SP ENERGY NETWORKS

Wednesday 7th December 2022

SP Energy Networks
Preparing For Net Zero Conference
Electrification of Transport and Heat

Thank you for joining - this session will start at 14:00.

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

AGENDA – Electrification of Transport and Heat

14:00 – Welcome, Housekeeping & Safety Contact

14:10 – iDentify App

14:30 – Project CHARGE: ConnectMore Interactive Mapping Tool

15:00 – Heat Balance

15:30 - ICE

16:00 – Close

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

Housekeeping

Thank you for taking the time to attend today.

- *This session is being recorded.*
  - *please let Louise know if you are not comfortable with this and we will take your comments in the Chat section*

- *Please try and keep background noise to a minimum by using the mute button when you are not speaking.*

- *We are keen for this to be an interactive session as your feedback is important.*
  - *please raise your hand electronically or use the chat function if you would like to ask questions to the speakers*

We value your opinions, and we are keen to generate an open session with opportunities to hear your feedback.

Safety/Environmental Contact

PANEL OF INQUIRY | SAFETY | HEALTH | ENVIRONMENT | DOCUMENTATION

TECHNICAL
ScottishPower *Express*

Reference no.: EXP-11-XXX | Incident: XX | Date: 01/11/2022

Secondary Substation Earthing: High Risk Areas

Designers must ensure that the earth potential rise (EPR) in a new secondary substation during an HV fault will not lead to unsafe step and touch potentials for network operators or the public. Additionally, high or extremely high EPR must not be transferred to a customer's LV earthing terminal.

High Risk Areas

EART-03-003 (Technical specification for earthing and bonding at secondary substations) is intended to provide standard earthing design solutions to a large proportion of the new construction activities we undertake. However, there will be instances where it is important to initiate a full earthing design study via an earthing specialist contract partner.

High risk areas are defined in Section 16 of EART-03-003 and extra care should be taken in these circumstances. Some of the most dangerous situations can occur when LV and HV earthing systems are combined in ground mounted substation fed by overhead lines. This risk is further elevated when such substations supply customers with wet room areas, outdoor play areas, hazardous zones such as fuel stations or areas with livestock. The combination of high or extremely high EPR and higher risk factors for people with wet feet, combustion of flammable fuel or livestock can present a significant danger which should be addressed.

Secondary substations installed near existing substations at 33kV, 132kV or National Grid ESO sites can also be problematic. It's important to understand the implications of how a fault at these higher voltage substation can lead to EPR which impacts the safety of the earthing system in the new secondary substation. A new document providing design solutions is currently being written but in the meantime it is important to discuss directly with an earthing specialist.

Recommendations and action points

- Look out for network configurations with OHL feeding ground mounted substations and check if the HV/LV earthing systems are combined. Notify your local design team of any potential issues so that a full earthing study can be carried out.
- Ensure you are familiar with EART-03-003 and escalate any issues to the HV earthing sub group via the local representative for your area.
- Designers should ensure that standard earthing design assessments are recorded in accordance with section 18 of EART-03-003. A new template with a 4 step approach has been circulated to all SPEN designers and ICP's.
- Delivery project managers should ensure that all new substation installations are measured and recorded in accordance with section 17 of EART-03-003.

Originator: Neil Woodcock | Approved by: XX | Date: 01/11/2022

Internal Use

- Change from 1Ω rule for combine LV/HV earthing systems
- EART-03-003 – standardised designs
- High risk areas – Section 16 EART-03-003
  - Wet rooms
  - Fuel stations
  - Play areas
  - Livestock
  - Ground mounted substations fed via HV overhead lines
  - Other higher voltage substation sites
- Recommendations
  - HV earthing sub group
  - Recording of standardised design approach – Section 18 EART-03-003
  - Recording of new substation earthing installations – Section 17 EART-03-003

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Michael Alexander,
SPEN Business Change Project Manager

iDentify App

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

You do the install, iDentify does the admin.

The new way to notify the network.

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iDentify - Project

EVCP, HP and G98 Information

iDentify Vision…

Digitise the ENA paper forms providing installers with a maximum demand calculator and cut-out recognition using AI, while crowdsourcing data on high load customer devices enabling an enriched view of the LV network.

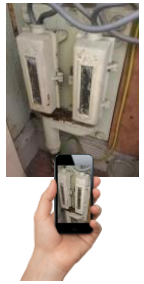
Registration

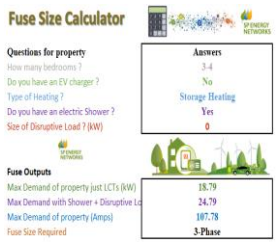
Who's installing?

- Verified and reverified source
- Trusted list

Survey – App or web

Site fit for installation?





- Fuse and MD calc
- AI Cut-out check

What's being installed?

- ENA asset database lookup
- Add those that don't exist

Where?

- Address checked in ECOES - routing

Survey result

Connect and notify

All okay

Apply to connect – SPEN intervene

Either
- Looped service
- Fuse upgrade
- Cut-out change
- Device not to standard

- Rules based decision made on app

Installation – app only

Confirm and recheck

- Confirm original device install
- Check no changes on site

Installation information

Survey Outputs to SPEN
- All existing household information. Generation, Heating type, EVCP etc
- Trusted installer or not

Install Outputs to SPEN
- New device being installed
- Cut-out/address proximity check

iDentify – Rollout

Dec

1 Engage directly with specific installers

- Tutorial video created
- Direct e-mail to installers
- Webinar
- Web landing page – www.spenergynetworks.co.uk/identify

SCAN ME

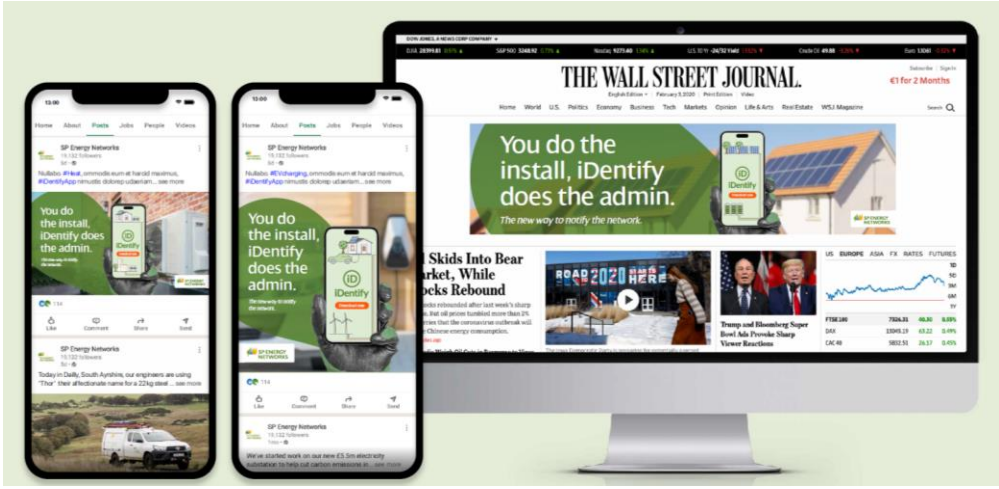
Jan/Feb

2 External media/PR; website & social; internal comms

- Press release
- Promotional video
- Social media
- Internal comms – The Wire etc

3 One month external marketing campaign

- Paid media campaign
- Number of formats across digital display adverts
- Campaign performance monitored

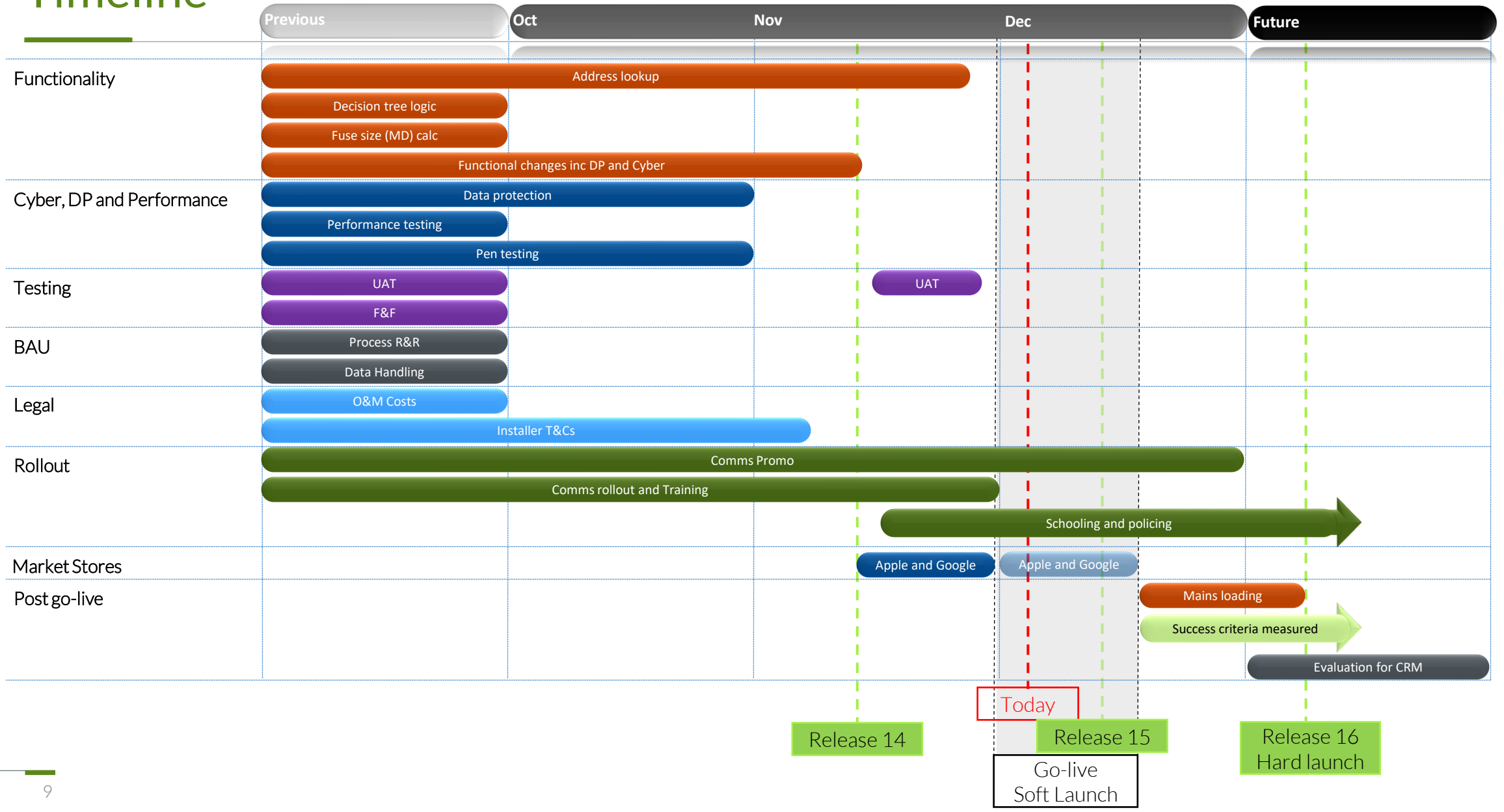


Mar

4 Ongoing promotion of benefits to encourage wider use

- Lessons learned
- Push for remaining installers
- Consider further campaigns to influence key stakeholders
- Showcase at industry events

Timeline


Previous
Oct
Nov
Dec
Future
Functionality
Address lookup
Decision tree logic
Fuse size (MD) calc
Functional changes inc DP and Cyber
Cyber, DP and Performance
Data protection
Performance testing
Pen testing
Testing
UAT
F&F
UAT
BAU
Process R&R
Data Handling
Legal
O&M Costs
Installer T&Cs
Rollout
Comms Promo
Comms rollout and Training
Schooling and policing
Market Stores
Apple and Google
Apple and Google
Post go-live
Mains loading
Success criteria measured
Evaluation for CRM
Today
Release 14
Release 15
Release 16
Hard launch
Go-live
Soft Launch

End

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John Orr, Project Manager, CHARGE

CHARGE Project

ConnectMore Interactive Mapping Tool

Develop a network that is ready for Net Zero

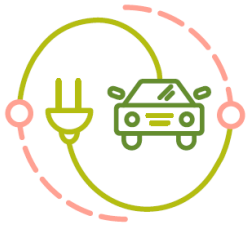
Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

Challenges giving businesses the tools to invest in public charge points

As of 2021 the UK had around **25,000** public charge points

Per 100,000 people:



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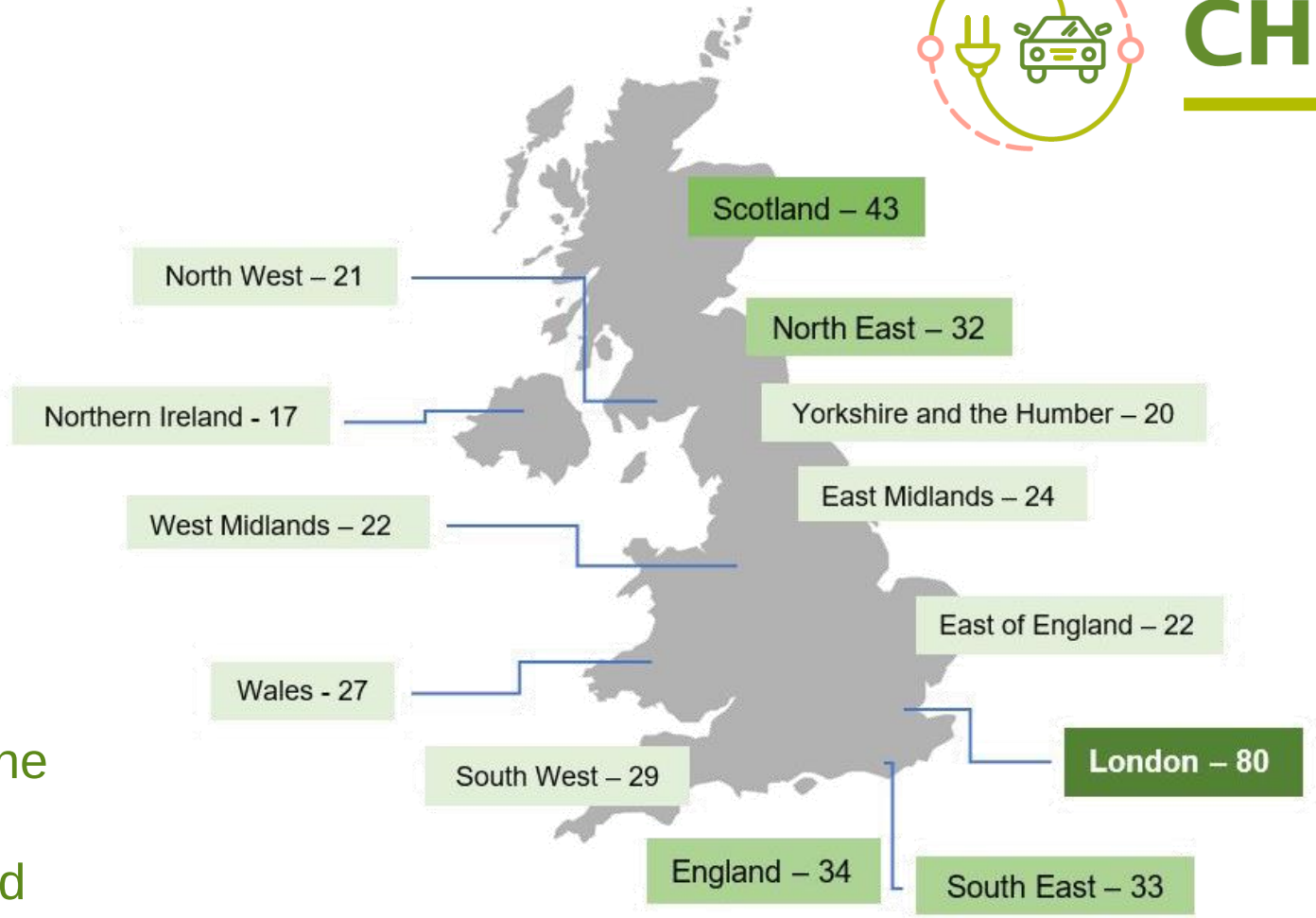


By 2030, **10 times** the current charging infrastructure needed

Refuelling Tomorrow's Electrified Transport

CHARGE

SP ENERGY NETWORKS | PTV GROUP | smarter grid solutions | ea technology

Accelerate the connection of public EV charging infrastructure across SPM

April 2019 – March 2023

Transport model

PTV GROUP

Lawrence Chittock

Smart charging solutions

smarter grid solutions

Callum Watkins

ConnectMore online tool

ea technology

Tim Butler

RIIO NIC NETWORK INNOVATION COMPETITION

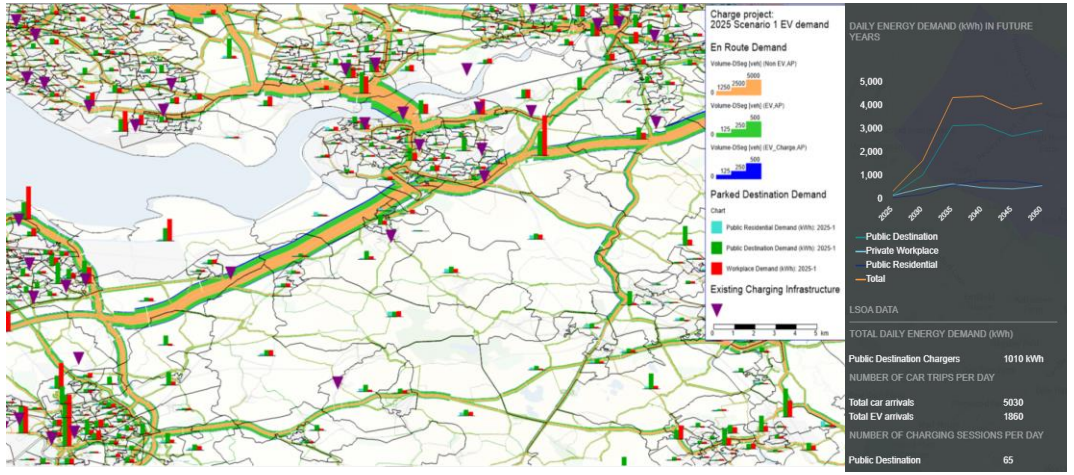
Modelling Future EV Patterns

- Transport model built to cover SPM region, including full representation of population and mobility patterns

- Modelled travel pattern data and distribution of EV ownership helps determine:
  - **Where** EVs are likely to be driven and for what purpose
  - **How far** they travel & energy consumed
  - **When** and where they might require charging
  - **How long** the car is parked and the electricity required to charge

Transport Model Final Report

Method, Findings and Conclusions



Transport Model Usage

Where, how many, and what type of charging points do we need?

- Charging infrastructure is necessary to **enable EV usage** and encourage uptake
- **Understanding the scale of need** can help planners prioritise intervention
- Knowing where charge points are needed can help identify **gaps in supply**
- Understanding population segmentation highlights **which drivers will rely on public infrastructure**

Charge includes three methods:

- Method 1: Strategic transport and network planning.
- **Method 2: Tactical solutions to support EV charging connections.**
- Method 3: The development of the 'ConnectMore' software tool.

CHARGE

1. Charge Point Data Analysis
2. Desktop and Virtual Trial Design and Implementation
3. Flexible Connection Design
4. DNO Policy Recommendations
5. ConnectMore Integration

Smarter Grid Solutions (SGS) is responsible for Method 2 which designs and demonstrates Smart Charging Connection (SCC) Solutions that enhance the flexibility of EV charging and support the improved hosting of charging infrastructure without expensive reinforcement.

Smart Charging Connections (SCCs) are innovative connection solutions that control EV chargepoint energy consumption based on real-time network loading conditions.

CHARGE

SCCs offer a novel planning methodology for the smart, flexible management of EV chargepoints:

- Maximising utilisation of network infrastructure
- Functioning as an alternative to network reinforcement
- Accelerating EV chargepoint roll-out

SCCs are separated into two categories: DNO-Led and Customer-Led which provides different architectures and increased utilisation of network capacity

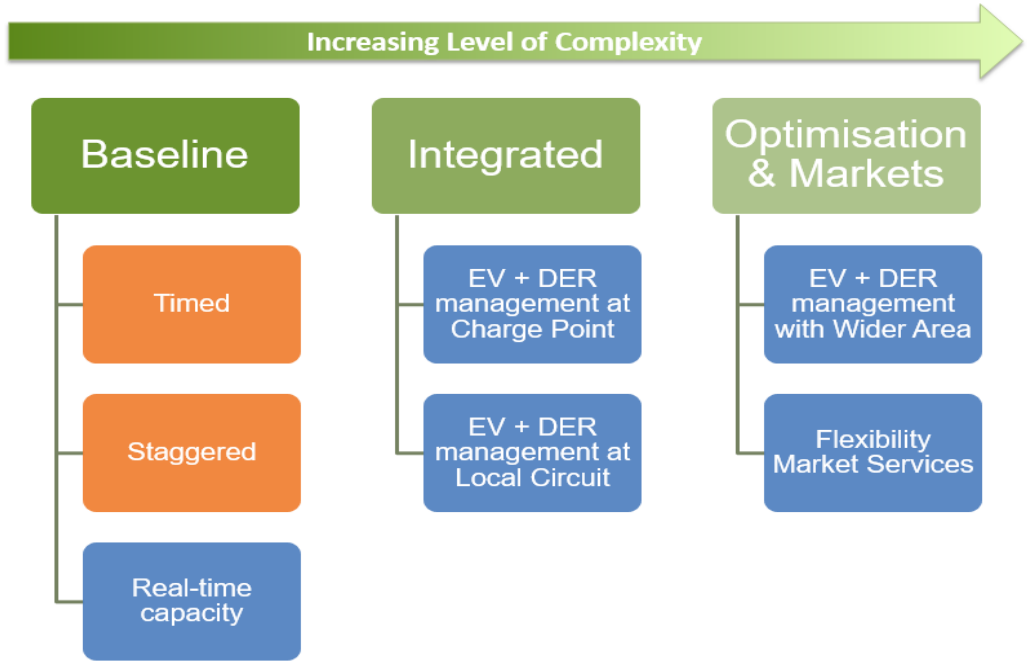
Charge EV Capacity Headroom Analysis considered existing headroom, EV charger deployment scenarios and conventional and smart charging solutions

CHARGE

Conventional solutions considered by SPM planners when network capacity headroom is spent.

LV Upgrade	Connect to existing feeder to nearest Tx	Construction of new network circuits or upgrading existing cables to enable connection to the nearest Tx
	Connect to proximity Tx	If the nearest Tx is at capacity, connect in to next closest Tx
	Interconnection between closest Tx and Proximity Tx	Provide interconnection between nearest Tx and Proximity Tx to enable load sharing
	New 500kVA substation	Construction of new 500kVA substation
HV Upgrades	New Circuits or upgrade existing circuit	Adding new feeder to existing substation
	New Substation	Construction of new HV Primary substation

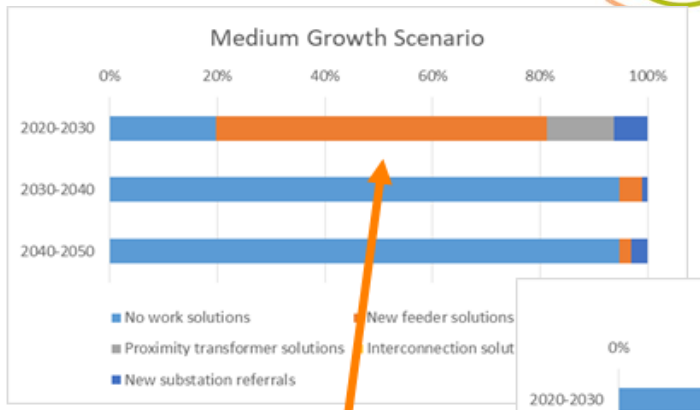
EV smart charging solutions considered by Charge project team as alternative to conventions reinforcement.



Significant capacity issues to be resolved in LV and HV networks in 2020-2030 period

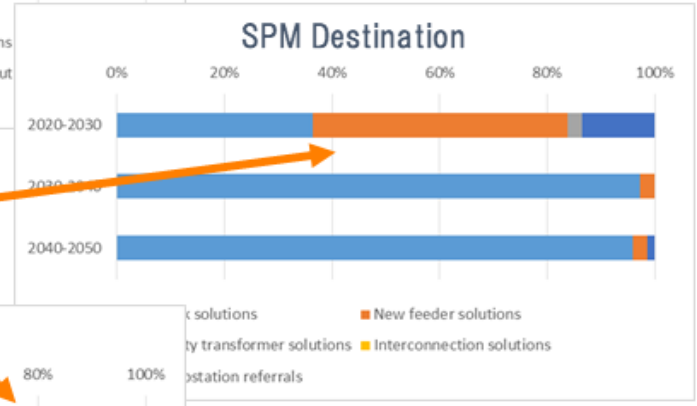
CHARGE

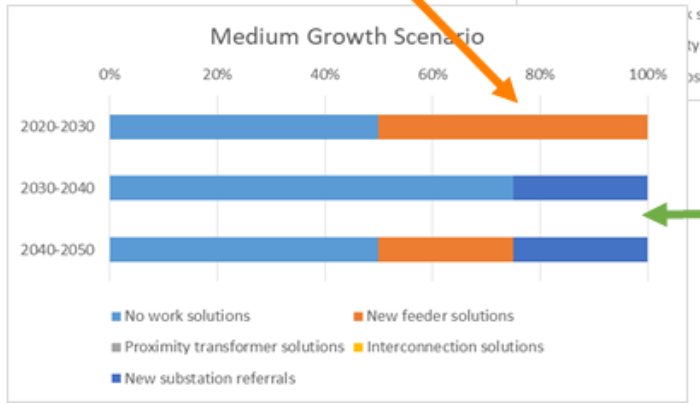
- Based on the outcomes from Medium EV growth scenario (i.e. 1% of parking spaces are fitted with a charge point) a significant amount of network reinforcement is required (shown in orange bars).
- Majority of the network reinforcements are required in the planning period 2020-2030
- There is a clear impact to existing HV network capacity margins with some HV upgrades required.
- Higher rated En-Route and Destination chargers create more need for substation upgrades (through 'referral' process – shown in darker blue bars).



All results based on 1% (Medium growth case) of customer parking spaces having a charge point installed

All scenarios and cases show significant feeder replacement required in 2020-2030





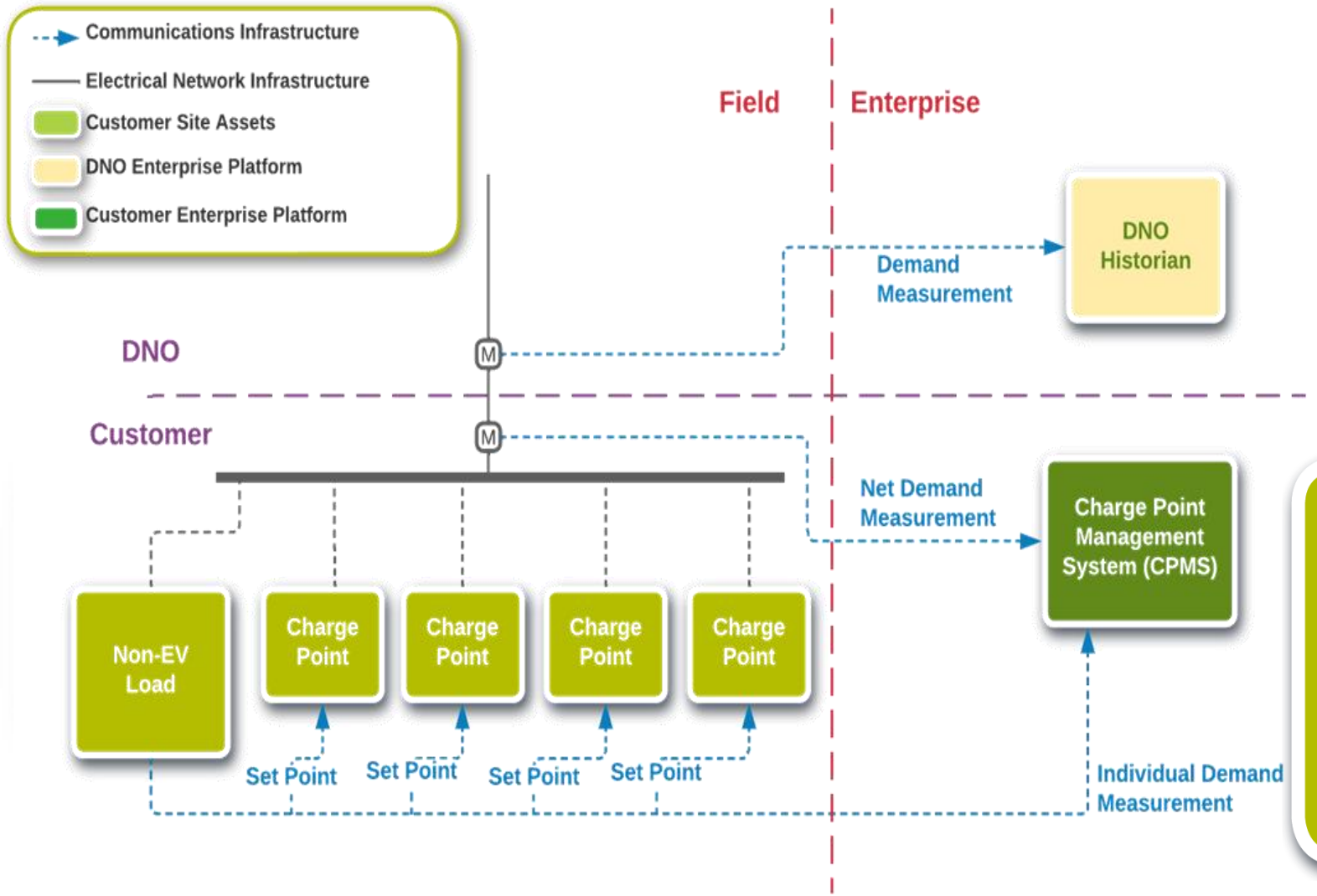
Greater number of substation referrals needed in Destination and En-Route use cases

What are Smart Charging Connections (SCCs)?

CHARGE

Charge has consulted with stakeholders across the distribution networks and Electric Vehicle domain, using learning from this process to refine the SCC offerings. This has established two forms of SCC:

- **Customer-Led SCCs**: where the customer is responsible for managing EV CP consumption against pre-agreed, fixed import limitations; and
- **DNO-Led SCCs**: where the customer must manage EV CP consumption against a varying import threshold that reflects prevailing network conditions.



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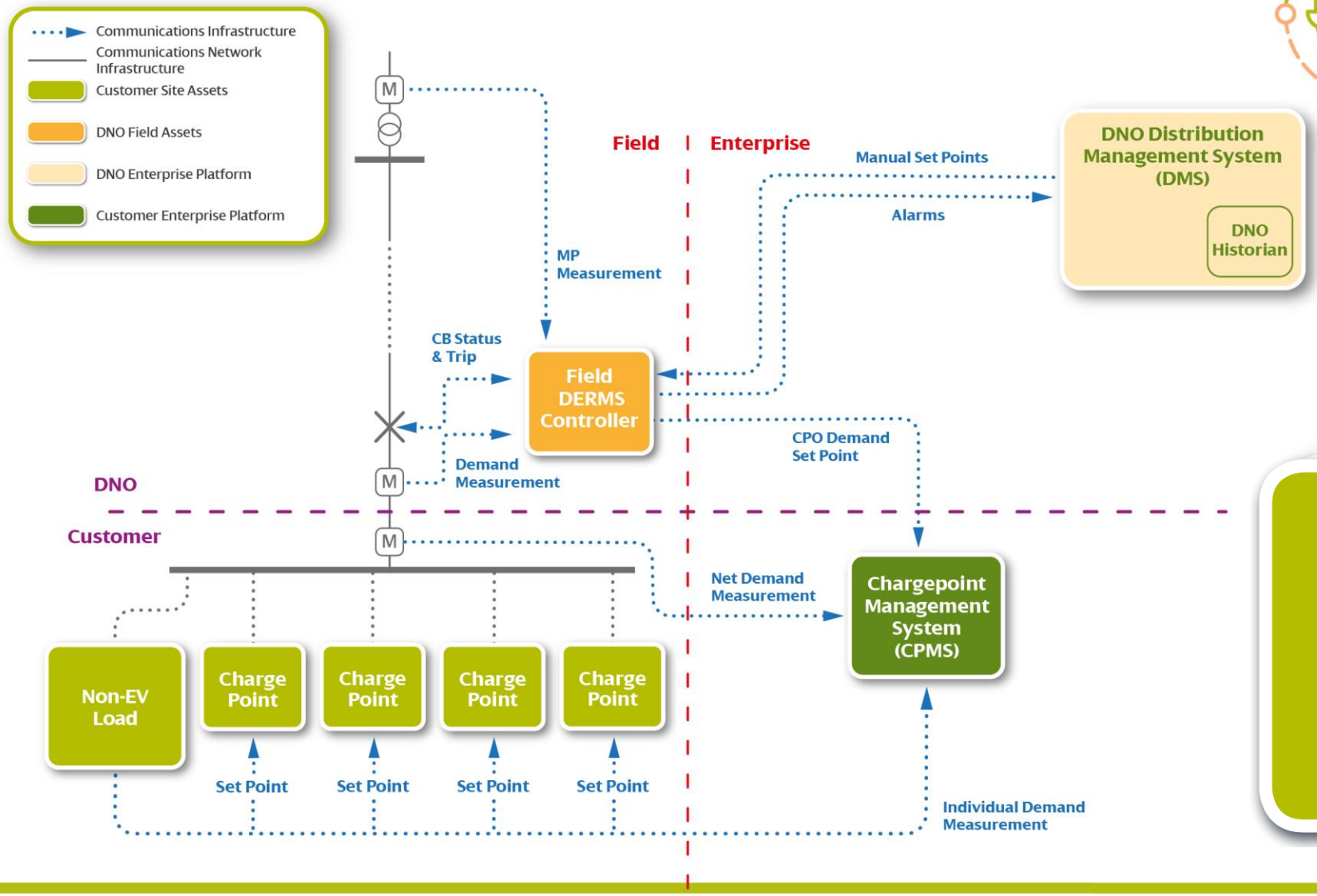
Architecture 1:

Customer Load Management (CLM) Schemes

CHARGE



Architecture 2:

Locally Managed Constraint (LMC) Schemes

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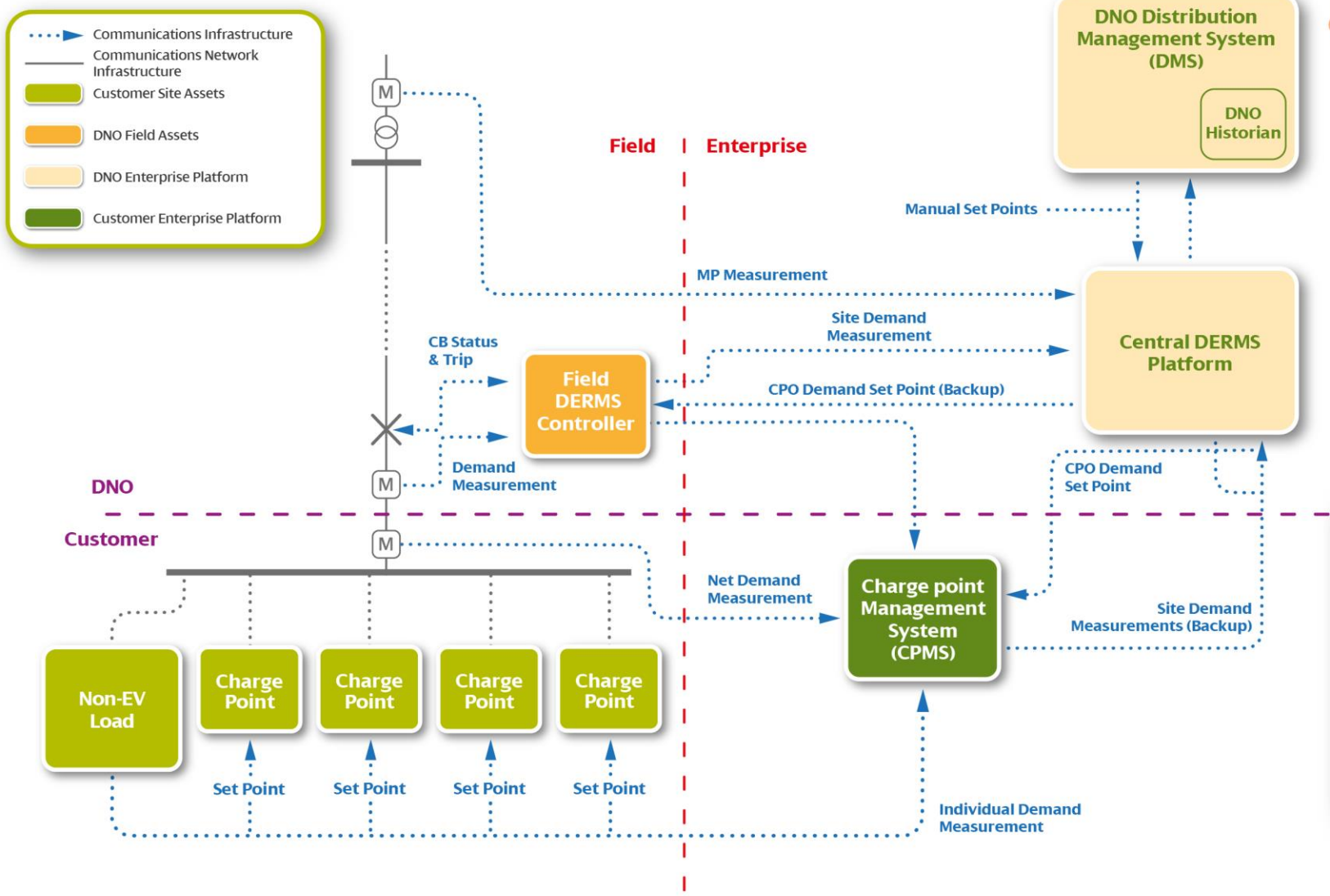

Architecture 3:

Centrally Managed Constraint (CMC) Schemes

Solution Components

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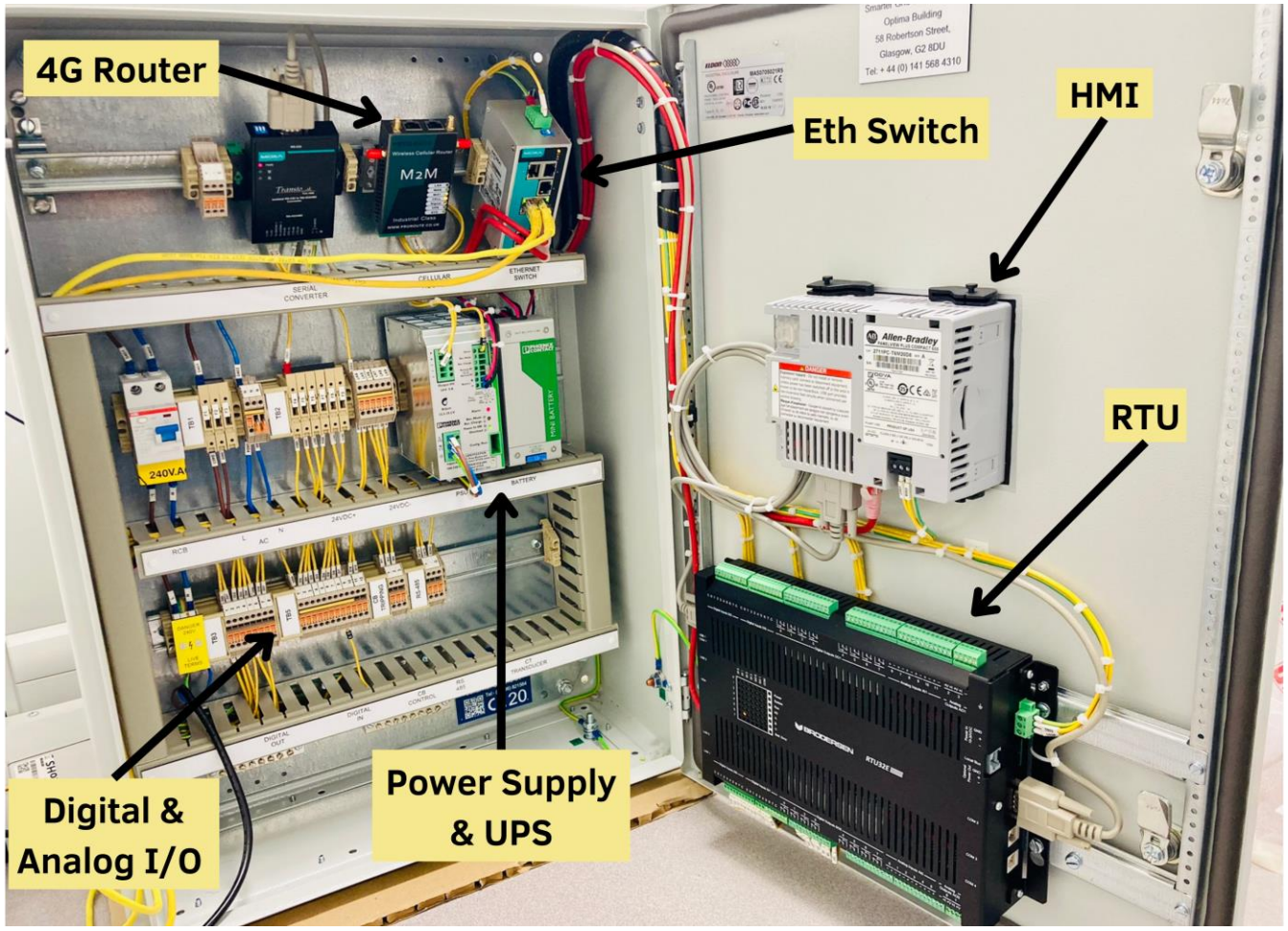

ANM Element Panel - Inside

4G Router to connect to ANM Strata

What challenges do Smart Charging Connections face?

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Commercial Challenges

- **Economic**: Non-firm connection vs traditional reinforcement question especially for low voltage applications where near real-time monitoring would need to be installed
- **Legal**: Existing connection offers not fit for SCC purpose
- **Policy & Process**: DNO Policies need improved to accommodate SCCs

Technical Challenges

- **Performance**: Charging infrastructure must be able to react fast enough to ensure safe network operation
- **Curtailment Studies**: Customer/DNO needs tools to assess the likely curtailment of EV sites
- **Network Security**: There are no long terms studies on reliability of EV control systems and failsafe provision for SCCs

Societal Challenges

- **Customer and End-User Acceptance:** Will customers be satisfied with charging service? Are customers willing to have DNO control?
- **Awareness:** Supply chain delivery needs to be informed to accommodate SCCs

Charge Project Analysis

45% of Residential Charging is >6hrs

80% of Destination Charging is <2hrs

50% of all Charging Events are <20kWh

Desktop Studies

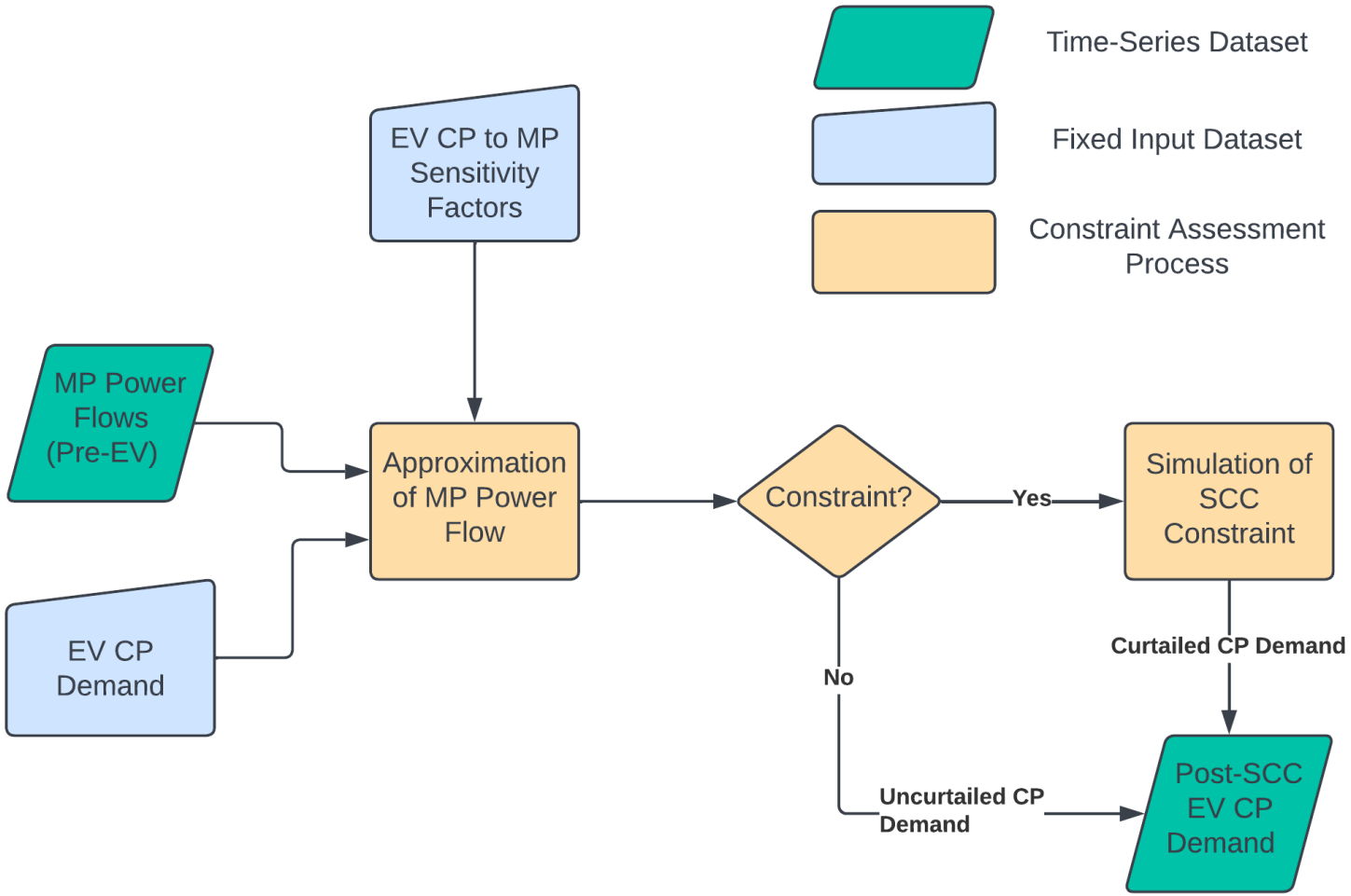
- Establish Half-Hourly Studies of SCC Deployment for 2025/2030
- Study Curtailment of SCCs in Deployment Scenarios
- Establish Approximate Curtailment Ranges for SCC Deployment Scenarios

Virtual Trials

- Demonstrate SCC Configuration and Operation for Winter 2030
- Simulate Sub-minute Charge Point Connecti and Control
- Study Constraint Management Across SCCs

Desktop Trials Process Flowchart

CHARGE



Case Study – Sandbach LMC Scheme

CHARGE

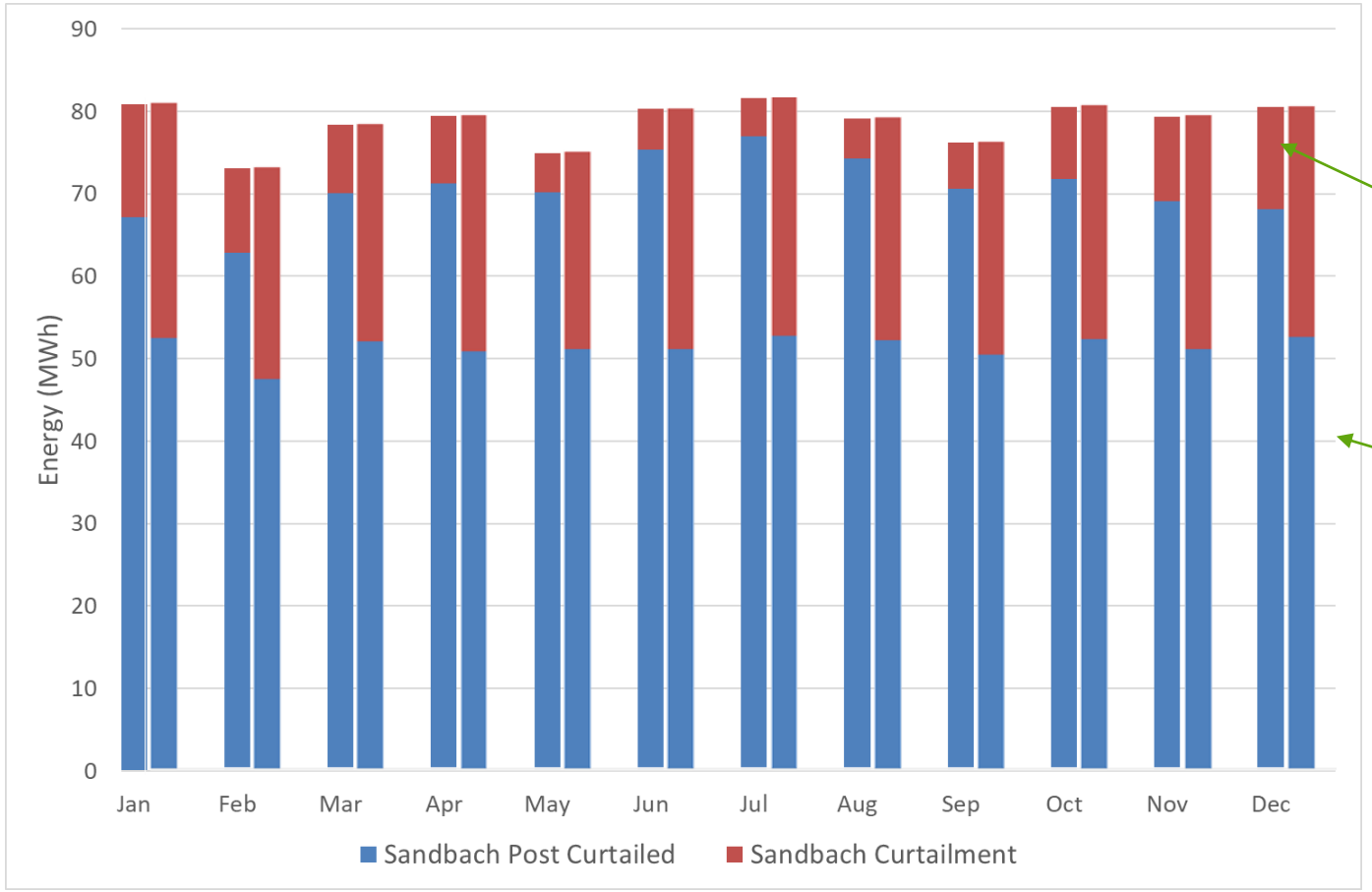
- Market Town in Chester East local authority close to the M6 Motorway
- Population of 18,000
- Small market town for shoppers and visitors as well as regular commuters
- Proposed 500 kVA Public Destination EV Charging Site

Desktop Trials Results

CHARGE

Site	Utilisation	Scenarios							
		Distribution Substation Constraint				Primary Substation Constraint			
		LMC 2025	LMC 2030	CLM 2025	CLM 2030	CMC 2025	CMC 2030	CLM 2025	CLM 2030
Sandbach	Pre-Constraint	10.9%	21.3%	10.9%	21.3%	10.9%	21.3%	10.9%	21.3%
	Post-Constraint	10.7%	19.1%	10.2%	13.9%	10.4%	12.3%	0.0%	0.0%

Desktop Trials Results

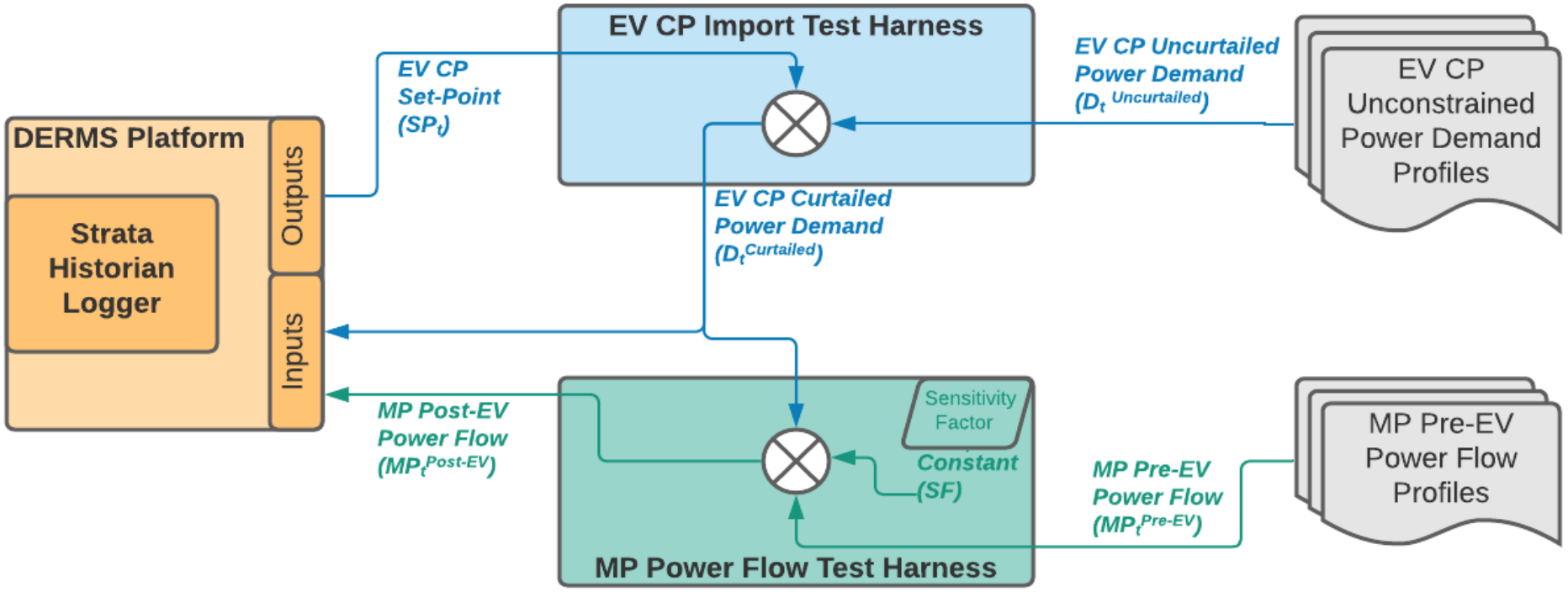


Locally Managed Constraint

vs Customer Load Management

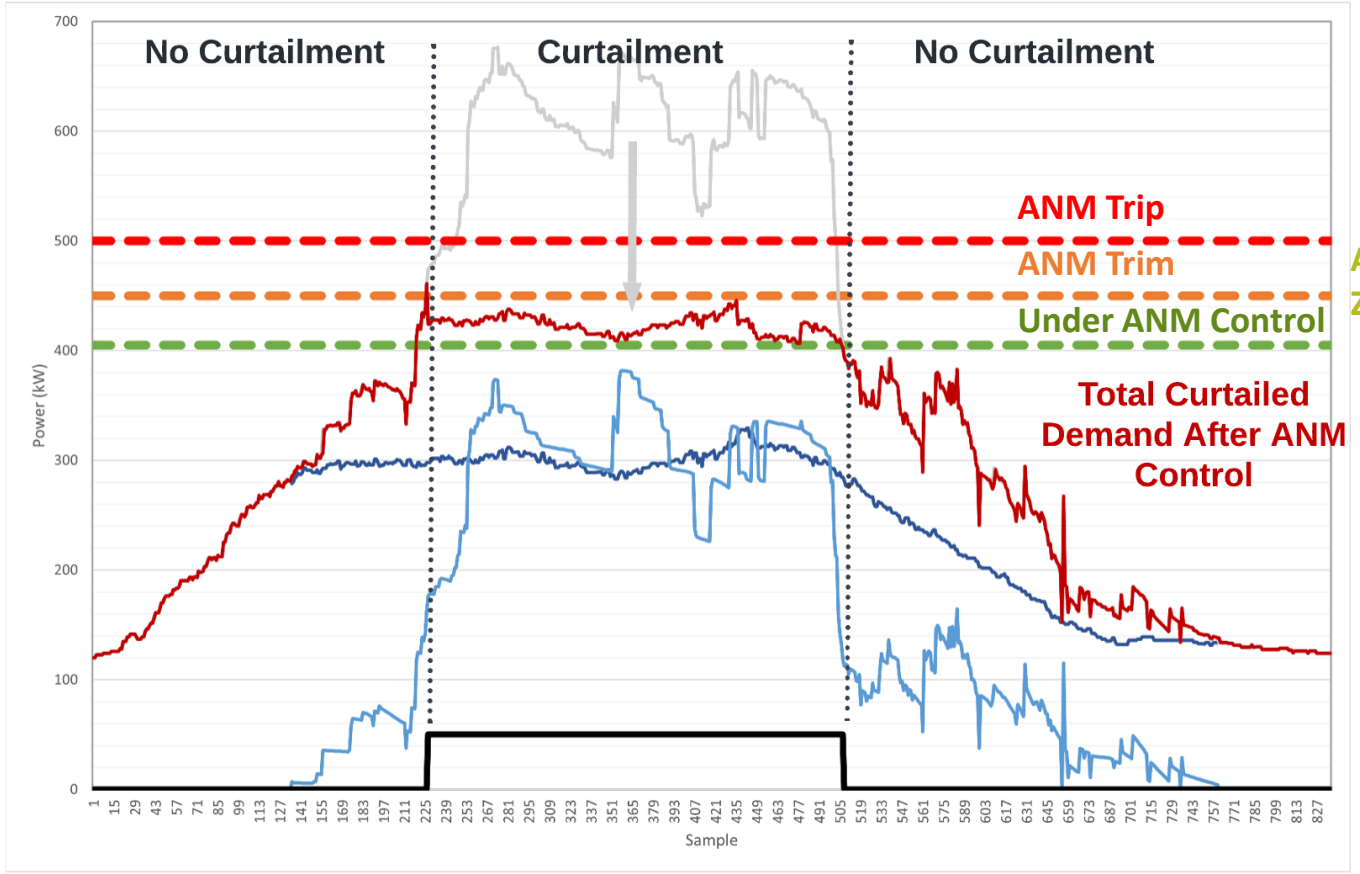
Virtual Trials Description

CHARGE



Case Study – 7 Day Trial: Results and Observations

CHARGE



ANM Management Zones

CHARGE SITE OVERALL METRIC	RESULT
Number Curtailment Events	3
Total Curtailment Time	701 Min
Total Demand Energy (PRE CURTAILMENT)	3507 kWh
Total EV Load Demanded (POST CURTAILMENT)	1713 kWh
Unmet Demand Due to Curtailment	1795 kWh
% Unmet Demand Relative to Total Demand	51.2%

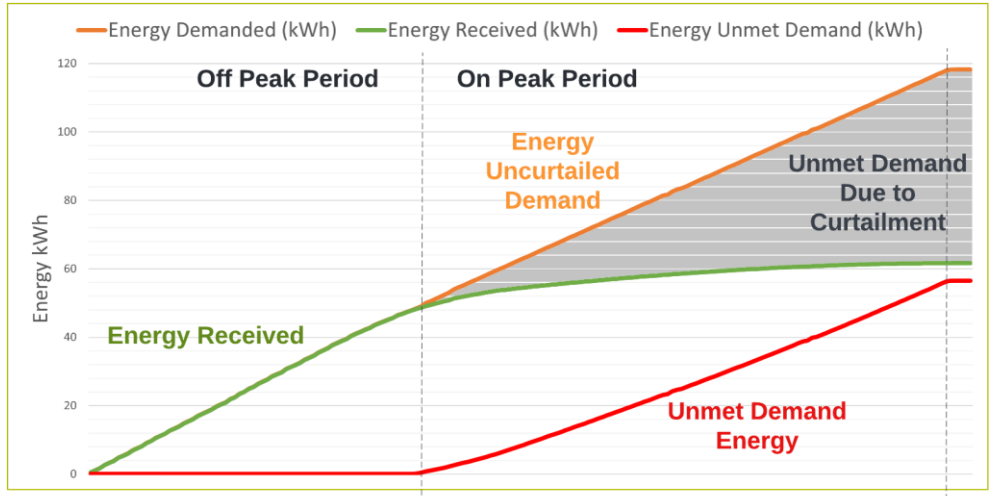
ANM Curtailment Operations Sequence (Single Day)

Case Study – 7 Day Trial: Single Charge Session Results

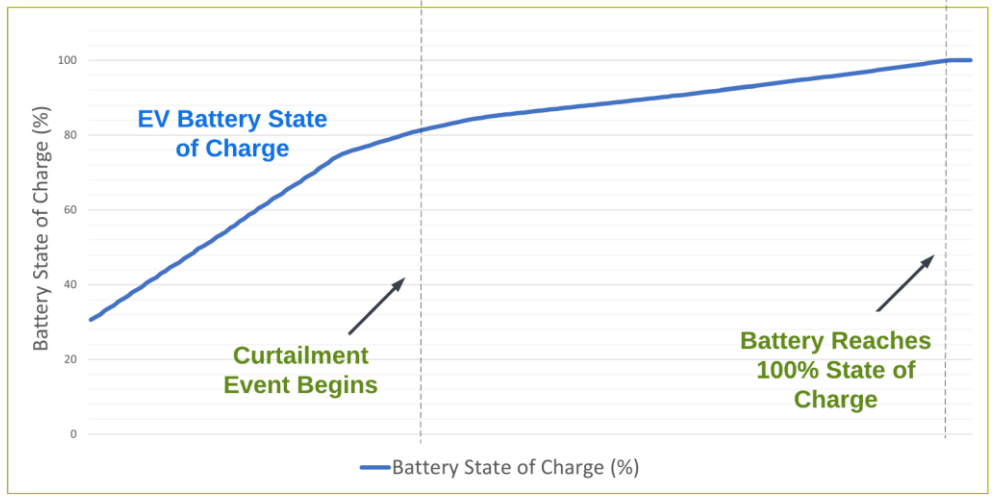
Single EV Charging Session Behaviour Simulated using Virtual Trials EV Charging Site Simulator

CHARGE

Energy Demand Metrics



State of Charge Metric



22kW Charge Point

Off Peak and Peak Time Charging

Charging Rate Reduced during Curtailment

EV Charging Time Extended

EV Reaches 100% Charge during the Fixed Time Connected Session

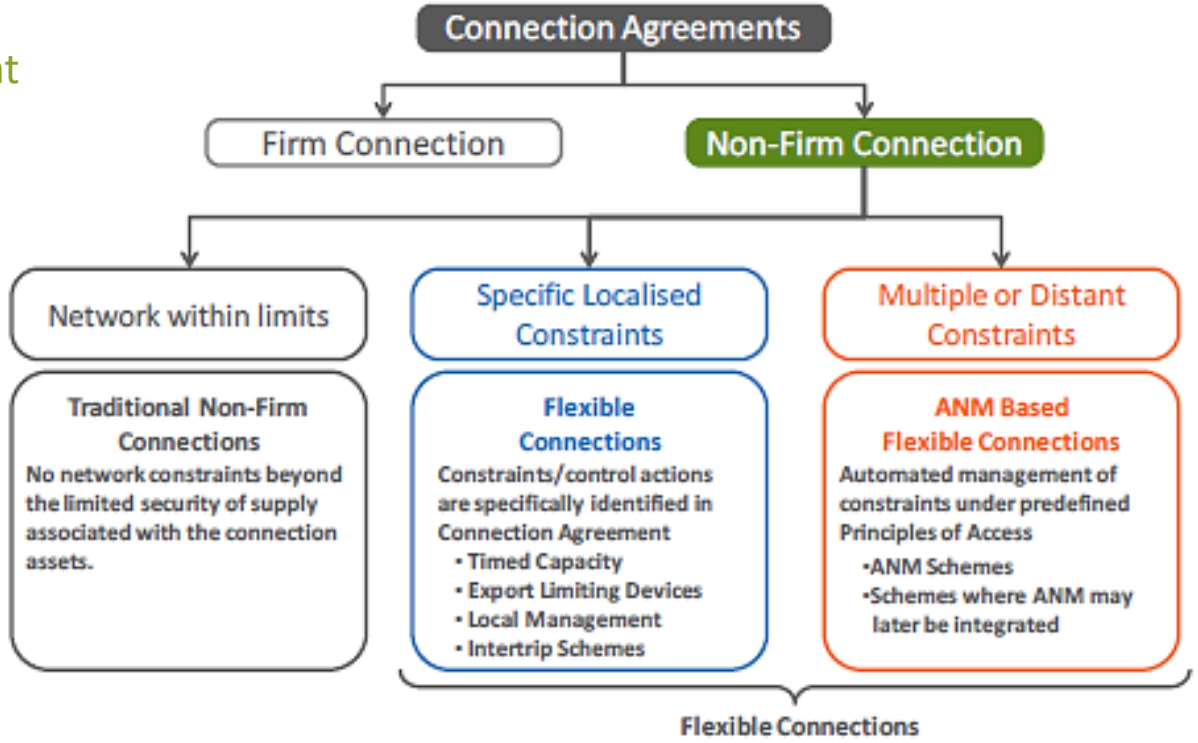
CHARGE POINT METRIC	RESULT
Time Connected	333 Min
Time Charging	326 Min
Time Curtailed	192 Min
CP Energy Demanded (PRE CURTAILMENT)	118 kWh
CP Energy Received (POST CURTAILMENT)	62 kWh
CP Unmet Demand Due to Curtailment	57 kWh

DNO Policy Recommendations

CHARGE

- Policies need to accommodate flexible connection offers for EVs
- DNOs need a method to estimate curtailment and provide transparency of assumptions
- Updates to policies must allow SCC assessment to be achievable within mandated period or be considered as an additional contractual measure

- ESDD-01-009 Flexible Connections and Principles of Access
- Third-Party Design and Connections Related Policies
- Engineering Recommendation P2/7 Security of Supply Standard
- Engineering Recommendation G100, Issue 2



Customer Behaviours

CHARGE

- *"**Faster installation** of public charging infrastructure can only be a good thing. Most drivers **don't need full charge** and are **not needing rapid charging** as they would leave them for several hours anyway."*

- *The most stressful aspect of EV ownership is **not being able to find a charge point** on a long journey. Having to spend **longer charging is not a problem**, compared to driving on and on again to find somewhere to simply plug in and start."*

- *"Seeing **more charging points** around will increase the likelihood of people transitioning to EVs. One of the biggest blockers is the **perception of insufficient access to charging** infrastructure, so the more charging points that are 'seen', the more people will be willing to consider an EV."*

Customer Behaviours

CHARGE

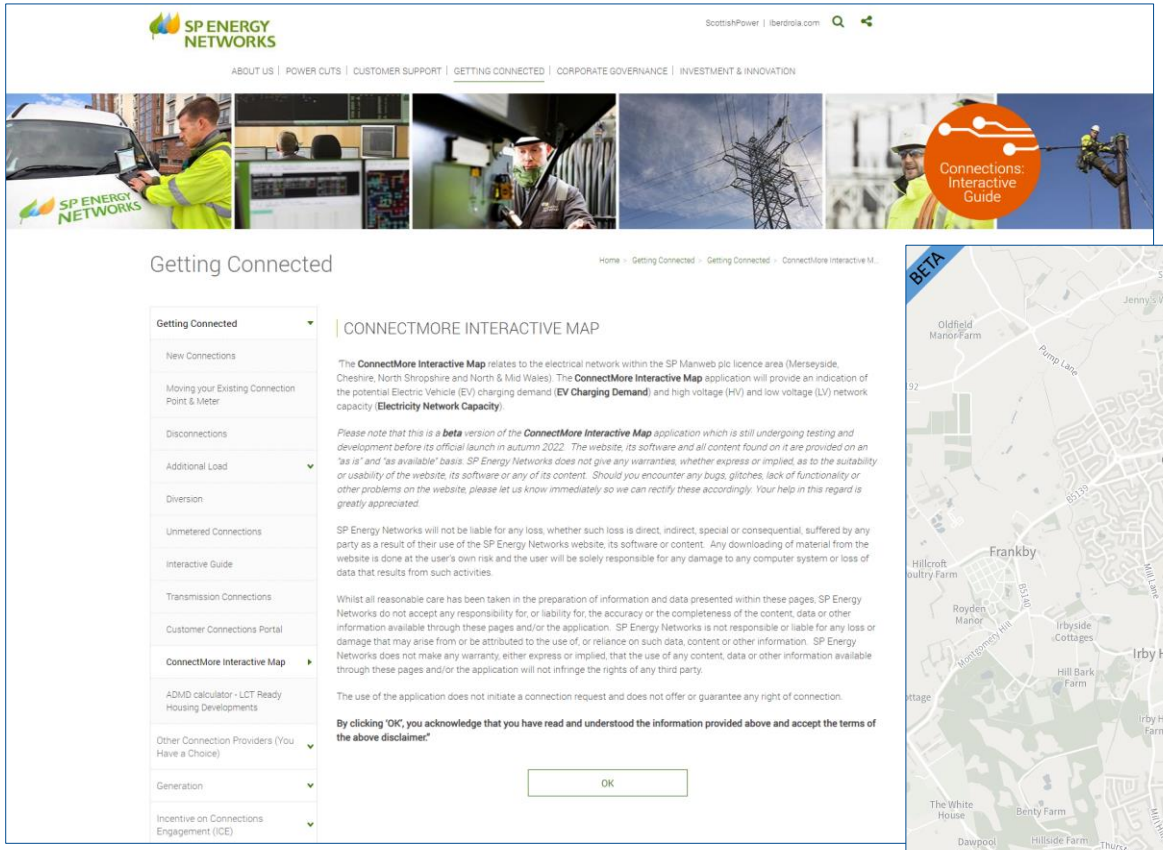
- *"Smart public charge points will cause **chaos and confusion** and risk slowing mass adoption of electric vehicles."*
- *"People will not accept having their charge restricted under any circumstances; **public charging needs to be available** to those who need it when they need it."*
- *"**Curtailment of chargers at en route locations is totally unacceptable** as the objective is to charge quickly and continue with the onward journey."*

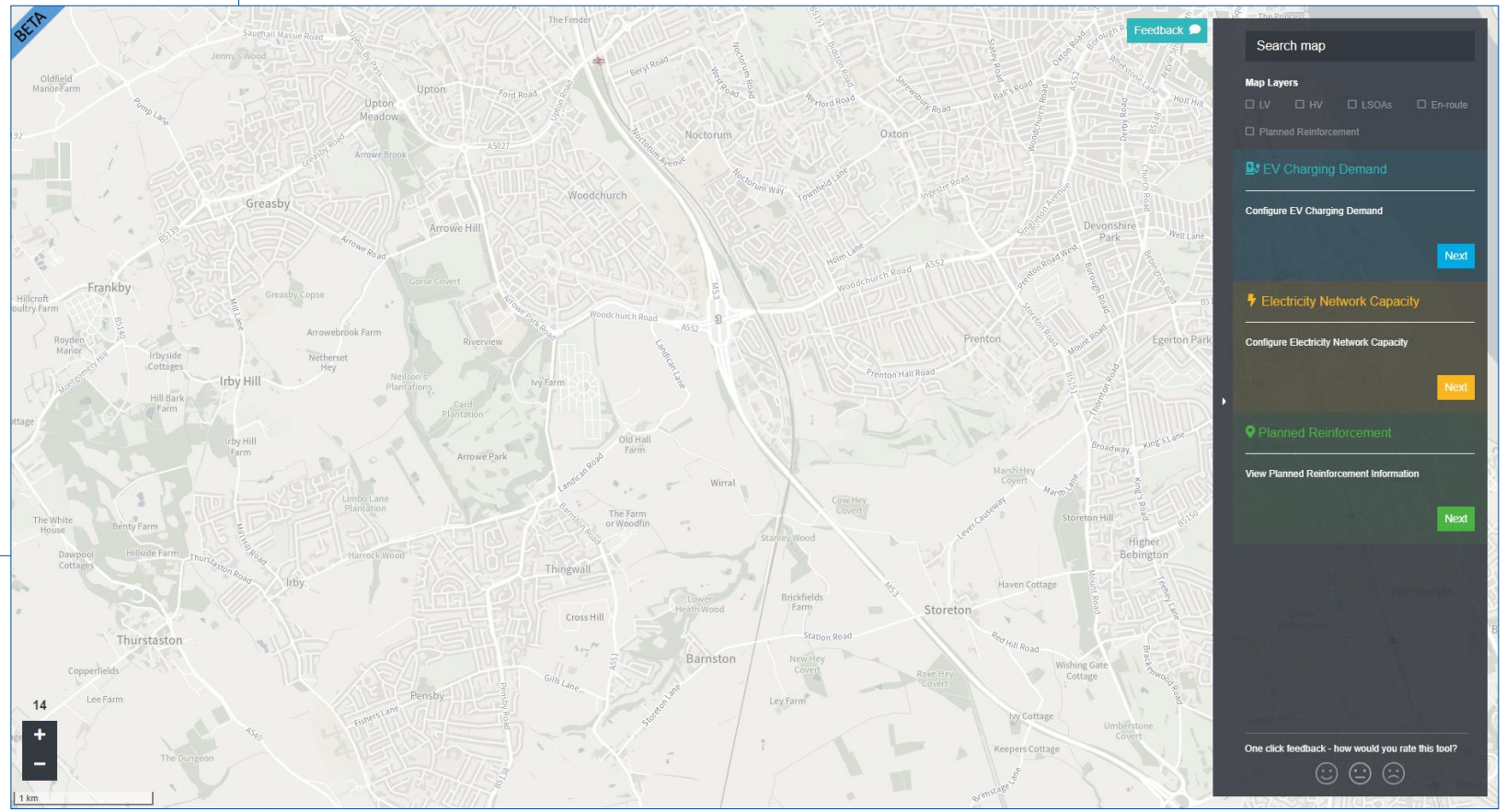
In Summary

CHARGE

- All models are imperfect - But they are useful.
- Understanding behaviour of EV drivers is key to unlocking grid capacity.
- Accurate network models and forecasts inform smarter planning choices.

ConnectMore - Overview





www.spenergynetworks.co.uk/pages/charge.aspx

ConnectMore HeatMap: EV Charging Demand

CHARGE

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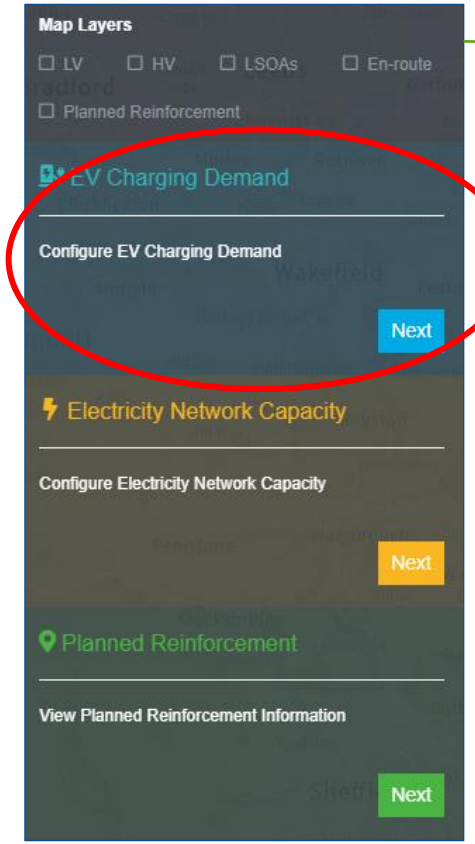
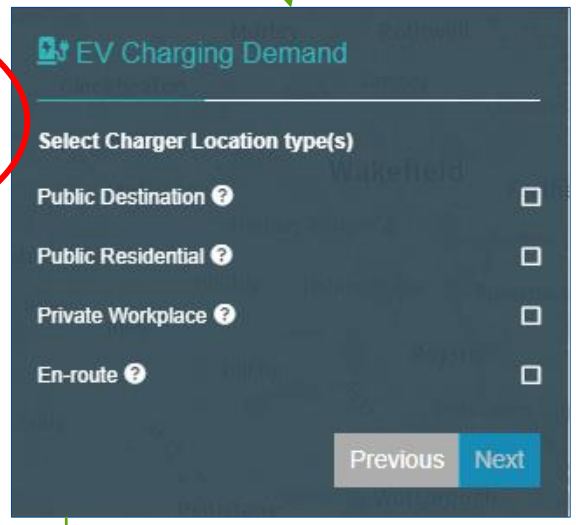
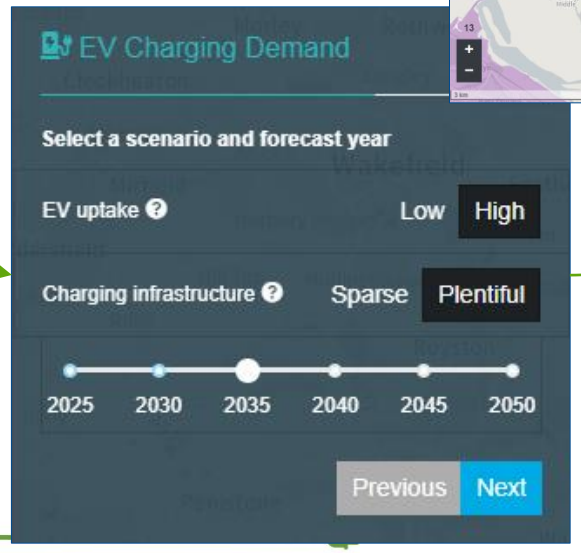
PTV GROUP

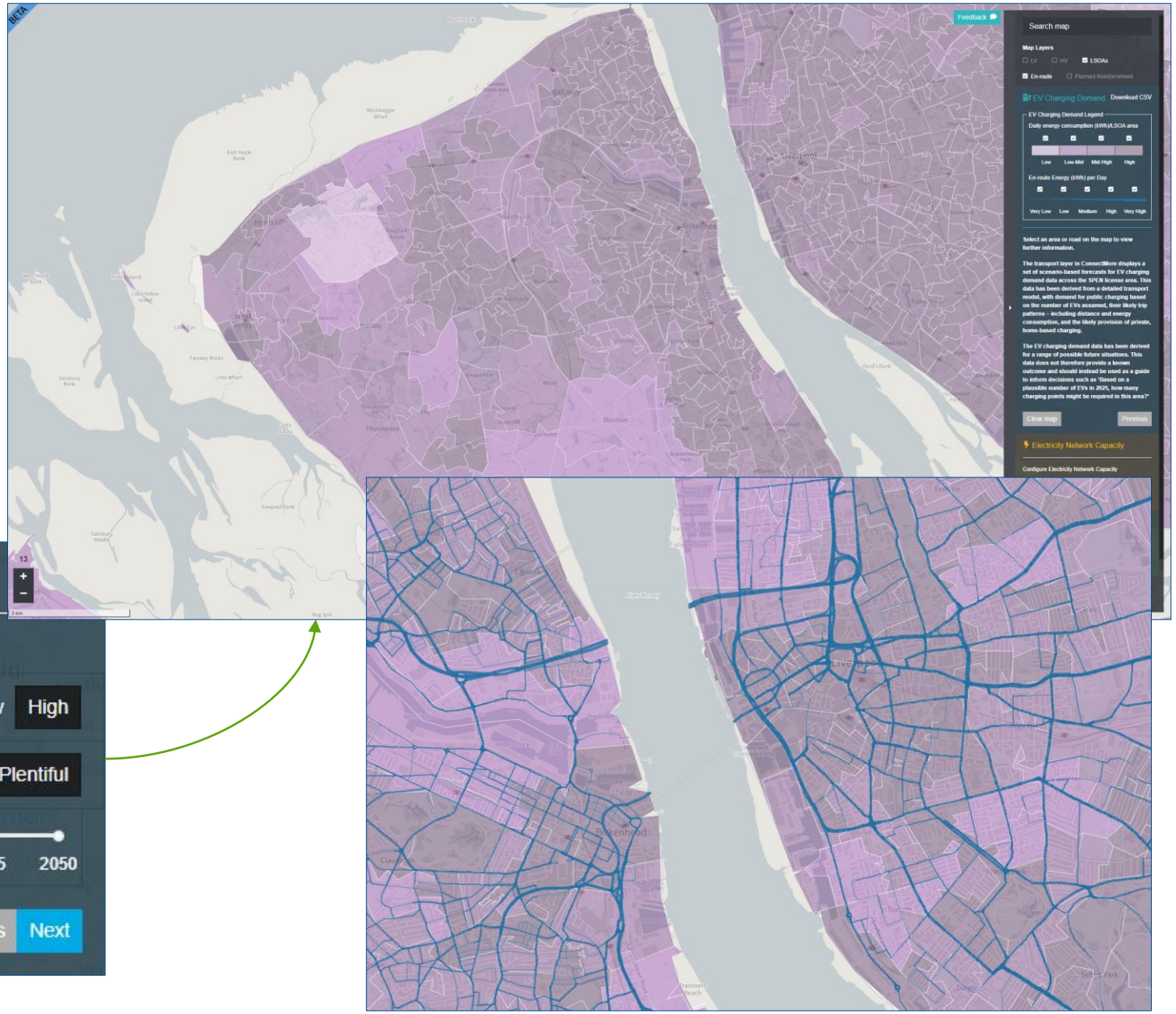
smarter grid solutions

ea technology









ConnectMore HeatMap: EV Charging Demand

CHARGE

SP ENERGY NETWORKS

PTV GROUP

smarter grid solutions

ea technology

LSOA INFORMATION

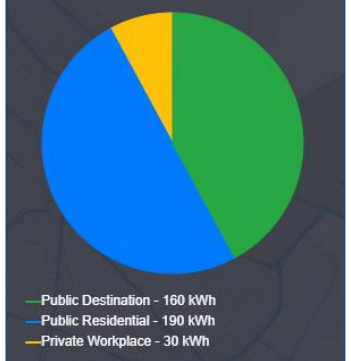
LSOA Code: E01007110
LSOA Postcode: CH61 1DG
Zone Number: 1868

Daily energy consumption for selected location types: Low (57 kWh/km^2)

Number of charging events per day for selected location types: 5 per km^2

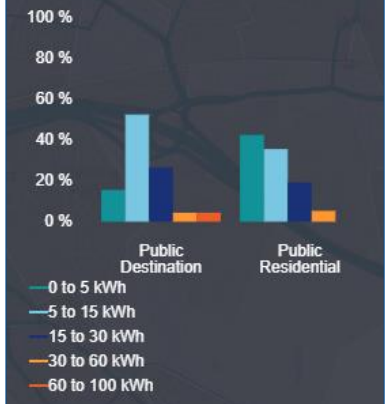
LSOA CHARTS

DAILY ENERGY DEMAND (kWh)

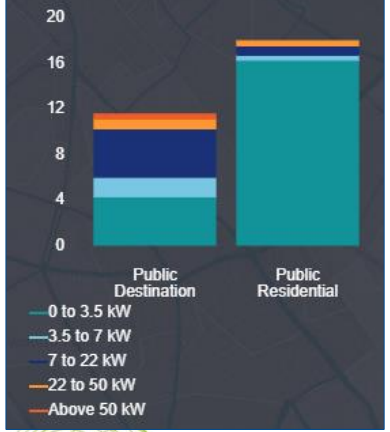


DWELL TIME DISTRIBUTION (%)

ENERGY (kWh) PER CHARGING SESSION DISTRIBUTION



NUMBER OF SESSIONS A DAY BY CHARGING SPEED



CHARGING EVENTS ARRIVAL PROFILE – ALL SELECTED LOCATIONS

DAILY ENERGY DEMAND (kWh) IN FUTURE YEARS

TOTAL DAILY ENERGY DEMAND (kWh)

Public Destination Chargers	160 kWh
Public Residential Chargers	190 kWh

NUMBER OF CAR TRIPS PER DAY

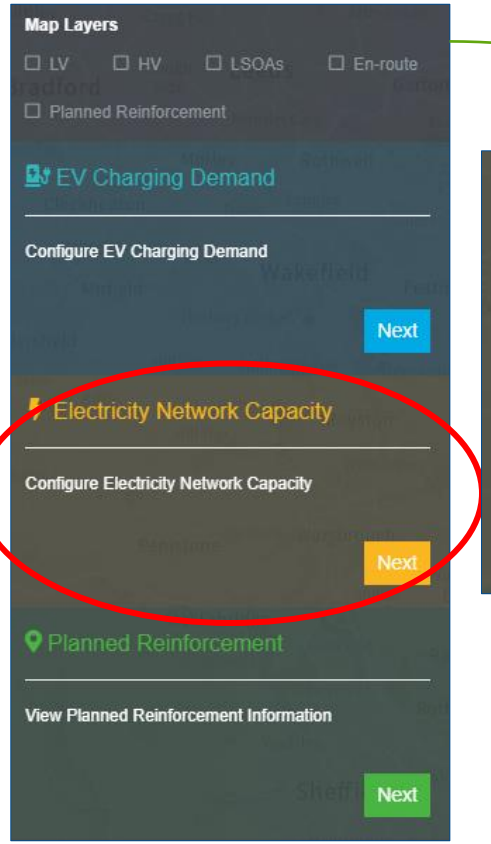
Total car arrivals	2040
Total EV arrivals	1380

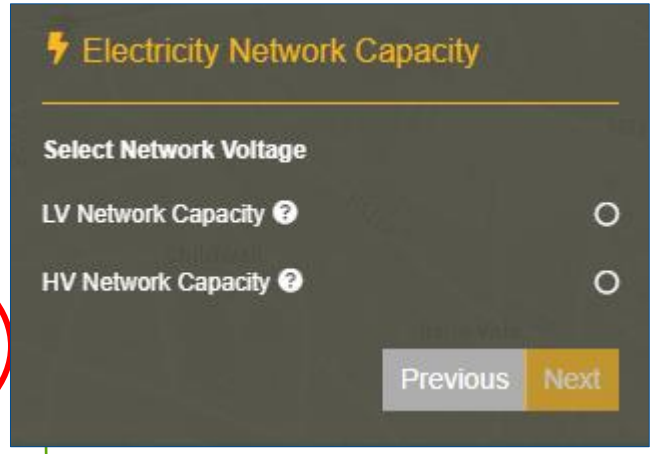
NUMBER OF CHARGING SESSIONS PER DAY

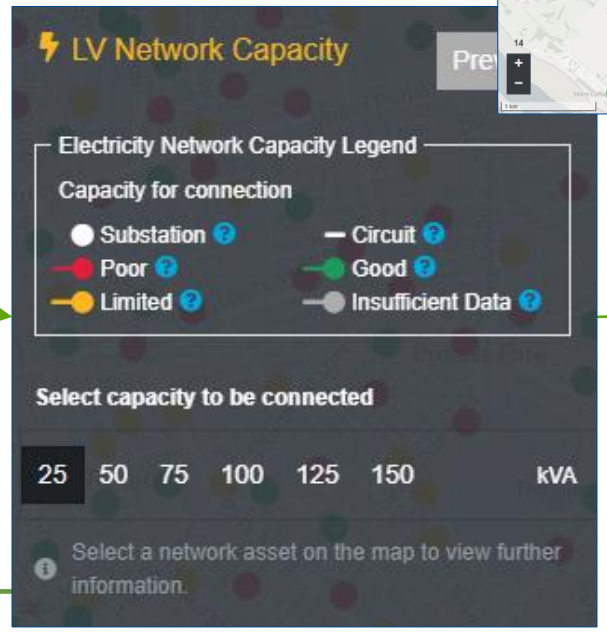
Public Destination	10
Public Residential	20

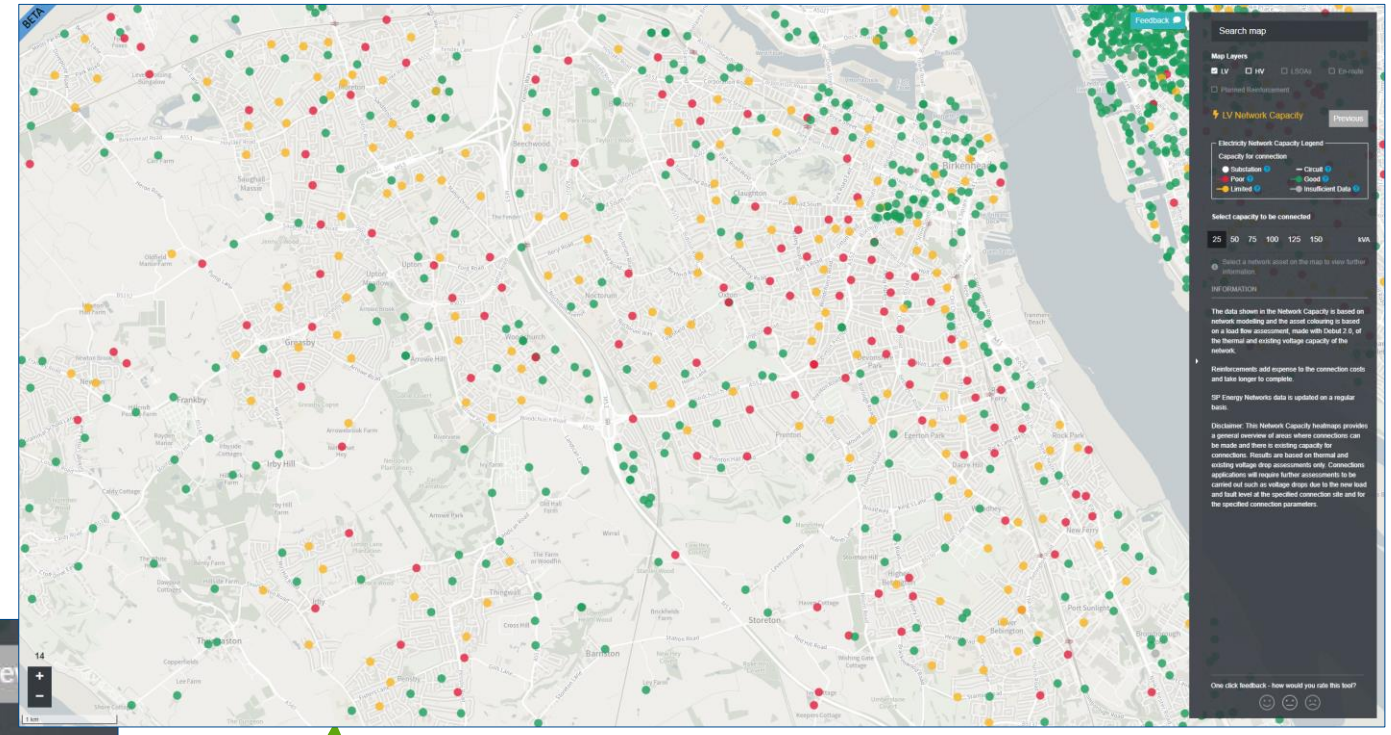
RIIO NIC NETWORK INNOVATION COMPETITION

ConnectMore HeatMap: Distribution Network

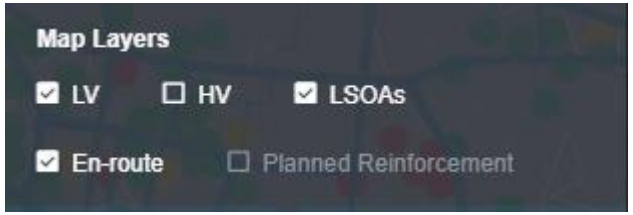




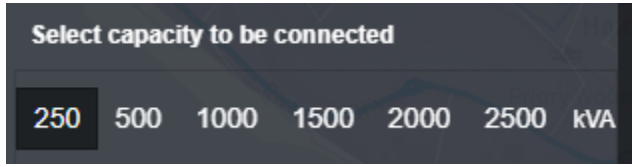




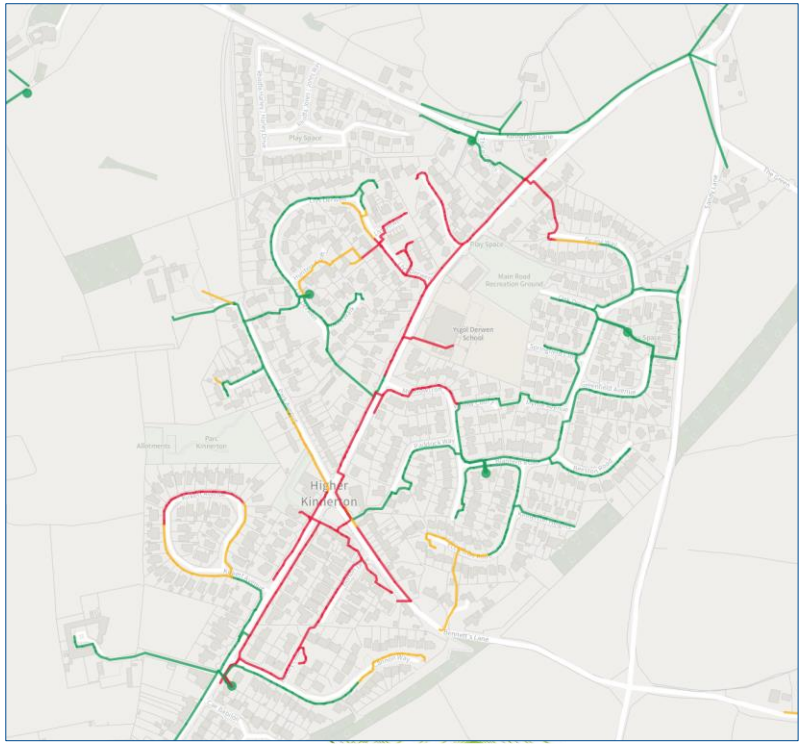
Map Layer Options



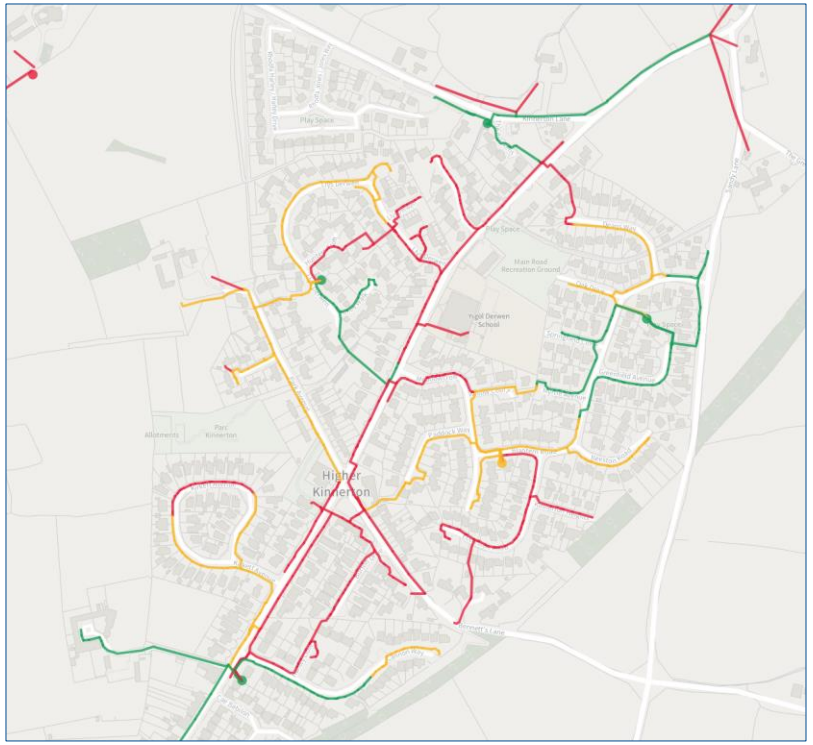
HV Network Capacity Options



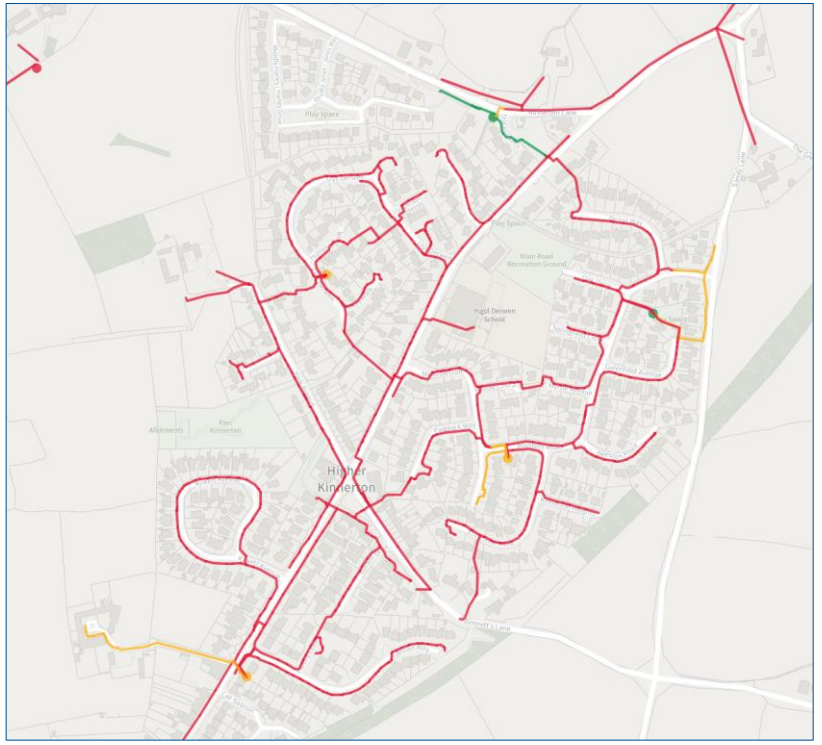
ConnectMore HeatMap: Distribution Network



New Connection: 25kVA

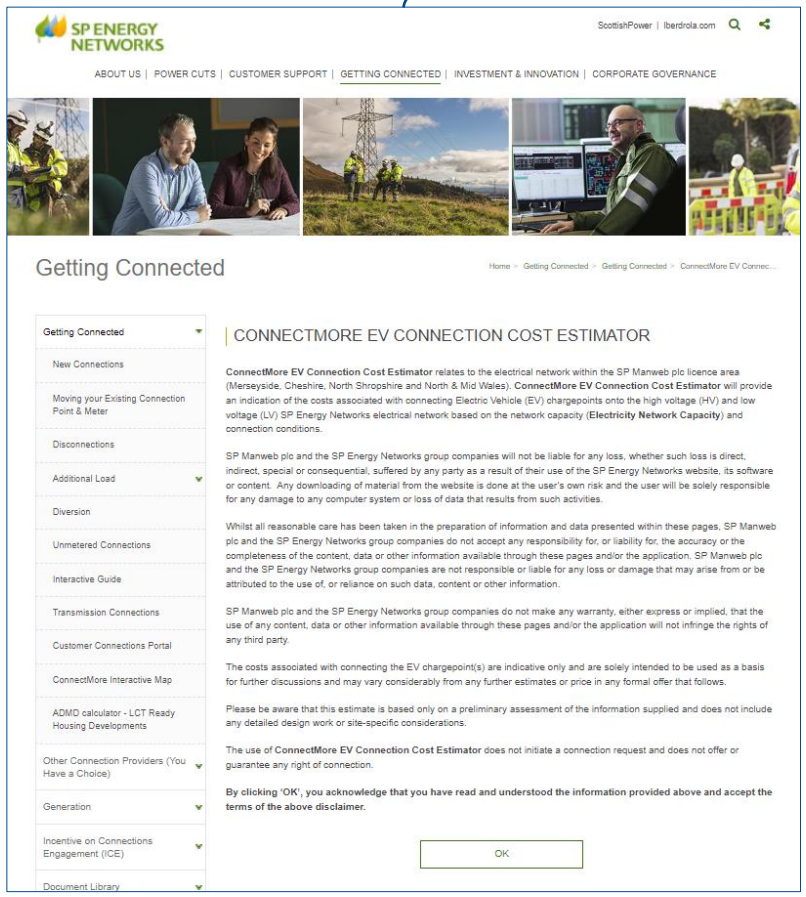


New Connection: 75kVA



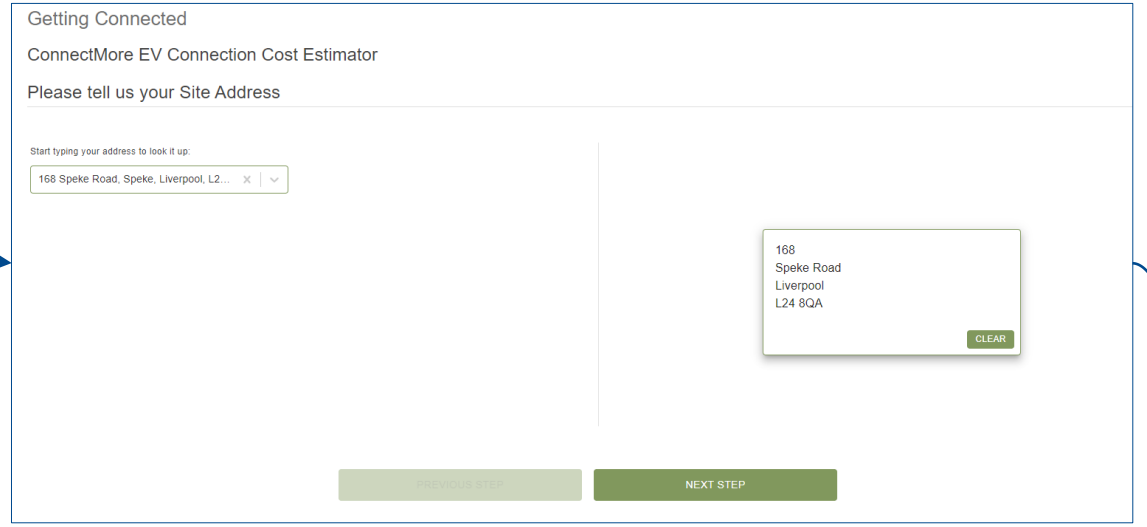
New Connection: 125kVA

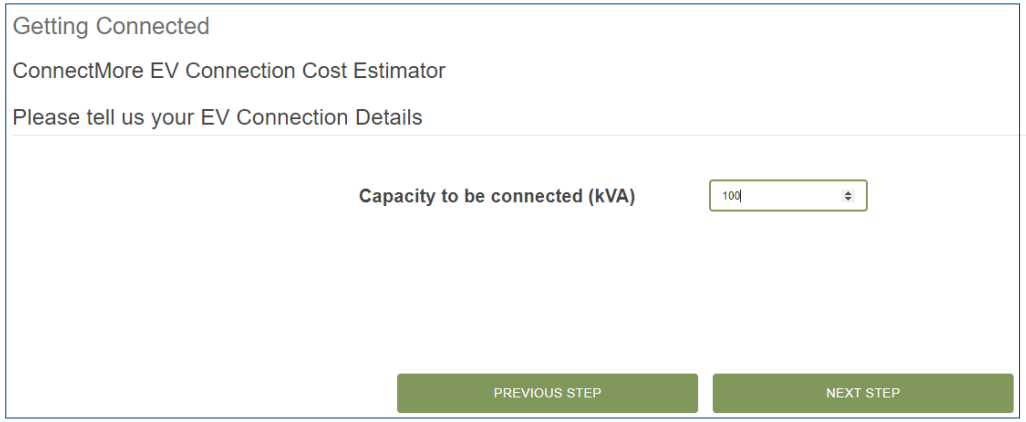
ConnectMore Cost Estimator



Routed through the Getting Connected Portal

Where do you want to connect?

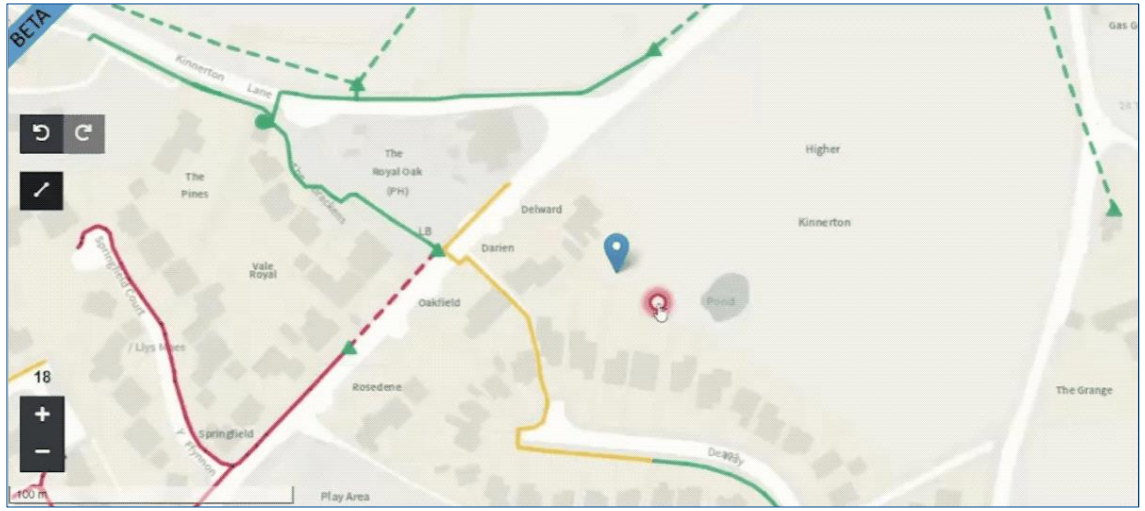




Tell us the load you need

ConnectMore Cost Estimator

Pinpoint the location, save your quotation and get another…



This QR code links directly to a short video detailing the complete cost estimation process.

Getting Connected

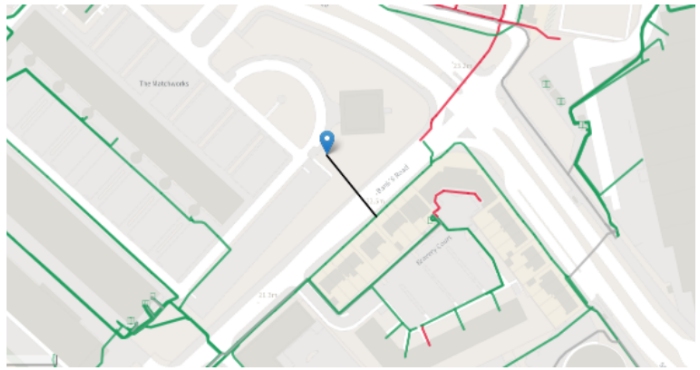
ConnectMore EV Connection Cost Estimator

The Estimate price for the works is: £4500 +VAT

Your voltage drop for this 100kva connection is: 1.2%

You now have a choice (click on the applicable navigation button):

SAVE RESTART EXIT



Please Note: The Estimate is based on typical simple connections and is calculated by making assumptions based on similar work that we have previously carried out. The ConnectMore EV Connection Cost Estimator will complete an initial technical assessment based on the existing SPEN electrical network, however, if you apply for a formal quotation, the quotation price may vary:

- No reinforcement of the electrical network required
- No diversions of electrical assets required
- No disturbing loads, generating equipment of energy storage being connected
- No works within abnormal ground
- All works to be completed during Normal Working Hours (8:30 am to 4:30 pm of the days Monday to Friday of any week, excluding any public holiday applicable to the location of the Site)

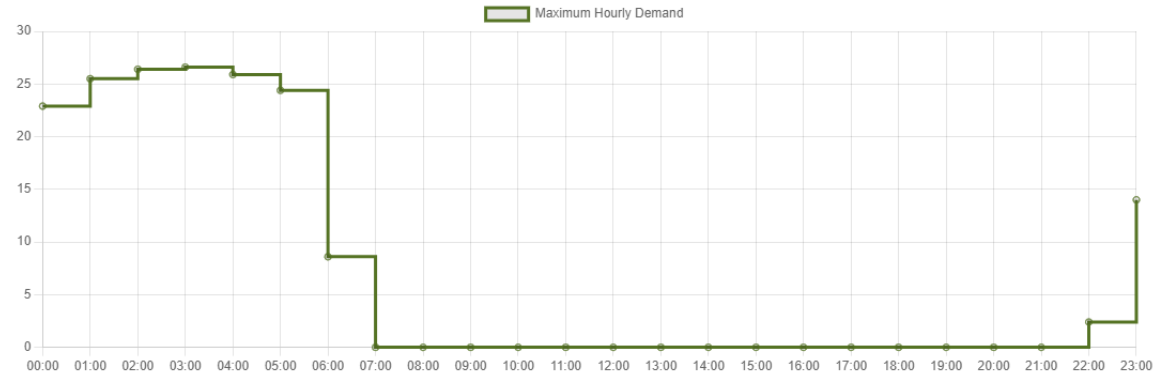
PREVIOUS STEP

ConnectMore Cost Estimator: Flexible Connections

Flexible Connection Information & Costs

Requested Capacity to be Connected (kVA)	150

Hourly Capacities Available on the Network for Selected POC



Time Constrained Connection (TCC) Scheme

Maximum Allowed Demands per Hour (kVA)

00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00
22.9	25.5	26.4	26.6	25.9	24.4	8.6	0.0	0.0	0.0	0.0	0.0
12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	14.0

Customer Load Management (CLM) Scheme

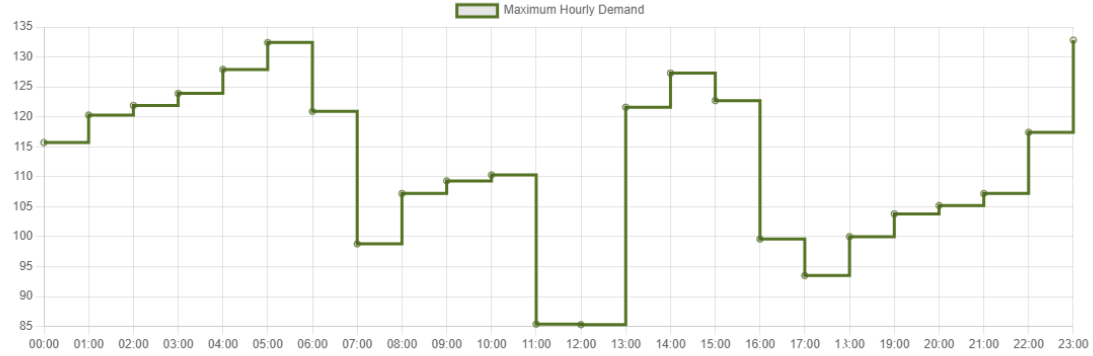
Maximum Allowed Demand per Hour (kVA)	0.0

Unfortunately, there is no spare capacity at this location for the Customer Load Management Scheme.
This flexible connection cannot be offered for this Point of Connection (POC)

Flexible Connection Information & Costs

Requested Capacity to be Connected (kVA)	100

Hourly Capacities Available on the Network for Selected POC



Time Constrained Connection (TCC) Scheme

Maximum Allowed Demands per Hour (kVA)

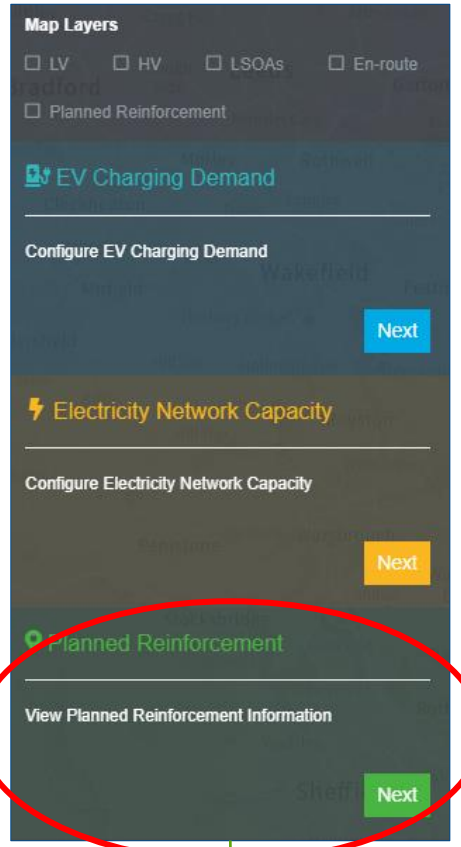
00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00
115.7	120.3	121.9	123.9	127.9	132.4	120.9	98.8	107.2	109.3	110.3	85.4
12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
85.3	121.6	127.3	122.7	99.6	93.5	100.0	103.8	105.2	107.2	117.4	132.8

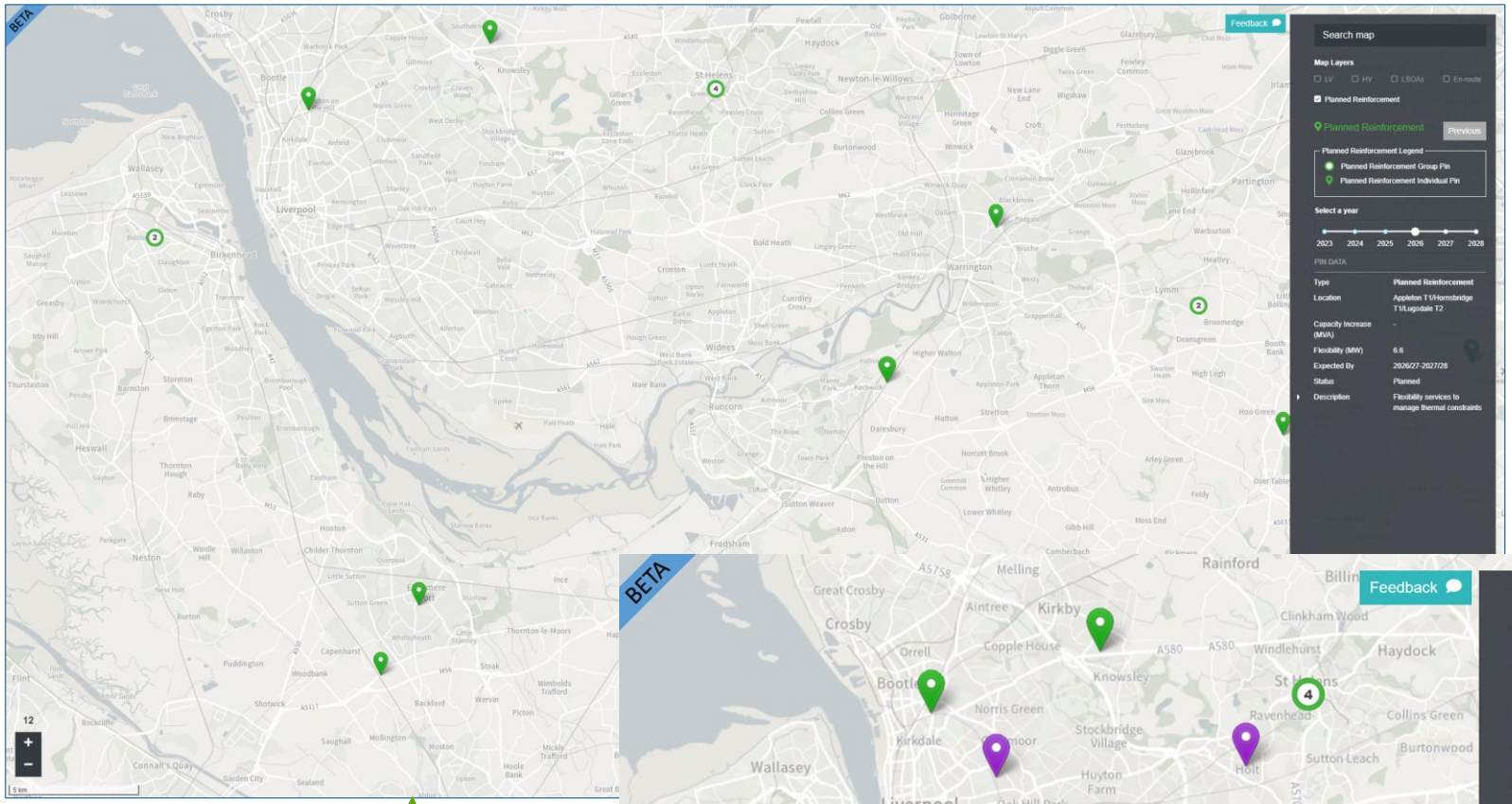
Customer Load Management (CLM) Scheme

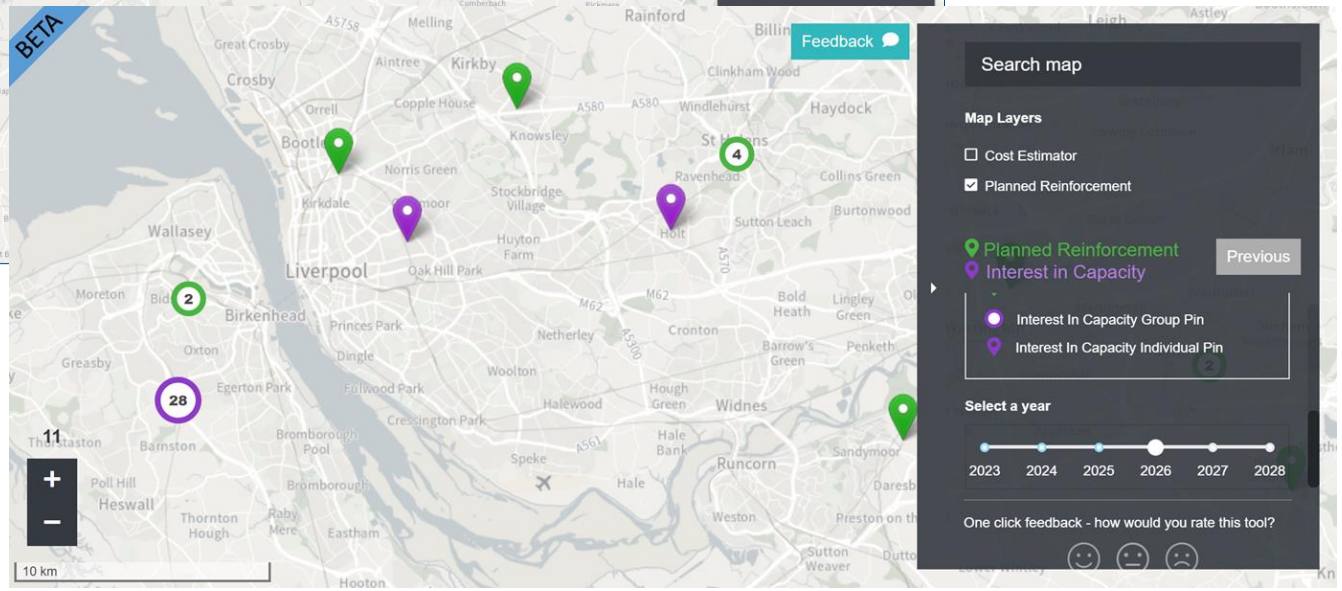
Maximum Allowed Demand per Hour (kVA)	85.3
Connection Cost (including VAT but excluding local controller)	£5520
Cost Saving Against Reinforcement Quote	£480

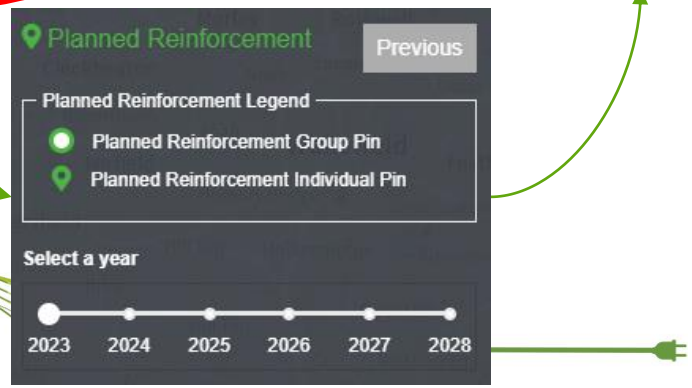
Note graph scales….

ConnectMore: Planned Reinforcement & 'Interest in Capacity'

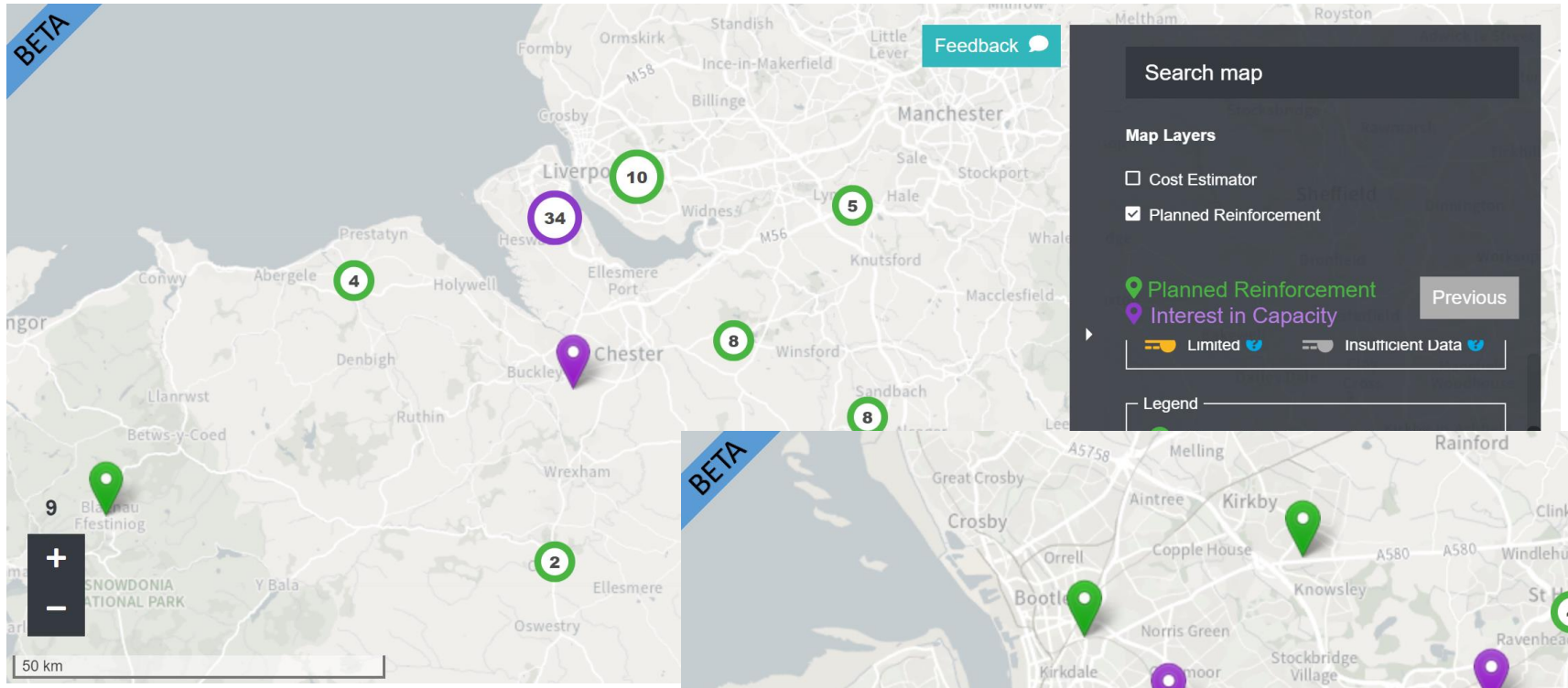


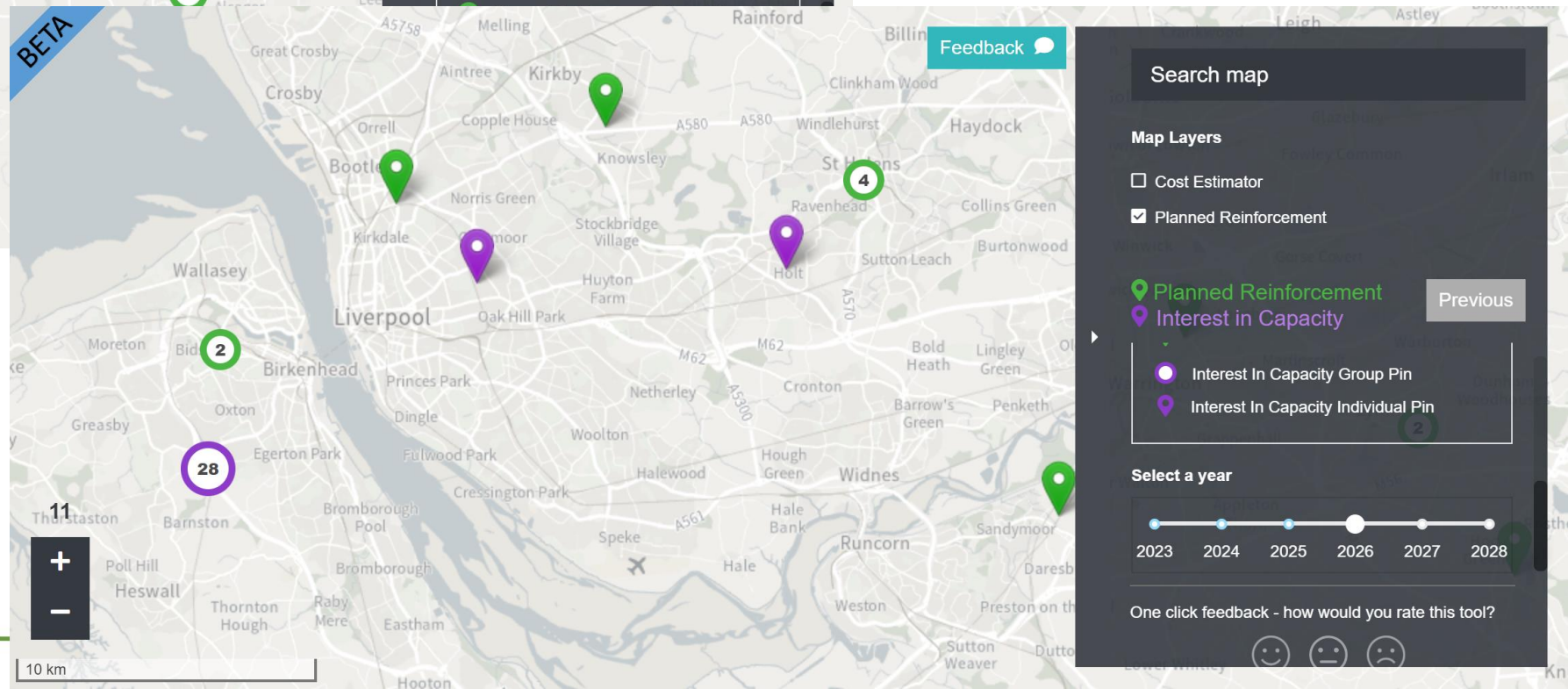






ConnectMore: Interest in Capacity





Summer 2022

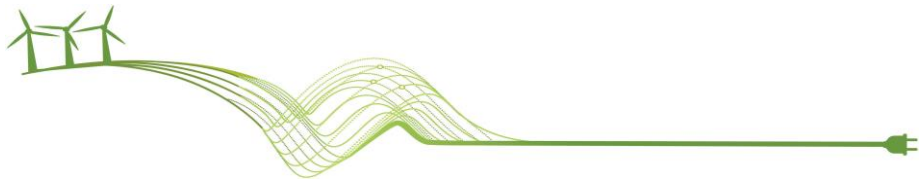
- **ConnectMore launched externally**
- Enables customers to generate their own Budget Quotes for connections
- Support for traditional Budget Quotes remain.

December 2022

- **ConnectMore fully launched**
- HV data integrated
- ConnectMore the default mechanism for customers to generate Budget Quotes?

Spring 2023

- **Implementation on SPD Areas**



SP ENERGY NETWORKS

John Allen, Senior Innovation Engineer

ReHeat

Show and Tell

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

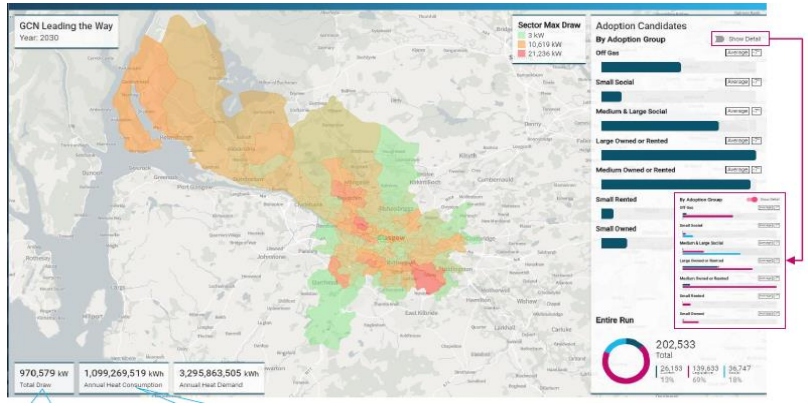
Ready our business for a digital and sustainable future

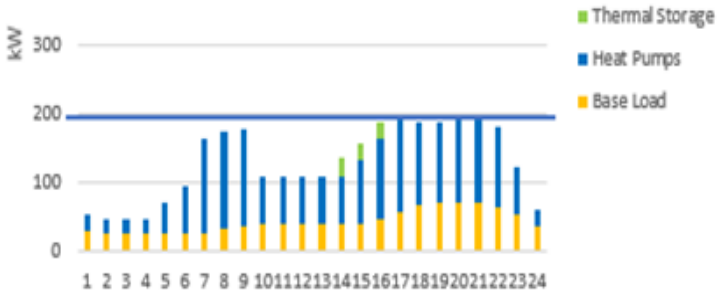
Re-Heat

Decarbonising heat is one of the biggest challenges we face on the journey to net zero. Heating and hot water are responsible for 21% of UK carbon emissions.

Peak Heat Energy requirements are currently approximately 4 times that of Peak Electrical

Electrification will be a key enabler however networks will be overloaded without intervention.



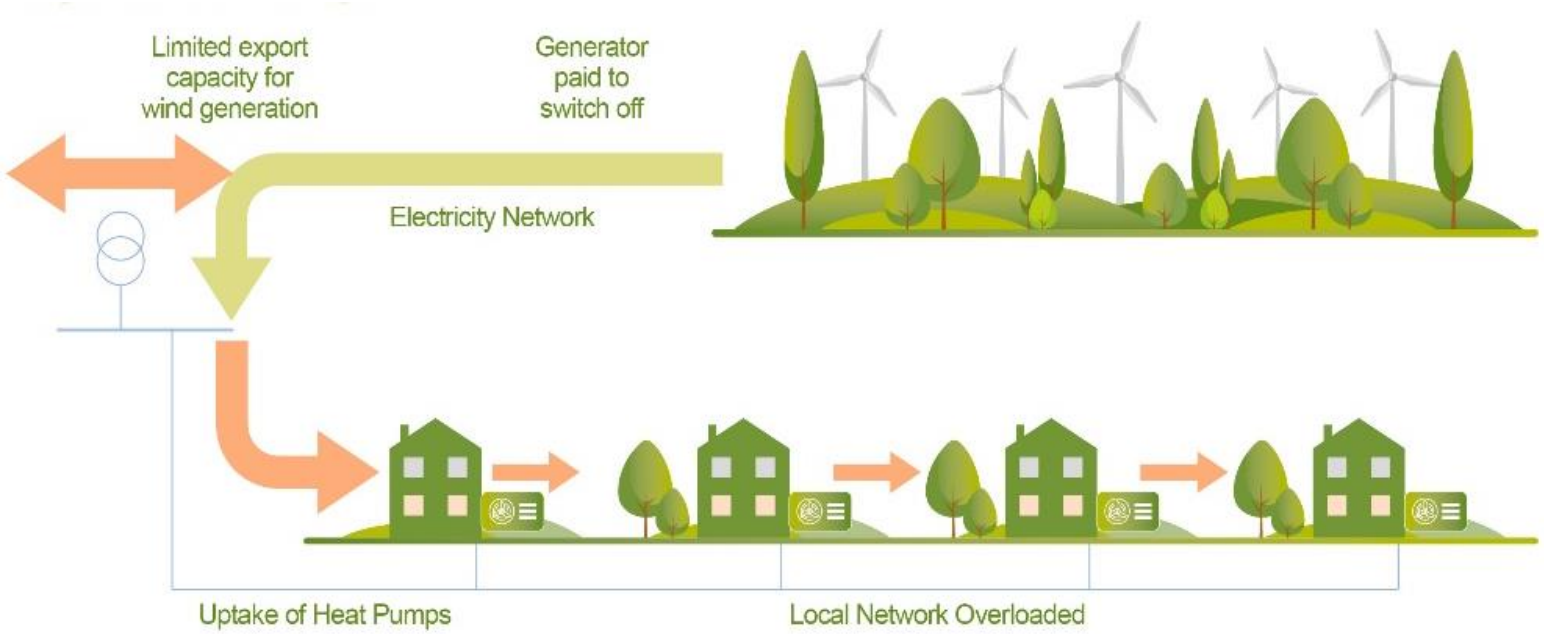


We must make heat flexible. This means shifting demand to reduce peak demand.

Decarbonisation of Heat

Some of the challenges

- Electrified heat will overload our local networks in many places
- Renewable generation is being constrained; low carbon electricity is being lost
- Flexibility from heat will be necessary to address whole-system issues
- Customers need to be engaged in the transition and become flexible prosumers



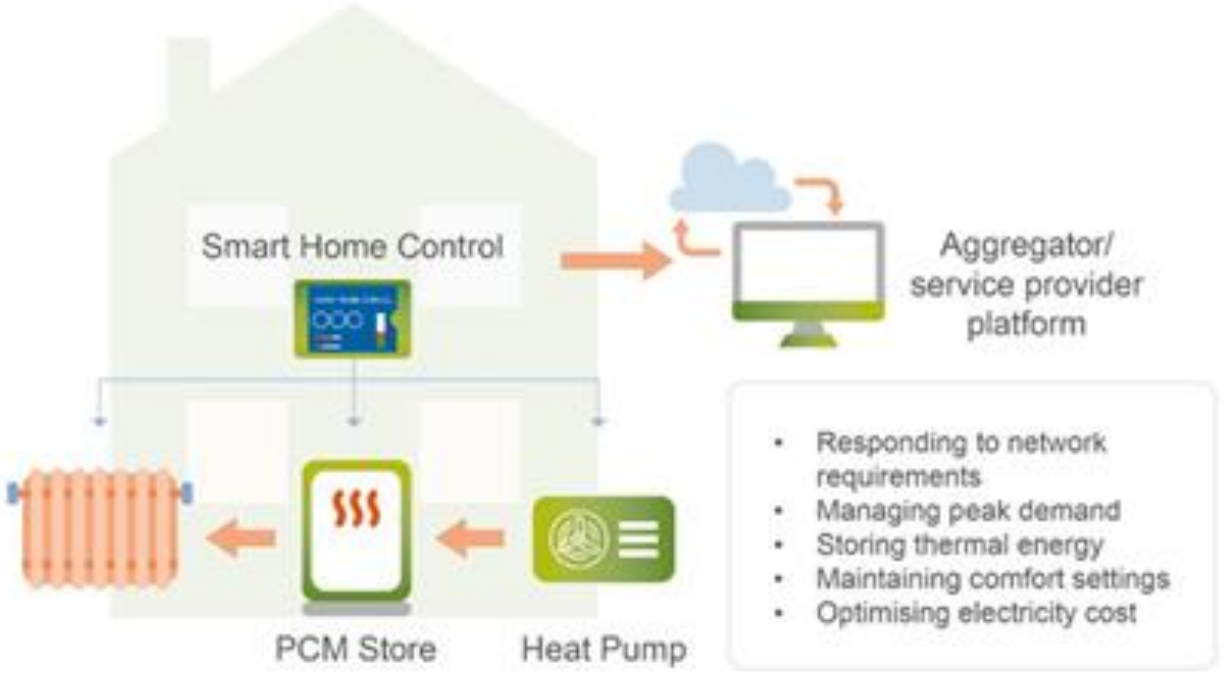
Re-Heat will address these challenges; demonstrating the whole-system benefits of making heat flexible

Re-Heat Project

The solution being trialled

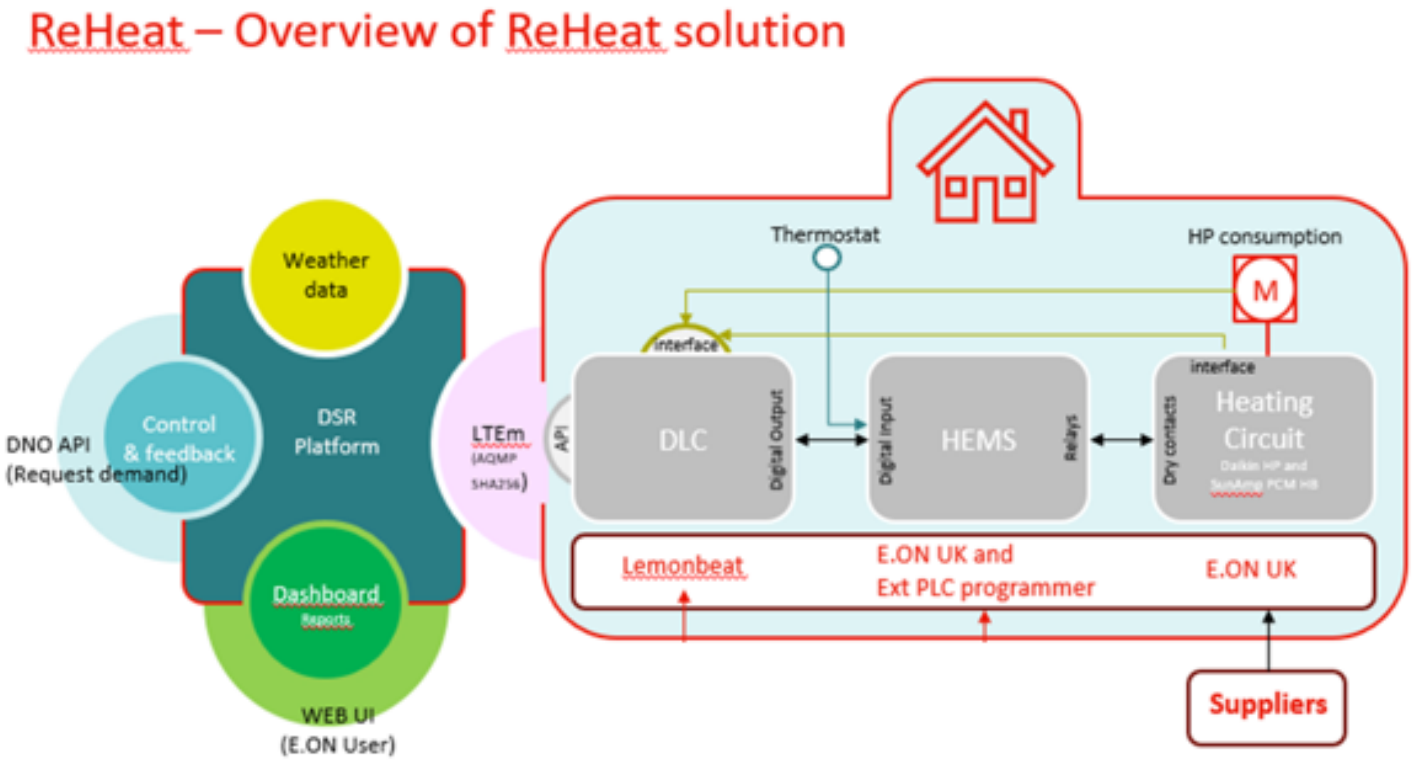
- In Home:
- Improve building thermal insulation
- Replace Oil-fired boiler with efficient Air Source Heat Pump
- Provide a thermal store and smart controller

- Network:
- Develop network planning tools to support decarbonisation of heat.



The solution includes smart grid controls and smart heating management with domestic heat storage to reduce peak electricity demand as a customer friendly and cost-effective alternative to network upgrades

Detailed System Overview



Large scale trial

150 homes across East Ayrshire, East Dunbartonshire and Highland council areas, primarily in off-gas grid areas

Benefits

- Keep load within network limits while maintaining customer comfort
- Solution rollout could avoid or defer reinforcement in 606 clusters across SPD by 2040
- Helps customers to transition to low carbon heat quicker and benefit from flexible tariffs

Working in Partnership

Private and public sector working together

- Led by SP Energy Networks and supported by SSEN
- Financially supported by the Scottish Government LCITP fund
- Heat Electrification Strategic Partnership
- Three local authority partners
- E.ON are the delivery partner including customer recruitment
- Derryherk developing the network tools

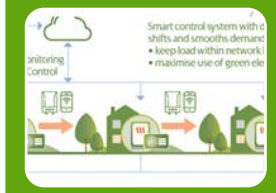
Re-Heat

WP1 : DSO Network Planning and Analysis Tools

- Network Tools, Design, develop and Integration to SPEN Systems
- Post-Trial Smart Solutions Modelling

WP2 - Direct Load Control Architecture and Deployment

- DLC development and delivery
- Operation and Monitoring

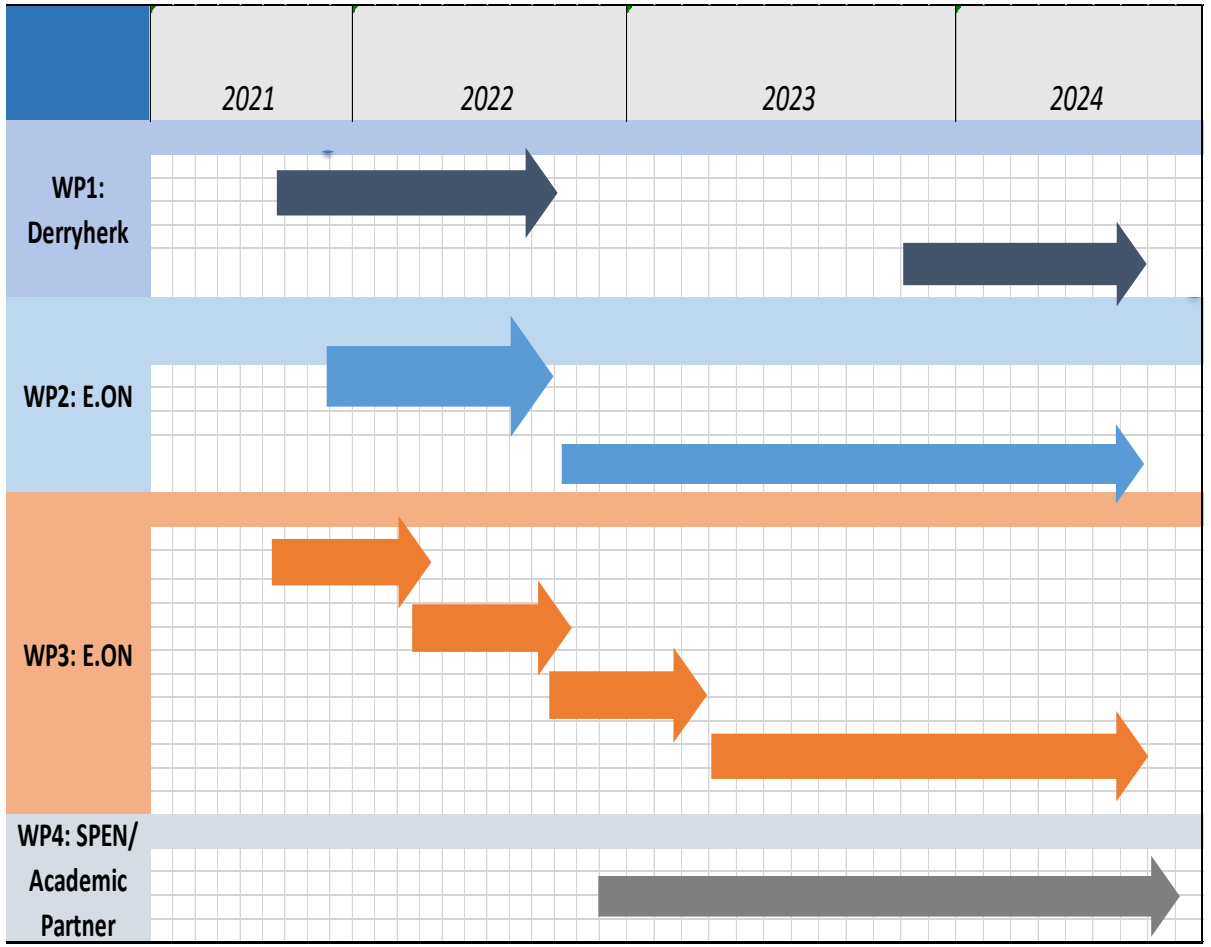


WP3 - Large scale live trials

- Inception, Planning, Procurement & Contracting
- Recruitment & Survey
- Installation
- Operation and Monitoring

WP4 - Analysis and Reporting

- Collation and analysis of field trial results and modelling



Current status and plans

- Good progress with NAVI developments for system modelling
- Detailed design of in-home solution and E.ON platform nearing completion
- Customer recruitment underway – 7000 homes receiving letters
- Good engagement from customers with aged oil-fired boilers
- Pilot installations planned for October 2022
- Aim to complete all domestic installations by March 2023

Louise Taylor
SPEN ICE Engagement Manager

Incentive for Connections Engagement
ICE Plan Update November 2022

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

Action 1 Policy Documents

We committed to updating and publishing 4 policy documents this year. 11 have been done so far.

Equipment Register		29.04.22
New connections ICP approval	Asset – 01-015	02.08.22
General Spec Civil Substation	Sub - 03-017	30.06.22
Appendix 1 for above spec	Sub – 03-025	30.06.22
General Spec prefab substation	Sub - 03-041	05.04.22
SPEN install LV Internal Mains	Cab – 03-032	13.10.22
Authorisation process	OPSAF – 13-001	12.08.22
LV/HV Connection SPEN & ICP	Con – 04-002	01.07.22
Project completion	Con – 04-006	17.05.22
Declaration of test result 1 ph	Con – 09-001	17.06.22
Declaration of test result 3 ph	Con – 09-001	17.06.22

These can all be found here: https://www.spenergynetworks.co.uk/pages/documents.aspx

Action 2- Communication

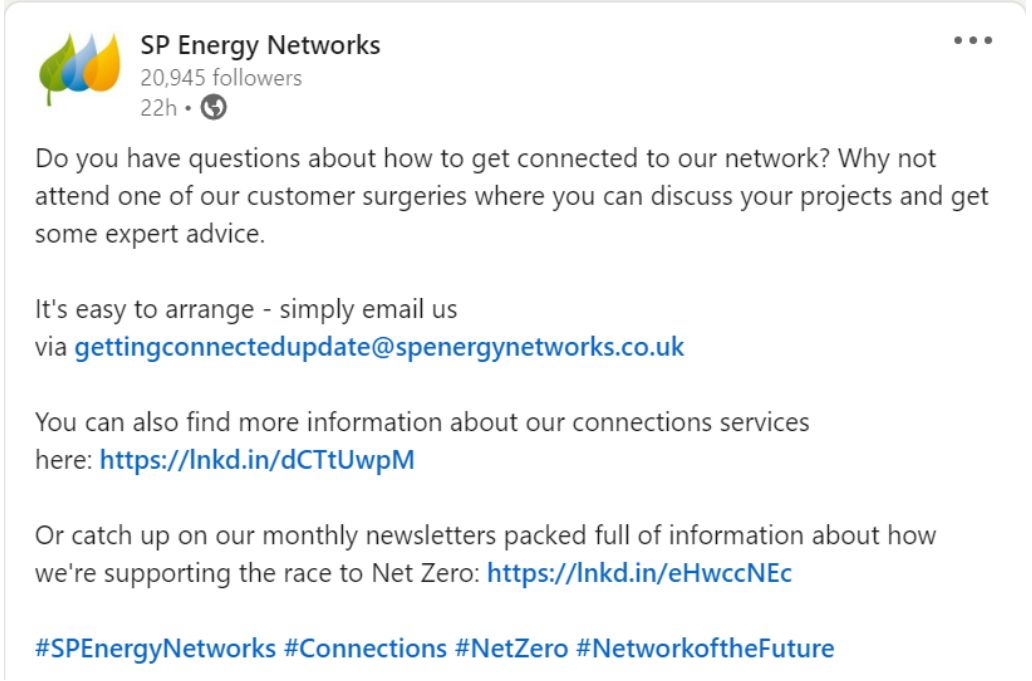
Date of Conference
Wednesday 15th June 2022
Wednesday 26th October (Postponed from 14th September)
Wednesday 7th December 2022
Wednesday 8th March 2023

Customer Surgeries

We continue to offer them to anyone who would like them and these are advertised on social media

Net Zero Conferences

We continued to host our Preparing for Net Zero Conferences each quarter.



Action 2- Communication

Stakeholder Newsletters

We have continued to produce monthly newsletters to give a regular update on the work we are doing to facilitate Net Zero and to help customers understand the improvements we are implementing to make connections simpler and more efficient.

All newsletters are available here:

https://www.spenergynetworks.co.uk/pages/stakeholder_newsletters.aspx

Action 2- Customer Relationship Manager

www.spenergynetworks.co.uk/pages/connections_contact_us

Details of how to contact our Connections team are detailed below. Printable contact lists are available for SPD and SPM. Our full contact us page is also available.

View the printable contact list for the SP Distribution licence area

View the printable contact list for the SP Manweb licence area

SP Distribution
Customer Relationship Manager

Nicola Maxwell

nmaxwell@
spenergynetworks.co.uk

SP Manweb
Customer Relationship Manager

To Be Appointed

Action 3 - Customer Contact

Customer Engagement Focus Groups

We will continue to host our 'Customer Engagement Focus Group' to discuss and review any ongoing proposed website modifications prior to publication

Customer Engagement Focus Group
Wednesday 3rd August
Wednesday 8th February 2023

August session we discussed iDentify and the Design Self Service Tool

Please let us know if there are specific topics you wish for us to cover at our February session

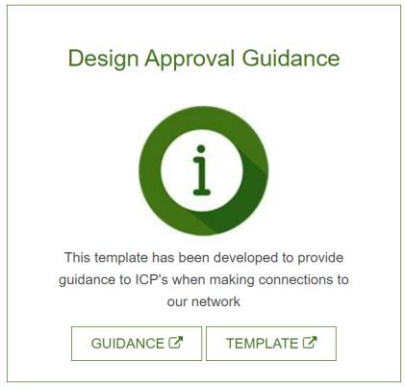
Action 4 – ICP/IDNO

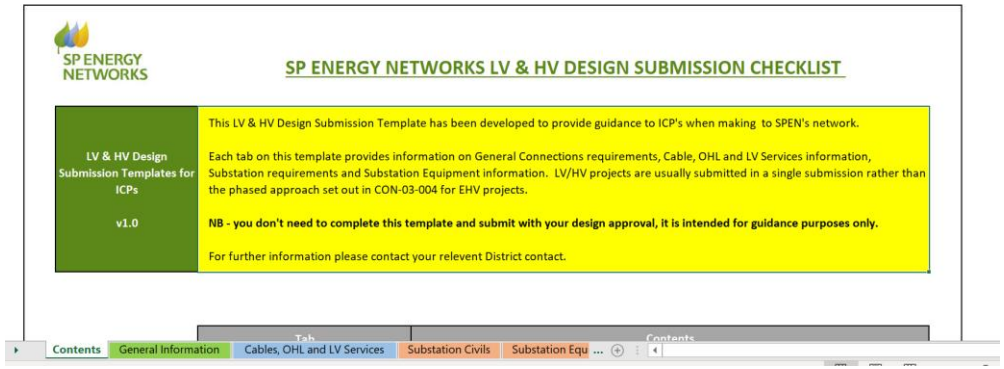
Design Approval Guidance

As part of this year's ICE actions we've committed to develop design approval guidance for our ICP customers.

The aim is to be more explicit in identifying the information we require and to provide supporting documents and guidance to assist you in preparing your design approval submission.

This should lead to a more consistent approach from SP Energy Networks designers in both SPD and SPM licence areas and help you to submit designs which are more likely to gain approval at the first attempt.





https://www.spenergynetworks.co.uk/pages/information_for_icps_and_idnos.aspx

Action 4 – ICP/IDNO

RAdAR Working Group.

We have hosted 2 Workshops this year, will a further 2 planned for next year.

Radar Meetings
Wednesday 17th August 2022
Thursday 13th October 2022
Wednesday 11th January 2023
Wednesday 29th March 2023

We have now gone live with the 7 changes that we committed to delivering:

- Upload enhancements – speed, file size and multiple drop
- POC Register Improvement - SLC15 Expiry Dates visibility
- Search functionality improvements
- Land rights flexibility added
- Increased duration before Timing Out
- Hyperlink to latest minimum info requirements on application form
- Ability to reject a POC Acceptance if documentation missing

RAdAR changes
now Live!
20+ new application
Additional File Size Being Used

Action 4 – ICP/IDNO

ICP Safety Seminar: Thursday 16th February 2023

Key areas for Possible Focus at next Workshop

- Need more traction with manufacturers and Installers
- Look to benchmark with other DNO's / IDNO's and ICP's
- Need to work together to raise awareness of the improvements within the industry
- Lobbying all manufacturers to gain their support and commitment

- SPEN and GTC looking for ither IDNO's and ICP's to share the delivery of this workshop
  - Is this something you want to get involved in?

Action 8 – Partnership

Action 8 - We will continue to share the learnings and best practice from our Net Zero Knowledge Forum with our wider base of community partners, academic institutions and local government bodies.

We will disseminate all learnings at our quarterly Preparing for Net Zero Conferences and on our website

Action 8 - We are currently Creating a Optioneering and Decision making model for the Net Zero Community.

- Tirage Filter to Focus on Key LCT tools aligned with Building Architype and specific project
- Dynamix LCT Scoring Matrix – which incorporates a full suite of climate, social and commercial elements
- Year on Year Utility investment map to allow Customer alignment of plans
- Individual LCT Playbooks that outline all the key information regarding each technology
- Model to create an overall 10 year + Climate master plan

Action 9- Preparing for DSO & Action 10- Project Charge

Action 9 Preparing for DSO

At our Preparing for Net Zero Conference in October 2022, we had Smarter Grid solutions presenting on Active Network Management. A further update will be done at our March conference on Wednesday 8th March 2023.

Action 10 Project Charge

There will be an update at our Preparing for Net Zero Conferences in the afternoon session at 14:00

Dates for the diary

Dates for the diary

Wednesday 8th February- Customer Contact Focus Group

Thursday 16th February – ICP/ IDNO Safety Seminar

February/ March TBC- ICP Design Template Webinar

Wednesday 8th March - Preparing for Net Zero Conference

Please register for our next events at:

spenergynetworks.co.uk/stakeholderevents

Thank you for your time today.

Your feedback has been useful and we will incorporate your comments when planning our next engagements.

Please register as a stakeholder if your would like to receive further updates from us:

spenergynetworks.co.uk/register