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A GUIDE TO ENERGY REDUCTION FOR HOMES



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INTRODUCTION

The following guide offers advice to homeowners and tenants who are considering how to make their homes low carbon. The first part outlines the cost-benefit ratio of undertaking various simple energy-saving initiatives to reduce bills, and the latter section provides signposts to other key sources of advice for homeowners considering more extensive measures, such as retrofit and renovation.

Although we understand that the guide and measures might be more suitable to urban residential dwellers, most of the measures can be applied by anyone in the country.

TOP TIPS FOR BUILDING HOUSEHOLD ENERGY RESILIENCE DURING POWER SHORTAGES

Back-up energy



Have back-up power sources such as batteries, and renewable-based appliances such as solar-powered or battery-operated lights, readily available for emergency use. Although gas is not a sustainable fuel for cooking, in rural areas in times of energy shortage, gas bottle heaters can be used as an alternative.

Use energy efficiently

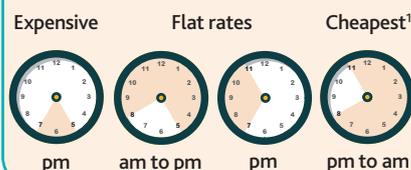


Switch over to energy-efficient appliances. Many modern appliances with Energy Star ratings consume less energy. By using energy efficiently, we ease the pressure on the grid and avoid greater damage to our energy supply.

Planning energy use



If possible, plan and schedule the use of heavy energy-consuming appliances such as dishwashers and washing machines to take place outside peak hours. Be flexible and use energy efficiently. As per Electric Ireland:



1 Time-of-Use Tariffs | Electric Ireland Residential.

TOP TIPS TO REDUCE CONSUMPTION



Monitor your electricity use by installing energy meters and ensuring that there is no waste or leaks.



Use heavy power appliances such as washing machines, dishwashers or tumble dryers at night-time (if you are on a day/night meter) to avoid unnecessary stress on the grid. If you are drying clothes on a stand instead of in a dryer, please be aware of the possibility of dampness in the room.



Find manual alternatives to appliances that can be used every day or in case of emergency, e.g., portable gas hobs for cooking, manual hand mixer, manual hand blender.



Turn off or plug out appliances when they are not in use and try your best to not use appliances often.



Keep the doors closed to avoid any loss of heat from the house – use thick curtains to prevent the heat from escaping through the windows.



Wearing an extra layer of clothes in the house will help in keeping us warm.

19°C

Setting the thermostat on low (around 19 degrees Celsius) helps to save energy.²



Batch cooking consumes less energy since food for two to three days is cooked together.

² Playing my part (europa.eu).

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USING OUR APPLIANCES MORE EFFICIENTLY

Table 1 lists 30 appliances that we use every day, and shows their environmental and economic impact. This can give us an idea of the costs of running these appliances, so that we can alter our behaviour or stop using the appliance to reduce our energy consumption.



Table 1: Electrical appliances – environmental and economic costs.

Unit prices are based on the expected price for October 2022 (Electric Ireland).

Appliance	Power rating (W)	Cost per hour	Cost per 10 minutes	Emission after one hour
Electric shower	10,000	€4.10	€0.68	4.33kg of CO ₂
Immersion heater	3,000	€1.23	€0.21	1.30kg of CO ₂
Kettle	3,000	€1.23	€0.21	1.30kg of CO ₂
Tumble dryer	2,500	€1.03	€0.17	1.08kg of CO ₂
Electric heater	1,500	€0.62	€0.10	0.65kg of CO ₂
Oven	2,500	€1.03	€0.17	1.08kg of CO ₂
Washing machine	2,500	€1.03	€0.17	1.08kg of CO ₂
Oil-filled radiator	2,000	€0.82	€0.14	0.87kg of CO ₂
Hairdryer	2,000	€0.82	€0.14	0.87kg of CO ₂
Hob	2,000	€0.82	€0.14	0.87kg of CO ₂
Grill	1,000	€0.41	€0.07	0.43kg of CO ₂
Iron	1,500	€0.62	€0.10	0.65kg of CO ₂
Toaster	1,000	€0.41	€0.07	0.43kg of CO ₂
Microwave	1,200	€0.49	€0.08	0.52kg of CO ₂
Electric mower	1,500	€0.62	€0.10	0.65kg of CO ₂
Vacuum cleaner	1,500	€0.62	€0.10	0.65kg of CO ₂
Dehumidifier	500	€0.21	€0.03	0.22kg of CO ₂
Towel rail	500	€0.21	€0.03	0.22kg of CO ₂
LED TV	100	€0.04	€0.01	0.04kg of CO ₂
Fridge	200	€0.08	€0.01	0.09kg of CO ₂
Freezer	350	€0.14	€0.02	0.15kg of CO ₂
Electric blanket	100	€0.04	€0.01	0.04kg of CO ₂
Computer	150	€0.06	€0.01	0.06kg of CO ₂
Games console	150	€0.06	€0.01	0.06kg of CO ₂
LCD TV	120	€0.05	€0.01	0.05kg of CO ₂
Laptop	50	€0.02	-	0.02kg of CO ₂
TV box	50	€0.02	-	0.02kg of CO ₂
DVD player	50	€0.02	-	0.02kg of CO ₂
Extractor fan	20	€0.01	-	0.01kg of CO ₂
Broadband router	10	€0.01	-	-

SHORT-TERM ENERGY-SAVING MEASURES TO MAKE YOUR HOME LOW CARBON

The SCSi has produced a list of short- and long-term actions that households can undertake to reduce Ireland's fossil fuel dependence. The financial cost of these short-term measures is not significant and they can be implemented at home by anyone without the involvement of major structural or building changes and updates. We have considered a house with four people, who have mixed use of gas for heating and electricity for all other purposes, based on the average of 20,955kWh/year given by the Sustainable Energy Authority of Ireland (SEAI).³ The average bill for the house is estimated to be €4,130 per year (see panel).

AVERAGE HOUSE ENERGY CONSUMPTION

Number of persons in the house – 4
 Amount of electricity used – 5,030kWh (24%)
 Cost of electricity – 5030 x €0.41 ≈ €2,060
 Amount of gas used – 15,925kWh (76%)
 Cost of gas – 15,925 x €0.13 ≈ €2,070
 Total energy bill for the house ≈ €4,130/year*

(Note: Gas unit price = €0.13 and electricity unit price = €0.41)
 *Doesn't include standing and night charges. Unit prices considered are based on the expected price for October 2022 (Electric Ireland).

Measures	Utilities used	Energy saved/year	Money saved/year	% savings on total bill
Space heating Gas – 11,000kWh/year (61% of total energy use)				
Draught proofing A substantial part of our heating bills can be reduced just by patching up the gaps in our windows and doors, and preventing the leakage of heating from the house and the entry of cold air from outside. Draught-proofing windows and doors can prevent 30% of heat loss and can save 20% on your bills ⁴	Gas	~2,200kWh	€286.00	7%
Save on your thermostat Even a one-degree reduction in your thermostat could save 10% of electricity consumed over the course of a year. ⁵ Wearing a layer of thermal underwear beneath clothes and using the curtains at night while in the house helps to keep you warm and save energy.	Gas	~1,100kWh	€143.00	3.5%
Electric blanket As a portion of heating is used at night in winter, instead of heating the entire room, using an electric blanket would save at least 20-30% of the energy consumed by space heating during the night. An excellent quality blanket with a timer costs around €100-€150 and can save a lot of energy.	Gas	~2,200 kWh	€286.00	7%
Water heating Gas – 4,900kWh/year or electricity – 3,900kWh/year (19% of total energy use)				

3 SEAI - Residential | Energy Statistics In Ireland | SEAI.

4 Waterford City and County Council – Sheet No.2 Thermal Insulation (waterfordcouncil.ie).

5 SEAI – Take control of your energy bills | Blog | SEAI.

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Measures	Utilities used	Energy saved/year	Money saved/year	% savings on total bill
<p>Turning down the boiler</p> <p>Reducing the gas or electric water heater to lower levels can help in saving at least 10% of energy consumed.⁶ The ideal temperature for a water heater is around 45-50 degrees.</p>	Gas	~490kWh	€63.70	1.5%
<p>Shower alarms</p> <p>Not only will you save water, but you will also save electricity if you take shorter showers. Trials have shown that a household can save around 2.4% of electricity consumption using a shower alarm.⁷</p>	Electricity	~502kWh	€205.82	4.9%
<p>Lighting and appliances</p> <p>Electricity – 3,600kWh (17% of total energy use)</p>				
<p>Washing clothes at 30°C</p> <p>When clothes are washed at lower temperatures it helps to save 40% of the energy used by the machine.⁸ Most washing detergent can work effectively with cold water and does not require the water to be hot to remove stains.</p>	Electricity	~100kWh	€41.00	1%
<p>Replace old bulbs with LEDs</p> <p>The mean weekly lighting energy consumption for a typical house is 3.8kWh.⁹ A good EU Energy Label or Energy Star-rated LED light consumes 75% less energy than incandescent lights or other power-consuming lighting appliances.¹⁰</p>	Electricity	~50kWh	€15.50	0.4%
<p>Plug out appliances</p> <p>Just switching off appliances or plugging them out when not in use saves around 20% of the energy used.¹¹ Having several appliances on standby mode wastes energy and affects battery life.</p>	Electricity	~500kWh	€205.00	5%
<p>Monitor usage using smart meters</p> <p>Tracking the energy you consume helps to save energy. According to the Commission for Regulation of Utilities, early smart meter trials showed that a household can save an average of 2.5% on bills.¹²</p>	Electricity	~500kWh	€205.00	5%

The final energy values used in the table are averages taken from the SEAI's Energy in the Residential Sector report. Unit prices considered for the calculations are based on the Electric Ireland estimate for October 2022.

6 Energy Saving Trust UK – Heating controls - Energy Saving Trust.

7 EC-Europa - 213na3_en.pdf (europa.eu).

8 Energy Saving Trust UK - EST_11120_Save Energy in your Home_15.6.pdf (energysavingtrust.org.uk).

9 Household Electric Survey - Microsoft Word - Revised Lighting Report 070414b

(publishing.service.gov.uk).

10 Energy Star USA - LED Lighting | Department of Energy.

11 Electric Ireland - The Truth About Standby Electricity - The Electric Ireland Blog.

12 CRU - cer11080ai.pdf (cru.ie).

OTHER MEASURES



Keep the doors closed – Keeping room doors closed to conserve heat and keeping fridge doors closed to maintain coldness are easy measures to save energy. A refrigerator takes 45 minutes to get back to its normal temperature if it is left open for 10-20 seconds.¹³



Installing timers – Installing timers for all your major energy-consuming appliances will help you to save on utility bills. Most timers are easy to install.



Cooking meals together – By cooking meals together, you can save electricity. If using your oven, try to cook multiple food items at a time.



Do not waste heat – Closing food items after cooking and cooking with lids can prevent heat from being wasted. Also, by frequently opening the oven to check it, we let out the heat and it takes extra time for the temperature to get back. Just boil the water you need, rather than filling the kettle each time.



Using alternative appliances for cooking – Cooking, which was once done using much manual effort, is now not possible for many of us without the help of electrical appliances. Alternative manual equipment is available for blending, mixing and other kitchen activities. Measures such as heating the water in a kettle and using it for cooking will help in saving energy.

LONG-TERM ENERGY-SAVING MEASURES TO MAKE YOUR HOME LOW CARBON

Although the above short-term measures might help as an immediate response to the energy crisis and make your home more energy efficient, in the long run, it is necessary to ensure that your house is also highly energy efficient. Home retrofitting helps in increasing efficiency and makes the home less energy reliant.

Home retrofitting/renovation

Since reduction in energy usage is the goal, it is important to understand where you can make a difference. About 60% of the energy in homes is used for heating, so a substantial difference can be made by reducing the amount of energy required to keep homes warm and moving towards using non-fossil fuel-based energy for this purpose. In a typical home, most of the heat is lost through walls and the roof,¹⁴ so that is often the first focus of an energy retrofit:

improving the insulation of walls, roof, and floor, and upgrading the building components such as the heat ventilation air conditioning (HVAC) systems, windows, doors, etc. The installation of heat pumps and solar panels might also help in reducing your home's dependency on the grid. More information can be found at the SEAI website.

Based on your home's energy performance, you can choose to either carry out a shallow retrofit or a deep retrofit. A standard retrofitting would include the installation of heat pumps, solar PV cells and other upgrades to the house. These measures require a proper consultation with a registered surveyor or other expert. Particularly in the case of traditional buildings, it is best to consult an expert to achieve a professional standard and highly energy-efficient building. Check out the SCSi's [Find an Expert](#) page to find someone who can assist you.

¹³ CRU - Energy Saving Advice - Commission for Regulation of Utilities (cru.ie).

¹⁴ NSAI – National Standards Authority Ireland.

HOW THE SCSI CAN HELP YOU

As Ireland's largest professional body for Chartered Surveyors, the SCSI offers clear, impartial, expert advice on the issues raised in this guide. SCSI members can assist homeowners in a variety of ways, so whether you want an expert assessment and opinion on costs, an innovative design solution, or a building surveyor to manage a project for you, visit Find an Expert to find an SCSI member in your area.

You can be confident in the services of SCSI members because:

- they give you clear, impartial and expert advice;
- they are tightly regulated and have strict rules of conduct to protect you – including appropriate insurance;

- they must update their skills and knowledge throughout their careers, so you can rely on their expertise; and,
- you are further protected by the SCSI's complaints service and access to independent redress.

USEFUL LINKS

Sustainable Energy Authority of Ireland – www.seai.ie

International Energy Agency (IEA) – Playing my part – Analysis - IEA

Commission for Energy Regulation – www.cer.ie

World Green Building Council – www.worldgbgc.org

SCSI - Guide To Engaging A Contractor: <https://scsi.ie/checklist/>

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