

# sustainable energy

what it means for you





If each of us becomes aware of our own power when it comes to energy efficiency, and use it properly, we can collectively make a big difference. To ourselves, to our pockets, and to the environment. By taking individual responsibility and changing our behaviour in small ways every day, we'll help save energy while we save money too.

All we have to do is recognise our power, and use it.  
That's what the Power of One is all about.

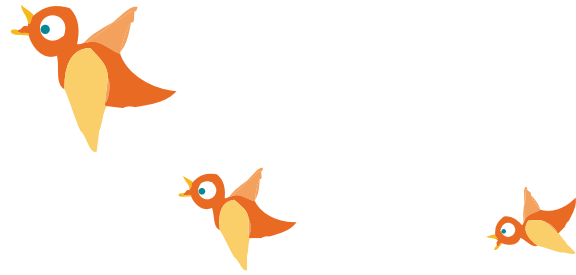
For more information check out [www.seai.ie/powerofone](http://www.seai.ie/powerofone)



### The Change Campaign

The change campaign is a vital part of Ireland's plan of action on climate change. The campaign's overriding goal is to engage the nation on the issue and to drive the significant behavioural changes that will be required to lower greenhouse gas emissions. At the core of the campaign is the change.ie website and carbon calculator which helps people identify real savings you can make because when you cut carbon, you cut costs.

For more information visit [www.change.ie](http://www.change.ie)



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## About the Sustainable Energy Authority of Ireland

The Sustainable Energy Authority of Ireland (SEAI), established by Government under the Sustainable Energy Act 2002, has a mission to play a leading role in transforming Ireland into a society based on sustainable energy structures, technologies and practices.

Its key objectives are implementing strong energy efficiency actions, accelerating the development and adoption of technologies to exploit renewable energy sources, supporting innovation and enterprise for our low-carbon future and supporting evidence-based responses that engage all actors.

### **SEAI's activities can be divided into two main areas:**

- **Energy Use** – SEAI can help to reduce the amount of energy we use in Ireland by assisting our homes, businesses and industries to be more energy efficient.
- **Renewable Energy** – By promoting the development and wider use of renewable energy in Ireland, SEAI can help to further reduce the threat of climate change and benefit the environment.

SEAI is here to help every energy user in Ireland – homeowners and businesses, farmers and food outlets, schools and hospitals. We do this by raising awareness and providing information, advice and publicity on best practice; stimulating research and development; advising on energy policy and publishing energy statistics.

You'll find up to date information about our activities, as well as advice and tips, on our website at [www.seai.ie](http://www.seai.ie)

Contact us, engage with us, ask for advice, put forward your ideas. We're here to listen and to help. By working together, we'll create a greener, cleaner, sustainable future for Ireland.

## Understanding our energy needs

We use energy to heat and light our homes and to run our appliances, TVs and computers. In fact, the residential sector is one of Ireland's largest energy consumers, accounting for almost a quarter of our energy use - more than either transport or industry. And virtually all of that energy comes from non renewable fossil fuels with consequent emissions of CO<sub>2</sub>, a greenhouse gas that causes climate change.

We also use energy to run our cars, and personal mobility is a central part of modern life. However, our dependence on individual car driving raises some serious concerns. We know that transport is a major contributor of CO<sub>2</sub>. Here in Ireland, emissions from transport are growing at a faster rate than any other sector.

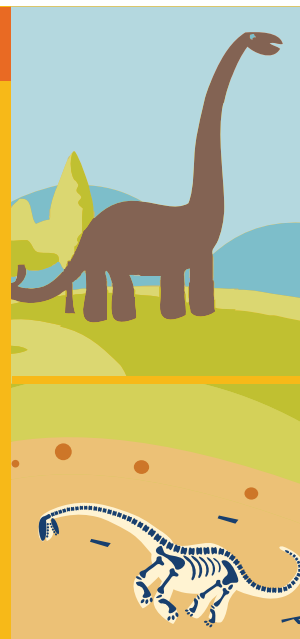
Some energy usage is essential in the modern world, but hopefully this leaflet will inform you of the many practical ways each of us can save energy and make a difference to climate change.

## Where our energy comes from

Most of the energy we use in Ireland comes from oil, coal, peat and gas. These are called "fossil fuels" because they have been formed from the organic remains of prehistoric plants and animals.

### The story of fossil fuels

- Millions of years ago, land-plants and sea algae absorbed energy from sunlight.
- When they died, they were buried in mud and over time, became fossilised.
- Under immense pressure and heat, the plants were slowly transformed into coal and the algae into oil and gas deposits.
- We burn these fossil fuels in our power stations to produce electricity and also use the fuels directly to heat our homes and run our cars.



## Energy... at the flick of a switch

We burn fossil fuels every day to heat our homes, fuel our cars and provide power for our cities, factories, schools, shops and hospitals. But fossil fuels are not renewable – once they are gone, they cannot be replenished. So, it is vital that we don't waste them.

Burning fossil fuels releases carbon dioxide (CO<sub>2</sub>) into the atmosphere. CO<sub>2</sub> is a so called greenhouse gas and is a major contributor to climate change.

### The challenge facing our society is twofold:

1. We must ensure we leave sufficient energy reserves for future generations.
2. We must act now to minimise the impact our energy use is having on climate change.

To achieve these goals, we have to change the types of energy we use, and how we use them.

## What is Climate Change?

The earth's climate is not static. It has changed many times in response to a variety of natural causes. However, scientists now agree that a definite link exists between the energy we use and climate change.

When we burn fossil fuels to produce energy, we release greenhouse gases into the atmosphere. They act like an insulating blanket, allowing the heat from the sun into the atmosphere and trapping it there. Over time, this trapped heat causes the atmosphere to slowly warm up, and changes the global temperatures, wind and rainfall patterns. In other words, climate change.

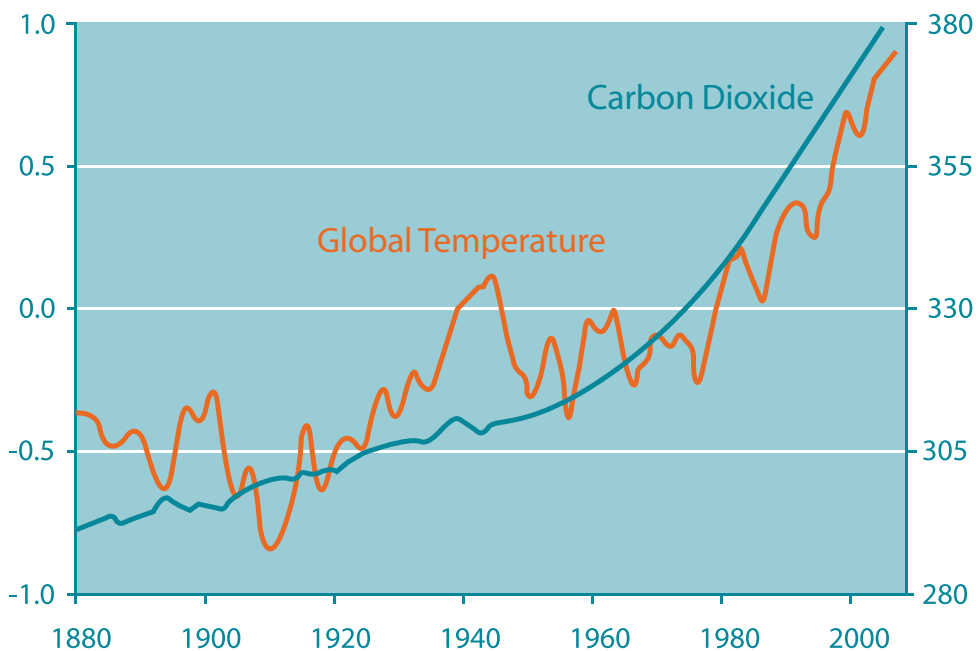


Carbon Dioxide (CO<sub>2</sub>) is the main greenhouse gas and the amount of CO<sub>2</sub> released into the atmosphere has increased tenfold over the last century. This is illustrated below, and scientists point to the rises in global temperature closely following the recent increases in atmospheric CO<sub>2</sub> as proof of the effects of energy use on our climate.

In its Fourth Assessment Report: Climate Change 2007, the Intergovernmental Panel on Climate Change (IPCC) stated that

- Warming of the earth's climate system is indisputable.
- It is very likely that most of the increase in global temperatures since the mid-20<sup>th</sup> century is due to the increase in greenhouse gas resulting from human activities.

## Global temperature and carbon dioxide



Source: IPCC

Never before has humanity had such a large and direct impact on the global environment.



## Why does Climate Change matter?

Climate change cannot be ignored. It affects every living creature and plant on earth and it has major social, economic and environmental implications for us all. We can already see its impact on shifting weather patterns. Extreme conditions such as floods, droughts and storms are on the increase all around the world and these will continue in the coming years.

So what will be the impact of climate change here in Ireland? Experts believe it is likely to be severe. Many aspects of our landscape and way of life may change forever. Warmer summers will bring severe water shortages, with up to 40% less rainfall during the summer and early autumn months. Winter will see up to 11% more precipitation, leading to increased incidences of flooding.

### Climate change will also have a major impact on the Irish landscape\*

- Our lush green Irish countryside will be replaced by a landscape of dried grasses in summer and autumn
- Our world famous fresh water fisheries will be hard-hit by rising temperatures and reduced rainfall
- Grain crops will replace our traditional open pastures
- Farmers will no longer be able to grow the potato as a commercially viable crop
- Bog bursts will be more frequent, as dry mountain bogs tear free from their bedrock.

**Climate change affects all of us and we are all part of the solution. Read on to find out how you can play your part.**

\*"Downscaling Global Climate Models for Ireland and Assessing Impacts"  
John Sweeney et al, National University of Ireland, Maynooth



## Sustainable energy

Sustainability means adopting a common sense approach to living so that we do not waste resources, including energy, or needlessly damage the world around us. It means:

- Utilising energy in ways that are less harmful to the environment
- Using energy more efficiently.

Sustainability means using renewable sources of energy, such as the wind, the sun, oceans and rivers, because energy derived in this way is clean and doesn't produce harmful greenhouse gases. It also means living and working in ways that are less wasteful of energy.

If we decide on a sustainable approach to life, everyone should choose to be involved and take an active part in shaping our society. The starting point for all of us is personal action - deciding for ourselves how we want to live.

## And the good news is...

Being sustainable in how we use energy isn't just about helping the environment. It offers sound financial and practical benefits as well:

- It will save you money on your electricity, heating and motoring bills
- Your home will be more comfortable
- You will be helping to reduce climate change.

Remember, the actions that we take in our homes and everyday life can have major benefits for the environment.



## Save energy at home – being smart

Energy is essential to the comfort of our homes to provide heat and electricity. However there are lots of ways we can be more efficient in how we use energy, while still meeting all our energy needs.

Some things you can start doing straight away and they will cost you nothing. Others take more time and effort, but by becoming energy aware at home, you can save money, increase the comfort of your home and help to reduce climate change.

Here are some common sense, practical ways you can reduce the amount of energy used in your home:

### \*Heating

- Turn your heating down - reducing your thermostat by 1°C can cut your heating bill by 10%.
- Use TRVs (thermostatic radiator valves) to keep your rooms at a constant, comfortable temperature.
- Service your boiler regularly to maximise its efficiency, reliability and safety.

### \*Insulation

- Insulate the attic and walls to make your home more comfortable and reduce heating costs. Between them they could reduce heat loss by 30-40%. Effective attic insulation can pay for itself in two to three years.
- Draught proof windows and external doors to reduce heat loss, making sure to leave sufficient ventilation for the home occupants and any fuel burning appliances or fires.

\*SEAI offers a range of grants for homeowners. Check out [www.seai.ie/grants](http://www.seai.ie/grants) for more information.

## Lighting

- Use energy efficient light bulbs, Compact Fluorescent Lamps (CFLs), instead of traditional bulbs. CFLs consume only 1/5 of the energy and last 10 times as long.
- Turn off unnecessary lights.

## Appliances

- Look for the energy label (rated A to G) when buying a new appliance and choose the most efficient one you can. It will save you money on energy bills and be less harmful to the environment.
- Unplug or turn off electrical equipment that's not in use.

For a full explanation of how you can improve the overall energy efficiency of your home, read our *Householders - be your own energy manager* booklet.

## Save energy on the road



The number of cars on Irish roads has increased by over 50% in the past ten years. As a result, transport emissions represent a large proportion of overall polluting emissions (78% of carbon monoxide emissions and 22% of carbon dioxide emissions). In addition, transport fuels are expensive to import and they cause their own environmental impacts in extraction, refining and shipping.

The increasing number of cars also raises concerns about the depletion of scarce natural resources, as petrol and diesel are not renewable and supplies will eventually run out.

We can all play our part in helping to reduce the impact of cars on the environment.

## Think about when you drive



- Avoid using your car for short or unnecessary journeys. Try walking or cycling instead. It's great for your health.
- Take public transport when it's available. It's cost effective, convenient and you'll be helping the environment.

## Think about what you drive



- Check the Environmental Labelling of Cars. Under EU and Irish law, the motor industry must clearly display the fuel economy and CO<sub>2</sub> emissions of new passenger cars. Labels indicate the energy performance of cars on an A to G range, with A being best. Cars registered are now subject to VRT and annual road tax based on their CO<sub>2</sub> emissions, so the more efficient the car, the lower the VRT and tax.
- To find out how your car rates check out the 'How Clean is your Car' section of the SEAI website which lists the fuel consumption, CO<sub>2</sub>, and other performance figures of cars from the year 2000 on.

## Think about how you drive



A more conservative, energy conscious driving style could save you significant amounts on petrol and diesel and is also safer and more relaxing.

- When starting your car, turn the engine on and drive off gently, without delay. This will reduce excessive fuel consumption and pollution.
- Maintain your car regularly. A properly serviced car, with good engine lubrication, wheel alignment and well adjusted brakes, will reduce your fuel consumption. It will also be safer and more reliable.
- Save fuel in town. Avoid over-revving the engine and drive in as high a gear as is suitable to road conditions.
- Reduce unnecessary drag. Removing unused bike racks or roof boxes will save 15-40% fuel consumption. Keep cool by using the car's vents, rather than leaving the windows or sun roof open, will save a further 3-5%.



## The next step... Renewable Energy

As we have seen, not only are the fossil fuels we use to generate energy bad for the environment, but they will eventually run out. The sustainable alternative to fossil fuels is renewable energy and this will never be exhausted.

### Renewable energy is available to us in many forms

#### The main ones are:

- the sun (solar energy),
- heat from below the surface of the earth (geothermal),
- energy crops, wood (biomass),
- the wind (wind-powered turbines),
- moving water (hydro-electric power, wave and tidal energy).

The good news is that Ireland is rich in renewable sources of energy. Harnessing them will help us reduce harmful greenhouse gases and break our dependence on imported fossil fuels.

Several of these renewable energy technologies are now capable of supplying clean, economical power and heat in your home.

### Solar energy

#### Environmentally friendly, inexhaustible and free

- Passive solar gain or free heat from the sun can be maximised through south facing windows.
- Active solar energy systems have a roof mounted solar collector. This changes direct and indirect sunlight into heat which is used to provide hot water for space and/or hot water needs.
- Photovoltaic cells (PV) collect sunlight to generate electricity. PV is silent and has a low visual impact, making it ideal for urban areas.



## Ground source heat pumps

**Used for space heating and cooling, and water heating.**

→ Also called geothermal heat pumps, these use the constant temperature of the ground beneath the earth's surface as a heat source in winter and a heat sink in summer for cooling.



## Biomass/wood

**Energy resources derived from organic matter.**

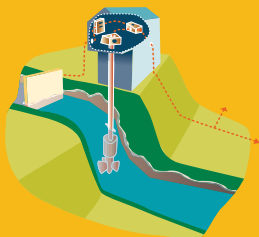
→ Uses compressed pellets of sawdust or wood shavings. Easy to ignite, these can be burned in a boiler or a stove to provide full central heating and hot water. Wood fuel is a 'carbon neutral' fuel as it absorbs as much CO<sub>2</sub> when it grows as is released when burns.



## Wind

**An abundant source of energy in Ireland.**

→ Small-scale wind turbines, from less than 1kW to 50kW, can be cost effective in off-grid applications. Wind power can be more economic than other renewable options.



## Hydropower

**The greatest energy yield factor of the renewable technologies.**

→ A modest 20kW hydro-electric scheme would save 70 tonnes of atmospheric CO<sub>2</sub> being released per annum from fossil fuelled power stations.



## How does Renewable Energy contribute to sustainability?

It makes sense to adopt a sustainable approach to the way we live. Using energy in a sustainable way is an integral part of this approach. It lets us save money, reduce imports, protect the environment and guard valuable resources for use by future generations.

Most renewable energy sources are directly influenced by the sun. The sun provides us with an infinite, sustainable resource through the processes of nature. Heat from the sun causes air currents, which drive the winds. Winds cause rainfall, which powers our rivers. In these ways, heat and light from the sun allow us to generate renewable energy. Harnessing this renewable energy will enable us to use less fossil fuel and reduce the impact of climate change.

**If we adopt a sustainable approach now, we win as individuals and we win as a society. It all starts by each of us shaping our own behaviour.**

## Other publications



SEAI have published a range of brochures for homeowners.

A full list of these can be found and downloaded at [www.seai.ie/publications](http://www.seai.ie/publications)



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