Heat Pack

A simple guide to low carbon heating for local authorities

In this guide

How this guide will help you

We're determined to facilitate the Net Zero revolution and engage with organisations from all backgrounds to make it easy to switch to low carbon technologies (more on 'Net Zero' on page 3). We've put this guide together to provide support to local authorities who are interested in learning more about decarbonising heating.

We want to listen to you to make sure we are answering the questions you have, so we've written this guide with a wide range of interested parties in mind. We've also teamed up with leading organisations to make sure we're meeting the needs and ambitions of all. If you have feedback or questions, please get in touch with us at innovation@ukpowernetworks.co.uk.

Our research so far has shown there is always more we could offer to help consumers, and that lack of awareness and education is a major barrier to low carbon heating. We hope this guide can act as a useful resource to equip readers with information that can help them in their decarbonisation journey, whatever form that might take.

We surveyed 412 industry stakeholders to understand their views on heating decarbonisation

87%

Said we should focus on supporting customers' decision making process on low carbon tech

75%

Think we should coordinate with local authorities when exploring low carbon heating pathways

Learn more about our company, industry and how we're regulated

About us

We are the UK's largest distribution network operator (DNO). We own, maintain and operate all of the wires, cables and substations of the electricity distribution network across London, the South East and East of England (highlighted in orange below).

Our core role is to keep the power flowing safely, efficiently and reliably while providing excellent customer service to more than eight million homes and businesses in our areas.

We're not the same as commercial energy suppliers. We don't generate or buy electricity or sell it to customers. Energy consumers pay a small portion of their monthly bills - on average £6.32 a month - to us to transport energy to them.

92%

Customer satisfaction score 2020

21p

Per day cost. Industry lowest

99.99%

Network reliability

Learn more about where greenhouse gases come from

Facilitating the ‘Net Zero’ revolution

In 2019, the UK became the world’s first major economy to make a legal commitment to reaching ‘Net Zero’ greenhouse gas emissions by 2050. The goal aims that by the end of that year, the amount of carbon we emit will be reduced to *almost* zero. Any remaining emissions will be offset by removing carbon from the atmosphere. It is an extensive challenge but we’re determined to lead the way in our industry. Our regulator Ofgem has demonstrated leadership with their decarbonisation action plan and we fully support their approach. Right now, we’re focusing our efforts on three main pillars:

Renewable energy

Electricity used to be only produced through high carbon fossil fuels like coal, oil and gas. This has changed dramatically in the last decade. Innovation and smart solutions are helping us connect more renewables than ever at lower cost. So far we’ve connected enough renewable energy to power 3.5m homes. We forecast this to double by 2030, meaning 80% of the 8m homes and businesses on our electricity network will be powered by renewable energy.

Electric transport

New technologies have brought electric vehicles into the mainstream in recent years. Our latest forecast project 1.9m to 4.5m on our networks by 2030. Every single one will charge through our network which creates some significant technical challenge. Our industry-leading EV Strategy explains how we are adapting to help facilitate the roll-out of electric vehicle charging in four steps: forecast, monitor, deploy a flexibility first approach and invest strategically in network upgrades.

Heat decarbonisation

Along with electricity generation and transport, heating homes and businesses is one of the largest greenhouse gas emitters across the UK, accounting for about a third of total emissions. We have an established role in enabling renewable energy and electric vehicles, and decarbonising heat is our next area of focus. Through our initial research, we have identified that providing more information and resources to stakeholders is a key role for us. View our Heat Strategy to learn more about our approach.

Decarbonising heat: vital for ‘Net Zero’

When we talk about ‘heating decarbonisation’ or ‘the decarbonisation of heat’ we really mean removing a lot of the carbon that is currently emitted supplying heat to homes and businesses. Three quarters of our customers use natural gas for heating, producing significant greenhouse gas emissions. hundreds of thousands more use oil or diesel, which is even more carbon intensive. There are two main ways to ‘decarbonise’ heating:

Switch more properties to low carbon heating

More properties using low carbon heating means lower carbon emissions. There are various different types of low carbon heating options, including heating through electricity, biomass, heat storage or hydrogen gas delivered through the traditional gas network. The Government’s ‘Ten Point Plan for a Green Industrial Revolution’ - published in December 2020 - sets out an ambition to drive the growth of low carbon hydrogen gas and scale up the electric heat pump market in the coming years. Hydrogen gas is not currently commercially available in the UK.

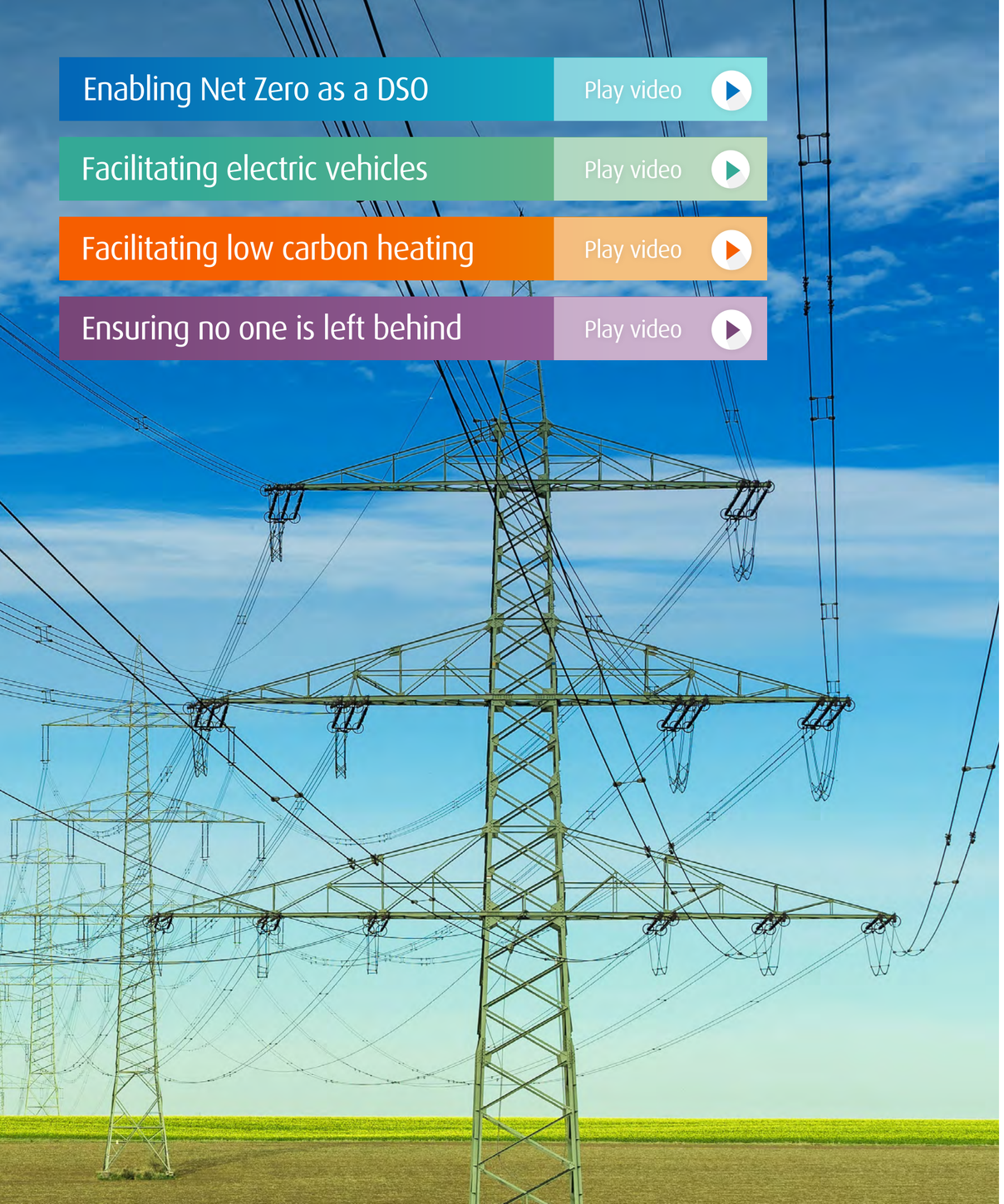
Reduce the overall need for heat

Using less energy for heat will lower carbon too. However, it’s not simply about lowering energy demand by having everyone turn down their thermostats. We need to reduce the amount of energy required to achieve the same comfort level of heat - especially important during winter! This can be achieved by making energy efficiency improvements to buildings. There are a whole host of energy efficiency measures, including double glazing or extra loft insulation. The benefits of energy efficiency are long-lasting and there are no ongoing costs to consumers once installation is complete. Energy efficiency measures also go hand in hand with electric heating, as they help lower overall energy demand - taking the pressure off our equipment - while saving people money on their bills.

Commercially available low carbon heating options

- **Electric heat pumps**
- **District heating with a low carbon source**
- **Immersion boilers**
- **Solar thermal panels**
- **Biomass heating systems**
- **Heat storage (such as a hot water tank)**

Find out more at Which? ▶



Our broader strategy

As a company we strive to be the best performing Distribution Network Operator (DNO). This is supported by our vision to be an employer of choice, a respected and trusted corporate citizen, and to do so in a sustainable, cost-efficient way while keeping everyone safe.

We have a critical role at the heart of the future energy landscape, enabling the transition to Net Zero carbon emissions. We plan to enable all our customers and stakeholders to benefit from better safety, reliability and cost efficiencies, especially as we innovate and invest to deliver a sustainable future.

To achieve Net Zero, the decarbonisation, decentralisation and digitisation of the UK's energy system will have to accelerate in the coming years. We're well underway in several key areas, including plans to evolve into a Distribution System Operator (DSO). That means we will develop from being a company that simply manages the network, into one that is proactive and enables a smart, flexible system. We've produced some helpful videos which you can watch on the left. You can see all of our recent performance results in our 2020 Annual Review.

Read our Heat Strategy

Read our Electric Vehicle Strategy

Innovating for a green future

Innovation will play a crucial role in the transition to low carbon heating and Net Zero in general. We know this because we've invested in innovation and seen benefits - no other network has saved more money through innovation, or turned more innovation ideas into business as usual, than us.

We are already underway on projects which we believe could help support local authorities Some of our initiatives which you can get involved in are below. To learn more please get in touch with us at innovation@ukpowernetworks.co.uk.

Decarbonising off-gas grid communities

Through our Communiheat project we're aiming to create a blueprint for local area energy planning which could be replicated in other areas.

A zoning approach to inform local authorities

Our Heat Street project is generating insights on various local solutions based on policy drivers, demographics and regional dynamics.

Creating potential uptake scenarios

Data forecasting and research helps us understand how the future might look and plan ahead. We want to share our insights with local authorities.

Innovation case study: Flexible Connections

Our successful innovation project 'Flexible Plug and Play' proved the benefits of flexible connections. Using our Active Network Management software system, flexible connections allow new generators like wind and solar farms to connect for a much lower up-front cost for agreeing to export less electricity when supply exceeds demand. Since 2014, flexible connections have saved more than £80m in connection costs.

Practical steps consumers can take

Most people are rightly concerned about the climate crisis. Recent research by National Grid Gas Transmission showed that this is a widespread concern. The majority of those surveyed report to have changed their habits to lower their carbon footprint, but it does depend on which habit. For example, 91% of people said they had reduced their household waste, and 64% said they had installed new insulation. However, only 3% have installed solar panels or bought an electric vehicle. Here are some of the practical things consumers could consider to lower their energy use and/or carbon footprint through electrification.

- Install an electric heat pump | the natural gas network that heats most UK homes creates significant carbon emissions. Using electricity for heating and cooking produces less carbon. Read more
- Switch to an electric vehicle or hybrid | Just like with heat, using a petrol or diesel car creates carbon emissions. Electric vehicles produce no emissions when they're being used. Read more
- Upgrade energy efficiency | consumers could consider installing extra insulation, or switching to double glazed windows. Anything that keeps the heat in properties will lower energy use, and therefore the amount of carbon emitted to heat the home. While some involve physical upgrades, other energy efficiency measures are relatively inexpensive. Simple measures like having thicker curtains or draught proofing a door can make a big difference. Read more
- Installing rooftop solar panels | With solar panels consumers can generate their own renewable electricity, meaning their property will 'import' less energy from the grid. Overall, this means fewer carbon emissions. Read more
- Use less energy | This seems like a simple one, but making sure to turn off lights before leaving the home, using smart heating controls, or having the heating clock on slightly later will help consumers use less energy and lower carbon emissions. Consumers could also ask their energy supplier for a free smart meter to help track energy use.

Further resources

Energy Savings Trust
Advice on saving energy at home

Heat Pump Association
Information about heat pumps

Making the Most of Local Energy
A previous UK Power Networks Publication

Green Homes Grant
Government funding for home improvements

Our Heat Strategy
Published March 2020

Energy Networks Association
EV and Heat Pump notification process

Which? Guide
Heating with renewable energy

Simple Energy Advice
Government-backed resource with advice on low carbon heating options

Domestic RHI Scheme
Renewable Heat Incentive

Non-Domestic RHI Scheme
RHI for businesses

Zero Carbon Heating Trial
Opportunity for free technology

Our EV Strategy
Re-launched in October 2019

Frequently asked questions

How can we achieve our commitment to ‘Net Zero’ carbon emissions before 2050?

The largest carbon emitters are transport, heating and electricity generation. We are working to actively facilitate the ‘decarbonisation’ of all three areas.

How do consumers start with low carbon heating?

There are many ways consumers can switch to a low-carbon heating alternative. See page 7.

What are the up-front costs with UK Power Networks of low carbon heating?

If a consumer wants to switch to low carbon heating, there may be some up front costs from us to upgrade their electrical supply to accommodate, say, an electric heat pump. Some properties may not need any upgrades. In most cases there will be no cost involved. For more, visit our website.

What is UK Power Networks’ role in low carbon heating?

As mandated by our regulator, Ofgem, We are a ‘technology agnostic neutral market facilitator’. That means our role is to provide information and facilitate Net Zero carbon emission by supporting all types of consumers and stakeholders through their low carbon technology journey, whatever form that might take.

Can smart technology help people save money?

In short, yes. There are numerous home technology options that can help save consumers’ money by lowering energy use and/or improving energy efficiency. See page 7.

What is UK Power Networks?

We are the UK’s largest distribution network operator (DNO). Find out more about us on the next page.

Who is in UK Power Networks’ areas?

We cover London, the South East and East of England. There are six DNOs in the UK is working to facilitate low carbon technologies in their individual region, however, we’re working closely with the Energy Networks Association to establish GB-wide practices. Find out the DNO in your area here: Who is my DNO?

What about energy efficiency?

Energy efficiency is an important part of decarbonising heat. See page 5.

Where are your standards and technical documents

We are currently and consistently reviewing our technical standards to keep up with the latest developments in the sector. View here.

Frequently asked questions

Is ‘low carbon heating’ the same as ‘electric heating’?

No. Low carbon heating is a wide term that includes lots of different modern heating methods. Electric heating is just one example.

‘low carbon heating’ is any type of heating that emits significantly less carbon emissions than standard alternatives. ‘Electric heating’ is any heating that is powered by electricity, such as an electric heat pump.

How can local authorities help?

Many local authorities have already begun working on initiatives to disseminate information about climate change and support consumers in managing their energy use or switching to low carbon technologies. When it comes to electric heating, local authorities can get involved by helping us co-design our priorities, ambitions and services. Our aim is to work hand in hand with local authorities and other stakeholders to facilitate all types of low carbon technologies, including electric heating.

To have your say, you can come along to one of our events or get in touch with us at innovation@ukpowernetworks.co.uk

Will low carbon heating actually happen?

It’s certainly likely. Net Zero by 2050 is a legally binding government commitment. In the future government policy, changing consumer attitudes and new technologies in will likely make it more and more attractive to switch to low carbon heating. The Government’s ‘Ten Point Plan for a Green Industrial Revolution’, published in December 2020, sets out an ambition to support low carbon heating in two major ways in the coming years: driving the growth of low carbon hydrogen gas and scaling up the electric heat pump market.

Are lots of electric heat pumps going to overload the network?

New electric heat pumps will put extra pressure on our network assets. This means we need to forecast, monitor, deploy smart solutions through innovation and invest strategically to make sure our network stays resilient and reliable. We’re already underway on various innovation projects to make this a reality and stay ahead of the curve. We currently forecast there will be up to 712,000 heat pumps on our network by 2030, up from about 20,000 today.

Are there new technologies to replace traditional gas boilers?

Yes. Electric heat pumps are currently commercially available to consumers. There are other types of low carbon heating devices such as immersion boliers, solar thermal panels, storage heaters or heating systems which use biomass. Furthermore, research is ongoing into the use of zero emission hydrogen gas, which could one day replace natural gas in the UK’s gas network.

Thank you!

We'd like to extend our enormous gratitude to our collaborators who helped us shape and co-design our Heat Pack. Without your valuable input, it wouldn't have been possible.

citizens advice

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COMMUNITY ENERGY SOUTH

Find out more

HPF HEAT PUMP FEDERATION

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Passivhaus Trust

Find out more

Greater South East Energy Hub

Find out more

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