

Our homes: Electricity

Our own homes are the area where we can do lots to immediately reduce our energy use. These actions will actually reduce your emissions, and are not just helping the environment they save money too.



In the current cost of living crisis - many of us have learnt how to cut our fuel bills at home.

Actions to reduce Electricity consumption

Check your baseload

Find out your home's base load and find out where you are 'leaking' power - see link below as an example and contact ACT as we have a guide for this.

Read the article: tinyurl.com/2p9hewwv



Where possible
dry clothes on a
washing line

It helps to understand how electricity usage is measured and priced. You pay for each kilowatt hour (kWh) you use. A kWh is the power, or number of watts, a device uses multiplied by the time for which it is using power. If you have a smart meter and a device that shows how much energy you are using it is easy to see the difference turning on a device makes. But there is another important element to your consumption that is harder to see, which is the base load. This is the power your house uses even when you are asleep or on holiday.

"When we first got a smart meter, we found that even when we thought nothing was going on, the house was drawing a not inconsiderable 541 watts all the time. So, every day our base load was 541 x 24 or nearly 13kWh, costing £3.12 a day at a capped unit price of 24p a kWh."

An Energy Saving Power Meter Plug can monitor and measure the energy use and costs of running household appliances. These sockets measure the power used by any device connected to it. They can be purchased quite cheaply, you may know someone you can borrow one from.

Minimise use of air conditioners and/or dehumidifiers

DID YOU KNOW?

Typical small (room sized) air conditioners and/or dehumidifiers operates at 500 W, kept on for two hours a day over 6 months will cost £54.75 and emit 47.73 kg CO₂e.

Use power showers sparingly as they use a lot of energy

DID YOU KNOW?

Power showers use a lot of energy, so use them sparingly. Every minute you operate a 7 kW power shower, once a day for a year will cost £12.77 and emit 11.14 kg CO₂e.

Consider a PV system

If you have a perfect aspect roof, are not at home most days a typical 3.6kWp solar PV system may reduce the running cost £240 and emit 209.24 kg CO₂e less annually. Your savings could be double that if you are at home during the day.

If it cost £5,000 to install, your financial pay-back would be 10-20 years depending on electricity prices in the future. This is within the 25 year expected life of the panels.

If you have a perfect aspect roof (with battery), for a typical 3.6kWp and a 6kWh battery, you could save £720 and emit 627.72 kg CO₂e less annually depending on electricity prices and how the battery is used. If it cost £6,000 to install, your financial pay-back would be 8-12 years, about the warranted life of the battery. The higher the electricity prices the shorter the pay-back period. Your carbon pay-back would typically be much quicker.

Vacuum clean on the lowest setting you can get away with

DID YOU KNOW?

In one hour of hoovering, 3 times a week, the difference can mean a saving of nearly £85 and emit 73.65 kg CO₂e less per year.

Switching lights off

DID YOU KNOW?

Even LED use energy! If you turn off 5 lights in a room when you don't need these; for 5 W LED spotlight not used 5 hours a day would save you 9kWh p.a. equivalent to a reduced cost £2.74 and emit 2.39 kg CO₂e less in that time. For 38W LED ceiling panels, you'd save 70 kWh p.a. or £20.81 and emit 18.14 kg CO₂e less p.a.

Wash clothes at 30°C instead of 60°C and only when you have a full load, it's about six times as efficient.

DID YOU KNOW?

Washing a full load in a A+++ rated washing machine at 20°C instead of 60°C, 3 times a week for a year, would typically cost £36.6 and emit 31.91 kg CO₂e less.

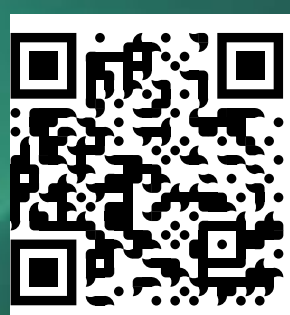
QUICK GUIDE

A kWh (kilo Watt hour) is referred to as a unit of Energy.
1 kW = 1000 Watt

Energy (in kWh) = Power (in kW) x Time (in hours).

- Every 1 Watt on all the time is costing you £2.20 a year (assuming a unit price of 25p).
- 2kg of CO₂ is about 1 cubic metre of greenhouse gas.

The shorthand for GHG emissions often used for carbon dioxide is CO₂ equivalent (CO₂e).



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Calculations are based upon electricity unit rates being 30p per kWh, mains gas being 8p per kWh, and Fuel being £1.45 a litre

Our homes: Heating

Actions to reduce Heat consumption

How we heat our homes efficiently, and avoid wasting that energy is one of the major ways we can make carbon emission reductions, and the financial savings can often be seen immediately.



Make your home heating more efficient and save money at the same time.

Make sure your windows are closed when heating Especially the upstairs ones. Left open, a 1 m2 window in a typical house could cost you as much as £34 and emit an unnecessary 4.5kg CO2e p.a. if you heat with gas.

TOP CARBON CUTTING TIP:
Improve your home's insulation and ventilation, get impartial advice.

Reduce heat loss in the winter

The higher the difference in temperature between inside and outside, the more energy you will need to heat (or cool) your home. You can lose heat in winter from walls, roofs, floors, windows doors and from unwanted ventilation. Some actions will cost you nothing or very little, so consider doing those first.

Reduce unwanted ventilation caused by badly fitting windows and doors

This could add up to having a window open 24/7, so a potential cost of £820 and 106 kg CO2e. Make sure windows are properly shut! You can fit draught excluder strips or door sausages. You may also need to seal wall cracks between walls, ceiling, floor and window/door frames. Consider covering draughty floors with carpets or sealing these. Remember to leave enough ventilation to maintain appropriate levels of oxygen/CO2 and moisture.

Try keeping yourself warm while reducing the background heating temperature Warmer clothes, a hot water bottle or even a 'safe' electric blanket are good options. You can also investigate infra-red heating panels or even use small electric heaters for short periods when/where you need these.

Experiment with how long you need to keep your immersion heater/boiler on for hot water purposes

Start with 30 mins of heating before you need the water, once or twice a day. Increase this by 10 mins until you have enough hot water for your needs.

Heat only the area you need, set this to the lowest temperature to remain comfortable

Only heat the water that you need

DID YOU KNOW?

Most of the energy used to heat a well lagged conventional hot water tank for 1 hr using a 3 kW emersion element can be lost in a day if you don't use it

Make sure your hot water cylinder and pipes are well lagged

If your home has a hot water cylinder (as opposed to a combi boiler), fitting it with a thermostat and making sure it is properly insulated are simple and cost-effective ways to save energy.

Find out more at the Centre For Sustainable Energy
tinyurl.com/53cthm8e

and see The Heating Hub Tips
tinyurl.com/mvywvnpud

Put up thick curtains to retain heat in winter, use reflective curtains to reduce heat in summer.

Use thermostatic radiator valves to control heating and make sure your main thermostat is in the right place and used appropriately.

Get advice on whole house retrofit

Ideally this would be from an independent trust mark assessor with appropriate qualifications (e.g. PAS 2035). This will cost more than an EPC, but at around £550 should give you effective advice on what to do and when.

For residential buildings contact Energy Saving Devon
www.energysavingdevon.org.uk

For commercial/community buildings contact Decarbonise Devon
tinyurl.com/nhzz38tb



Use the appropriate heating system for your home and your needs.

This will depend on your particular circumstances and preferences, but could save you as much as 50% on your heating bills. Invest some time in finding out if you have the right heating system and controls, also if you are using these correctly.

Fit secondary glazing, either a seasonal thin film or snug fitting framed polycarbonate

Turn your main thermostat down by 1°C.

DID YOU KNOW?

For each 1 m2 single glazed window in a typical house, this could save you £9.50 and avoid 18kg of CO2e.

DID YOU KNOW?

For a typical house this will save around 10% equivalent to 1,300 kWh p.a. ; 280 kg CO2e p.a. avoided £169 p.a. saved.

Find out where you are losing most heat and tackle those areas first.

You may need help with this from an independent source. It may be your walls, roof or floor that need additional insulation.

Visit TECs E-Pack for a self-help programme
tinyurl.com/sp6xrn9p



Consider electric heating if you are a low heat energy user

This technology can be localised

There are Heat Pumps of various types, Infra-Red panels that heat you rather than the air around you or a good old fashioned electric heater with/without a fan. Note that solar panels (PV or thermal) do not supply enough surplus energy for heating in the winter, unless you have your personal solar farm!

Consider fitting a Heat Pump

First make sure your home is suitable by having it independently assessed.

Ideally, your annual heat energy demand should be less than 75 kWh/m2 of floor space. Alternatives such as pellet boilers may be an option, but get independent advice on practicality and costs.

If you have a Heat Pump experiment with the times you operate it

Ideally keep a lower background room temperature and raise this only when you need it, there can be quite a lag. For example, raise the room thermostat as late as possible before you need the heat and lower the room thermostat before you no longer need the heat. The timing will depend on your particular circumstances. Find out how well insulated and how much internal heat-mass there is (e.g. solid walls and floors) by asking your installer for advice or using apps to calculate this for you.

If you have a Heat Pump and don't need much hot water

(e.g. less than 50 L per day at 40°C), use direct heating for a short time, such as an immersion heater, instead of your HP. If you have a PV system with surplus electricity, use this during the summer. You can fit a device to divert this surplus to the immersion element in your hot water tank.

If you have a correctly sized/fitted Heat Pump, make sure you are using it correctly

Fit and draw your curtains when heating

Make sure these are snug fitting into the reveal of the window, not overhanging a radiator.

Lifestyle:

Food

One area of our homes that we can easily make energy reductions in is our kitchens.



Actions to reduce Food consumption

Eat less red meat, avoid imported meat

DID YOU KNOW?

Replacing 100g of beef with the same amount of chicken or pork once a week may cost the same but would avoid ~ 100 kg CO₂e p.a. . Replacing this with lentils would save you ~£14 p.a. and avoid ~185kg CO₂e p.a.

Growing your own food

Try to do this with others to share, it will reduce costs and emissions. You'll also know what's gone into them.

Preserving food

Keeping food for longer periods means they need to be either processed, frozen or kept in controlled environments. Processing needs a little more energy but can reduce the nutritional value in some cases, the other two methods of preserving food use more energy.

Plan your meals and buy what you need

On average we throw away 30% of our food, that's nearly £2,000 per average household per year. On the basis that household food waste accounts for half of this, you could save up to £1,000 and avoid some 500 kg CO₂e in a year

There are some good tips in the "love food hate waste" campaign www.lovefoodhatewaste.com

Only fill the kettle with the water you need

DID YOU KNOW?

Every ½ litre of water boiled unnecessarily will use 0.05 kWh, this costs 2p. Doing that 3 times a day all year round is equivalent to 14.32 kg CO₂e and £16.43 p.a.

Buy local food (ideally seasonal and prepared/grown locally)

This can make a significant difference, however, it can also be quite confusing and often difficult to work out. Food grown seasonally will, in the majority of cases, use less energy and therefore have lower emissions and cost less. Transport, contrary to what we may think, is not always the biggest contributor to higher emissions and costs, unless it is air freighted or refrigerated. If grown locally, you have an opportunity to find out how the food is grown, stored and transported.

Reuse, repurpose, recycle and share kitchen gadgets you only use occasionally, they could make great presents - seek out your nearest library of things to borrow things you only use very occasionally.

Ovens use a lot of energy so try to cook several things together

DID YOU KNOW?

Cooking in an oven at 200°C for one hour, 3 times a week, would cost £70.39 and emit 61.37 kg CO₂e per year.

FOR EXAMPLE

Naturally heated greenhouse grown vegetables (tomatoes and peppers) about 1.02 kgCO₂e/kg.

FOR EXAMPLE

In season field grown vegetables (peas and beans) have about 0.47kgCO₂e/kg

DID YOU KNOW?

Running a typical 100L freezer for a year will consume 250 kWh p.a. this will cost you £75 p.a. and emit around 65.39 kg CO₂e p.a.. Pasteurizing 100 L of food/drink would cost £3 and emit 2.62 kg CO₂e once and keep for a year.

TOP CARBON CUTTING TIP:

Use a microwave, air-fryer and induction hob where possible, avoid ovens, especially a gas one that runs all the time.

Eating less red and processed meat is a healthy option

Ask where your meat comes from. You can then find out what the animals were fed on, whether forests had to be cleared for them and how far they've travelled.

Diet



Did you know that known emissions for diet can also be calculated?

ACT's Carbon Footprint Tracker enables users to calculate their food carbon footprint and search to find emissions from buying different food items.

This allows you to enter calculated emissions from other sources such as the Carbon Factor Search (remember you can contact Teign Energy Communities - TECs for help on this).

<https://teignenergycommunities.co.uk/carbonfactors/site/codes.html>

More information

Here are some useful links:

<https://www.nutrition.org.uk/media/nmmewdug/nutrition-requirements.pdf>

<https://carbsandcals.com>

<https://ourworldindata.org/food-choice-vs-eating-local>

<https://howbadarebananas.com>



Microwaves are much more efficient than ovens

DID YOU KNOW?

With microwaves, almost all the energy goes into the food you are cooking. For 6 minutes of cooking in a microwave at full power (1000W), once a day all year round, would cost £15 and emit 11 kg CO₂e per year.

FOR EXAMPLE

1kg of Tomatoes shows even greater variability from 1.3kgCO₂e for salad tomatoes grown locally to 28.2kgCO₂e for 1kg of organic vine cherry tomatoes grown in the UK in a heated greenhouse in March, better get these flown from Spain or Morocco, the flight adds 2.3kgCO₂e to an estimated 1.2kgCO₂e making 3.5 kgCO₂e. Tinned tomatoes from Italy with emissions of about 1.2kgCO₂e.

TOP CARBON CUTTING TIP:
Plan your meals and buy what you need

Alternatives to Cow's milk

Dairy products tend to have higher emissions, so reducing these makes sense. Replacing the cow's milk in your latte with oat milk will cost about the same, but could avoid 50g of CO₂e emissions (18kg CO₂e p.a. if you had one cup a day). Putting a little cow's milk in your americano costs a little less and could avoid 70g of CO₂e.

Eat well.

A healthy diet does not need to cost more or have higher emissions. It does need you to know what a healthy diet is, in your case. It also needs you to check the label and look things up.



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Transport: Travel

Globally transport accounts for around a quarter of all CO₂ emissions. We can all help to speed up the transition to lower emission.



Actions to reduce Transport consumption

Consider reducing how far and how often you travel. If you could reduce your car travel by 740 mi in a year it would save you £120 on fuel costs and avoid 40 kg CO₂e in a conventional car that does 50mpg. Cutting out one flight Exeter-Alicante return would save £150 and avoid 470 kg CO₂e.

If you need to get a taxi, request an electric vehicle on your cab hailing app.

It's time to slow travel to holiday destinations, enjoying getting there without the huge carbon emissions.



If you don't use your car a lot consider selling it and joining a car share initiative.

Consider transport alternatives, especially for your regular journeys.

- Walking is ideal, do it whenever you can it's healthy and costs nothing.
- You can go further cycling, especially with an E-bike. The average journey distance in a car is 7 miles, doing that on an E-bike instead of a car will save you £1.13 and avoid 2 kg CO₂e. It's similar when compared to an EV, £0.91 saved and 0.66 kg CO₂ avoided. If you used your car for this short journey every other day, in a year it would save you £206 and avoid 372 kg CO₂e.
- Use public transport where possible. Taking the train from Newton Abbot to Exeter and back instead of a car will save you £0.80 and avoid 10 kg CO₂e. It's also a lot less hassle and you get some great views.

If you travel alot for work, consider digital meetings instead of in person ones.

Tips to reduce emissions and costs when driving.

- Accelerate less quickly, especially uphill. Avoid accelerating only to have to brake more, drive more smoothly.
- Turn off your engine when idling for more than 30 sec. Idling for 1 minute five times a day would typically cost you £33 and emit 59 kg CO₂e p.a.. That's without accounting for air conditioning or heating.
- Keep your tyres correctly inflated. Underinflated tyre pressure of ~10% can put £36 on your annual fuel bill and emit an extra 65 kg CO₂e p.a. for a typical care that clocks up 7,400 miles. It will also extend the life of your tyres and make driving safer.

Consider when to buy a new car.

- Do this either when you have to, for example it's no longer road worthy or uses a lot of fuel. If you do 7,400 mi in an old car that does 30mpg, replacing it with a small EV that does 3mi/kWh would save you more than £1,000 and avoid 2,900 kg CO₂e in one year on fuel alone. You can work out the payback years.
- Buy a second-hand car or lease one provided the costs make sense for you.
- An EV is unlikely to reduce your emissions or costs if you do less than 5,000 a year. A lot will depend on what EV you buy, how you drive it and where the electricity to charge it comes from. You'll need to do that calculation.
- Buy an EV appropriate to your needs, the heavier the car and the longer it's range, the more emissions and cost you will have.

Best and easiest way to know what the likely emissions are is to check the miles/kWh, both those stated by the manufacturer and those available on the internet for real world conditions. You can reduce this figure by ~10-20% to account for inefficiencies in the charging process.

To work out the embedded emissions (emissions from manufacturing things), use the Carbon Footprint Tracker tinyurl.com/5n7mnx6x



FOR EXAMPLE

Driving a smaller EV compared to a larger one with double the weight (batteries are heavy) could save you £296 and avoid 214kg CO₂e p.a.. The embedded carbon and vehicle cost is also likely to be 30% higher for the heavier EV, extending the payback even longer.

A comprehensive guide For more information on Electric Vehicles, see the TECs EV document tinyurl.com/TECSEV



Share your journeys

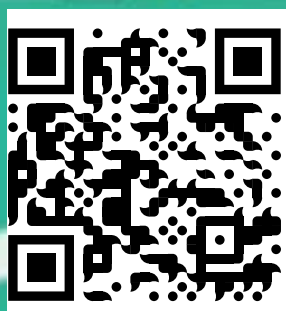
DID YOU KNOW?

Sharing a 50 mile daily commute to work with one other person can save you £962 p.a. just in fuel costs, it would also reduce your personal emissions by 1,720 kg CO₂e p.a., that's doing 50mpg, 5 days a week for 47 weeks.

Reduce your speed

DID YOU KNOW?

Driving 500 miles at 70mph instead of 80 in an average car (50mpg) can save you £63 and avoid 112 kg CO₂e. An annual mileage of 7,400 equates to a saving of £925 and 1,655 kg CO₂e emissions avoided p.a. More savings can be achieved by driving at 60mph.



TOP CARBON CUTTING TIP:
Swap short journeys for a bicycle or electric bike, it's the most eco-friendly way to travel.

Calculations are based upon electricity unit rates being 30p per kWh, mains gas being 8p per kWh, and Fuel being £1.45 a litre

Lifestyle: Shopping

The way we live our lives and the choices we make all contribute to our total carbon footprint. Actions we can take to reduce, reuse, and recycle all make a big difference.



Actions to reduce consumption of Goods & Services


Repair cafés

WHAT ARE THEY?

Repair Cafés are free meeting places and they're all about repairing things (together). In the place where a Repair Café is located, you'll find tools and materials to help you make any repairs you need. On clothes, furniture, electrical appliances, bicycles, crockery, appliances, toys, et cetera. You'll also find expert volunteers, with repair skills in all kinds of fields.

Buy refurbished or second-hand

Lots of opportunities for that, but make sure the running costs/emissions are not more than a newer more efficient replacement. For this you need to do a payback calculation:

Embodied emissions sometimes called embedded emissions are the emissions from manufacturing the thing 

$$\begin{aligned} \text{Emissions payback time in years} &= \frac{\text{Embodied emissions of new thing}}{(\text{annual emissions of old thing} - \text{annual emissions of new thing})} \\ \text{Money payback time in years} &= \frac{\text{Price of new thing}}{(\text{annual running costs of old thing} - \text{annual running costs of new thing})} \end{aligned}$$

TOP TIP:
Move your investments to low Carbon businesses

Make things

It may sound strange when it's so much easier to buy, but there's a lot more long-term satisfaction to be had from learning and doing things for yourself, especially when it's done with others.

Rent or share

Almost everything manufactured will have some embedded carbon emission associated with making and delivering it, the bigger/more expensive, the higher these emissions. If you are not using it all the time, consider renting or sharing the item. There are plenty of schemes, but the best ones for sharing are with those you know/trust. Doing this means you share the carbon footprint, whether its car sharing, car renting or buying a car with a relative/friend.

Recycle

That's not just our waste collected by the council, it includes passing things on to others when they are still usable. Clothes, furniture and tools lend themselves for this. There are lots of local opportunities to do this.

Move your money to an ethical bank

Have a pension?

Contact your pension provider and ask if they are planning to divest from fossil fuels. If not, find a low carbon alternative.

Get in the habit

Get in the habit of thinking about your day-to-day environmental impact and make changes that are kinder to the planet. Think about what you can do to reduce your carbon footprint every day.

Repair rather than replace

It's becoming more accepted (and cheaper) to repair things. If we are prepared to take our car to the garage for some repairs, why don't we take those trousers or skirts to have the zip replaced? Some things are beyond repair, but it's worth finding out.

Offsetting

Offsetting our greenhouse gas emissions seems a reasonable option.

It is something that has been available for some time with schemes becoming more transparent, publicising their 'Gold Standard' credentials. But what is offsetting and how effective is it?

CARBON INSETTING

Businesses and organisations can use carbon insetting as a strategy to reduce their carbon footprint by investing in emissions reducing projects within their own supply chains. Insetting focuses on internal sustainability efforts to mitigate emissions, promote sustainable practices, and create a more environmental business model across the supply chain.

Too often offsetting schemes are presented either without a greenhouse gas impact analysis or one which only considers part of the total lifecycle emissions.

Even more worrying is that technologies such as heat pumps and EVs are often 'sold' as low-carbon without stating the full life-cycle emissions to allow an informed decision. In other words, how much greenhouse gas do I reduce, at what cost and under what circumstances.

Worst of all is the accounting trick that quite a few offsetting schemes use, even some of the more 'reputable' ones. What they do is calculate a future or even the total 'offset' emissions over the life of the measure, but apply it to the year the offset payment was made.

- There are two types of offsetting considered here:.
- We can sequester CO₂ from the atmosphere, by removing it using natural means (photosynthesis of plants) or engineered mechanical/chemical means referred to as Carbon Capture Utilisation and Storage (CCUS or just CCS). There is also Direct Air Capture (DAC) of CO₂.
 - We can generate low-carbon energy which is used by us or others to replace energy with higher greenhouse gas emissions. It is also possible to replace systems with more energy efficient ones (e.g. insulating buildings).

Both are valid, provided they:

- account for their full life-cycle emissions and demonstrate the time.
- accurately state the amount of 'removed' or 'avoided' emissions.