

The outcomes we have delivered through engaging with stakeholders

2020/21 Stakeholder Engagement and Consumer Vulnerability Incentive



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DNOs COMBINED



Our compact Motorway Service
Area substation – see p.06



Heat pump in off-gas grid
community of Barcombe – see p.04



UK Power Networks is the country's largest electricity distributor, making sure the lights stay on for more than eight million homes and businesses across London, the South East and the East of England.

Every year we take the opportunity through the Stakeholder Engagement and Consumer Vulnerability (SECV) submission to summarise how we engage with our wide range of stakeholders and address key consumer vulnerability issues. This suite of reports aims to demonstrate how we embrace wider social and environmental objectives through our engagement activities while ensuring the ongoing delivery of an efficient network.

Our submission is divided into three parts:

Part 1

Outlines our strategic approach to engaging and working with stakeholders and supporting those in vulnerable circumstances

Part 2

Highlights the results and impact that we have delivered through engaging with our stakeholders

Part 3

Focuses on the initiatives and impact we have delivered to support those in vulnerable circumstances

Report contents and structure

This is Part 2 of our 2020/21 SECV Submission.

This year we expand on how we measure and deliver the greatest impact through our initiatives, as a result of the personal and passionate engagement of our employees.

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Director of Strategy & Customer Service's introduction



In a uniquely challenging year, UK Power Networks has remained committed to customer and stakeholder engagement. We have adapted the ways we engage during the COVID-19 outbreak and responded to the new challenges faced by our customers, while continuing to drive progress on long-term priorities.

Decarbonisation is growing increasingly urgent, with significant change in the policy landscape over the last year, from the Government's Ten Point Plan for a green industrial revolution, to the Climate Change Committee's Sixth Carbon Budget, and the Climate Assembly's citizen-led report on climate change. All of this points to enormous change for the country and for UK Power Networks, with 4.5 million electric vehicles (EVs) forecast to be connected to our network by 2030 – 1 million higher than our forecast this time last year.

From setting ourselves ambitious science-based carbon reduction targets, to collaborating on innovative, customer-

centred approaches to decarbonise transport and heat, as well as being rated as having the number 1 smart grid in the world, we are taking the leadership role that stakeholders expect of us to facilitate the rapid transition to Net Zero. We are committed to ensuring that our current and future services leave no customer behind, and this is reflected across all our services.

We have accelerated the opening up of data, directed by stakeholder needs and by consumer benefits, ranging from local authorities developing their decarbonisation plans to distributed energy resources customers wanting to better plan their connections.

Throughout, we have prioritised our engagement through measuring the overall impact of our actions and enhancing our approach to measuring social value.

I really hope you enjoy reading this document and the examples of how engagement has led to positive outcomes for our customers and wider communities in our region.

Suleman Alli

Director of Strategy & Customer Service

Measuring overall impact

We aim to undertake the best engagement in our industry to deliver the greatest impact for our stakeholders and customers. We engage with stakeholders to create new services and enhance existing services, to improve performance by learning from innovative practices, and to meet the needs of hard-to-reach customer groups and those in vulnerable circumstances, to ensure no one is left behind in the energy transition.

To maximise value for our customers, we need to target actions that deliver the greatest benefit.

EMBEDDED – This year we embedded our end-to-end impact measurement approach and almost **tripled the number of Part 2 initiatives** assessed through social impact valuation compared to last year. We sought external assurance of our SROI valuations by SIA Partners to ensure our decision making process was transparent and independently verified.

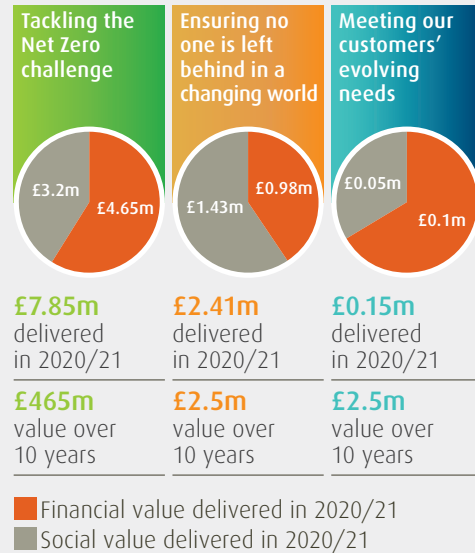
ENHANCED – We extended our social valuation approach to model costs and benefits over **one, five and ten year timeframes** to more easily compare initiatives, recognising that initiatives seeking to deliver long-term change (e.g. in support of Net Zero) have a longer payback period. Part 1 explains our approach to measuring impact in detail.

The adjacent charts show the financial and social value delivered by Part 2 initiatives in 2020/21 and the value forecast over ten years. Our initiatives to tackle the Net Zero challenge and meet our customers' evolving needs deliver long-term change, whereas our initiatives to ensure no one is left behind in a changing world place more focus on in-year impact.

This section highlights examples of how we have applied the impact measurement framework to evaluate Part 2 initiatives.

Case Study 1: We wanted to ensure our flexibility marketplace encouraged more renewable generation to connect and to maximise their output. This is a complex area for consumers to provide an informed view, so we sought feedback from expert stakeholders such as distributed generation (DG) owners. At our Winter Flexibility Forum, 95% of DG stakeholders supported introducing a mechanism to allow generators, such as batteries and solar farms, to **trade curtailment obligations**, to increase the total generation output through our network. Our market modelling found curtailment trading would allow more renewable generation to participate in flexibility, and SROI analysis estimated a return of £4.91 for every £1 spent over ten years due to reduced CO₂ emissions and a marketplace with more sustainable returns. These insights informed our decision to invest in a trial.

Case Study 2: With 4.5m EVs forecast to be connected to our network by 2030, we evaluated whether to invest in a scalable process to manage increasing volumes of EV connection applications. Feedback from chargepoint installers and customers suggested a simpler, faster application process would improve the customer experience, so we explored introducing a **digital self-service portal for EV connections**.



SROI analysis revealed a negative value of -£0.24 over five years, but a positive value of £5.18 for every £1 spent over ten years due to automation savings as demand for EV connections grows. Despite the longer payback period, we considered the opportunity cost of not automating the process would be high as service levels could degrade at higher volumes. Installer and customer feedback also told us it was important to improve the existing process now so installers can provide a positive service experience that facilitates widespread EV take-up.

Tackling the Net Zero challenge



To deliver the Government's ambition to achieve Net Zero by 2050, the Climate Change Committee has recommended that UK companies adopt the highest possible ambitions, including setting significantly earlier Net Zero targets where possible.

Setting science-based targets to lead the way in reducing emissions

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Stakeholders said:

Given the increased urgency of the climate crisis, we asked our Environment Critical Friends Panel how far and fast we should go in our carbon reduction plans. The Panel, which brings together expertise from beyond the energy sector, including the Carbon Trust, Wildlife Trusts, green construction, transport, supply chain and the water sector, told us not to wait, but to take visible leadership in our sector. The Panel supported our intention to have our plans independently assessed, and challenged us to set ambitious, comprehensive targets to reduce the full scope of our emissions, including our indirect supply chain emissions.

Our Willingness to Pay research found a strong majority of customers believe we should make ambitious change to achieve Net Zero before 2050, while our Social Contract customer research told us customers see environmental responsibility as an important part of our social role. It is clear customers expect us to take bold action.

What we did:

Building on our Green Action Plan and last year's Carbon Trust accreditation, this year we became the first GB DNO to set science-based targets covering the entirety of our emissions, including our supply chain, accredited by the Science Based Targets initiative (SBTi). SBTi accreditation provides independent verification that our targets are robust and in line with the latest science and Paris Agreement goals. Learning from best practice beyond our sector, we worked with market leaders the Carbon Trust to determine our baseline emissions and develop ambitious targets aligned to our regulatory price control periods.

Achieving Net Zero requires radical change. We have set ourselves the target of ensuring our directly-controlled business operations are Net Zero by 2028, supported by robust plans, putting us among the leading companies in the energy sector. To deliver this, we must fundamentally change how we operate, from electrifying our fleet to improving the

efficiency of our buildings, as well as working with our supply chain to embed change in their own organisations. We will look to offsetting only as a last resort.

Stakeholder outcomes

- ✓ SBTi accredited 'Well Below 2 Degree' target for our total carbon footprint including network losses and supply chain emissions, equating to a 25% reduction by 2028
- ✓ Internal stretch target of 1.5 Degrees for emissions directly within our control, equating to a 42% reduction by 2028
- ✓ Net Zero target for emissions directly under our control by 2028
- ✓ Reduced our CO₂ emissions by 25.5% since 2014/15, surpassing our stakeholders' initial target of 2% each year

Embedding sustainability throughout the business and supply chain

Since launching our Green Action Plan in 2019, we have been building on our knowledge and actions year-on-year and we are making great strides in reducing our environmental impact.

Stakeholders said:

Our Critical Friends Panel emphasised that for our Net Zero plans to be credible, we must involve our supply chain and demonstrate we are serious about taking a leadership role. These expert stakeholders also told us that partnerships and collaboration are key to delivering on our targets across carbon, energy, waste, water, noise, pollution and biodiversity.

What we did:

Embedded sustainability within our supply chain

Building on last year's commitment to analyse carbon embedded in our global supply chain of over 1,000 suppliers, we carried out a thorough benchmarking process with expert input from the Carbon Trust to assess emissions. We learnt that 84% of our company carbon emissions (excluding losses) stem from third party suppliers. Of these, 30 suppliers make up 50% of total supply chain emissions. We are now creating targeted action plans with each of the 30 highest-emitting suppliers to achieve and report on year-on-year carbon reductions.

We are continuing our attack on single-use plastic and non-recyclable waste by

reviewing suppliers with the highest plastic consumption and setting them targets to reduce virgin plastic year-on-year. As part of this journey, we worked with our PPE supplier to replace plastic packaging with recycled alternatives, eliminating plastic waste for over 7,300 coveralls, trousers and t-shirts per year.

We also switched to off-site pre-cast concrete bases for new substations. This material incorporates pulverised fuel ash, reducing associated embodied carbon emissions by at least 34%, as well as significantly lowering emissions through reduced materials, labour and deliveries to site.

Biodiversity

Building on our work with stakeholders to identify 100 substations with the greatest biodiversity potential across rural and urban locations, we engaged wildlife trusts to survey these areas and benchmarked sites using the DEFRA biodiversity net gain tool. To maximise impact as part of a coordinated approach, we engaged with local authorities, Natural England and local wildlife trusts to integrate their local biodiversity plans with our proposals. This led to specialist measures in our plans

to support specific flora and fauna; from the restoration of acid grassland in Suffolk, to the encouragement of the Cetti's Warbler in Kent.

We also commenced grass seed trials to increase species diversity across our sites, supported by managing sites differently, and will monitor the impact over the next two to three years.

Stakeholder outcomes

- ✓ 19 tonnes CO₂ avoided due to switching to recycled PPE packing for over 7,300 items per year
- ✓ At least 34% lower embodied carbon emissions associated with concrete use due to switching to low-carbon concrete
- ✓ Developed a plan to increase potential biodiversity net gain by up to 30% over the next year, creating a biodiversity asset worth up to £2 million of environmental value



£14.77 social value created in excess of every £1 spent each year on adopting recycled PPE packaging

Tackling the Net Zero challenge continued

Delivering our Heat Strategy: facilitating the decarbonisation of heat

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As the UK's single largest source of greenhouse gas emissions, the heat sector must decarbonise to achieve Net Zero by 2050. Decarbonising heat will directly affect consumers more than any other decarbonisation efforts to date: consumers rely on heat for their comfort, and changes to install new heating systems or to upgrade energy efficiency mean disruption inside their homes. Consumers will need to fully understand the need to change, and any impact it may have on their lifestyle and financial situation.

Our DNO-first Heat Strategy co-developed with stakeholders in 2019/20 focuses on three pillars:

- 1 Inform** heat decarbonisation policy through provision of data and evidence
- 2 Deliver a great service experience** to customers wishing to connect low carbon heating solutions
- 3 Undertake least regret actions** to ensure network readiness

This year we have built on our engagement to advance progress against each of these pillars to facilitate the decarbonisation journey.

1 Developing data and evidence to inform practical and inclusive heat decarbonisation

Collaborating to develop policy proposals for efficient heat decarbonisation

Strategic context:

We need to understand how and when different types of communities will transition to low carbon heating to ensure our network is ready. Energy efficiency has a large part to play alongside heat technology to support customers in vulnerable circumstances to decarbonise at the lowest possible cost.

Stakeholders said:

During our Heat Decarbonisation webinar, almost 80% of local authorities, suppliers, and industry colleagues told us a local area-based approach is the best way to decarbonise heat. Over half of attendees said we should collaborate with local authorities on energy efficiency measures alongside decarbonisation.

What we did:

We partnered with the Association for Decentralised Energy, who are leading in this space, and engaged with 188 stakeholders to advocate for a zoning approach to heat decarbonisation and energy efficiency. We formed a coalition

of the willing and launched an initiative to combine data sets and develop a common plan allowing local authorities and networks to understand which heat technologies their communities are likely to take up and where to focus first.

We assembled focus groups of other networks and local authorities such as Hammersmith & Fulham to develop a common tool to help prepare for the transition. We then mapped out the most cost-effective package of energy efficiency and low carbon heating technologies for every building type based on their heating, hot water needs and affordability, down to street level. This mapping gives local authorities and community energy groups a practical framework to plan their decarbonisation approach and target support to local areas. For example, Hammersmith & Fulham used our data to target their Green Homes Grant support to over 2,000 residents.

We took this further by identifying customers at risk of being disadvantaged during the

heat transition, and shared our analysis with the Carbon Trust, who are leading the Mayor of London's Retrofit Accelerator programme, to inform their targeted support to retrofit energy-inefficient homes.

Stakeholder outcomes

- ✓ Co-created local granular pathways to decarbonisation, reducing cumulative CO₂ emissions by 34 million tonnes and potentially avoiding £341 million network reinforcement costs
- ✓ Identified up to 54,000 customers whose energy bills could be reduced to under £1,500 via energy efficiency and heat decarbonisation measures and shared this insight with 61 local authorities to help target support



£1.59 social value forecast in excess of every £1 spent over 10 years due to predicted energy efficiency uptake and reduced CO₂ emissions

Making hybrid heating a real contender

Strategic context:

The Government has identified two primary pathways for decarbonising heat: hydrogen and electricity. We should consider the opportunities of a blended pathway for our customers.

Stakeholders said:

A quarter of developers, local authorities and trade associations said hybrid heat pumps are the first heating technology they would consider installing. However, gas network Wales and West Utilities found that common barriers to hybrid solutions are space requirements, the disruption of installing a hybrid heat pump alongside a standard gas boiler, and the higher costs of maintaining two units.

What we did:

We joined forces with Wales and West Utilities to engage with 1,000 customers across Great Britain to explore attitudes and barriers to adopting hybrid heating and found that comfort and reliability are key concerns in making the switch. Almost 60% of respondents also said they had little to no understanding of heat pumps and even fewer understood other low carbon heating technologies, so we expanded our range of heat guidance to give customers more information.

The partnership then engaged with manufacturers to combine the gas boiler and heat pump into a first-of-a-kind hybrid unit and install these in customers' homes, significantly reducing the space requirements and installation disruption compared to

existing separate-unit alternatives. Learning from this collaboration, we identified the need to model what impact a hybrid pathway would have on the network.

Stakeholder outcomes

- ✓ Hybrid heat pump solution reduces space requirements by 50% and can be installed in a third of the time compared to dual-unit hybrids
- ✓ Initial findings show 43% reduction in carbon emissions due to switching to a hybrid heat pump and increased heating system efficiencies



£5.55 social value created in excess of every £1 spent over 10 years due to lower installation costs of hybrid systems, based on forecast heat pump uptake

2 Delivering great service to customers connecting low carbon heating

Strategic context:

As customers transition to complex new heating technologies, they need the right information and support to feel confident in making the change.

Stakeholders said:

Net Zero Forum and Local Authorities Roadshow attendees said we should collaborate to increase customer awareness of decarbonising heat. 224 stakeholders such as local authorities and heat pump installers told us DNOs should consider how we support customers at all stages of the journey.

What we did:

We published a Net Zero resources web page, heat pump guidance and customer point-of-view videos explaining heat pump installations and fuse upgrades.

We worked with Citizens Advice, community energy groups, local authorities and developers to produce tailored heat information packs, publishing these on our website and sharing them with domestic

consumers and other community energy groups, local authorities and developers, including mail delivery to early adopters through Community Energy South to keep them engaged and informed.

We co-developed staff training material with the Heat Pump Federation, South East London Community Energy, isoenergy, and Trane Technologies to upskill over 300 customer service staff in heat decarbonisation and heat pumps to enhance our customer support. Working together with energy supplier OVO on heat pump installations, we gained practical insights to improve our service offering.

"The Heat Pump Federation has been really encouraged with the increasing degree of collaboration with UK Power Networks on topics from upgrading connections to future-proofing and training materials. Getting the customer experience right is vital to give both homeowners and tenants the confidence to switch to low-carbon heating."

Bean Beanland,
Heat Pump Federation



Stakeholder outcomes

- ✓ 1,689% increased traffic to our low carbon technologies connections portal, including 2,068 views of heat-related videos, 9,471 views of heat information pack plus mail delivery to 700 home-owners and businesses
- ✓ 45% increase in heat-related jobs raised following the launch of our information portal
- ✓ Supported customers to avoid 688 tonnes CO₂ emissions by facilitating installation of 24 heat pumps



3 Supporting early adopters and preparing for future uptake

Strategic context:

Heat represents 37% of the UK's carbon emissions. With heat policy still unclear, time is of the essence so we need to focus on least-regret areas such as supporting off-gas grid communities.

Stakeholders said:

95% of stakeholders at our Local Authorities Forum identified off-gas grid customers and new builds as the most likely early adopters of low carbon heating, a finding reinforced by the Climate Change Committee. Engagement with regional gas network operators validated that electrification is the clear pathway for off-gas grid customers.

What we did:

Creating the UK's first playbook for off-gas grid decarbonisation

To transition a whole community is complex, especially in an efficient and co-ordinated way, so we worked with partners in Barcombe, an off-gas grid village in East Sussex, to develop a repeatable playbook for other off-gas grid communities to follow.

Working with Community Energy South, Buro Happold and Lewes Council, we engaged with over 600 individual households and businesses, including the wider community via digital town-hall meetings, to understand their needs and challenges, identifying customer journey

improvements and evaluating the benefits of a locally coordinated transition. We installed energy monitors in 50 homes to assess the customer comfort and associated network impact of transitioning to electrified heat alongside other low carbon technologies such as EVs and solar panels. This approach could now be replicated to benefit our 340,000 off-gas grid and wider GB customers who are yet to transition.

Accelerating the Net Zero transition with local authorities

Looking beyond off-gas grids, we engaged with 53 local authorities to proactively upgrade fuses in customers' homes so that they are ready to adopt low carbon heating as part of our Net Zero Make-Ready programme. We partnered with gas network Cadent to support the Greater London Authority in developing a cost-effective Local Area Energy Plan (LAEP) for the Isle of Dogs, blending the use of heat pumps, gas, hydrogen and district heating.

"Decarbonising heating systems is crucial to tackling the UK's greenhouse gas emissions and I'm delighted that Barcombe is leading the way to demonstrate how to make the decarbonisation of heat a reality. It is fantastic to see UK Power Networks passionately collaborating with a range of stakeholders, to ensure they support rural constituents like mine to decarbonise as quickly and efficiently as possible."

Maria Caulfield, MP for Lewes Constituency



Stakeholder outcomes

- ✓ Barcombe's coordinated transition is expected to deliver over £200k energy savings, avoid £199k network reinforcement costs, and reduce 5,400 tonnes CO₂ emissions
- ✓ Isle of Dogs LAEP will enable the building of 10k low-carbon homes, support 110k jobs and avoid as much as 286,794 tonnes CO₂ emissions in a full electrification scenario
- ✓ 11% increase in customer fuse upgrade requests through our Net Zero Make-Ready programme



£1.11 social value created for off-gas grid communities in excess of every £1 spent over 10 years

Tackling the Net Zero challenge continued

Enabling Net Zero by facilitating Electric Vehicle (EV) uptake

Transport accounts for 28% of greenhouse gas emissions in the UK. EV uptake is accelerating, with 4.5 million EVs forecast to connect to our network by 2030. We are supporting the fast, affordable and inclusive roll-out of EV infrastructure as part of a smart, flexible energy system.

Streamlining the customer journey for EV owners

Strategic context:

We have a role to play to make it easier and more appealing to transition to EVs by making the experience simpler and looking for ways to reduce the whole-life cost of transitioning – for example, using Vehicle-to-Grid (V2G) charging to unlock transport assets as energy assets.

Stakeholders said:

Chargepoint installers asked for a simpler and faster application process to connect EV and V2G chargepoints to keep pace with growing demand. Customer feedback highlighted we could improve the customer experience by integrating the fuse upgrade and charger installation processes.

What we did:

Having seen a 250% increase in EV connection interactions since 2019, we created the UK's first self-service portal for domestic low carbon technologies (LCTs) that combines the application and fuse upgrade process in a single digital journey. Designed and tested with customers and LCT installers, this service automatically assesses connections applications in minutes and allows us to proactively schedule a fuse upgrade where required,

providing a simpler, faster, scalable service to support growing LCT uptake.

To support chargepoint installers, we took the lead in creating a single simple application process for small-scale V2G and worked with other DNOs to ensure installers have the same experience nationally.

To improve the guidance available to customers considering buying an EV, we partnered with Scottish and Southern Electricity Networks to co-design a data sharing platform with EV service providers such as car websites and chargepoint operators (CPOs). The platform allows us to proactively identify new EV owners and provide earlier guidance on whether a fuse upgrade is required. We published a video sharing one customer's experience of upgrading their supply, which Octopus EVs has shared with its customers across the UK.

Stakeholders told us the reliability of public charging is a barrier to transitioning, so we engaged with CPOs to automatically share planned network outage data from our control system to their chargepoint availability platforms so the chargers are displayed as unavailable, avoiding customers travelling to offline chargers.

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"The launch of the portal will be a game changer for customers and installers alike, making the connection assessment and process fast and transparent."

Albena Ivanova, Octopus Electric Vehicles



Stakeholder outcomes

- ✓ 36% of domestic LCT applications automatically approved via our portal, saving customers five days on average per connection, with 18% of applications automatically referred for a free engineer check of their electricity supply
- ✓ Customers can easily submit and track applications through our self-service portal, with automatic updates when work is complete
- ✓ Customers will receive advance notice when chargepoints are unavailable due to a planned electricity outage



£5.18 social value created through self-service portal in excess of every £1 spent over 10 years due to more efficient process

Developing EV flexibility services around customer preferences

Strategic context:

To deliver Net Zero at the lowest cost to customers, we need to look at options which incentivise customers to shift their energy use to when it is cheaper and greener to do so. We need to better understand consumer behaviour to design attractive flexibility products to maximise participation and value.

Stakeholders said:

Industry stakeholders told us a market-based approach to smart charging should focus on real-world propositions designed around customer behaviour. Our research found 94% of motorists valued the ability to override a smart charging session.

What we did:

We partnered with forward-thinking energy companies to develop and run UK-first trials of a range of smart charging products, with over 2,000 EV owners in control of how they respond to financial incentives.

Through trials, we identified that 7.5% of customers chose to manually charge their car more often than they chose to follow

the automated smart charging schedule. This insight validates that a small but significant number of customers want to stay in control of their EV charging and allows us to factor this real-world behaviour into our network planning.

We worked with our partners to survey customers and understand which aspects of behaviour can be influenced through proposition design. We found 83% of Octopus Energy customers surveyed moved the demand of other devices alongside their EV, such as dishwashers and washing machines, in response to tariff signals. This insight will help us develop products that optimise existing network capacity, minimising cost and customer disruption.

Our insights into real-world customer behaviour are now informing policy and flexibility services for domestic consumers in ongoing V2G trials with Octopus EV. We are also partnering with vehicle manufacturers, suppliers, technology providers and academics to design and test commercial V2G services for electric buses and fleet vehicles to gain practical insights.

Stakeholder outcomes

- ✓ 2,000 customers saved 33% on their EV charging bill in our domestic smart charging trial over the course of the last year
- ✓ New revenue streams for EV customers thanks to new commercial products for V2G trials, supporting the business case for electrification of transport
- ✓ 1MW+ capacity provided by energy stored in 28 double-decker buses in the largest electrified bus garage in Europe

"UK Power Networks' market-led approach is innovative and supports widespread adoption of smart charging, which is a win for customers by reducing energy costs, a win for the network by reducing congestion, and a win for society by supporting a zero-carbon grid."

Nick Woolley,
CEO and co-founder of ev.energy





Supporting local authorities to plan on-street community charging

Strategic context:

51% of our customers do not have access to off-street parking to install their own EV charger. Lack of public charging is the main barrier to these customers switching to an EV. Effective investment in public charging is needed to ensure customers without a driveway are not left behind in the EV transition.

Stakeholders said:

77% of stakeholders at our Net Zero Forum said DNOs should do more to support at-home on-street charging.

What we did:

We developed a new approach to planning on-street chargepoints in areas where they are needed most, but where investing in public charging has traditionally been uneconomic.

We partnered with Cambridge City Council and Cambridgeshire County Council to bring together their local knowledge, our expertise on network capacity and forecast EV uptake, and CPOs' delivery experience to ensure chargepoints are planned in optimal locations to meet community needs. Strategic planning enables a 'dig once' approach to upgrading the network to support EVs, delivering investment at the lowest overall cost and with less roadworks

disruption. We are developing this pathfinder approach further in both Norwich and Redbridge by incorporating feedback from resident surveys on barriers to EV uptake and predicted charging behaviours.

High upfront connection costs are a barrier to investment for CPOs. We launched a tender in Cambridge using Green Recovery Funding to fully offset connection costs. We are also launching competitions to reveal what level of discount on connection costs is needed to incentivise investment in public charging blackspots, while supporting efficient coordination to 'dig once'. Given the progressive nature of this initiative and its pressure on current regulations, we are working with Ofgem through the regulatory sandbox to align regulation to need. We will test both approaches to evaluate which is the most effective way to ensure customers without off-street charging are not left behind.

From this initial insight, we will embed the community-based approach with other local authorities and DNOs through Green Recovery investments, and share learnings with community energy groups, other DNOs, BEIS and the Office for Zero Emission Vehicles (OZEV) to stimulate greater public charging provision for those without access to off-street parking.

"This new approach with UK Power Networks has helped us understand local barriers to EV uptake and plan public charging in the right locations for our communities – a key step towards achieving Norfolk's ambitious 2030 Net Zero target."

Dominic Allen, Sustainability Manager,
Norfolk County Council

Stakeholder outcomes

- ✓ Identified 283 strategic locations for public charging across three pathfinder areas, unlocking chargers in areas where they would not otherwise be installed – giving nearly 100k more people access to public charging within five minutes' walk of their home
- ✓ Tender launched for 42 additional on-street chargers in Cambridge pathfinder area
- ✓ 14,045 tonnes CO₂ reduction forecast due to increased public charging
- ✓ Network savings and reduced disruption thanks to coordinated planning and a 'dig once' approach: c.85% of costs are due to excavation



£1.31 social value created in excess of every £1 spent over 10 years due to network savings, lower CO₂ emissions and improved air quality

Connecting rapid charging hubs faster and more affordably

Strategic context:

Our customer research found a lack of public charging and range anxiety are barriers to EV uptake. The Government's Rapid Charging Fund supports new charging hubs along some motorways and major A roads, but charging in areas such as city centres is also needed to build range confidence for consumers.

Stakeholders said:

Engagement with forecourt providers, service area operators and CPOs identified five issues affecting rapid charging hub viability: cost; speed of delivery; space constraints; flexibility of charging capacity; and information to make the right decisions at the right time.

What we did:

We worked alongside BP to develop a new approach to significantly lower EV forecourt connection costs and maximise charger availability in constrained areas by adapting the Active Network Management (ANM) solution we developed for large solar farms. To do this, we worked with BP to model how a fully-electric forecourt would work, when customers would charge their

EVs and for how long. This approach makes efficient use of available power and avoids costly network upgrades, with the potential to unlock the viability of sites which would be unviable using traditional options.

We developed a model which we can now use to assess any forecourt, and tested it at a trial site in Kent. The proof of concept was successful and we are now able to offer this product to all forecourt operators.

To further address the cost barrier, we worked with Ofgem and the ENA to advocate for the Green Recovery Fund (GRF) and developed a new process for assessing proposals, including their wider social benefits.

Learning from the rapid uptake of distributed generation connections, which identified the need for innovative substation designs to support rollout at pace, we set out to understand the challenges Motorway Service Area (MSA) sites face in rolling out EV charging at scale. In-depth engagement revealed MSA and forecourt operators want to maximise the space available for charging and minimise on-site disruption. We then co-created a new substation design which fits in a single parking space,

and is delivered in kit form for rapid deployment. The scalable design allows MSAs to add capacity in 1.5MVA blocks to match growing demand or accommodate multiple CPOs onsite, providing flexibility to expand while lowering upfront investment. We have partnered with Ecotricity at Thurrock MSA to trial the prototype, which could accelerate the roll-out of rapid charging.

Stakeholder outcomes

- ✓ Proved ANM is a viable solution for rapid charging sites, with potential to lower network connection costs by up to 80% in the right circumstances
- ✓ 359 applications received for the GRF including 12 of the 13 MSAs in our area, representing £2.94bn in value and 2.7GW capacity
- ✓ Compact substation kit is two weeks faster to connect and takes up 20-50% less space than traditional solutions

Tackling the Net Zero challenge continued

Building a Smart Grid to enable Net Zero for all

DNO FIRST


In December 2020 we were humbled to be named the world leader in smart grids in the Smart Grid Index commissioned by Singapore-based SP Group. This independent study benchmarked 85 utilities across 37 countries.



Evolving our market leading flexibility services

Strategic context:

The Climate Change Committee highlighted that Net Zero relies on decarbonisation becoming more local. Having focused on maximising participation last year, we now set out to embed and scale the solutions.

Stakeholders said:

Last year stakeholders asked for greater accessibility to flexibility opportunities. Building on our DNO-first offering of flexibility at street level, 55% of our Summer Flexibility Forum participants advised us to ramp up the scale of these opportunities.

What we did:

We took action, launching the biggest ever flexibility tender in the UK with 138 locations, enabling 1.2m customers to participate. We went further to remove

barriers, lowering the participation threshold by a further 80%, from 50kW to 10kW.

To widen opportunities, we stimulated a buzz of flexibility interest with 50% more flexibility engagement sessions requested and a 25% increase in the number of flexibility forum participants. We also saw a four-fold growth in new flexibility tender providers, including smaller businesses and start-ups – leading to the biggest flexibility opportunity opened to market yet, growing from 19.3MW to 473MW.

“Network flexibility is a key enabler for our EV infrastructure rollout. UK Power Networks is playing a vital role in opening up new markets which will galvanise the growth of electric vehicles for all.”

Nick Ballamy, Director of EV Chargers (EVC)



Stakeholder outcomes

- ✓ Unlocked 350MW contracted flexibility capacity, deferring £95.5m network reinforcement by 2028
- ✓ 493% expansion in flexibility tender locations, resulting in the highest flexibility award of any DNO, spanning 60 LV locations
- ✓ Stimulated new participation from domestic batteries and EVs with a three-fold increase to 248MW, equivalent to a gas-fired power station.



£0.29 social value created through flexibility tenders in excess of every £1 spent over 10 years

Delivering value through digitalisation

Strategic context:

In a smart and connected world, by 2050 we could see daily data transactions on our network grow ten times to 70m.

Stakeholders said:

Stakeholders asked us to explore automation to reduce flexibility transaction costs and barriers, and to deliver data on our low voltage network faster and cheaper.

What we did:

We developed a digital Application Programming Interface platform with leading smart battery company Moixa to

automate flexibility activation, replacing traditional email dispatch and enabling flexibility services to be introduced and called upon more easily, supporting a resilient and efficient grid.

Building on innovation from the telecoms industry, we launched a ground-breaking trial with machine learning experts and data scientists to co-develop a data-driven model providing a predicted measurement of low voltage network demand. This enables customers to connect faster and supports network reliability in the transition to electrified transport and heating.

Stakeholder outcomes

- ✓ Flexibility providers can now integrate to our systems 50% faster
- ✓ Unlocking network visibility at 69,000+ substations, saving £4m in network reinforcement and avoiding 597 tonnes CO₂ emissions from journeys by operational staff



£0.85 social value created in excess of every £1 spent over 10 years due to analytics-driven low voltage monitoring

Collaborating to realise whole system benefits

Strategic context:

By 2050, 42% of generation capacity is forecast to be connected to the distribution network. We need to work beyond traditional silos to deliver smart grid solutions.

Stakeholders said:

Generation owners asked for easier ways to connect, navigate complexity and access previously restricted markets.

What we did:

We launched a UK-first digital control scheme with the Electricity System Operator (ESO), working smarter to reduce system faults whilst allowing 600MW of additional renewable generation to connect affordably.

Building on our world-first initiative with the ESO to create a reactive power marketplace, we worked side-by-side with our generators to successfully demonstrate live technical and commercial trials to manage transmission voltage levels, validating this ground-breaking approach.

In supporting 1,700 hard-to-reach smaller generation customers to upgrade their protection settings, we quickly identified our engagement approach wasn't working. We looked to our distributed energy resources stakeholders for insight, driving us to adapt our approach through 1-2-1 calls, LinkedIn adverts and direct letters to better reach these customers and offer support.

Stakeholder outcomes

- ✓ Regional whole system control scheme will avoid £1bn reinforcement costs
- ✓ 100Mvar reactive power provided via world-first marketplace – when scaled could unlock additional 4GW clean generation in the South East saving £412m by 2050
- ✓ 70% increased response from smaller generators following adapted engagement



£2.86 social value created through protection setting upgrades in excess of every £1 spent over 10 years

Ensuring no one is left behind in a changing world

As a socially responsible business, we want to ensure all customers can benefit from the services and products we offer. Customers may be at risk of being left behind for many reasons, so we need to understand their changing needs and how we can address the short-term and long-term barriers they might face.

Below we provide two examples of how we are improving support for 2.3m Small and Medium Enterprises (SMEs) in our area. We wanted to better understand the different needs of this diverse group, ranging from sole traders to companies with 249 employees, to understand who is at risk of being left behind and how we can support them.

Leaving no SME customer behind during power cuts

Stakeholders said:

Customer feedback from Rant & Rave emphasised the importance of minimising disruption from power cuts to help businesses stay afloat during the COVID-19 pandemic. During a power cut, SMEs do not inherently receive the support available to either domestic customers or larger commercial customers.

What we did:

We recognised the heightened impact of power cuts during the pandemic and engaged with over 6,000 COVID-19 critical customers such as hospitals, GP surgeries, care homes and ventilator manufacturers to register them on our Extra Care Register (ECR). Launched last year, the ECR gives smaller businesses extra support in the event of a power cut.

Learning from the financial sector's mortgage holidays, we looked at how we could support SMEs facing immediate financial pressures and provided payment holidays on cable damage bills until government financial assistance was in place. We also extended the validity of connections quotations for three months

for customers whose quotations were due to expire during the first lockdown, when businesses were closed, ensuring no increase in connection costs once they re-opened.

We wanted to do more, so we explored how to enhance our enduring support for SMEs. We launched a research initiative with expert agency Huntswood to better understand the needs of SMEs and develop a definition of SME vulnerability, which we explore further in Part 3. We formed a SME online community and its first task was to test this definition and review what additional support would benefit SMEs. As a result, we enhanced our range of SME support options:

- We use more generation to keep SMEs powered during planned shutdowns. Where this is not possible, we deploy additional engineers to ensure work lasts no longer than six hours. We offer practical support such as battery-powered WiFi routers with mobile data to help SMEs keep their businesses running.

- All SMEs on the ECR now receive local power cut notifications, a service previously only supplied to domestic customers, to keep them and their customers updated.

Stakeholder outcomes

- ✓ 13,533 eligible SMEs, including NHS Clinical Commissioning Groups, on our Extra Care Register – a 2,700% increase on last year
- ✓ SME customer satisfaction during a power cut improved by 1.10 percentage points compared to 2019/20
- ✓ 401 internal high profile alerts raised to support SME customers as a priority
- ✓ £1,008,814 total cable damage bills deferred for three months for 720 small businesses – equivalent to the average monthly turnover of 32 SMEs



£5.06 social value created in excess of every £1 spent in-year on enhanced services for businesses providing COVID-19 sensitive services

Supporting our SME customers to transition to Electric Vehicles

Strategic context:

Many SMEs want to actively engage in the low carbon transition but lack the time or expertise to prepare, and need support.

Stakeholders said:

As part of our participation in the Mayor of London's Electric Vehicle task force and partnership with the Federation of Small Businesses (FSB), we learnt that to support SMEs in the EV transition, we need to understand the unique challenges faced by this diverse group. Stakeholders at our Net Zero event validated that SMEs are the customer group most likely to be left behind in the EV transition.

What we did:

With no segmentation data available to tell us about SMEs' use of vehicles, we launched an ambitious research project with hard-to-reach SMEs across our regions to understand the challenges they face in transitioning to EVs, receiving over 1,200

online survey responses and holding 88 interviews with representative bodies across all sectors. Based on our learnings, we segmented SMEs into groups with similar needs, identified 13 initial recommendations and developed an action plan supported by a tailored engagement approach for each SME segment.

Microbusinesses, who make up 96% of SMEs, are currently least likely to switch to EVs, so we prioritised supporting this group first. With limited time available for research, these SMEs want a central trusted source to provide real-life SME case studies to help them weigh up the costs, savings and practical implications of switching to EVs.

Rather than set up our own SME website, we are collaborating in the Zero Carbon Business partnership along with BEIS and the FSB, to develop a central online advice service for small businesses wishing to

decarbonise, alongside developing SME advocacy in the run-up to COP26. Using the detailed insights from our research, we are informing and accelerating the development of tailored content for this service, ensuring the hub addresses key barriers faced by each SME segment.

Stakeholder outcomes

- ✓ Tailored action plan and segmented engagement strategy in place to provide tailored, relevant guidance to support the EV transition of c.790,000 SMEs who operate a vehicle for business
- ✓ Central information hub co-designed with SMEs will provide clear, accessible, practical guidance they can trust

Meeting our customers' evolving needs

To ensure we are at the forefront and keeping pace with customers' evolving needs, we continuously scan the horizon to anticipate developments and innovate to offer new and improved services based on feedback.

Opening up our network data to enable a more flexible and efficient network

Strategic context:

The Energy Data Taskforce recommends that modernising the UK's energy system and driving towards a Net Zero future will require better data transparency and access.

Stakeholders said:

Distributed Energy Resources (DER) customers asked for better visibility of network data beyond static maps to locate the most affordable points to connect. To deliver up to £40bn benefits associated with a smart flexible energy system, all participants need a clear, detailed, real-time picture of what is happening on the network.

What we did:

We engaged with over 60 stakeholders including DER customers, the Electricity System Operator (ESO) and academics to co-develop and trial a dynamic interactive dashboard of detailed real-time network information. Based on the DER community's requirements, we released

over 200 data points, from network frequency, voltage, volumes of active and reactive power, to generation connected to the network and generation mix.

Customers asked us to go deeper into the network than other DNOs have done to date, so we made data available at Grid Supply Point level, rather than licence area level, to support efficient planning of connections and operations.

Following positive feedback from flexibility developers, DER operators and academics, with 97% interested in seeing it being developed further, we are taking a release-based approach to evolving the dashboard. Based on user feedback, we plan to go even deeper into our network in upcoming releases to open up data at lower voltage levels, add power quality data and add geographic and demographic context so our customers can locate the most affordable points to connect.

"Fantastic to co-design new open data services that help us decide where to connect clean, green resources."

Declan O'Halloran, Managing Director, Quintas Energy



Stakeholder outcomes

- ✓ Over 200 data points requested by DER customers opened up for the first time
- ✓ DER customers can now assess potential sites on a self-service basis, scoring the dashboard 84% for usability
- ✓ Opened up detailed visibility of 2.5GW distributed generation to the ESO
- ✓ Unique granular dataset enables open innovation and research into new flexible connection and market products

Unlocking smart meter technology to improve the customer experience

DNO FIRST



Strategic context:

Unlocking smart meter remote technology can lead to environmental, financial and customer service benefits. We challenged ourselves to expand the frontiers of using smart meter data to improve our service for customers.

Stakeholders said:

Most homeowners are unfamiliar with the lines of responsibility between themselves, suppliers and DNOs regarding their property's electrical equipment in the event of a power cut. If a single household reports a power cut, we ask them to test their own internal equipment trip switches to confirm the fault is on our network. This can be very difficult for customers with conditions such as sight loss, dementia or those with learning difficulties, and in some circumstances a fault cannot be confirmed until a site visit.

We carry out around 734 visits a month where we find the fault is with the customer's or supplier's equipment, costing consumers around £1.8m every year. Customers are also frustrated by unnecessary delays before they find out they need to contact their supplier or a domestic electrician instead.

What we did:

We looked globally for companies that lead in smart meter deployment to learn and adapt quickly for the UK market. Learning from Australian counterparts Victoria Power Networks, which has 100% smart meter penetration, we are the first UK DNO to have integrated smart meter capabilities across our customer contact channels.

Contacting the smart meter allows us to quickly and remotely confirm whether a power cut is network-related or not. This avoids the risk to over 1.27m smart meter customers, particularly those with a disability, navigating their homes in the dark to check their meter. It also means we can immediately signpost the customer to the most appropriate course of action, such as contacting their supplier, saving the customer time and removing the need to send an engineer to enter the customer's property.

We are the first DNO to integrate smart meters into the digital customer journey, so that customers reporting a power cut online have their smart meter checked automatically, without needing to call us or wait for an engineer visit. We are also the first DNO to integrate this technology into our phone systems, so that when a customer calls to report a power cut, our

call agent has the results from the customer's smart meter as soon as the conversation begins, supporting a seamless and tailored service.

Stakeholder outcomes

- ✓ 94.0% smart meter customer satisfaction when contacting us during a power cut, compared to 93.2% for non-smart meter customers
- ✓ 713 unnecessary customer visits avoided in first four months, reducing power cut length by 109 minutes on average
- ✓ 3,660 customers using our fully-digital power cut customer journey had their smart meter automatically checked

"Smart meters have so much potential to improve the customer experience, especially for customers in vulnerable circumstances. We've learnt from international best practice and taken this even further to make sure our customers benefit from the latest technology and smart capabilities."

Saleem Naeem, DSO & Smart Network Operations Manager



Distribution Future Energy Scenarios – accelerating local authority climate action planning

Strategic context:

78% of the local authorities we serve have declared a climate emergency and increasingly need data to model the potential take-up of low carbon technologies (LCTs) across their communities to develop robust, locally-tailored climate action plans.

Stakeholders said:

Councils told us they see our granular Distribution Future Energy Scenarios (DFES) as a valuable input to their decarbonisation plans, but a number do not have the capability to analyse the detailed data supplied on our Open Data portal. They asked for ready-to-use information that matches the resource and capabilities they have available.

What we did:

We developed bespoke 'heat maps' overlaying DFES data onto local areas and shared these with local authorities. After receiving positive feedback, we ran focused sessions with local authorities in our area to explore co-developing an interactive tool to make it easier for them and other stakeholders to apply our granular LCT forecasts to inform their climate policies.

We then worked with Open Data Institute Leeds and local authorities to design and trial a graphical tool that allows stakeholders to visualise and download data in ready-to-use formats. We learnt from stakeholder feedback on the beta version to improve the usability of the official release, with the DFES data to be refreshed annually.

Stakeholder outcomes

- ✓ 127 regional governmental bodies given access to publicly-available graphical interface tool providing accessible, ready-to-use visualisations of granular data to inform climate action plans
- ✓ 90% of local authorities responding to our survey said they plan to use DFES data to inform their climate plans

"The visualisations are so much easier to interpret than the raw data sets and will be invaluable in developing our plans to support decarbonisation of public transport as part of our ambition to achieve Net Zero carbon emissions for our operations by 2030."

Sandra Norval, West Sussex County Council

Embedding our generation customers into the outage planning process

DNO FIRST

Strategic context:

Distributed generation (DG) stakeholders such as solar providers are critical to decarbonising generation. We need to cater for the operational needs of this large and growing group of customers.

Stakeholders said:

DG stakeholders asked for earlier visibility of planned outages via a digital tool and the opportunity to coordinate with us to reschedule outages to optimise the amount of low carbon generation on the network.

What we did:

We are the first UK DNO to provide a dynamic outage planning portal. Having found no existing automated tool available on the market, we co-developed an online

self-service portal with DER owners, operators and high voltage customers.

The portal allows DG customers to influence and, if needed, request changes to the planned outage schedule to manage the operational impact on their business, using the same tool that our staff use to arrange outages on the network. Customers may also choose to coordinate their own maintenance with planned outage windows.

To maximise usage of the portal, we trained customers via demos, webinars and tailored one-to-one sessions offered to all DG customers. Following a showcase of the portal, two additional DNOs are looking to adopt a similar tool.

Stakeholder outcomes

- ✓ 160 customers have accurate eight week-ahead visibility of EHV outages impacting their sites and high level visibility of outages up to a year in advance
- ✓ All customers surveyed who engage with other utilities on planned outages said our tool was better
- ✓ 80% of customers surveyed said the tool would save them time and 70% are more satisfied compared to the previous system



£1.15 social value created in excess of every £1 spent over 10 years

Introducing Robotic Process Automation to support rapid uptake of Low Carbon Technology

DNO FIRST

Stakeholders said:

Chargepoint installers at the ENA Industry EV Forum asked us how we plan to efficiently manage growing EV connection applications as EVs increase from 150,000 today to 4.5m by 2030.

What we did:

Though horizon scanning and engagement with First Direct, we found Robotic Process Automation (RPA) is well-established in industries such as financial services, but is not widely used by UK utilities. After engaging with an RPA provider to learn from implementation elsewhere, including Australian utilities, we trialled the technology in our Connections customer payments process, which

is highly repetitive and rules-based, finding RPA reduced the time to process a single transaction by up to 70%.

Based on this success, we are developing our systems to become the first DNO to apply RPA to our LCT connection application and notification process, where lead times have increased to eight days to cope with growing demand – a trend set to continue as more customers adopt LCTs. Implementing RPA and integrating the process with our new digital self-service portal for LCT connections will provide customers with an instantaneous notification service with 24-hour availability, to support growing demand. Automated triage means up to 90% of applications could be processed

automatically, allowing staff to focus on value-add activities to progress the remaining 10% of applications.

Stakeholder outcomes

- ✓ Same-day processing of Connections customer payments benefits 28,000 Connections customers per year
- ✓ Instantaneous EV and other LCT notification processing will improve our eight-day average lead time
- ✓ Future-proof solution will maintain or improve application SLAs at higher volumes and avoid costs of scaling up the existing process

Our lowest carbon submission journey ever

This year we challenged ourselves to produce a printed low carbon Stakeholder Engagement and Consumer Vulnerability submission, from production to output.



I am passionate about finding and adopting the latest sustainability measures to help us reduce our business carbon footprint. I am pleased to have helped deliver a low carbon journey of this report - ultimately every little bit helps.

Jen Bäckström, Sustainability Lead



225kg of CO₂ avoided

using digital materials rather than printing documents to support engagement.



9,020kg of CO₂ avoided

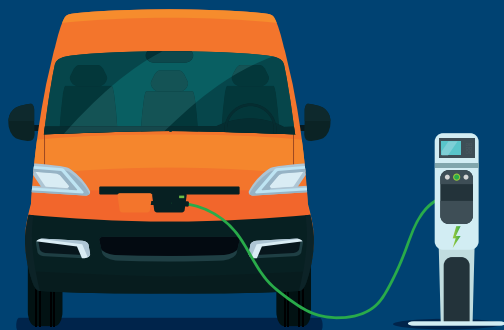
through switching to over 1,200 digital meetings with stakeholders.

Offset 43kg of CO₂

from using carbon-balanced paper in partnership with the World Land Trust.



WORLD
LAND
TRUST™



7kg of CO₂ avoided

by using electric vehicle couriers to transport our submission from the printing office to our London office.

Digital meetings have had a huge positive impact on reducing the carbon footprint of all the engagement activities making up this report. I wanted us to go a step further by ensuring the production and delivery reflected our enthusiasm to continue innovating and our ambition to deliver Net Zero in everything that we do.

**Michael Horwood, ED1 Stakeholder
Engagement Manager**



1.21kg of CO₂ avoided

by Michael cycling the submission copies across London to deliver at Ofgem offices.

181kg of CO₂ offset

for the entire production of this report through the supporting of planting 31 trees with Trees for Cities.



So now it's over to you...

We hope you enjoy reading our submission as much as we did preparing it. However we would like to pass this challenge forward, so have provided a fully recyclable pencil for your marking, which can be planted helping you reduce CO₂ even further.

