# Working with a distribution network operator (DNO)

real-world challenges and solutions



Salix DNO workgroup

# Our guest speakers

## Scottish and Southern Electricity Network (SSEN)

- **Margarita Bogatsjova**
  business relationship manager, SHEPD
- **James McNeish**
  major connections design manager, SHEPD

## Perth and Kinross Council

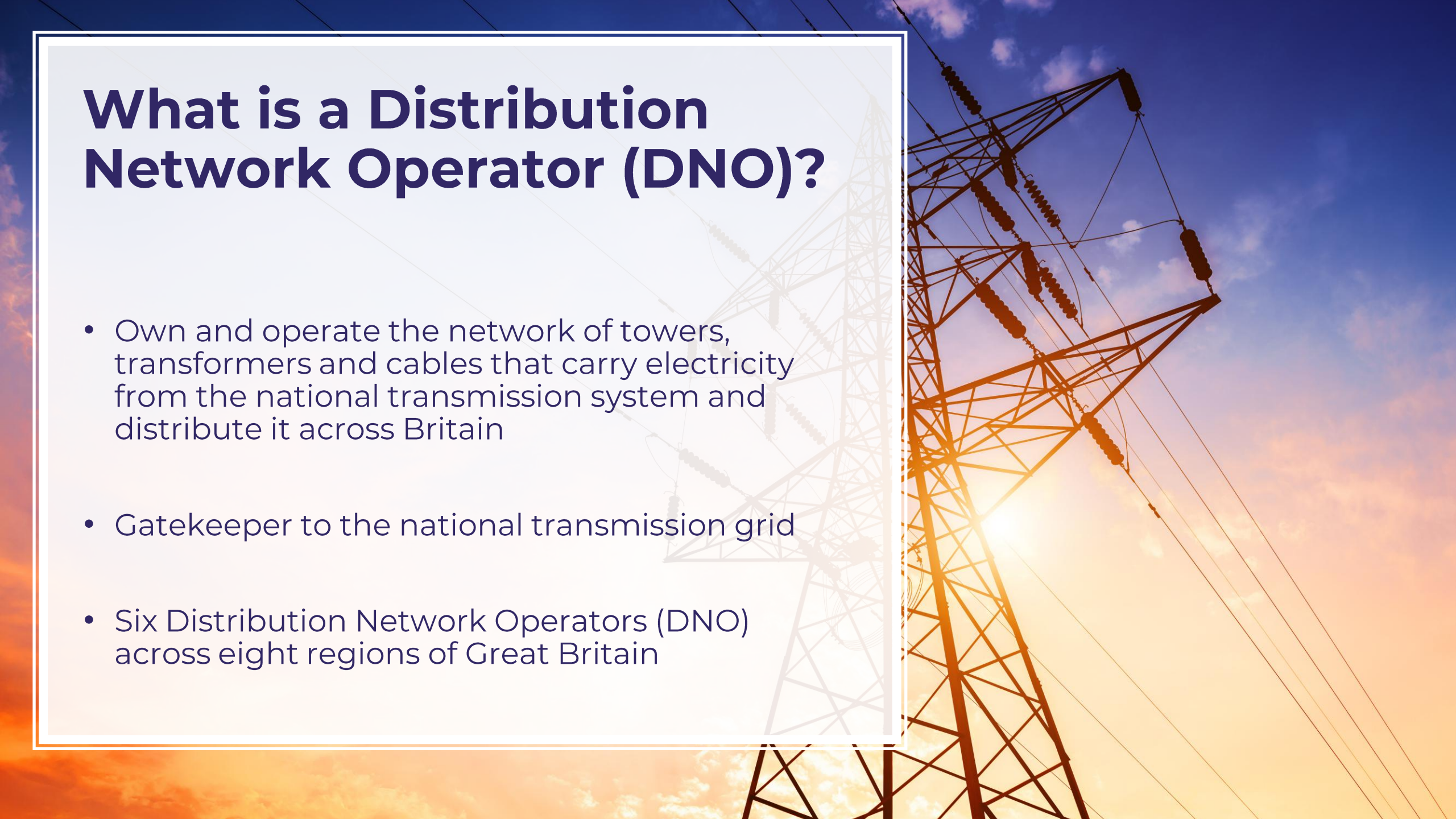
- **Chris Anton**
  principal officer, energy
- **Fraser Nicoll**
  lead officer, energy and decarbonisation

# Purpose

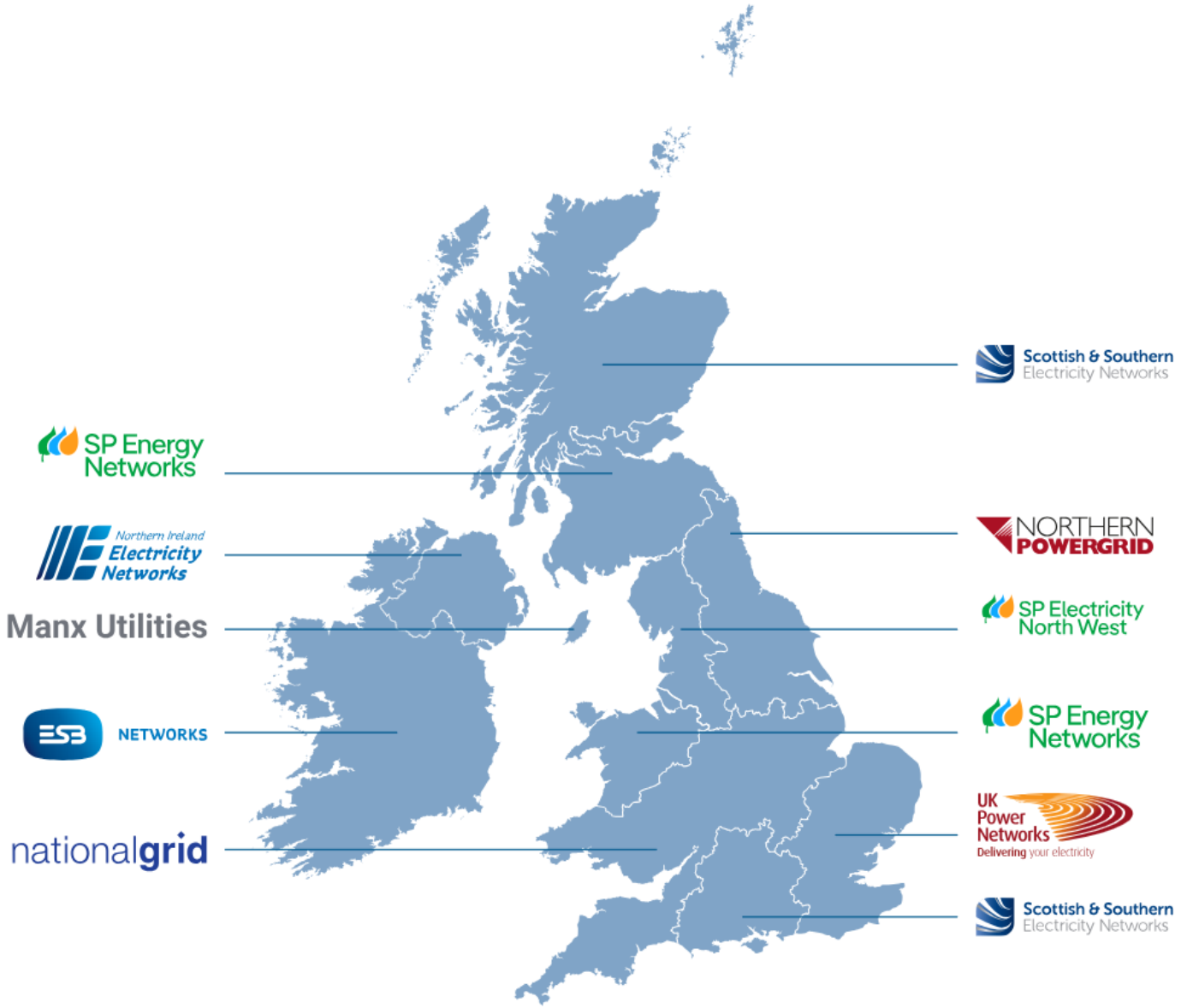
- Understand DNOs and their role in your project
- Support successful project planning and delivery
- Share good practice and lessons learnt
- Ask questions directly to our guest speakers

# What is a Distribution Network Operator (DNO)?

- Own and operate the network of towers, transformers and cables that carry electricity from the national transmission system and distribute it across Britain
- Gatekeeper to the national transmission grid
- Six Distribution Network Operators (DNO) across eight regions of Great Britain



# Who is your DNO?



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# Lesson one: engage early

- Contact the DNO before finalising your design
- Confirm the available capacity at each site
- Use the DNO’s response to inform your heating design
- Identify access, permissions and landowner requirements

# Lesson two: build in contingency

- Allow for changes between estimates and formal quotations
- Include contingency in your project budget
- Plan for DNO lead times and possible delays
- Review costs and timescales as the project develops

# Lesson three: remain flexible

- Review the design if network constraints arise
- Explore phased installation or commissioning
- Work with the DNO and your design team
- Check that changes still meet project requirements

# Lesson four: stay connected

- Use the contact named in your connection offer
- Tell the DNO promptly if project information changes
- Maintain regular contact with all stakeholders
- Raise questions and risks as early as possible

# Working with a DNO
# Real-World Challenges and Solutions

**Fraser Nicoll – Lead Officer – Energy & Decarbonisation**

**Chris Anton – Principal Officer - Energy**

PERTH & KINROSS COUNCIL

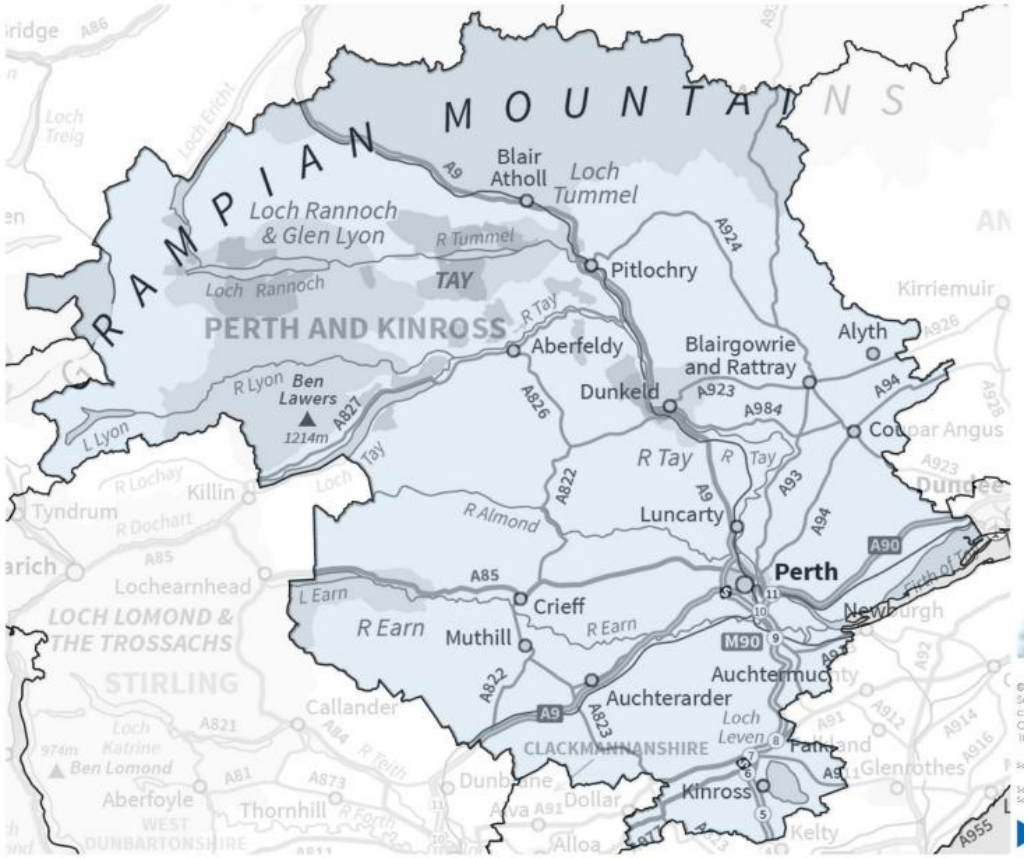


# Perth And Kinross

Covering 5,286 km², Perth & Kinross is one of the largest and most varied council areas in Scotland. The geography ranges from dense urban areas to remote rural communities and exposed Highland terrain. This diversity makes energy and heating improvements particularly challenging:

- Wide travel distances between sites increase project time and operational cost.
- Older rural buildings can have poor insulation, outdated systems, connectivity issues or access limitations.
- Remote locations experience harsher weather, increasing heating demand and requiring more resilient systems.
- Urban sites often need complex controls and integration with existing infrastructure.

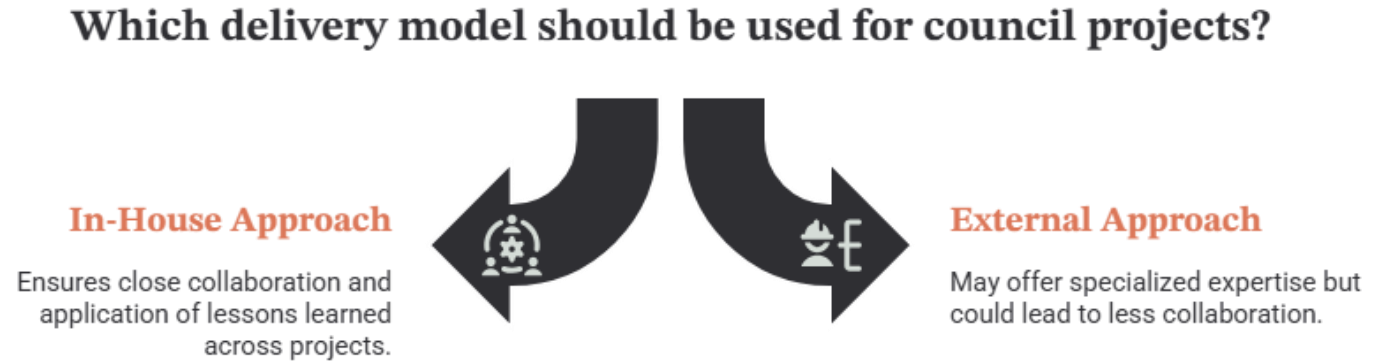
Because every building faces different conditions, a one-size-fits-all approach doesn't work; solutions must be tailored, innovative, and flexible.



# Our Delivery Model

Perth & Kinross Council's in-house approach

- Dedicated Energy, Mechanical and Electrical teams working closely together.
- The Energy team manages utility data, metering, supplier relationships, meter exchanges, fault resolution, and energy performance monitoring.
- Electrical engineers assess infrastructure requirements, coordinate DNO engagement and support electrical design and connection applications.
- Mechanical engineers develop low-carbon heating solutions and building services designs.
- Strong internal collaboration allows lessons learned from one project to be applied across the wider estate.

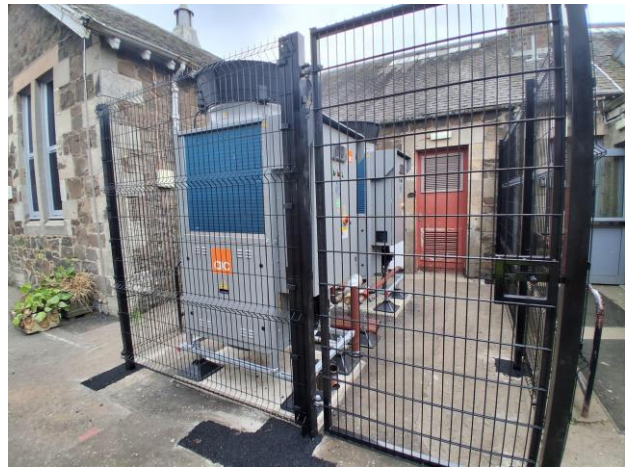


# Project Background

## Arngask & Auchtergaven Primary School

- Projects focused on replacing redundant or near end-of-life oil boilers.
- Measures included: Air Source Heat Pumps (heating only); building fabric improvements; decentralised hot water systems
- Thermal storage to reduce peak electrical demand
- Auchtergaven utilised point-of-use water heaters.
- Arngask utilised Sunamp thermal storage units.
- Fabric improvements and thermal storage were designed to reduce heat loss and minimise the required ASHP size and electrical demand.



# Working with a DNO- Challenges

## Electrical Capacity Constraints

- Electrical capacity investigations were undertaken as part of project development.
- Applications were submitted to SSEN to increase electrical supply at both schools.
- Initial responses identified network constraints and insufficient available capacity for the proposed upgrades, delaying the project.
- The outcome highlighted the importance of understanding network capacity at the earliest stages of project planning.

# Challenges- Desktop Assessments vs Site Reality

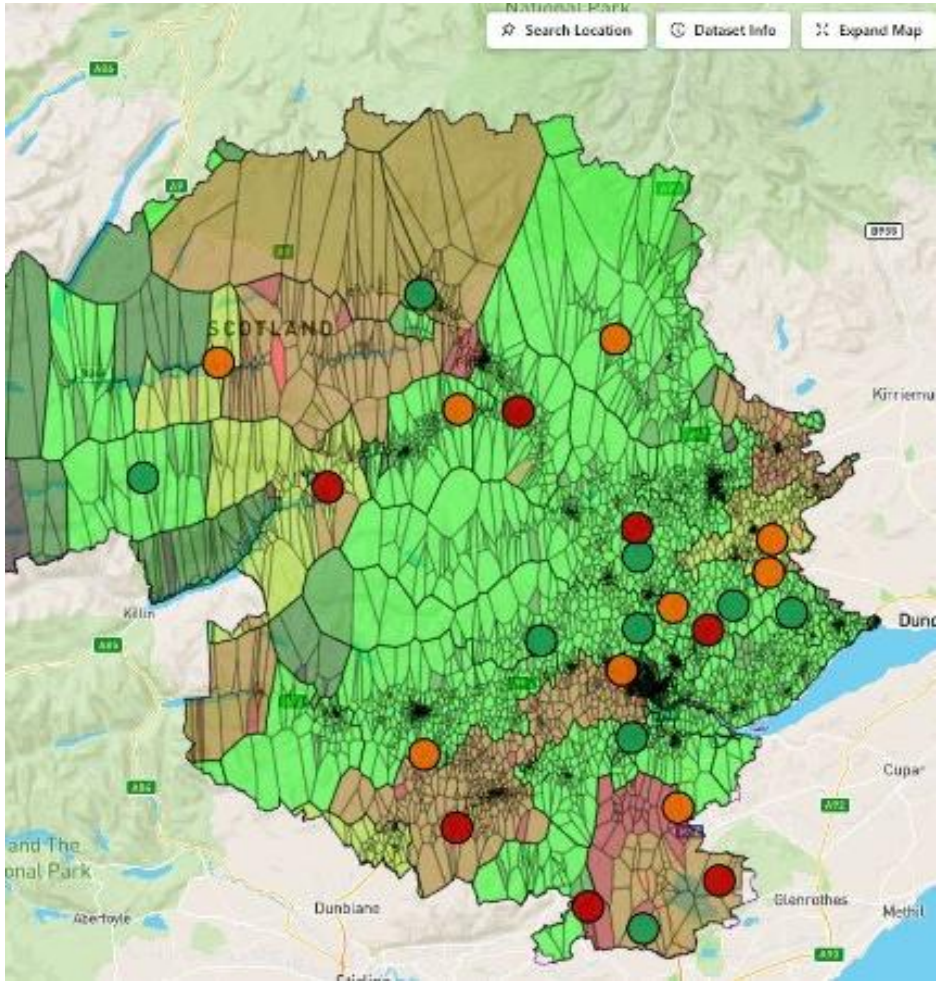
- Initial assessments were largely based on desktop information and available records.
- Existing site conditions and operational requirements were not always fully reflected within desktop studies.
- Early site visits helped validate assumptions and identify practical constraints.
- Greater technical collaboration during project development can reduce the need for later design and cost revision.
- Access to technical expertise/local project manager during the design and application stage could help validate assumptions and inform decision-making sooner.
- This may improve cost certainty and reduce the need for changes later in the project lifecycle.

# Working with SSEN

- PKC worked collaboratively with SSEN to identify a viable route forward.
- The parties agreed on a compromise solution, with PKC contributing a % to the cost of substation upgrades.
- This enabled increased supply capacity and upgraded connection arrangements for both schools.
- The projects subsequently progressed with low-carbon heating and supporting energy efficiency measures.

**Outcome**

- Successful delivery of ASHP projects
- Increased understanding of DNO requirements
- Better awareness of network constraints during early project development.



# Real Example: New Build Schools Capacity Optimisation and Cost Savings

- Optimising Capacity and TCR Banding Requirements
- Initial designs for new-build schools included relatively high electrical capacity requirements.
- Working with SSEN and reviewing demand assumptions helped identify opportunities to reduce required capacity.
- Capacity requirements were reduced significantly through design review and load assessment.
- Reduced infrastructure requirements and avoided unnecessary costs.
- Annual savings are estimated at around £100,000.

New Perth High School- Capacity reduced from 1300Kva to 500 kVA

Riverside Primary School 400Kva to 199 kVA

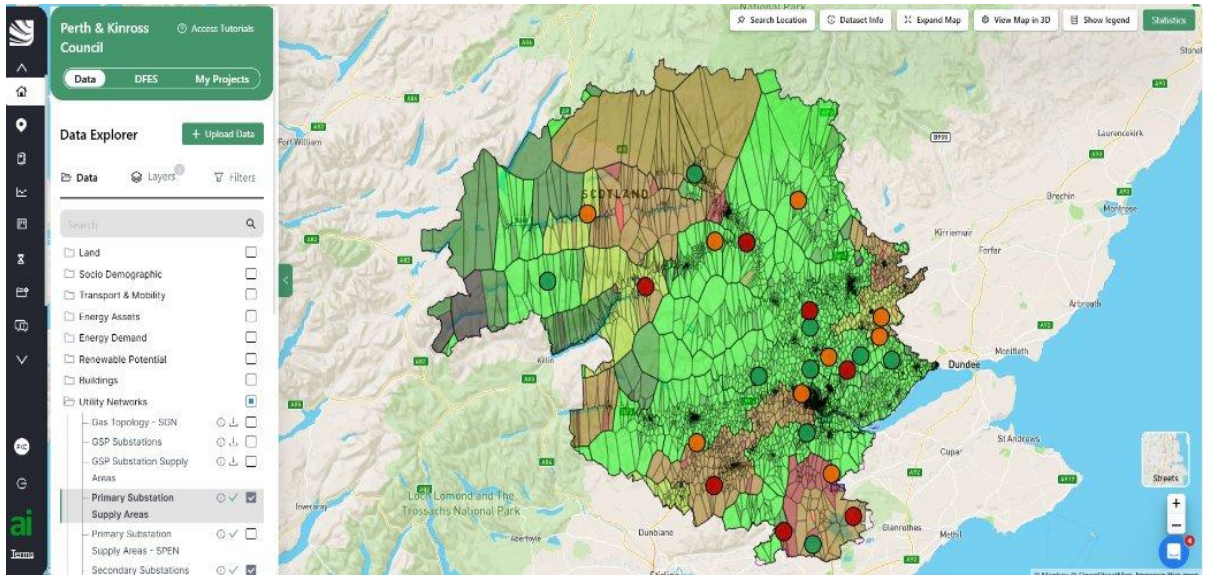
Auchtergaven Primary 218 Kva to 110 Kva

Bertha Park 650 kVA to 250 kVA

# LENZA/LAEP+ and Stakeholder Engagement

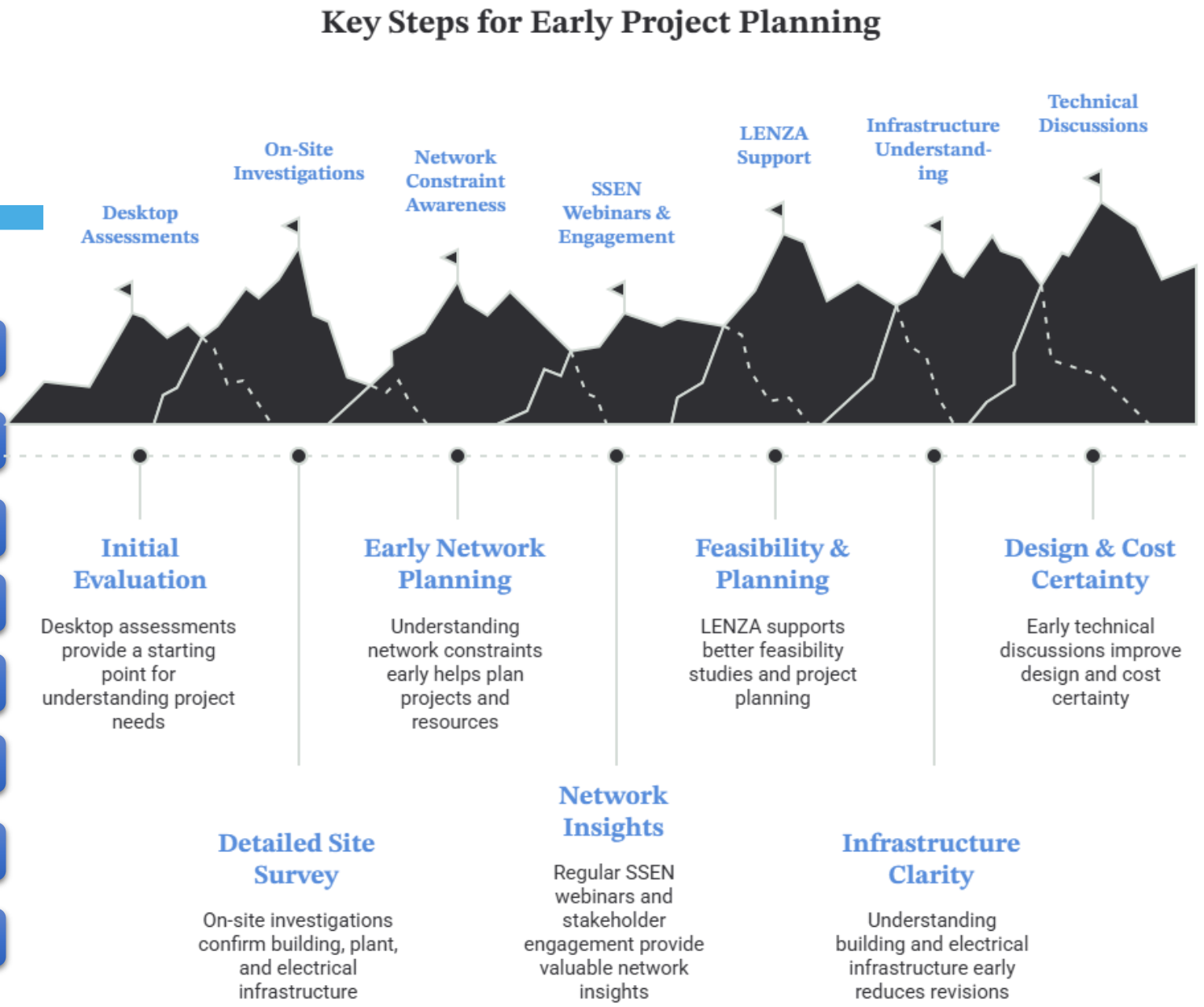
Following the experience at Arngask and Auchtergaven

- PKC now:  Uses SSEN's LENZA/LAEP+ platform during early-stage feasibility studies.
- Reviews primary and secondary substation capacity before developing projects.
- Assesses different decarbonisation and renewable energy scenarios.
- Supports heat network and area-based energy planning.
- Shares network insights across teams to support collaborative decision-making.
- Attends regular SSEN stakeholder workshops, webinars and engagement sessions.



# Lessons Learned

- Early DNO engagement identifies constraints sooner.
- LENZA improves early project planning.
- Site visits validate desktop assessments.
- Early planning reduces design changes.
- Technical engagement improves cost certainty.
- SSEN webinars provide valuable insights.
- Collaboration supports better decisions.
- Early network awareness reduces project risk.



# THANK YOU FOR LISTENING

**Prepared by Harsha Priya, Energy Technician – Energy, Perth & Kinross Council.**

# MARGARITA BOGATSJOVA
# BUSINESS RELATIONSHIP MANAGER

Scottish & Southern
Electricity Networks

# ABOUT US

Scottish & Southern Electricity Networks

# ABOUT US

- Our electricity distribution network delivers power to almost 4 million homes and businesses across the diverse and unique geographies of the north of Scotland and central southern England.
- As a regulated business, our investments and income are governed through a regulated price control process.
- We are part of the broad-based energy company, SSE plc, which is leading the UK's transition to net zero.

## OUR NETWORK AT A GLANCE

**Nearly 4m homes and businesses**

**More than 1m customers on our Priority Services**

**Over 129,000km of overhead lines and underground cables**

**470km subsea cables powering island communities**

**Over 4,560 employees across the country**



# SHEPD CONNECTION APPLICATION TYPES

Scottish & Southern Electricity Networks

# SHEPD CONNECTION APPLICATION TYPES




| | |
|---|---|
| **New Generation** | Hydro, Solar, Wind, BESS<br>G98, G99 & G100 applications |
| **Repowering Existing Generation** | Turbine upgrades<br>Generator replacement<br>Capacity increases |
| **New Demand Connection** | New buildings<br>Commercial sites<br>Farm developments |
| **Additional Demand / Load Increase** | Heat pumps<br>EV charging<br>Industrial expansion |
| **Flexible & Low Carbon Technologies** | Battery storage<br>Hybrid schemes<br>Hydrogen projects |

## Before You Apply

- ✓ Pre-application meeting
- ✓ Discuss project objectives
- ✓ Understand network capacity
- ✓ Identify constraints & costs
- ✓ Select the most suitable application route

**Early engagement helps avoid delays and identifies the most efficient connection solution.**

# BEFORE YOU APPLY

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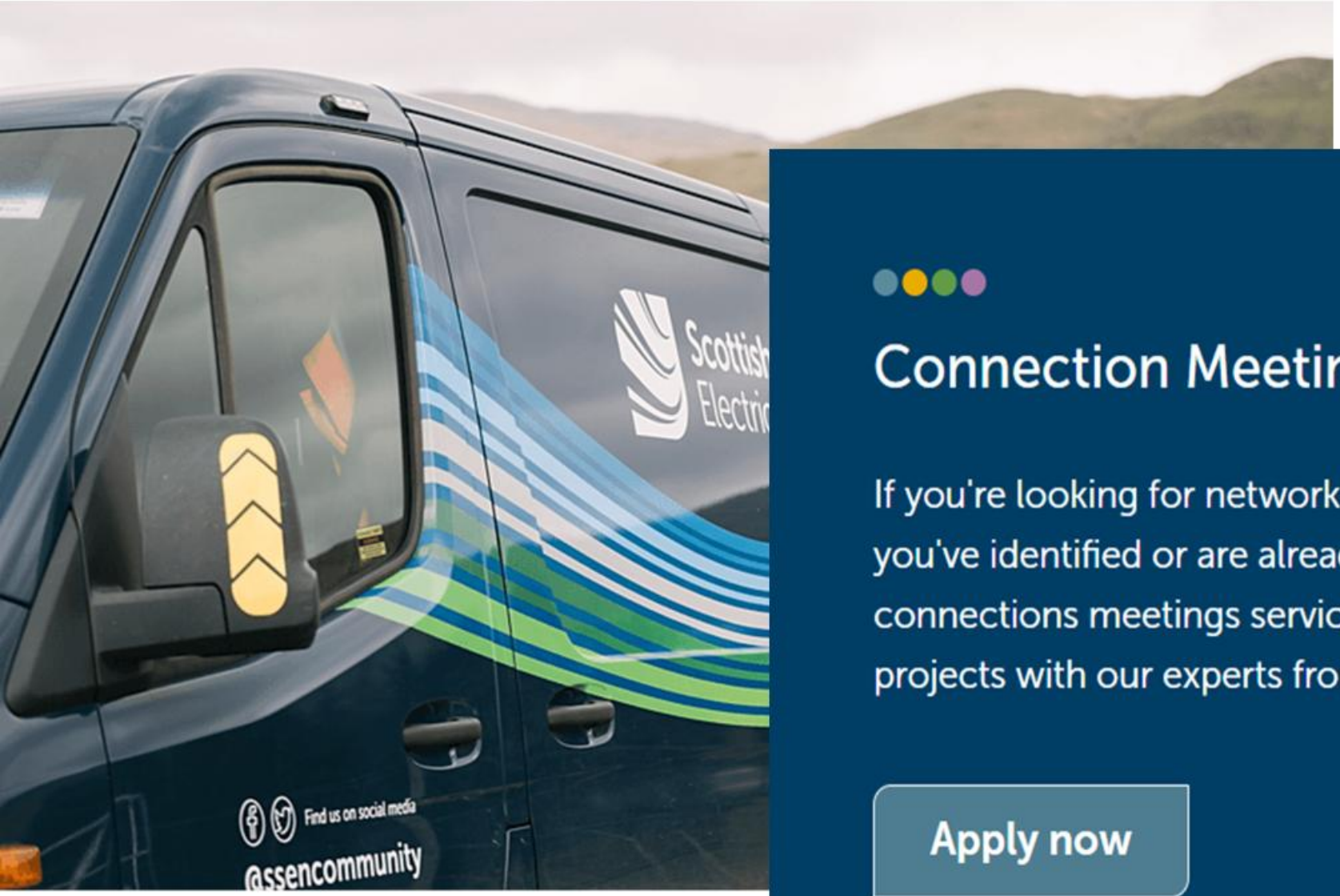


## Connection Meetings

If you're looking for network information relevant to a site or sites you've identified or are already progressing toward energisation, our connections meetings service provides an opportunity to discuss your projects with our experts from pre-application to delivery.

**Apply now**

# OPTIONS WHEN YOU APPLY

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# Budget Estimate

- Quick Quote
- Basic Costing for onsite works
- Free of Charge
- Can't be accepted
- No Network Study Completed




# Feasibility study

- Detailed option
- Accurate costs based on assessments
- Longer to receive than a budget
- Cost £248 to £8,060 paid early
- Up to three options can be looked at
- Good if you are considering different options
- Can't be accepted so still need a formal application




# Formal Offer

- Detailed option
- Accurate costs based on assessments
- Set timescales for issuing offer
- Cost £459 to £2,563 COE fee
- Restricted to Single Option
- Good when you know the solution
- Can be accepted



# FORMAL OFFER
# WHAT DOES SSEN DO?

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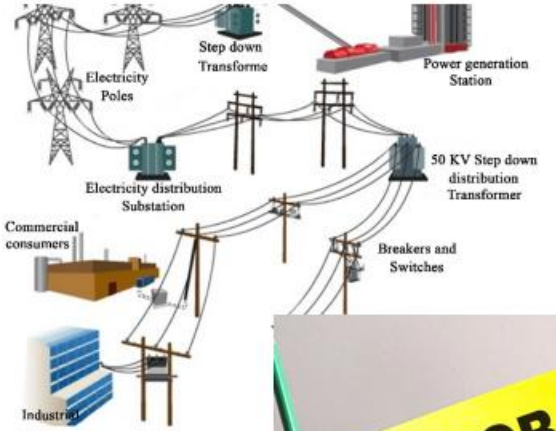
Network Studies

Cost and Prepare The Offer

Delivery of the Works

New Connection Agreement











# WHAT'S GOING ON IN THE INDUSTRY

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# Connections Reform
# CP2030



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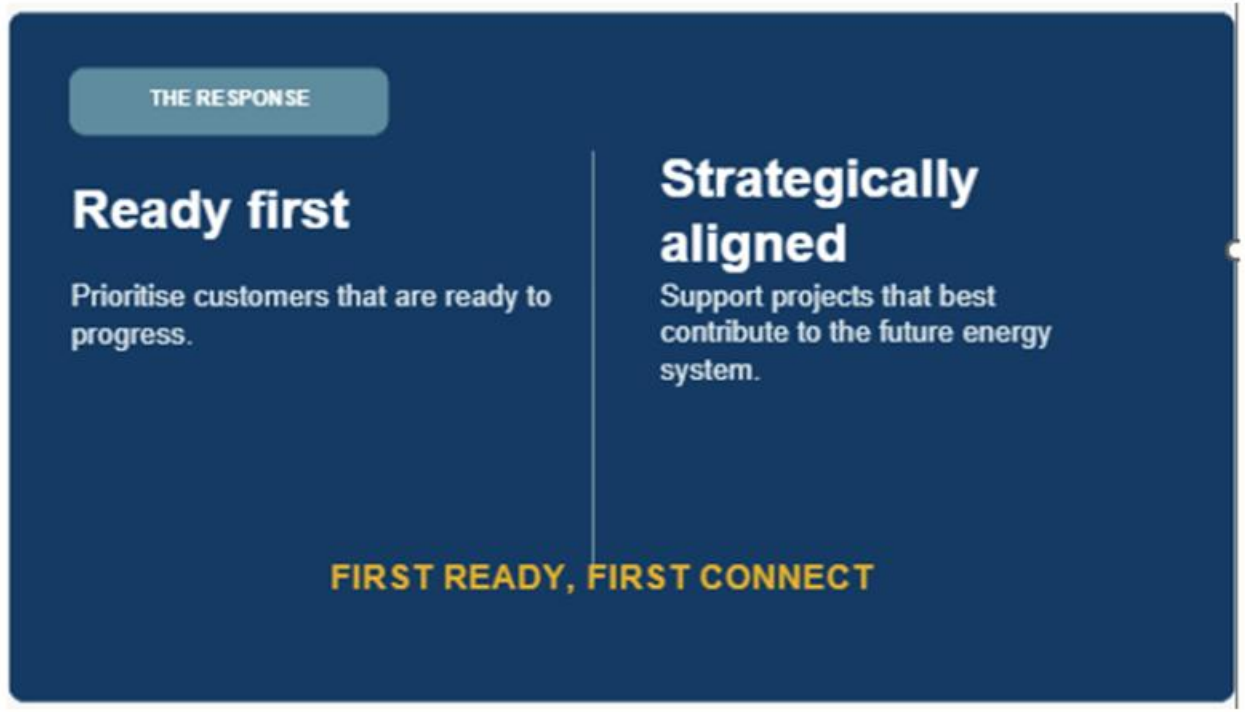
# The challenge is not ambition. It’s getting ready projects connected.

Connections reform shifts the queue towards projects that are ready and strategically aligned.

THE PROBLEM

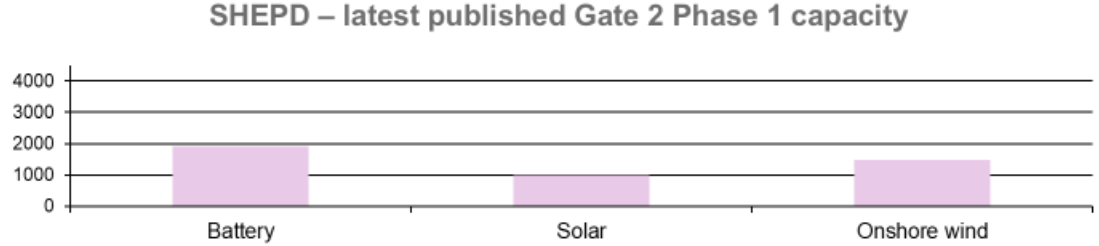
**The UK has ambitious 2030 net zero targets, but renewable projects cannot contribute until they connect.**

A long queue does not automatically mean faster delivery. Reform focuses capacity and attention on projects that can
genuinely progress.




**What changes for customers? Clearer prioritisation, refreshed information and a more deliverable route to connection.**

# CLEAN POWER 2030 FOR SSEN DISTRIBUTION







## Key takeaways – capacity allocations

- Connections Reform has reordered the SSEN queue around readiness and strategic alignment rather than historic queue position.
- Storage remains materially oversubscribed across both SSEN license areas; non-protected storage projects received Gate 1 offers.
- SSEN identifies a small 2030 solar undersupply in SHEPD and around 800 MW undersupply in SEPD against the CP30 allocation.
- Onshore wind is structurally different: SHEPD has an identified 180 MW 2030 undersupply; no SEPD onshore-wind projects applied in the reform process.
- 2035 solar should not be shown as a separate DNO-only quota under the updated CP30 framework.

## Key takeaways – projects

- The current framework uses Gate 2 / Gate 1 status.
- Gate 2 is the new delivery pipeline; Gate 1 does not reserve capacity, provide a queue position or guarantee a connection.
- Across GB, NESO's January 2026 detailed results identified 554.8 GW of projects expected to receive Gate 1 offers.
- Distribution Gate 2 Phase 1 offers are scheduled through November 2026, with Phase 2 through March 2027.
- Current data should therefore be described as a queue-formation / offer-delivery position, not delivered capacity.

# THANK YOU!

Scottish & Southern Electricity Networks

# Key takeaways

- Engage early
- Plan for change
- Explore your options
- Keep communicating

# How can we help

- Expertise from our DNO workgroup
- Practical guidance, FAQs and resources
- Webinars and direct insight from DNOs
- Lessons from public sector projects
- Support through your Salix relationship manager

**Have a lesson to share? Speak to your Salix relationship manager**

# Thanks for listening

Please also remember your relationship manager, single point of contact or project support officer is also available for any questions you may have

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