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A CONSUMER GUIDE TO **SUSTAINABLE ENERGY**



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The energy for life...

Energy is essential to our daily lives. It heats our homes, fuels our transport and supplies our electricity. At the moment, most of the energy we use comes from fossil fuels such as oil, gas, coal and peat. Unfortunately there is a limited supply of fossil fuels in the world and we are using them up at a very fast rate. The other downside to fossil fuels is that burning them for energy also produces CO₂, a greenhouse gas, which causes climate change. That's where sustainable energy comes in.

So what is sustainable energy?

Sustainable energy refers to a way we can generate and use energy that is more efficient and less harmful to the environment. Another way of explaining sustainable energy is that it will allow us to meet our present energy needs without compromising the ability of future generations to meet their own needs. We can do this by being more efficient in how we use energy in our daily lives and also by increasing the amount of energy that we get from renewable sources such as the wind, the sun, rivers and oceans.

What are the benefits of sustainable energy?

The good news is that being sustainable in how you use energy has immediate benefits:

- It will save you money on your electricity and heating bills
- Your home will be more comfortable and convenient
- And you will also be making a vital contribution to reducing climate change

Believe it or not, the small actions you take to be more energy efficient in your home can have a very significant impact on improving the environment. The collective efforts of individuals can often be the most powerful of all.

Who is Sustainable Energy Ireland?

Sustainable Energy Ireland (SEI) was set up by the government in 2002 as Ireland's national energy agency with a mission to promote and assist the development of sustainable energy. SEI's activities can be divided into two main areas:

- **Energy Use** - Energy is vital to how we live our daily lives but most of us don't use energy as efficiently as we could. By assisting those who use energy (mainly industry, businesses and householders), to be more energy efficient, SEI can help to reduce the amount of energy we use overall.
- **Renewable Energy** - Energy that is generated from renewable sources such as wind and solar power is clean and doesn't produce harmful greenhouse gases. By promoting the development and wider use of renewable energy in Ireland SEI can help to further benefit the environment, in particular reducing the threat of climate change.

SEI is also involved in other activities such as stimulating research and development, advising on energy policy and publishing energy statistics.

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Did you know...

- **Energy use is responsible for two-thirds of Ireland's greenhouse gas emissions.**
- **Irish homes use around a quarter of all energy used in the country– that's even more than industry.**
- **The average home consumes almost 40% more electricity than it did in 1990.**
- **Renewable energy currently accounts for just 2% of Ireland's energy supply.**

The Story of Energy

To appreciate the impact that our energy usage has had on earth, particularly over the last 100 years, it is important to understand where energy comes from and how it affects climate change.

Millions of years ago land-plants and sea algae absorbed energy from sunlight. This 'energy' was then consumed by fish and animals. When the plants and animals died they were buried in mud and, over time, became fossilised. Under intense pressure and heat, from deep in the earth, plants became coal and animals formed crude oil and natural gas, which was trapped in tiny pores of sandstone rock. These are fossil fuels. By burning these fossil fuels we release the energy they contain, which allows us to generate steam in a power station boiler which, in turn, drives a generator to produce electricity. We also use these fossil fuels when we heat our homes and drive our cars.



What is Climate Change?

Climate change means potentially huge changes in our weather systems and scientists believe that a definite link exists between the energy we use and climate change. Most of our energy usage, at home and in industry, comes from burning fossil fuels. This produces greenhouse gases which are released into the atmosphere where they trap the heat of the sun, allowing the sun's rays in but not out. The end result is an overall warming of the earth's atmosphere and, ultimately, climate change.



Carbon Dioxide, or CO_2 , is the main greenhouse gas. The amount of CO_2 being released into the atmosphere has increased tenfold over the last century, due to our energy usage. This has led to the earth's average surface temperature rising by around 0.6°C in the 20th century. Never before have humans had such a large and direct impact on the global environment.

Consequences of Climate Change

We are already experiencing the effects of climate change through shifting weather patterns. Extreme conditions, such as floods, droughts and storms are on the increase and these will continue in the coming years.

Elsewhere, some scientists see a risk of a colder climate for Ireland if the Gulf Stream is diverted. This current of warmer water runs past our western shores and heavily influences our weather patterns.

It is also essential to consider the worldwide impact on plants and animals, many of which face the risk of extinction as their ability to evolve cannot keep pace with the speed of change in their natural habitat.

Climate change is a critical environmental concern that cannot be ignored. It affects every living creature and plant on the planet. Read on to find out how you can make a difference; by pursuing a sustainable approach to energy you're taking a positive step to making the world more environmentally friendly.

Understanding Sustainability and Your Energy Needs

Looking at Why You Use Energy

Why do we use energy? We use it to generate warmth, switch on lights and power vehicles. We use it at home, in the office, on holiday, in fact pretty much everywhere we go. We're probably using energy when we don't even realise it; consider your freezer which is on 24 hours a day, the coffee machine at work, or the traffic lights at every junction. Undoubtedly some energy usage is crucial in the modern world, but there are many ways in which you, the individual, can make a difference and reduce your energy consumption.

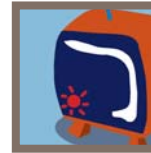


Transport

The number of cars on Irish roads has increased by over 50% in the past ten years. Transport fumes represent a large proportion of overall air emissions: 78% of carbon monoxide emissions and 22% of carbon dioxide emissions. Transport emissions of greenhouse gases are rising faster than any other sector. By opting to walk, cycle or use public transport we are reducing the amount of harmful emissions being released into the atmosphere.

Another alternative is to consider a car with a smaller engine, which will prove particularly fuel efficient if you're a city driver.

Top tips to save energy



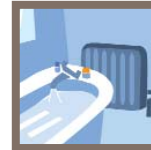
Turn your TV off rather than leave it on standby

Equipment on standby uses up to 20% of the energy it would use when fully on.



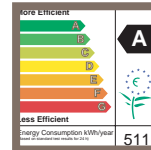
Walk or cycle instead of driving

It costs nothing and is good for your health.



Turn your heating down

Reducing your thermostat by 1° celsius will cut your heating bill by 10%.



Buy 'A' rated kitchen appliances

They cost less to run and over time, they will give you considerable savings on your electricity bill.



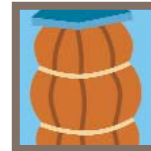
Use energy efficient light bulbs (CFLs) instead of traditional bulbs

They use 1/5th of the energy and last up to 10 times as long.



Insulate your attic

Attic insulation will keep the heat in your home for longer and pay for itself in 2-3 years.



Fit a lagging jacket

Lagging your hot water cylinder will keep the water hotter for longer and pay for itself in just 2-3 months.

Energy Efficiency at Home

There are plenty of ways to ensure that energy is used efficiently and not wasted around your home. Some things you can start doing straight away and they will cost you nothing. Other measures take more time and effort but will bring many added benefits such as increased comfort and warmth.

Using a little common sense can instantly cut down your energy use and reduce your energy bills. For instance, when you turn on your central heating check that you have turned off radiators in rooms that are not being used. Similarly, turn off lights in rooms that are not in use and replace regular light bulbs with CFL light bulbs, which use far less energy and last a lot longer.

See Red, Switch Off

Appliances left on standby use up to 20% of the energy they use when fully on. Total standby power consumption in Irish homes represents approximately 5% of all residential electricity consumption. This accounts for over a quarter over a quarter of a million tonnes of carbon dioxide (CO₂), every year, and our usage continues to climb.



Look around your home on any given night and you'll see little red lights on many of the appliances that you own. The main standby offenders are TVs, video recorders, DVD players, video game consoles, satellite decoders, Hi-Fi's, PCs and monitors and microwave ovens. But don't forget washing machines and dishwashers that have finished their cycles. If you see a red light on your appliances, switch it off. Not only are you being energy efficient, you're also being safety conscious.

Home Renovations

There are many improvements you can make to your house that will significantly reduce your energy costs, especially if you live in a house that was built before 1980. For example, insulating your attic and walls will make your home much more comfortable and reduce your heating costs. For more detail read our *Renovating an Older Home* booklet.

Building a New Home

If you are planning to build a new house make sure you take the energy features into account. It is easier and more economical to incorporate these features when the house is being built rather than later on. For example consider the orientation and form of the house. A rectangular building that has one of the longer sides facing south will give you significant passive solar heating as well as making these rooms very bright and pleasant. Other factors that will improve the energy efficiency of a house are the proper selection of building and insulation materials and the proper design and installation of a heating and control system. For more information read our *Building an Energy Efficient Home* booklet.

Appliance Labelling

By law special energy labels must be visible on all shop display models for washers, dryers, fridges, freezers, dishwashers and electric ovens. The label helps you make a more informed choice when buying an appliance by allowing you to compare how efficient each appliance is in their use of energy. You can also compare the machine's performance on items such as capacity, wash/dry performance and noise. Purchasing the most energy efficient appliance will save you money on your energy bills and will be less harmful to the environment in the long run.

All new cars also must carry a label by law which indicates how energy efficient they are – ask your motor dealer for more details.

Energy	
Manufacturer Model	
More Efficient	
A	
B	
C	
D	
E	
F	
Less Efficient	
Energy Consumption kWh/year (Based on standard test results for 24 h)	511
Actual consumption will depend on how the appliance is used and where it is located	
Fresh food Volume 1	180
Frozen food Volume 1	140
Noise (dB(A) re 1 pW)	
Further information is contained in product brochures	
<small>Norm EN103 May 1990 Refrigerator Label Directive No.94/2/EC</small>	

To find out exactly what your energy costs are and where to make savings you could carry out a home energy survey. Details are in our *How to Make Your Home More Energy Efficient* booklet.

* As of 31st December 2004 all fridges on display in shops must be labelled with a new energy rating: A++, A+, A, B, C, where A++ is the most efficient rating.

Go That Step Further and Think 'Renewable Energy'

Most of the energy we use today is generated by fossil fuels. These are finite resources and therefore not sustainable. So, not only are they bad for the environment, they will also eventually run out.

The sustainable alternative is renewable energy which will never be exhausted. The main sources of renewable energy are the sun (solar energy), the wind, moving water (hydropower, wave and tidal energy), heat below the surface of the earth (geothermal energy) and biomass (wood, waste, energy crops). Ireland is rich in all of these and their use will reduce harmful greenhouse emissions as well as presenting opportunities to reduce our reliance on imported fuels.

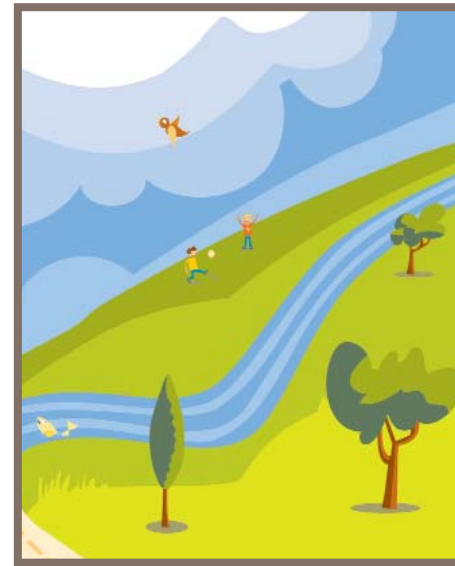


Several renewable energy technologies are now commercially viable and capable of supplying clean, economical heat and power in your home. When building or renovating your home consider installing solar panels on your roof, to save on your heating bills, or use passive solar design to maximise energy from the sun. Or simply consider room layout and window location/size to gain maximum benefit from the sun's free heat and light. Solar energy is clean, environmentally friendly, inexhaustible and free. Alternatively there are a variety of heat pumps that convert the heat of water, air or the earth to warm your home. You'll find more detailed information in the SEI booklet, *Your Guide to Renewable Energy*, and on our website www.sei.ie

How Does Renewable Energy Contribute to Sustainability?

This is an important question and gets to the heart of the objectives of Sustainable Energy Ireland. The answer is straightforward: most renewable energy sources are directly influenced by the sun, which provides us with an infinite, sustainable resource through the cycles of nature. This could be the sun stimulating growth in plants, causing thermal currents and creating the wind, or causing precipitation

resulting in river currents. As long as there is light from the sun we can generate renewable energy, encouraging us to reduce our demand and consumption of fossil fuels, thereby reducing the likely impacts of climate change.



Sustainability is a wise approach to take to the way we live. And using energy in a more sustainable way is a part of this approach. We can save money, reduce imports, protect the environment, and move society forward in a positive manner enabling future generations to avail of the vital resources we now take for granted. If we adopt the sustainable approach now, we win as individuals and we win as a society.

Everyone can decide how they want to live. Shaping society together starts by shaping our individual behaviour.

For more information on how to save energy and other aspects of sustainable energy, log onto www.sei.ie or call 1850 376 666.

Relevant Standards

Building Regulations, 2002
Part L: Conservation of Fuel and Energy
Part F: Ventilation
Part J: Heat Producing Appliances

ISEN 832 - Thermal performance of buildings - calculation of energy use for building
-residential buildings CEN 1998.

Useful Contacts for Further Information

For information on energy efficiency measures

SEI, Glasnevin, Dublin 9

For information on solar technologies

Energy Research Group, UCD School of Architecture, Richview, Clonskeagh, Dublin 14.

Irish Solar Energy Association, 17 Kildare St., Dublin 2.

SEI, Renewable Energy Information Office, Shinagh House, Bandon, Co. Cork.

For information on radon

Radiological Protection Institute of Ireland, 3 Clonskeagh Square, Dublin 14.

ENFO, 17 St. Andrew Street, Dublin 2.

For information on insulation

Insulating Contractors Association, Construction Industry Federation,
Federation House, Canal Road, Dublin 6.

For information on building products standards

National Standards Authority of Ireland, Glasnevin, Dublin 9.

Irish Agrément Board, Glasnevin, Dublin 9.