Electrifying your fleet

Joint Stakeholder Session with SP Energy Networks and SSEN

23 March 2022

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Slido: #EVFLEET22

Housekeeping

To avoid bandwidth issues, please only use video during Q&A sessions

Please stay on mute whilst presentations are delivered

Please participate freely in the discussions, using the chat box at any time

If you have any technical queries let us know through the chat function

Agenda

01 Welcome and Introductions

02 Connections and the context for RIIO-ED2

03 EV Fleet Guide Overview

04 Case Study: Stagecoach

05 Site Planning Tool – Optimise Prime Project

06 Q&A

07 Next steps and contact details

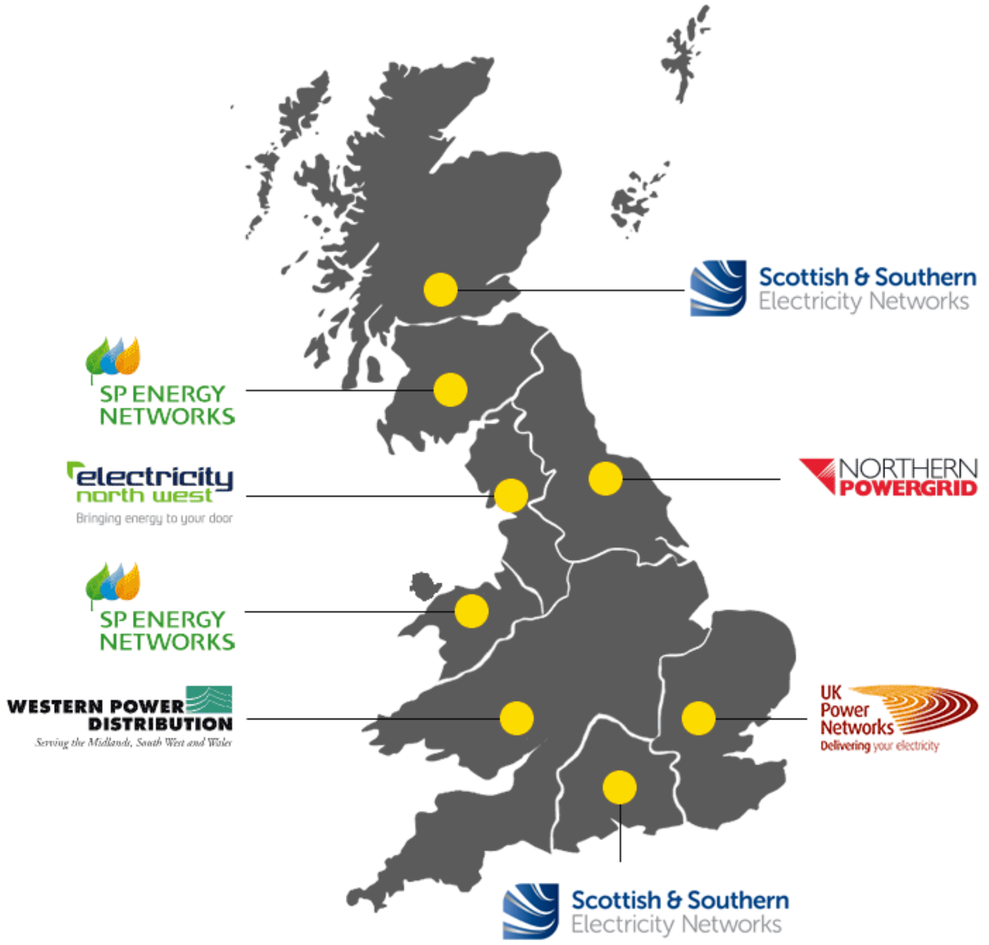
Safety First

ssen.co.uk/PowerCuts
spenergynetworks.co.uk/powercut

ssen.co.uk/PSR
spenergynetworks.co.uk/psr

Who we are

- Distribution Network Operators (DNOs)
- We carry electricity to homes and businesses across the UK
- 6 DNOs with 14 license areas



Connections and RIIO-ED2

Overview

Sophie Sudworth

Connections Transformation lead,

SP Energy Networks

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RIIO - ED2

What is ED2

Price control which sets outputs Distribution Network Operators (DNOs) need to deliver for their consumers and the revenues they are allowed to collect for the five-year period from 1 April 2023 to 31 March 2028.

Goals of ED2

Act an enablers to achieve Net Zero targets at an efficient cost to consumers both today and tomorrow.

Facilitate the transition to decentralised operation through new technologies and market mechanisms.

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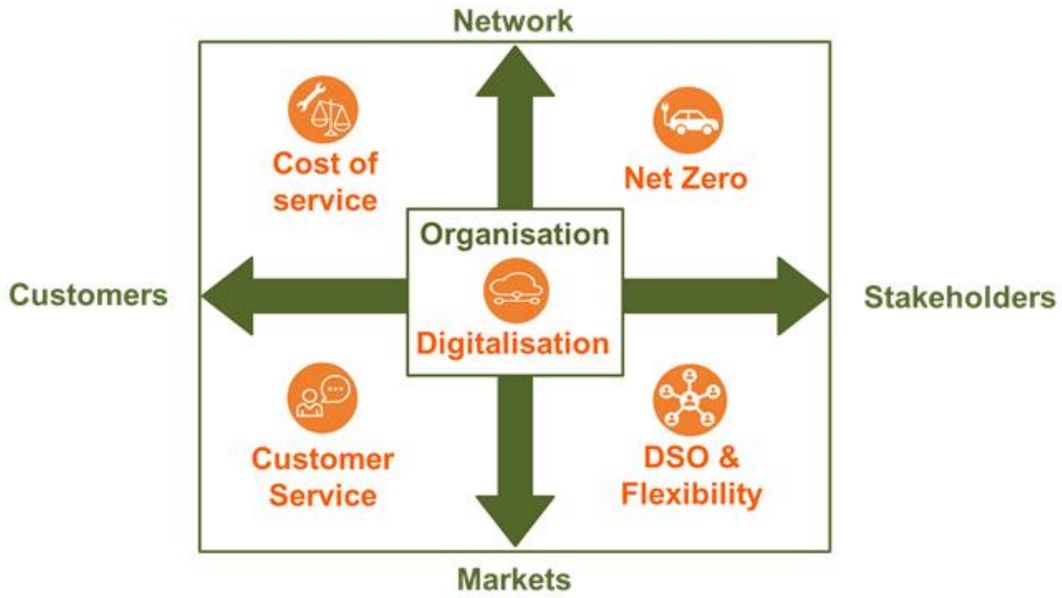
The Context for RIIO-ED2

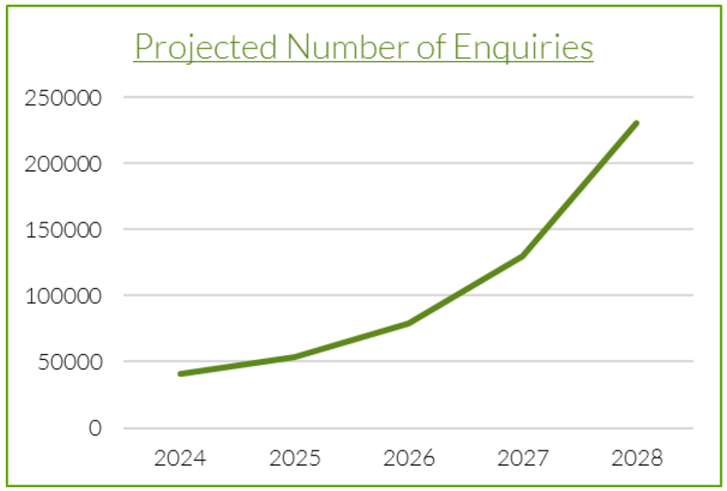
RIIO-ED2 will be a time of profound change for Distribution Networks

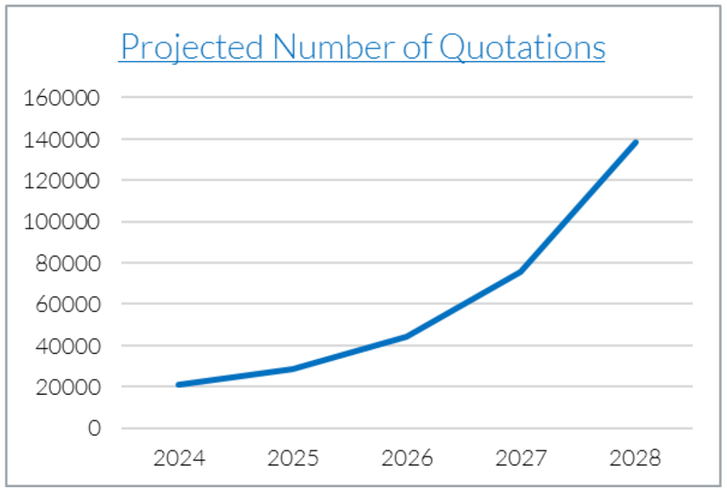


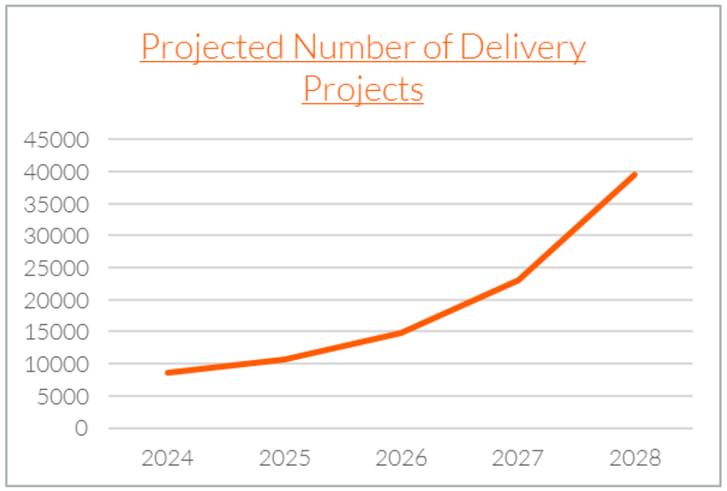
Forecasted Increase in Connection Activity

A statistical model based on DFES inputs estimated volume of activity by connection market segment

We expect a five fold increase in connections related activity by the end of ED2







Connection Themes and Commitment

Speed....

- Communication
- Information Provision
- Early Indicators
- Quotation
- Delivery

Transparency Upfront
Provide clear, revealing information tailored to individual needs, on-line.

Immediate Assessment
Provide customers with an immediate assessment of their connection request

Agile Delivery
Improve speed of delivery through smart outsourcing and refined processes.

Timescales to Suit Customers
Work to customers timescales for the provision of an offer or delivery.

Ease....

- Contact
- Process
- Obtaining Data
- Quotation
- Delivery

Trackable Progress
Allow customers to track their connection online from enquiry, through design, acceptance and delivery.

Process Rationalisation
Make our process(es) clear and easily understood. Including ICP & IDNO works.

Intelligent Assessment
Provide tools to enable automated network assessment.

Real- Time Information
Make network information available in real-time.

Support....

- Setting Expectations
- Possible Alternatives
- Timescales
- Pre-Quote Advice
- Repeat Customers

Supporting Self Service
Offer support for customers during roll- out of our new tools and services.

Supporting an Evolving & Competitive Market
Continuous, agile and iterative stakeholder engagement activities.

Fast Flexibility
Provide technical and commercial alternatives at HV & above

Supporting Digitalised Service
Ongoing support for customers in using digital suite of tools available

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Connecting your EV Fleet – A Guide for Fleet Operators

Ian Jessiman

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Scottish and Southern Electricity Networks

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Overview of the EV guide

Introduction: Origin of the Guide – Working with others

The Bus Decarbonisation Taskforce

In Autumn 2020 the Bus Decarbonisation Taskforce was convened. The Taskforce is a joint initiative between industry and government to decarbonise the bus fleet in Scotland and is made up of senior leaders from across the bus industry including operators, manufacturers, supply chain experts, financiers, energy representatives and both local and national government

Scope

The remit of the Taskforce was to identify and co-design creative and practical solutions to maximise opportunities and tackle any hurdles remaining in relation to charging infrastructure (electric and hydrogen)

- Technology (battery-electric, hydrogen fuel-cell and other potential zero-emission technologies; on-route charging; depot considerations)
- Costs, including economies of scale, warranties
- Finance, including suitable financial structures, products and guarantees
- Knowledge and experience
- Vehicle and charging requirements in rural, island and urban areas

Taskforce Membership

- Transport Scotland
- Confederation of Passenger Transport Scotland
- Scottish Enterprise
- Scottish and Southern Electricity Networks
- SP Energy Networks
- Stagecoach
- FirstGroup Plc
- West Coast Motors
- Alexander Dennis Ltd
- Switch Mobility (Optare)
- Wrightbus
- Zenobe
- BOC
- Scottish National Infrastructure Bank
- HSBC
- Lloyds Bank
- Association of Transport Coordinating Officers

Overview of the EV guide

Introduction: Origin of the Guide – Taskforce outcomes

- Scottish and Southern Electricity Networks and SP Energy Networks as the Distribution Network Operators in Scotland were invited to work with bus operators to produce a “how to guide” on navigating electricity grid issues that met bus operators requirements

  “Connecting your EV Fleet – A Guide for Fleet Operators” was developed with the assistance of the Confederation of Passenger Transport Scotland and was expanded to include all fleet operators. Copies of the Guide can be viewed and downloaded using the following web links:

  www.ssen.co.uk/globalassets/electric-vehicle/ev-media/ssen-ev-fleet-guide.pdf

  www.spenergynetworks.co.uk/userfiles/file/Connecting%20your%20EV%20fleet%20-%20final.pdf

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Overview of the EV guide

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  www.spenergynetworks.co.uk/userfiles/file/Connecting%20your%20EV%20fleet%20-%20final.pdf

- In addition, Zenobe, as a Taskforce partner, were also invited to share information about best practice in maximising the value of batteries. Zenobe’s “Leading the Charge” guide can be viewed using the link below:

  www.zenobe.com/static/4d23ebfbf315795a5a0d2b86613a94b7/1-ZENOBE-BATTERY-GUIDE-V2-23_2_22.pdf

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Overview of the EV guide

Contents – 4 main sections

What you can do – Assessing your site

- *Understanding your demand profile*
- *Optimising your network connection*
- *Calculating your fleet charging requirements*
- *Do you have sufficient capacity?*

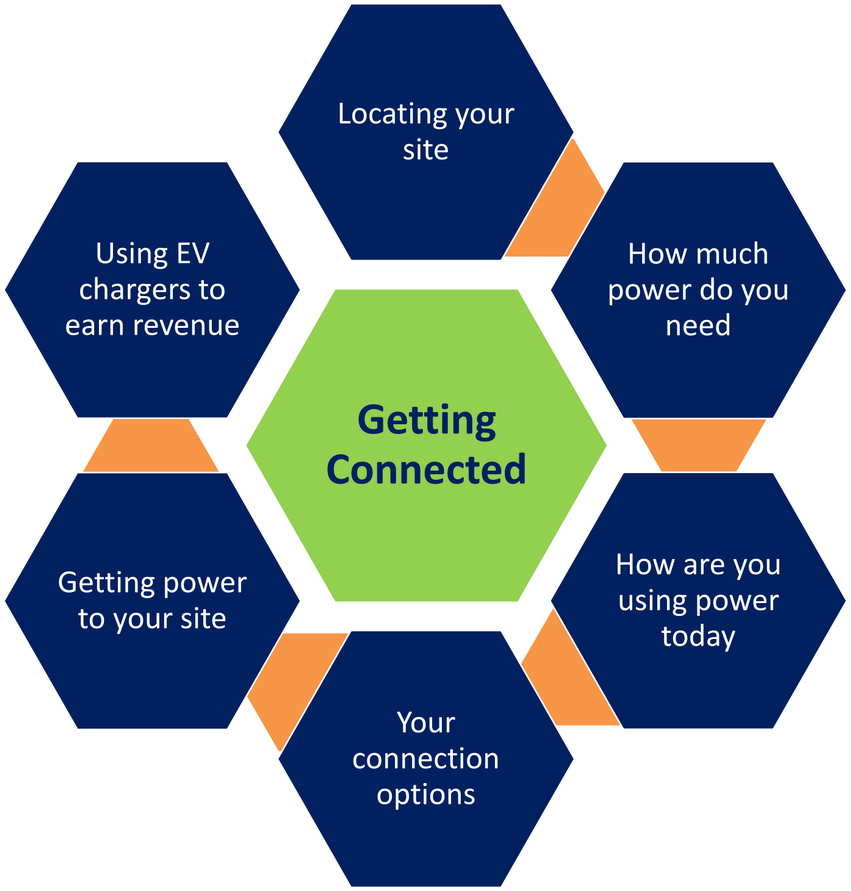
How we can help

- *Pre application meetings and discussions*
- *Applying for a new or upgraded connection*
- *Designing your connection*
- *Delivering your connection*

Options to consider

- *Load management*
- *Smart charging*
- *Timed profile connections*
- *Onsite/Offsite generation and storage*

Case studies



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Overview of the EV guide

Section 1: What you can do - Assessing your site

Understanding your Demand Profile

Before deciding on whether you need to upgrade your existing electricity connection to accommodate the additional load requirements from electric vehicle charge points, you will need to establish how much electricity you are currently consuming on your site (i.e. your Maximum Demand) and at what times.

You should then check this against your Authorised Capacity for the site, as set out in your connection agreement (i.e. the capacity that you are authorised to use as part of your agreement with your Distribution Network Operator).

This will determine if you have available capacity to accommodate all, or part, of the additional load from your proposed EV charge points. While the provision of a single EV charger to support one or two vehicles may not be an issue, connecting multiple commercial vehicles will normally require an assessment of the electricity network.

Optimising your Network Connection

Assessing your overall site requirements, rather than just looking at EV charging, may identify easy wins that can reduce your power requirements significantly. Reduction in your overall demand by achieving energy efficiencies and the introduction of demand side management technologies could also minimise, or in certain cases avoid, the need for reinforcement of the electricity network.

As an example, improving the energy efficiency of your depot/office buildings by reducing the amount of power used in heating, lighting, and other processes can help deliver additional capacity.

Modifying how much and when you consume power on your site is also important in freeing up capacity at certain times for EV charging. This is particularly relevant where overnight charging is a requirement..

Overview of the EV guide

Section 1: What you can do - Assessing your site

Calculating your Fleet Charging Requirements

To calculate your EV charging requirements, you will need to consider the following:

- The distance the individual vehicles needs to cover each day and over what timescale.
- When will your fleet need to be charged? - (throughout the day, overnight, when vehicles return, etc.)
- Where will your fleet charge? - (at home, en-route, at a destination or in depot)
- The number of vehicles that you will need to charge at any one time, both now and in the future.
- What duration does your fleet need to be charged? – (e.g. 40 mins, 2-4 hours, throughout the day or overnight)
- The likely charging patterns - (e.g. from 80% state of charge to 100% or do you expect your fleet to be recharging from almost 0% on every occasion?).

Do you have Sufficient Capacity?

Once you know how much demand you are using, when this is occurring and the spare capacity you have available, you can determine whether your maximum peak demand, including the EV charging requirements, is likely to be below your existing Authorised Capacity.

If your maximum demand is within your Authorised Capacity and total EV demand is less than 30% of your total site demand, then it may simply be a case of notifying your DNO of your plans, which you can ask your charge point installer to do on your behalf.

If your EV charging requirements take you above your Authorised Capacity or your total EV demand is more than 30% of your total site demand, then you will either need to take steps to reduce your maximum demand, as highlighted previously, or ask your DNO to provide more power to the site before your charge point installer undertakes the installation.

Overview of the EV guide

Will there be available network capacity when I need it

Available capacity on the local distribution network is constantly changing with existing demand loads increasing or reducing as connections are installed to serve new developments or existing supplies are disconnected, The dynamic nature of the network therefore makes it difficult to predict future available capacity which can only be fixed once this is contracted (i.e. by entering into a Connection Agreement with your Distribution Network Operator).

There are several factors which will determine how the electricity network will respond to the demands of fleet electrification.

These include:

- Depot locations
- No of vehicles operating at each depot
- Where will the fleet charge (on site, off site or en-route)
- When will the fleet charge (peak, off peak or timed)
- Existing authorised capacities and current electricity usage at each site
- Whether there will be generation or energy storage on site or nearby
- Local network constraints (11kV network)
- Wider network constraints (Primary substation and 33/132kV networks)

Overview of the EV guide

Section 2: How we can help - Your connection journey

Designing your connection

Our designer will discuss your connection requirements, design your connection and send you a quotation
(up to 65 working days)

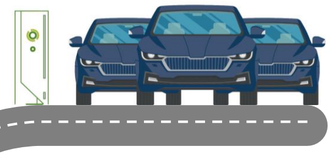
Consents

We will arrange for all consents necessary to deliver your connection (eg Wayleaves, Section 37, etc).
(Allow 3 to 6 months depending on complexity and cooperation of third parties)

START

Pre application meetings

We would be happy to arrange pre-application meetings to discuss your project and highlight any network issues



FINISH
(Allow 18 to 24 months)

Apply for your connection

Once you are ready, you complete and submit your application form and plans either by post, e-mail or online

You accept your quote

Valid for 90 days

Delivering your connection

Your allocated Project Manager will discuss your construction programme and schedule your connection
(Allow 6 to12 months)

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You have a choice

www.lrqa.com/en/utilities/national-electricity-registration-scheme-ners/search/

Overview of the EV guide

Section 3: Options to consider

- **Load Management**

Load management systems offer a solution for multiple charge points to be operated without exceeding the maximum power capacity of a site.

Load management can be achieved through dynamic power management to charge points, reducing the speed of charge as necessary to moderate total electrical demand, striking a balance between the number and the speed of charge points.

This can allow you to install a larger number of charge points that will simply charge at a slower rate if they are all in use at the same time.

The advantage of this approach is that you may not have to spend as much upgrading your grid connection yet can still install several chargers.

You will need specific and control systems for this, so we'd encourage you to speak to your charge point provider about this option.

Overview of the EV guide

Section 3: Options to consider

- Load Management
- **Smart Charging**

Smart charging refers to different intelligent functionalities that help you recharge your vehicles in an efficient and flexible way in response to an external signal.

Smart charging includes load management but goes beyond that, allowing you to manage your EV charging in a more sophisticated manner.

For instance, smart chargers enable you to automatically charge when power is cheapest, or to operate your individual charge points at different rates depending on when you need each vehicle.

As with load management, coordinating your charging can enable you to install several chargers whilst not increasing your required capacity or by simply utilising the capacity you are not using at a particular time.

Overview of the EV guide

Section 3: Options to consider

- Load Management
- Smart Charging
- **On Site Generation and Storage**

On-site generation and energy storage – combined with smart charging – can also enable you to reduce the size of your grid connection by levelling out your power demand.

This means in addition to your charge points, you would also install a stationary battery that would charge up gradually over the course of the day, or whenever you're not using a large volume of energy.

You can then use that stored electricity to help charge your EV fleet and reduce, or even remove, the power needed from the grid. If you also have solar PV installed, your solar panels will generate electricity during the day to charge up your batteries.

Where that energy is not needed, you can store it for use later or sell it to your supplier and be rewarded for helping to maintain security of the network.

Overview of the EV guide

Section 3: Options to consider

- Load Management
- Smart Charging
- On Site Generation and Storage
- **Timed Profile Connections**

A timed profile connection agreement with your Distribution Network Operator allows you to vary the amount of power that you can use based on the time of the day, subject to a pre-agreed schedule.

For instance, if your maximum power requirements are outwith peak times due to you charging your EVs overnight, this can be an effective solution as it allows you to agree different load capacities based on your usage patterns.

As an example, you may wish to use up to 2.5MW of power overnight and then reduce this to 0.5MW during the daytime to meet your operational needs.

This approach may avoid having to upgrade the electricity network to provide the 2.5MW of capacity 24 hours a day – the cost of which could be substantial and may take some time to implement.

Overview of the EV guide

Section 3: Options to consider

- Load Management
- Smart Charging
- On Site Generation and Storage
- Timed Profile Connections
- **Using a different part of the Network**

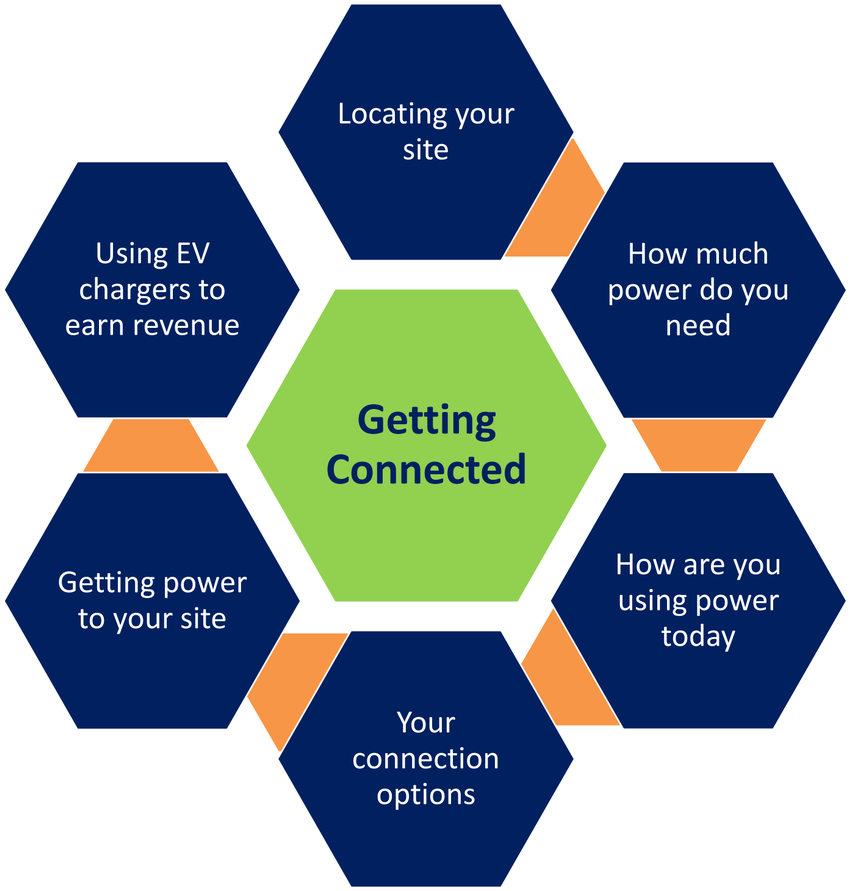
Where you have a large site and have some flexibility over where to install charge points it is worth exploring whether you have access to another part of the network.

Your Distribution Network Operator will be able to help you assess any such option, which may result in a lower connection cost if it means an alternative substation faces less of a constraint.

Overview of the EV guide

Summary

- Do your initial site/fleet assessments
- Consider different options for your site
- Decide on your site requirements
- Speak to your DNO as early as possible
- Factor in a reasonable timescale in your delivery programme



Thank you

and

Enjoy the rest of the webinar

Stagecoach

Case Study

Karl Watson

Ayrshire Design Manager,

SP Energy Networks

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What was the ask?

Stagecoach Requirements

The Challenges?

The barriers to success

- Capacity Requirements
- Future Ambitions
- Type of Supply required
- Land Rights
- Timescales


1
2
3
Bus Depot
DUNNETT AVENUE
SAMSON AVENUE
CHAPMANS TERRACE
Nursery Cottage
Hall
91a
Rosebank
Resource Centre
0.15ins(3) PILC 11kV
25.0m
IDNO
CONNECT/IPNL 0800 01 2345 67
GRP NS 4337/011 RIVERBANK K/K

Working in Partnership

Early Engagement is Key

- Health & Safety comes first
- Best Connection Solution
- Compiling with Rules/Regulations
- Effective Coordination to meet timescales

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Summary

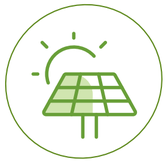
Timescales

Capacity/Cost

Smart Charging Options

Collaboration

Network Capacity



Generation Options

Break

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Site Planning Tool

Optimise Prime Project

Florentine Roy
Innovation Project Lead, UKPN

Ben Kinrade
Senior Business Analyst, Hitachi

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Q&A

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#EVFLEET22

Jillian Violaris

Funding & Partnership Manager,

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Thank you for joining us

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