

CHARLTON KINGS HOME ENERGY

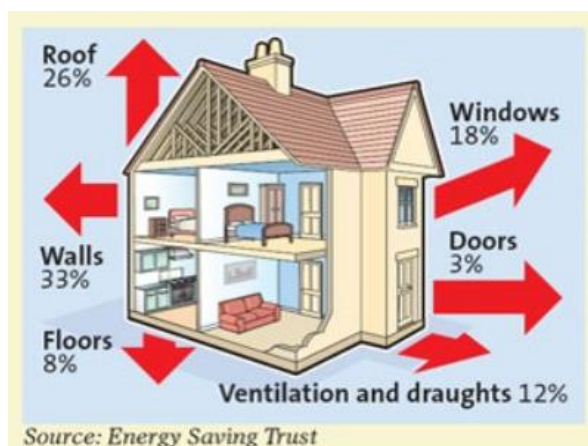
About this guide

This guide explains how homes in Charlton Kings typically consume energy **and** the straightforward ways in which energy use (and £bills and carbon emissions) can be reduced.

Keeping Heat In

DID YOU KNOW ?

As at Nov 2022, the average mid-size household in the UK spent around £1,000 on heating rooms, generating about 2 tonnes of carbon emissions.



Reduce Heat Loss

The warmth generated by a heating system is inevitably lost; through the roof, doors, walls, windows, floors, etc.

The key is to **REDUCE** the rate of heat loss. A lower rate of heat loss translates into less heating, less cost and fewer carbon emissions.

Loft Insulation

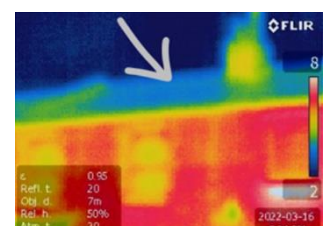
Loft space insulation is a very effective and relatively cheap way to reduce heat loss. Insulating to a depth of 270mm will typically pay back within 2 or 3 years. If your loft is (part-)boarded it is usually possible to raise boarding above the joists with 'loft legs', allowing insulation to be installed beneath. The loft hatch should also be insulated, otherwise overall performance of the loft insulation will be reduced.

A cold loft space should be ventilated! Appropriate air flow is required to minimise the risk of condensation, which can occur when temperatures dip over winter.



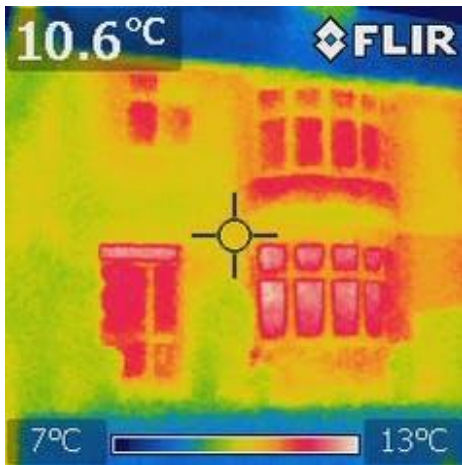
The *Energy Saving Trust* website has useful advice on loft insulation - <https://energysavingtrust.org.uk/advice/roof-and-loft-insulation/>

This house in Charlton Kings has a relatively cold roof. The loft floor is well insulated, making it difficult for heat to escape from the living space into the roof space. Hence, the roof is cold. Great!



Covering windows

During daylight hours, windows help warm a home by allowing radiant heat in. But as day gives way to night most windows, even double-glazed ones, allow heat to escape. Around **1/5th of heat loss** from the average UK home is through its windows.



Creating a barrier with curtains or blinds (or both) is a great way to reduce loss. Ideally, lined curtains and thermal blinds. If you'd like to make your own thermal curtains, here's how: <https://tinyurl.com/3ytja3yj>

***Radiators** – around ¾ of the heat emitted by a standard radiator rises out of the top. It is important therefore that curtains don't drape over the radiator - otherwise heat is guided to the window, not into the room

Chimney

If your home has a chimney, you may have noticed the 'stack effect' – warm air from inside a house is drawn up & out the chimney, and replaced by cold air drawn in from outside through floors, doors and windows. Heat loss via this route can be tackled by draught proofing the chimney.



Information on Chimney draft excluders can be found here ...

<https://energysavingtrust.org.uk/how-draught-proof-your-chimney/>

Shut That Door

When an **external door** is opened warm air flows out and cold air flows in. The exchange of air can be significant, so minimising the amount of time that door is open will help.

Internal doors, if closed, will help to keep warm air where you want it. Hot air rises, so if you want the downstairs living space to be warmer than upstairs bedrooms, close both the living room and bedroom doors.

Draughts

Preventing the intrusion of cold air through leaky doors, windows and floors can be an easy DIY fix. Info on how to locate and fix draughts can be found here ... <https://energysavingtrust.org.uk/cutting-out-draughts-older-homes/>



Heat People Not Air?

The *modern* way to stay warm at home involves heating the entire volume of air to somewhere around 18-21°C. This requires a great deal of energy — around 60% of total energy consumed in the average home is used for space heating.

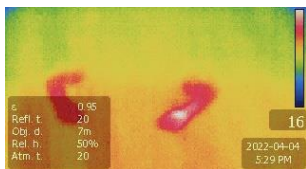
DID YOU KNOW ?

Turning down a thermostat by just 1°C reduces energy consumption by around 10% *Energy Saving Trust

The human body generates around 100 Watts of heat energy at rest and a lot more when active. Insulating the body to trap this heat is a super-efficient way to stay warm and usually allows the thermostat to be turned down.

Jumpers, fleecy blankets, etc. are great insulators.

Alternatively, garments like a heated gilet can work very well. Heating a person directly is much more efficient than heating the large volume of air that surrounds them.



Hands & feet lose a lot of heat. Keeping these areas covered helps to keep the whole body warm. Two pairs of socks works surprising well. Slippers, of course. Attractive mitts, why not.

← *This CK kitchen floor has sucked heat from slipper-less feet.*

Heating System Efficiency

Condensing Gas Combination Boilers

For the majority of CK homes, heating and hot water is provided by a Gas Combination (Combi) boiler. Most combi boilers allow the homeowner to set the heating system **flow temperature** – the temperature at which water flows from the boiler to the radiators. If the flow temperature is too high, approx. 70°C or more, the boiler will not operate efficiently – it will turn less of the gas you pay for into heat.

This article provides more information on setting the flow temperature for combi boilers

<https://www.theheatinghub.co.uk/articles/turn-down-the-boiler-flow-temperature>



Some combi boilers have a 'Preheat' function This can be switched ON or OFF via the **Eco / Comfort** button. Preheat determines how quickly the boiler delivers hot water to taps and showers. Preheat ON (that's Eco turned OFF) delivers hot water to the tap more quickly **but** the boiler will burn more gas to provide this level of responsiveness.

Central Heating Thermostat

The location of a central thermostat can influence the efficiency of a heating system. The thermostat should be located where the air temperature is relatively stable, away from sources of heat and cold. If located above a radiator or near a fire for example, the thermostat may turn off the heating system prematurely. Conversely, if located next to a front door, an in rush of cold air might cause the thermostat to turn the heating system on for the whole house. Other locations that could be problematic include: a window ledge (which can be affected by direct sunlight as well as external temperature) and kitchens (heated by cooking).

If your central thermostat is near a TRV controlled radiator (see below), it's usually best to fully open this TRV so that it does not contend with the central thermostat.

Thermostatic Radiator Valves (TRV's)

TRV's conserve energy by ensuring rooms are heated to the required temperature, and no more. For example, if the TRV knob is set to position "2" (which corresponds to approx. 19°C), the radiator will stop emitting heat when a room temperature of 19°C is reached. And, as the room's temperature falls below 19°C, the TRV will allow the radiator to emit heat once more.



Example — TRV's in living rooms could be set to a target temperature of 20°C, TRV's in bedrooms set to 17°C (in general, people prefer to sleep at a cooler 16-18°C). A TRV in an unused room could be set to a minimal temperature, although be aware that cold spaces may suffer condensation.

As mentioned previously, if your main Central Heating Thermostat is located in a room with a TRV controlled radiator, it's probably best to fully open this TRV, allowing the main Central Heating Thermostat to control that room's temperature.

Is it better to leave my heating on all day?

A question often asked in relation to central heating — "Is it better to leave my heating on at a low temperature for a long period, or just turn it on for an hour or two when needed?".

The answer is ... "it depends". It depends on factors like occupancy, the type of heat source, heating controls and insulation. Here is a nice YouTube video which discusses the relevant factors. <https://tinyurl.com/89nwujat>



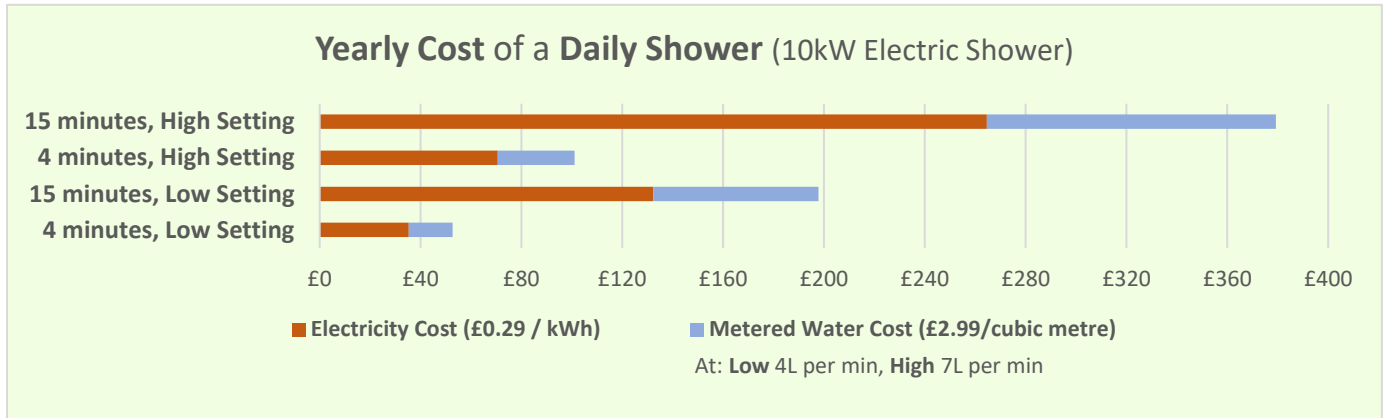
If you have a Smart Meter, it's possible to assess different heating approaches for your home. Detailed gas usage data is collected by the smart meter which should be available via your energy provider website, or the Smart Meter home display.

Heating Water

DID YOU KNOW ?

Heating water to 40°C for baths, showers, washing, etc. accounts for about ¼ of all energy consumed in the average UK home. *Energy Saving Trust

Showers



The chart above illustrates the annual cost of a daily shower, using a typical **Electric Shower** with two *Power Settings*, **High** (10kW) and **Low/Eco** (5kW). In addition to the cost of energy, Severn Trent will charge metered customers for the water consumed.

The obvious energy saving step is ... reduce time spent under the shower. Research into showering habits shows that ¼ of people who shower spend over 15 minutes/day in the shower, shaving, brushing teeth, singing, listening to music, relaxing.

Also bear in mind the *Power Setting* you select. The High-power setting will use around 2x more energy than the Low-power setting.

If you have a mixer shower supplied from a **boiler / cylinder** its worth checking the shower's 'Flow Rate' – how much water is coming out of the shower head?

A standard mixer shower will output around 10 litres a minute, **if** the tap/lever is fully opened. That's enough to fill a 100-litre water butt in 10 minutes. Heating that volume of water to around 40°C costs a lot of energy.



To check your flow rate, take a 1 litre jug and see how long it takes to fill. Eg. If it takes 6 seconds, the shower will be outputting 10 litres per minute (60 secs ÷ 6 secs = 10 litres per min). Energy consumption can be reduced by using less water:

- Avoid turning the tap/lever to its maximum. A flow rate of 5-6 litres per minute gives a nice shower
- Alternatively, fit a flow restrictor (around £10) to your shower.

Baths

Baths typically use more hot water than short showers. It's therefore best to limit baths. For small children, consider using a child's bathtub within the main bath or in the shower cubicle – this will consume a lot less water & therefore less energy.

Electricity

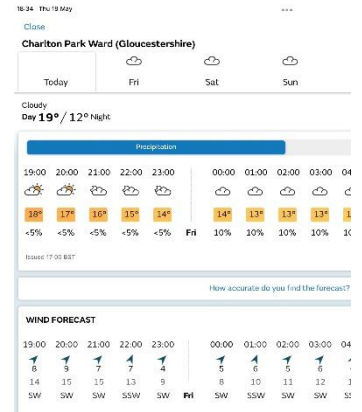
Tumble Dryers

Condensing and Vented tumble dryers consume around 4.5-6 kWh per cycle. Around £1.50 (assuming 29p/kWh) per cycle.



Alternatively, drying clothes outside costs no money and emits zero carbon. And if personal circumstances allow, line drying is possible all-year round, just about.

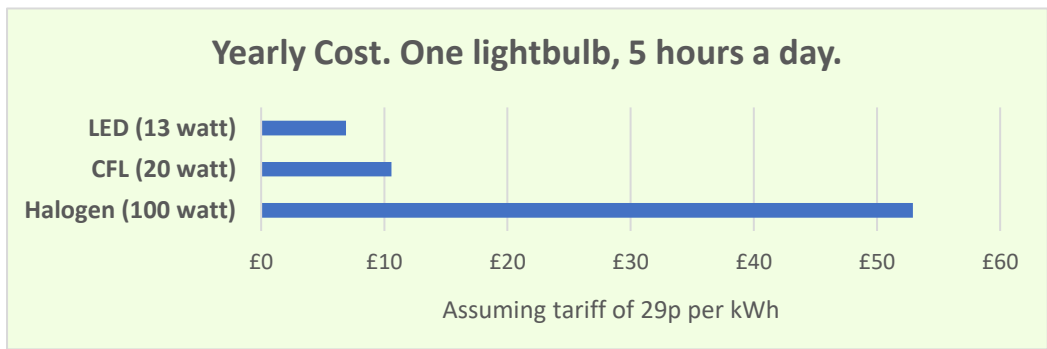
The **MetOffice** app is great – it provides a local Charlton Kings forecast, ideal for line drying enthusiasts → → →



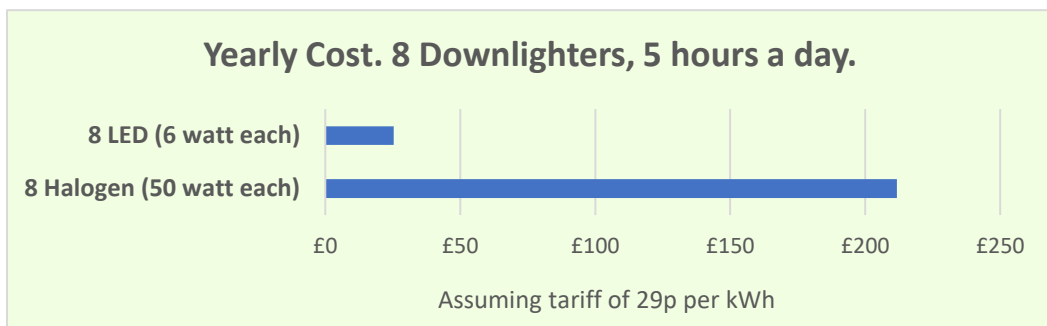
Heat Pump dryers are a new-ish technology. They are more expensive to buy but use considerably less electricity than conventional tumble driers.

Light Bulbs

Old-style Halogen lightbulbs are very costly to run. An LED light bulb is typically **9 times more efficient** than a halogen bulb.



** Halogen bulbs are very hot to touch — please be careful!



← 1200 Lumens

LED and Halogen bulbs provide the same brightness (Lumens) but consume very different amounts of electricity

← 430 Lumens

This website provides instruction on replacing Halogen downlights with LED

<https://www.wikihow.com/Replace-Halogen-Downlights-with-Led>



Understanding Your Home Energy Use

Our homes typically contain loads of appliances, devices, lighting and heating systems. Some of these items will be efficient, some probably not. Some may be efficient but are used for long periods. Understanding this picture can be incredibly useful.

Understanding Your Consumption

Smart Meter

Smart meters are ordered free of charge from your energy provider. The associated 'In-House Display' will show consumption of electricity in real time Eg. switch on a light, oven or other appliance and observe its electricity usage. The display unit can be used in this way to gain an understanding of how electricity is being consumed in your home.



Energy Monitor Plug



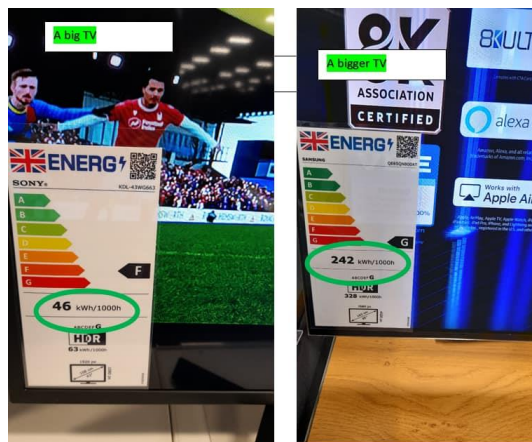
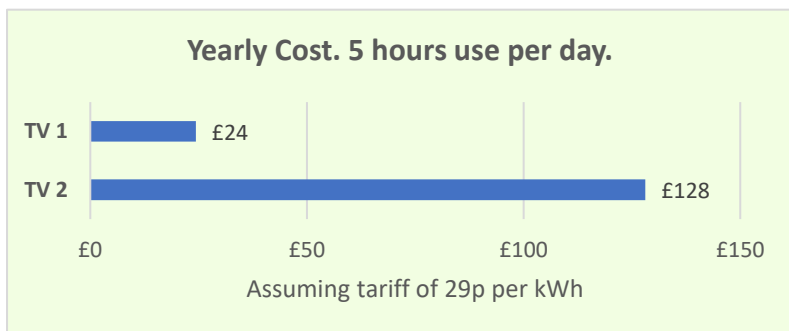
Another option is an energy monitor plug. For example, if you want to know how much electricity that garage freezer or tumble dryer consumes, the monitor will tell you. Typical cost is £15-20. Alternatively contact [Charlton Kings Parish Council](#), they have a plug which can be borrowed.

If you're comfortable with controlling devices over the internet, Smart Plugs can record energy consumption, making this information available via an App.

Energy Labels

If you're looking to introduce a new electrical appliance into your home, it's a good idea to establish how much electricity it's going to use.

As an example, here are Energy Labels for 2 televisions on sale in Cheltenham. These TV's are the same size, but one consumes 46 kWh per 1000 hours, the other 242kWh per 1000 hours.



Condensation, Damp, Mould & Ventilation

Although this guide focuses on energy efficiency, it's worth touching on the issue of **damp**, a problem which can be exacerbated by energy-saving efforts. Eliminating draughts certainly keeps heat in, but unless a home is ventilated, its air can become moisture-laden. And, although reducing the temperature of an unused room will save energy, that room might become cold enough for humid air to condense onto its surfaces.

It's recommended that indoor **Relative Humidity (RH)** (a measure of air moisture level) is maintained between **40% and 60%**. Above 60-70% makes it more likely that you'll see condensation on cold surfaces: windows, upstairs ceiling with inadequate insulation above, behind a wardrobe, etc. Persistent condensation can then lead to mould growth.

High Humidity → Condensation → Damp → Mould

So, what to do?

Ventilate

For most of us, the best way to ventilate is to open windows. This will exchange humid indoor air for fresh air. Once the fresh air is warmed to room temperature, **RH** will fall.

More Info: <https://www.getenergysavvy.info/post/ventilation-practical-solutions>

Human Activity

Occupant activity can introduce many litres of water vapour into the air each day, and this can cause or make damp problems worse. Steps that can be taken include:

-Showering / bathing. Close the bathroom door to prevent water vapour escaping from that room. Use the extractor fan if you have one. Open the window to ventilate. Wipe down the bath / shower area afterwards – otherwise that water will evaporate into the air over the next few hours. For babies and toddlers, use a baby bath.

-Cooking. Like showering, close the kitchen door if you have one, use the extractor if it extracts to the outside, open a window to ventilate. Keep lids on simmering pans.

-Drying laundry. If you can, dry laundry outside. If this removes just $\frac{3}{4}$ of the water in a wash load, that's around 1 litre of water which will not evaporate inside your home. If you do need to dry indoors, close the drying room door and open a window.

-Workout. People generate a fair bit of water vapour just by breathing and sweating. That amount increases when doing physical activity. Again, it's best to close the exercise room door and ventilate by opening a window.

What's the Relative Humidity in your home?

A hygrometer will tell you. They measure *Relative Humidity* and cost around £10.

