

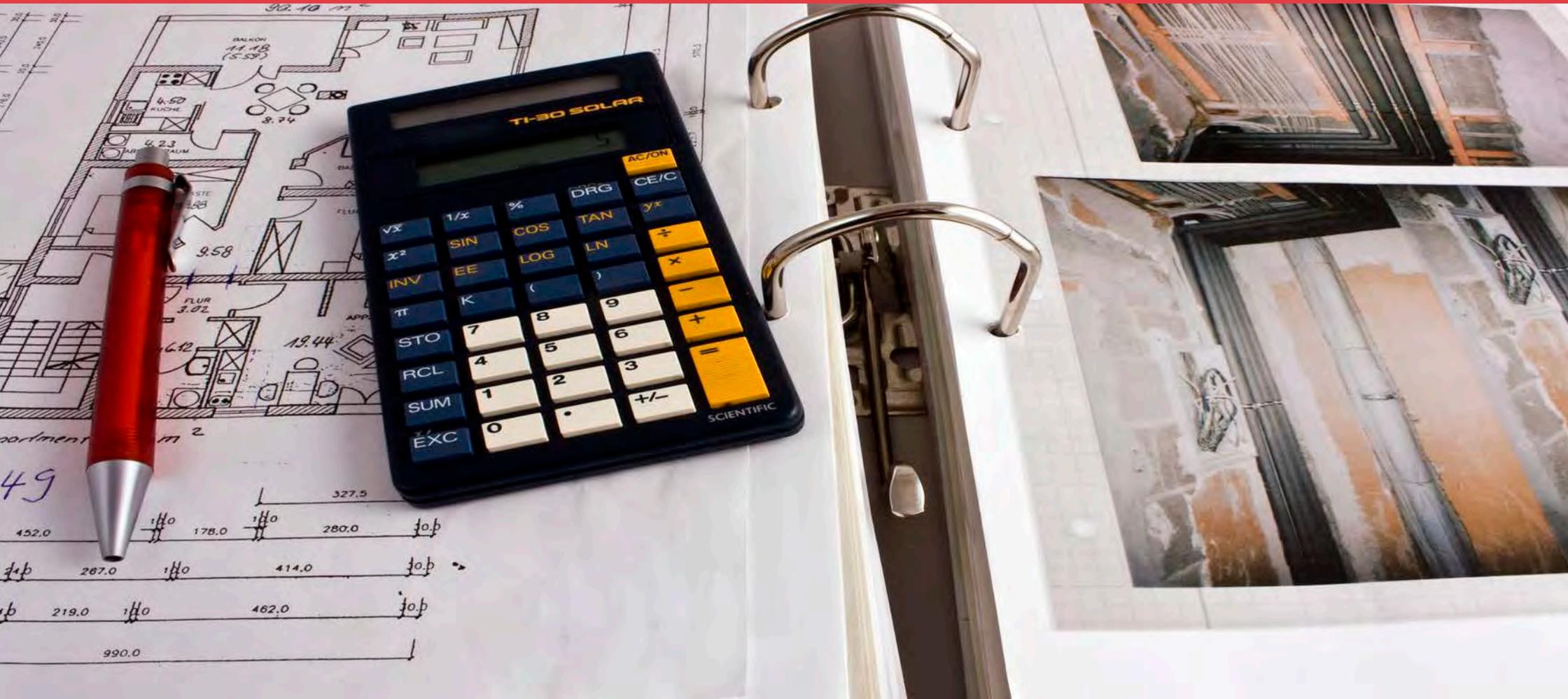


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**GET READY**

# SMALL MEASURES TO IMPROVE THE ENERGY EFFICIENCY OF YOUR HOME



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## MEASURES TO SAVE ENERGY – HEATING

In this brochure we present some small energy-saving measures for your home. Depending on your skills and abilities you might be able to do many of them yourself and most of these measures can be easily introduced at home. In addition to their environmental benefits, they can improve your comfort and save you money. Furthermore, there are some additional things which you might not be able to do on your own entirely, but which are not very costly when done by an expert.

### Insulate your pipes

In many older apartment buildings, heating is produced centrally in a special boiler room, from where it has to be transported through pipes into the individual apartments. Often these pipes are not insulated and residents are left wondering why the system is so inefficient and so little heat gets to where it is needed.



**Fig. 1.** Insulating your heat pipes ensures that the heat reaches your rooms rather than to get lost on the way | Image: © Philipp Engewald.

Insulating the pipes yourself is a simple measure that can make a dramatic difference to the comfort of your home. There are many insulating materials available, most of which are suitable for the purpose as long as they are heat resistant and non-flammable. For maximum benefit, make sure that the insulation is wrapped as tightly as possible around the pipes and that no gaps are left. Further insulation of pumps and armatures along the pipes minimizes further heat losses.

## **Insulate behind your radiators**

Heat loss through outside walls can be reduced significantly by insulating the space between wall and radiator. Since heat is emitted from all radiator surfaces, it is also directed towards the wall, and if the wall is not properly insulated, much of the heat will never reach your room.

A good insulating material is thin polystyrene coated with aluminium to reflect the heat. Several other options, including natural fibres, may be available for your local do-it-yourself store. To prevent mould from developing, it is important to fasten the insulating material securely so that no air can circulate between the sheet of insulation and the wall.

## **Adjusting your central heating**

In larger buildings, the boiler room may be located in a small room or cellar, while in the case of district heating systems, heat is piped in the form of steam or hot water to hundreds of properties from one large central heating plant. In the individual apartments, room temperature is regulated by thermostats on the radiators.

The system is centrally regulated to ensure that heat is produced only when it is needed, depending on the outside temperature and the time of day. You can ask your building representative about the efficiency of your system and whether heat production is reduced during the night, for example. Many district heating systems need to be upgraded in order to improve their efficiency.

## Adjusting the radiators

If your radiators have thermostatic valves or other means of regulation, make sure you are using them as efficiently as possible. Using the thermostatic valve, the temperature of each room in your home can be individually set according to when and how the room is used. Thermostatic valves are cheap and easy to fit and can result in significant energy savings. Bear in mind that raising the temperature by just one degree increases your energy consumption by 6 to 8 percent, with a corresponding rise in your heating bill. Always switch off your radiators when you open the windows to avoid heat loss.



**Fig. 2.** “Always switch off your radiators when you open the windows to avoid heat loss.” | Image: © Philipp Engewald

If thermostatic valves are older than 15 years, they often work not properly anymore. In such cases, it is recommended to exchange them and install new ones that allow a regulation of 1K (that means 1 Kelvin = 1 degree Celsius, the older ones regulate 2K). When installing new thermostatic valves, the heat that is needed to supply the room should be recalculated. This calculation can be done by an energy consultant and a heating contractor can adjust your heating system manually after that.

## **VENTILATION AND AIR TIGHTNESS**

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Everyone needs fresh air. If you are feeling drowsy indoors and finding it difficult to concentrate, the levels of carbon dioxide in your room may be too high. It is a good idea to open the windows regularly, even if only briefly, to change the air in the room. Everybody needs at least 30 cubic metres of fresh air per hour, depending on their level of activity. Letting in fresh air will also prevent excess humidity, which otherwise leads to condensation on cold walls and the development of harmful mould.

### **Correct ventilation**

The amount of ventilation you need depends on the outside temperature and wind speed: the lower the temperature and the stronger the wind, the shorter the time you will need to keep your windows open to change the interior air. If the windows are opened widely you will only need to open them briefly to change the air once. During the time the windows are open, remember to shut the thermostatic valves on your radiators.

### **Technical solutions**

In the same way that you choose suitable clothing when going outside in temperatures of minus 10 degrees Celsius, there are many things you can do to keep the interior of your home warm in winter. Insulation, like warm clothing, must be well fitting and leave no gaps through which cold air can enter.

## Window and door frames

Ideally, your home should have an airtight building envelope in order to eliminate drafts and heat loss. In terms of ventilation, it is sufficient to open your windows briefly but regularly to change the interior air. However, in older buildings there are often gaps in the construction where different types of building materials meet, or around door and window frames. As a first step, you should check that your doors and windows shut tightly and that the closing mechanism is in good working order.

## Window and door seals

Fitting sealing around window sashes and doorframes is a good way to block drafts, save energy and cut heating costs.



**Fig. 3.** Application of sealant on a window frame.

Image: © e.u.[z.]

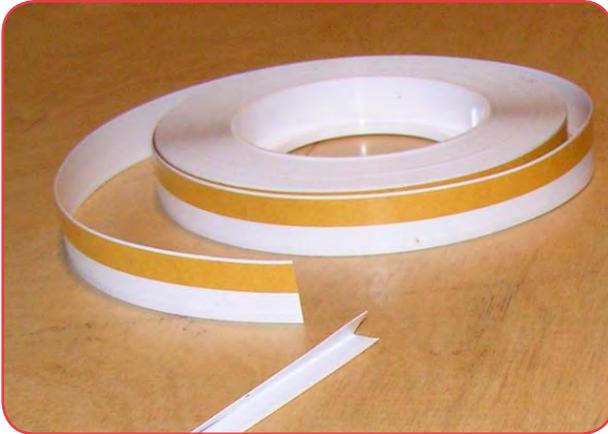
There are various sealants available on the market for use around windows and doors. However, many of them are not suitable for use on wood, which tends to shrink and swell seasonally and to warp over time, leaving gaps through which cold air can enter. Other options,

such as the thicker foam rubber and rubber beading, may not fit into narrower window channels. The most suitable sealant is likely to be V-shaped plastic weather strips that can be adjusted to fit various widths of window channel and around the moving parts of a window. Interior doors can also be sealed to prevent drafts between rooms.

As an alternative to tapes and strips, larger gaps can be filled with a silicon sealant that can be applied using a caulking gun.

## Door thresholds

Cold air that enters the home through a badly fitting door threshold will stay at floor level, making your rooms drafty and uncomfortable. To overcome the problem, you can glue a flexible sealing tape to the bottom of the door to close the gap between door and floor, while still allowing your door to open easily. A particularly effective threshold seal is a tubular rubber gasket, where the pressure and weight of the door when closed helps to form a tight seal.



**Fig. 4.** Insulation tapes are a cheap and simple way to improve the air tightness of windows and doors. | Image: © e.u.[z.]

## INSULATION

As well as providing protection from the elements, the building envelope should ensure comfortable interior conditions in both extreme high and low external temperatures. To be as effective as possible, the outside walls of your home should be adequately insulated.

Your insulation needs and approaches will be different, depending on whether your building is made of stone or wood. Stone walls should ideally be insulated from outside in order to retain warmth in winter and to keep the interior cool in summer. External wall insulation can renew the appearance of your building and improve weatherproofing and airtightness, but if your home is a listed building you may not be permitted to alter the appearance of its façade.



**Fig. 5.** Prepared wood casing on an outside wall to be later filled with insulation material | Image: © Jörg Faltn

While internal wall insulation is often cheaper to install and will not change the appearance of your building, one disadvantage is that not all parts of the building can be insulated equally, and moisture damage from rising or penetrating damp can occur if the insulation is not properly installed. Inside insulations must be therefore installed without any gaps and airtight against the warm indoor air. Another disadvantage is that there will be no protection from heat in the summer, as bricks will be left exposed to the high outside temperatures.

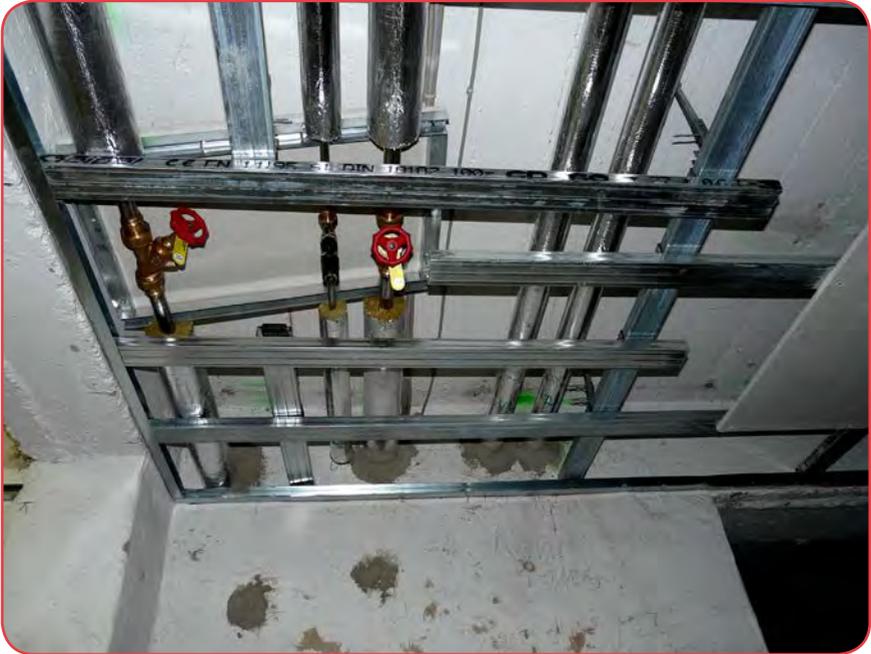
Wooden houses do not have these strong needs for additional insulation as stone houses. Wood leads heat much slower than bricks and it has small cavities which have an additional insulating effect. Known problems of older wooden houses is the syndrome “Hot head – cold foot”. The cause of this uncomfortable indoor climate is badly insulated roofs. It is therefore strongly recommended to insulate the roof first.



**Fig. 6.** Adding of rafter insulation to decrease the heat loss through the roof.  
Image: © Rainer Sturm | PIXELIO.

## Insulating the ceiling of cellars

If you have cold cellar rooms under your ground floor, insulation of the cellar ceiling can be upgraded easily. In most cases, 6-8 cm of insulation will be enough. A simple and cheap polystyrene insulation, which is glued without gaps to the ceiling, is enough. If the upper edge of windows or doors would be behind the insulation, it should be thinner around windows and doors. Pipes and other cables could be just left out.



**Fig. 7.** Preparation for insulating the cellar ceiling  
Image: © Jörg Faltin

## SUMMER HEAT PROTECTION

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Although they exclude direct sunlight, interior blinds, жалousies and curtains provide no effective protection against the heat from outside, unlike exterior shutters. However, perhaps the most attractive, cheapest and most ecological solution to your shading needs is to plant deciduous trees and bushes around your building. The leaves will ensure that your walls and windows remain in shadow in the summer, while in winter the sun will shine directly through the leafless branches into your rooms.



**Fig. 8.** Bushes and trees can be an effective heat protection.  
Image: © Philipp Engewald

For your notes

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