



SSEN DISTRIBUTION NETWORK DEVELOPMENT REPORT

Draft Report for Consultation

March 2024





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INTRODUCTION

This is Scottish and Southern Electricity Networks (SSEN) Distribution's draft 2024 Network Development Report and is part of a suite of new information that sets out our longer-term Network Development Plans for our distribution networks. It gives users access to information pertaining to our network plans for the next ten years in relation to our 11 kV networks and above, allowing all interested parties to better assess and identify the future opportunities to use and engage with us and the network. Specifically, it includes:

- a) A description of those parts of the Distribution Network Operator's (DNO's) network that are most suited to new connections and distribution of further quantities of electricity;
- b) A description of those parts of the DNO's network where reinforcement may be required to connect new capacity and new loads;
- c) Information that supports the secure and efficient operation, coordination, development and interoperability of the interconnected system; and
- d) Flexibility or Energy Efficiency Services that the DNO reasonably expects to need as an alternative to reinforcement.

This Report and our wider Network Development Plan (NDP) build on existing publications, including our Long-Term Development Statements and Flexibility Services publications, which provide information on our nearer-term opportunities and our key focus areas as we continue to develop and improve our network to meet the changing needs and requirements of all stakeholders. These supporting documents can be found in the following links.

- a) [Long term development statements \(LTDS\) - SSEN](#)
- b) [Flexible Solutions - SSEN](#)

To aid users of this Report, we have worked with all DNOs across Great Britain to ensure consistency in reporting. This was achieved through the Energy Networks Association (ENA) and the development of a Form of Statement of Network Development Plans¹ through the ENA's Open Networks workstream 1B. As a result of this work, the NDP is split into three distinct reports, as illustrated in Figure 1; the red box highlights the part that this document – the Network Development Report – represents.

¹ [ENA NDP Form of Statement Template and Process \(22 Dec 2021\)](#)

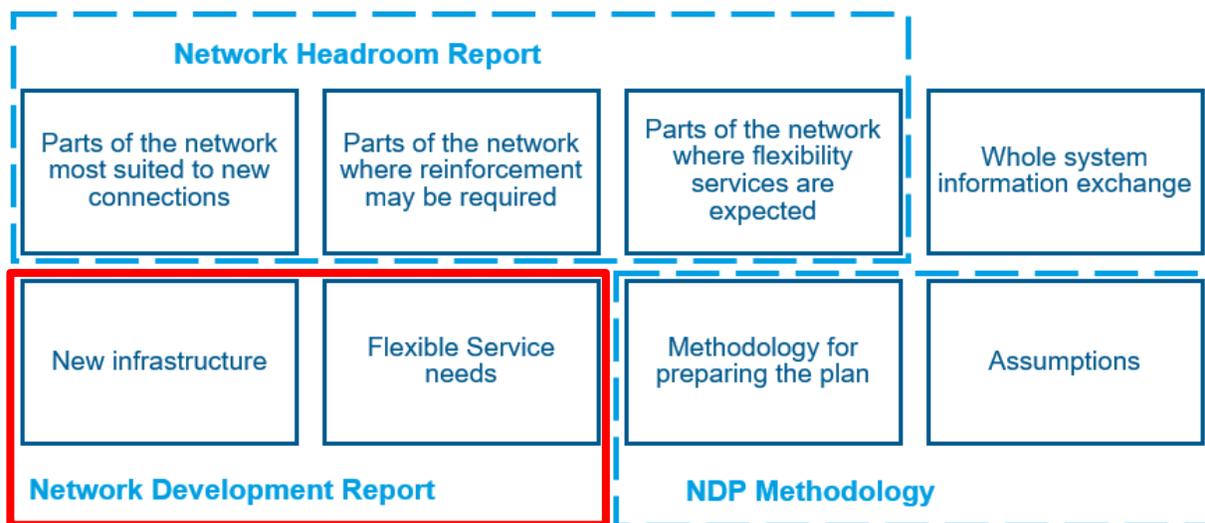


Figure 1: NDP Reporting Structure

Network Development Report (NDR) overview

The NDR provides a comprehensive view of our network, bringing together our plans for the current price control period (RIIO-ED2, which runs until March 2028) and initial programmes for subsequent years, up to 2034. It also references other key publications that set out the likely use and development of our network and the opportunities that this may present.

Using latest available Distribution Future Energy Scenarios (DFES) at the time of publication, the NDR sets out our proposed investments and likely areas for service requirements going forward. Together with the NDP Methodology, it also sets out the wider information used to inform this Report, which users of our network can call upon to inform their own plans and activities. Further, the information contained within this report informs our Network Scenario Headroom Report (NSHR), which indicates potential investment opportunities for flexible services and new connections at a granular level across our network. allows interested parties to clearly correlate proposed areas of investment with changes in network headroom capacity.

The NDR provides a list of high-level plans for network interventions and flexible service requirements:

- For the next ten years
- Location of the intervention
- Requirements for flexibility services or increasing existing asset capacity
- When the works are forecast for delivery



How to read this report

The NDR describes our forward programme of interventions required on our networks over the next decade. This includes details of our proposed flexibility needs as well as network interventions. These decisions are derived from our network development process which is described in the accompanying NDP Methodology report as well as our latest DNOA methodology.

This section provides both guidance on the information pertaining to potential Flexibility Services and network interventions listed in the report. It also provides further context on our current suite of Flexibility Services. Please note that this document forms part of a consultation and information will be updated in the final document. Please therefore treat data as indicative at this stage.

We provide summary tables of forward-looking flexibility needs and network interventions in three appendices attached to this report. These appendices are;

- **Appendix 1: Flexibility Service Solutions** – This appendix lists known flexibility opportunities as reported in our latest SLC 31E procurement statement.
- **Appendix 2: SEPD Interventions** – This appendix summarises interventions needed at individual substations and substation groups in SEPD for projects in initial development and detailed development and delivery (see below).
- **Appendix 3: SHEPD Interventions** – This appendix summarises interventions needed at individual substations and substation groups in SHEPD for projects in initial development and detailed development and delivery (see below).

The project statuses mentioned above refer to the following:

- **Projects in initial development** – these are projects which are still at an early phase of development and have yet to arrive at a DNOA outcome. As such there is still a possibility that the intervention may not be needed or not needed in its current form. The use of flexibility may be a feasible outcome. These tend to be longer term projects. Further updates on these projects and other developments at an even earlier stage will be updated through our periodic DNOA outcome releases.
- **Projects in detailed development and delivery** – these are projects that have progressed into more detailed development and delivery. They include projects required for both primary reinforcement and asset replacement purposes. Going forwards an increasing proportion of primary reinforcement projects will be those that have been through the DNOA process and have been assessed as needing network intervention. Projects that have been through the first DNOA outcomes have been identified in this report. Some primary reinforcement projects on the list pre-date the DNOA process but will have been similarly assessed for flexibility needs.



Current Flexibility Services products

SSEN Distribution align with the definition of Flexibility Service products as agreed within the ENA's Open Network Programme². The four key services utilised across all distribution network are: Scheduled Utilisation, Operational Utilisation, Scheduled Availability + Operational Utilisation, and Variable Availability + Operational Utilisation. Currently, SSEN primarily procures Variable Availability + Operational Utilisation – week ahead response for supporting the deferral of reinforcement. The payment terms for and definitions of these services are summarised in Figure 2.

	Product	Description	Decision timescales	Payment
 Flexibility service products	Peak Reduction	This product seeks a reduction in peak power utilised over time. This response can manage peaks in demand.	<ul style="list-style-type: none"> ■ Utilisation Instruction: At Trade 	Utilisation
	Scheduled Utilisation	In this product, the time that flexibility is delivered has been pre-agreed in advance with the provider.	<ul style="list-style-type: none"> ■ Utilisation Instruction: At Trade 	Utilisation
	Operational Utilisation	This product allows for the use case where the amount of flexibility delivered is agreed nearer to real time.	<ul style="list-style-type: none"> ■ Utilisation Instruction: Real Time or Week Ahead 	Utilisation
	Operational Utilisation + Scheduled Availability	This product procures, ahead of time, the ability of an FSP to deliver an agreed change following a network abnormality.	<ul style="list-style-type: none"> ■ Availability Refinement: Not allowed ■ Utilisation Instruction: Real Time or Day Ahead 	Availability + Utilisation
	Operational Utilisation + Variable Availability	This product allows for DNOs and the ESO to procure a level of contracted capacity, but then refine the requirements in terms of availability closer to the event.	<ul style="list-style-type: none"> ■ Availability Refinement: Week Ahead or Month Ahead ■ Utilisation Instruction: Real Time or Day Ahead or Week Ahead 	Availability + Utilisation

Figure 2: New Standard Flexibility Service Products³

We will continue to dispatch services procured under previous names and Figure 4 shows how the previous services match to the new names. It should be noted the mapping is not exact. Some variables, such as when availability instructions are given, have been adjusted to align with the new definitions.

Previous Product Name	New Product Name	Variation
Sustain	Scheduled Utilisation	
Secure	Variable Availability + Operational Dispatch	Month Ahead
Dynamic	Variable Availability + Operational Dispatch	Week Ahead

² [https://www.energynetworks.org/assets/images/2023/Aug/on-flexibility-products-alignment-\(feb-2024\).pdf?1711357255](https://www.energynetworks.org/assets/images/2023/Aug/on-flexibility-products-alignment-(feb-2024).pdf?1711357255)

³ SLC 31E Flexibility Services Procurement Statement



Appendix 1 highlights where we are proposing to procure flexible services and the type of services required.



RELATED PUBLICATIONS

SSEN Distribution's NDP is informed and supplemented by multiple data sources that are publicly available. This section provides a high-level overview of these documents and provides the reader with an understanding of how each document can be used to provide a view of the network from today to 2050. Figure 2 shows how these documents fit together within our planning horizon.

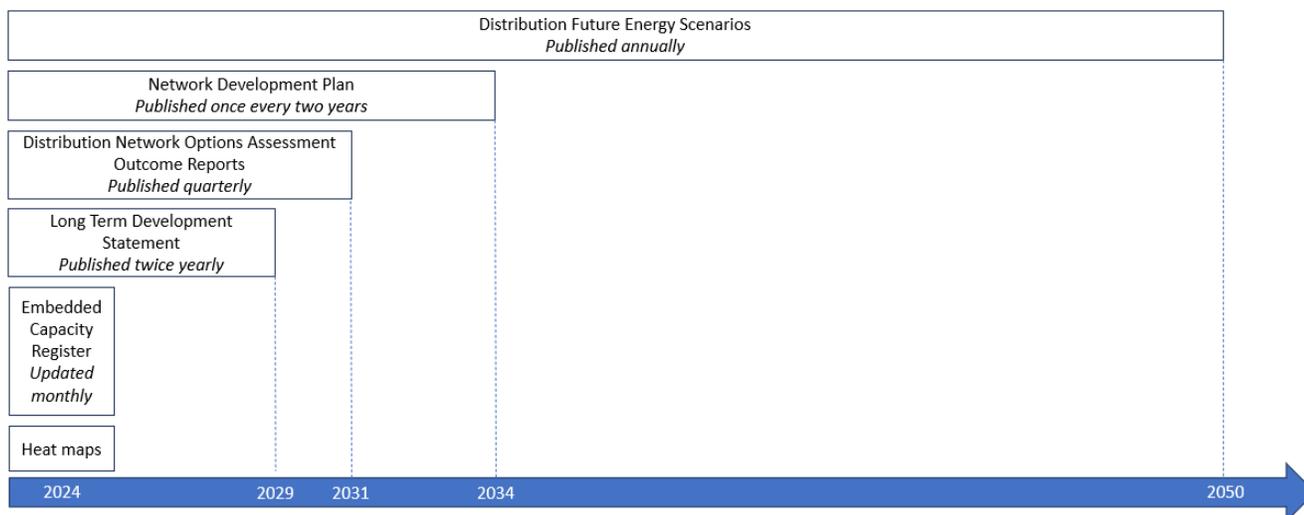


Figure 2 – Planning horizons and frequency of publications for NDP and related documents.

Heat Maps

SSEN Distribution regularly updates and publishes network Heat Maps for both generation and demand on its website⁴. The purpose of the Heat Maps is to highlight areas of the network, through colour codes, that have available capacity (green), areas that have limited capacity (amber) and areas where there is no capacity (red). As a result, these Heat Maps can help inform large-scale developers where they can most likely connect without triggering significant reinforcement. The view presented via our Heat Maps is based on our connected and contracted background.

Please note that this view is subject to continual change as new connection offers are accepted and other connection agreements are cancelled. Further, the Heat Maps do not utilise future energy scenarios or consider small scale developments such as low carbon technologies. Notwithstanding this, these maps provide a good indicator of headroom capacity.

⁴ [Network Maps \(ssen.co.uk\)](https://www.ssen.co.uk)



Embedded Capacity Register (ECR)

The embedded capacity register⁵ contains details of Distribution Energy Resource (DER) either connected or accepted to connect to our networks. It adopts the standard format for all GB DNOs and covers all generation and storage assets with capacity greater than or equal to 50kW. It also provides information on flexibility services that are being provided and network reinforcement to facilitate connections.

Long Term Development Statement

The purpose of the Long-Term Development Statement (LTDS)⁶ is to provide information for anyone connecting to our EHV (132kV, 66kV, 33kV and 22kV) distribution system including the HV (11kV and 6.6kV) busbar of primary substations. It is designed to help parties that might wish to use or connect to our system to identify and evaluate their opportunities for doing so. Our statements include the following network data;

- The likely development of our distribution system;
- Our plans for modifying our distribution system; and
- Identification of parts of our distribution system that are likely to reach their capacity limit in 0 – 5 years.

As part of our forecasts, particularly for the NSHR, the investments proposed in the latest LTDS for the short-term period of 0 – 5 years prior to publication of the NSHR are reflected in the outputs of the NSHR.

The LTDS is published annually in November and updated every May to reflect the latest peak demands. For the purposes of the NDP, and as per SLC 25B, we align investments and demands to the latest LTDS to inform the NDP. This means that the LTDS released in the November prior to the NDP publication are used.

Distribution Future Energy Scenarios (DFES)

SSEN's DFES publications are produced annually and provide significant information on potential future generation and demand projections in both our licence areas through to 2050.

SSEN DFES⁷ analysis produces granular scenario projections for the increase (or reduction) in electricity distribution network connected capacity of electricity generation, storage and low carbon demand technologies. The SSEN DFES analysis also includes projections for new housing growth and new commercial and industrial developments. It achieves this through a combination of significant input from local and regional stakeholders, including local authorities, regional growth factors and detailed analysis of the pipeline of projects and developments within SSEN Distribution's licence areas.

As a framework, the DFES uses a set of four national energy scenarios based on the latest National Grid ESO Future Energy Scenarios (ESO FES) publication, each driven by different societal change and speed of decarbonisation. These are known as: Falling Short (FS), Consumer Transformation (CT), System Transformation (ST) and Leading the Way (LW).

⁵ [Embedded capacity register - SSEN](#)

⁶ [Long term development statements \(LTDS\) - SSEN](#)

⁷ SSEN Future Energy Scenario, [Smart and local benefits for our communities - SSEN](#)



Distribution Network Options Assessment (DNOA) – outcomes and methodology

Earlier this year we published our first DNOA methodology report explaining our strategic development process and how we assess flexibility and network options to meet a system need⁸. This process provides stakeholders with greater transparency of the decisions we make. The DNOA methodology was published as a consultation and will be updated annually.

The DNOA methodology is then used as an integral part of our network development process. We are now publishing the outcomes of our DNOA process periodically on our website alongside the DNOA methodology. These outcomes provide a timely notification of both future flexibility opportunities as well as areas of new network interventions.

Going forwards a significant proportion of the NDR will be constituted from DNOA outcomes, providing a snapshot forwards view of both flexibility opportunities and areas of network interventions that have already been published in DNOA outcome reports.

We have already started this process with this NDR including the outputs of our first DNOA outcomes report. These outcomes are either shown in Appendix 1 for flexibility opportunities or Appendices 2&3 for network interventions (for projects in detailed development and delivery).

Some projects are listed in Appendices 2 and 3 as in 'initial development'. These projects have yet to complete the DNOA process.

⁸ [Publications & Reports - SSEN](#)



GETTING IN TOUCH

Although the NDP provides a view of the future in terms of our investments and potential network constraints, we would encourage any party using this information in their decision-making process to engage with us ahead of making an application to connect or offer flexible services.

The following table sets out the key e-mail addresses, phone numbers and websites that can support you with your decision making:

Type of Enquiry	DNO	Email	Telephone	Website
Flexible Services	SHEPD SEPD	FlexibleServices@sse.com Flexibilityprocurement@sse.com	N/A	Flexible Solutions Flexibility Services - SSEN
Load Connections	SHEPD SEPD	connections@ssen.com	0800 0483516	New Supplies Existing Supplies
Generation Connections (>50kW)	SHEPD SEPD	mcc@sse.com	0345 0724319	Generation Connections
Generation Connections (<50kW)	SEPD	Southmicrogen@sse.com	0345 0724319	Generation Connections

Further, if you have any feedback on this NDR, or any aspect of the NDP, which we can use to improve future publications, we would like to hear from you. Please get in touch through the following address whole.system.distribution@sse.com. Please state "Network Development Plan Feedback" in the subject title.



APPENDICES 1 TO 3

APPENDIX 1: FLEXIBILITY SERVICE SOLUTIONS

This section provides information on the substations that have been identified as potential opportunities for flexible services due to their loading. The information includes the service requirement, the anticipated year that we would go to market and the years of forecast need. Further information is provided through our SLC 31E Flexibility Services Statement, which is an annual statement published on our website every April that sets out our Flexibility Service requirements for the forthcoming year. Further information on our flexibility requirements can be found in our Flexibility Services Document Library⁹.

To participate in the Bidding rounds listed in this section first an Overarching Agreement must be signed, for more information on this please refer to the website or email Flexibility Services team.

2024 Long Term Bidding Rounds

Greatest certainty of our future flexibility needs can be found from our 2024 anticipated flexibility service requirements. These are taken from the latest SLC 31E Flexibility Services Statement.

Table A1.1 May Bidding Round Anticipated Flexibility Service Requirements

Zone Name	Licence Area	Peak Capacity	Forecast Utilisation (MWh)	Voltage Level Flexibility	Service Start Year	Service End Year	Service Window
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⁹ <https://www.ssen.co.uk/our-services/flexible-solutions/flexibility-services/flexibility-services-document-library/>



		Required (MW)		Year Procured at (kV)			
West London – Ealing (excl. Boston Manor Road)	SEPD	29	790	132	24/25	26/27	Winter 16:00-20:00
West London – Ealing Boston Manor Road Only	SEPD	6	330	66	24/25	26/27	Summer 10:00-16:00
West London – Iwer 66kV	SEPD	2	50	66	24/25	26/27	Winter 16:00 – 20:00
West London – Laleham. Church Road, Hope and Anchor, East Bedford B, Staines	SEPD	2	50	22	24/25	26/27	Winter 16:00-20:00
West London –	SEPD	7	190	33	24/25	26/27	Winter 16:00-20:00



North Hyde 33kV							
West London – Willesden. Leamington Park and Park Royal	SEPD	1	50	22	24/25	26/27	Winter 09:00-17:00
West London – Willesden. Greenford and Goldsmiths	SEPD	4	110	66	24/25	26/27	Winter 16:00 - 20:00
West London – Willesden. Perivale Only	SEPD	15	200	66	24/25	26/27	Winter 16:00 – 18:00
West London – Willesden. Canal Bank Only	SEPD	10	550	66	24/25	26/27	Summer 10:00-16:00
Lytchett	SEPD	5.43	7.7	33	24/25	24/25	Autumn 18:00-18:30 Winter 18:00-19:00
Abernethy	SHEPD	0.28	0.27	11	24/25	24/25	Winter 17:30-18:00



Springhill	SHEPD	1.5	3.9	11	24/25	24/25	Winter 17:00-18:30
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Table A1.2 August Bidding Round Anticipated Flexibility Service Requirements

Zone Name	Licence Area	Peak Capacity Required (MW)	Voltage Level Flexibility Procured at (kV)	First Year of Service	Last Year Service Required	Service Windows
Beaconsfield	SEPD	3.03	11	25/26	26/27	Spring/Autumn 17:30-18:30 Winter 14:00-20:30
Culloden	SHEPD	0.71	11	25/26	26/27	Winter 17:30-18:00
Burghmuir ¹⁰	SHEPD	1.08	33	25/26	25/26	Winter 15:00-16:00
Abernethy	SHEPD	0.99	11	25/26	25/26	Winter 17:30-18:30
Stoneywood	SHEPD	0.09	11	25/26	26/27	Winter 17:30-19:00

¹⁰ Listed as Inveralmond and Redgorton in the DNOA Outcomes report



Lytchett	SEPD	5.87	33	25/26	26/27	Autumn 18:00-18:30 Winter 18:00-19:00
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January 2025 Bidding Round

The review of the network using the DNOA network is ongoing and will be reviewed yearly. The areas where a review is expected to occur ahead of the January 2025 bidding round are listed in Figure 8. Not all these areas will result in Flexibility Services being the optimal solution. If information is available sooner, some of these services may be procured in August 2024 bidding round.

Table A1.3 January 2025 Bidding Round Anticipated Flexibility Service Requirements

CMZ Name	Licence Area
Alresford	SEPD
Ashludie	SHEPD
Calne	SEPD
Charlbury-Woodstock	SEPD
Bemerton	SEPD
Botley Wood	SEPD
Dufftown	SHEPD
Fawley North	SEPD
Fort Widley	SHEPD
Oxford (Osney)	SEPD



Rowden	SEPD
Witney	SEPD
Fort Widely	SEPD
Yarnton	SEPD
Yattendon	SEPD



APPENDIX 2: SEPD INTERVENTIONS

This section provides information on planned interventions in the SEPD licence area. It is organised based on stages of project development and delivery;

- **Projects in initial development** – these are projects which are still at an early phase of development and have yet to arrive at a DNOA outcome. As such there is still a possibility that the intervention may not be needed or not needed in its current form. The use of flexibility may be a feasible outcome. These tend to be longer term projects. Further updates on these projects and other developments at an even earlier stage will be updated through our periodic DNOA outcome releases.
- **Projects in detailed development and delivery** – these are projects that have progressed into more detailed development and delivery. They include projects required for both primary reinforcement and asset replacement purposes. Going forwards an increasing proportion of primary reinforcement projects will be those that have been through the DNOA process and have been assessed as needing network intervention. Projects that have been through the first DNOA outcomes have been identified in this report. Some primary reinforcement projects on the list pre-date the DNOA process but will have been similarly assessed for flexibility needs.

Within these sections, there are two tables each: the first is for individual substations that have planned reinforcement works associated with them due to their loading. The second is for substation groups that have planned reinforcement works associated with them due to their loading. The information in the tables includes the capacity to be released as well as the forecasted reinforcement completion date, which is reflected in the NSHR.

The map below shows the supply areas of each Grid Supply Point in the SEPD licence area. The upstream GSP is provided for each intervention in the tables below so that readers can locate the relevant geographic areas. Supply areas for Bulk Supply Points and Primary Substations are available on our Open Data Portal.



Figure A2.1 GSP Supply Areas in the SEPD licence area.



Projects in initial development

Table A2.1: SEPD Substation reinforcement projects in initial development

Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Capacity (MVA)	Updated Capacity (MVA)	Forecast Completion Date	Status	Project Description	Driver
Fulscot	Cowley	33/11	19.9	51.2	2027/2028	In DNOA process	Replace 2x15MVA transformers to 2x20/40MVA units	CV1 - Primary Reinforcement
Wimborne	Mannington	33/11	25.35	51.2	2027/2028	In DNOA process	Replace 2x15MVA transformers to 2x20/40MVA units	CV1 - Primary Reinforcement
Alderton	Melksham	33/11	3.9	15	2026/2027	In DNOA process	Replacement of two 33kV transformers	CV1 - Primary Reinforcement
Faringdon	Minety	33/11	14.9	39	2026/2027	In DNOA process	Replacement of two 33kV transformers to release 11.1MVA	CV1 - Primary Reinforcement



Table A2.2 SEPD Substation group reinforcement projects in initial development

Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Capacity (MVA)	Updated Capacity (MVA)	Forecast Completion Date	Status	Project Description	Driver
Yeovil-Yetminster-Axminster (P)	Axminster	33	19.1	30.7	2027/2028	In DNOA process	Replacement of overhead line to release 1MVA	CV1 - Primary Reinforcement
Basingstoke / Overton (P) / Bramley Green	Bramley (Basingstoke)	33	TBD	TBD	2027/2028	In DNOA process	Replacement of overhead line to release 4.1MVA	CV1 - Primary Reinforcement
Aldershot - (P) / Tongham	Bramley (Fleet)	33	TBD	TBD	2026/2027	In DNOA process	Replacement of overhead line to release 1MVA	CV1 - Primary Reinforcement
Fernhurst - (P) / Midhurst	Bramley (Fleet)	33	TBD	TBD	2026/2027	In DNOA process	Replacement of overhead line release 1MVA	CV1 - Primary Reinforcement
Berinsfield	Cowley	33	TBD	TBD	2027/2028	In DNOA process	Replacement of overhead line to release 1MVA	CV1 - Primary Reinforcement



Stokenchurch	Cowley	33	TBD	TBD	2025/2026	In DNOA process	Add 20.5km underground cable and 4x33kV circuit breakers	CV1 - Primary Reinforcement
Cholsey (S) / Goring	Cowley/Bramley (Fleet)	33	TBD	TBD	2026/2027	In DNOA process	Replacement of overhead line release 10MVA	CV1 - Primary Reinforcement
Chichester - Shripney	Lovedean	33	TBD	TBD	2027/2028	In DNOA process	Replacement of underground cable and overhead line to release 10.8MVA	CV1 - Primary Reinforcement
Fareham - Hoeford	Lovedean	33	TBD	TBD	2027/2028	In DNOA process	TBC	CV1 - Primary Reinforcement
Bemerton 33kV	Mannington	33	21	30.7	2025/2026	In DNOA process	Ring network primary reinforcement	CV1 - Primary Reinforcement
Shaftesbury – Bourton	Mannington	33	19.1	30.7	2024/2025	In DNOA process	33kV overhead line reinforcement	CV1 - Primary Reinforcement



Bruton	Melksham	33	TBD	TBD	2026/2027	In DNOA process	Replacement of overhead line to release 1.7MVA	CV1 - Primary Reinforcement
Malmesbury - Tetbury	Melksham	33	TBD	TBD	2027/2028	In DNOA process	Replace overhead line to release 1MVA	CV1 - Primary Reinforcement

Projects in detailed development and delivery

Table A2.3: SEPD Substation reinforcement projects in detailed development and delivery

Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Capacity (MVA)	Updated Capacity (MVA)	Forecast Completion Date	DNOA assessment (Y/N)	Project Description	Driver
SHERBORNE	Axminster	33/11	9.75	19.5	2024/2025	N	Replace the transformer with new 7.5/15MVA CER unit	CV7 - Asset Replacement
Bishops Waltham	Botley Wood	33/11	31.2	52	2026/2027	N	Change twin 12/24 CER units to 20/40 units at Bishops Waltham, also upgrade circuits	CV1 - Primary Reinforcement



Netley Common	Botley Wood	132/33	114	228	2025/2026	N	Add one 132/33kV 90MVA Tx at Netley Common BSP, also add a new 33kV 2200A circuit breaker	CV1 - Primary Reinforcement
Basingstoke T1A & T2A	Bramley (Basingstoke)	132/33	78	114	2024/2025	N	Replace existing 60MVA transformer with 90MVA unit, also change circuit breaker	CV7 - Asset Replacement
Basingstoke T1A and T2A	Bramley (Basingstoke)	132/33	78	114	2024/2025	N	Replace 60MVA A2MT transformer with 90MVA unit	CV7 - Asset Replacement
Alresford	Bramley (Fleet)	33/11	16.9	27.9	2026/2027	N	Release 11MVA at Alresford due to transformer reinforcement	CV1 - Primary Reinforcement
CHOBHAM	Bramley (Fleet)	33/11	14.3	31.2	2025/2026	N	Replace C1MT and C2MT with 2x12/24MVA CER units	CV7 - Asset Replacement



HASLINGBOURNE	Bramley (Fleet)	33/11	16.9	31.2	2025/2026	N	Replace C1MT and C2MT with 2x12/24MVA CER units, and replace 33kV switchgear	CV7 - Asset Replacement
MVEE	Bramley (Fleet)	33/11	28.35	39	2025/2026	N	Replace C1MT and C2MT with 2x15/30MVA units, also replace 33kV switchgears	CV7 - Asset Replacement
HUNGERFORD	Bramley (Thatcham)	33/11	16.9	19.5	2025/2026	N	Replace C1MT and C2MT with 2x7.5/15MVA CER units	CV7 - Asset Replacement
CERNE ABBAS	Chickerell	33/11	2.6	4	2025/2026	N	Replace C1MT with a new 4MVA unit	CV7 - Asset Replacement
CHOLSEY	Cowley	33/11	9.75	19.5	TBC	N	Replace C1MT and C2MT with 2x7.5/15MVA units	CV7 - Asset Replacement
Wheatley	Cowley	33/11	18	52	TBC	N	Upgrade 2x7.5/15 transformers to 20/40MVA units, also	CV1 - Primary Reinforcement



							upgrade circuits	
Witney Town	Cowley	33/11	29.25	52	2026/2027	N	Replace two 15/22.5MVA Tx to 20/40MVA at Witney Town	CV1 - Primary Reinforcement
Ealing	Ealing	22/11	N/A	N/A	2028/2029	Y	Replacement of 17 circuit breakers with new circuit breakers with higher fault rating.	TBD
Ealing	Ealing	66/22	N/A	N/A	2028/2029	Y	Air insulated switchgear replaced with gas insulated switchgear. 21 new 132kV gas insulated circuit breakers replacing existing 66kV air insulated circuit breakers.	TBD



Harvard Lane	Ealing	33/11	23.6	74.6	2028/2029	Y	Dispose 3 transformers, install 2 new units to release 51MVA	CV1 - Primary Reinforcement
Southfield Road	Ealing	66/11	37.8	56.7	2025/2026	N	Replace B1MT B2MT 40MVA units with 60MVA CMR units	CV1 - Primary Reinforcement
Beaconsfield	Iver 132kV	33/11	37.8	50.7	2028/2029	Y	Dispose 4 transformers, install 2 dual-ratio 33/6.6 - 11kV units and upgrade circuits to release 12.9MVA	CV1 - Primary Reinforcement
Denham	Iver 132kV	132/22	83.83	136.5	2028/2029	N	Replace twin transformers with two 60MVA transformers	CV7 - Asset Replacement
East Bedfont A	Laleham	132/22	78	94	2028/2029	Y	Replace two 132kV transformers to release 16MVA	CV1 - Primary Reinforcement
Egham	Laleham	33/11	30	60	2029/2030	Y	Add a 15/30MVA CER 33/11 kV transformer in	TBD



							parallel and additional supply circuit.	
Ashling Road	Lovedean	33/11	26	31.1	2027/2028	N	Replace two 33kV transformers and upgrade circuits to release 5.1MVA	CV1 - Primary Reinforcement
Birdham	Lovedean	33/11	13	39	2029/2030	Y	Replace two 10MVA transformers to 15/30MVA units	CV1 - Primary Reinforcement
Havant	Lovedean	132/33	81.62	114	TBC	N	Replace A1MT A2MT with 45/90MVA units. Remove A2MTB	CV7 - Asset Replacement
Hoeford	Lovedean	33/11	19.5	31.2	TBC	N	Dispose C2MT, install new C1MT and C2MT transformers. Replace 11kV and 33kV switchgear.	CV7 - Asset Replacement



Bournemouth	Mannington	132/33	78	114	2024/2025	N	Replace 60MVA A6MT transformer with 90MVA unit and replace 132kV CB A420	CV7 - Asset Replacement
Swanage	Mannington	33/11	16.9	52	2026/2027	N	Replace two 10MVA transformers to 20/40MVA CER units	CV1 – Primary Reinforcement
Wareham	Mannington	132/33	39	51.2	2026/2027	N	Replace two 30MVA Tx A1MT and A2MT transformers with 22.5/45MVA units to meet future demand	CV7 - Asset Replacement
WINTERBORNE KINGSTON	Mannington	33/11	12.61	31.2	2026/2027	N	Replace C1MT and C2MT with two 12/24MVA CER transformers, replace 33kV switchgear C1H3 and C2H5 with new Horizon circuit	CV7 - Asset Replacement



							breakers (rating 1250A 71.45MVA)	
Amesbury	Melksham	132/33	114	228	2024/2025	N	Replace of both 45MVA grid transformers with new 90MVA units	CV7 - Asset Replacement
LECHLADE	Minety	33/11	9.75	10.4	2025/2026	N	Replace C1MT and C2MT with 2x8MVA units	CV7 - Asset Replacement
Stratton	Minety	132/33	78	114	2026/2027	N	Replace 60MVA A1MT and A2MT with 90MVA units	CV7 - Asset Replacement
North Baddesley	Nursling	33/11	18	39	2025/2026	N	Change twin 15MVA transformers to 15/30MVA CER units, upgrade circuits	CV1 - Primary Reinforcement



Canal Bank 22/6.6kV	Willesden	22/6.6	3.46	55.46	2025/2026	N	Install two new 66/11 kV 40 MVA transformers (92011) substation, install two new 66/11 kV 40 MVA transformers	CV1 - Primary Reinforcement
Leamington Park Substation	Willesden	22/6.6	38.1	93.6	2025/2026	N	Install two 22/11 kV, 24 MVA transformers and new 11 kV switchgear	CV1 - Primary Reinforcement



Table A2.4 SEPD Substation group reinforcement projects in detailed development and delivery

Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Capacity (MVA)	Updated Capacity (MVA)	Forecast Completion Date	DNOA Outcome (Y/N)	Project Description	Driver
Fernhurst - Five Oaks - Plaistow	Bramley (Fleet)	33	16.9	19.5	2024/2025	<u>N</u>	Overlay existing 33kV overhead line and upgrade Plaistow transformers	CV1 - Primary Reinforcement
Reading to Little Hungerford to Arborfield	Bramley (Fleet)/Bramley (Basingstoke)	33	20.5	30	TBC	<u>N</u>	33kV circuit reinforcement including disposal and installation of cables, overheadlines, and circuit breakers to release 16MVA	CV1 - Primary Reinforcement
Shripney - ARGR - SBER	Lovedean	33	0	30.8	2024/2025	<u>N</u>	Rutter pole removal and installation of new underground circuit	CV1 - Primary Reinforcement
Denham - Iver	Iver 132kV	132	138	200	2025/2026	Y	Reinforce 270m of 132kV circuit with a cable of a higher thermal rating.	TBD



APPENDIX 3: SHEPD INTERVENTIONS

This section provides information on planned interventions in the SHEPD licence area. It is organised based on stages of project development and delivery;

- **Projects in initial development** – these are projects which are still at an early phase of development and have yet to arrive at a DNOA outcome. As such there is still a possibility that the intervention may not be needed or not needed in its current form. The use of flexibility may be a feasible outcome. These tend to be longer term projects. Further updates on these projects and other developments at an even earlier stage will be updated through our periodic DNOA outcome releases.
- **Projects in detailed development and delivery** – these are projects that have progressed into more detailed development and delivery. They include projects required for both primary reinforcement and asset replacement purposes. Going forwards an increasing proportion of primary reinforcement projects will be those that have been through the DNOA process and have been assessed as needing network intervention. Projects that have been through the first DNOA outcomes have been identified in this report. Some primary reinforcement projects on the list pre-date the DNOA process but will have been similarly assessed for flexibility needs.

Within these sections, there are two tables each: the first is for individual substations that have planned reinforcement works associated with them due to their loading. The second is for substation groups that have planned reinforcement works associated with them due to their loading. The information in the tables includes the capacity to be released as well as the forecasted reinforcement completion date, which is reflected in the NSHR.

The maps below show the supply areas of each Grid Supply Point in the SHEPD licence area. The upstream GSP is provided for each intervention in the tables below so that readers can locate the relevant geographic areas. Supply areas for Primary Substations are available on our Open Data Portal.

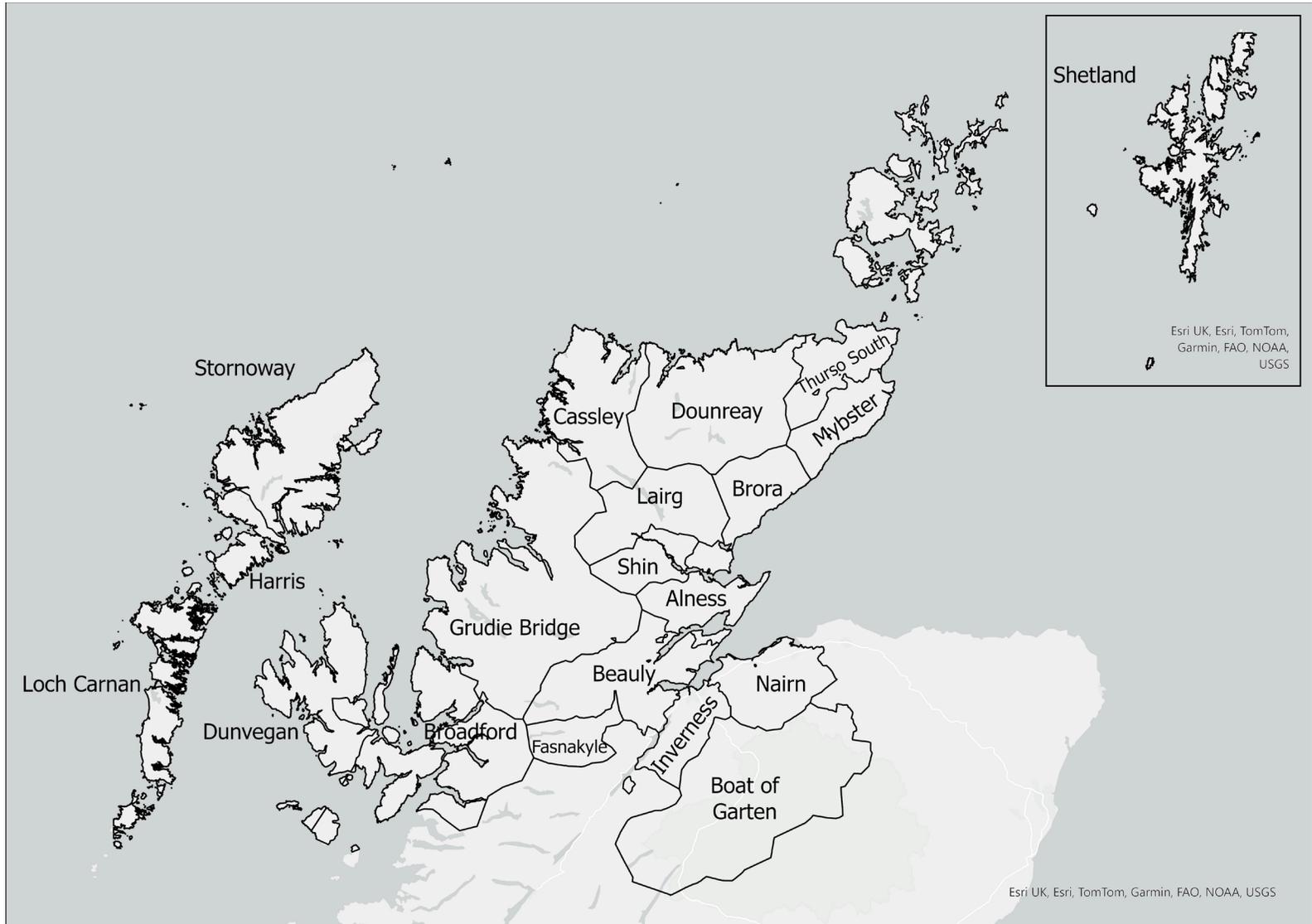


Figure A3.1 GSP Supply Areas in the northwestern portion of the SHEPD licence area.

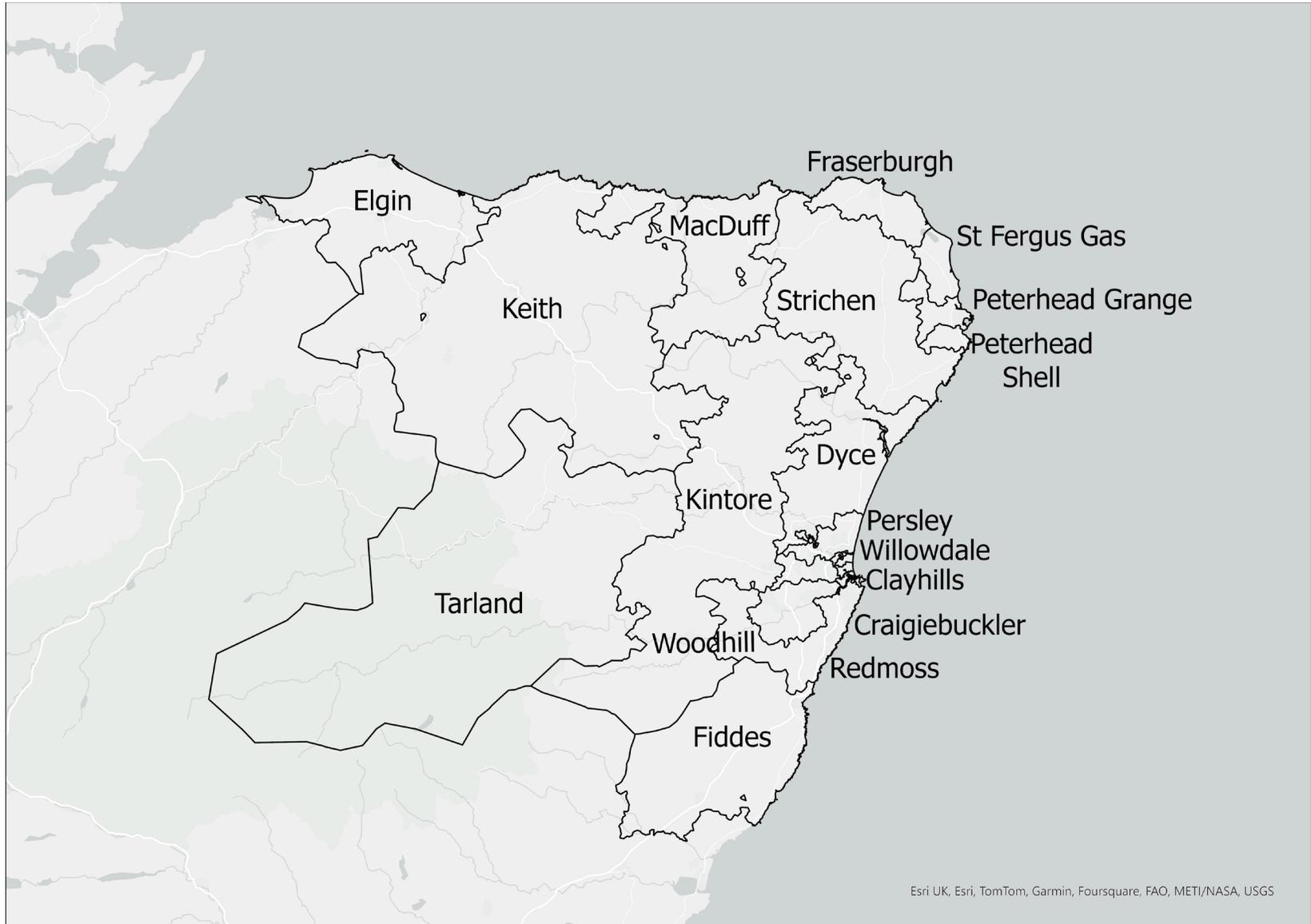


Figure A3.2 GSP Supply Areas in the eastern portion of the SHEPD licence area.

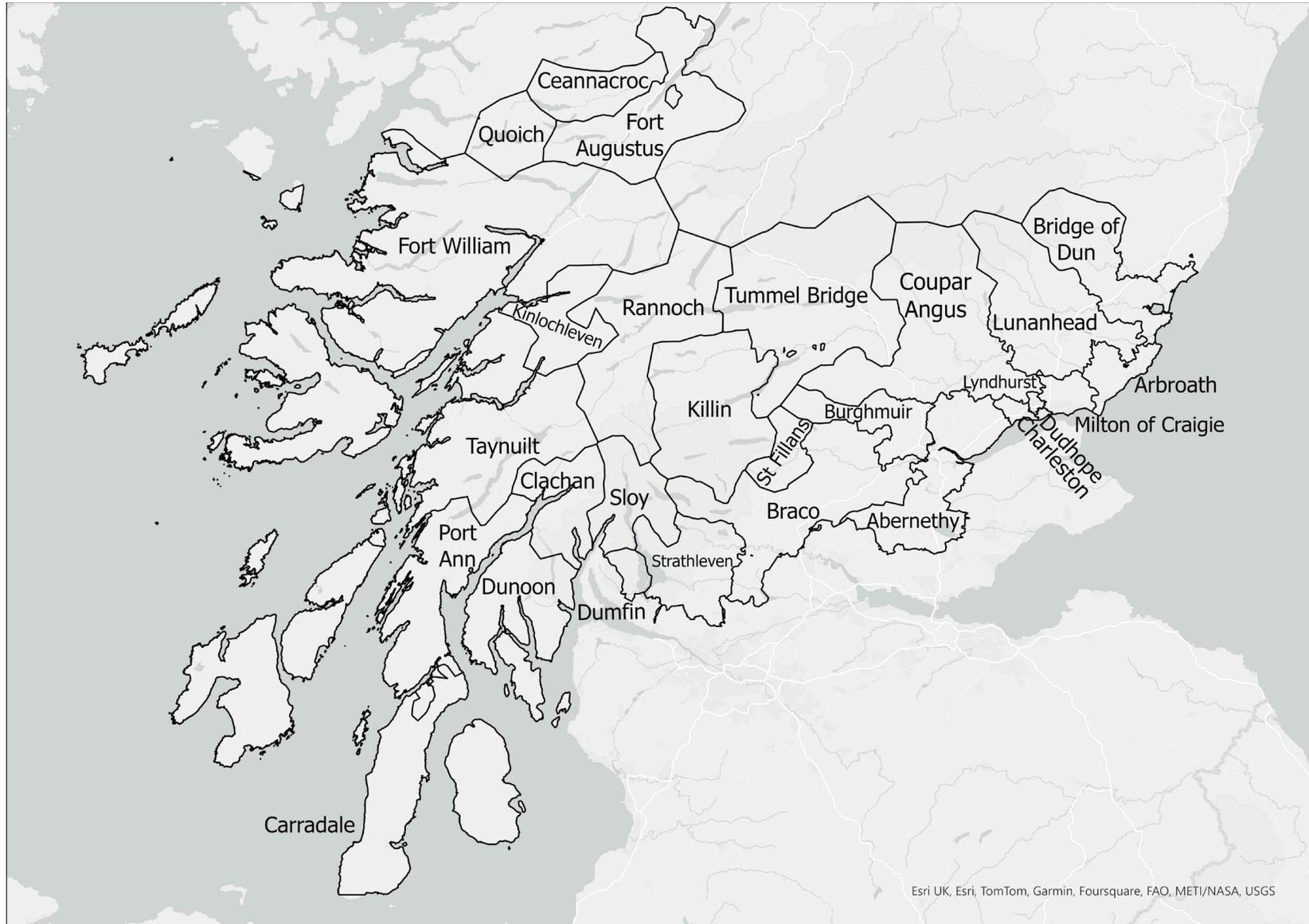


Figure A3.3 GSP Supply Areas in the southwestern portion of the SHEPD licence area.



Projects in initial development

Table A3.1: SHEPD Substation reinforcement projects in initial development



Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Firm Capacity (MVA)	Updated Firm Capacity (MVA)	Forecast Completion Date	Status	Project Description	Driver
Milnathort	Abernethy	33/11	15	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Glastullich	Alness	33/11	1.55	TBC	TBC	In DNOA process	TBC	CV7 – Asset replacement
Lower Ollach	Broadford	33/11	1	TBC	TBC	In DNOA process	TBC	CV7 – Asset replacement
Helmsdale	Brora	33/11	1.35	TBC	TBC	In DNOA process	TBC	CV7 – Asset replacement
Dippen	Carradale	33/11	1	1	2026/2027	In DNOA process	Replacement of transformer with a 1MVA unit	CV7 – Asset replacement
Ellon	Dyce	33/11	12.5	24	2026	In DNOA process	Replace both 10/12.5MVA transformers with 12/24MVA units	CV1 - Primary Reinforcement



Corran	Fort William	33/11	1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Glenuig	Fort William	33/11	0.1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Salen 2	Fort William	33/11	2.5	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Kerry Falls	Grudie Bridge	33/11	3.7	TBC	TBC	In DNOA process	TBC	CV7 – Asset replacement
Waterloo Place	Inverness	33/11	23	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Dufftown	Keith	33/11	5	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Cashlie	Killin	33/11	1	1	2024	In DNOA process	Replace the single 1MVA transformer with a 2.5MVA unit	CV1 - Primary Reinforcement
Banchory	Kintore	33/11	14	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement



Oldmeldrum	Kintore	33/11	8	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Crinan	Port Ann	33/11	1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Cromalt	Port Ann	33/11	0.05	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Quoich	Quoich	33/11	1	1	TBC	In DNOA process	Replace the single 4MVA transformer with a 6.3MVA unit	CV1 - Primary Reinforcement
Craiginches	Redmoss	33/11	22.86	TBC	2026/2027	In DNOA process	TBC	CV7 – Asset replacement
Netwonhill	Redmoss	33/11	15	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Scalloway	Shetland/Gremista	33/11	1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Barvas	Stornoway	33/11	1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement



Coll	Stornoway	33/11	2.5	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Gisla	Stornoway	33/11	1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Halkirk	Thurso	33/11	2.23	2.23	2028	In DNOA process	TBC	CV1 - Primary Reinforcement
Calvine	Tummel Bridge	33/11	1	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Coshieville	Tummel Bridge	33/11	2.5	TBC	TBC	In DNOA process	TBC	CV1 - Primary Reinforcement
Springhill	Woodhill	33/11	21	30	2025/2026	In DNOA process	Replace both 15/21MVA transformers with 15/30MVA units	CV7 – Asset replacement

Table A3.2 SHEPD Substation group reinforcement projects in initial development

None



Projects in detailed development and delivery

Table A3.3: SHEPD Substation reinforcement projects in detailed development and delivery

Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Firm Capacity (MVA)	Updated Firm Capacity (MVA)	Forecast Completion Date	DNOA outcome (Y/N)	Project Description	Driver
Balbeggie	Abernethy	33/11	5	6.25	2025/2026	N	Replace the single 5MVA transformer with a 7.5/15MVA unit	CV7 – Asset replacement
Clachan	Ardmore	33/11	2.5	3.3	2024/2025	N	Replace T1 with a 6.3MVA unit and add a 2nd matching Tx	CV1 - Primary Reinforcement
Creiff	Braco	33/11	15	24	2026/2027	N	TBC	CV7 – Asset replacement
Kyle	Broadford	33/11	5	6.3	2025/2026	N	Replace both 5MVA transformers with 6.3MVA units	CV7 – Asset replacement
Lusa*	Broadford	33/11	0	1	TBC	N	Establish a new 4MVA primary substation between Skulamus and Kuleakin substations	CV1 - Primary Reinforcement



Shieldaig	Broadford	33/11	1	1	2024	N	Replace the single 1MVA transformer with a 4MVA unit	TBC
Machrie	Carradale	33/11	2.5	2.5	2026/2027	Y	Add a 2nd 4MVA transformer	CV1 - Primary Reinforcement
Craigton	Craigiebuckler	33/11	10	15	2024/2025	N	Replace both 10MVA transformers with 7.5/15MVA units	CV7 – Asset replacement
Constable Street	Dudhope	33/11	15	30	2024/2025	N	Replace both 15MVA transformers with 15/30MVA units	CV1 - Primary Reinforcement
Bruchag	Dunoon	33/11	10	15	2025/2026	N	Replace both 10MVA transformers with 7.5/15MVA units	CV7 – Asset replacement
Glendaruel	Dunoon	33/11	0.3	0.315	2024/2025	N	Replace T1 with a 0.315MVA unit and add a 2nd matching transformer	CV1 - Primary Reinforcement
Rothesay	Dunoon	33/11	24	15	2025/2026	N	Replace both 12/24MVA transformers with 7.5/15MVA units	CV7 – Asset replacement
Balmedie	Dyce	33/11	4	8	2024/2025	N	Add a 2nd 4/8MVA transformer	CV1 - Primary Reinforcement



Kingseat	Dyce	33/11	5	7.5	TBC	N	Replace both 5MVA transformers with 7.5/15MVA units	CV1 - Primary Reinforcement
Ashgrove	Elgin	33/11	10	24	TBC	N	Replace T1 with a 12/24MVA unit and add a 2nd matching transformer	CV1 - Primary Reinforcement
Bilbohall	Elgin	33/11	12	24	TBC	N	Replace T1 with a 12/24MVA unit and add a 2nd matching transformer	CV1 - Primary Reinforcement
Ullapool	Grudie Bridge	33/11	2.5	4	2025/2026	N	Replace T1 with a 4MVA transformer to match T2	CV1 - Primary Reinforcement
Culloden	Inverness	33/11	15	24	2026	Y	Replace both 7.5/15MVA transformers with 12/24MVA units	CV1 - Primary Reinforcement
Inverness	Inverness	33/11	10	15	2024/2025	N	Replace both 10MVA transformers with 7.5/15MVA units	CV7 – Asset replacement
Longman Drive*	Inverness	33/11	0	24	2024/2025	N	Establish a new 2 x 12/24MVA substation at Longman Drive	CV1 - Primary Reinforcement
Insch	Keith	33/11	7.5	15	2024/2025	N	Replace both 5/7.5MVA	CV1 - Primary Reinforcement



							transformers with 7.5/15MVA units	
Methlick	Kintore	33/11	5	6.3	2024/2025	N	Replace T1 with a 6.3MVA transformer to match T2	CV1 - Primary Reinforcement
Tressaday	Lairg	33/11	0.5	1	2027	N	Replace the single 0.5MVA transformer with a 1MVA unit	CV1 - Primary Reinforcement
Longhaugh	Milton of Craigie	33/11	22.9	22.9	TBC	N	Replace both 11.5/23MVA transformers with 15/30MVA units	CV7 – Asset replacement
Bridge of Gaur	Rannoch	33/11	0.5	1	2025/2026	N	Replace the single 0.5MVA transformer with a 1MVA unit	CV7 – Asset replacement
Firth	Shetland/Gremista	33/11	1	1	2025	N	Replace the single 6MVA transformer with a 7.5/15MVA unit	CV7 – Asset replacement
Battery Point	Stornoway	33/11	16	30	TBC	N	Replace all three 4/8MVA transformers with two 15/30MVA units	CV7 – Asset replacement



New Pitsligo	Strichen	33/11	2.5	6.3	TBC	N	Replace both 2.5MVA transformers with 6.3MVA units	CV1 - Primary Reinforcement
Tarland*	Tarland	33/11	0	4	TBC	Y	Establish a new 8MVA primary substation in the Tarland area	CV1 - Primary Reinforcement
Tiroran Bridge	Taynuilt	33/11	0.05	0.2	TBC	N	Replace the single 0.05MVA transformer with a 0.2MVA unit	CV1 - Primary Reinforcement
Eday	Thurso	33/11	1	1	2024/2025	N	Replace the single 1MVA transformer with a 2.5MVA unit	CV7 – Asset replacement
Lyness	Thurso	33/11	1	1	2026	N	Replace the single 1MVA transformer with a 1.5MVA unit	CV7 – Asset replacement
Mount Pleasant	Thurso	33/11	7.5	TBC	2024/2025	N	Replace transformers with 12MVA released	CV1 - Primary Reinforcement



Ormlie	Thurso	33/11	7.5	TBC	2024/2025	N	Replace transformers with 12MVA released	CV1 - Primary Reinforcement
Sanday	Thurso	33/11	1	1	2025	N	Replace the single 1MVA transformer with a 2.5MVA unit	CV7 – Asset replacement
South Ronaldsay*	Thurso	33/11	0	1	TBC	N	Establish a new 4MVA primary substation in on South Ronaldsay	CV1 - Primary Reinforcement
Stronsay	Thurso	33/11	1	1	2024/2025	N	Replace the single 1MVA transformer with a 2.5MVA unit	CV7 – Asset replacement
Bonskied	Tummel Bridge	33/11	1	1	2024/2025	N	Replace single 5MVA transformer with a 6.3MVA unit	CV7 – Asset replacement

* New substation proposed, names have been assumed based on approximate location so may change



Table A3.4 SHEPD Substation group reinforcement projects in detailed development and delivery

Substation Name	Upstream Grid Supply Point	Primary/Secondary Voltage (kV)	Existing Firm Capacity (MVA)	Updated Capacity (MVA)	Forecast Completion Date	DNOA Outcome (Y/N)	Project Description	Driver
Burghmuir – Inveralmond - Redgorton	Burghmuir	33	22.5	23.6	2026/2027	Y	Installation and reinforcement of Burghmuir 33kV feeders to Inveralmond and Redgorton.	CV1 - Primary Reinforcement
Tummel Bridge - Errochty	Errochty	33	21	90	2026/2027	Y	Transfer 5 x 33kV circuits from Tummel Bridge 33kV switchboard to the new Errochty 33kV switchboard.	CV1 - Primary Reinforcement
Keith 1	Keith	33	24.59	32.27	2028/2029	Y	A combination of network reconfiguration and reinforcement of existing assets.	CV1 - Primary Reinforcement
Keith 2	Keith	33	20.34	20.43	2025/2026	Y	Reinforce voltage compensation equipment at the new Glenrothes Distillery 33kV switchboard and loop into the 33kV ring.	CV1 - Primary Reinforcement







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