DISTRIBUTION FUTURE ENERGY SCENARIOS (DFES) WEBINAR

DFES 2025 AND HOW IT WILL INFORM OUR FUTURE PLANS

SHEPD Webinar

Scottish & Southern Electricity Networks

HOUSEKEEPING

- We're using Slido today to capture some of your thoughts and feedback
- Please feel free to ask questions throughout the session in the Teams chat
- Today's session will be recorded
- QR Codes

Video/webcams off
Please only turn your video on for the discussion in break-out rooms

Mics on mute
Please stay on mute unless you are asking a question

Technical queries
If you have any technical questions let us know

Slido

How many chocolate eggs did you eat over Easter?

DFES Webinar

AGENDA

11:00 - 11:10

Welcome and Introduction

Andy Wainwright
Whole System Manager

11:10 – 11:20

Transition to Pathways

Dom Bizabani
Strategic Development Engineer

11:20 – 11:30

Factoring local ambition and data into DFES

Ray Arrell
Associate Director, Regen

11:30 – 11:45

DFES technology forecasts

Pedro Aspiazu
Net Zero Engagement Specialist

11:45 – 11:50

Industrial Demand Forecasting

Rianne Cunningham
Net Zero Engagement Specialist

11:50 – 12:00

Next steps, Q&A and Close

WHO WE ARE

We are Scottish and Southern Electricity Networks Distribution.

Our electricity distribution network delivers power to over 3.9 million homes and businesses across the diverse and unique geographies of the north of Scotland and central southern England.

OUR NETWORK AT A GLANCE

Over 3.9 million homes and businesses

More than customers 1m on our Priority Services Register

Over 128,000km of overhead lines and underground cables

460km subsea cables powering island communities

Over 4,400 employees across the country

MANAGING POLICY UNCERTAINTY

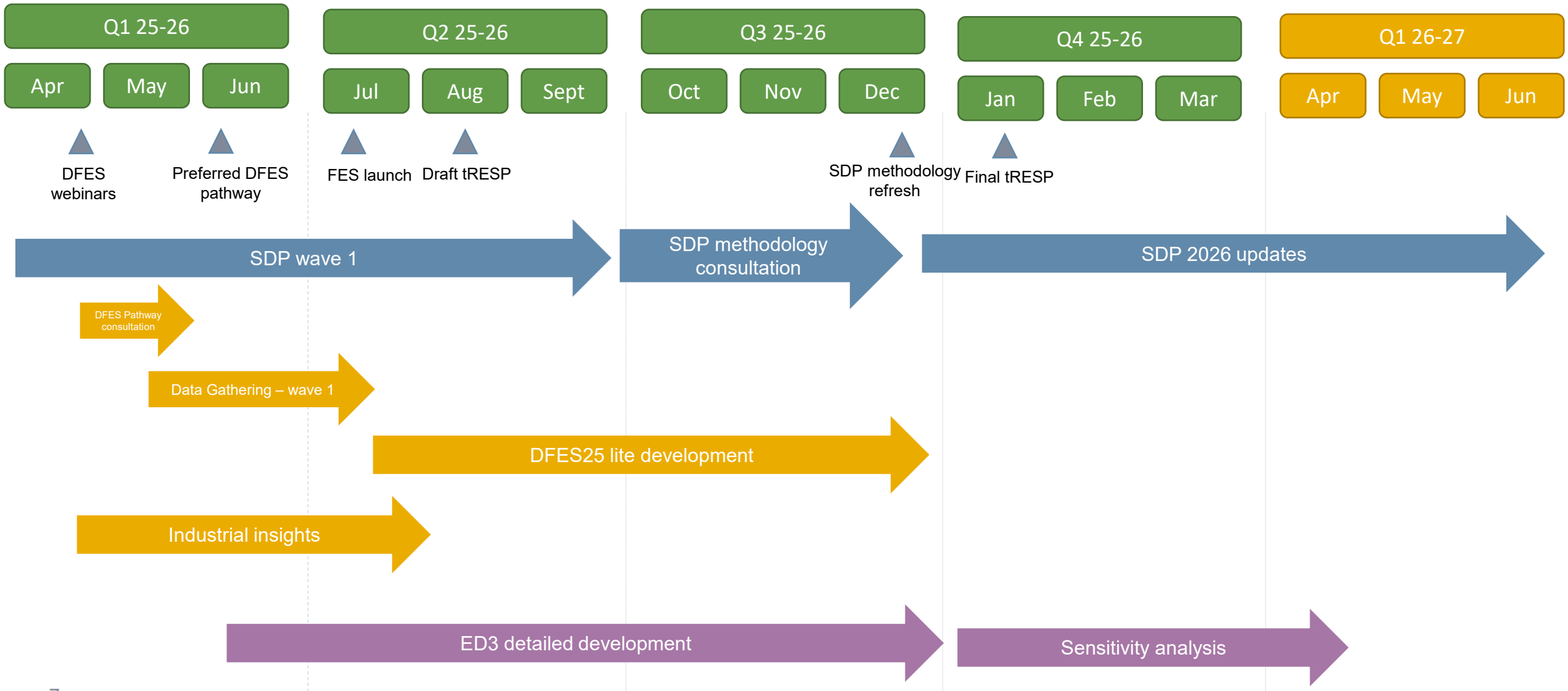
- There is significant policy change expected in 2025 including the outcome of connections reform and the government new homes ambition.

- We recognise the need to work with agility in our approach to determining future needs.

- We are therefore taking a more agile approach to the development of our plan that will see;

  - Earlier ingestion of insights from local authorities and other stakeholders.
  - Incremental updates that account for industry change as it happens.
  - A streamlined DFES25 process that will focus on major areas of changing electricity demand.
  - Incorporation of t-RESP as details become available.
  - Periodic reviews of our plans against major changes to forecast backgrounds.

DFES 2025 TIMELINE AND KEY INTERACTIONS



THE TRANSITION TO PATHWAYS

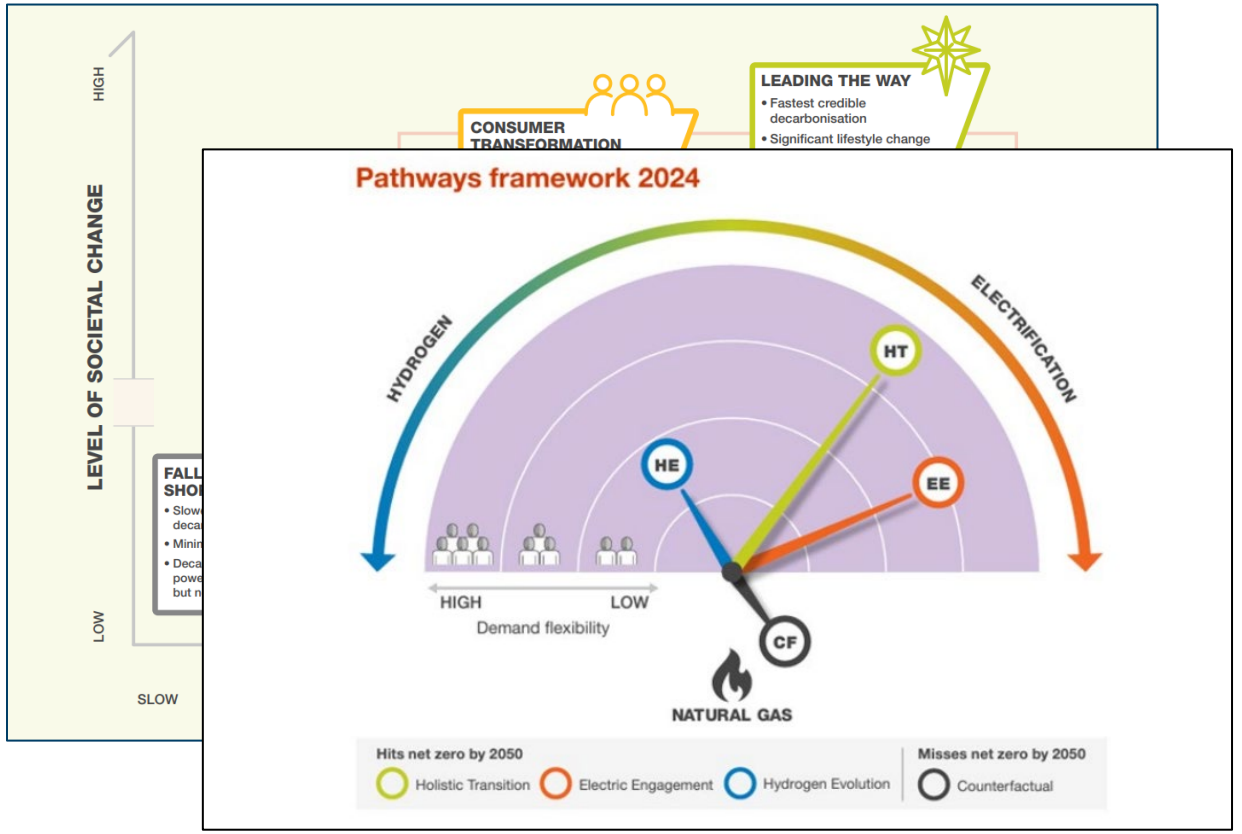
Dom Bizabani
Strategic Development Engineer

Scottish & Southern Electricity Networks

DFES PATHWAYS

The ESO have moved to DFES to a narrower Pathways, aiming to provide more clarity on the uptake of well-established technologies and solutions, whilst still reflecting ongoing uncertainties for how we are to decarbonise industry and homes.

- **Scenarios**: Distinct futures based on different assumptions, like “Consumer Transformation” or “Steady Progression.” They’re like parallel storylines.
- **Pathways**: Focus on the **routes** toward a particular goal, mainly **net zero,** highlighting the choices, interactions, and transitions along the way.



DFES PATHWAYS

Consumer Transformation

The 2050 Net Zero target is met by a high degree of societal change as well as deep electrification of transport and heat

System Transformation

The 2050 Net Zero target is met by relying on hydrogen to decarbonise the more difficult sectors of heat and heavy transport.

Leading the Way

This was the fastest of the scenario worlds to achieve Net Zero, with the highest level of societal change, utilising both hydrogen and electric low-carbon technologies.

Falling Short

General progress is made towards decarbonisation; however, this is the only scenario world that does not meet Net Zero by 2050.

Scenarios

to

Pathways

Electric Engagement

To explore a route to net zero under a highly electrified development path.

Hydrogen Evolution

To explore a route to net zero under a strategic hydrogen development path

Holistic Transition

To explore a route to net zero under a mixed technology development path.

Counterfactual

A reframe of FES 2023 Falling Short scenarios to become a Counterfactual that is deliberately separate from the core pathways. Falling short represented the slowest credible speed to decarbonisation. It did not meet net zero by 2050

SELECTING A BEST VIEW FORECAST

We're updating how we plan and invest for the future.

- During ED2, we based our planning around the **Consumer Transformation** scenario, the one most aligned with stakeholder ambition at the time.
- Feedback through LENZA now points to a shift in ambition, aligning more with the Leading the Way scenario.
- We're proposing to adopt the **Holistic Transition** pathway as our new baseline for investment planning for **ED3**.
  - ✓ Aligns with stakeholder ambition
  - ✓ Consistent with national transmission

Consumer Transformation

The 2050 Net Zero target is met by a high degree of societal change as well as deep electrification of transport and heat

Holistic Transition

Balanced Energy Mix
60% electricity, 19% hydrogen by 2050

High Renewable Integration
Large-scale deployment of wind and solar

Smart Consumer Participation
Widespread use of smart devices, EVs and heat pumps to manage energy demand flexibly

Grid Flexibility and Stability
Investment in energy storage and interconnectors

PROPOSED APPROACH TO VALIDATE THE BEST VIEW

- We want to ensure that our analysis continues to best reflect the ambitions of the communities we serve.
- This will inform and direct our approach and the selection of the best view pathway for ED3 planning.
- We want your views today but will also follow up with the opportunity to provide further feedback in our next newsletter.

On a scale of 1 to 6 (1 being not sure, 2 being not at all and 6 being strongly agree) how do you feel about this statement: "The holistic transition pathway accurately represents both ambitions and priorities"

FACTORING LOCAL AMBITION AND DATA INTO DFES

Ray Arrell
Associate Director

REGEN

Scottish & Southern Electricity Networks

DFES APPROACH - REMINDER

Distribution-connected electricity generation

Renewable and low carbon
- Onshore and offshore wind
- Ground-mounted and rooftop solar PV
- Hydropower
- Marine

Fossil fuels and waste
- Biomass CHP
- Renewable engines (anaerobic digestion, landfill gas and sewage gas)
- Energy from waste
- Diesel generation
- Gas fired power

Distribution-connected energy storage

- Large-scale battery storage
- Non-battery storage, such as LAES and High-Density Pumped Hydro
- Domestic battery storage
- Domestic thermal storage (w/ heat pumps)

Large-scale electricity demand

New conventional demand
- New housing developments
- New non-domestic developments
- Data centres

Low carbon demand
- Hydrogen electrolysers

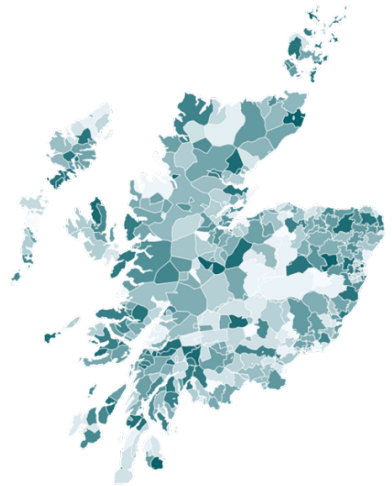
Small-scale new electricity demand

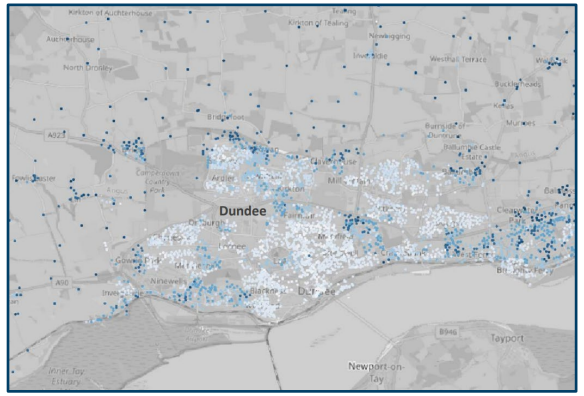
Low carbon heat
- Heat pumps (all types)
- Direct electric heating
- Domestic air conditioners

Low carbon transport
- Electric cars and motorcycles
- Electric LGVs
- Electric HGVs
- Electric buses and coaches
- Domestic EV chargers
- Non-domestic EV chargers

Baseline → Pipeline → Projections → Spatial Distribution

North of Scotland 11kV ESAs



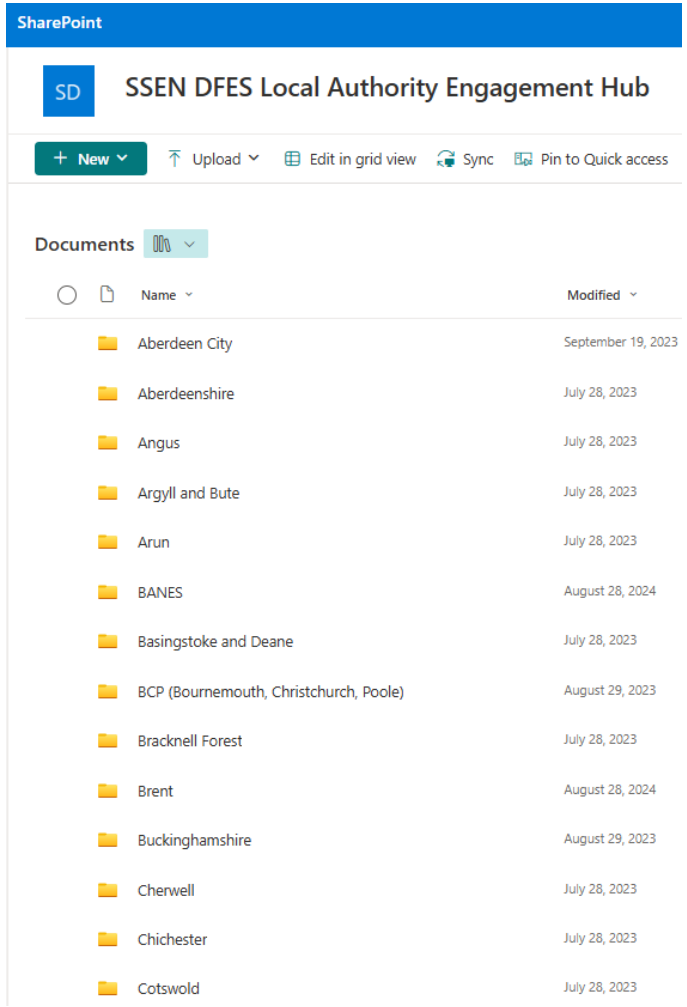


Dundee LV Secondary Substations

USE OF LOCAL DATA AND AMBITION IN DFES 2024

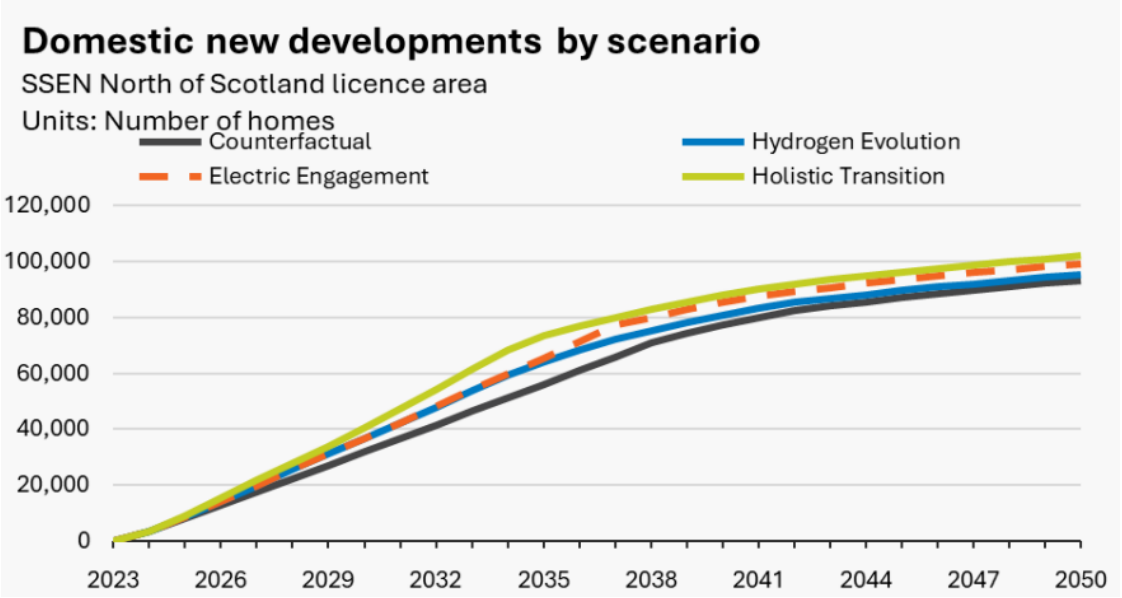
- Licence area specific engagement webinars
- Direct contact with project developers and sector experts
- New developments data exchange
- Use of LA planning status/information
- Local energy strategy survey and data share
- LAEP LHEES Reflect specific local energy plans/targets

UPDATING NEW DEVELOPMENTS DATA FOR DFES 2025



Seeking any updates to strategic housing or non-domestic developments in SSEN's licence areas.

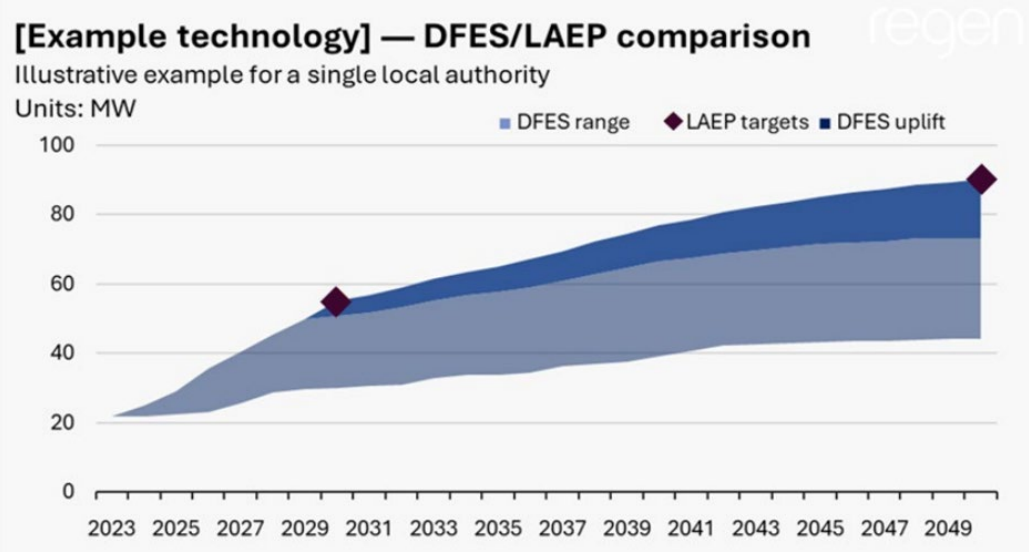
- New Labour housing targets
- Other strategic priorities that have come through from developers or commercial businesses
- Positive response rate in 2024, but would be great to get latest data where possible



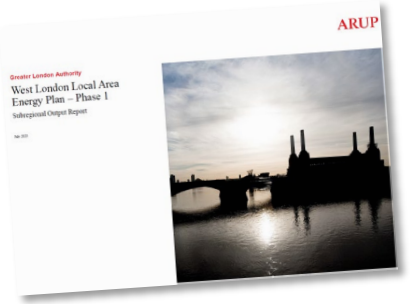
LOCAL AREA ENERGY PLANS

Our approach in DFES 2024 included comparing published LAEPs and LHEES sector targets to DFES building block projections in specific Local Authority areas.

Suitable uplifts were completed against the highest DFES scenario, to reflect higher levels of viable local ambition targets in the final projections for that LA area.



	Local authority	Borough	Technology	Sub-technology	Target	Units	Timeframe
1	Perth and Kinross	n/a	Onshore wind	n/a	14	MW	2035
	This target is within the DFES projection envelope and no adjustments to the DFES data were required.						
2	Perth and Kinross	n/a	Hydropower	n/a	6	MW	2035
	This target is within the DFES projection envelope and no adjustments to the DFES data were required.						
3	Perth and Kinross	n/a	Electric vehicles	n/a	5x baseline level	number	2029
	A fivefold increase in the number of EVs equates to 13,390 EVs registered in 2029 in the local authority area. This target is within the DFES projection envelope and no adjustments to the DFES data were required.						
10	Perth and Kinross	n/a	EV chargers	n/a	10,500	number	2045
	This target is above the maximum DFES envelope, and the most ambitious DFES scenario (for EV chargers this is **Electric Engagement**) has been uplifted by 10% to reflect this ambition for the Perth and Kinross local authority.						
11	West London	n/a	Solar PV	Small-scale	1,200	MW	2030
	This target is above the maximum DFES envelope, and the most ambitious DFES scenario (for small-scale solar PV this is **Holistic Transition**) has been uplifted by 10% to reflect this ambition for the West London geographic area.						



We would welcome any updates or newly published LAEPs to inform the 2025 analysis

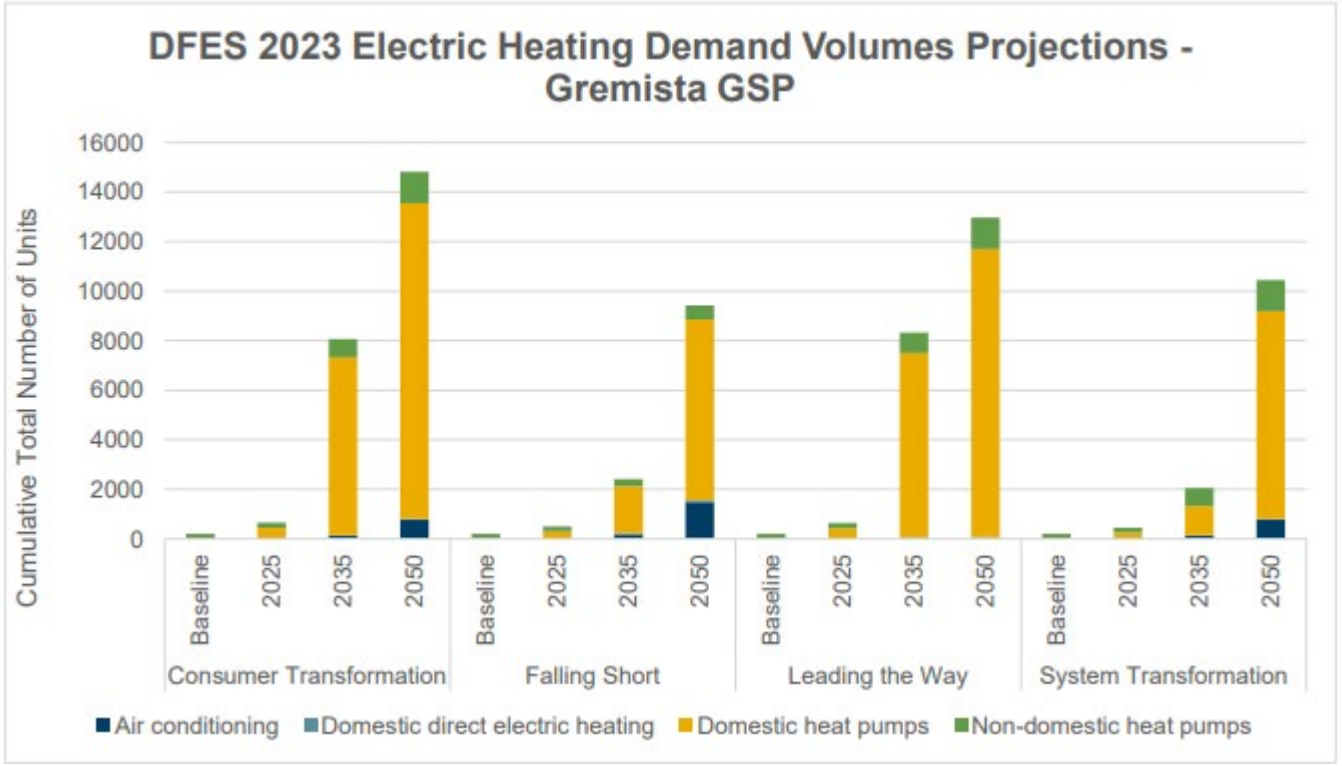
DFES TECHNOLOGY FORECASTS

Pedro Aspiazu
Net Zero Engagement Specialist

Scottish & Southern Electricity Networks

VISUALISATION OF TECHNOLOGY FORECASTS

- We have already provided visual charts of Grid Supply Point area trends for different Low Carbon Technologies within our Strategic Development Plans (SDPs).
- Feedback from stakeholders is that this is helpful but they would like to see data aggregated by different boundaries.
- In response we have recently moved to providing this data, and more, on our data portal.



DFES 2024 TECHNOLOGY PROJECTIONS

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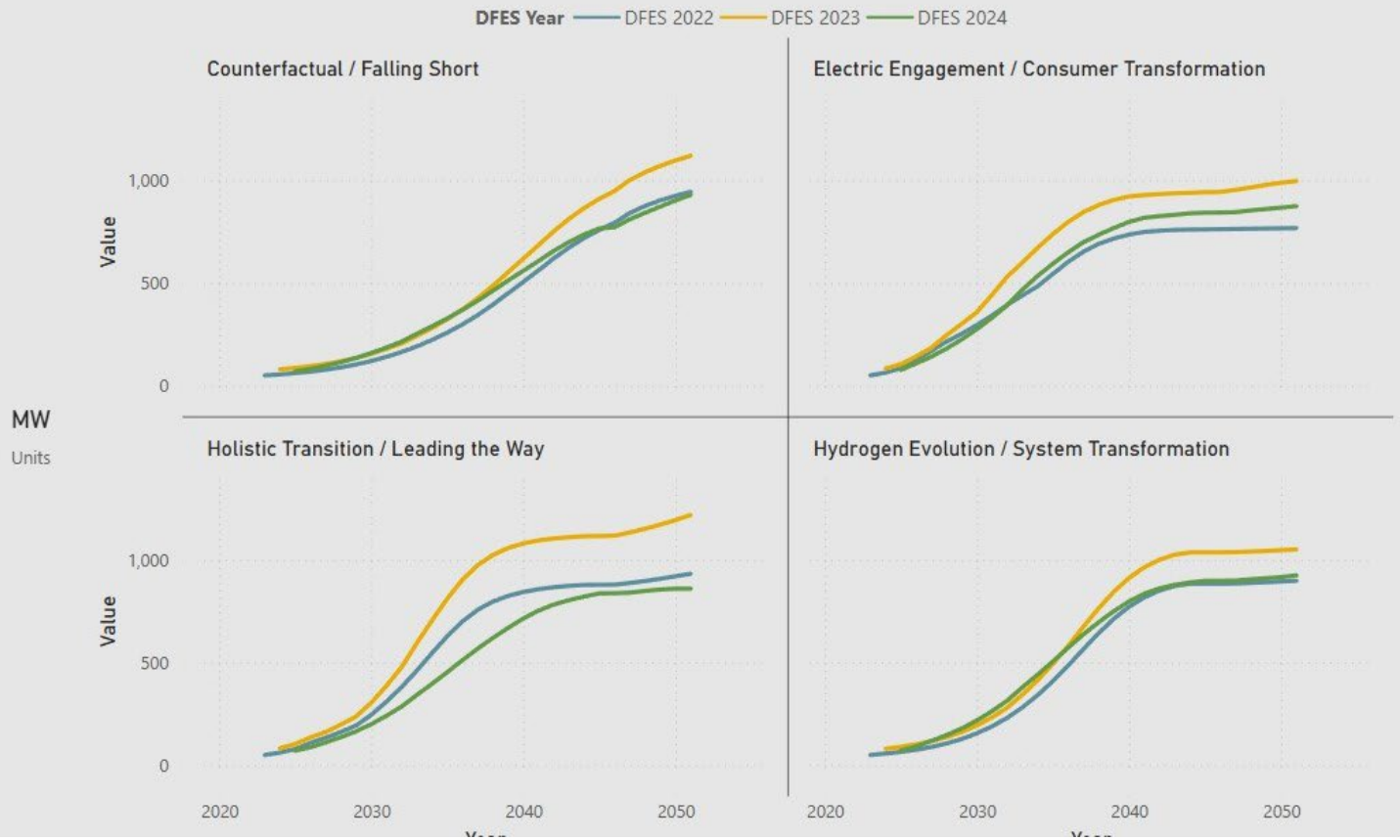
DSO Powering Change

SSEN DFES - SHEPD Technology Projections by Local Authority

Local Authority
All

Technology, Subtechnology
- Air conditioning
- Battery storage
- Biomass CHP
- Diesel
- Domestic direct electric heating
- Domestic heat pumps
- Electric vehicles
- Energy from Waste
- EV Charger - Domestic off-street with charger
- EV chargers
- Gas
- Hydrogen electrolysis
- Hydropower
- Liquid Air Energy Storage (LAES)
- Marine
- New Developments - Data centres
- New Developments - Domestic
- New developments - Non-domestic
- Non-domestic heat pumps
- Non-domestic resistive electric heating
- Offshore wind
- Onshore wind



Data can be viewed in three different geographies:

- Local Authority
- Strategic Development Plan
- Primary Substation

Data can also be filtered by sub-technologies:

- EV chargers
  - Car parks
  - Destination
  - Domestic on-street
  - En-route / local charging stations
  - En-route national network
  - Fleet/Depot
  - Workplace

GATHERING DATA ON THE MOST SIGNIFICANT DEMAND AREAS

Given the tight timescales for ED3, we are focusing technology data gathering on demand technologies with the greatest impact on our electricity distribution networks. The rapid growth of Low Carbon Technology (LCT) installations at the lower voltage levels require an agile approach in our distribution network planning.

This year we are proposing demand data collection of:

- EV chargers (domestic and non-domestic) *
- Heat pumps (domestic and non-domestic)
- Any other significant technologies (data centres, district heat networks, electrolysers, etc)

***** EV chargers are projected to be the largest aggregated demand technology on our electricity distribution network. Local authorities, in collaboration with their delivery partners (CPOs) and external local stakeholders (fleet operators), are encouraged to inform us soonest the ***future locations, timeline and power/unit*** of their planned installations.

GATHERING LOW CARBON TECHNOLOGY (LCT) INSIGHTS

We plan to collect LCT insights with demand data via an online questionnaire available on the data portal.

It needs to be used if you believe LCT forecasts have significantly changed since the values submitted in Autumn 2024.

This will be similar to previous surveys but now we will look to further align with other DNO practices where possible.

We aim to start data collection during week commencing 19th May and remain open for insights until 11th July.

We would also be interested in whether you would be prepared to submit LCT data directly to us via an online solution (e.g. spreadsheet).

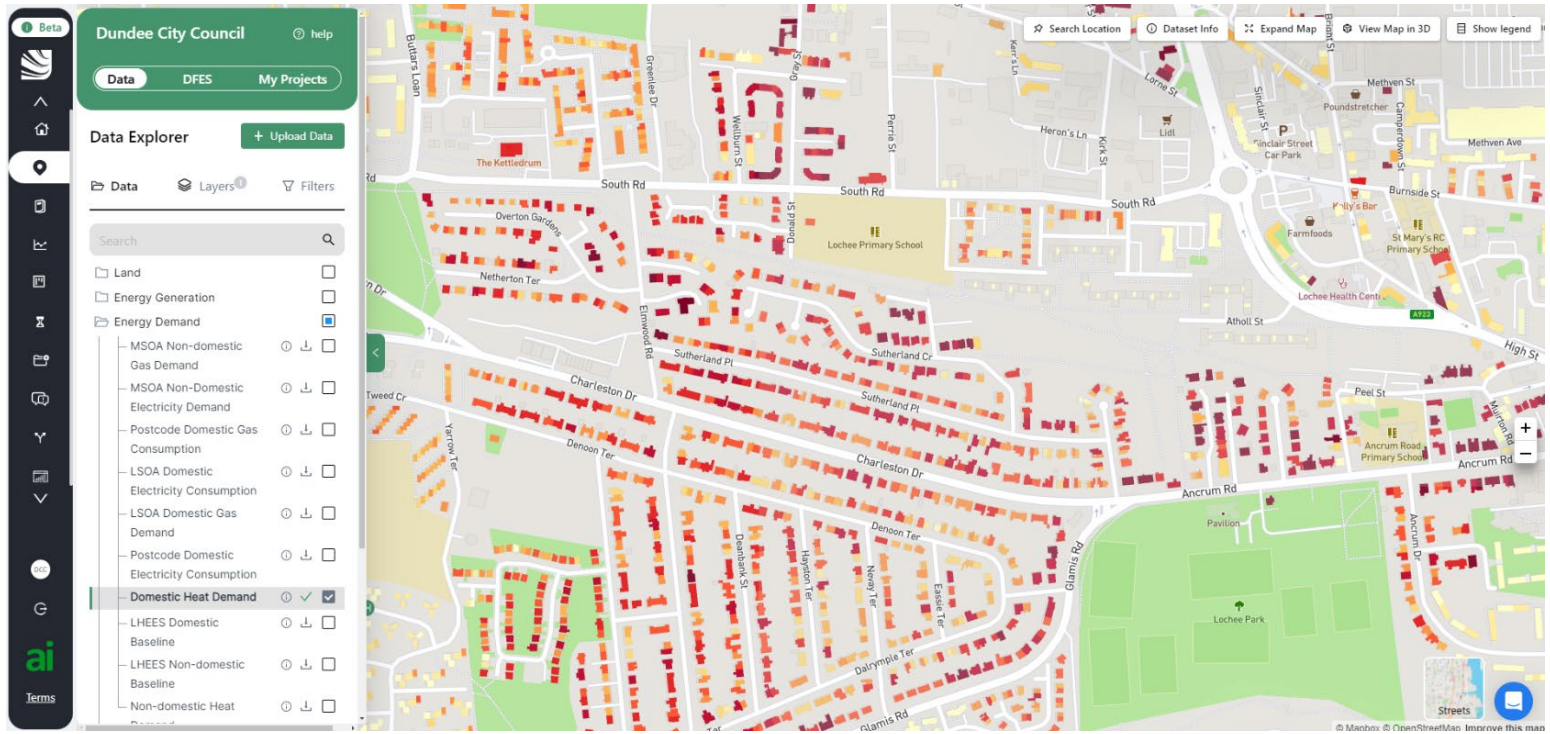
FUTURE ASPIRATION – LENZA USE

LENZA is a powerful visualisation tool that can support the development of local area energy plans and other decarbonisation strategies.

LENZA is now available to all local authorities in our licence areas, with over 470 active users currently and growing.

Our long-term aim is that LENZA will become a primary repository for the retention of energy insights enabling more efficient and frequent exchange of data.

This year we are opening the door to local authorities who may want to use LENZA to feed into the DFES process. Please contact us if this pilot is of interest.



Which method of data input would work best for you?

O a scale of 1-5 (1 being not at all and 5 being fully support), to what extent do you support our choice of LCT data inputs?

Are there any further demand techologies you believe we should investigate, and if so what are they?

INDUSTRIAL DEMAND FORECASTING

Rianne Cunningham
Net Zero Engagement Specialist

Scottish & Southern Electricity Networks

FORECASTING INDUSTRIAL DEMAND OUTSIDE THE DFES PROCESS

Forecasting future industrial demand

- Last year we trialled a method to enhance insights into **future industrial demand.**
- Insights on more bespoke large demand (e.g. process decarbonisation) is not routinely captured through **DFES building blocks.**
- These projections are not yet mature enough for connection applications but may influence **future strategy.**
- We refer to such demands as **'speculative'.**

How are we going to do this?

- We will be reaching out to stakeholders in key geographic areas through **surveys and bilateral** discussions.
- We will be rolling out this approach across **both licence areas** to understand future energy needs from industrial users.
- This will primarily be **ahead of SDP development.** Insights will inform both SDP development and more detailed optioneering.

Next steps and timeframes

- **Wave 1:** from late April for Q2 Strategic Development Plans
- **Wave 2:** from late May for Q3 SDPs
- **Wave 3:** from late June for remaining SDPs
- Our engagement leads will be in touch with further details.

Q2 2025	Q3 2025
• Keith • Errochty • Mybster • Tealing	• Braco • Inverarnan • Dounreay • Peterhead • Inverness

HOW WE WILL USE THIS INFORMATION

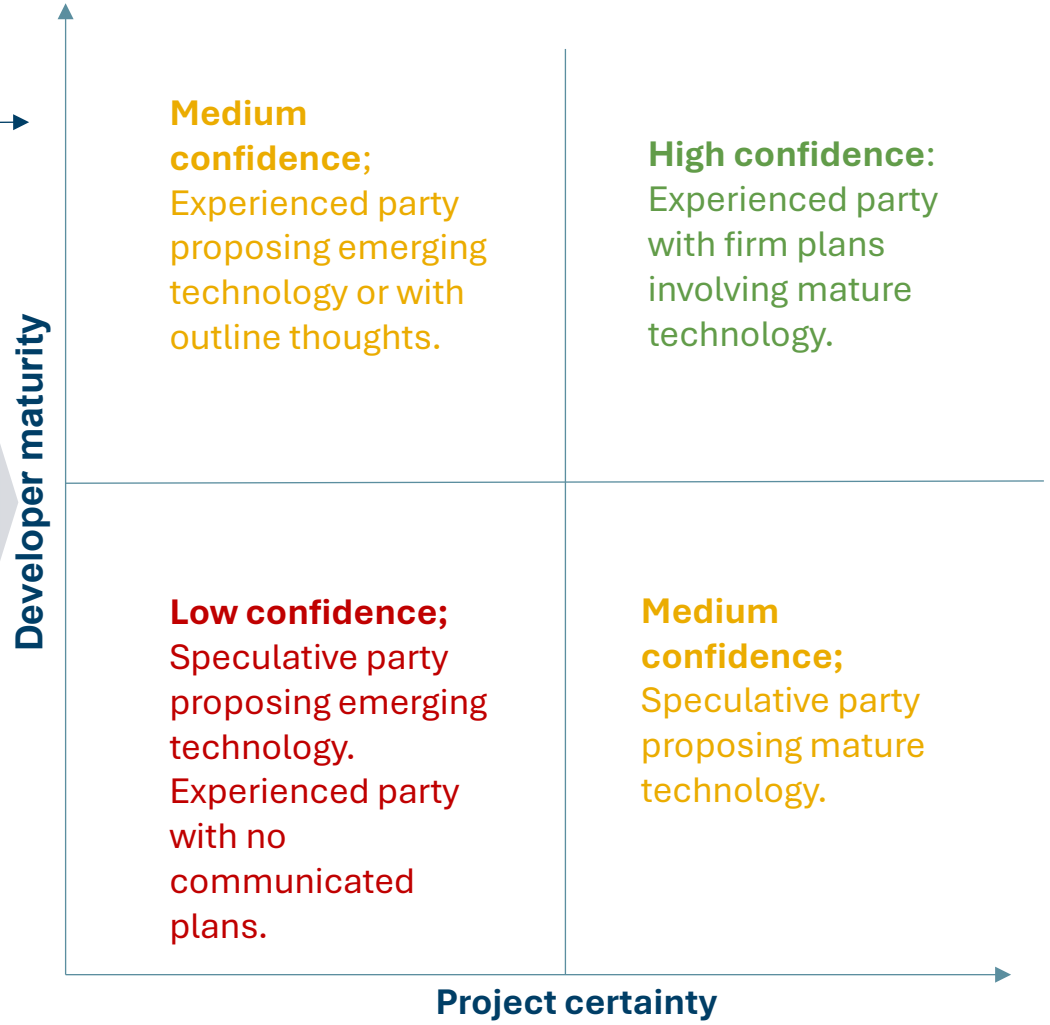
We will use the stakeholder insights to understand the confidence in future projections. The process will be as follows:

1. Classification of confidence: we will assess the insights to understand whether they have high, medium or low confidence in a demand forecast (see chart).

2. Application in forecasts: we will assess whether the insights should be added to our baseline projections based on the confidence level (see table).

3. Strategic Development Plan Development and Detailed Network Options: depending on the confidence level, the insights may be fed into our Strategic Development Plans and detailed optioneering for the area.

Scenario	Forecast demand growth
High confidence	Included in baseline projections
Medium confidence	Sensitivity analysis
Low confidence	May be used in some sensitivity analysis



On a scale of 1-5 (1 being not at all and 5 being fully agree) how do you feel about the following statement "I agree that the proposed insights gathering process is clear and logical".

Do you have any suggestions on how to further improve the process?

NEXT STEPS

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SUMMARY & NEXT STEPS

Validation of preferred 2024 DFES pathway

- Collect **initial feedback** from stakeholders on the preferred pathway (Holistic Transition) at today's webinar.
- Stakeholders to provide any **further feedback** to the Whole System inbox following today's session.
- Our plans will be further refined against tRESPs when available

Local authority DFES insights

- Survey opens on **19th May**
- Survey closes on **11th July**
- Please advise by 9th May if you would like to complete your DFES 2025 submission using LENZA.

Industrial demand forecasts

- Relevant stakeholders will be contacted by engagement leads ahead of SDP production.
- Wave 1: from late April for Q2 Strategic Development Plans
- Wave 2: from late May for Q3 SDPs
- Wave 3: from late June for remaining SDPs

Whole.system.distribution@sse.com

Q&A

Scottish & Southern Electricity Networks

THANK YOU

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