LONG TERM DEVELOPMENT STATEMENT

FOR SCOTTISH HYDRO ELECTRIC POWER DISTRIBUTION PLC'S ELECTRICITY DISTRIBUTION SYSTEM

November 2024

Scottish & Southern Electricity Networks

SCOTTISH HYDRO ELECTRIC POWER DISTRIBUTION PLC
LONG TERM DEVELOPMENT STATEMENT

FOREWORD

Scottish Hydro Electric Power Distribution plc (SHEPD) is pleased to present this Long-Term Development Statement (LTDS) for its electricity distribution network. It is produced by SHEPD in accordance with its Electricity Distribution Standard Licence Condition (SLC) 25. The statement covers the period 2023/24 to 2028/29.

The main purpose of the LTDS is to assist existing and prospective users of the electricity distribution network in assessing opportunities available for making new connections, or for additional use of the SHEPD distribution system.

The assets referred to in this document are in the ownership of Scottish Hydro Electric Power Distribution plc which delivers electricity to over 795,437 customers in Scotland.

Although all reasonable efforts have been made to ensure the accuracy of data, SHEPD does not accept any liability for the accuracy of the information contained herein and in particular neither SHEPD, nor its directors or employees, shall be under any liability for any errors.

CONTENTS

INTRODUCTORY SECTION

1 PURPOSE OF STATEMENT

This Long Term Development Statement (LTDS) is prepared in accordance with Standard Licence Condition 25.

The purpose of this statement is to:

- Provide sufficient information which will assist existing and prospective new users who are contemplating entering into distribution arrangements with the licensee, to identify and evaluate opportunities.
- Ensure the general availability of such information in the public domain.
- Inform users of distribution network development proposals.
- Provide users of the correct point of contact for specific enquiries.

Users of the distribution system should also be aware that the main document which governs development and operation of the distribution system is the Distribution Code. This code covers all material technical aspects relating to connections to and the operation and use of the distribution systems of the Licensee.

2 CONTENTS OF STATEMENT

This LTDS is in two parts.

- Part 1 gives an overview of document content and provides relevant contact details and sources of information.
- Part 2 contains detailed information of the system.

The statement contains a range of information associated with our 33kV distribution system, including the 11kV busbar of 33/11 kV primary substations.

Information relating to 11kV, and LV systems may be available on request depending on the area. A price list for the provision of this data is included in Appendix 1.

Part 2 of the statement gives:

- Detailed information on the guiding principles for planning the distribution system, company internal standards, design policies and network characteristics.
- Schematic and geographical plans showing the 33 kV system including location of 132/33 kV and 33/11 kV substations.
- Details of embedded generation.
- Planned network development proposals for which financial approvals have been given in Appendix 3. They provide a summary of the work to be carried out, timescale and area of the network impacted by each proposal. These exclude like for like replacement (as this does not change system capability) and system developments for new or existing users.

- Detailed information relating to:
  - Circuit Data, Table 1
  - Transformer Data, Table 2
  - Demand Data*, Table 3
  - Fault Level Data**, Table 4
  - Generation Data, Table 5
  - Connection Interest, Table 6
  - Schematic Diagrams of the Distribution Network Single Line Diagrams

*The forecast demand is based on our Distribution Future Energy Scenarios (DFES) projections, specifically the Consumer Transformation (CT) scenario and the contracted jobs. Key factors relevant to the DFES include LCT uptake, geographic economic factors, data derived from local authority development plans and demand forecast from large users with knowledge of major changes in connected load. Any known connections work not included in the DFES are added separately with a relevant diversity factor. Diversity factors are applied to the contracted jobs depending on the voltage level and the requested capacity

The key assumptions included in the demand forecast are as follows:

- DFES projections are specifically based on the Consumer Transformation (CT) scenario.
- Consistent running arrangement and system configurations are considered. Recorded substation peak demands are normalised to account for abnormal running arrangements or equipment faults to ensure the forecast is consistent to previous years running arrangement.
- Power export from distributed generators (DG) is removed, where possible, from recorded figures to give a true representation of underlying substation demand.
- Individual demand forecast submissions from projected connections works are factored into the forcasts
- Committed new loads and new connections are assumed to materialise in the manner predicted i.e., user timing and usage is assumed to occur as advised/requested by customer.
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** SHEPD will undertake further assessments to determine whether intervention is required where the calculated planning fault levels, identified in Table 4, exceed 95% of the circuit breaker fault level rating. The additional assessments undertaken by SHEPD include, but are not limited to, site specific protection settings analysis and circuit breaker trip testing.

If further assessments confirm that intervention is required SHEPD will determine the most economic, efficient and cost-effective solution to reduce the overall fault level. Possible mitigation works include, but are not limited to, opening the bus-section circuit breaker, reconfiguring the network, installing fast response automation, and extending circuit breaker trip times.

Details of the 132kV system (regarded as transmission voltage in Scotland) are included in the Electricity Ten Year Statement, which is available on the National Energy System Operator (NESO) website: https://www.neso.energy/

3 CONTACT DETAILS

The LTDS is available free of charge by sending an email to: Modelling.Reporting@sse.com

or by making a request through the Scottish and Southern Electricity Networks website: https://www.ssen.co.uk/our-services/tools-and-maps/long-term-development-statements-ltds/

For further information relating to LTDS, or to provide feedback:

Modelling & Reporting
Scottish Hydro Electric Power Distribution plc
Inveralmond House
200 Dunkeld Road
Perth
PH1 3AQ
E-mail: Modelling.Reporting@sse.com

Enquiries relating to new load connections or changes to existing load connections should be addressed to:

Connections and Engineering
Customer Service Centre
Scottish and Southern Electricity Networks
Walton Park, Walton Road
Cosham, Portsmouth
PO6 1UJ
E-mail: connections@sse.com
Tel: 0800 0483516

Enquiries relating to connection of generators should be addressed to:

Major Connections Contracts (MCC)
Scottish and Southern Electricity Networks
Perth Training Centre
Ruthvenfield Way
Inveralmond Industrial Estate
Perth
PH1 3AF
E-mail: mcc@sse.com
Tel: 0345 0724319

Enquiries relating to connection of generators should review the options on the Scottish and Southern Electricity Networks website: http://www.ssen.co.uk/GenerationConnectionsHome/

Enquiries relating to the provision of copies of the “Statement of methodology and charges for connection" should be addressed to:

Connections Policy Team
Scottish Hydro Electric Power Distribution plc
Inveralmond House
200 Dunkeld Road
Perth
PH1 3AQ
Email: connections.policy@sse.com

The Connection and Use of System charging statements can be viewed on our website. Our connection charging statements are revised from time to time and our Use of System charging statements are revised at least annually. Revised Use of System charges normally take effect from 1 April of each year. The latest documents can be viewed via the link below: http://www.ssen.co.uk/Library/ChargingStatements/SHEPD/

4 OTHER INFORMATION SOURCES

Distributed Generation Connection Guide

The ENA produces connection guides to help users as an owner or developer of distributed generation to connect distributed generation to the UK’s electricity distribution networks.

The guides can be viewed by following the link below:

2024 DG Guides Combined – Energy Networks Association (ENA)

Guaranteed Standards

In accordance with the Electricity (Standards of Performance) Regulations 2015, DNOs are obliged to meet guaranteed standards of performance set by Ofgem, the industry regulator.

These guaranteed standards are laid out in three documents which can be viewed by following the below links:

The Guaranteed Standards:

- The Electricity (Connection Standards of Performance) Regulations 2015

http://www.legislation.gov.uk/uksi/2015/698/pdfs/uksi_20150698_en.pdf

Part 2 – Services and Standards for Metered Connections
Part 3 – Services and Standards for Unmetered Connections

- The Electricity (Standards of Performance) Regulations 2015

http://www.legislation.gov.uk/uksi/2015/699/pdfs/uksi_20150699_en.pdf

- The Electricity and Gas (Standards of Performance) (Suppliers) Regulations 2015

http://www.legislation.gov.uk/uksi/2015/1544/pdfs/uksi_20151544_en.pdf

Process to Request Additional Network Data

Enquiries relating to the provision of additional network data to that contained in the LTDS should be sent to: Modelling.Reporting@sse.com

SSEN Data Portal

In October 2023, we launched our Data Portal to drive forward net zero decisions. Our Data Portal is a single point of access to all the data SSEN publishes and a catalogue of data that brings visibility to our network assets, their location, their usage, and their performance. All documents related to the SHEPD and SEPD LTDS submission are published on our Open Data Portal, along with other planning publications such as the Network Development Plan, DFES, Capacity Heatmaps and Embedded Capacity Register (ECR). The timeline of these documents is shown in the figure below.

SSEN Distribution's commitment to transparency and accessibility is a significant step forward in the transition to a net-zero future, and by providing this vital information, this data portal will play a pivotal role in reducing greenhouse gas emissions, improving energy efficiency, and ultimately taking us all closer to achieving our sustainability goals.

We have built our data portal on CKAN allowing us to display our data in a user-friendly environment and allow our data consumers to use data in a meaningful way. CKAN has been used extensively by our Open Data Peers and Partners and allows us to tailor our portal, to serve our customers.

Link to data portal: SSEN Data Portal. To understand how to use our portal please view our video guide here.

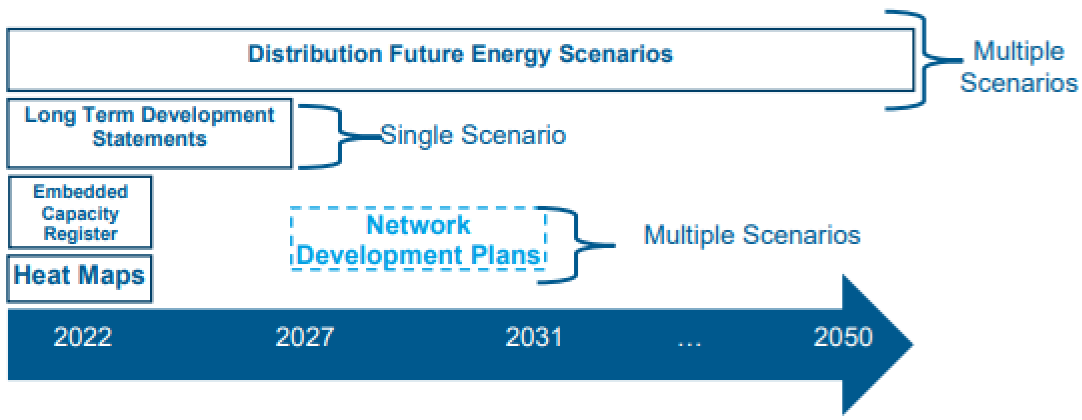


Figure 1 - LTDS in relation to other scenario and capacity reporting by DNOs

SUMMARY INFORMATION

The following information can be obtained by contacting us at Modelling.Reporting@sse.com:

▪ Details of the substation group and the substation or busbar node names
▪ Contact point for information requests
▪ Timescales for providing information
▪ Cost for providing additional information

Details of the 132kV system (regarded as transmission voltage in Scotland) are included in the Electricity Ten Year Statement, which is available on the National Energy System Operator (NESO) website: https://www.neso.energy/

1 GUIDING PRINCIPLES FOR PLANNING THE DISTRIBUTION SYSTEM

The following standards are the guiding principles which underpin the policy for planning and designing the distribution network in Scottish Hydro Electric Power Distribution plc:

- Licence Conditions
- Distribution Code
- Electricity Safety, Quality and Continuity Regulations
- Environmental Standards
- Company Internal Standards

2 STANDARDS

2.1 Licence Conditions

2.1.1 Pursuant to a licensing scheme made by the Secretary of State, under part II of Schedule 7 to the Utilities Act 2000, Scottish Hydro Electric Power Distribution plc has been granted a licence under section 6(1) (c) of the Electricity Act 1989 authorising it to distribute electricity for the purpose of giving a supply to any premises in the area specified in Schedule 1 of the Act.

2.1.2 Standard Licence Condition (SLC) 24 – Distribution System Planning and Quality of Supply sets out the requirement for licensees to plan and develop their distribution system to a certain standard. SHEPD meets this requirement by having an Ofgem approved planning standard (TG-NET-NPL-012 Distribution Planning – Standards of Voltage and Security of Supply) which sets out how security of supply will be met in its distribution services area.

To meet the above standard our policy is to plan networks at the most economic cost. To achieve this, we have taken two approaches:

- For high volume works where point of connection is low voltage (230 and 400 V) or high voltage (11kV) we have standard connection arrangements which ensure compliance with Engineering Recommendation P2/8.

- For lower volume, high cost developments, principally at 33kV and above, we will tailor development to meet standards on an individual basis to optimise cost-benefit and customer requirements.

2.1.3 Under SLC 12 - Requirement to Offer Terms for Use of System and Connection, the licensee shall, on application, offer to enter into an agreement (Connection Agreement) for use of system.

Where the licensee makes an offer to enter into a connection agreement, the licensee shall, in making the offer, make detailed provision regarding:

- The carrying out of the works required to connect the licensee's distribution system to any other system for distribution of electricity.
- The carrying out of works in connection with the extension or reinforcement of licensee's distribution system rendered appropriate by reasons of making the connection.
- Installation of such switchgear or other apparatus (if any) as may be required for the interruption of supply where the person seeking connection or modification of an existing connection does not require the provision of top-up or standby.
- The charges to be paid in respect of services required. To determining an appropriate proportion of the costs directly or indirectly incurred, the licensee shall have regard to the benefit to be obtained or likely in the future to be obtained.

In determining the costs of connection of demand and generation, the licensee shall apply the charging principles set out in the annual charging statements including, where applicable, application of:

- Cost apportionment of any necessary reinforcement for the Connection; and
- Distributed Generation Incentives.

The statements which set out the basis of charges for "Use of System" and "Connection to the Distribution System" are entitled:

- Scottish Hydro Electric Power Distribution plc’s Use of System Charging Statement;
- Statement of Methodology and Charges for Connection to Scottish Hydro Electric Power Distribution plc’s Electricity Distribution System.

(all the above are amended as required)

All the above statements are available on our website www.ssen.co.uk or by sending an email to connections@ssen.co.uk.

Note: Some distribution connected generators will have impact on the transmission system (typically where the generator's authorised export capacity is either greater than 10MW and / or is more than the declared summer minimum demand at the 33kV busbar of the relevant 132/ 33 kV substation). Such generators may be liable for transmission use of system charges (TNUoS) from the NESO. Prospective generators seeking a distribution connection should also consult NESO under BETTA (British Electricity Trading and Transmission Arrangements), to assess the impact their generation project may have on the GB transmission system.

2.2 Distribution Code

Under SLC 20 of the Licence the licensee shall prepare and always have in force and shall implement and comply with the Distribution Code.

The Distribution Code covers all material technical aspects relating to connections to and the operation and use of the licensee's distribution system or the operation of electric lines and electrical plant connected to the licensee's distribution system.

It requires the licensee's distribution system to be designed to permit the development, maintenance and operation of an efficient, coordinated and economical system and to facilitate competition in the generation and supply of electricity.

The Distribution Code includes:

- A distribution planning and connection code containing:
  - Connection conditions specifying the technical, design and operational criteria to be complied with by any person connected or seeking connection to the licensee's distribution system; and
  - Planning conditions specifying the technical and design criteria and procedures to be applied by the licensee in the planning and development of the licensee's distribution system and to be taken into account by persons connected or seeking connection with the licensee's distribution system in the planning and development of their own plant and system; and
- A distribution operating code specifying the conditions under which the licensee shall operate the licensee's distribution system and under which persons shall operate their plant and/or distribution systems in relation to the licensee's distribution system, in so far as necessary to protect the security and quality of supply and safe operation of the licensee's distribution system under both normal and abnormal conditions.

It contains references to the following Electricity Supply Industry publications which provide guidance on planning and design criteria:

- **Engineering Recommendation G5/5**
  Planning levels for harmonic voltage distortion and the connection of harmonic sources and/or resonant plant to transmission systems and distribution networks in the United Kingdom.
- **Engineering Recommendation G12/4**
  Requirements for the application of protective multiple earthing to low voltage networks.
- **Engineering Recommendation P2/8**
  Security of Supply.
- **Engineering Recommendation P24**
  AC supplies to railway systems.
- **Engineering Recommendation P25**
  The short-circuit characteristics of single-phase and three-phase low voltage distribution networks.
- **Engineering Recommendation P28**
  Planning limits for voltage fluctuations and the connection of disturbing equipment to transmission systems and distribution networks in the United Kingdom.
- **Engineering Recommendation P29**
  Planning limits for voltage unbalance in the United Kingdom for 132kV and below.
- **Technical Specification 41-24**
  Guidance for the design, installation, testing and maintenance of main earthing systems in substations.
- **Engineering Recommendation S34**
  A guide for assessing the rise of earth potential at substation sites.
- **Engineering Recommendation G98**
  Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16A per phase) in parallel with public Low Voltage Distribution Networks.
- **Engineering Recommendation G99**
  Requirements for the connection of generating equipment in parallel with public distribution networks.

See Section 9 for enquiries relating to the Distribution Code.

2.3 Electricity Safety, Quality and Continuity Regulations

The Secretary of State issued The Electricity Safety, Quality and Continuity Regulations in 2002 to:

- Ensure that the electricity supplies are regular and efficient.
- Protect the public from dangers arising from distribution of electricity, use of electricity supplied or from installation, maintenance or use of any electricity line or electrical plant.
- Eliminate or reduce the risks of personal injury or damage to property or interference with its use.

Regulation 27 gives permitted variations at all low voltage customers' terminals of +10% and -6% of the declared voltage of 230V single phase or 400V three phase. For 33kV the permitted variations are between +6% and -6% of the declared voltage. It is therefore necessary to hold the system voltage within these ranges on all systems to which customers are connected, i.e. all low voltage systems, most 11kV systems and some 33kV systems.

2.4 Environmental Standards

Schedule 9 of the Electricity Act 1989 requires SHEPD to consider the effect of its work on the amenity and fisheries and to mitigate the effects where reasonable.

In planning, designing and operating the distribution system our policy is to pay due regard to environmental matters and noise, visual amenity and pollution. We seek Planning Authority and Scottish Ministers' approval to build new lines. We also endeavor to meet the requirements of other bodies in protected areas such as National Scenic Areas. We will seek to avoid disturbance or detriment to such areas as far as reasonably practicable consistent with the economic and reliability impact on our distribution network and on customers' costs.

2.5 Company Internal Standards

In addition to meeting the above standards, SHEPD has internal standards to improve quality of supply and reduce duration of supply interruptions.

2.5.1 General

The targets for duration of supply interruption, customer minutes lost (CMLs) per customer per year, and number of customer interruptions (CIs) are agreed with Ofgem. These standards are in addition to the Guaranteed Standards set by Ofgem.

In planning, designing and operating the distribution system the systematic use of automation, mobile generation and targeted investment for refurbishment of the distribution system is designed to deliver these targets.

To meet the individual needs of customers, we will agree standards of connection whether in excess or lower than the appropriate levels as stated in the relevant network standard. In these cases, we will agree special commercial terms.

2.5.2 Capacity Planning

To ensure that the distribution system has adequate capacity to meet system demand, voltage and current flows are regularly monitored and adequacy of the network is checked. Capacity is benchmarked to estimated loads. Where there is a shortfall in network capacity we will seek appropriate solutions. These will usually involve network reinforcement but could involve alternative solutions.

2.5.3 System Voltage Control

The total full load volt drop for the transfer of power from the high voltage distribution system to the low voltage supply system is approximately 30%. Therefore, voltage correction must be applied in the appropriate places to comply with Regulation 27 of the Electricity Safety, Quality and Continuity Regulations 2002. This is carried out as follows:

- At transmission voltages by the NESO:
  - Control of reactive power flows. This includes switching in or out lightly loaded circuits, shunt capacitors and reactors, use of synchronous compensators, operation of "tap-stagger" and use of voltage above or below nominal.
  - Auto or manually controlled on-load tapchangers on 275/132 kV transformers.
  - Central control by despatch of reactive power from synchronous generators.
  - Automatic voltage control on synchronous generators.
- At distribution voltage levels by:
  - Automatically controlled on-load tapchangers fitted to 132/33 kV and 33/11 kV transformers (some smaller < 1MVA 33/11 kV transformers have off-load tap changers);
  - Automatically controlled on-load tapchangers fitted to 33kV, 11kV and LV voltage regulators;
  - Line drop compensation on some rural 11 kV systems;
  - Automatic voltage control on embedded generators;
  - Reactive compensation (fixed & variable tap shunt reactors, fixed shunt capacitors and DSTATCOMs);
  - Off load tap changers fitted to 33kV/LV and 11kV/LV transformers.

3 DESIGN POLICIES

3.1 General

When planning and designing an electricity distribution system it is necessary to consider all alternative options to achieve an optimum solution based on technical and economic considerations.

The company's distribution system has been standardised at 33kV (called EHV), 11kV called HV) and 230/400 V (called LV).

The forecast demand is based on our Distribution Future Energy Scenarios (DFES) projections, specifically the Consumer Transformation (CT) scenario and the contracted jobs. The DFES projections and contracted jobs for 2023/24 are shown alongside the actual recorded values for a direct comparison. DFES projections for the next 5 years are shown where available, otherwise the forecast is based on the historical growth trend plus any large known developments. Diversity factors are applied to the contracted jobs depending on the voltage level and the requested capacity.

The key assumptions included in the demand forecast are as follows:

- The average cold spell (ACS) forecast assumed system peak demand is adjusted so the annual forecast references to a common temperature base. A weighted average temperature, where ambient temperature is considered over a three-day period, is used in the calculation and appropriate adjustments are made to demand readings to produce the ACS values, which is what the demand would have been if the ambient temperature had been 0° C.
- Consistent running arrangement and system configurations are considered. Recorded substation peak demands are normalised to account for abnormal running arrangement to ensure the forecast is consistent with previous years running arrangement.
- Individual demand forecast submissions from large consumers are factored into forecasts.
- Committed new loads and new connections are assumed to materialise in the manner predicted i.e. user timing and usage is assumed to occur as advised/requested by customer.

SHEPD will undertake further assessments to determine whether intervention is required where the calculated planning fault levels, identified in Table 4, exceed 95% of the circuit breaker fault level rating. The additional assessments undertaken by SHEPD include, but are not limited to, site specific protection settings analysis and circuit breaker trip testing.

If further assessments confirm that intervention is required SHEPD will determine the most economic, efficient and cost-effective solution to reduce the overall fault level. Possible mitigation works include, but are not limited to, opening the bus-section circuit breaker, reconfiguring the network, installing fast response automation and extending circuit breaker trip times.

Fault level information is published for planning purposes only. It should not be used for operational purposes and does not necessarily reflect current operational circumstances.

3.2 132 and 33 kV System Design

33kV networks from 132/33 kV substations normally run either radially or as open or closed rings. However, some networks run in parallel with those from other sources where technically acceptable and economically advantageous.

Additions to or reinforcements of these networks are considered individually and tailored to the existing network arrangements. The most economic investment is determined in line with any long term proposals and having regard to network complexity, operational requirements and flexibility.

Studies are completed to ensure acceptable voltage conditions, compliance with security of supply standards for first and second circuit outages and that circuit and plant ratings are not exceeded.

Additionally, for generation, studies are completed to identify any locations where increased fault currents exceed switchgear ratings. For larger sets, or where there is likely to be interaction with existing customers with large motor drives, steady state and transient stability studies are needed to:

- Ensure generation and the network remain stable following circuit switching or a network fault.
- Check interaction with other nearby generation.
- Predict any possible loss of synchronism and the corresponding need for additional protection to avoid damage to the generator or unacceptable voltage or power swings.

3.3 Supplies from 33/11 kV Substations

The maximum number of 11kV circuits from a 33/11 kV substation is determined based on network configuration and maximum utilisation e.g. for a substation with 2 x 12/24 MVA transformer capacity the normal maximum number of 11kV feeders would be 7.

Interconnecting feeders, where practical, would emanate from separate sections of busbar consistent with minimising initial switchgear requirements and allowing for future extensions.

Feeders will be controlled by automatic circuit breakers of 630A nominal load rating. Many existing circuit breakers have nominal load rating of 400A or less.

3.4 11kV Network Configuration

The 11kV network is normally configured to achieve maximum utilisation whilst maintaining security of supply standards at a minimum cost.

The 11kV urban network is normally configured as a "loop-tee-loop" arrangement in an open "ring" formation. However, where an individual customer requires more or less security of supply standard, then the connection to that customer will be designed to meet specific needs.

The 11kV rural network is normally configured as an open "ring" with pole mounted 11 kV/LV transformers directly connected. However, where group demand is below 1MVA the network configuration may be radial feed with no backfeed facility.

Furthermore, there may be lengthy single phase and three phase spurs in particularly remote locations served by overhead line circuits.

3.5 Low Voltage Network Configuration

The feeding arrangement on the low voltage network is normally radial with no interconnection. There is existing interconnected LV network which operates as radial and is configured as "open" ring. The layout of distributors is optimised in relation to services to be supplied. Distributors are normally laid in footways.

4 NETWORK CHARACTERISTICS

4.1 Standard Plant and Equipment sizes

Various types of plant and equipment exist on the 33kV and 11kV systems. Typical details are given below.

4.1.1 33kV System

- Voltage Regulators
  - Vector Group — Auto transformer
  - Voltage Ratio — 33/33 kV
  - Rating Between — 5MVA and 32MVA
  - Tapping Range — -18% to + 4%

- Primary Transformers

  Voltage Ratio 33/11 kV or 33/11.5kV (off load)
  - Vector Group: YY0
  - Rating: 1, 2.5, 4, 6.3 & 8 MVA ONAN 7.5/15, 10, 12/24, 15/30, 20/40 MVA CER
  - Tapping Ranges: -18% to +4% (on load) for 33/11kV or -15% to +11.67% (on load) for 33/11.5kV ONAN or -13.33% to +13.33% (on load) for 33/11.5kV CER
  - Rating: 0.1, 0.15, 0.2, 0.3, 0.5, 1.0, 1.5 MVA
  - Tapping Range: -5% to +5% (off-load).

  Voltage Ratio 33 kV/LV (433V) (off load)
  - Vector Group: DYn11
  - Rating: 200, 500, 800, 1000, 1500 kVA (ground mounted)
  - Tapping Range: -5% to +5% (off load)

  Voltage Ratio 33 kV/LV (250 or 500V) (off load)
  - Rating: 16, 25, 50, 100 kVA (pole mounted)
  - Tapping Range: -5% to +5% (off load)

- Switchgear
  - Current Rating 400, 800, 1200, 1600, 2000, 2200, 2500 A
  - Fault rating 8.7, 13.1, 17.5, 25, 31.5 kA

4.1.2 11 kV System

- Voltage Regulators
  - Vector Group — Auto transformer
  - Voltage Ratio — 11/11 kV
  - Rating Between — 1 MVA and 8 MVA
  - Tapping Range — -18% to + 4%
- Transformers
  - Vector Group: — DYn11
  - Voltage Ratio: — 11 kV/LV (433V)

  Ground Mounted
  - Rating: — 315, 500, 800, 1000, 1500 kVA
  - Tapping Range — -5% to 5% (off load).

  Pole Mounted
  - Rating — 50, 100, 200 kVA
  - Tapping Range — -5% to 5% (off load).
  - Transformers
  - Voltage Ratio — 11 kV/LV (250 or 500 V)
  - Rating — 16, 25, 50, 100 kVA (pole mounted)
  - Tapping Range — -5% to 5% (off load).
- Switchgear
  - Current Rating — 400, 630, 800, 1250, 2000 A
  - Fault rating — 13.1 or 18.4 kA - some pole mounted switchgear may be rated below 13.1kA.

4.1.4 Telecontrol

Normally all 33kV or higher voltage switchgear is equipped with telecontrol. Use of telecontrol at 11kV is considered according to the situation and location.

4.1.5 Batteries

SHEPD will normally provide its own battery systems where required for distribution substations. However, shared use is considered if appropriate.

4.2 Power Quality

4.2.1 Harmonics

Engineering Recommendation G5/5 sets the planning levels for harmonic voltage distortion to be used for the connection of non linear equipment. These levels should not normally be exceeded when considering the connection of non linear loads and generating plant to the distribution networks under the Distribution Code. The table below gives a summary of Total Harmonic Distortion (THD) planning levels at supply system point of common coupling (PCC) nominal operating voltage:

Nominal Voltage (V) kV	THD Limit
LV (≤ 400V)	5%
HV (< 20kV)	4%
EHV (< 400kV)	3%

Table 1 – Total Harmonic Distortion Limits

The assessment procedure for non-linear equipment follows three stages:

- Stage 1 facilitates the connection of harmonic sources to LV supply systems.
- Stage 2 facilitates the connection of harmonic sources to all supply systems operating at a voltage of greater than LV and less than 33kV, including any harmonic source that is too large for consideration under Stage 1, or that cannot meet the emission limits of Stage 1. Measurement of the background harmonic level may be required, before a simplified assessment is made of the predicted harmonic voltage level at the PCC that may result from the connection of the new harmonic source.
- Stage 3 applies to the connection of the harmonic sources that are not found to be acceptable under Stage 2 assessment or which fall outside the scope of Stages 1 & 2, excluding Stage 2 assessments with an LV PCC. It also applies to any harmonic sources that have a nominal PCC voltage greater than or equal to 33kV and to the assessment of relevant plant where the connection is made at system voltages of 33kV or higher.

The objective is to balance the degree of detail with degree of risk that the connection of the particular equipment will result on the supply system.

4.2.2 Voltage Fluctuations

Engineering Recommendation P28 sets the planning limits of voltage fluctuations caused by industrial, commercial and domestic equipment. Allowable limits vary with the interval between fluctuations and are based on the likelihood of customer complaints. Normally acceptable values are 3% and below.

4.2.3 Unbalance

Engineering Recommendation P29 sets the limits of voltage unbalance on networks up to 132kV. Normally acceptable values are 2% and below.

4.2.4 Investigations

There are no areas in SHEPD where harmonic levels, voltage fluctuations or unbalance are known to be an issue. However, we will investigate and take measurements in response to customer requests. If found to be unacceptable we will seek an appropriate solution.

4.3 Method of Earthing

4.3.1 Primary substations

The methods currently employed to earth the neutral of High Voltage networks at primary (33/11 kV) substations are:

- Direct Earthing

The only impedance between the transformer lower voltage winding star point (neutral) and earth consists of the earthing conductor and the resistance between the earth mat and earth.

- Resistance Earthing

Use is made of an earthing resistor between the transformer lower voltage winding star point (neutral) and earth to limit the earth fault current.

- Matching Transformer

In some instances, where generation is connected to the transformer low voltage winding, the neutral is earthed by a single phase transformer with secondary load resistor to restrict fault current to low values.

- Earthing Transformers

In instances where the transformer lower voltage winding is delta connected a neutral point is derived artificially by inclusion of an earthing transformer. This neutral point is then appropriately earthed.

In addition to the above Arc Suppression (Peterson) coils are also used in some cases. Furthermore, there are occasions where transformer high voltage winding is earthed (or provided with a selectable earth switch). This is where there is islanded generation or where there are subsea cables (for protection against overvoltage during faults).

4.3.2 Distribution Substations

Earthing is provided for HV metal work, LV neutral and extraneous metal work not associated with the power system e.g. fences etc.

Where the overall resistance to earth does not exceed 1 ohm the HV metal work, LV neutral earth and fence metal work (within 2 metres of HV metal work) are combined together. Where the overall resistance to earth exceeds 1 ohm HV metal work earth, LV neutral and fence metal work earths are kept separate and resistance to earth of each separate earth electrode must not exceed 40 ohms.

4.3.3 Low Voltage System

The method applied to earth the LV system of most new networks and many existing networks is Protective Multiple Earthing (PME). This refers to the use of the supply neutral conductor of the LV network to provide earthing facilities for customers.

There is also use of Continuous Earth Wire, Separate Neutral and Earth and Protective Neutral Bonding systems.

The general requirements that must be fulfilled are:

- The supply neutral conductor will be connected to an earth electrode at or near the transformer star point.
- The supply neutral conductor will not contain a fusible cutout, circuit breaker or switch.
- The value of the transformer neutral earth electrode will not exceed 40 ohms.
- The overall resistance to earth of the supply neutral conductor will not exceed 20 ohms.

In addition to the neutral earth at or near the transformer star point, the supply neutral conductor will be connected to other points either to earth electrodes or supply neutral conductor of another distributing main.

4.4 Protection Systems

4.4.1 General

Protection equipment is used to recognise, locate and initiate removal of a fault or abnormal condition from the power system, normally by operation of a switching device. Circuit breakers and relays are normally used at higher voltages, but fuses are employed where relays are not economically justified.

To avoid unnecessary damage to plant and equipment and to minimise disconnection of healthy plant, it is essential that the protection systems employed on the distribution system are reliable, selective, fast and sensitive.

4.4.2 LV Feeders

In most cases low voltage feeders are protected by fuses. These provide short circuit protection to the main feeder and connected services. The fuses are rated to provide discrimination with HV protection.

4.4.3 11kV/LV Transformers (Ground Mounted)

Ground mounted 11kV / LV transformers are normally protected by HV fuse switches. The fuses provide protection for faults on the HV cable to the transformer, faults within the transformer and faults on the LV connections.

4.4.4 11kV/LV Transformers (Pole Mounted)

Pole mounted 11kV / LV transformers receive protection from either feeder circuit breaker, pole mounted auto reclosers / sectionalisers or pole mounted HV fuses.

4.4.5 11kV Feeders

11kV feeders are normally protected by circuit breakers with the following protections and typical clearance times:

- Predominantly underground circuits:
  - Inverse Definite Minimum Time (IDMT) overcurrent and earth fault protection - up to 1s, but possibly up to 3 s depending on fault type and location.
- Predominantly overhead line circuits:
  - Instantaneous high set overcurrent - 150ms.
  - IDMT overcurrent and earth fault - up to 1s, but possibly up to 3s depending on fault type and location.
  - Time delayed sensitive earth fault - 7s.
  - Auto-reclosing as para. 4.6

Additional pole mounted auto reclosers are strategically located on the overhead network to limit the number of supply interruptions to customers for transient and permanent faults.

4.4.6 33/11 kV Transformers

33/11 kV transformers typically have the following protection and clearance times:

- High set overcurrent, instantaneous earth fault and restricted earth fault – 150ms.
- 3 stage standby earth fault - 1.4s, 2.1s and 2.9s.

- IDMT overcurrent and earth fault - up to 3s.
- Neutral voltage displacement protection - 3 – 10 s.
- Buchholz and winding / oil temperature relays.
- Intertripping or fault throwing switch if needed to trip remote circuit breaker – 300ms or operating time of remote protection.

4.4.7 33 kV Feeders and Transformer Feeders

33 kV feeders are normally protected by circuit breakers fitted with protection dependent upon feeder type (overhead or underground cable). Typical protection provided (and clearance time) is a selection from:

- Unit protection - 150ms.
- Distance protection - 150ms zone 1, 500ms zone 2, 1.3 s zone 3.
- IDMT overcurrent and earth fault - up to 3s.
- Auto-reclosing as para. 4.6 for predominately overhead circuits.

Additional protection is needed if remote transformers are connected, typically:

- High set overcurrent - 150ms.
- Instantaneous earth fault - 150ms.
- Intertripping over pilot cable or fault throwing switch.

4.5 Network Automation

To minimise customer minutes lost and customer interruptions due to outages, where economically viable, opportunity is taken to automate the 11kV distribution system by installing in line circuit breakers or actuators.

Circuits are generally prioritised for automation based on customer numbers and fault history.

4.6 Auto Reclosers

Most faults on overhead lines are of transient nature (e.g. insulator flash over) generally caused by wind borne materials. These faults are normally cleared by opening of the source circuit breaker or pole mounted recloser and do not recur when reclosed. Auto-reclosing is therefore applied to most predominantly overhead circuits.

Typical or preferred settings, where relays permit, are:

- 11kV source circuit breaker:
  - Trip 1 - Instantaneous high set overcurrent or time delayed overcurrent or earth fault or sensitive earth fault.
  - 10s dead time.
  - Trip 2 - Instantaneous high set overcurrent or time delayed overcurrent or earth fault or sensitive earth fault.
  - 10s dead time (or lock-out if sensitive earth fault).
  - Trip 3 - Time delayed overcurrent or earth fault.
  - Trip 4 - Time delayed overcurrent and earth fault to lock-out.
  - Reclaim time 5s.
- 11kV pole-mounted circuit breakers:
  - Settings to co-ordinate with the above.

    - Final dead time 140s.
- 33kV circuit:
    - Single shot.
    - 10-15 s dead time.
    - 15s reclaim time.

4.7 Operating Voltages

4.7.1 General

The company's distribution system operates at nominal voltages such as 33kV, 11kV and 230/400 V. Voltage control is applied at various voltage levels to ensure that statutory levels are maintained at customers' supply terminals as below.

4.7.2 Voltage Control of 11kV and LV system

Automatic control of the 11kV source voltage is obtained by the on-load tapchanger on the 33/11 kV transformers. The interval between taps is typically 1.25%, 1.43 or 1.67%.

Line drop compensation is applied to some rural 33/11 kV transformer tapchanger control schemes to arrange automatic increase in the 11kV source voltage with increase in demand. Typical settings are 1.05p.u. at full load and 0.985p.u. at no load. The 11kV system is typically designed to accommodate 6% volt drop.

The low voltage system is typically designed so that the aggregate volt drop in the low voltage distributor and service does not exceed 7% with normally less than 2% in the service.

4.7.3 Voltage Control of 33 kV System

Where appropriate the voltage at the 33kV source is set to the highest permissible value, typically 1.03p.u., in order to permit maximum design volt drop in the 33kV system. It is also chosen to ensure that the required 11kV and LV busbar voltages at both nearby and remote substations can be achieved.

4.8 Generation Connection Policy

The principal duty placed on the authority is to protect the interest of consumers having regard to the need to secure that all reasonable demands for electricity are met. This duty is devolved to the licensee to develop the distribution systems in an economical manner whilst maintaining defined planning standards. The implications are that whereas demand for electricity must be met year round, generators will not always be able to simultaneously generate at their authorised capacity (generation is dispatched by the Transmission Operator) since the supply and demand for electricity must be balanced at all times. However, distribution connected generation is self dispatched and therefore networks must provide firm access. Therefore, it is necessary that before any offer for connection is made, detailed network analysis is carried out to ascertain the impact of generation so that the quality of supply to connected consumers is not compromised.

Generators connected to the LV, 11kV or 33kV distribution system must comply with the general principles specified in Engineering Recommendation G98 or ER G99 as applicable. Where appropriate, the requirements of the Distribution Code and Grid Code must be met.

It is a requirement that Neutral Voltage Displacement will be fitted to all generators where the size of the generator or group of generators on the same connection point exceeds 200kVA. This is to ensure that the risks of back-energising the 11kV network from an LV generator is small.

Please also see section 4.10 - Network Constraints and Opportunities.

4.9 Load Management Areas

Due to the extent of SHEPD's unique geographic area, historic network and sparsely populated areas, there are several primary substations that are currently exempt from ER P2/8. This is because the solution to reinforce the network to meet ER P2 would not be coordinated, efficient and/or economic. These areas of the distribution network are governed by SHEPD's approved alternative planning standard.

The customer base at these sites is mainly domestic and the heating load is controlled by time switched regimes; these are managed to contain demands within circuit capability and to optimise utilisation.

4.10 Network Constraints and Opportunities

In accordance with its licence, SHEPD develops an efficient, coordinated and economical distribution system. However, our island networks present some additional challenges.

The distribution network in Shetland is not currently connected to any mainland distribution or transmission system. Supplies are provided from local generation using the 33kV, 11kV and LV systems.

The distribution system in Orkney is connected via 33kV subsea circuits to the mainland distribution system. Security for the local distribution system is also currently provided by SHEPD owned local generation.

The distribution system supplying the Outer Hebrides is connected via 33kV subsea cable and the security of supply is currently provided by SHEPD owned local generation.

Therefore, any application for large connection (demand or generation) in the above areas require careful evaluation so that voltage profile to customers, switchgear and plant fault level rating, subsea cable rating and stability of the system are not compromised.

SHEPD is committed to working with all parties looking to connect to its network to identify and deliver the best possible connection package for optimum benefit.

In particular, the continued growth in generation connecting at distribution voltages is driving ongoing improvements in how SHEPD seeks to provide information and assistance to customers wishing to connect to its network.

It is essential that prospective generation developers work with SHEPD to ensure correctly located and well-matched generation is incorporated into its network to the mutual benefit of both customers and the network.

Key areas that need to be discussed and monitored are the impacts of the generation on the network and the impacts of the network on the generation.

The addition of generation to the network impacts the system fault levels, which in turn can lead to network reinforcement works or other smarter solutions being necessary to support the connection. The power flows experienced by the modified network, if not accurately analysed, monitored and controlled, could cause system overload, over and under voltage, system frequency variations and reduce system power factors. All of these are undesirable on the distribution network.

Networks may have to be redesigned to best adapt to the generation connection requirement. This will add both cost and time to the connection project and should be considered and remembered when submitting any such connection enquiry or request.

Importantly, connection of well-sited and adaptable generation could provide network support and reduce network losses. The development must supplement SHEPD's responsibility to deliver a safe, secure and reliable network.

When considering connecting new load or generation to the network, it must be thoroughly planned and designed to meet the requirements set out in the Distribution Code, and in line with the information contained within this LTDS document.

The following short guide may assist users who wish to complete initial investigations and assessments of proposed connections to SHEPD's network."

Key Milestones in the initial connection investigation process.

Fill out a generation connection form, available from the ENA Website and submit this to SSEN: Connecting to the networks – Energy Networks Association (ENA)

This will commence dialog with the company in relation to the connection request. Identify your new Connection, Generation or Load.

- Decide on the capacity and type of generation to connect; Wind, Solar, Hydro, combined Heat and Power systems, Bio-mass or other.
- Unless a specific location is required, select an area on the LTDS geographic map or select a substation local to the desired connection area.
- Using the information available in the LTDS investigate that the selected Substation's capacity, demand, forecast demand and fault level could support the new connection.
- Collect technical data from LTDS and perform self study.
- Carry out study to access the impact of new generation on the existing network parameters including;
    - Fault level contribution of connecting new generator?
    - Clean or dirty load giving rise to System harmonics?
    - Impedance of the unit, how will this alter fault level?
    - What is the effect under 1st circuit outage conditions?

Connection charges will vary with the location and size of the proposed connection. At the point of connection request or enquiry, costings will be advised in line with the SSEPD Statement of Methodology and Charges for Connection to SSEPD's Electricity Distribution System:
http://www.ssen.co.uk/Library/ChargingStatements/SHEPD/

Applications for connection of generation are evaluated on an individual basis. Information on generation connections and applications can be found in Table 5 and Table 6 of this statement's data section which summarises larger embedded generation installations in SHEPD's area.

4.11 Transmission Constraints

Further information on constraints on the transmission system can be obtained in the Electricity Ten Year Statement, which is available on the NESO's websitehttps://www.neso.energy/

SSEPD produce a Generation Availability map, which provides an indication of the networks capability to connect a large-scale development to a major substation.

The map can be viewed by following the link below: https://www.ssen.co.uk/generationavailability/

5 GEOGRAPHIC AND SCHEMATIC PLANS

The following are included in this LTDS:

- Schematic plans for the 33kV system showing the electrical connectivity of the system.
- Geographic map of the Network area.

Maps of 33kV, 11kV and LV systems for particular areas may be available on request depending on area. A price list for these is included in Appendix 1.

The distribution system of SHEPD interconnects with:

- The transmission system of Scottish Hydro Electric Transmission Ltd at the 132/33 kV substations shown in the schematic diagrams shown in the Electricity Ten Year Statement, which is available on the NESO's: https://www.neso.energy/
- SP Energy Network's distribution systems at Strathleven & Abernethy 132/33 kV substations.

SP Energy Networks can be contacted via their website at: http://www.spenergynetworks.co.uk/

The Distribution Code specifies the process for managing network development at interface point with users, which includes other Network Operators. It also describes the interface with the National Electricity Transmission System and SHEPD.

6 SOURCES OF NETWORK AND CHARGING INFORMATION

As described in Summary Information Section 2.1.3, the statements which set out the basis of the "Use of System" and "Connection to the Distribution System" charges are as follows:

- Charging Information is saved at: https://www.ssen.co.uk/Library/ChargingStatements/SHEPD/
- Competition in connections information is located at: https://www.ssen.co.uk/Connections/UsefulDocuments/
- Select "Competition in Connections" from the filter list.
- SSEN Open Data Portal located at: SSEN Data Portal

DETAILED INFORMATION

7 OVERVIEW OF THE SYSTEM

7.1 Network Volumes

The following table shows the volume of SHEPD's distribution network.

Overview of the System			
Voltage		**23/24 Volume**	
EHV	Subsea Cable	km	292.38
HV	Subsea Cable	km	153.70
33kV	Overhead Line	km	5,312.92
	Cable	km	1,894.53
	Transformers	33/11 kV and 33kV/LV	2,868.0
11kV	Overhead Line	km	20,787.65
	Cable	km	5,705.89
	Transformers	11 kV/LV ground and pole mounted	53,956.0
Low Voltage	Overhead Line	km	3,779.9
	Cable	km	11,785.0

Table 2 – SHEPD Network Volumes

7.2 Network Data

The following data are included in this LTDS.

7.2.1 Circuit Data

The electrical parameters for 33kV circuits are shown in Table 1. All 33kV circuits emanating from a grid substation are shown in a group. The circuit rating information relates to the main item i.e., cable or overhead line and is based on the smallest cross section. Cyclic ratings are given where appropriate. In practice other items such as current transformers, protection equipment and isolators may restrict the circuit rating. The information is intended to illustrate the basic circuit capability. The vast majority of circuits operate at their construction voltage.

7.2.2 Transformer Data

33/11 kV transformer data is shown in Table 2. A site-specific analysis can be carried out to ascertain the reverse power capability of each transformer.

7.2.3 Demand Data

The maximum demand recorded at the substation is shown in MW and power factor in Table 3. The forecast demand is based on our Distribution Future Energy Scenarios (DFES) projections, specifically the Consumer Transformation (CT) scenario and the contracted jobs. The DFES projections and contracted jobs for 2023/24 are shown alongside the actual recorded values for a direct comparison. DFES projections for the next 5 years are shown where available, otherwise the forecast is based on the historical growth trend plus any large known developments. Diversity factors are applied to the contracted jobs depending on the voltage level and the requested capacity. Firm capacity for multiple transformer sites relates to the remaining capacity under n-1 (largest unit loss), although higher loads can often be supplied by using load transfers or mobile or local generation. For single transformer sites the demand will normally be secured by use of interconnection, mobile generation or combination of both.

The minimum load scaling factor is the ratio of minimum to maximum demand.

Appendix 2 shows typical substation load profiles.

7.2.4 Fault Level Data

Calculated three phase fault level data under normal running arrangements at 33kV and 11kV nodes is shown in Table 4. There are some nodes which require a detailed network investigation before data is published. Normally there will be more than one circuit breaker at a substation site; the make and break ratings shown relate to the lowest rated circuit breaker. At most sites, not all circuit breakers would be subject to the fault currents given.

Fault currents given include contributions from all transmission and distribution networks and generation included in our study model. Making values include contributions from induction motors as set out in Engineering Recommendation G74.

The two fault currents published in this document are Peak Make and RMS Break. The Peak Make value has been calculated at a time of 10ms and includes both the AC and DC component of the fault current. The symmetrical RMS Break has been calculated at 60ms and includes the AC component of the fault current only. The associated X/R ratio is published and can be used to calculate the DC component of the fault. The asymmetrical RMS Break current is not published due to this value being dependent on site-specific components and settings.

Any fault levels calculated to within 95% of the circuit breaker rating at any given site will be highlighted before being assessed in further detail. Following the outcome of an additional study, steps to reduce fault level or reinforcement of switchgear may be proposed by SHEPD.

7.2.5 Connected Generation

A list of generation connected to SHEPD's distribution network is shown in Table 5. Standby and peak lopping generations are excluded from the table.

7.2.6 Interest in a connection

A high level summary of interest in demand and generation connections is shown in Table 6. 1MVA is the minimum installed capacity included in this table.

7.3 Other Information

Additional information is available on request:

- Circuits e.g. zero sequence impedance.
- Transformers e.g. zero sequence reactance, earthing details, hot sites.
- Demand e.g. limitation on firm capacity, demand duration profiles.
- Fault Level e.g. contributions to fault current at each node, decremented break fault currents, details of limitations and indicative cost to relieve.

A price list for provision of such additional information is included in Appendix 1; contact details are in Part 1 Section 4.

8 NETWORK DEVELOPMENT PROPOSALS

Appendix 3 lists financially approved distribution system reinforcement proposals. These schemes are either under construction or are in the design stage.

9 UPCOMING CHANGES TO THE FORM OF THE LTDS

On the 10th of January 2024, Ofgem opened the Formal Consultation for the LTDS reform, outlining proposed changes for how DNOs will produce and publish LTDS data moving forward. This reform intends to improve the usability of LTDS as DNOs are required to publish network models in Common Information Model (CIM) format, removing the need for customers to build models themselves. This consultation was followed up by a Formal Direction Letter published 30th of April 2024, which includes a suite of supporting documents including the new LTDS Form of Statement (FoS). SSEN are currently working on the staged implementation of the LTDS reform outlined by Ofgem. The below provides a summary of each stage of the LTDS reform and the associated timescales.

Stage 1: Existing Equipment (EQ) Model

This stage requires DNOs to produce and publish a CIM Physical grid Model (EQ profile only) representing the existing grid of the entire licence area. While this stage will provide the EQ data within the model, users will still require the data from existing LTDS tables to run power flow studies. EQ profiles are to be completed by 15 October 2025 and published in the November 2025 LTDS submission as an extension to the previous deadlines is agreed upon with Ofgem.

Stage 2: Existing & Future Equipment (EQ), Short Circuit (SC) and System Capacity (SYSCAP) Models

This stage requires DNOs to produce and publish CIM Physical grid Models (EQ and SC profiles) representing the existing grid of their licence area accompanied by a SYSCAP profile Model. Data included at this stage includes historic peak load, system capacity, and fault level information. Models of the network representing each of five future years are also required at this stage. Models at this stage could provide sufficient data for a power flow study. Users could use this approach for both the existing network and for planned future changes reflected in future year models. This stage is planned to be completed by 15 April 2025 with models being published in the May 2025 LTDS submission.

Stage 3: Complete LTDS in CIM Grid Model Data with Solved Cases and Geospatial Location (GL) Model

This stage is intended to provide geo-location of substations and circuits enabling understanding of the physical distance between a proposed development and the surrounding network. Schematic diagrams generated from, and related to, the underlying network model provide users with reliable visualisation of network data. Solved cases will allow users to validate their power flow calculations against our solutions, including information about future development projects or accepted-to-connect projects. This stage is planned to be completed by 15 August 2025 with models being published in the November 2025 submission.

The Solution Development Stages and LTDS publication cycle requirements are illustrated in the diagram below:

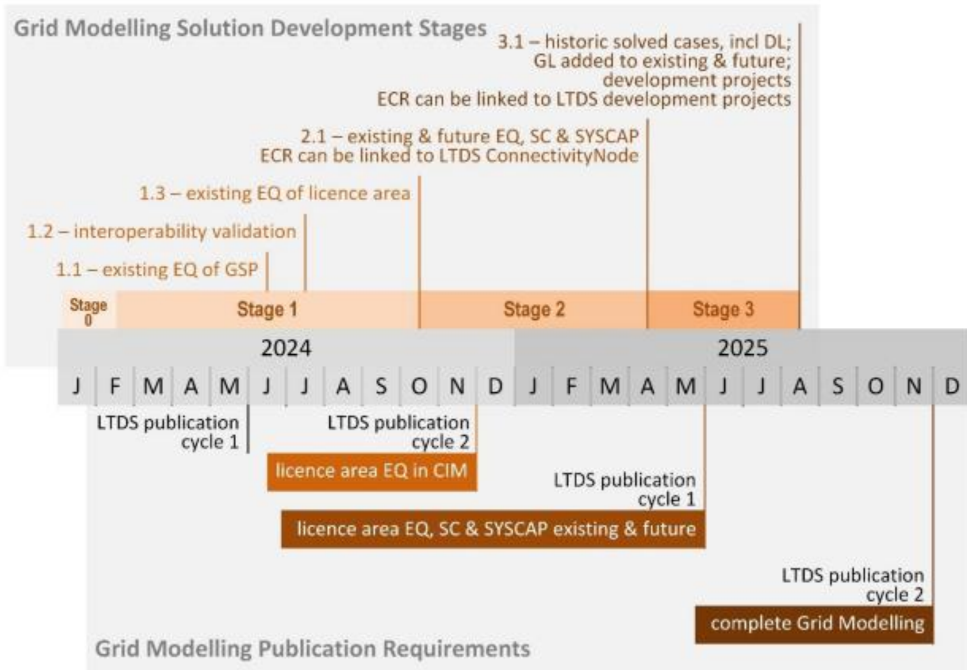


Figure 2 - LTDS Publication Cycle Requirements[1]

The current format of the LTDS is proposed to be retired over the staged implementation of the reform. The below table shows the proposed retirement dates of the existing LTDS Document and Data Tables. If these retirement timescales cause concern for your future use of the LTDS, please get in touch by emailing the SSEN Modelling and Reporting team at; Modelling.Reporting@sse.com.

Statement Section	Earliest Retirement Date
1.2.2 Detailed Information Section Content (other than schematic diagrams)	November 2025
3.2 Tables (entire subsection)	May 2025
Table 1 and 2	November 2024
Table 3, 4, and 5	May 2025
3.3 Decommissioned Assets	November 2024
4.1 Development Proposal Detail	November 2025
4.3 Interest in Connections (incl Table 6)	May 2025
7.1 File Format, Detailed Information subsection	November 2025
7.2 Frequency of Update and Availability, Detailed Information subsection	November 2025
7.2 Frequency of Update and Availability, Development Proposals - Development Proposal Detail subsection and Interest in Connections subsection	November 2025

Table 3 – Retirement of Existing LTDS Format: Proposed Timescales[1]

Further information on the proposed changes to the form of the LTDS can be found on Ofgem website.
Long Term Development Statement direction | Ofgem

1 Form of Long Term Development Statement (ofgem.gov.uk)

10 FURTHER INFORMATION

9.1 Distribution Code

See: www.dcode.org.uk

9.2 Electricity Ten Year Statement

See: https://www.neso.energy/

9.3 Engineering Recommendations

Copies of National Engineering Recommendations and Technical Specifications are available from:

Energy Networks Association
6th Floor
Dean Bradley House
52 Horseferry Road
London
SW1P 2AF

Tel: 020 7706 5100

Email: info@energynetworks.org

or

www.energynetworks.org

APPENDIX 1

NETWORK INFORMATION PRICE LIST

SHEPD will be able to provide additional and/or site-specific network information on request. The price list given below is for general data which is normally available but will require time and effort to collect.

For some site-specific enquiries, and for those items that are not included in the list below, it may be necessary to carry out network analysis, site checks and in some cases shut down of the network to obtain information. A quotation will be provided to the customer before work is undertaken.

Network Data

a)	**Reliability Data**	
	Typical reliability data for 33 or 11 kV and LV system	£25 per voltage
	Specific circuit reliability data	£100 per circuit
b)	**Demand Data**	
	Specific demand (maximum and minimum) data - normal running for 33 and 11 kV circuits	£100 per circuit
c)	**Impedance Data**	
	Specific 11kV circuit impedance data	£50 per circuit
	Specific 33kV circuit data additional to LTDS standard data	£50 per circuit
d)	**Plant Data**	
	Rating, fault levels rating and protection details without site visit. (Where site visit is required, price will be provided on request)	£100 per site

Any request for the above information should be sent in writing (see Part 1 Section 4 for contact details) including areas of interest showing details of the substation group and the substation or busbar node names and the information required. Under normal situations return of information will be within 15 working days.

Geographic Mapping Information

Maps and network plans are available on request from SHEPD's Mapping Services department.

Mapping Services can offer access to our GIS mapping system information via the internet. This would allow repeated access at user's convenience. Requests for this service should be made directly to Mapping Services via email: mapping.services@sse.com

This service may be subject to access and is provided free.

One set of specific 33 kV system map with OS background	£50 per printed set
One set of specific 33 kV schematic diagrams	£50 per printed set
One set of specific 11 kV system map with OS background	£50 per printed set
One set of specific 11 kV schematic diagram	Price on request

"One set of specific system mapping" Is defined as a 2km area centered as requested by the customer. This can be produced in either paper format or as a digital shape file or PDF.

In some cases, it will be necessary to obtain information from manufacturers or suppliers. SHEPD will use its best endeavors to obtain this but will not be held responsible for non-provision or delayed provision of such information. Any additional cost to provide such information will be advised.

Any request for the above information should be sent in writing accompanied with a cheque payable to Scottish Hydro Electric Power Distribution plc to:

Mapping Services
Daneshill Depot
Faraday Road
Basingstoke
Hampshire
RG27 8QQ

Email: asset.data@sse.com

OR

Connections and Engineering
Customer Service Centre
Southern Electric Power Distribution
Walton Park
Walton Road
Cosham
Portsmouth
PO6 1UJ

Email: connections@sse.com

All prices are subject to VAT at current rates

APPENDIX 2

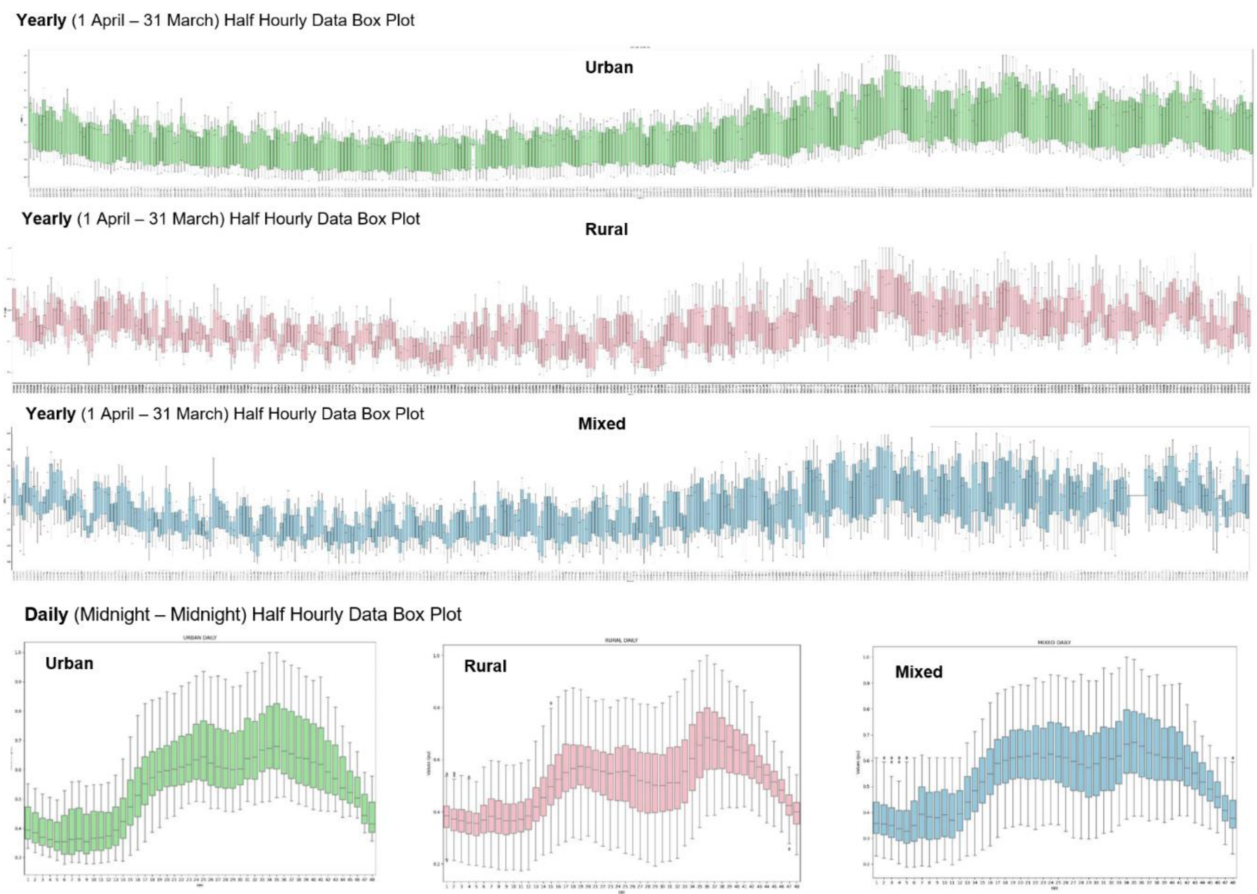
TYPICAL 33/11 KV SUBSTATION LOAD PROFILES

The following box plots illustrate typical load profiles for 33/11 kV Substations in Urban, Rural or Mixed environments.

Two sets of graphics for each environment are shown, a yearly profile and a daily profile, both derived from a Half Hourly dataset.

For the yearly graph, each box and whisker present a whole day's worth of half hourly data, illustrating the minimum and maximum for the day alongside the median and interquartile range.

For the daily graph, each box represents a specific half hour of the day, again illustrating the minimum and maximum for the day alongside the median and interquartile range.



APPENDIX 3

NETWORK DEVELOPMENT PROPOSALS

GSP	Name	Estimated Completion	Impact on Distribution Network Capability	Changes from previous LTDS
Scorradale	Stronsay 33/11kV Transformer Replacement	Complete	Increase in Transformer capacity Nodes: 86120	Completion date changed from May-25
Dounreay	Dounreay 33kV Circuit Reinforcement	Complete	Fault level reinforcement	Completion date changed from May-25
Coupar Angus	Coupar Angus T2	Complete	Coupar Angus T2 was disconnected from network in May 2022 after it tripped the local protection. Coupar Angus T2 will be replaced with a 6.3MVA transformer. 81726	Completion date changed from May-25
Scorradale	Submarine Cable Replacement - Shapinsay/Mainland	Complete	Subsea cable replacement - new cable has higher rating Nodes: 86121	Completion date changed from May-25
Dyce	Balmedie P2 Compliance	Complete	Increase in network security 82416	Completion date changed from May-25
Abernethy	Abernethy 33kV Busbar Replacement	Dec-24	Increase in network capacity - Replace the 33kV busbar to increase its thermal rating Nodes: 10130	New
Strichen	Boddam 11kV Cable Reinforcement	Dec-24	Increase in circuit capacity -84801	Completion date changed from Aug-24
Abernethy	Milnathort 11kV switchboard Replacement	Dec-24	Increase in make and break fault ratings Nodes: 80037	Completion date changed from Aug-24
Craigiebuckler	Craigiebuckler 11kV Board Replacement	Dec-24	Ageing plant replaced with telecontrol. Increase in make and break fault ratings - 81800	Completion date changed from Nov-24
Lyndhurst	Lyndhurst 302 & 305 33kV FFC replacement	Dec-24	Replace 33kV fliuid filled cable with Al cables: change in cable	New

			capacity Nodes: 84206 - 84208, 84209 - 84210	
Dunoon	Bruchag 33/11kV Transformer Replacement	Dec-24	Increase in Transformer capacity - replace both 10MVA transformers with 7.5/15MVA transformers Nodes: 82222	No change
Gremista	Gremista 302 Undergrounding	Jan-25	Increase in network capacity Nodes: 89901 - 89991	New
Loch Carnan	Clachan 33/11kV Transformer Replacement	Jan-25	Increase in Transformer capacity - replace existing 2.5MVA transformer with 2 x 6.3MVA transformers Nodes: 84013	Completion date changed from Oct-24
Gremista	Gremista 33kV outdoor c/b replaced with indoor switchroom	Apr-25	Ageing plant replacement; increase in make and break fault ratings	No change
Milton of Craigie	Constable Street	Mar-25	Upgrading the transformers to 15/30 (CER) units, 82002	No change
Thurso South	Mount Plesant 33/11kV Transformer Addition	Mar-25	Increase in network capacity - add a 2nd 7.5/15MVA transformer Nodes: 86011	No change
Thurso South	Ormlie 33/11kV Transformer Addition	Mar-25	Increase in network capacity - add a 2nd 7.5/15MVA transformer Nodes: 86007	No change
Dunoon	Primary Reinforcement - Glendaruel	Mar-25	Increase in transformer capacity Nodes: 82236 & 82237	No change
Persley	Persley-Bridge of Don No1 & 2 33kV FFC replacement	Mar-25	Replace 33kV fliuid filled cable with Al cables: change in cable capacity	Completion date changed from Dec-24
Thurso South	Spurness Reactor Replacement	Mar-25	Increase in Reactor size - from 2.5 to 4 DVAR solution Nodes: 86155	No change
Inverness	Inverness 33/11kV Transformer Replacement	Mar-25	Increase in transformer capacity Nodes: 83523	Completion date changed from Aug-24

Tummel Brudge	Bonskied 33/11kV Transformer Replacement	Mar-25	Increase in Transformer capacity - replace existing 5MVA transformer with a 6.3MVA transformer Nodes: 86212	No change
Port Ann	Islay (NoSR)	May-25	North of Scotland Resilience (NoSR) Increase in network security	Completion date changed from Mar-25
Bridge of Dun	Logie Pert 11kV switchboard Replacement	May-25	Increase in make and break fault ratings Nodes: 80604	Completion date changed from Oct-24
Taynuilt	Taynuilt - Tullich 33kV Circuit Reinforcement	Jun-25	Increase in network capacity Nodes: 3L5: 19730-85917-85966 -85913; 6L5: 19730-85941-85964-85913	Completion date changed from Apr-25
St Fergus	St Fergus Gas 11kV Board Replacement	Jun-25	Increase in make and break fault ratings Nodes: 21350	Completion date changed from Dec-24
Dyce	Circuit Reinforcement Dyce North	Jun-25	Increase in circuit capacity Nodes: 82419 - 82404, 82420 - 82405	Completion date changed from Aug-24
Strichen	New Pitsligo 33/11kV Transformer Replacement	Jul-25	Increase in Transformer capacity - replace both 2.5MVA transformers with 6.3MVA transformers Nodes: 85802	No change
Dyce	Kingseat 33/11kV Transformer Replacement	Aug-25	Increase in Transformer capacity - replace both 5MVA transformers with 7.5/15MVA transformers Nodes: 82409	Completion date changed from Mar-27
Taynuilt	Kinloch Isle of Mull (NoSR)	Aug-25	North of Scotland Resilience (NoSR) Increase in network security	Completion date changed from Dec-24
Fort William	Fort William 303 & 305 - Loch A'Choire Subsea Cable Replacement	Sep-25	Increase in network capacity Nodes: 82928 - 82929, 82938 - 82939	New
Scorradale	Eday 33/11kV Transformer Replacement	Oct-25	Increase in Transformer capacity - Replace the 1MVA transformer with	Description updated to correct transformer

			2.5MVA unit Nodes: 86116	capacities Completion date changed from Feb-25
Inverness	Longman Drive Substation	Nov-25	The proposed solution involves construction at both Longman Drive and Waterloo Primary substation (83519) with approximately 1.73km of dual 33kV cable linking both substations. The proposal for Longman Drive involves the building of a new indoor primary substation with associated transformers (2 x 12/24MVA) and switchgear (5 x 33kV & 10 x 11kV circuit breakers).	No change
Dunoon	Rothesay 33/11kV Transformer Replacement	Mar-26	Increase in Transformer capacity - replace both 12/24MVA transformers with 7.5/15MVA transformers Nodes: 82218	No change
Gremista	Shetland GSP and 33kV Network Integration Works	Mar-26	Connect the existing 33kV Shetland network to the new Gremista GSP	New
Keith	Insch 33/11kV Transformer and Switchboard Replacement	Mar-26	Increase in Transformer capacity and replacement of 11kV switchboard - replace both 5/7.5MVA transformers with 7.5/15MVA transformers Nodes: 83630	Transformer and switchboard replacements consolidated into one entry Completion date changed from Mar-27
Kintore	Methlick 33/11kV Transformer Replacement	Mar-26	Increase in Transformer capacity - replace T1 with a 6.3MVA transformer to match T2 Nodes: 83849	No change
Abernethy	Balbeggie 33/11kV Transformer Replacement	Mar-26	Increase in Transformer capacity - replace existing 5MVA transformer with a	No change

			7.5/15MVA transformer Nodes: 80005	
Thurso South	Sanday 33/11kV Transformer & Reactor Replacement	Mar-26	Increase in Transformer capacity Substation replacement - outdoor 33kV isolator arrangement to be replaced with indoor 33kV Switchboard alongside replacement of the reactor. 1.5MVA Transformer to be replaced with 2.5MVA. Nodes: 86118	Completion date changed from Mar-28
Woodhill	Springhill 33/11kV Transformer Replacement	Mar-26	Increase in Transformer capacity - replace both 15/21MVA transformers with 20/40MVA transformers and replace the 11kV switchboard Nodes: 85107	No change
Keith	Keith 304 & 303 Circuit Reinforcement	Apr-26	Increase in network capacity Nodes: 83640 - 83640, 83642 - 83644, 83643 - 83646	New
NEW	Rothienorman GSP Integration	May-26	Facilitate renewable generation / DGEN reconfiguration to free up capacity at Keith & Kintore. Involves transferring Methlick, Insch & Fyvie primaries alongside embedded generation to Rothienorman GSP.	No change
Loch Carnan	Drimore - NOSR	May-26	New network arrangement - 84005	Completion date changed from Mar-28
Grudie Bridge	Achiltibuie - NOSR	Jun-26	New 11kV Interconnector	Completion date changed from Jul-27
Tummel Brudge	Errochty/Tummel Bridge Integration Works	Jun-26	Transfer 5 x 33kV circuits from Tummel Bridge 33kV switchboard to the new Errochty 33kV switchboard Nodes: 20130	Completion date changed from Feb-25

Braco West	Callander 33kV STATCOM	Aug-26	Alleviate forecast voltage constraints - Reinforce Braco 4L5 and install 2 x 4MVAr STATCOMs at Callander Primary Nodes: 80516 - 80518, 80523, 80527	New
Broadford	Broadford 306 Reinforcement	Aug-26	Establish a new Primary substation in the Ruarach / Inverinate area including a 4MVA transformer.	New
Broadford	Skulamus - Transformer Reinforcement	Aug-26	Increase in transformer capacity and network security - Add a second 6.3MVA transformer at Skulamus and 33kV circuit to connect this to Broadford feeder 305 Nodes: 80733	New
Harris	Tarbert & Stockinish (NoSR)	Nov-26	Increase in network security - Install a new 33kV circuit breaker at Harris Grid and run a new 33kV circuit to Stockinish primary to remove it from Feeder 302	New
Coupar Angus	Coupar Angus - Transformer and Switchboard Replacement	Dec-26	Increase in Transformer capacity - Replace the 6.3MVA transformer with 7.5/15MVA unit to match T1 and replace the 11kV switchboard Nodes: 81726	New
Abernethy	Scone - Switchgear Replacement	Dec-26	Increase in make and break fault ratings Nodes: 80008	New
Gremista	33kV North Shetland Strategy	Jan-27	Increase in network capacity - Run 2 new 33kV circuits from Gremista GSP to a new 33kV switchboard adjacent Sullom Voe and integrate existing sections of feeder 302 (towards Brae, Firth and Shetland Gas Plant) into the new 33kV switchboard. Replace	New

			the 33kV switchboard at Mid Yell and install 2 x 4MVAr STATCOMs, replace the 33kV switchboard at Firth	
Keith	Keith 2 33kV circuits	Mar-27	Increase in network security - Reinforce voltage compensation equipment at the new Glenrothes Distillery 33kV switchboard and loop into the 33kV ring Nodes: 83605, 83615 & 83618	No change
Woodhill	Queens Lane North - Transformer and Switchgear Replacement	Mar-27	Increase in Transformer capacity and replacement of 11kV switchgear - replace both 10/12.5MVA transformers with 15/30MVA units 86400	Replacement of transformers added to the project Completion date changed from Mar-25
Thurso South	Lyness Primary - T1 Replacement	Mar-27	Increase in T1 transformer capacity to 1MVA Nodes: 86133	Completion date changed from Feb-28
Ardmore	Ardmore-Harris OHL	Mar-27	Increase network capacity Nodes: 85650 - 85651	New
Nairn	Nairn 4L5 Reinforcement	Mar-27	Increase in network capacity Nodes: 84505 - 84519	New
Keith	Rothes 11kV & 33kV Switchgear Replacement	Mar-27	Increase in make and break fault ratings Nodes: 83608, 83609 & 83605?	No change
Elgin	Bilbohall 33/11kV Transformer Replacement	Mar-27	Increase in Transformer capacity and network security - Install a 33kV circuit between Cumming Street and Bilbohall primaries and add a 2nd matching 12/24MVA transformer Nodes: 82502	Project description updated to include reference to 33kV circuit works
Stornoway	Stornoway 305 Circuit Reinforcement (Voltage)	Mar-27	Alleviate forecast voltage constraints - Install a 4MVAr STATCOM to feeder 305 in the vicinity	New

			of Tarbert primary Nodes: 85601	
Tarland	Ruthven Primary	Mar-27	Establish a new primary substation in the Ruthven area including a 8MVA transformer	New
Lairg	Tressady Transformer Reinforcement	Apr-27	Increase in transformer capacity Nodes: 83904 - 83905	No change
Lairg	Tressady Additional Transformer	Apr-27	Increase network capacity - Establish an additional pole mounted 33/11kV 0.315MVA transformer in the Tressady area	New
Strichen	Strichen 302 & 303 Circuit Reinforcement	May-27	Feeder 302: Increase in circuit capacity and the installation of a new 33kV switchboard at Mintlaw primary Nodes: 85841 - 85805 / 85806 Feeder 303: increase in circuit capacity and the installation of a new 33kV switchboard at Maud primary Nodes: 85842 - 85815 / 85816	New
Tummel Brudge	Calvine - Transformer Replacement	Jun-27	Increase in Transformer capacity - Replace the 2.5MVA transformer with a 6.3MVA unit Nodes: 86222	New
Milton of Craigie	Ashludie Primary - Transformer and Switchboard Replacement	Jun-27	Increase in Transformer capacity, replace 33kV and 11kV switchgear - replace both 10/12.5MVA transformers with 15/30MVA units Nodes: 84329, 84330 & 84331	New
Strathleven	Drymen - Transformer Replacement	Jun-27	Increase in Transformer capacity - Replace the 5/6.25MVA transformer with a 7.5/15MVA unit Nodes: 85707	New

Strathleven	Killearn - Transformer Replacement	Jun-27	Increase in Transformer capacity - Replace the 5/6.25MVA transformer with a 7.5/15MVA unit Nodes: 85718	New
Broadford	Kyle Primary - Transformer Replacement	Jul-27	Increase in Transformer capacity - 5MVA Transformers to be increased to 6.3MVA. Nodes 80724 & 80725	Completion date changed from Mar-27
Dyce	Ellon 33/11kV Transformer and Switchboard Replacement	Aug-27	Increase in Transformer capacity, replace 33kV and 11kV switchgear - replace both 10/12.5MVA transformers with 20/40MVA units Nodes: 82426, 82441 & 82427	New
Fort William	Loch Mudle Primary / Salen 2 P2 Compliance	Aug-27	Increase in transformer capacity and network security - Replace the 2.5MVA transformer at Salen 2 with a 4MVA unit (node 82921) and establish a new Primary substation in the Loch Mudle area including a 4MVA transformer.	New
Stornoway	Gisla - Circuit Reinforcement and Transformer Replacement	Sep-27	Increase in transformer and circuit capacity - Replace the single 1MVA transformer with 2 x 2.5MVA units and install a new 33kV circuit between Garynahine and Gisla Nodes: 85617	New
Ardmore	Laxay P2 Compliance	Sep-27	Increase network security - Extend Stornoway feeder 6L5 to Laxay primary, replace the 2.5MVA transformer with a 6.3MVA unit and install a second 6.3MVA transformer Nodes: 85609	New
Finstown	Hatston Primary	Oct-27	Establish a new Primary substation in the Hatston	New

			area including 2 x 15/30MVA transformers.	
Kintore	Midmar - Transformer Replacement	Oct-27	Increase in transformer capacity - Replace the existing 5MVA transformer with 2 x 8MVA units Nodes: 83818	New
Burghmuir	Burghmuir 33kV circuits	Oct-27	Increase in network capacity - Replace the Burghmuir to Inveralmond / Redgorton feeders and establish a new 33kV switchboard at Inveralmond Primary Nodes: 80904 & 80926	Completion date changed from Mar-27
Tummel Brudge	Coshieville - Transformer Replacement	Dec-27	Increase in Transformer capacity - Replace the 2.5MVA transformer with a 6.3MVA unit Nodes: 86222	New
Port Ann	Lochgilphead Circuit reinforcement	Dec-27	Lochgilphead 1L5 - Increase in network capacity Nodes: 84909 - 84947	New
Carradale	Carradale Circuit Reinforcement	Dec-27	Carradale 5L5 - Increase in network capacity Nodes: 81132 - 81147	New
Braco West	Creiff 33/11kV Transformer and Switchboard Replacement	Dec-27	Increase in Transformer capacity and replacement of 11kV switchboard - replace both 7.5/15MVA transformers with 12/24MVA transformers Nodes: 80509	Transformer and switchboard replacements at Creiff primary consolidated into one entry Completion date changed from Mar-27
Carradale	Carradale / Port Ellen 33kV Circuits	Dec-27	Increase in network security - Establish a new 33kV circuit between Carradale GSP and Port Ellen Primary, a new switchboard at Port Ellen and install 2 x STATCOMs at Port Ellen	New
Dunoon	Dunoon 33kV Circuits	Dec-27	Increase in network capacity (feeders 306 & 307) and establishment	New

			of a switchboard that includes 2 x 8MVAr STATCOMs at Craigagoul Primary Nodes: 82264 - 82265, 82258 - 82267, 82214 & 82216	
Persley	Stoneywood T1 & T2 - Circuit Reinforcement	Dec-27	Increase in network capacity Nodes: 84608 - 84612, 84613 - 84614	New
Stornoway	Barvas - Transformer Replacement	Jan-28	Increase in Transformer capacity - Replace both 2.5MVA transformers with 6.3MVA units Nodes: 85627	New
Stornoway	Coll - Transformer and Switchboard Replacement	Jan-28	Increase in Transformer capacity - Replace the 2.5MVA transformer with 2 x 6.3MVA units and replace the 11kV switchboard Nodes: 85625	New
Stornoway	Coll & Barvas (NoSR)	Jan-28	Increase network security - Build a 2nd 33kV circuit from Stornoway GSP connecting to both Coll and Barvas primaries, at Coll replace both the 11kV and 33kV switchboards, at Barvas replace the 33kV switchboard Nodes:	New
Grudie Bridge	Ullapool Primary - T1 Replacement	Feb-28	Increase in Transformer capacity Nodes: 83324	No change
NEW	Finstown GSP Integration	Mar-28	Connect the existing 33kV Orkney network to the new Finstown GSP. Increasing network capacity and facilitating the connection of renewable generation	No change
Stornoway	Battery Point 33kV Substation Replacement	Mar-28	The proposed works seeks to replace the three 4/8MVA transformers (85622)	Completion date changed from Apr-26

			with two 15/30MVA. The works will also seek to replace both the 33kV and 11kV switchgear.	
Tarland	Tarland Interconnection Circuits	Mar-28	Feeder 305: Increase in circuit capacity Nodes: 86723 & 86716 Feeder 405: Increase in Mossat Primary transformer capacity, replace both 2.5MVA transformers with 8MVA units and install a 33kV switchboard Nodes: 86712, 86703 & 86711	New
Beauly	Circuit Reinforcement - Muir of Ord	Mar-28	Increase in circuit capacity Nodes: 80311 - 80325, 80318 - 80326	New
Beauly	Conon Bridge - Circuit Reinforcement and Transformer Replacement	Mar-28	Increase in Transformer and 306 circuit capacity - Replace both 5/6.25MVA transformers with 7.5/15MVA units Nodes: 80322, 80323 - 80321	New
Brora	New Dornoch Primary	Mar-28	Establish a new Primary substation in the Dornoch area including a 8MVA transformer.	New
Fort William	Lochailort STATCOMs	Mar-28	Alleviate forecast voltage constraints - At the Lochailort regulator site install a new 33kV switchboard and 2 x 4MVAr STATCOMs Nodes: 82968, 82915, 82963	New
Grudie Bridge	Grudie Bridge 1L5 & 3L5 Circuit Reinforcement (Voltage)	Mar-28	Alleviate forecast voltage constraints - At Achiltibuie Primary install 2 x 4MVAr STATCOMs Nodes: 83334	New
Lairg	Lairg P2 Compliance	Mar-28	Increase in transformer capacity and network security - Add a 4MVA transformer and replace the 33kV switchboard at	New

			Lairg primary Nodes: 83908	
Thurso South	Halkirk - Transformer Replacement	Mar-28	Increase in Transformer capacity - Replace the 2.5MVA transformer with 2 x 6.3MVA units Nodes: 86017	New
Inverness	Waterloo Place - Transformer & Switchboard Replacement	Mar-28	Increase in Transformer capacity - Replace the 23MVA transformers with 20/40MVA units and replace the 11kV switchboard Nodes: 83519	New
Gremista	Unst New Primary	Mar-28	Increase in network security - Establish a new primary substation in the south Unst area including a 4MVA transformer	New
Nairn	Forres - Circuit Reinforcement and Transformer Replacement	Mar-28	Increase in transformer and circuit capacity - Replace the existing 7.5/15MVA transformers with 20/40MVA units and reinforce feeders 303 and 306 Nodes: 84504, 84503 - 84508, 84503 - 84511	New
Broadford	Broadford 303 Reinforcement	Mar-28	Establish a new Primary substation in the Sconser area including a 4MVA transformer.	New
Gremista	Firth - Circuit Reinforcement	Mar-28	Increase in network security - Install a second 33kV circuit to Firth primary from feeder 303 Nodes: 89943 - 89942	New
Tarland	Tarland 304 Circuit Reinforcement	Mar-28	Increase in network capacity Nodes: 86713 - 86727	New
Carradale	Machrie T2 and 11kV switchboard Replacement	Mar-28	Increase in network capacity - Establish a 33kV switching station and STATCOMS at Brodick Primary (81106) Install an additional 2.5MVA Tx to match	Completion date changed from Mar-27

			existing unit and new indoor 11kV switchboard at Machrie Primary (81114)	
Inverness	Culloden 33/11kV Transformer and Switchboard Replacements	Mar-28	Increase in transformer capacity and replace all switchgear - Replace both 15MVA transformers with 15/30MVA transformers Nodes: 83504	Proposed transformer sizes updated from 12/24 to 15/30MVA units Estimated completion changed from Apr-26
Elgin	Ashgrove Circuit & Transformer Replacement	Mar-28	Increase in network and transformer capacity - Remove Ashgrove primary from the existing 33kV network via 2 x new 33kV circuits from Elgin GSP, replace T1 with a 20/40MVA transformer and add a 2nd matching 20/40MVA transformer, replace the 11kV switchboard Nodes: 82513	Project description updated to include change in proposed transformer sizes and addition of new 33kV circuits Completion date changed from Mar-27
Tarland	Tarland Ring Reinforcement	Mar-28	Increase in network capacity - Separate Aboyne Primary from the Tarland 33kV ring via 2 new 33kV circuits, replace the 33kV switchgear at Ballater Primary to allow the connection of 2 x 4MVAr STATCOMs and establish a new primary substation in Braemar including 2 x 6.3MVA transformers Nodes: 86704 & 86708	Project description updated to include reference to Ballater STATCOMs
Keith	Keith 1 33kV circuits	Mar-28	Increase in network capacity - Reconfigure network with new circuit to Buckie, shed Cullen from ring and reinforce existing circuits Nodes: 83641 & 83645	No change

Abernethy	Abernethy, Glendevon & Milnathort reinforcement	Mar-28	Increase in network capacity - Reconfigure the Milnathort/Glendevon 33kV network via the addition of 2 new 33kV circuits between Abernethy GSP and Milnathort Primary. Replace both Milnathort transformers with 20/40MVA units Nodes: 80033 & 80037	No change
Loch Carnan	Lochmaddy Primary	Mar-28	Establish a new Primary substation in the Lochmaddy area including a 6.3MVA transformer.	New
Carradale	Lochranza Primary	Mar-28	Establish a new Primary substation in the Lochranza area including a 2.5MVA transformer.	New
Finstown	St Mary's P2 Compliance	Mar-28	Establish a new Primary substation on South Ronaldsay including 2 x 4MVA transformers.	New
Dunvegan	Dunvegan 33kV Circuit Reinforcements	Mar-28	Increase in network capacity and alleviate forecast voltage constraints - 33kV circuit reinforcement, installation of 2 x 2.5MVAr STATCOM's at Uig primary and the establishment a new primary substation in the Brogaig area including a 4MVA transformer Nodes: 82313 - 82316, 82308	New
Port Ann	Cromalt - Transformer Replacement	Jun-28	Increase in Transformer capacity - Replace the 2.5MVA transformer with a 4MVA unit Nodes: 84952	New
Clachan	Inverary - Transformer Replacement	Jun-28	Increase in Transformer capacity - Replace the 2.5MVA transformer with a 4MVA unit Nodes: 81521	New

Taynuilt	Kimleford & Kilninver P2 Compliance	Aug-28	Increase in transformer capacity and network security - Establish a new 33kV circuit between Tullich Switching Station and Kilmelford primary, replace the 2.5MVA Kilmelford transformer with a 6MVA unit (85986), install 2 x 2MVAr STATCOM's in the vicinity of Kilmelford (85985) and establish a new primary substation south of Kilmelford including a 4MVA transformer	New
Taynuilt	Dervaig Undervoltage	Aug-28	Alleviate forecast voltage constraints - Install a 3 x 2MVAr STATCOMs at Dervaig primary Nodes: 85940	New
Taynuilt	Kinloch P2 Compliance	Aug-28	Increase network security - Establish a new 33kV circuit between Lochdonhead and a new primary substation in the Bunessan area including a 2.5MVA transformer, establish a 33kV circuit between this new primary substation and Kinloch primary Nodes: 85928, 85934	New
Taynuilt	Oban 33kV Circuits	Aug-28	Increase in network capacity Nodes: 85913 - 85914, 85913 - 85915	New
Fort William	Inverlochy - Circuit Reinforcement and Transformer Replacement	Sep-28	Increase in transformer and circuit capacity - Replace the existing 7.5/15MVA transformers with 15/30MVA units and install 2 new 33kV circuits between Fort William GSP and Inverlochy Primary to remove it from the 1L5 /	New

			2L5 33kV ring Nodes: 82956	
Fort William	Fort William 3L5 Circuit Reinforcement	Sep-28	Increase in network capacity Nodes: 82940 - 82936 - 82930	New
Kintore	Kintore 301 Circuit Reinforcement	Mar-29	Increase in network capacity Nodes: 83848 - 83835	New
Kintore	Oldmeldrum 33/11kV Transformer and Switchboard Replacement	Mar-29	Increase in Transformer capacity, replace 33kV and 11kV switchgear - replace both 4/8MVA transformers with 15/30MVA units Nodes: 83842, 83843, 83845	New
Redmoss	Newtonhill - Transformer and Switchgear Replacement	Apr-29	Increase in Transformer capacity, replace 33kV and 11kV switchgear - replace both 15MVA transformers with 15/30MVA units Nodes: 85107	Proposed transformer sizes updated from 12/24 to 15/30MVA units
Gremista	Scalloway - Setter Sandwick - Sumburgh Reinforcement	Jun-29	Increase in network security and increase transformer capacity - Install a 2nd 33kV circuit to Scalloway & Sandwick primaries. At Scalloway add a 2nd 8MVA transformer, at Setter Sandwick add a 2nd 8MVA transformer Nodes: 89972 & 89981	Completion date changed from Mar-28
Strathleven	Kepculloch - Transformer Replacement	Jun-29	Increase in Transformer capacity - Replace the 5MVA transformers with 7.5/15MVA units Nodes: 85712	New
Elgin	Elgin Circuit Reinforcement	Aug-29	Elgin 304 - Increase in network capacity Nodes: 82537 - 82527	New
Keith	Dufftown - Transformer Replacement	Aug-29	Increase in Transformer capacity - Replace the 5MVA transformers with 7.5/15MVA units Nodes: 83618	New

Inverness	Raigmore - New Primary Substation & Circuit Reinforcment	Aug-29	Establish new 33kV circuits from Inverness GSP to a new primary substation south of Raigmore primary including 2 x 15/30MVA transformers, extend these new 33kV circuits to the existing Raigmore primary substation. Nodes: 83544 - 83509, 83506 - 83546	New
Kintore	Banchory - Circuit Reinforcement and Transformer Replacement	Oct-29	Increase in transformer and circuit capacity - Replace the existing 10/14MVA transformers with 20/40MVA units and reinforce feeder 304 Nodes: 83818, 83823 - 83833	New
Bridge of Dun	Montrose North - Circuit Reinforcement and Transformer Replacement	Mar-30	Increase in Transformer and circuit capacity - Replace both 7.5/15MVA transformers with 20/40MVA units Nodes: 80623, 80641 - 80622, 80640 - 80621	New
Rannoch	Bridge of Gaur 33/11kV Transformer Replacement	Mar-30	Increase in Transformer capacity - replace existing 0.5MVA transformer with a 1MVA transformer Nodes: 85020	Completion date changed from Mar-26
Port Ann	Crinan 11kV switchboard Replacement	Mar-30	Increase in make and break fault ratings Nodes: 84915	Completion date changed from Mar-27
Port Ann	Port Ann / Port Askaig 33kV Circuits	Jun-30	Increase in network security - Establish a new 33kV circuit between Port Ann GSP and Knocklearoch switching station	New

Assets Decommissioned

There are no decommissioned assets since May 2024.