

Getting smarter with energy

A changing energy system means changing our energy habits ...

Our energy system is changing. In 2010, almost all of our electricity was generated in power stations from fossil or nuclear fuels. By 2021, almost 40% was generated by renewables. This is great for reducing carbon emissions – essential for tackling climate change. But renewable energy generation varies over time and is difficult to predict. Solar and wind farms are located all around the UK and sometimes the grid can struggle to cope with too much electricity being generated in one place, when the demand for it is somewhere else or at a different time of day.

We need to become more aware of *when* we use electricity as well as *how much* we're using for this new energy system to work. The highest demand for electricity is 4-8pm each day, when households are cooking, watching TV etc. This is called 'peak time'.

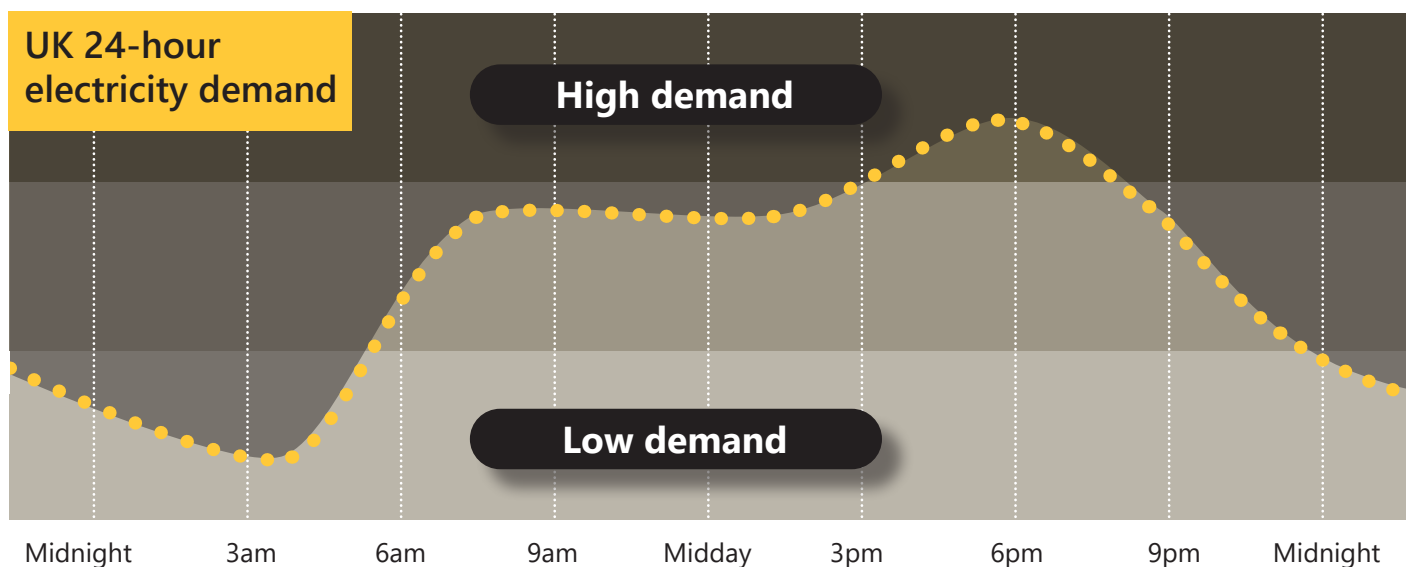
To meet this demand gas power stations are fired up, which is expensive and high in carbon emissions. If households can shift some of their home activities out of peak time – like doing laundry – this will help to cut fuel bills and greenhouse gas emissions.

As we move away from using fossil fuels for heating and transport, for example with heat pumps, electric cars and E-bikes - more of our household activities will use electricity. This makes balancing the demand and supply of electricity even more crucial and means we need to shift our electricity use in time to make use of the cheapest, greenest available energy.

Smart energy use

We're already experts in shifting our electricity use to reduce our costs. We might wait for a sunny day to do our laundry and avoid using a tumble drier, or batch cook food to avoid using our oven every evening. Some households are on Economy 7, a tariff which has a cheap off-peak rate for electricity at night and a higher standard day-rate. Economy 7 is an example of a time-of-use tariff – where the cost of electricity varies according to the time of day you use it. If you're not on a time-of-use tariff, you will be on a single rate tariff meaning that you pay the same rate for electricity regardless of when you use it.

Smart meters provide better information about a home's consumption of gas and electricity to help households and suppliers manage energy more efficiently. A smart meter monitors the household's energy use and tariff and communicates this information to the energy supplier and to the household via an in-home display or phone app. If you are on a time-of-use tariff, it will show when the cost of the energy changes. This enables you to become more knowledgeable about your energy use and to decide whether changes to activities are needed, depending on



**In-home display**

your circumstances. For example, you may decide to put your washing machine on first thing in the morning to take advantage of lower electricity rates. Smart meters automatically send accurate meter readings to energy suppliers enabling them to bill you for exactly how much energy you have used.

Data from smart meters also helps the energy industry to better predict energy demand for the UK. If electricity supply does not meet demand, power cuts can occur. Overall, shifting when electricity is used and time-of-use tariffs – enabled by smart meters – will help balance energy need across the UK and allow more renewable energy to be used.

Smart products and services

Smart products and services are any appliance or service that helps you to automate when and how much energy you use. For instance, teasmades, heating timers and mechanical timer plugs are examples of simple devices that do this. A growing number of smart devices - smart washing machine, heating controls and lighting – can be controlled remotely via a smart phone or by voice activation (Alexa, Siri). A home's smart devices can be integrated via platforms that use smart meter data to make sure households are using the cheapest energy available to them.

Many homes now produce their own electricity, mainly using solar panels. These households both produce and consume energy and are sometimes called 'prosumers'. In addition, battery storage enables any household to store electricity, great for prosumers who can store their free solar electricity for use at night. With time-of-use tariffs any household with a battery could automatically store cheap electricity from the grid when renewable generation

was high or demand low and provide some back during peak times when it's needed. Batteries which provide this 'shifting' service help to balance the electricity grid, reduce the network costs for all consumers and reduce household energy bills.

Community groups are also producing their own electricity and working out ways to make renewable energy available locally. Community energy groups can provide information about smart energy products and services and can sometimes help households to experiment with new technologies.

Smart energy use in the future might involve households and communities all over the UK working together to generate, share and store electricity from the cheapest source, be it solar panels on the roof, a neighbourhood battery or renewable grid electricity.

Who will benefit?

These options will suit some households but not others. For example, households with young children might need to cook meals at peak times and can't shift the time they use their washing machine. Similarly, smart heating controls may not be the best option for those without a smart phone. Some smart appliances are currently quite costly to buy so may not be an option for those on a lower income. However, the right smart products and services could help you to achieve real improvements in your levels of comfort and lower your bills.

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We're a charity supporting people and organisations across the UK to tackle the climate emergency and end the suffering caused by cold homes.

Our Home Energy Team offers free advice on domestic energy use to people in Bristol, Somerset, Wiltshire, South Gloucestershire and Dorset.