

Transforming power delivery

Central London Plan Update 2018



Welcome to the Central London Plan Update 2018

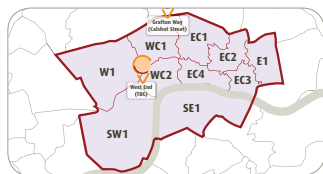
As part of our RII0-ED1 business plan, we made 77 commitments. One of these was to produce an annual update about the progress we have made on improving the Central London Network.

Contents



**Chief Executive's
introduction**

page 01



**Background to the
Central London Plan**

page 02



**Increasing capacity to
meet future demand**

page 04



**Improving Operational
Response**

page 06



**Investing in Network
Resilience**

page 08



London highlights

page 10

Chief Executive's Introduction



I am pleased to present the second annual update on the progress of our Central London Plan.

I am delighted to report that we are making great progress on delivering our plans for the Central London Area. We are building four large substations to increase capacity and support future growth in the capital, and we continue to make progress on their delivery.

Over the last four years, in London, we have seen a 23% reduction in the number of power cuts, due to investment in network resilience, and a 33% reduction in their duration, thanks to our improved operational response. A key contributor to this is our Central London depot, which enables us to provide a faster response 24 hours a day when power cuts occur. As a result, customer satisfaction in London has improved significantly, from 73% in 2012/13 to 86% in 2016/17.

This report provides updates on the progress of each of these three areas:

- Increased capacity;
- Improved operational response; and
- Network resilience.

London is constantly evolving and work is continuing on many fronts in support of becoming a "low carbon" city, including plans to encourage the use of electric vehicles. We recognise that we have a vital role to play in facilitating these plans. We are helping to realise the ambitious visions laid out in the Mayor's environment and transport strategies by creating a more flexible and responsive network that will support electric vehicles. In this way we will help improve air quality and enable healthier environments for the people of London. Alongside our commitment to supporting a low carbon city, we are conscious of our vulnerable customers in London and we are working on a number of projects to support the communities we serve. Our consumer vulnerability strategy consists of informing customers about the priority services register, addressing the issue of fuel poverty, improving communications with hard-to-reach customers and understanding vulnerability.

I hope you will find this update informative and useful. It sets out the many exciting projects on which we are delivering to improve and support Central London. We welcome any feedback on the work we are doing and this report.

Basil Scarsella
Chief Executive Officer

Our vision

To be the best performing distribution network operator in the UK from 2015/16 to 2018/19.

We will achieve this by demonstrating industry leadership in the three areas below:

An employer of choice

- > The safest – with an exemplary safety record
- > A place where people love to come to work
- > A more diverse workforce

A respected corporate citizen

- > The most reliable networks
- > The most satisfied customers
- > The most innovative
- > Deliver on our commitments
- > The most socially responsible

Sustainably cost-efficient

- > Be the lowest cost electricity distributor for our customers

Background to the Central London Plan

The Central London Area is the financial hub of the United Kingdom. It also contains some of the world's largest political, entertainment and tourist regions. Our plan focuses on delivering the infrastructure which will improve the Central London Network.

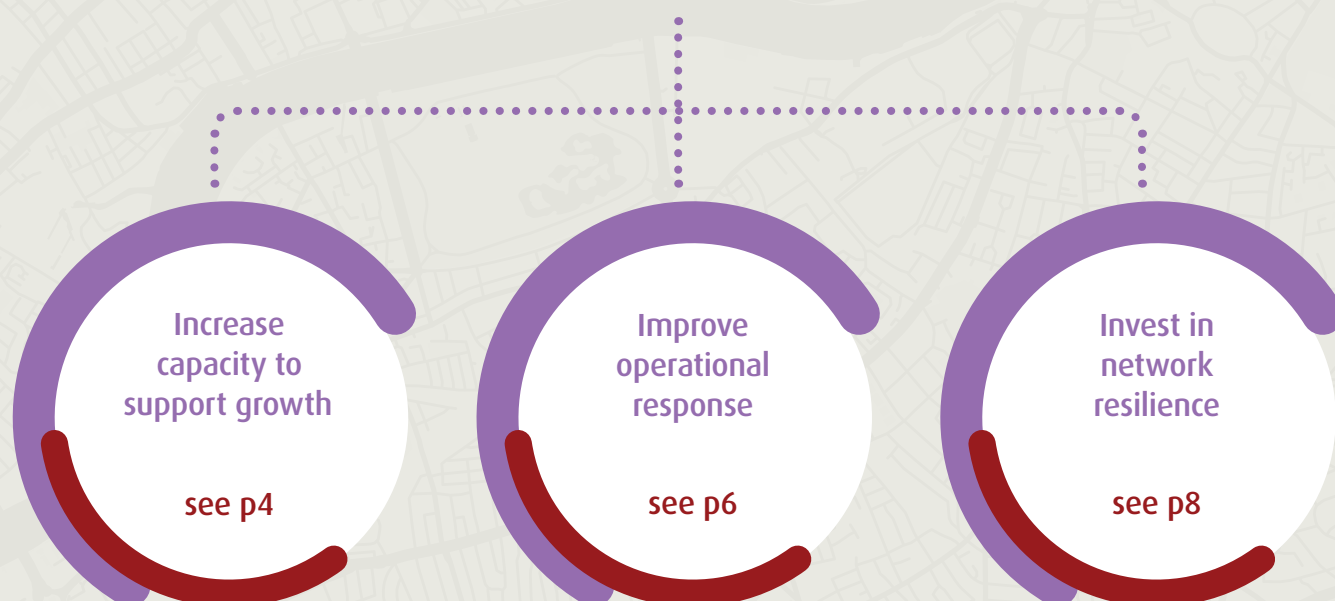
We recognise what a great responsibility it is to deliver power to customers in Central London, so we engaged with our key London stakeholders while developing our RIIO-ED1 business plan, to find out what is important to our customers and other stakeholders in the city. Three main priorities became clear from these discussions and are reflected in our Central London Plan:

- Increase capacity to meet future electricity demand;
- Improve operational response; and
- Invest in network resilience

The next few pages provide an update on the progress we have made in these three areas.

The maps show the geographic areas in the Central London Area, by postcode and by borough, and the locations of our new substations that will increase the network's capacity.

The **Central London Plan** has three distinct elements:





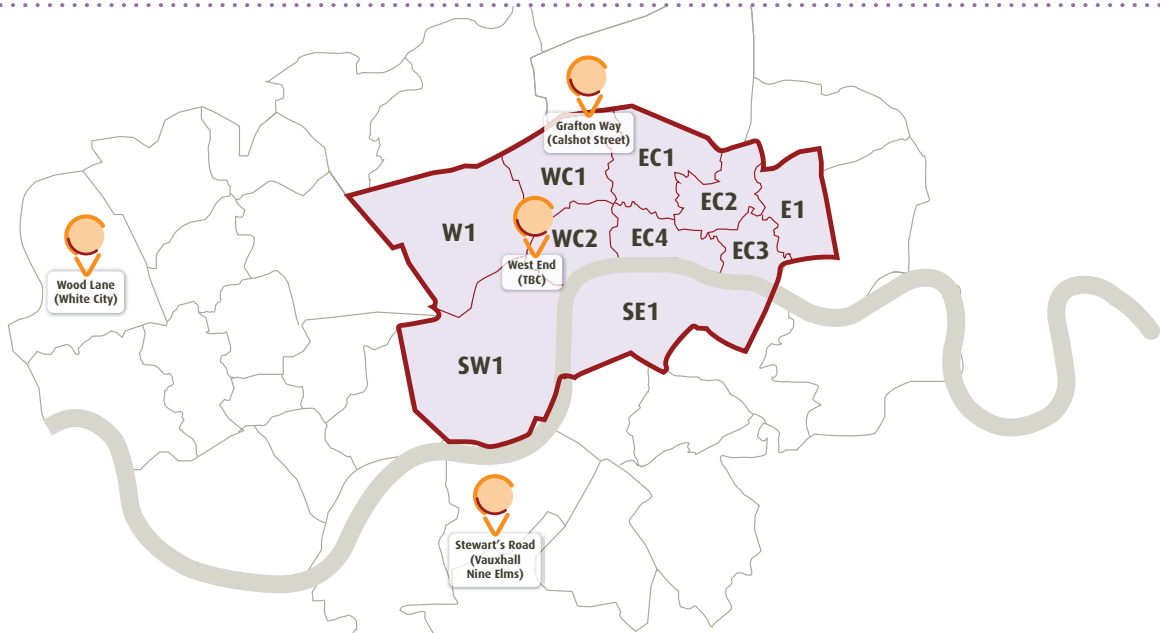
We want to make sure London maintains its standing alongside other major world cities such as New York and Hong Kong.

165,000

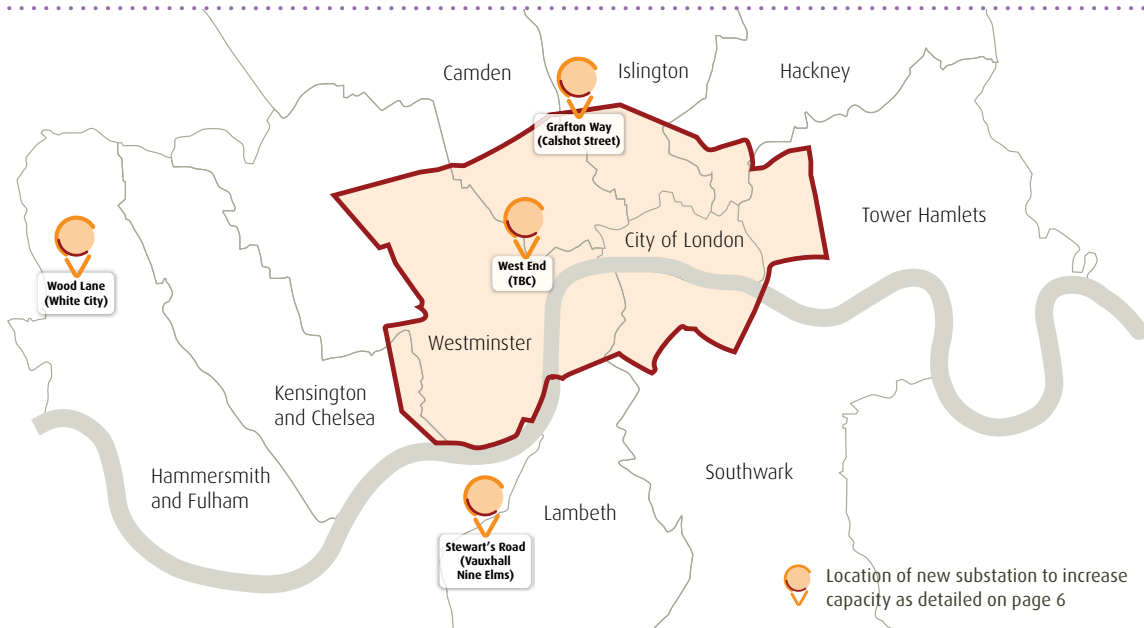
The Central London Area contains 165,000 customers

The LV interconnected network of the Central London Area makes it unique

Overview of the Central London Area by Postcode



Overview of the Central London Area by Borough



Central London Plan

Increasing capacity to support growth

As London continues to grow, so does the need for network capacity.

As part of our plan to increase capacity to meet the future demand for power in Central London, we are delivering four new substations, located where demand is expected to rise over the coming years. These new substations will be vital in providing an extra 300 MVA of capacity.

300 MVA

is the equivalent of the power needed for nearly 2 Olympic Parks



Capacity proposals



Forecast completion



Forecast cost*

* In line with regulatory reporting guidelines, the forecast costs here are only the direct costs of delivering the project



Calshot Street (now known as Grafton Way)



86 MVA



May 2018



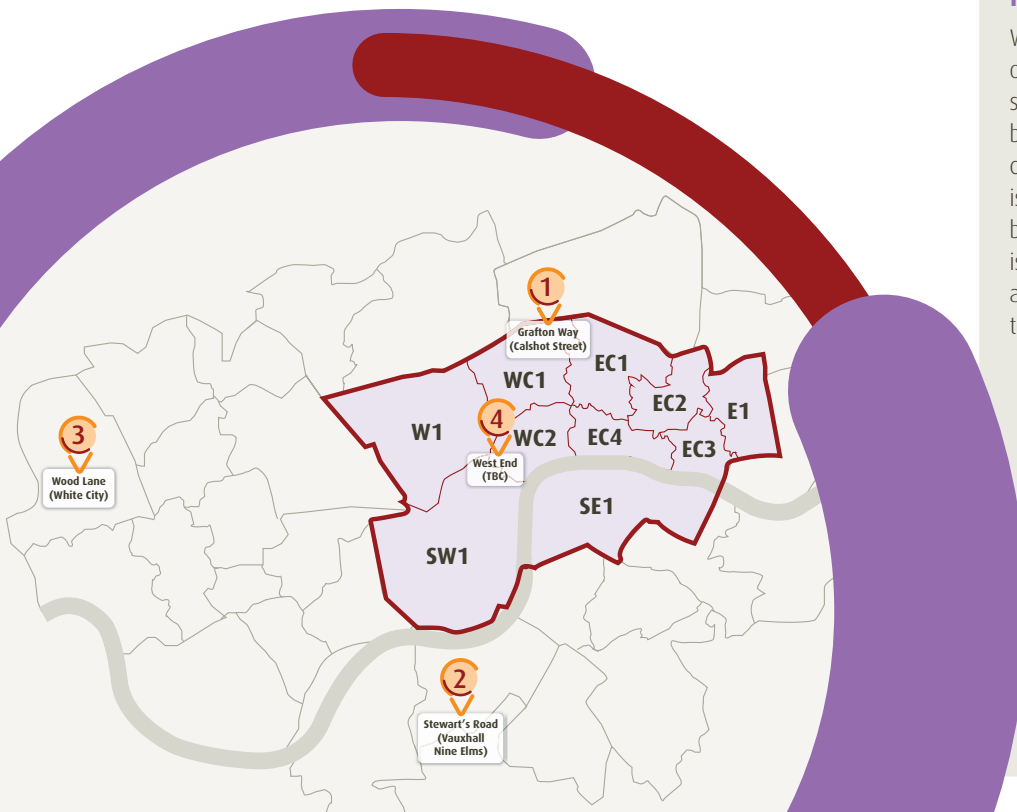
£10.4m

Background:

Grafton Way is a part of our City Road/City of London Regional Development Plan. The plan is to build a new substation in the Kings Cross area that will provide an increase in capacity of 86 MVA. This extra capacity will allow load to be transferred from the nearby Back Hill substation.

Progress update:


We have completed the construction of the building to house the new substation and the transformers have been installed. Work has started on commissioning the equipment that is already installed and the cables are being fitted and connected. Once this is complete the site will be energised and the new capacity will be available to customers in May.





Vauxhall, Nine Elms, Battersea (now known as Stewart's Road)

 86 MVA

 December 2019

 £29.4m

Background:

We proposed the building of a new substation to facilitate the development of new planning proposals in the Vauxhall, Nine Elms, Battersea area on the south bank of the Thames. This substation will facilitate:

- 16,000 new homes;
- An extension to the London Underground Northern Line; and
- Regeneration of Battersea Power Station


Progress update:

We have constructed the tunnel between Stewart's Road and the existing UK Power Networks tunnel infrastructure. We have secured planning permission for the new substation and the design is complete. The construction of the substation will be completed under our Alliance Delivery model, for the installation to commence January 2018. We are on target to achieve our completion date of December 2019.



White City (now known as Wood Lane)

 43 MVA

 May 2020

 £16.1m

Background:

The London Borough of Hammersmith and Fulham and the Greater London Authority have agreed a new White City Development, with mixed office, residential and community use. The site is close to the BBC Television Centre and Westfield shopping centre. A new substation in the White City area was proposed to support the new development.

Progress update:

The design is complete and lease agreements are being developed for the site. A feasibility study for the 132kV cable route is complete and the route has been deemed viable. We have engaged contractors and are preparing for a start date on site in January 2018. The completion date of the project has been extended and remains in line with customer developments in the area.



West End

 86 MVA

 2022

 £36.5m

Background:

London's West End is one of the most economically important areas of London. It encompasses the entertainment districts of Leicester Square and Covent Garden, as well as shopping districts on Oxford Street, Regent Street and Bond Street. Three substations that supply this area are expected to exceed their current capacity and hence we are developing plans to construct this new substation.


Progress update:

A land search to identify sites for the substation has found a number of potential locations and we are now reviewing these in detail. We will then carry out a feasibility study for a tunnel to connect the location of the chosen site with the existing infrastructure. The three substations that currently supply the area are not expected to exceed capacity before the new substation will be completed in 2022.

Improving Operational Response

A reliable power supply in Central London is vital for such a sensitive and economically significant area.

Our RIIO-ED1 business plan proposed the establishment of an additional depot specifically for the Central London Area, with teams available to respond to power cuts 24 hours a day, seven days a week. This has been a great success and helped significantly reduce the time it takes for us to arrive at a power cut.



A customer in Great Britain has a power cut on average every two years, compared to only every five years in Central London.

Shorts Garden

We now have over 100 qualified and professional members of staff in this Central London office in Covent Garden. We achieved this without reducing the capability of other London areas. Shifts are covered in a way that means the staff are fully capable of responding to any high or low voltage fault from a central location. A maintenance team working on a partial shift basis helps meet customer needs and clear up network defects.



Keeping response times as short as possible, we aim to achieve:

- 30 minutes on site for a low voltage (LV) fault
- An average completion time for LV faults of 170 minutes
- All customers to be restored within 60 minutes for a HV fault



Ways in which we reduce the number of power cuts in Central London:

- Assign dedicated teams working in shifts to maintain the LV interconnected network
- Install additional remote network monitoring and control of the network
- Annual inspection programme of plant in Central London
- Engineers are available 24 hours a day to repair HV faults to reduce risk to the network of further faults
- Using Ultra High Speed fuses so teams can work safely on the network without having to turn off supplies to customers



The measures we have in place to reduce the duration of power cuts in Central London:

- 24-hour response and repair teams working in shifts
- 24-hour line management working in shifts
- Authorised fault engineer available 24 hours a day to respond to HV and LV faults
- Parts delivery to site by mobile stores
- Response staff are at the depot in Central London, so we are not reliant on calling staff out from home



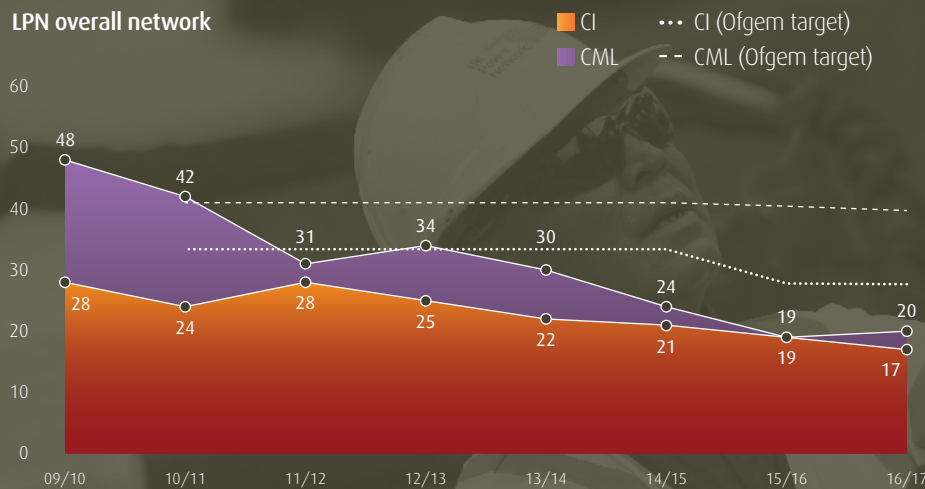
As a result:

In 2017 year to date (to December) the number of customers that were off supply for more than 8 hours was 283, which is a 81% improvement compared to 2014 and 24 customers were off supply for more than 12 hours, a 94% improvement.

Reducing power cuts and the duration of them has resulted in an improvement in customer satisfaction. For London, in 2016/17 we achieved a score of 86%, compared to 73% in 2012/13.



LPN overall network



Ofgem targets

CML	41.0	41.0	41.0	41.0	41.0	40.44	39.72
CI	33.4	33.4	33.4	33.4	33.4	27.80	27.68

Ofgem embedded the performance improvements expected from establishing our Central London depot in the overall CI and CML targets for the wider London network. Since 2013/14, when the Central London depot was introduced, Customer Interruptions (CIs) have improved by 23% and Customer Minutes Lost (CMLs) by 33% in London. Performance in 2016/17 was significantly ahead of the Ofgem targets of 28 CIs and 40 CMLs.

Investing in network resilience

The complex design of the Central London Network contributes to its resilience, but it also makes the task of operating the network more complicated. By improving the operation of the more complex areas of the network, we will improve performance. We are putting in place state-of-the-art control systems and new network designs, as well as focusing on linkbox and substation inspections. These measures will all contribute to making the network more resilient.





Increasing resilience of interconnected groups

The Central London Network is unique in the UK in that it operates LV interconnected networks, which supply power to “groups” of demand. The advantage of this design is that it helps us support large amounts of concentrated electricity demand and means we are able to continue to provide power to customers when there is a fault on the High Voltage network. The design of these networks has evolved over time to provide better safety and to reduce the complexity of operation.

Last year we began to convert some of the groups to a new design using HV Unit Protection. This is designed to reduce the complexity of operating the LV network, improving safety and allowing supplies to be restored more quickly. We are piloting a group in the Leicester Square area to test the new equipment.



Update on new equipment testing:

- We have worked with manufacturers to develop new, compact switchgear to fit the challenging environment of Central London substations
- We are surveying all substation sites in the Leicester Square West group
- This survey will establish which sites are compatible with the equipment and can be used in the trial
- Protection assessment and settings for the unit protected conversion are being worked on alongside the final switchgear design and specifications, which is due for completion in December 2017
- The first batch of the newly designed switchgear will be delivered in 2018
- The substation chosen for the trial will be based on the survey

Linkbox inspections

We inspect all linkboxes in Central London once a year. Linkboxes allow us to re-arrange the low-voltage network by providing links between multiple electrical cables. They are installed under covers in the pavement and are operated by inserting or removing either solid links or fuses. We began doing this in 2013/14 and it has resulted in increased rectification of defects identified during these inspections. In addition to the improved inspection regime, we are now installing a protection blanket in every linkbox. The blanket is designed to remove air/gas present in the enclosure in the linkbox and also to reduce the impact if a fault occurs. We are replacing 250 linkboxes each year and we have installed a blanket in all linkboxes that we can access on the Central London Network.

2,371

linkbox inspections carried out in 2016/17

250

linkboxes replaced each year



We have installed a protection blanket in every linkbox in Central London*

*where access allows

Substation inspections

There are teams in place to enable us to move to inspecting substations annually, compared to a 2.4 year cycle. By carrying out substation inspections more regularly on an annual basis, we are able to identify defects and fix them before they develop into further problems. Both electrical and non-electrical defects can be resolved more quickly and this improves network availability and reliability.

2,516*

substation inspections carried out in 2016/17

*including 3rd party substations

London highlights

UK Power Networks recognises the importance of ensuring environmental sustainability in London. By 2030, we forecast between 1.2 and 1.9 million additional electric vehicles (EVs) will be connected to our electricity networks alone. We are aware we play a key role in helping facilitate the uptake of EVs to improve air quality and we have been working on a number of projects to support the transition to a low carbon future.

Our vision is about being an employer of choice, a respected corporate citizen and sustainably cost efficient. We always ensure the work we do supports our vision.



Kensington & Chelsea electric street lamps



The streetlights connected to our network in Kensington & Chelsea have been converted into charge points for electric vehicles: a first for Central London. The trial – by the Royal Borough of Kensington and Chelsea, UK Power Networks and Ubitricity – allows two local residents at a time to charge their vehicles from a street light near their front door. It also allows them to receive accurate electricity bills via their smart phone or home PC. The trial, which started in November 2017, could pave the way for greater EV use and tackle air pollution in London by giving drivers the convenience of charging their vehicles closer to home overnight.

These adapted streetlights avoid the need to build new electricity network infrastructure and makes better use of the cables, particularly in the daytime when the lights are switched off.

46%

For inner London, 46% of households have no access to off-street parking to charge an EV. In outer London this falls to 33%.

Statistics from Go Ultra Low City Bid to Office for Low Emission Vehicles



Smart Electric Urban Logistics project



We have teamed up with logistics company UPS to increase by almost 50% the number of electric freight vehicles operating from one of central London's biggest depots in Camden. The two-year project, which started in April 2017, will enable the depot to be a testbed for leading edge technology aimed at reducing the cost of charging electric freight vehicles. The project will increase the number of electric freight vehicles operating in the fleet from 52 to 72. It will pave the way for running more than 150 vehicles from the site. Electric freight vehicles can use up to 10 times as much power as a typical home when they are charging. This means that charging large numbers at the same time puts significant demand on the depot's electricity supply.

Currently, freight vehicles account for around one fifth of traffic in London. The Mayor of London's draft Transport Strategy highlights how distribution centres in Inner and Central London, from where deliveries will be made by low and zero emission vehicles, will form part of the solution towards a zero emission transport system in London by 2050.

Low Voltage Network Visibility and Control



Low voltage networks are experiencing a quicker than expected uptake in Low Carbon Technologies (LCTs), such as EVs. LV networks have historically not required monitoring, but this is changing given the uncertainty that is currently associated with the magnitude and timing of the uptake of LCTs. UK Power Networks has successfully trialled a range of solutions for LV network monitoring, as well as automation and control. We are now looking to deploy a targeted LV Network Visibility and Control System across over 5,000 LV network sites. The establishment of real-time network visibility in our control room will ultimately enable the use of "smart" network control solutions.

Such solutions will allow our planning and control engineers to manage the network in a proactive way, so releasing capacity and delivering network reinforcement efficiently. As a result, we will be able to facilitate LCT connections for our customers cost-effectively, while maintaining network performance and reliability.



We estimate that the roll-out of Low Voltage Network Visibility and Control across over 5,000 sites in RIIO-ED1 can deliver lifetime benefits of approximately £54 million in the form of efficient LV network reinforcement, as well as an annual reduction of 20 thousand tonnes of CO₂ by cost-effectively enabling LCT connections to LV networks for our customers."

Case studies | London highlights

It is part of our vision to be a respected corporate citizen. We recognise that Central London has many customers who may be living in fuel poverty. We have been working on a number of projects, such as Faith & Power and energywise, to support these vulnerable customers. From engaging with our older customers, making them aware of the services available to them, to providing apprentice and traineeships for the young people of London, we are always looking for ways to help the communities in which we operate.

Tenancy Loan Scheme



.....

We strive to be an employer of choice. We are already a signatory to the Mayor's 50,000 homes campaign, and we have launched a new tenancy loan scheme for our employees. This scheme provides interest-free loans to staff to help them meet the cost of a deposit when they rent a new home.



Substantial increases in London rental costs mean that people from all walks of life struggle to pay the deposit and rent required at the start of a tenancy. With almost 2,000 staff based in London it's important that our staff are able to choose to live near their place of work. We have 1,950 staff based in London and, for a variety of reasons, 350 of these currently live outside the city.

We already pay above the Living Wage, operate a loan scheme for season ticket commuters and offer independent advice to employees with housing problems through our Employee Assistance Programme. The new tenancy loan scheme is another important way in which we can support our employees."

Chris Degg
Director of Human Resources

Faith & Power



Research with black and minority ethnic groups suggested that in certain communities, trusted sources are important when disseminating information. This led us to join in partnership with London Sustainability Exchange to deliver the Faith & Power project. The project aimed to improve our understanding of the needs and concerns of hard-to-reach or seldom heard groups, as well as informing them about our Priority Services Register and other support services available to them. We held focus groups that identified limited understanding of the energy market and significant concern about the cost of energy.

The focus groups identified these priorities:

- Make customers aware of energy efficiency
- Provide wider money saving advice to help reduce fuel bills
- Address energy debt
- Tell customers about warm home discounts and grants
- Help people understand the benefit of smart meters

The Priority Services Register aims to reduce the impact of power cuts on customers who have a specific need or dependence on electricity by identifying those eligible for priority service.



Outcomes of the project:

193

priority services registrations

1,433

energy behaviour changes pledged

40,624

people received messages from the project

60

mosques and other organisations that work with the Muslim community contacted



Fuel poverty is a vital issue for us. That's why we work hard to maintain our position as the lowest cost DNO."



London Youth Programme



We teamed up with the Energy & Utility Skills Group to run the London Youth programme. This is a scheme designed to support young people who are not in education, employment or training. It provides them with practical, valuable and relevant work experience. As well as providing mentoring and coaching, the aim is for the young people on the programme to become “work ready”. The 10-week placement includes a focus on developing the young person’s employability skills, self-confidence, self-awareness and a work placement.



Jay, who was in the first group on the scheme, talks about his experience.

Twenty-year-old Jay’s life looked like it was going in the wrong direction. He had got in with the wrong crowd and, when he was stabbed, it nearly cost him his life. Jay’s cousin had heard about the UK Power Networks programme and suggested he find out about it.

Jay says, “The 10 weeks flew by. I learnt how to use different tools at their training centre and team building skills at an army event. I learnt that I have leadership skills; I am a good team worker and a really confident person. I also recognise when others need help and encourage them, which I never thought I could do. I was really delighted with myself.”

UK Power Networks gave Jay a 12-month paid contract with the “First Response Unit”, which is the first team on site in the case of a power cut.



Repowering in Brixton



We are working in partnership with Repowering London. Set to run until early 2018, the project aims to improve access to the Priority Services Register among “hard-to-reach” customers in Brixton. This project takes a community-based approach to raising awareness about the services we offer.

energywise



energywise is a partnership of ten organisations led by UK Power Networks. By working with the tenants of two social housing associations in Tower Hamlets, East London, energywise is pioneering ways for DNOs to work collaboratively with energy suppliers and local trusted organisations to deliver appropriate services to communities of low income households who may be struggling with their energy bills.

The project recruited over 500 social tenants in Tower Hamlets living in less efficient properties. By designing an engagement strategy tailored to the specific needs of the demographics of the area, with a dedicated customer field officer team established with local intelligence and language skills, energywise has successfully engaged with different age bands (including elderly customers) and an ethnically diverse population.

Over the course of the project, trial participants have received:

- a smart meter equipped with a smart energy display (for a total of 230 credit and 93 prepayment customers);
- a set of energy efficiency devices such as LED lightbulbs, an eco-kettle and a stand-by shutdown (a total of around 2,000 devices delivered to date); and simple energy efficiency advice.

From the analysis of the first energy saving trial data:

- Participants saved on average 3.3% off their annual electricity consumption, in line with the national average for households with smart meters – this is generally enough to do up to 150 loads of washing a year;
- These savings correspond to a 5.2% reduction in average peak demand per household

The project is now exploring how trial participants can change their electricity consumption when they are on non-punitive Time of Use tariffs in conjunction with tailored time-shifting advice and the energy saving interventions.



energywise



Customer comments:

"The field officer was brilliant, we were talking and laughing; he was lovely, understandable, understood my concerns, took on board my issues."

"I'm on a pay-as-you-go meter – it's great to see on the energy display how much energy I'm using and when I need to top up."

"The project is absolutely great; the people are very good, there's nothing I'd want to change. Everything is explained properly. The best thing about it is the panel; I really like going to that."

"The eco-kettle is brilliant. You can just fill up what you need, rather than too much."



Key contacts

General enquiries

0800 029 4285

Emergencies or power cuts (24 hours a day)

Free power cut helpline number: **105**

or 0800 31 63 105

Please note these numbers are free to call from landlines and mobile phones

Text message updates during a power cut

To keep updated if you have a power cut in your area text **'Power'** followed by your postcode, to 80876, e.g. Power IP3 6QX

Text relay

We offer a 24-hour Text Relay service for customers who are deaf, hard of hearing or have any other communication difficulties. For more information, visit www.ukpowernetworks.co.uk

Connection services

0845 234 0040

Media enquiries

0330 159 1712



A full list of our contact details can be found at:
www.ukpowernetworks.co.uk

UK Power Networks Holdings Limited

Registered in England and Wales No. 7290590
Registered office: Newington House,
237 Southwark Bridge Road, London SE1 6NP

www.ukpowernetworks.co.uk

UK Power Networks Holdings Limited is the holding company
of the companies in the UK Power Networks group of companies.

