DSO | UK Power Networks Delivering your electricity

Distribution Future Energy Scenarios 2024

Preparing to enable the Net Zero transition for all

Executive summary

Welcome to the summary document of our latest Distribution Future Energy Scenarios (DFES). This document aims to provide a concise overview of the DFES, highlighting its significance, and presenting key findings derived from our comprehensive modelling efforts.

In conjunction with this summary, we offer access to detailed datasets, an interactive map, and the complete technical report, providing stakeholders with a holistic understanding of the DFES. See our website.

As part of our commitment to staying abreast of evolving energy landscapes, we annually revisit and refine our assumptions and insights into the energy system. This is the fifth year of the DFES. This iterative approach ensures that we optimise network capacity allocation, aligning with evolving needs and developments in the energy sector.

Within this latest edition, notable enhancements have been made to our baseline data, incorporating revised assumptions related to reduced availability of electric vehicles (EVs) and higher grants for heat pumps.

There is deeper analysis of battery storage. Grid-scale storage connections grew from 530MW to 830MW over just six months in 2023, and we assessed a pipeline of 15GW to form realistic uptake profiles. We also horizon scan, and for the first time assess the prospects for long duration energy storage.

New for this year, our analysis is stated on the latest Census 2021 spatial geography of 11,000 Lower Layer Super Output Areas (LSOAs), updating from the 2011 definitions.

So much has changed in the energy landscape since our first publication in 2020. We have seen the UK adopt a 2050 Net Zero Target, a plan to decarbonise the power system by 2035, the release of multiple policy documents including the Net Zero Strategy.

We have 10GW of connected generation on our network, more than 500,000 EVs in our areas and more than 43,000 heat pumps installed. Increased costs of gas and oil, while past their recent peak, and the climbing global and UK temperature averages have both sharpened the need to move to a Net Zero economy.

11,000

LSOAs definitions updated for 2024

In this report

Executive summary continued

In the last year, we have seen accelerating growth in uptake of storage and of small solar photovoltaics. Growth in EV usage, heat pump installations and smart meter adoption continued, but these all lagged behind a trajectory to deliver Net Zero. UK Power Networks will continue to plan our networks to facilitate the Net Zero transition at the lowest cost to customers. The DFES contributes to this by providing updated forecasts of where future electrical demand may materialise on our network.

This year we established the first independent Distribution System Operator (DSO). The DSO makes decisions, independently from the Distribution Network Operator (DNO), on the most cost-effective way of expanding the capacity of the network.

The delivery of DFES is now under the purview of our DSO directorate. The benefit of this cannot be understated. We have committed to delivering £410m of savings over the five years to 2028, though better utilisation of the network and use of flexibility compared to a conventional approach, while enabling unprecedented low carbon technology (LCT) growth. Our analysis shows that the DSO will deliver wider system savings of between £780 million and £2.6 billion by 2040 across our region.

Informed by our market intelligence and regional engagement, the DFES underpins our DSO functions, giving us an idea of when, where, and how many LCTs will be connecting to our network under a range of assumptions, and underlying trends in demand due to energy efficiency and changes in building stock.

Within our DSO, our Local Area Energy Planning (LAEP) team develops collaborative relationships with regional governmental bodies, such as Local Authorities, County Councils, and London Boroughs. We support them in creating well justified energy plans and have developed a new methodology to allow local insights to shape our network investment decisions, ensuring that we can facilitate local decarbonisation, while saving money for our customers. Energy Systems Catapult estimates that a Net Zero approach that is locally planned and coordinated with electricity networks could save £252 billion between 2025 and 2050.

In 2024, we will integrate this DFES with the most up-to-date local inputs to create a 'Locally Enhanced' scenario. This enhanced scenario will serve as the foundation for our network planning in the upcoming years.

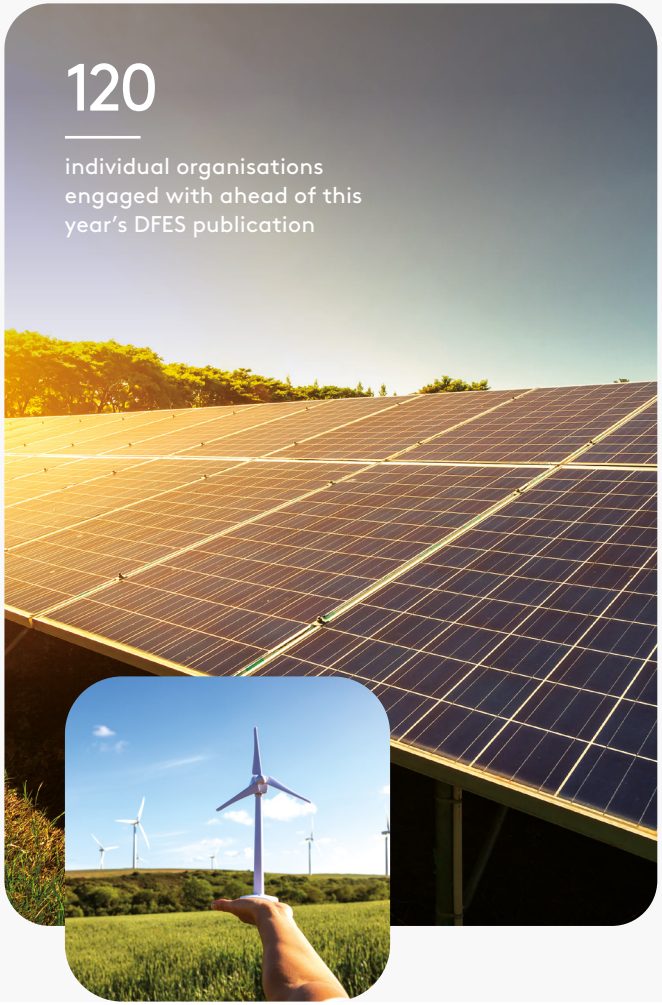
We are always looking to improve, so please share suggestions, with DFES in the heading, with networkinsights@ukpowernetworks.co.uk.

"Grid-scale storage connections grew from 530MW to 830MW in six months"

Sotiris Georgiopoulos
DSO Director, UK Power Networks

Why we're developing the DFES

As the UK heads towards a Net Zero economy, different areas will do so at different speeds and using different technologies. The best solution for densely populated urban areas is unlikely to be the same as for sparsely populated rural areas.



As different areas decarbonise at different rates, clusters of LCTs will emerge. This can present a significant challenge for our network. For example, a single ultra-rapid charge point can require as much electrical demand as 175 homes. Our DSO function will assess the most efficient route to providing capacity for these technologies to connect, whether it be building more assets, or procuring flexibility. However, both options require a significant amount of time. This underscores the critical importance of obtaining early insights into the locations where LCT clusters are likely to emerge. Our approach involves proactive engagement through our LAEP team as one method, and the utilisation of geographically tailored forecasting through our DFES as another.

Some of the changes we've made this year include updating our EV model for price changes and reduced supply, our heat pump uptake for increases in grant funding, and introducing a more granular approach to battery storage scenarios. We also reviewed drivers for long duration energy storage and confirmed it does not need to be part of our scenarios yet.

Whilst we use the DFES for a number of internal purposes, we recognise the value of it to external parties, such as local government and stakeholders, of having geographically specific forecasts of key low-carbon technologies. Therefore, we have developed a suite of resources within the DFES to ensure it is both useful and accessible. This includes:

A technical report,
detailing the modelling process and conducting in depth analysis into the results;

Excel forecasts,
the main DFES output, detailing the how many, by when, and where, for a number of LCT drivers;

An interactive mapping tool,
a visualisation allowing users to see the forecasts projected onto our licence area at a range of different levels of spatial disaggregation;

This summary document,
giving an overview of the DFES, the modelling, and the scenarios.

What is the DFES?

The DFES is primarily a series of granular forecasts of key drivers whose deployment are essential to achieving Net Zero. This includes EVs, decarbonised heating such as heat pumps and district heat networks, and forms of renewable energy generation and storage.

For each driver, a range of forecasts are produced under different assumptions. For example; a 'high' EV scenario where charge points are abundant, battery prices continue to fall, and sales of new conventional vehicles are banned from 2030. Once the range of forecasts are completed for all drivers, they are collected into overarching scenario worlds. These help to contextualise the forecasts and give an indication of what the decarbonisation trajectory could look like under different scenarios. For example, in our 'Consumer Transformation' scenario, high EV adoption, the use of electric heat pumps and district heat networks for decarbonising heating, and active consumer participation in energy systems, including smart charging, are key features. This engagement is driven by both cost savings and a collective effort to alleviate stress on the energy system.

It is important for us to model different scenarios due to the high degree of uncertainty regarding the path the UK will tread towards Net Zero, especially surrounding the decarbonisation of heat and buildings. We must ensure we are prepared for the future by understanding the potential impact of different situations regarding policy and economics.

What drivers are we modelling?

In our analysis we identified 62 individual key drivers that we believe are crucial in enabling the transition to Net Zero. These included technologies related to electrical demand, such as battery EVs and electric heat pumps, as well as generation technologies like solar photovoltaic. Additionally, 'soft' factors, such as consumer engagement in smart charging and domestic energy efficiency improvements, were integral components of the considerations. We believe the DFES provides a holistic picture of various decarbonisation pathways, enabling us, as a network operator, to ensure our assets are prepared for the future.

We modelled drivers belonging to six unique groups that effect our network, these were:

Core Demand
- Building energy efficiency
- Domestic building stock growth
- Industrial and Commercial (I&C) building stock growth

Low-carbon Transport
- EVs (cars and vans)
- EVs (buses, coaches, and heavy goods vehicles)

Battery Storage
- Domestic battery storage
- I&C behind-the-meter battery storage
- Grid scale battery storage

Decarbonised Heating
- Low-carbon heating technologies
- District heating

Distributed Generation
- Solar photovoltaic (PV)
- Onshore wind

Flexibility
- EV smart charging including EV to grid (V2G)
- Demand Side Response (DSR)

Our licence area and DFES data

UK Power Networks is the UK's biggest electricity distributor, ensuring that the electricity infrastructure is in place to deliver power to 8.5 million homes and business, keep the lights on across 29,250 square kilometres, and support and serve 19 million people across London, the East of England, and the South East of England.

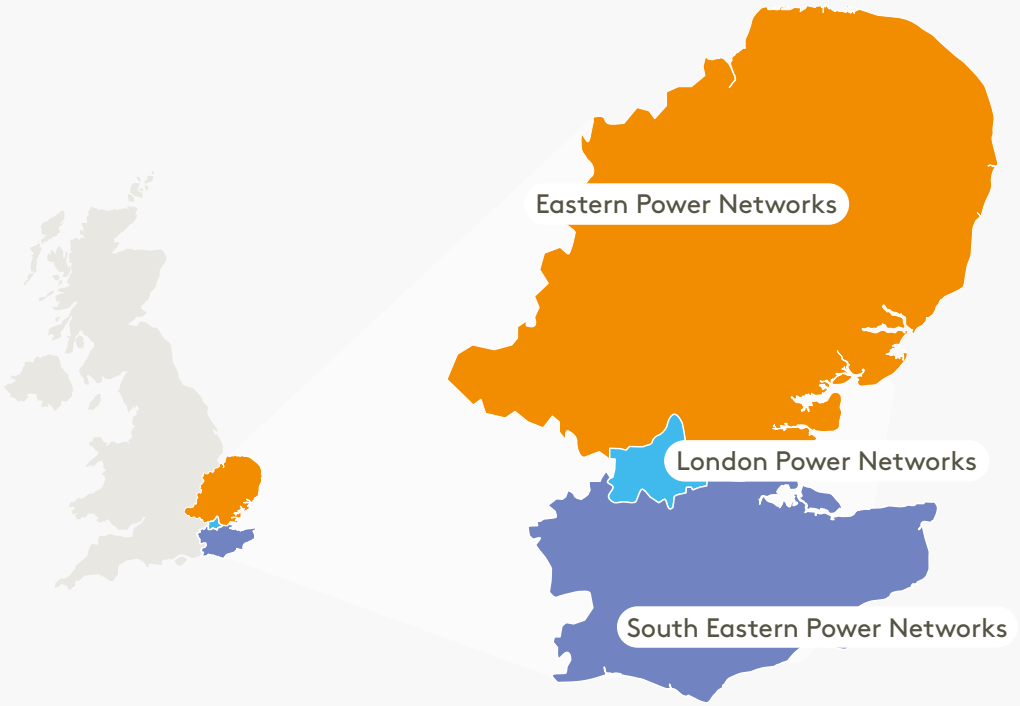
Our region is divided into three major regions, called licence areas:

Eastern Power Networks (EPN);
London Power Networks (LPN); and
South Eastern Power Networks (SPN)

Following discussions with our stakeholders, we've chosen to enhance the granularity of our DFES forecasts. This decision enables stakeholders to gain a detailed understanding of the potential decarbonisation pathways, offering insights into how different sets of assumptions may impact their specific local areas.

To breakdown the scenarios into these smaller geographical regions, we used the Office for National Statistics' (ONS) areas called Middle Layer Super Output Areas (MSOAs); and Lower Layer Super Output Areas (LSOAs). On average, an LSOA contains 800 houses, and an MSOA contains 4,000 houses. The benefits of this level of resolution are that they are both granular enough to be meaningful at a local level, and they are easy to aggregate up to Local Authority or County Council level – making them useful to local governmental bodies.

Our region is made up of about 2,200 MSOAs which in turn are made up of around 11,000 LSOAs. We publish all our DFES outputs at LSOA level on our website.



Eastern Power Networks

We deliver power to the East of England region which extends from the Wash in the east, to North London and the Thames estuary, encompassing a diverse range of urban and rural areas as well as a huge coastline.

London Power Networks

We look after the electricity network for Inner London, with responsibility for delivering power to iconic buildings and businesses as well as high-profile international events throughout the year.

South Eastern Power Networks

We serve South London, Kent, East Sussex and parts of Surrey and West Sussex, covering a rich variety of customers and locations.

Our Business Strategy

Our commitment is to ensure a seamless and swift connection process for low carbon technologies. Failing to achieve this would not only hinder meeting customer needs but also impede the timely deployment of technologies crucial for reducing carbon emissions, thereby negatively impacting society.

Additionally, maintaining customer confidence throughout the Net Zero transition necessitates executing these connections at the most cost-effective rates.

The challenge lies in uncertainties about the transformation of the energy system, requiring a demand-driven and adaptable approach. We believe in using flexibility services to reduce immediate investment needs and advocate for a justified and robust investment approach that is informed by local insights.

Our Final Business Plan incorporates stakeholder feedback, detailing a strategy to facilitate community decarbonisation while safeguarding customers. The plan outlines steps to use the most sensible demand forecast, continuously update information, and act swiftly for efficient network usage and timely investments. This approach aims to facilitate Net Zero on time and at the lowest cost to our customers.

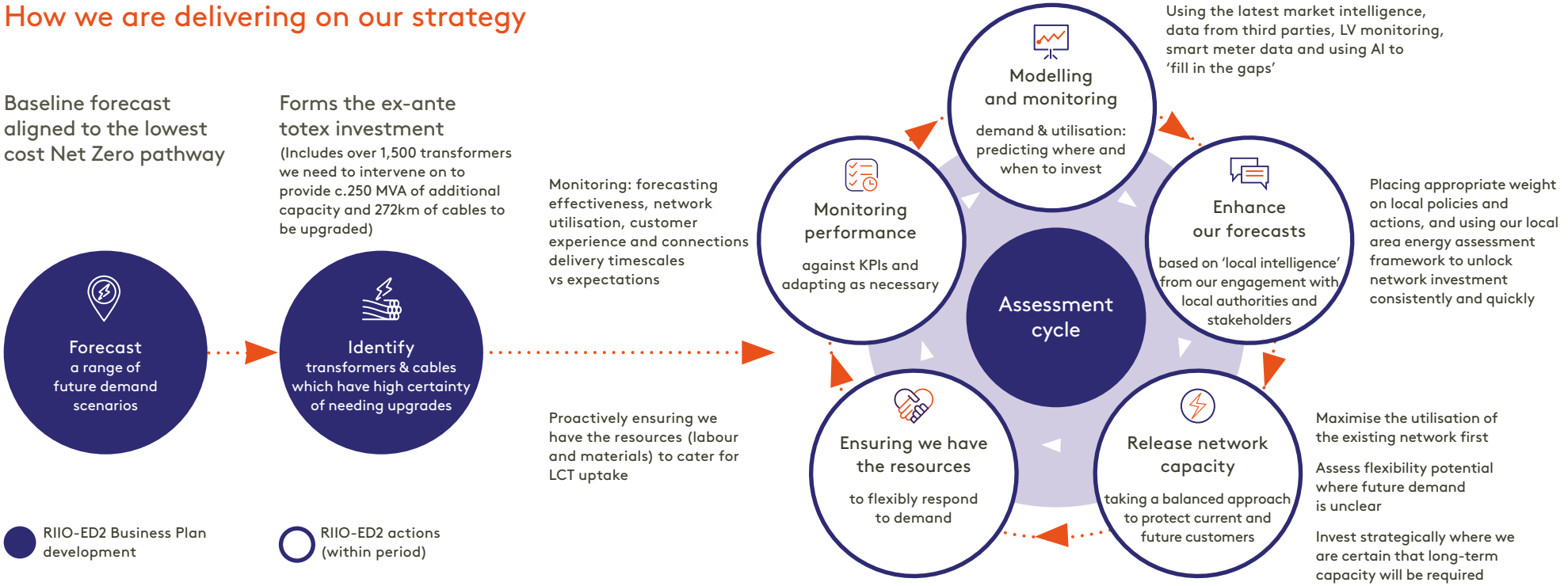
Critical success factors relevant to our strategy include providing capacity at the right time and place, incorporating local intelligence, engaging stakeholders, balancing investments, and having a responsive regulatory framework and resources. You can see how we are incorporating local intelligence on the following page.

Acknowledging the unprecedented nature of the transformation, the plan emphasises measuring progress against key targets and public reporting for transparency to customers, stakeholders, Ofgem, and government entities.

How we are delivering on our strategy

Baseline forecast aligned to the lowest cost Net Zero pathway

Forms the ex-ante totex investment
(Includes over 1,500 transformers we need to intervene on to provide c.250 MVA of additional capacity and 272km of cables to be upgraded)



Enhancing our forecasts with local intelligence

We need to accurately forecast future demand so we can efficiently plan when and where we need to invest in the network. Knowing where demand is being driven by decarbonising buildings, heat, or transport is a key factor in our forecasts. Local authorities have a key role to play in delivering Net Zero, influencing over 80% of the UK's carbon emissions according to the Climate Change Committee.

As mentioned earlier, this year we will be adding in the latest local inputs, creating our 'Locally Enhanced' scenario.

There are 133 local authorities in our area, with over 90% aiming to reach Net Zero before the national 2050 target – a 23% increase on last year. This represents a new challenge for us, as our network investment strategy is based against the national 2050 target. To ensure we facilitate this future demand, it is crucial we enhance our forecasts with local intelligence.

The majority of decarbonising actions depend on the uptake of LCTs. To support local authorities with their Net Zero plans, UK Power Networks established the UK's first DSO. A key element of the DSO is a dedicated Local Net Zero team responsible for engaging with local authorities on their regional or local climate change action plans. We're collaborating with local authorities by asking them to share their planned decarbonisation activities (e.g., deployment of EV charging points). To enable these local ambitions we work with local authorities using our LAEP framework, ensuring that we can be confident before any local climate change action plans are used to adjust our annually updated DFES. By working together, we are facilitating local Net Zero Plans and investing with confidence.

Our collaboration with local authorities includes close conversations through our annual Regional Engagement sessions.

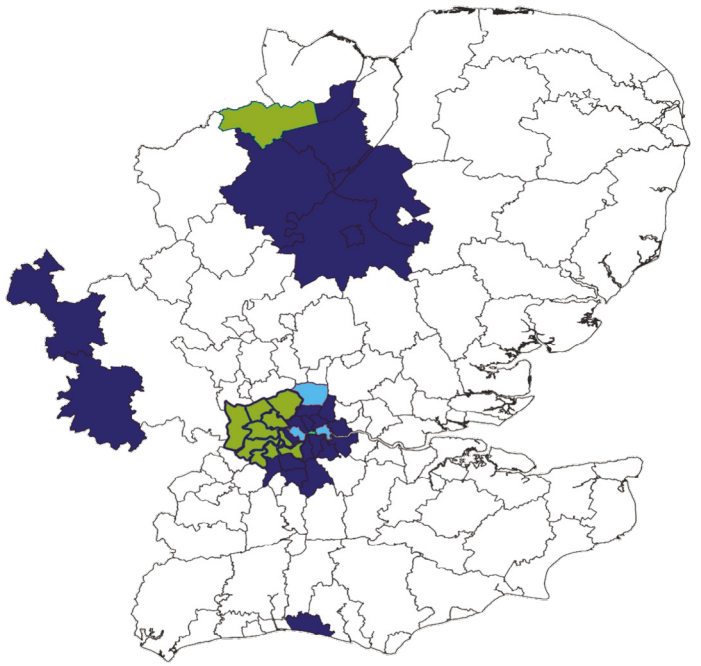
To further strengthen our collaboration, we are creating new tools and exploring new processes designed in partnership with local authorities to make sharing local plans easier and more efficient at all stages of local energy planning.

Our enhancements include:

- **LAEP Open Data page** making it as easy as possible for local authorities to access data sets that can support their local energy planning;
- **DFES Widget** where local authorities can share their high-level decarbonisation targets; and
- **Your Local Net Zero Hub**, the first digital tool to be designed in partnership with local authorities and is open to all local authorities across UK Power Networks' entire licence area. The digital tool enables local authorities to combine their decarbonisation strategies, local market trends, transport plans and social inclusion policies with network infrastructure data to develop options for their communities.

Through the DSO Local Net Zero team we are offering our dedicated people, data, and digital tools so we can continuously support and integrate local authority plans and local intelligence to enhance our forecasts. Ultimately, this helps us all ensure we are providing a fit for purpose electricity network that facilitates local decarbonisation.

How Local Area Energy Planning is building momentum across UK Power Networks



UK Power Networks Boundary LEAR*/LAEP Status
Complete
In progress
Started

* LEAR: Local Energy Asset Register, sets the energy baseline

Our scenario worlds

We adopted the scenario framework published by National Grid Electricity System Operator in their 2023 Future Energy Scenarios, as well as that used by the other UK DNOs in their DFES. This framework includes four potential energy pathways to 2050, three of which reach Net Zero emissions by 2050 at the latest.

These pathways represent different positions with regards to their speed of decarbonisation and level of societal change.

During 2024, National Grid ESO will become the National Energy System Operator and will change the framework for the Future Energy Scenarios to a set of Net Zero pathways. We will update our 2025 DFES to the new pathways framework, and use those to continue to develop locally-influenced bottom-up scenarios for network planning.

We developed bespoke scenarios for each driver of demand and generation and constructed four overarching scenario worlds that align with the narratives of the pathways from National Grid. By developing our own uptake scenarios with local knowledge, we are able to more accurately reflect UK Power Networks' region, the customers within this region and the current deployment of LCTs.

The four scenario worlds are structured as follows:

Falling Short

General progress is made towards decarbonisation; however, this is the only scenario world that does not meet Net Zero by 2050.

Consumer Transformation

The 2050 Net Zero target is met by a high degree of societal change as well as deep electrification of transport and heat.

System Transformation

The 2050 Net Zero target is met by relying on hydrogen to decarbonise the more difficult sectors of heat and heavy transport.

Leading the Way

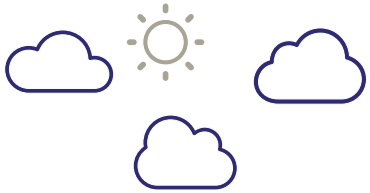
This is the fastest of the scenario worlds to achieve Net Zero, with the highest level of societal change, utilising both hydrogen and electric low-carbon technologies.

Falling Short

The Falling Short world sees the least amount of societal change and has the slowest speed of decarbonisation. In all sectors, from transport to energy efficiency, decarbonisation is not the priority. Whilst some areas see meaningful improvements, there is no holistic strategy. Despite making progress towards Net Zero, it is forecasted to fail to meet the ultimate target by 2050.

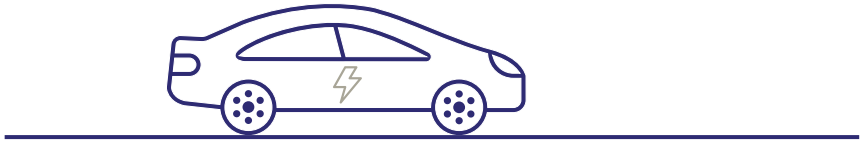
There has been considerable uptake of EVs and by 2050 it will be the most popular choice of passenger vehicle. However, a lack of widespread access to public charging infrastructure means that some consumers continue to rely on Internal Combustion Engine (ICE) vehicles instead. This is made possible as no policies have been put in place to remove ICE or plug-in hybrid electric (PHEV) vehicles from the vehicle stock. A lack of viable options for Heavy Duty Vehicles (HDV) means that decarbonisation of large road vehicles is much slower.

Does not meet Net Zero | Business-as-usual | Natural gas for heating



2027/28

1,800,000



Number of electric cars and vans

750% rise from 2022/23 to 2027/28

Key assumptions

Energy efficiency
Low Medium High

Electric vehicles (cars and vans)
Low Medium High

Number of heat pumps
Low Medium High

District heat uptake
Low Medium High

Rooftop solar PV
Low Medium High

Large scale solar PV
Low Medium High

Onshore wind
Low Medium High

Domestic battery storage
Low Medium High

Grid-level battery uptake
Low Medium High

EV smart charging
Low Medium High

Falling Short continued

Net Zero by 2050 ✕

Hydrogen gas grid ✕

Electric cars and vans in 2027/28
1.8 million

Homes with solar panels in 2027/28
201,600

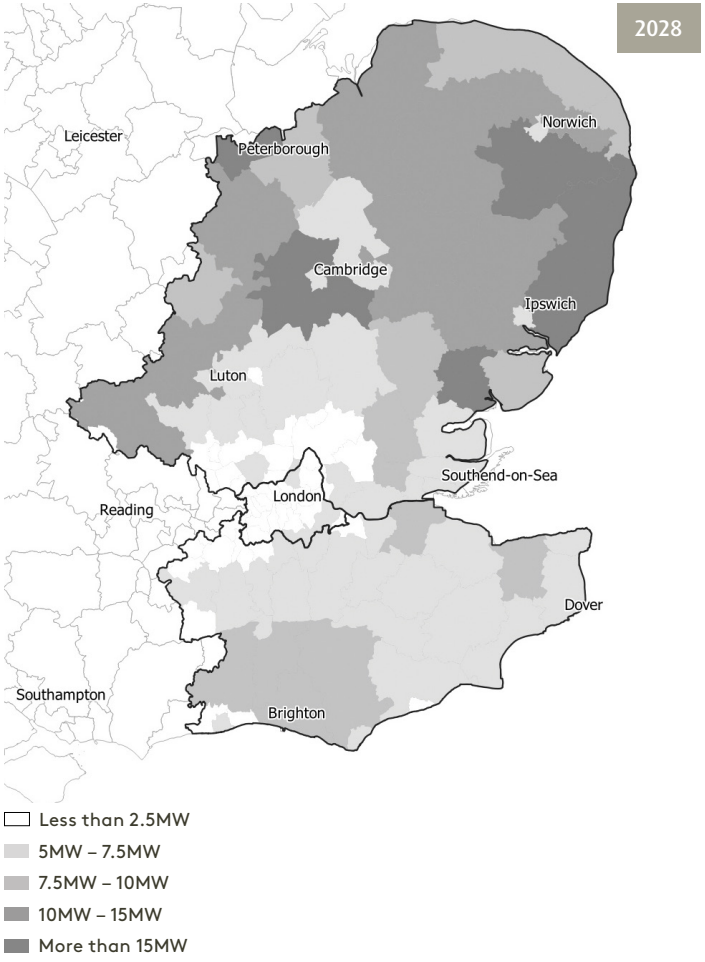
Grid scale battery capacity in 2027/28
4.1GW

Heat pumps in 2027/28
69,000

Natural gas continues to be the primary heating fuel and the uptake of heat pumps is limited despite the phase out of oil and other fossil fuel boilers in off-gas properties. This is the only policy put in place to remove fossil fuel heating sources, and there is no extension to existing subsidies designed to encourage the purchase of low-carbon heating units. As a result, this scenario sees low uptake of heat pumps and decarbonised district heat networks. Some biogas is introduced into the gas grid, but not in any significant capacity.

There is a slight increase in the renewable generation capacity of the UK, with increases primarily seen in both small and large-scale solar PV installations. However, this scenario continues to rely on electricity generated from natural gas out to 2050. There is limited appetite from the public to participate in the energy market via smart mechanisms such as demand side response and time-of-use tariffs.

Domestic solar PV capacity per local authority



Consumer Transformation

The Consumer Transformation world sees the UK reach Net Zero by 2050, thanks to widespread electrification, the decarbonisation of the electricity supply, and consumers willing to modify their behaviour and engage with new, smart technologies. In this scenario, significant societal changes contribute to many decarbonisation initiatives, with increased flexibility in the energy system playing a crucial role. Notably, the widespread adoption of smart charging for EVs is a key enabler in this context.

This scenario world sees a widespread uptake of EVs, especially cars and vans. Consumers are passionate about Net Zero in general, and for decarbonised transport this enthusiasm is supported by a ban on new ICE vehicles by 2030 and a widely available charging network. The decarbonisation of larger vehicles is slower, but by the mid 2030s there is a wide range of zero emission HDVs available, and a nationwide refuelling network completed by 2045. Electrification will be the main decarbonisation option for HDVs, with green hydrogen being deployed for a limited number of use cases.

Electrically powered | Engaged consumers | Net Zero by 2050

2027/28

840MW

Domestic solar PV capacity

52% rise on 2022/23 to 2027/28

Key assumptions

Energy efficiency
Low Medium High

Electric vehicles (cars and vans)
Low Medium High

Number of heat pumps
Low Medium High

District heat uptake
Low Medium High

Rooftop solar PV
Low Medium High

Large scale solar PV
Low Medium High

Onshore wind
Low Medium High

Domestic battery storage
Low Medium High

Grid-level battery uptake
Low Medium High

EV smart charging
Low Medium High

Consumer Transformation continued

Net Zero by 2050 ✓

Hydrogen gas grid ✗

Electric cars and vans in 2027/28
3.0 million

Homes with solar panels in 2027/28
281,000

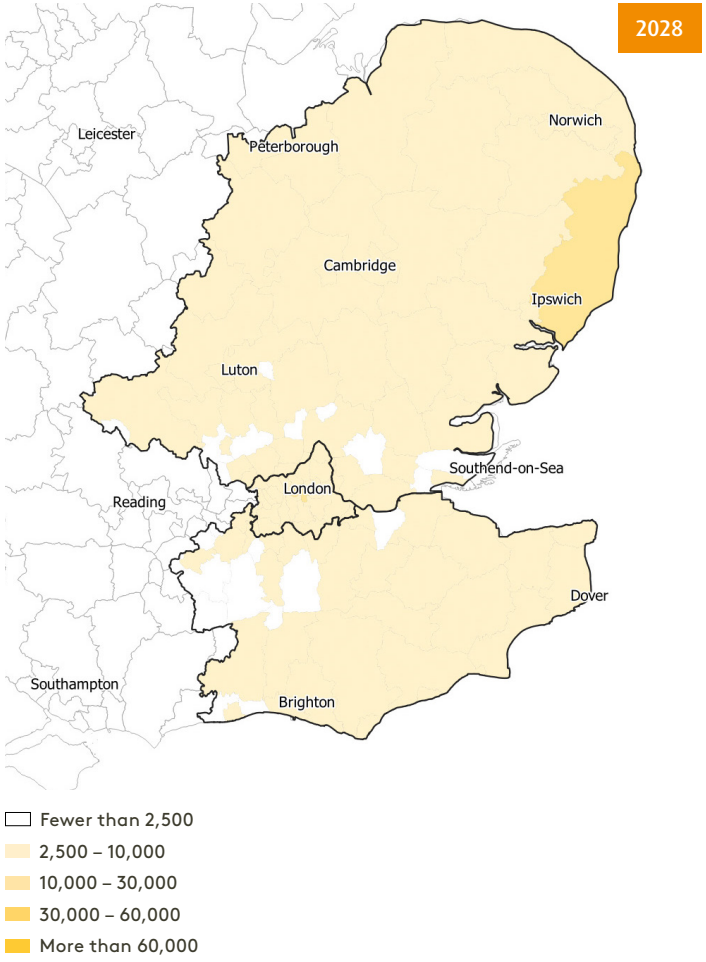
Grid scale battery capacity in 2027/28
3.2GW

Heat pumps in 2027/28
396,000

The Government decides that the electrification of heat is the best way to decarbonise the sector. New build homes cannot install gas boilers from 2025 onwards, and sales of new gas boilers are banned outright by 2035 (assumes the September 2023 policy change not implemented). There is a nationwide programme of energy efficiency improvements to all buildings, reducing the amount of electricity needed to heat people's homes. Various subsidies designed to make heat pumps more affordable are put in place and existing subsidies see their scope extended and are kept in operation until the late 2020s. This scenario also sees high uptake of properties connecting to district heat networks. In most cases, the heat for these heat networks is generated from either electric heat pumps or waste heat.

With both heat and transport becoming electrified, there is a requirement for much more electricity in the grid. This increase in demand is met predominantly through solar and wind installations, which become ever more affordable as their industries grow. As the amount of renewable generation grows, so does the amount of both grid scale and domestic battery storage.

Number of domestic heat pumps per local authority



System Transformation

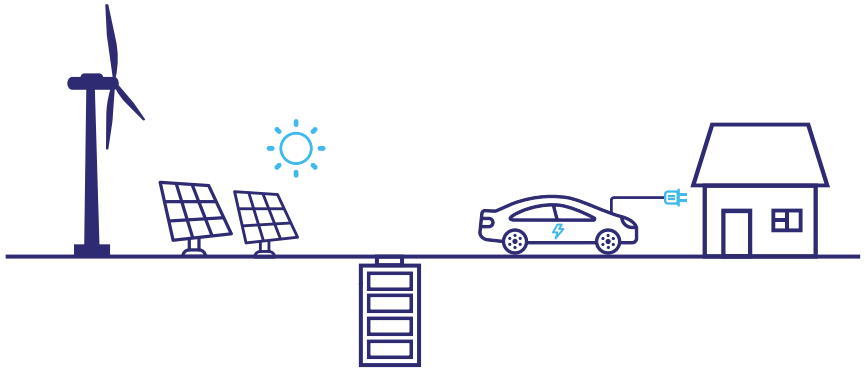
Relying on hydrogen to decarbonise the more difficult sectors of heat and heavy transport, the System Transformation sector strives to reach the Net Zero target by 2050. While engagement from consumers is not as high as other scenarios, centralised and effective decarbonisation solutions mean that consumers do not have to do as much individually for their lifestyle to be decarbonised.

As battery prices continue to fall, EVs reach price parity with ICE vehicles sooner than previously expected and high demand for EVs is seen from the early 2020s. As with Consumer Transformation, a ban on new ICE vehicles by 2030 is introduced and there is sufficient charging infrastructure to meet this demand. The global production of hydrogen fuel cells is ramping up, which will enable the large scale supply of zero emission HDVs, including buses, coaches and HGVs, to be available from mid-2030s.

Hydrogen heating | Centralised solutions | Net Zero by 2050

2027/28

1.8GW of standalone grid-level battery storage



200% rise from 2022/23

Key assumptions

Energy efficiency
Low — Medium — High

Electric vehicles (cars and vans)
Low — Medium — High

Number of heat pumps
Low — Medium — High

District heat uptake
Low — Medium — High

Rooftop solar PV
Low — Medium — High

Large scale solar PV
Low — Medium — High

Onshore wind
Low — Medium — High

Domestic battery storage
Low — Medium — High

Grid-level battery uptake
Low — Medium — High

EV smart charging
Low — Medium — High

System Transformation continued

Net Zero by 2050 ✓

Hydrogen gas grid ✓

Electric cars and vans in 2027/28
3.0 million

Homes with solar panels in 2027/28
225,000

Grid scale battery capacity in 2027/28
3.2GW

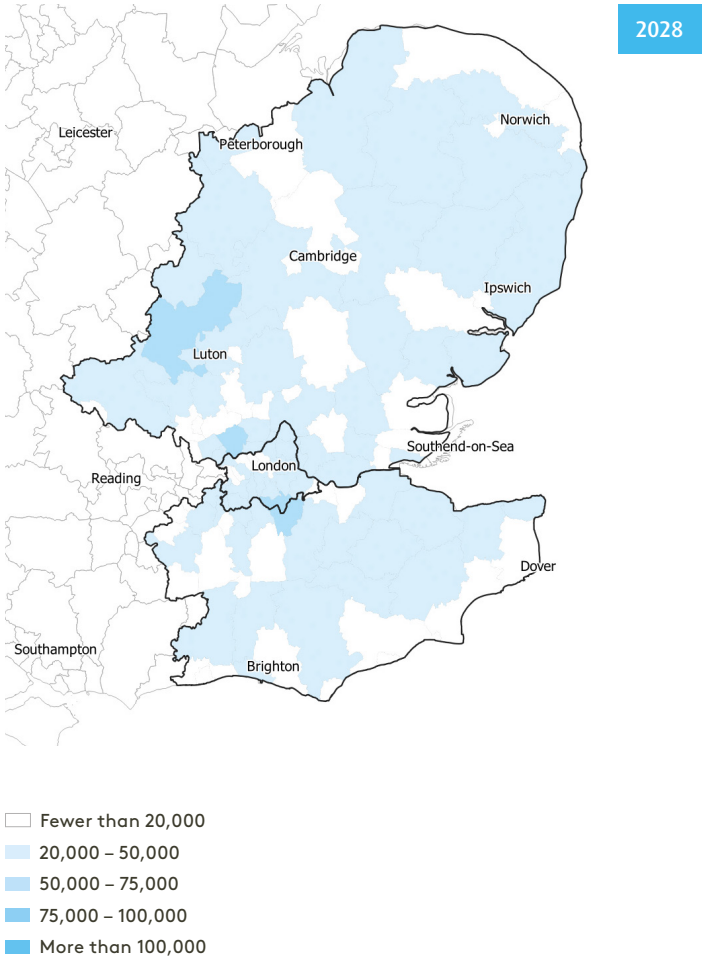
Heat pumps in 2027/28
170,000

The Government has chosen to decarbonise heat in existing buildings by repurposing the natural gas grid to distribute low-carbon hydrogen and installing electric heat pumps in new builds. By 2040 the gas grid is fully transitioned to accept hydrogen and other low carbon gases, and by 2050 hydrogen ready boilers are found in the majority of domestic buildings. There is also a fair uptake of properties connecting to district heat networks, which are predominantly supplied by hydrogen and waste heat. Of all the Net Zero scenarios, System Transformation sees the lowest uptake of thermal efficiency measures.

As heat and heavy transport is transitioned to hydrogen, there is less demand on the electricity network and as a result the installed capacity of distributed generation, including solar PV and other renewable generation, increases steadily in this scenario. However, there is a significant increase in transmission connected offshore wind generation, used for large scale green hydrogen electrolysers. There is also a moderate level of grid flexibility provided by a variety of technologies, including by demand side response, EV smart charging, as well as domestic, co-located, and grid scale battery storage installations.

Number of battery EVs per local authority

2028

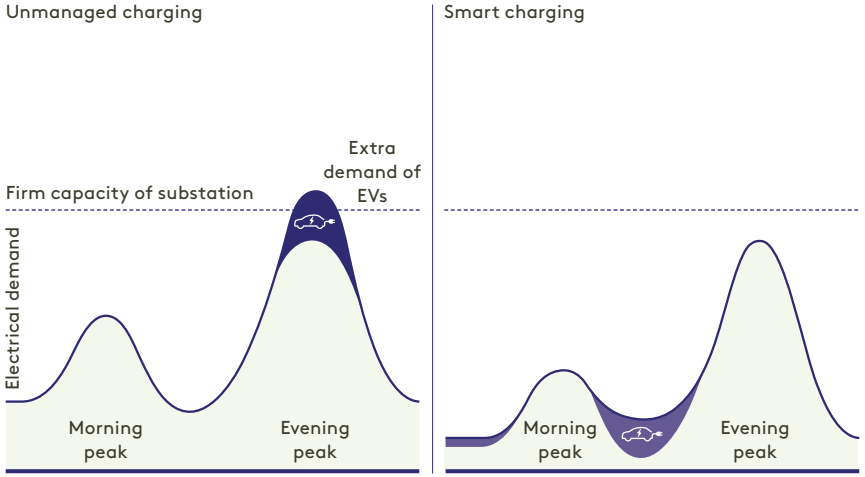


Leading the Way

In Leading the Way, the Net Zero target is reached before 2050 with the highest level of societal change involved. By utilising state of the art LCTs, both hydrogen and electric options, this is the fastest of the scenario worlds to achieve Net Zero. Consumers engage with market mechanisms, such as smart charging and time of use tariffs, as well as efficiency measures to reduce their heating demand. Aiding this high level of engagement are centralised solutions such as the decarbonisation of the gas grid.

A rapid uptake of EVs is seen in this scenario as all ICE and PHEV sales are banned from 2030 and 2035 respectively and there is widespread access to public EV charging. At the same time, consumers are more willing to take public transport and opt for active transport such as cycling and walking, resulting in a lower growth of car and van stock relative to other scenarios. This results in the fastest uptake of electric taxis, buses, and coaches. Consequently, there is a smaller overall vehicle stock than in other scenarios by 2050. For HDVs, both batteries and hydrogen fuel cells are developed at scale, and diesel ICE vehicles are completely phased out by the 2040s.

As fast as credible | Net Zero ahead of 2050 | Electric and hydrogen technologies



Smart charging allows EVs to be charged outside of peak times, flattening the demand curve. This means substations do not get overloaded and reduces the amount of reinforcement expenditure required, keeping customers' bills as low as possible.

Key assumptions

Energy efficiency
Low Medium High

Electric vehicles (cars and vans)
Low Medium High

Number of heat pumps
Low Medium High

District heat uptake
Low Medium High

Rooftop solar PV
Low Medium High

Large scale solar PV
Low Medium High

Onshore wind
Low Medium High

Domestic battery storage
Low Medium High

Grid-level battery uptake
Low Medium High

EV smart charging
Low Medium High

Leading the Way continued

Net Zero by 2050
Faster than 2050

Hydrogen gas grid
Low-carbon gases

Electric cars and vans in 2027/28
2.8 million

Homes with solar panels in 2027/28
281,000

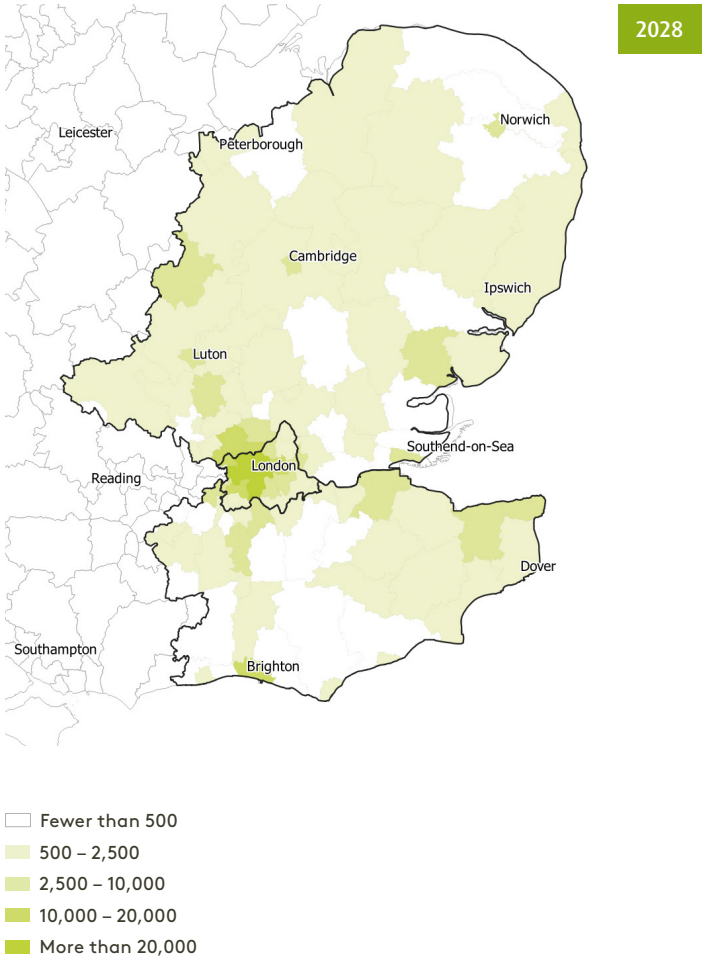
Grid scale battery capacity in 2027/28
3.0GW

Heat pumps in 2027/28
513,000

The decarbonisation of heat is achieved through a hybrid approach, deploying both high numbers of heat pumps as well as a gas grid converted to distributing low-carbon hydrogen. This provides a platform for hybrid heat pumps, combining electric heat pumps with hydrogen boilers. In addition to heat pumps and decarbonised gas connections, there is a high uptake of district heat networks powered by both electric heat pumps and waste heat. A significant policy development in this scenario is that environmental taxes are removed from the cost of electricity and shifted onto natural gas prices in a phased transition from 2025–2028.

The electricity generation capacity required to support the many EVs and heat pumps deployed in this scenario is high and will be met with a more centralised approach than in Consumer Transformation. With large solar PV being more popular, there is a high uptake of co-located battery storage. Consumers are willing to participate in flexibility programmes, with over 80% of those with EV charging at home taking part in some form of smart charging by 2050.

Number of domestic properties connected to district heat networks per local authority



UK Power Networks Holdings Limited
Registered in England and Wales No. 7290590
Registered office: Newington House,
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Useful links

Open Data to kick start Net Zero plans

- Check out our Local Area Energy Plan page
- Let us know what other data themes, uses cases or datasets you wish to see evolved or included here

Need a new connection?

- Click here to find out more

A free self-service digital planning tool under development to support best choices for communities in developing their Local Area Energy Plans

- Click here to find out more

Connecting EV, storage or heat pumps?

- Click here to find out more

Get in touch

- Any questions or clarifications please get in touch with us with the 'DFES' in the heading to networkinsights@ukpowernetworks.co.uk