



Baltic Environmental Forum Latvia
Antonijas iela 3-8
LV-1010 Riga, Latvia
www.bef.lv



REGIONAL ENVIRONMENTAL CENTER

Regional Environmental Center for
Central and Eastern Europe
2000 Szentendre
Ady Endre ut 9-11
Hungary

GET READY

ENERGY LABELS, AUDITS AND HOME ASSESSMENT



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Authors:

Péter Szuppinger/Éva Csobod | Regional Environmental Center, Hungary

Editor

Rachel Hideg | Regional Environmental Center

Translation:

XXXXX XXXXX

Layout:

Philipp Engewald | Baltic Environmental Forum Germany

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12, Typographer Grove

12345 Colorswatchtown

Country

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Energy consumption in buildings represents approximately 40 per cent of energy use in the European Union. However, significant energy and financial savings can be achieved by ensuring that new buildings are constructed in line with the latest energy standards and by retrofitting old, inefficient buildings using state-of-the-art technologies.

This brochure provides information for consumers on the benefits of energy labels, audits and help in home assessment. A checklist is included at the end to enable readers to assess their own energy consumption habits.

- 1 . Standards for energy efficiency in new and existing buildings are laid down in European Union legislation. Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings contains strict regulations on the energy performance of new buildings, and on the energy standards to be applied during the renovation of old buildings.
- 2 To support the implementation of this directive at national level, the European Union has developed an energy labelling system for buildings, providing practical and easy to understand information for homeowners and tenants.
- 3 . Energy use in buildings is determined by three factors: the characteristics of the building; the electronic appliances used in the building; and the consumption habits of the building's inhabitants. Energy audits can provide a detailed picture of domestic energy consumption and recommendations on how to reduce it. A simplified home energy assessment could also help you to save energy.

BACKGROUND INFORMATION

Step 1. What is meant by “energy performance”?

A building’s energy performance is the calculated or measured amount of energy required to meet the energy demand resulting from the typical use of the building. This includes energy consumption for heating, cooling, ventilation, hot water and lighting.

According to Directive 2010/31/EU, all member states are obliged to establish minimum requirements for the energy performance of buildings in order to achieve an optimal balance between the necessary investments and the energy costs saved throughout the life cycle of the building.

If you are planning to build a new house or undertake large-scale renovation work on an existing property, you will need to think about appropriate energy-efficient solutions with the help of planners and housing professionals. The construction authorities will examine your building to ensure compliance with the latest requirements.

Step 2. What is a building energy label?

The energy labelling of household appliances, such as fridges, washing machines and light bulbs, has been a very successful initiative in the European Union. Consumers are now familiar with these labels and rely on them when selecting new domestic appliances.

Based on this success, the European Union has introduced an energy performance certificate—in other words, an energy label—for buildings. This official certificate indicates the energy performance of buildings or building units, calculated according to a methodology adopted at state level that is in compliance with European regulations.

Energy performance certificates will be compulsory by 2015 at the latest, after which anyone selling or renting out a building will be obliged to provide an energy label that clearly indicates the building's energy costs.

Step 3. What is an energy audit?

An energy audit comprises the detailed inspection and analysis of the energy consumption of a building. Complex audits take into account the building's characteristics, the appliances used inside the building, and the energy consumption habits of the building's residents. Professional energy audits are carried out by engineering experts in order to identify opportunities to reduce energy consumption without negative effects on building utilisation.

You can also do your own simplified home energy assessment in order to pinpoint energy weaknesses in your home.

HOME ENERGY ASSESSMENT IN PRACTICE

Step 4. Analysis of the building structure

Heat may be lost from a building in many ways. The illustration below shows the relative proportion of heat lost via the main features of a typical home.

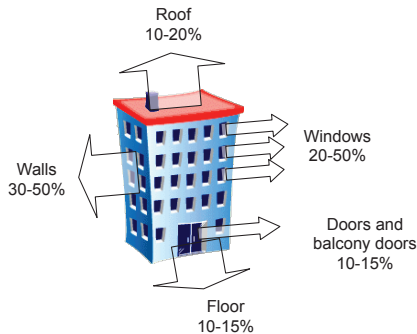


Fig. 1. Source: Application of small-scale renewable energy sources to the home to prevent climate change (www.kyotoinhome.info), 2006, p.64.

Heat loss from building elements and energy-saving measures

	Building element	Energy-saving measures
Walls	<p>The amount of heat lost through a building's walls depends on the building material and wall surface area. The biggest losses are therefore in detached houses. High levels of heat can be lost through the walls of older buildings, apartments in blocks, and even new buildings without insulation.</p>	<p>Heat loss via walls can be minimised by insulation with a thickness of a minimum 15cm up to 35cm for a passive house standard. As this may represent a big investment, it is worth first consulting with an expert who can calculate the costs and benefits of renovation and recommend the most appropriate option.</p>
Windows	<p>Glass is a very poor insulator, thus a great deal of heat can be lost via inadequate windows. The U value¹ of standard double glazed windows is between 2.8 and 3.0 W/m²K, while modern windows have a U value of between 1.1 and 1.4 W/m²K. Triple-glazed windows have U values of around 0.6 to 0.8 W/m²K.</p> <p>Proper installation is also extremely important, as significant amounts of heat can be lost via ill-fitting or poorly insulated window frames. Draughts entering the house between the wall and window frame are a good indication of the amount of heat being lost.</p>	<p>Although changing your windows requires a big investment, it will soon be paid back in the form of lower energy bills. The amount of energy lost via modern triple-glazed windows is three to five times lower than the energy lost via one glazed windows.</p> <p>With a smaller investment you can save energy by sealing the gaps between the wall and window frame using any of the various seals and insulating tapes readily available in the shops. Additionally you can optimize the tightness of your windows by sealing.</p>

	Building element	Energy-saving measures
Roof	<p>On average, 10 to 20 percent of heat is lost from a building via the gap between the ceiling and the roof. If you live in a house you can easily check whether or not your loft is insulated and, if so, how thick the insulating material is. If you have no access to your building's loft you will need to ask the building owner or representative.</p>	<p>Loft spaces are cheap and easy to insulate. The recommendation is to use insulating material that is at least 30 cm thick in order to achieve optimum savings.</p>
Floor	<p>Only recently built houses are required to have insulation between the floor and the ground beneath. If you are not the first owner of your house you may not have information about this. Houses with under-floor heating are likely to have a layer of insulation between the heating element and the ground.</p>	<p>It is difficult to insulate the floors of older houses, since the insertion of insulation will raise the floor level and can only be managed in the course of larger-scale renovations. If you have under-floor heating and your insulation is not appropriate, your investment will be even bigger as you will need to change the heating pipes as well.</p> <p>However if your building has a cellar, you can insulate the ceiling of the cellar with approximate 6cm until 20 cm.</p>

Step 5. Check your heating system

Your house may have individual heating, or you may be part of a district heating system. In the latter case, you will have less freedom when retrofitting. Older district heating systems generally use fossil fuels, have poorly insulated distribution systems and provide no possibility for individual metering. However, there are an increasing variety of modern or retrofitted district heating systems, many of which use local renewable energy sources. Joining such a system can result in big energy savings.

If you have individual central heating it will be easier for you to move in the direction of energy-efficient solutions when upgrading your home. The first step in general is to insulate your house for less energy demand (see above). The second step is to assess the efficiency of your boiler, ideally with the help of a specialist.

In general, if your gas boiler is more than 10 years old it is worth changing it, preferably to a condensing boiler. These are around 90 percent efficient, as compared to conventional gas boilers that are only around 50 to 60 percent efficient, while some older models are even less efficient. In other words, condensing boilers produce far more heat from the same amount of fuel for the same price. A further advantage is that these new gas boilers are very efficient in producing domestic hot water.

Older biomass-based boilers may still be useful, although it is worth consulting with an expert on technical upgrades (such as pumps, regulators and heat exchangers) that could help you save energy.

When changing your boiler it is also worth changing your radiators, especially if they are older than 15 to 20 years. Installing modern radiators of an appropriate size will result in greater energy efficiency.

Where possible, you should also think about replacing your distribution pipes with new, insulated piping.

Step 6. How much energy do your household appliances use?

Modern households rely on an ever-growing number of electrical appliances. If you are aware of the electricity consumption of the appliances in your home (which can be checked on the appliance itself or in the accompanying documentation) you can easily calculate their contribution to your electricity bill. If such information is not available, you can also think about buying a simple watt meter (for around EUR 25 to 50), which will indicate the real electricity consumption of your appliances. With this information, you can compare your present energy consumption with that of the latest models with the same characteristics.

Your electricity bill will also be affected by the lighting in your home. Traditional light bulbs usually consume between 60 and 100W, while new, energy-efficient compact fluorescent lamps consume only 10 to 15W and have also a comfortable “warm” light colour.

As domestic appliances are consuming more and more electricity, the European Union has drawn up regulations governing their use. A well-established energy labelling system is now compulsory in all EU member states. When you purchase a new appliance you can check its energy label, which must be prominently displayed. The system covers most domestic appliances, including light bulbs, although it does not yet cover televisions and DVD players. However, you can still request details of the energy consumption of these items at the point of purchase.

Step 7. Think about your consumption habits

Even in the most energy efficient building that features an optimum heating system and the best-performing appliances, the total energy consumption will still be affected to a great extent by the building occupants and their energy consumption habits. Using the checklist provided at the end of this brochure, you can easily evaluate your own progress towards energy efficiency.

MONITORING

Step 8. Monitor your energy consumption regularly

It is a good idea to check your electricity and gas meters regularly and to record your energy consumption per month and per year. You may find it useful to discuss your findings with an expert: your municipality or your local energy agency will provide assistance.

Using an Internet carbon calculator, you can also calculate the carbon footprint of your house: <http://www.carbonfootprint.com/calculator.aspx>

CHECKLIST FOR BUILDING OCCUPANTS

Using the simple table and evaluation below you can assess how energy conscious you are.

		YES	NO
Lighting	Most of the light bulbs in your home are energy efficient (e.g. compact fluorescent lamps, light-emitting diodes).		
	You switch off the lights when not in the room.		
Appliances	Most of your appliances belong to energy label category "A" or better.		
	You switch off appliances when not in use rather than leaving them in standby mode.		
	You only run your dishwasher with a full load.		
	You only run your washing machine with a full load.		
	You generally wash your clothes at a temperature of 40°C or lower.		
	You do not use a tumble dryer.		
	You do not have air conditioning.		
Heating	You have thermostatic valves fitted and the temperature can be adjusted room by room.		
	None of your rooms are heated to more than 19-21°C (except for the bathroom).		
	You lower the room temperature when not at home.		
Water	Your hot water temperature is 60°C or lower.		
	You generally take short showers rather than baths.		

EVALUATION

If you answered YES to between 11 and 14 questions: Congratulations! You are making great efforts to save energy in your home. Keep up the good work and try to persuade your friends and relatives to do the same.

If you answered YES to between 6 and 10 questions: You have made a good start but can still do better by following some of the tips in this brochure.

If you answered YES to between 0 and 5 questions: You need to take action. You are wasting a lot of energy and a substantial amount of money too. Make some changes by following the simple steps in this brochure.

Notes:

1 The U value is an energy efficiency indicator. It refers to the heat transmission coefficient (thermal transmittance) of a structure, describing the heat flow through the building element in watts per square metre at a temperature difference of one degree (K): W/m^2K . The higher the U value the lower its thermal resistance, therefore the more heat/energy passes through the building element.

For your notes

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