

# Reducing carbon from energy use at home

Guidance for households

August 2021



## Call to Action

HDCCC and Harrogate Council are both committed to becoming Net Zero by 2038. Our vision is that the Harrogate District as a whole has a net-zero carbon economy by 2038, and we invite you to help us by committing to making your home Net Zero by then.

These are the top five actions we recommend taking to reduce your energy carbon footprint:

- ✓ **Switch to a green electricity tariff** – saving up to 0.8 TCO<sub>2</sub>e p.a. at no extra cost
- ✓ **Reduce heat losses at home by insulating, draught-proofing and improving heating control** – saving up to 1.6 TCO<sub>2</sub>e and £290 p.a.
- ✓ **Replace your light bulbs with LEDs** – saving up to 0.04 TCO<sub>2</sub>e and £40 p.a.
- ✓ **When it is time to replace your boiler, choose the lowest carbon heating option that you can afford** – saving up to 0.8 TCO<sub>2</sub>e and £155 p.a.
- ✓ **Opt for greener travel** (e.g. walking, cycling, public transport and low carbon vehicles)

This guide provides details on these and other options to reduce your energy bill and energy carbon footprint.



## Background

The UK is in a climate emergency and the UK Government's target is to achieve Net Zero Carbon\* by 2050. Net Zero means achieving a balance between the carbon emitted into the atmosphere and the carbon removed from it. This balance will happen when the amount of carbon we add to the atmosphere is no more than the amount removed.

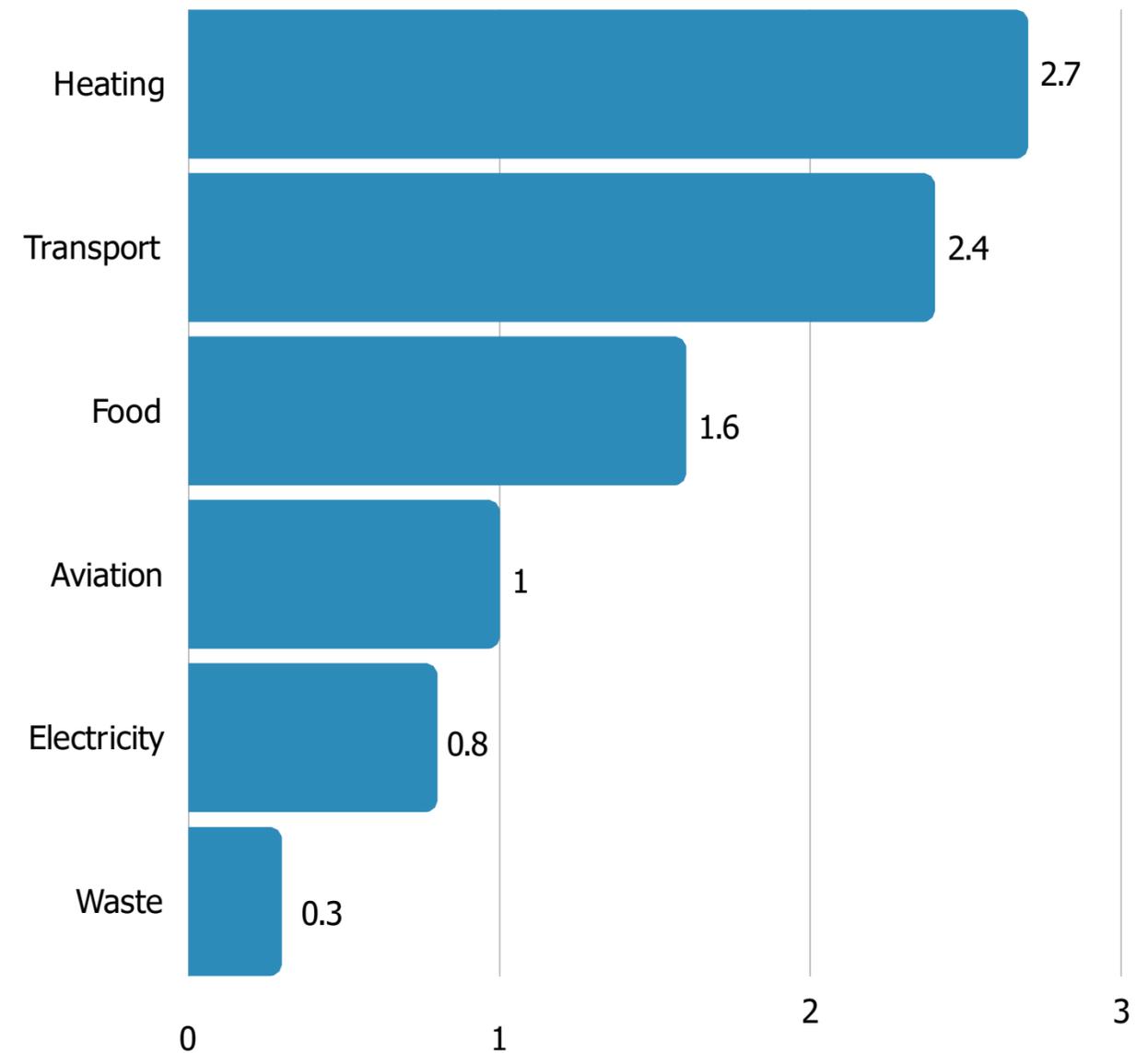
Thanks to the Government, business, industry, and households, we have reduced our carbon emissions by 44% relative to 1990 levels\*\*.

We all need to do more to achieve Net Zero. Reducing the energy we use for heating our homes and for transport are top priorities.



*The average UK household has a carbon footprint of 9 TCO<sub>2</sub>e per year\*\*\*. Energy emissions\*\*\*\* account for most (67%) of this.*

Breakdown of the average UK household carbon footprint (Tonnes CO<sub>2</sub>e/ year)



Source: Energy Savings Trust

\*Carbon is used as an abbreviation for all greenhouse gas emissions, the main one of which is carbon dioxide. Carbon units are expressed as tonnes of carbon dioxide equivalent (TCO<sub>2</sub>e for short)

\*\* Source UK Government. Note that this figure relates to pre-covid carbon emission levels in 2019 and excludes carbon emissions from international transport and the manufacture of imported goods.

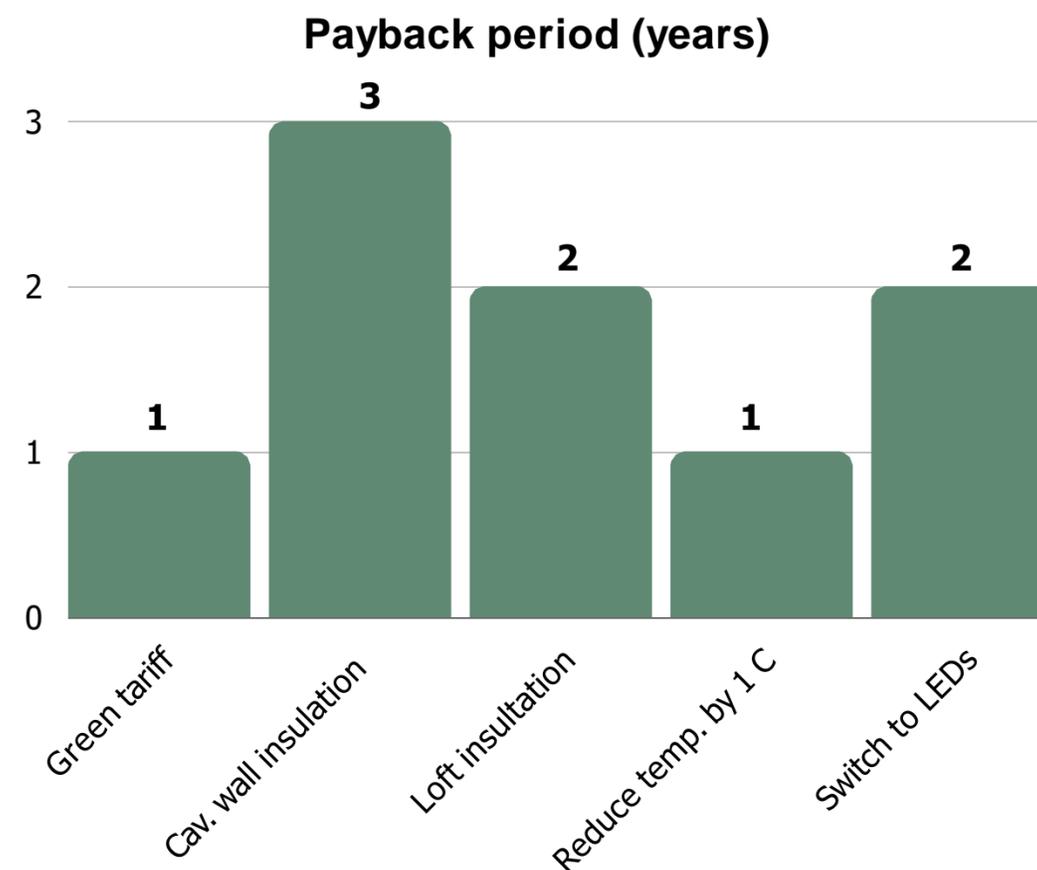
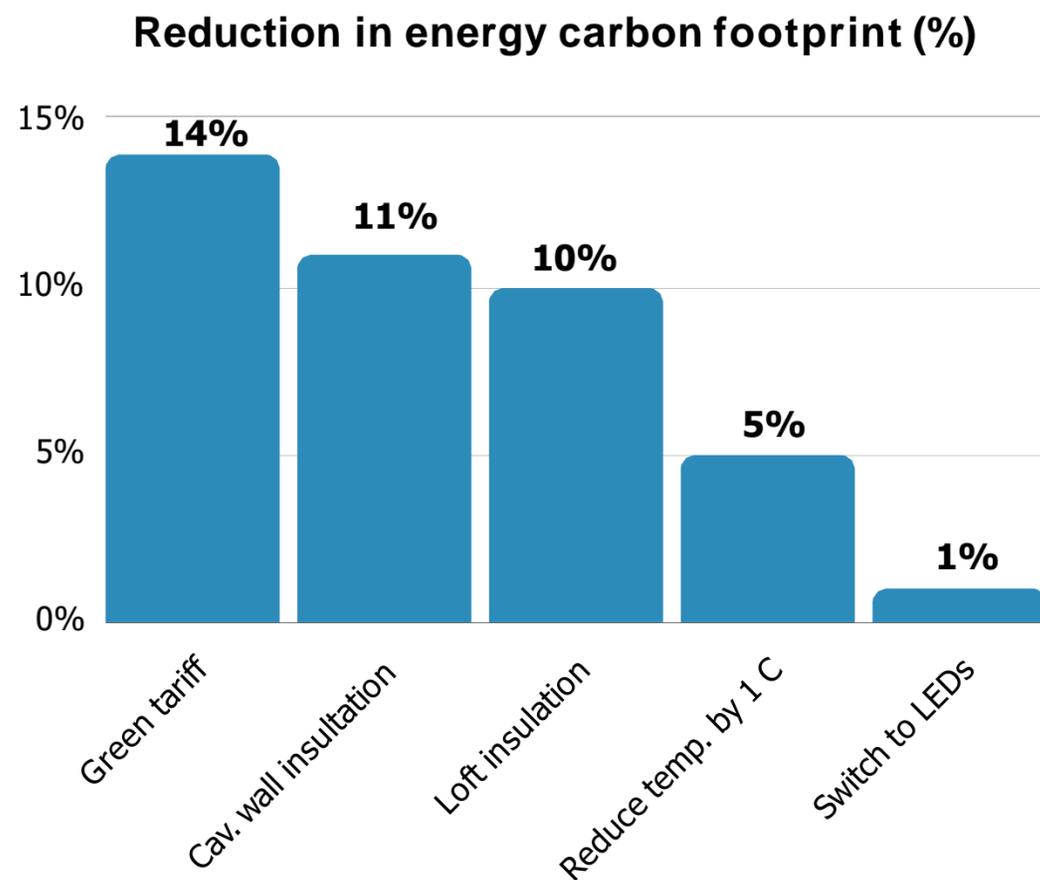
\*\*\*All figures in this guide are taken from the Energy Savings Trust (July 2021), a reputable source, and relate to a 3-bedroom semi-detached house.

\*\*\*\* From heating, electricity and transport

## Financial benefit of committing to net zero

Many carbon-saving actions will also save you money. The charts below show the average household energy carbon footprint reduction and payback periods for low-cost actions. The payback period is the time it takes for the cost savings of an action to pay for the upfront cost. These actions are described in more detail in the following sections.

As interest rates for savings accounts are so low, there has never been a better time to invest in energy-saving measures, many of which pay back in 0-5 years.



Many carbon-saving actions will save you money and pay for themselves in 0-5 years

## Switch to green electricity

### Switch to a green electricity tariff...

Switching to a green electricity tariff should save c.0.8 TCO<sub>2</sub>e p.a. and is recommended once stability returns to the energy market. Whilst green energy tariffs have in recent years been available at no extra cost to standard tariffs, the increase in the energy cap in October 2021 and further increases predicted, means switching tariffs and/or suppliers should only be done once the supply situation becomes clearer. See [guidance on switching your energy supplier and choosing the right green electricity tariff](#).

### ...or generate your own renewable electricity

An additional action that can reduce carbon at home is to generate your own renewable electricity. A few households may have the opportunity to generate electricity from wind and hydro. Solar panels tend to be the most common option available to homeowners (this will depend on whether you own your roof and the direction of your roof – South is best).

On average a solar home system costs around c.£4.8k and can save up to 1 TCO<sub>2</sub>e per year. Solar home systems will usually reduce your energy bills (though savings vary from £100–240 p.a.). In most cases, you can also earn money for surplus electricity that you export to the grid (worth £90–120 p.a.). For guidance on solar home systems and other home-based renewable electricity generation options, see [The Energy Savings Trust](#) and [MoneySavingsExpert](#)



## Reduce heat losses

- **Loft Insulation:** Up to 25% of heat can be lost through your roof. You can reduce this by insulating your loft with up to 270 mm of insulation and insulating your hot water tank. If your loft is uninsulated the cost will be around £300 and could save you c.£135 and 0.6 TCO<sub>2</sub>e p.a. paying for itself in c.2 years.
- **Wall insulation:** Up to 33% of heat is lost through your walls. Most post-1990 houses have cavity wall insulation. Post-1920 houses generally have cavity walls. Cavity wall insulation costs c.£475 for a 3-bed semi and could save you £155 and 0.7 TCO<sub>2</sub>e p.a, paying for itself in under 3 years. Unfortunately, it is expensive to insulate solid walls (£8-10K) though some grants are available (see page 10) and you can save c.£210 and 0.9 TCO<sub>2</sub>e p.a.
- **Draught-proofing:** If you have badly fitting external doors, windows, or an open fireplace you can lose a lot of heat. It is a relatively easy DIY job to draught-proof doors and most windows, and you can expect to save £25 and 0.1 TCO<sub>2</sub>e p.a. If you have an open fireplace, fitting a purpose-made inflatable chimney draught excluder, which fits inside your chimney, can cost £15 and will save you about £17 and 0.1 TCO<sub>2</sub>e p.a.
- **Heating controls:** Thermostats control your boiler turning it on and off to give your required room temperature. There are a few options to improve heating control. For example, try to set thermostats to the lowest comfortable temperature between 18-21°C. Turning a room thermostat down by one degree could save you £60 and 0.3 TCO<sub>2</sub>e p.a. Also consider 'smart' thermostats and thermostatic radiator valves.

Please refer to the Energy Savings Trust for further information and guidance on [reducing home heat loss](#) and [temperature control](#).



## Replacing your heating system

For homes with a mains gas connection, an A-rated condensing gas boiler is likely to be your cheapest option. Gas still tends to be the cheapest heating fuel per kWh. Replacing an old gas boiler with a new A-rated (condensing boiler) could cost c.£2.5k\* and save £110–200 and up to 0.8 TCO<sub>2</sub>e p.a.

For homes without a mains gas connection it might be worth switching to a low-carbon heating option. With the RHI subsidy (see page 10), these may be cheaper overall. These include:

- **Air Source Heat Pumps** which use air and refrigerant to create heat. A typical system costs £7–13k. If you also use 100% renewable electricity, this can eliminate your heat carbon footprint. When used in a well-insulated house, they are likely to reduce your energy bills. Savings depend on your original heating fuel.
- **Ground Source Heat Pumps** are similar to Air Source but have pipes buried in the garden to extract heat from the ground. They are more efficient than Air Source but need a large garden and cost c. £14–19k.
- **Solar Water Heating.** This uses solar panels, fitted to your roof to collect heat from the sun, which heat up water that is stored in a hot water cylinder. They cost c.£3–5k and save c.£75 and 0.35 TCO<sub>2</sub>e p.a. These systems can provide most of your hot water in the summer, but less in the winter.
- **Biomass Heating Systems.** These burn wood to provide warmth in a single room or the entire home. Biomass releases carbon when burned, but considerably less than fossil fuels\*\*. An automatically fed wood pellet boiler costs £9–15k. Wood costs depend on the size and method of delivery. A biomass boiler could save you money if you are currently using oil, electricity, or LPG for heating.

For more information see [The Energy Savings Trust](#).

\*With a programmer, room thermostat and thermostatic radiator controls

\*\*This is the case for sustainably sourced biomass. Sustainability certification (such as the [Forestry Stewardship Council \(FSC\)](#) certification, assures that the wood comes from sustainably managed forests.



## Energy efficient light bulbs and appliances

### Switch to LED light bulbs

Switching to energy-efficient light bulbs can reduce your carbon footprint and electricity bills by up to 20% without reducing the quality of light. They can save you up to 0.04 TCO<sub>2</sub>e and £40 p.a. The Energy Savings Trust provides a [detailed guide on choosing low-carbon lighting for your home.](#)

### Choose energy-efficient appliances

When replacing appliances, choosing an A-rated energy-efficient option can save you money and carbon. If you are looking for a new appliance for your home (e.g. washing machine, television, or freezer) lookout for the energy rating label. This information will help you choose the most energy-efficient appliance and work out how much it will cost to run. For more information see the [Energy Savings Trust's guide on buying energy-efficient products.](#)



## Low carbon transport

Working from home, walking, cycling, using public transport, [car sharing](#) or [car clubs](#) are key ways to reduce your transport-related emissions.

For those who have no option but to drive to work, switching to a lower carbon vehicle, such as a plug-in hybrid or fully electric car is likely to both reduce your fuel costs and your carbon footprint. When considering a lower carbon vehicle take care to consider full lifetime costs. Low carbon vehicles are generally more expensive to buy than petrol or diesel alternatives. If you are considering leasing your vehicle, they may be more cost-effective than conventional cars. [According to the RAC](#), leasing an electric car may cost only a small amount more than the petrol or diesel alternative. It may save you money overall due to fuel and other cost savings. Based on [Energy Saving Trust](#) data the fuel costs of an electric car are around £7 less per 100 miles than for a petrol or diesel car. Low carbon vehicles are also exempt from road tax and congestion charges.

Note that from 2030 it will no longer be possible to buy new petrol or diesel cars in the UK. Please see the following links for guidance on choosing a [low-carbon vehicle](#) and [your charging options](#).



## Funding

**Council grants:** Harrogate Borough Council is offering grant-funded insulation for low-income households across the district through its Home Upgrade Grant (HUG). HUG funding is available to you whether you own or privately rent\* your home (subject to terms and conditions). You can use the HUG for loft insulation, draught-proofing, or cavity wall insulation. If you own your home, the entire cost of the works will be covered by the grant and a maximum of £5,000 is available for improvements if you rent your home from a landlord.

\*Note: you will need your landlord's permission to carry out any work if you are in private rented accommodation. For more information see [Better Homes Yorkshire](#).

**Subsidy for green heating systems:** The Domestic Renewable Heat Incentive (RHI) is a government financial incentive to promote the use of renewable heat. It is available for certain heating systems including heat pumps, solar thermal and biomass heating, and often enables these systems to pay for themselves (via energy cost savings and subsidy payments) in 5–7 years. People who join the scheme and stick to its rules receive quarterly payments for seven years for the amount of clean, green renewable heat it is estimated their system produces. The RHI will run until March 2022. For further information see [Ofgem guidance](#).

**Payments for green electricity exports:** If you install a renewable electricity system at home you could benefit from a Smart Export Guarantee (SEG) tariff. The Smart Export Guarantee is a support mechanism designed to ensure small-scale generators are paid for the renewable electricity they export to the grid. It has been in place since 1 January 2020. It is available for households who generate their renewable electricity from solar, wind, hydro, and other renewable sources. For more information see the [Smart Export Guarantee](#).

