subsidy for individual measures to be adjusted from time to time. It will also provide consumers with better information, to enable them to decide which measures to install and also how they might need to change their behaviour to ensure they get the best value out of measures installed.

4.3 Hierarchy of measures

Some guidance needs to be provided to ensure that the most effective (and cost effective) measures are installed first. This will help to determine which measures should qualify for subsidy and also, where subsidy is not considered appropriate, help consumers to decide where it is best to spend their money.

The following initial suggestions are provide for hierarchies of measures, based on current available information, although clearly these would need to be validated by more detailed assessments.

Houses and low rise flats :

- loft and cavity wall insulation
- efficient gas or oil boilers and controls
- solar hot water heating
- solid wall insulation or heat pumps

- other microgeneration (e.g. biomass boiler, solar PV)

High rise flats :

- on site CHP or district heating
- heat pumps
- efficient electric heating plus solid wall insulation

Behavioural change measures

For these to be included in any obligation scheme (and hence to generate credits for obligated parties) they should lead to quantifiable and verifiable (i.e not deemed) savings. Smart meters will thus be key to this.

5. Delivery

This section develops the options outlined at 2.3 above for funding and delivery of the main programmes to incentivise household carbon emissions.

5.1 Electricity and gas supplier obligation

- Continuation and development of CERT For households not in fuel poverty (but probably defined through proxy measures such as welfare benefit status)
- Suppliers would have a CO2 reduction target (proportionate to market share) – suppliers would continue to have an incentive to find the most cost effective options for meeting their targets
- Suppliers would persuade householders to take up measures (energy efficiency and renewables) to reduce CO2 by offering incentives (incorporating RHI and FIT)
- All properties with lofts would need to have adequate loft insulation installed before (or at the same time as) other measures
- All properties with cavity walls would need to have CWI installed before (or at the same time as) other measures
- Cavity wall properties (that have CWI and loft insulation) can be eligible for help to install microgeneration/heat measures based on suitability and cost effectiveness
- Properties with solid walls (that have loft insulation) can be eligible for solid wall insulation and/or the most cost effective microgeneration/heat technologies – i..e the latter can be an alternative to solid wall insulation
- Behavioural measures can be offered (e.g. rising block tariffs) but need to lead to verifiable savings – smart meters

- This option would maintain the incentives for cost effectiveness of the current CERT but maintains the current problem that extra large credits would be needed for suppliers to offer more expensive measures

5.2 Distribution Network Operators (DNOs) /National Grid (NG) levy – fuel poverty

- Levy of x/kwh or CO2 unit collected from the obligated parties and handed to a national agency (new or existing- e.g. EST) for delivery of fuel poverty programmes
- DECC also hands Warm Front money to the agency to create a single fund
- DECC develops principles for bids to be assessed (e.g, target areas of multiple deprivation, over 80s, lowest SAP ratings etc), sets out who can bid and sets targets (e.g. numbers of homes, SAP ratings etc) for the agency
- Agency develops detailed criteria for bidders
- Agency invites bids (bidders could be suppliers, other companies, NGOs, local authorities, consortia of these etc), judges them against criteria and awards contracts
- Bids could be for areas or national
- Contracts set targets for the successful bidders (e.g. numbers of homes, SAP ratings etc)
- Measures will focus on those likely to remove households from fuel poverty – mostly insulation and conventional boilers, limited renewables except in off-gas grid areas
- This option has the benefit (compared to the supplier obligation) that schemes can be more directed to specific objectives
- Mechanisms will be needed to ensure cost effectiveness and limit bureaucracy

6.3 DNO/NG levy for able to pay households

- Could operate like fuel poverty one or :

- Could provide support directly to households through vouchers or grants towards the costs of approved measures fitted by accredited installers
- Householders could choose their installer and thus opens up scope for competition in delivery
- The main risk of this approach may be limited take up by households unless the grants are large – no one is obligated to achieve a target

6.4 Local authorities – voluntary home owners scheme

Long term financing – this is an alternative to the HESS consultation document proposal for financing via DNOs. It would avoid the complicated contractual arrangements that would be needed in the DNO financing model, by using local authorities and the council tax route (this would require legislation but so would the DNO option)

- home owners could choose to have work (energy efficiency and/or renewable technologies) done by their local authority who would recoup the costs via an additional charge collected with the council tax for that property over a long period – say 10-15 years
- if the householder moved the charge would stay with the council tax bill to be paid by the next occupant
- this option could work alongside the supplier obligation. Energy suppliers could earn credits for assisting local authorities to achieve take up of this scheme. For example, suppliers might provide some subsidy to reduce the charge to be passed on to the householder as a means of stimulating take up – if it is considered that some such subsidy should provided
- The main risk of this approach may be limited take up by households– no one is obligated to achieve a target. This may be mitigated to some extent through joint working with suppliers as outlined in the previous point.

6.5 Local authorities and other social housing landlords – own stock

- Social housing landlords would be required to achieve higher standards in all their own stock by certain dates
- this option could work alongside the supplier obligation. Energy suppliers could earn credits for assisting local authorities with the costs of measures to raise standards
- this option could also work alongside area based schemes run with a DNO/NG levy, where some of those funds could be used improve social housing ?
- there is likely to be considerable potential for district heating/CHP in some social housing – notably high rise flats. Joint working between social housing landlords and suppliers or a DNO levy could help to achieve this.

6.6 Local authorities obligated target for their area

- local authorities could be given a housing only or a broader carbon target giving flexibility to achieve carbon reductions via different means (e.g could include transport)
- local authority funding would need to reflect the extent to which targets were met to provide incentives to meet the target – this would require a link to the performance indicators system

- this option could work alongside the supplier obligation. Energy suppliers could earn credits for assisting local authorities to meet the targets – e.g. reduced cost measures council tax rebate schemes etc
- this option could also work alongside area based schemes run with a DNO/NG levy, where some of those funds could be used to help meet the targets - e.g. reduced cost measures, council tax rebate schemes etc
- The main potential problem is how well this its with all the other obligations that local authorities have and whether there would be sufficient funding (given all the other demands on local government finance) to achieve the targets.

7.Renewable heat

7.1 Two key points to note about renewable heat :

- There is scope for renewable heat at the large and small scale so all options need to be considered to assess what is most cost effective

- There is a need for more work to assess the technical feasibility, cost effectiveness and practicality of many of the large and small scale options. This needs to be done before jumping into widescale subsidy for options that may prove to be of limited value.

7.2 It would seem sensible to approach the development of renewable heat on a zonal basis as the appropriate options are unlikely to be the same everywhere.

- For areas of the country with connection to the gas network, the most appropriate solution may be large scale renewable gas, produced predominantly from waste, to be injected into the gas network to help meet heat demand.[4] In those areas, this may be more cost effective than individual or community level biomass boilers, for example.
- For areas not connected to the gas network (and with no realistic prospect of being connected), individual or community/district heating solutions will be the only options.
- In all areas, however, for suitable properties, solar water heating should be considered as an option as this will reduce the amount of gas, oil ,solid fuel or electricity needed for heating water.

[4] See information in : National Grid. The potential for renewable gas in the UK. January 2009.

7.3 Using a zonal basis therefore, the Renewable Heat Incentive :

- should be used partly to incentivise (in so far as this is necessary) renewable gas being produced from waste, and injected into the gas network, providing further assessment suggests that this is a technically viable, cost effective and practical option
- Should be available for individual households (and larger communal schemes where appropriate) for solar water heating, on suitable properties, throughout the country
- Assuming that the injection of biogas into the gas network proves viable the RHI should be available for individual households and community based schemes, using other forms of renewable heat, only in areas off the gas network or where individual gas heating cannot be used (e.g. high rise flats)

Appendix

Solid wall insulation – the need for a robust assessment of the realistic potential

The HESS consultation proposes that solid wall insulation should be a major component of energy saving programmes to 2030. However, there are a number of reasons to suggest that solid wall insulation may in fact be more of a "niche" product suitable only for some solid walled properties (e.g. those undergoing major renovation work), unless some way can be found to tackle the issues listed below.

- Cost – the costs of solid wall insulation seem to be consistently understated. The consultation suggests £4447 for external solid wall insulation. It is very difficult to obtain real cost data as so little of this work is done. However, recent research for the Energy Efficiency Partnership for Homes suggests that the cost (for a three bedroom semi) is in the region of £11-16,000.[5] The case study below suggests a realistic cost of between £10,000-20,000 per property, plus scaffolding and preparation costs. Part of the reason the cost may be so often understated is that the cost figures used may be based on the installation and materials only and not all the necessary additional costs – preparation of the building, scaffolding, adjustments that have to be made to rainwater pipes, eaves, verges, door and window surrounds to accommodate the insulation.

- Aesthetic impact of external insulation – quite possibly the majority of homeowners of traditional brick built properties (certainly those in more expensive areas) will not want the exterior of their property altered to a rendered façade. Many householders will not like this themslves and even those who are not concerned about the aesthetic impact personally may be concerned about the potential impact on the value of their property or its saleability. Although it is possible to achieve a brick façade with external wall insulation, this raises the costs even more.

- Conservation areas – according to the English Heritage website "external insulation would require planning permission which would be unlikely to be granted in most conservation areas." There are 9300 conservation areas in England[6] (EH website) There are no up to date estimates of the numbers of properties in conservation areas but an estimate based on 2001 data suggested

[5] Energy Efficiency Partnership for Homes and Energy Saving Trust. Solid wall insulation supply chain review. April 2009
[6] English Heritage website

about 1 million homes in England were in conservation areas.[7] It is quite likely that the numbers are greater now as designations of conservation areas have been increasing.

- Disrurption effects of internal solid wall insulation – installing this measure will require clearing rooms, removing and replacing cupboards, shelving, and decorative features such as cornicing, picture rails, skirting boards, door architraves etc. Pipes, radiators, cables, sockets and switches will also have to be repositioned. Finally rooms will need redecorating when the work is completed. These factors add to the costs and time taken for the work and the consequent disruption means that few householders will want this measure unless they are having major renovation work done.

- Dampness problems . All properties should be properly surveyed before internal or external insulation are installed to ensure any pre-existing dampness problems are dealt with. This is a further cost that needs to be taken into account. There are also the dampness risks of the insulation to consider which is likely to put off many households - see below

Risks of dampness

The information in this section is taken fron the English Heritage web site.

Traditional solid walled buildings exchange moisture readily with the indoor and outdoor environment and keep dampness below the levels at which decay can set in. Problems of dampness in a wall occur when it is subject to excessive soakings and/or its ability to evaporate moisture is inhibited by impervious materials, like cement based renders, gypsum plasters and waterproof paints.Insulation should not be applied to walls with a history of damp problems that have not been conclusively eradicated. Adding insulation is likely to make the damp problem worse, and have little or no thermal benefit.

Even on dry walls any insulation must be designed to allow the walls to continue to 'breathe', or else damp problems may start to occur. Cement based renders, foil backed insulations, glues and impervious paints can all trap moisture in walls, but there are good alternatives that are breathable.

When installing internal insulation, thought must be given to areas that cannot be directly insulated: where internal walls and intermediate floors butt up against the outside walls.

[7] Homes in Historic Conservation Areas in Great Britain: Calculating the Proportion of Residential Dwellings in Conservation Areas. Catherine Bottrill, Environmental Change Institute, University of Oxford. August 2005

Here there is a risk of creating cold spots which will reduce the effectiveness of the insulation and could lead to condensation and mould. Insulation must be extended around the corners of party walls and other internal walls to reduce the risk of thermal bridging.

Once a solid wall is insulated on the inside, the wall itself will be colder than it was previously. This could slow the rate of evaporation from its surface, making it more prone to damp. In extreme circumstances it could also make the wall subject to damaging frost action. These are both reasons for care and continued monitoring once work is completed. This caution is also given on many building advice web sites.

External insulation

The information in this section is taken from the English Heritage web site.

External insulation can radically alter a building's appearance. Most external insulation systems include an insulation layer fixed to the existing wall and a protective render or cladding. Even if it is already rendered, decorative architectural features such as cornicing, string courses and window surrounds will be affected. Planning permission may be required for external insulation whether or not the building is listed. For listed buildings, consent would only be likely to be granted in very special circumstances.

The increased depth of an external render or insulation system will mean adapting existing detailing to the roof and wall junctions, around window and door openings and the repositioning of rainwater down-pipes. These alterations will need scaffolding and possibly a temporary roof to reduce the risk of water penetration during the work. Making these changes to the building will significantly add to the cost of the insulation.

Internal insulation

The information in this section is taken fron the English Heritage web site.

A simple way of insulating flat, even walls internally is to fix insulating boards directly to the internal wall (or plaster) and then apply a finishing skim coat of plaster on the surface. An alternative internal insulation approach for less even walls is to fix timber battens to the wall and to pack the space between the battens tightly with insulation. The inner face can then be finished with plasterboard or more traditional alternatives, such as lath and plaster.

Internal wall insulation will mean that decorative features such as cornicing, picture rails, skirting boards, door architraves etc will either be concealed or have to be moved. Pipes, radiators, cables, sockets and switches will also have to be repositioned.

Internal insulation will reduce the floor area of the rooms which could be significant in rooms that are already small.

Case study

A Victorian solid brick semi-detached house in Stroud had external insulation - wood fibre insulation boards attached to the outside of the bricks and then a base coat, including mesh and a top coat of render.

Insulation material: 100mm Diffutherm wood fibre boards, containing 99.5% waste wood from sustainable forests. The system is particularly suitable for older buildings as the woodfibre boards have the same vapour openness as old brickwork, thereby assisting the passage of moisture through walls. The boards form a continuous layer over the outside of the building, providing an unbridged thermal shell. Other options for insulation material are mineral fibre (e.g. Rockwool) or plastic (e.g. Phenolic).

Render: Silicate (made from recycled glass) Other options for render material are those made from lime or those made from acrylics (e.g. Silicone).

Costs: These systems cost between £10,000 and £20,000 (not including all the preparation or the scaffolding – these items would add around £3000 according to estimates by the EEPfH research). Stroud District Council provided a grant of £1,000.

Savings: the household expects to save about 90% of their gas bills, which equates to 1440kgs of CO2 per year.

More information : Natural Building Technologies (NBT) www.natural-building.co.uk