

### Terms of Reference for Help and Discussion Drop-in Sessions on Zoom

*This drop-in session is provided with the intention of members coming together to share knowledge, experience and best practice on various aspects of technology, including software, of interest to u3as and their members.*

*We are unable to offer one-to-one advice to u3as and their members as all locations and abilities differ and operational decisions need to be made by the individual u3as or their members.*

*Items of equipment or software shown or listed in these sessions are there to give an idea of what may be needed and the approximate cost.*

*It is not to be treated as a recommendation or that it is the only suitable piece of equipment or software.*

*What you may decide to purchase is for you or your own u3a to choose based on available funds and your own particular needs.*

# **How to Save on Your Energy Costs in Comfort**

## **House Insulation**

There are three main ways to reduce your energy bill (without getting cold or reducing your hot-food intake)

1. Insulate your house and stop drafts
2. Install Solar PV Panels and a battery pack
3. Replace your hot-water and central heating boiler with an Air Source Heat Pump (ASHP) or Ground Source Heat Pump (GSHP)

**Today we will look at Insulation and Draft reduction options**

## Home Insulation




Heat loss in a typical house occurs because of two basic problems:

1. Badly fitting doors and windows (15%)
2. A lack of insulation
  - 25% through the roof
  - 33% through the walls
  - 20% through windows
  - 15% through ground floors

## Home Insulation

### Reduce Draughts.

Cause of draughts	How to stop Draughts
badly fitting doors and windows	Improve wooden doors and window fit. Fit draught excluders
around skirting boards	Reduced with wood mouldings which close the gap between floor and skirting boards 
timber floors with gaps in the floorboards	Soft rubber underlay will reduce the draught or fitting tongue and groove flooring

## Home Insulation

If you have an open gas fire or use gas to cook, you will have an air-brick in the room where the fire is located and/or the kitchen with the cooker.

Your only option for reducing draughts in this case is to replace the gas fire with a modern balanced flue fire where the air intake is via the balanced flue so that you can have the air-brick sealed or removed.

With a gas cooker, think carefully when you need to replace it and look at induction hobs, electric ovens, air cookers and microwaves as an alternative.

These are far cheaper to run.

**DO NOT BLOCK THE AIR-BRICK WHILE YOU HAVE THE OPEN GAS-FIRE OR COOKER**

**The air brick is there to allow fresh air in to replace the oxygen the gas appliance uses and blocking it could kill you!**

## Loft Insulation

There are two methods of insulating a loft:

1. Rigid foam held between two layers of foil which is fitted between the roof trusses or between the loft floor timbers (4 or 6 inches thick)
2. Fibreglass or Sheep's Wool insulation fitted between the loft floor timbers (usually 4 or 8 inches)

**A cheap and quick insulation which saves a large amount of heat loss**

If you have suspended timber floors on the upper floors of your home insulation such as Sheep's Wool Insulation can be added under the floorboards to insulate for both heat and noise.



## Sheep's Wool Insulation Advantages Insulation

- it's 100% pure and totally natural.
- It can be used horizontally or vertically
- It's a fantastic sound deadening material.
- It's breathable.
- The natural fibres in wool hold their shape well, so they won't sag over time.
- It's a sustainable product.
- It won't itch so it's easy to install yourself and it doesn't contain any dust or nasty chemicals.
- It's naturally fire retardant
- It has a high thermal mass So sheep's wool can help regulate the temperature changes within your home and maintain a more consistent temperature.
- The life expectancy of sheep wool insulation is around 60 years and during that time it will hold its shape well unlike low density man made insulations which tend to slump over time, often by as much as 25%.
- Sheep's wool does not give off gas as it's not full of chemicals like man made insulations.

**Sheep's Wool insulation has an R-value of approximately 3.5 to 3.8 per inch of material thickness. 0.3 to 0.6 points higher than fiberglass, cellulose, or mineral wool.**

**The higher the R-value, the better the material is at resisting the flow of heat.**

## Cavity Wall Insulation

In houses built before about 1910 the walls are likely to be solid with no cavity whereas houses built post the 1910s will have cavity walls which were introduced to stop moisture from penetrating to the inside of a house. The cavity width was initially about 1 to 2 inches.

In the 1950 the width of the cavity was between 2 and 3 inches while current rules allow for up to 12 inches, though 4 inches is more common.

The cavity in all houses built in the last 25 years will have had insulation included in the cavity when they were built while older houses will simply have a cavity air gap.



## Cavity Wall Insulation

### Retrofit Cavity Wall Insulation Options

The most common type of cavity wall insulation is blow-in insulation using either treated chewed up newspaper, mineral wool, polystyrene beads or chemical foam.

The chemical foam option has gone out of favour as it can cause fumes inside the house for up to six months and has been linked with causing damp patches on inside walls due to water ingress.

The treated newspaper, mineral wool and polystyrene beads options have no such problems and although it can settle in the cavity requiring topping up in some cases, it is very effective.

Time to recover cost is approx. 2 years.



## Grants and Costs

**Cavity Wall and Loft Insulation are generally free of charge to anyone in receipt of a qualifying income benefit or tax credits.**

**Roof Room and Internal Wall Insulation are also free to people receiving benefits, providing the property does not have mains gas. If it is on the gas network, a grant of up to 75% is available.**

**Grants of up to 25% can be claimed towards the cost of installing External Wall Insulation, regardless of income or benefits.**

**The property must also be privately owned/rented, occupied at the time of the survey and there must be a gas or electricity bill in the occupier's name**

## Hot Water Tank Insulation

While new hot water cylinders have insulation fitted when they are manufactured, older ones may not have it, or very poor insulation.

If your hot-water tank does not have any insulation then for about £20 you can buy a 'jacket' for the tank which is fitted around the tank – a simple DIY job which could save you at least a hundred pounds per year in heating your hot-water.

The jacket should be at least 80mm thick, and there is no reason why you should not fit two jackets if there is room.



## Double Glazing

How does double glazing work?

Double glazed windows work by trapping a layer of air or nitrogen gas, which is a natural insulator, between two panes of glass.

This stops the cold air transferring through the glass resulting in a decrease of heat loss across the window.

**The latest replacement windows use triple glazing to give even better heat retention, and incidentally, making it more difficult for thieves to break in, especially if the window has laminated glass.**

Triple glazing is 20% - 30% more energy efficient than double glazing and 50% more energy efficient than single glazing.

**An alternative is to add secondary glazing which can be as effective as fitting double glazing, is cheaper, and gets around conservation area rules.**



## Double Glazing

For wood sash or hinged windows make sure they are in good condition and fit well without draughts.

Upgrade the glass to double-glazing sealed units fitted to the existing wooden frames, or add secondary double glazing on the inside.

Remember, single-glazed windows account for between 20% - 30% of heat loss from a house and secondary glazing can be supplied and fitted for a whole 3-bed house for as little as £2,000 if you use a local glazier rather than a big national company.



## Under Floor Insulation

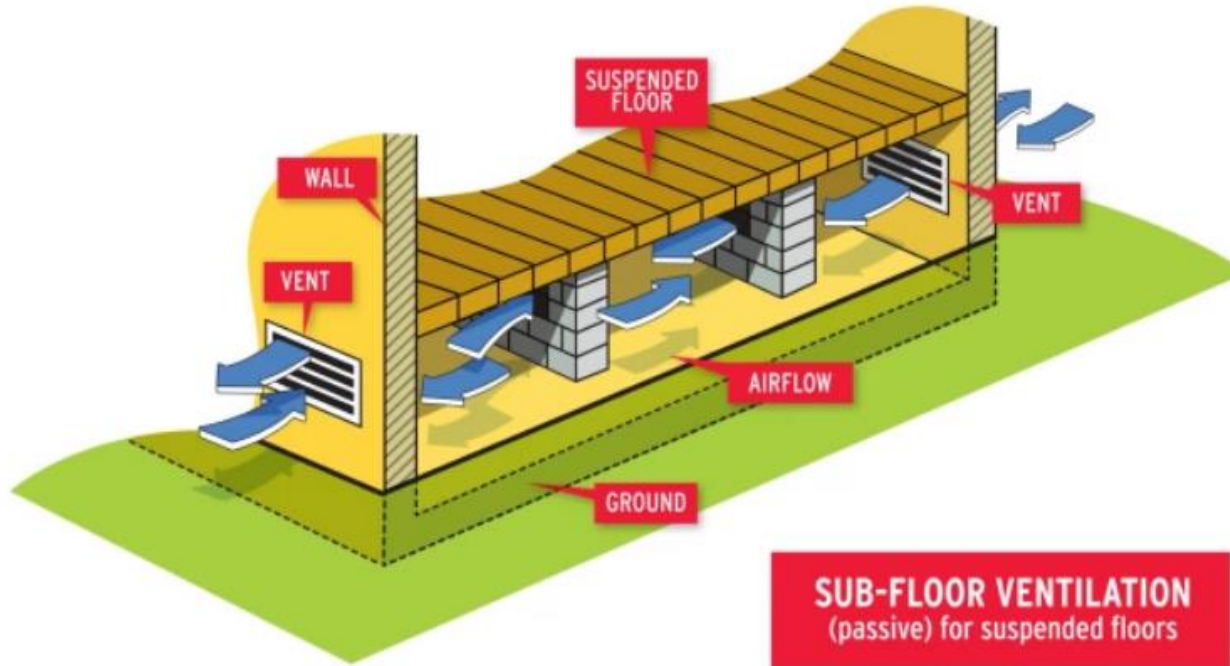


Image courtesy of The Environmental Protection Agency, Ireland. Used with permission.





## Underfloor Insulation



## Underfloor Insulation

### How much money will I save?

Having a timber floor insulated professionally, including filling the gaps between the floorboards and around the skirting, depends on the size and shape of the room and the insulation material used, but typically costs around £500.

The cost of insulating a concrete floor can vary greatly, especially if the concrete is removed or additional works are done, but costs will probably start around £1,000.

Insulation will make the room feel warmer in the winter and reduce heating bills by up to £150 per year.

With this level of saving the payback time on a timber floor is around 4 years, while carrying out the work on a DIY basis will significantly reduce the costs and the insulation could pay for itself in around 2 years.

Insulating a concrete floor might take 10 years to pay for itself, but this will reduce as energy prices continue to rise

## Solid Wall Insulation

### External Insulation

Where you physically add insulation to the exterior surface of your main walls. But there's more to it than you might think.

### Internal Insulation

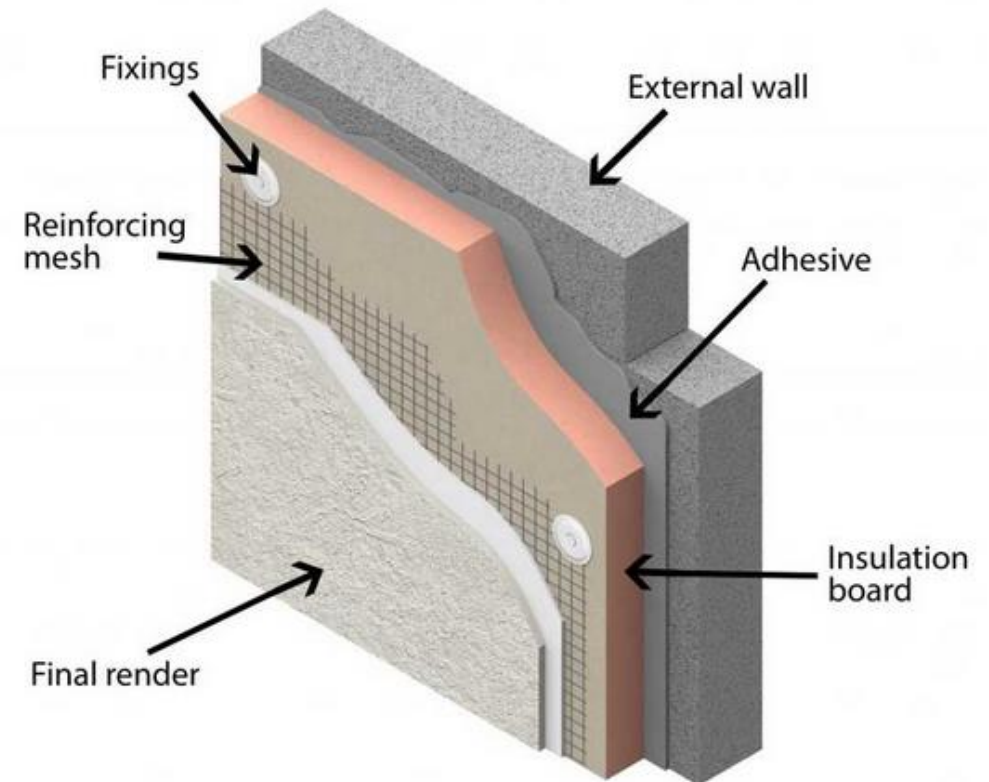
As the name suggests, this type of insulation is added to the inner surface of the main walls of your house. But, while it is straight forward, there are some things you **MUST** include, namely a vapour barrier.



## External Solid Wall Insulation

### What are the Advantages of External Wall Insulation?

- It reduces heat loss and energy bills
- Fewer draughts and increased the sense of comfort
- It does not disrupt the house while being installed
- This type of insulation does not reduce internal floor area
- It allows walls to contribute to thermal mass (the 'tea cosy' effect)
- It improves not only weatherproofing, but sound resistance too
- It increases the life of the wall
- It reduces condensation on internal walls



## External Solid Wall Insulation

### What are the Drawbacks of External Wall Insulation?

- Potential to cause issues with condensation, which could lead to damp problems
- Likely to require planning permission if changing the appearance of your home
- May not be suitable for listed buildings or those in Conservation Areas
- External wall insulation is thick, which can cause issues around windows, eaves and sills
- It's an expensive process



## Solid Wall Insulation

### Internal Fitted Wall Insulation

As the name suggests, this type of insulation is added to the inner surface of the main walls of your house.

But, while it is straight forward, there are some things you **MUST** include, namely a vapour barrier.

Also make sure your house wiring is in good condition before you start.

The most common type of insulation is to fix battens to the wall, fill the gap with insulation and then a damp membrane and finally add plasterboard, skim and decorate.

The main disadvantage is the loss of space due to the external walls being 75 – 100mm thicker.

