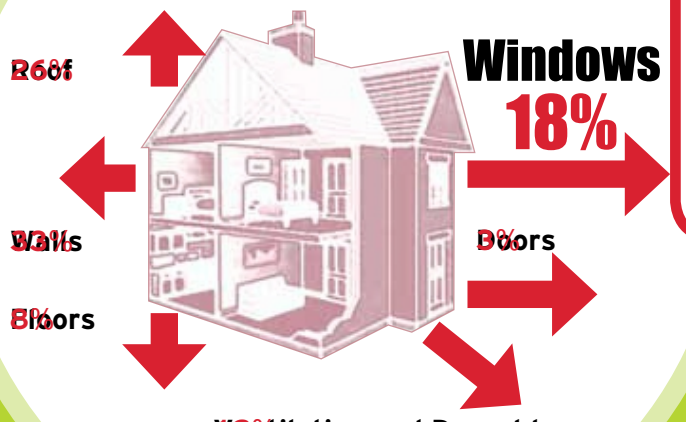
BRITISH BLIND & SHUTTER ASSOCIATION

Save Energy and Money with Blinds and Shutters

Blind and Shutter MON£RGY Energy Saving Calculator

Heat Loss in Homes



Source: Energy Saving Trust

Did you know

that by installing blinds or shutters you can reduce the heat loss through windows by up to 40%?

This means for every £1,000 spent on heating you could save £70

Closing blinds is simple and saves money

Using a thermal imaging camera you can see the heat loss through the windows without blinds. Red areas correspond to the heat loss.

Blinds and Shutters are for winter too!

Keep warm and save money

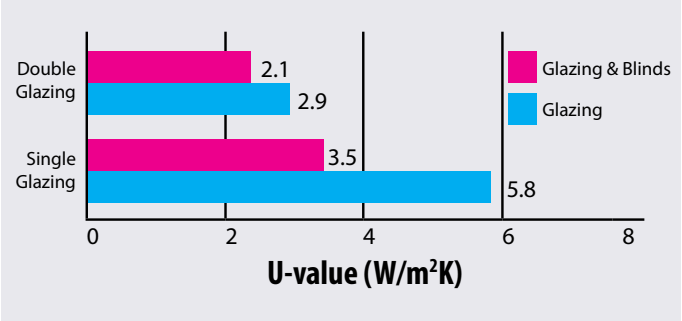
Using blinds and shutters correctly in winter can cut down heat loss through windows. This reduces the demand for heating meaning lower energy bills.

Simple but effective!

- In winter close the blinds after the sun goes down to retain heat
- In winter on sunny days open the blinds during the daytime to maximise heat gain from the winter sun
- Blinds in unoccupied rooms should be closed

Glazing + Blinds = Better Insulation

- The U-value is a measure that represents the heat losses going through a window. In all cases the U-value of glazing can be improved by installing blinds and shutters, so reducing the amount of heat lost. **The lower the value, the lower the heat loss**



- Typically the older the window, the bigger the insulating benefit of a blind and shutter

The Green Deal

The Green Deal is a Government initiative that is designed to encourage the installation of certain approved energy efficiency measures in homes and other buildings. The principle of the Green Deal is that the investment in the energy saving measure will be recouped through lower energy bills.

Blinds and Shutters are a recognised energy efficiency measure under the Green Deal.

How much can you save?

The usual energy savings from blinds and shutters are comparable with more common insulation measures:

Insulation Measure (3 bed house)	Approx Energy Savings (£/y)	Approx Cost (£)	Approx Payback Time (years)
Loft insulation	£45	£250	6
Blind insulation	**£96**	**£500**	**5**

- **Blinds and shutters are typically low cost insulation products**
- **Energy savings of blinds and shutters are similar to other common energy efficient measures and have a quick payback**

Statistics based on Carbon Emissions Reduction Target calculations and relate to an average three bedroom semi-detached house.
Source: Department of Energy and Climate Change, English Heritage and British Blind and Shutter Association

Behavioural Change and Solar Shading

Behavioural change constitutes all the things that we do repeatedly . They can be directly observed and affect others.

Changing behaviours is difficult because the things that we do frequently are the things that we want to do or that feel comfortable for us. We spend whole our lives consciously and unconsciously defining our behaviour patterns to bring ourselves maximum security, pleasure and fulfilment for minimum danger, pain and disappointment. With energy prices increasing and set to increase further in the future the only way for homeowners to save money on energy is to change the way they use it. In the last 5 years household bills have increased by 25%.

The Carbon Trust indicates that you can save up to 10% of your energy consumption through behavioural change, therefore at no extra cost.

Carbon Trust 2011

By adopting the BBSA best practice on shading you will realise quickly how much energy and money can be saved.

The BBSA best practice on using solar shading to maximise energy savings

Summer

- Close the blinds at night on the east and south-east elevations to protect from early morning heat gains
- Open the blinds at night on the west and north-west elevations to assist night time cooling

Winter

- Close the blinds after the sun goes down to retain heat
- On sunny days open the blinds to maximise the heat gains from the winter sun

Blinds in unoccupied rooms should be closed

Behavioural Change and Solar Shading

How blinds and shutters can help?

In most cases blinds and shutters are still thought of only as decoration for the home but they are more than that. Blinds and shutters should also form part of an energy saving strategy. Blinds and shutters can work to save energy in the home irrespective of the season.

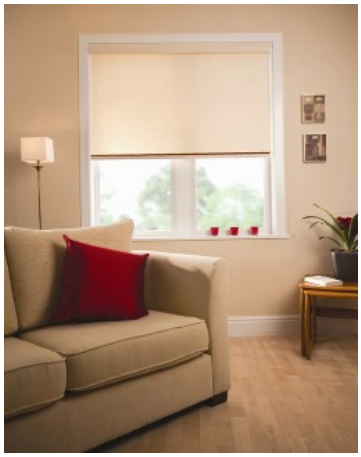
Reject heat gain with blinds and shutters in summer

An example of how this works in summer, particularly in hot climates is when you close the shutters in your room in the early morning, then later in the day the room is a cool refuge from the afternoon sun. This is because the shutters impede the entrance of light and consequently heat in the room. Conversely, it can get very hot in the UK during the summer months. So shutters can be an effective measure to reject the sun's rays.

In the summer, blinds and shutters can reject heat gain and in winter they can reduce heat loss through windows..

Keep heat in with blinds and shutters in winter

A significant amount of heat can be lost from a building through its windows especially during the cold winter months. Retracting your blinds during the day to maximise heat gain from the low position of the sun and extending them at night will keep the heat inside your room reducing the need for heating systems. In domestic buildings this means you can spend less money on your heating bills.



Behavioural change in action

BBSA members installed reflective blinds in a domestic building along with advice to the owner that if you close the blinds in winter you will reduce heat loss, keep the heat in and save energy. The owner monitored his central heating carefully and found that after having the blinds installed he was able to switch his heating on an hour later than usual therefore saving energy and money.

BRITISH BLIND & SHUTTER ASSOCIATION

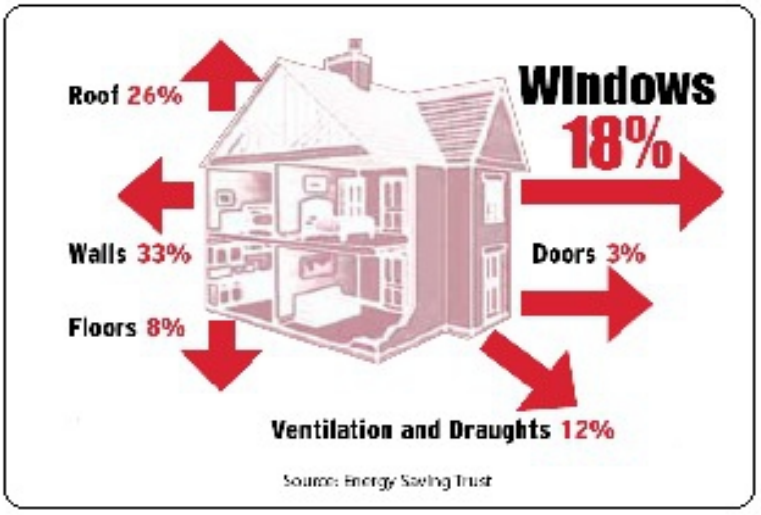
How much heat can you retain through using blinds?

Heat can be lost through windows, doors, ceiling and floors in your home. Blinds and shutters are proven to limit this loss of temperature.

With increasing costs of energy, it makes sense to retain as much heat as possible particularly in the winter season. Traditional, single glazed windows can often be a large source of heat loss. In some cases the windows are protected by planning restrictions and/or homeowners wish to keep the traditional windows or cannot afford to upgrade to new glazing units such as double or triple glazing. According to English Housing Survey in 2011, three quarters of dwellings had double glazing installed.

What blinds and shutters can do?

Blinds and shutters reduce the amount of heat that escapes through windows acting as an additional layer. The performance of the blinds always depends on the type of window. Blinds are more efficient when installed in a single glazing than in double glazing because the second glass already helps to retain the heat.

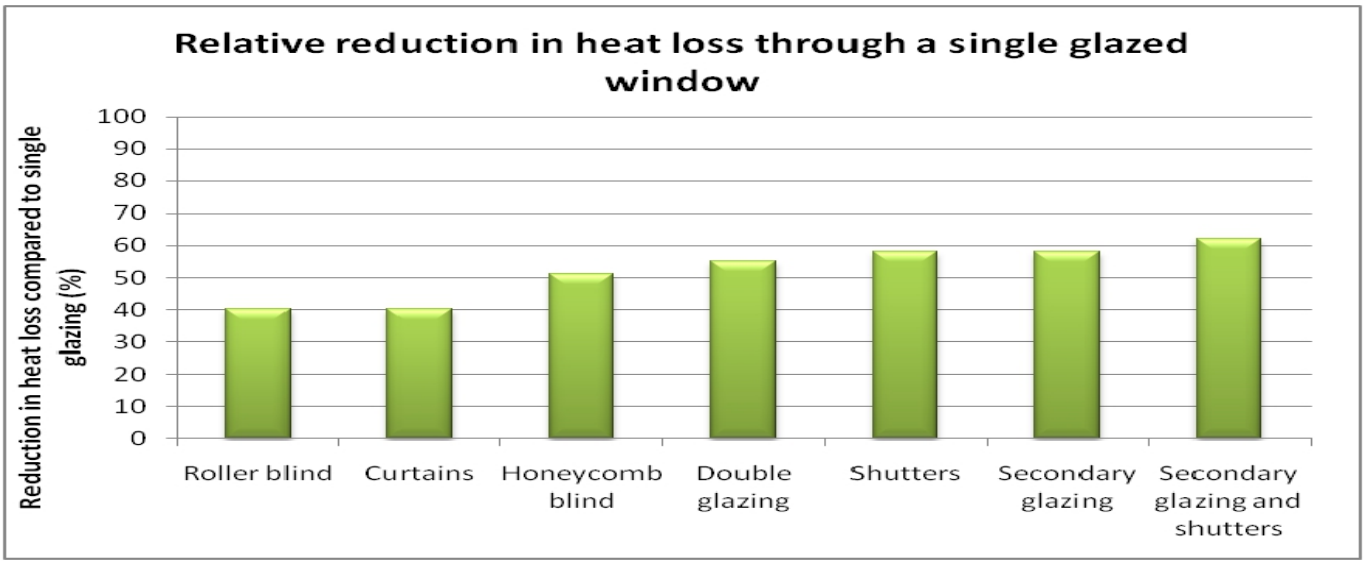


40% less heat escapes through a single glazed window when it has a roller blind covering it than when only the glass is present.

The performance of a blind will always depend on the type of window.

The Historic Scotland and English Heritage both commissioned research at Glasgow Caledonian University to investigate alternatives to reduce the heat lost through single-glazing traditional windows. This study considered roller blinds, curtains, honeycomb blind, double glazing, shutters and secondary glazing and shutters. All were installed in single glazing.

How much heat can you retain through using blinds?

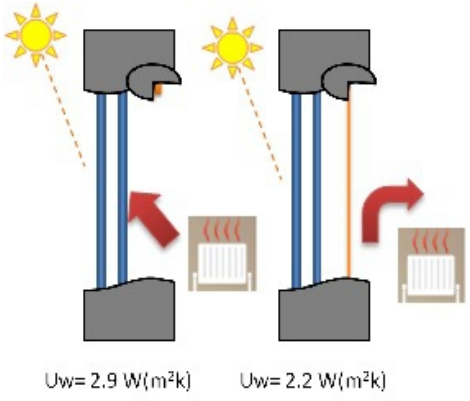


Device	Roller blind	Curtains	Honeycomb blind	Double glazing	Internal wooden panel shutters	Secondary glazing	Secondary glazing and internal wooden panel shutters
Reduction in heat loss (%)	40	40	51	55	55	58	62

The previous graph shows that a roller blind and shutters are competitive when reducing heat loss. This demonstrate that the installation of double and triple glazing is not the only way to keep your house warm, blinds and shutters can do it too.!! Another way to show the heat loss is through a measure called U-value.

What's the U-value measure?

This value shows the amount of heat that you can loose through your window. Blinds and shutters can always reduce this value. It is expressed in Watts per metre squared Celsius W/(m²°C) or Watts per metre square Kelvin W/(m²K). For example, the U-value of a standard double glazed window is 2.9 W/(m2K). This amount can be improved up to 2.2 W/(m²K). This means a reduction of 24% of the heat lost.



The lower the value, the lower the heat lost through the window.

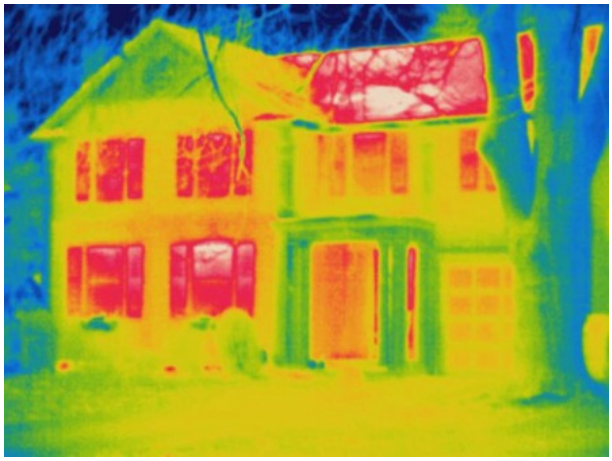
Comparison of domestic energy saving technologies

Have you considered installing energy efficient measures in your home to reduce your annual energy bills?

There are many different technologies available including loft insulation, cavity wall insulation, double glazing and blinds and shutters. All of these products will help to control the internal temperature of your house by reducing the amount of heat lost through the building elements such as walls, roofs and windows.

> The Green Deal has recognised blinds and shutters as an energy efficient measure
>
> *Green Deal, 2012*

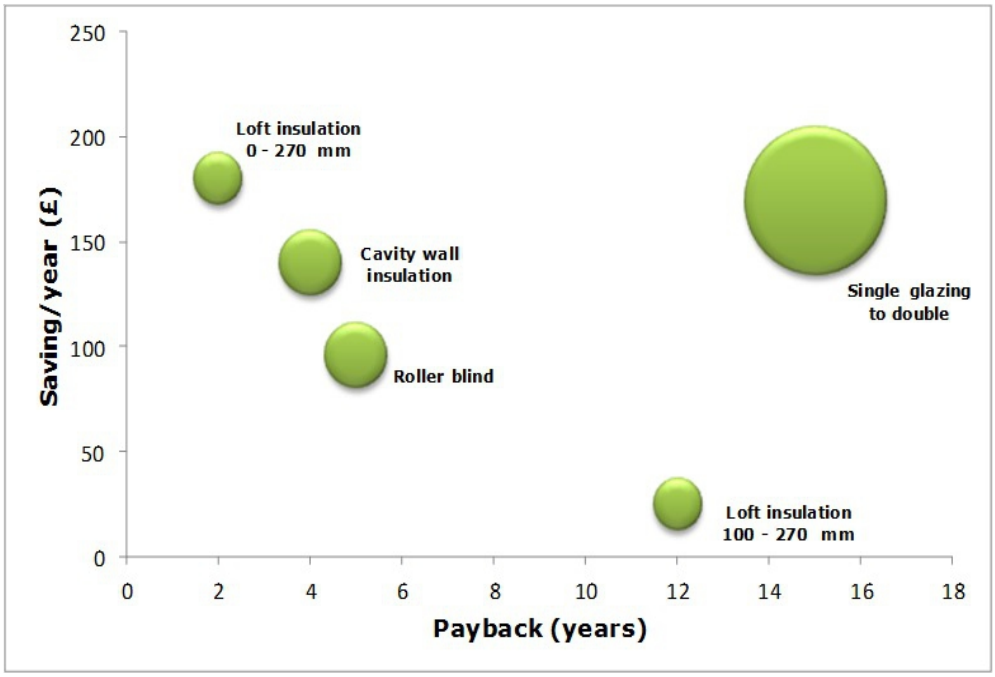
This thermal image shows that the majority of heat is lost through the glazing and the roof.



In the image, the red areas show the most significant areas of heat lost in a typical home. Blinds and shutters are an effective and competitive measure to retain the heat that would usually escape through glazing. Below there is a table comparing the installed cost, annual savings, payback period and CO^2 savings associated with a range of domestic heat loss reducing products. The values are all based on a three bedroom semi-detached house.

Technology	Saving/year (£)	Installed cost (£)	Payback (years)	CO_2 saving/year (kg)
Roller blind*	96	500	5	478
Loft Insulation 0 -270mm	180	300	2	730
Loft Insulation 100 -270mm	25	300	12	110
Cavity wall insulation	140	500	4	560
Single glazing to double glazing	170	2,500	15	680

Comparison of domestic energy saving technologies



The graph shows that a roller blind, when installed on single glazed windows is competitive with the other domestic energy saving products. The blinds have a short payback time of 5 years and can save £96 per year on heating bills.

The graph also shows the payback time for the initial product investment against the amount of money the product will save the household on heating bills each year. The size of the bubbles represents the initial cost of the product, with the larger bubble equal to a larger initial cost.

It is clear that double glazing is the most expensive of the products considered and therefore has the longest payback period. Loft insulation (0- 270mm) shows the shortest payback period, highest annual saving and has a low initial cost. The initial costs for the loft insulation are the lowest at £300. The cavity insulation still has one of the highest costs at £500. However, these payback cost are expected to be easier to cover once the **Green Deal** is implemented.

*The roller blind values are estimates made by the BBSA.

How warm is it going to get?

To understand the need for shading we need to comprehend how the Sun's rays work. The Sun is constantly flooding the Earth with its energy.

The amount of energy reaching the surface can vary due to cloud cover and absorption in the atmosphere. Even though the Sun's energy is changing we require a relatively constant and comfortable temperature inside our buildings. This constant internal temperature can be achieved through mechanical heating and cooling, using insulation in the roof and walls and also through shading.

Shading can help to lower the energy cost required to achieve a comfortable environment within our homes.

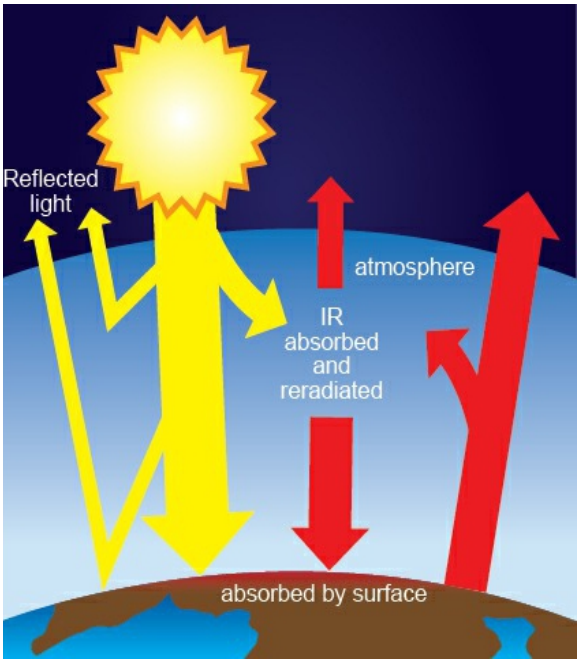
The sun emits radiation ultraviolet radiation (UV), visible light and infrared radiation (IR). This is transmitted at short and long wavelengths. The radiation that reaches the Earth's surface is predominantly visible light with only 5% being UV.

The Sun's rays enter the Earth's atmosphere as shortwave radiation which is mostly light.

Some of the radiation is reflected by the atmosphere and by the Earth's surface.

At the same time the Earth's surface absorbs some of the radiation and re-radiates it as heat.

Greenhouse gases in the atmosphere such as carbon dioxide absorb additional radiation and it becomes trapped within the Earth's atmosphere. As a result the Earth becomes hotter.

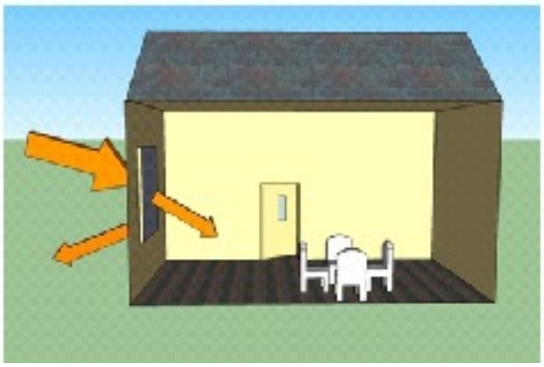


This is called the Greenhouse Effect, the same effect occurs in your room.

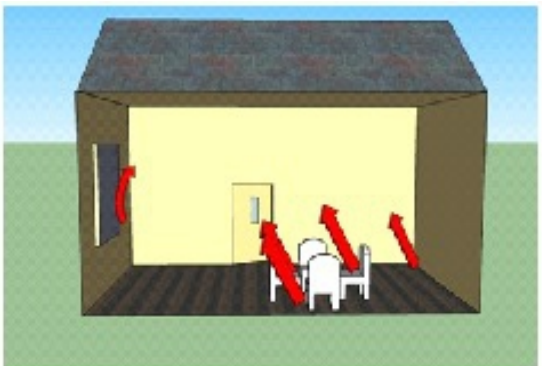
How warm is it going to get?

Solar radiation entering buildings

Glass allows visible light to pass through into the house. The glass reflects some of this light back to the atmosphere, however a large percentage is transmitted into the house. Once the radiation is in your house it is then absorbed by objects such as walls, floors, chairs, desks, people etc. These objects absorb and re-radiate energy transforming it into heat. This heat cannot pass back through the glass and becomes trapped in the room.



Radiation enters as light



Radiation converts to heat when hits objects and cannot leave through the glass

Solar shading prevent buildings from overheating

Blinds and shutters can prevent excessive solar gain by blocking some of the incoming solar radiation. External blinds are very effective at this as they prevent the radiation from even reaching the window. However, internal blinds can also reduce solar gain especially fabrics that have a reflective coating facing the window which will reject some of the incoming light radiation, therefore not allowing it to be absorbed and turned into heat.

The property that indicates the amount of solar gain you get is known as g-value or solar energy transmittance. This is expressed in values between 0 and 1, where 0 means no radiation is transmitted and 1 all radiation is transmitted. Transforming them in percentages, the lower the percentage the lower the heat gain. Therefore if you want to limit the quantity of heat gain, you should get a product with low value or low percentage of solar transmittance. For example, if you take a single glazing with 0.87, you can say that 87% of radiation is transmitted or that only 13% of radiation isrejected.

If you combine the g-value of glazing with a blind it results in a $g_{tot.}$. Then, if you have a $g_{tot.}$ of 0.63 this means that 63% of solar radiation is transmitted or that only 37% is rejected.