SP Energy Networks
Network Development Plan
April 2022

Network Development Plan

Parts 1 & 2 – SP Distribution Capacity & Development Report

PRINCIPAL PARTNER
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1 Introduction

1.1 Who we are

We are SP Energy Networks. We own and operate the electricity distribution network in Central and Southern Scotland (our SP Distribution network), and in North Wales, Merseyside, Cheshire, and North Shropshire (our SP Manweb network). It is through these two networks of underground cables, overhead lines, and substations that we provide our 3.5 million customers with a safe, reliable, and efficient supply of electricity.

1.2 Document Context and Purpose

Sharing data is key to the efficiency of the energy system as we decarbonise to Net Zero. It enables customers and stakeholders to assess market opportunities and participate in flexibility markets, in turn promoting the efficiency and competitiveness of these markets. It enables network companies and key stakeholders to work together to promote efficient whole system planning and operation. And it helps spur innovation and new solutions. Customers benefit from all of these.

In this context, Standard Licence Condition 25B came into force on 31 December 2020. It introduced a requirement for each DNO to publish a Network Development Plan (NDP), and set out a high-level scope of what was to be included. DNOs then worked together via the Energy Networks Association to define the detailed scope and content of NDPs; the resulting proposed Form of Statement was published in December 2021.

The primary objective of the NDP is to provide information on available network capacity to accommodate demand and generation growth, and interventions the DNO plans which will increase network capacity (such as flexibility use and reinforcement). The NDP is a medium-term outlook, and is designed to sit between short-term Long Term Development Statements (LTDS) and long-term Distribution Future Energy Scenarios (DFES) forecasts.

Each DNO's NDP must cover three main components:

1. **Part 1: Development report** – detailed information on the interventions we plan that will increase capacity. This includes non-load interventions which are not done to provide capacity but will increase capacity nonetheless (e.g. asset management interventions such as replacing an end-of-life transformer with a larger equivalent).
2. **Part 2: Network capacity headroom report** – the indicative demand and generation capacity available at each primary substation (down to and including the HV busbar). Forecasts are produced for every year for the first 10 years, and then for every five years after that out to 2050. These capacity forecasts must take account of known planned interventions which will increase capacity (i.e. those listed in Part 1).
3. **Part 3: Methodology statement** – a document explaining how we have produced Parts 1 and 2.

Parts 1 and 2 need to be produced for each DNO licence area, down to primary substation group (i.e. the NDP does not include network interventions and capacity headroom for the LV and HV networks). We have two licence areas: SP Distribution and SP Manweb. Therefore to meet our NDP licence obligation we are publishing four NDP documents[1]:

1. A summary document to introduce our NDP, summarise the contents, and set out our consultation questions.
2. A pdf report and supporting excel datasheet for SP Distribution, covering Parts 1 and 2. That is this document and supporting excel datasheet.
3. A pdf report and supporting excel datasheet for SP Manweb, covering Parts 1 and 2.
4. A single document for Part 3, covering SP Manweb and SP Distribution together as the methodology is the same for each. This includes the consultation feedback we received.

Our NDP will be updated annually. Figure 1 shows the document map for these four documents.

[1] www.spenergynetworks.co.uk/NDP

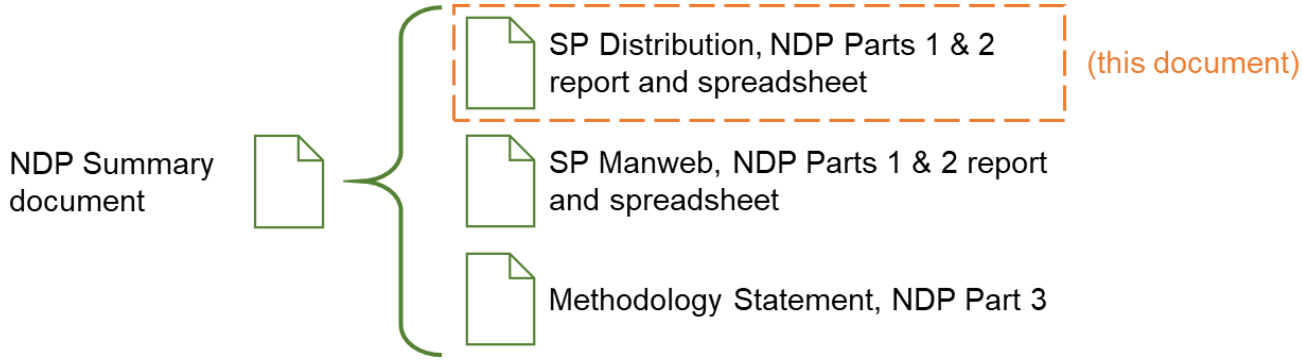


Figure 1: SP Energy Networks' NDP document map

These documents were consulted on from 16 March to 16 April 2022 and have been updated accordingly. Section 4 of the NDP summary document contains the questions we asked stakeholders. NDP Part 3 (the methodology statement) contains the feedback we received and how we acted on it.

1.3 Overarching Process

This document is the NDP Parts 1 and 2 Network Capacity and Development Report for SP Distribution. The process below summarises how we produced NDP Parts 1 and 2 for SP Distribution and SP Manweb. For further details please refer to NDP Part 3 Methodology Statement.

- **Step 1, forecasting:** we develop our network to accommodate our customers' demand and generation requirements. Therefore the first step of network planning is to understand what these are. We do this using forecasts.
- **Step 2, network impact assessments:** we undertake industry-leading assessments to understand where, when, and how much additional network capacity is needed to accommodate these forecast customer requirements.
- **Step 3, flexibility tenders:** where our assessments show we need additional capacity, we tender for flexibility services to understand the availability and cost of using flexibility to provide it. We don't place contracts at this stage – we only do that where the Step 4 options assessments establishes flexibility is the best solution.
- **Step 4, options assessment for load-driven investment:** to provide the capacity in the optimal way, we fairly and impartially assess different types and combinations of interventions (flexibility, energy efficiency, smart, innovation, and reinforcement), different delivery models (reactive, proactive), and how they could be coordinated with other interventions to reduce customer cost and disruption.

These four steps identify the RIIO-ED2 load interventions we will make that add network capacity – these are a key input to NDP Parts 1 and 2. Whilst these create the majority of the additional capacity we will deliver, the NDP requires that we include all interventions that increase capacity:

- **Step 5, NDP Part 1 – reporting of network interventions which add capacity:** we combine the load driven interventions identified in steps 1-4 with connections-driven, losses-driven, and non-load driven interventions which add capacity, to produce NDP Part 1.

After these five steps we know all the interventions we plan to make that will add capacity – this means Part 1 of the NDP is complete. To complete Part 2:

- **Step 6, NDP Part 2 – reporting network capacity headroom:** combining our existing network model, our scenario forecasts, and our known intervention plans to calculate the 'post-intervention' headroom. Our NDP Part 2 Capacity Headroom spreadsheet data files provide an indication of headroom for each primary substation/substation group for each year through to 2050.

1.4 Document scope and structure

1.4.1 Scope

This document is the NDP Parts 1 and 2 for SP Distribution. The scope of the Network Development report (Part 1) and Network Capacity Headroom report (Part 2) and are summarised below.

Documents	Network Capacity Headroom		Network Development
Date Range	Up to 2050. Consideration to 2050 matches the DFES date range and so can reflect the uncertainty on long term network impacts.		Planned interventions for the next 10 years.
Reporting granularity	Every year for the first ten years. Every five years beyond that to the end of 2050.		Location, magnitude (MW) and timescales of interventions.
Network coverage	All Primary substations (33/11 kV). NOTE: In Scotland the 132/33 kV substations are considered as Grid Supply Points (GSPs), and are excluded from this document.		All Primary substations (33/11 kV).
Forecast scenarios	Load scenarios based on DFES for all years up to 2050.		
Reported headroom	Demand	Generation	
Network parameters underlying headroom calculations	Thermal loading Voltage	Fault level Reverse power flows	
Evaluation methodology	Detailed analysis for the short-term where practical. Simple tabular comparisons for the longer-term to 2050 (loading versus firm capacity).		

1.4.2 Document structure

The structure of this document is as follows:

- **Section 2 – Understanding the results in this document:** this section provides background information and key considerations when reviewing the NDP Parts 1 and 2.
- **Section 3 – Constraint Management Zones:** this section explains what Constraint Management Zones are and why they are relevant in the context of the NDP.
- **Section 4 – NDP Part 1, Network Development information**: this section outlines the specific details of all the interventions we are planning in the SPD network that increase network capacity, including losses-driven and asset management-driven interventions which increase network capacity even though this isn't the primary reason for the intervention.
- **Section 5 – NDP Part 2, Network Development information**: this section provides a summary of the headroom results from our NDP Part 2 Capacity Headroom spreadsheet data files.

We are aware that our industry includes a wide range of terminology, so **Section 6** is a glossary to explain the terms we use within our NDP documents.

1.5 Stakeholder engagement

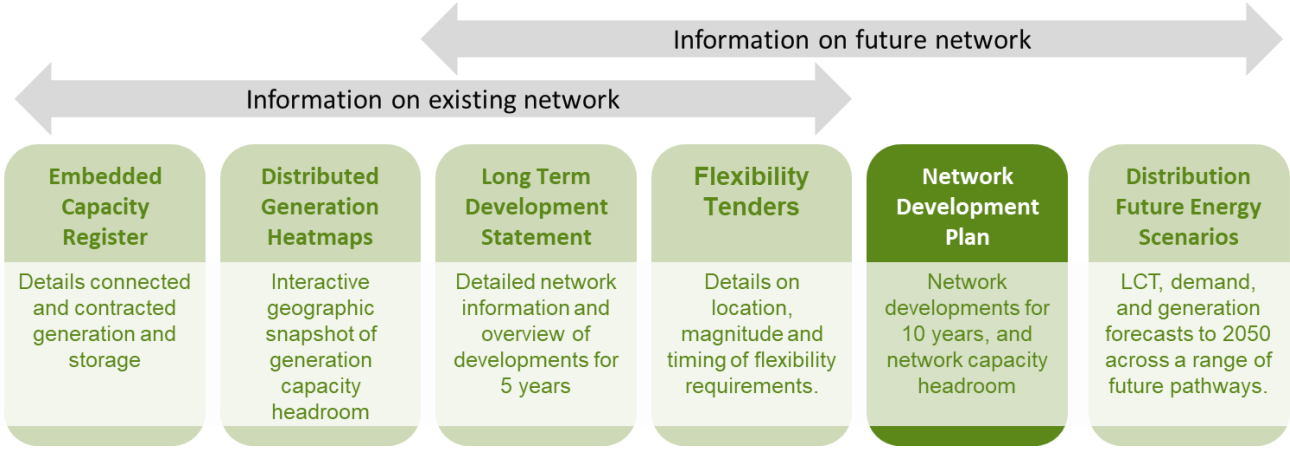
Our NDP documents were out for consultation from 16 March until 16 April 2022. We increased awareness and gathered feedback on the publication through our "Key Stakeholder Panel" meetings and our "Preparation for Net Zero" conference. We ran an online consultation with details on how stakeholders could feedback both in our NDP summary document, and on our website[2]. Communications were sent to a wide range of stakeholders, including the link to our NDP website and online survey.

We would like to thank stakeholders for sharing their views with us. A summary of this feedback and the actions we have taken is available in our NDP Methodology Statement.

[2] Our NDP is available here: Network Development Plan - SP Energy Networks

1.6 How the NDP fits with other data provision

Publishing our NDP is just one measure we're taking to increase the transparency of how we plan and operate our distribution network, and is aligned with our approach of sharing an increasing range of network data with stakeholders. Other current data provision includes:



- **DFES forecasts**[3] – these are forecasts for key customer demand and generation metrics up until 2050. We develop these considering a range of sources, including UK and devolved government targets and other industry forecasts. Given the uncertainties out to 2050, we create forecasts for multiple energy scenarios. These scenarios represent differing levels of customer ambition, government and policy support, economic growth, and technology development. Our stakeholders review our forecasts and we make changes based on their well-justified feedback. We will update our DFES annually.
- **LTDS**[4] – these statements contain a range of information on our 132kV, 33kV, and 11kV network. This includes network asset technical data, network configuration, geographic plans, fault level information, demand and generation levels, and planned works. This information helps customers identify opportunities and carry out high level assessments of the capability of the network to accommodate new demand and generation. A main update is published every November with a minor update every May.
- **Embedded Capacity Register**[5] – previously known as the System Wide Resource Register, this currently provides information on generation and storage resources (≥1MW) that are connected, or accepted to connect, to our distribution network. It is updated on the 10th working day of each month.
- **Heatmaps**[6] – these provide a geographic view of where there is available network capacity to accommodate new generation.
- **Flexibility tenders**[7] – we tender for flexibility for all viable network constraints. When we run tenders we publish information on the location, magnitude, and duration of the constraint. In some cases we will also send ceiling price information. We run tenders twice annually.

Looking forward to RIIO-ED2, we plan to share a wider range of historical, near-time, real-time, and forecast data with stakeholders. This will be underpinned by infrastructure to gather, assess, and share data, and engagement with stakeholders to prioritise data publication. Please see our DSO Strategy[8] for more information on the network data we plan to share in RIIO-ED2 based on stakeholder input.

1.7 How the NDP overlaps with our RIIO-ED2 Business Plan

The NDP requires us to publish our planned interventions which will increase network capacity, and the resulting network capacity headroom. This first NDP comes a few months after we published our RIIO-ED2 Business Plan[9] on 1 December 2021. There is significant overlap between the two publications: the work we need to do to produce the NDP is the same that was done to create our RIIO-ED2 Business Plan, and all the

[3] Our DFES is available here: Distribution Future Energy Scenarios - SP Energy Networks
[4] Our LTDS is available here: Long Term Development Statement - SP Energy Networks
[5] Available here: Embedded Capacity Register - SP Energy Networks
[6] Our heatmaps are available here: Distributed Generation Heat Maps - SP Energy Networks
[7] Available here: Flexibility Services - SP Energy Networks
[8] Our DSO Strategy is Annex 4A.3 of our RIIO-ED2 Business Plan. Available at: https://www.spenergynetworks.co.uk/userfiles/file/Annex 4A.3 - DSO Strategy .pdf
[9] Our RIIO-ED2 Business Plan is available at: https://www.spenergynetworks.co.uk/userfiles/file/SPEN%20RIIO-ED2%20Final%20Business%20Plan%20-%201st%20December%202021%20-%20FINAL.pdf

EHV and 132kV interventions that increase capacity that we included in our RIIO-ED2 Business Plan need to be included within the NDP. So where our suite of NDP documents refers to RIIO-ED2 interventions and the RIIO-ED2 process, it is because they are directly relevant to the NDP.

Providing capacity (the scope of the NDP) is only one part of planning and developing a network. This means the interventions covered in our NDP are only a subset of those we need to make through RIIO-ED2. For a good summary overview of the full range of measures we're taking to ensure we have a safe, reliable, and efficient network, please see our Future System Strategy[10].

1.8 Information and contact

The information used to compile this report is derived from SP Distribution plc's own data. Whilst all reasonable care has been taken in the preparation of this data, SP Distribution plc is not responsible for any loss that may be attributed to the use of this information.

Opportunities exist for the connection of new load or generation throughout the SP Distribution system. System conditions and connection parameters are site specific and therefore the economics of a development may vary across the system. Developers are encouraged to discuss their development opportunities and SP Distribution will be pleased to advise on connection issues.

To discuss a specific enquiry about a new connection to the distribution network, or an enhancement to an existing connection, please contact: gettingconnected@scottishpower.com

[10] Our Future System Strategy is Annex 4A.1 of our RIIO-ED2 Business Plan. Available at: https://www.spenergynetworks.co.uk/userfiles/file/Annex%204A.1%20-%20Future%20System%20Strategy.pdf

2 Understanding the results in this document

2.1 Network Development Plan results (NDP Part 1)

Our NDP Part 1 outlines the specific details of all the interventions we are planning in the SP Distribution network that increase network capacity. This means that in our NDP Part 1 we have not only included load-driven interventions but also included losses-driven and asset management-driven interventions which increase network capacity, even though this isn't the primary reason for the intervention.

We have included interventions which add capacity in RIIO-ED1 (before April 2023) and those that add capacity and are part of our Business Plan for RIIO-ED2 (April 2023 – March 2028). Beyond 2028 we still haven't yet planned interventions (we will start this in 2025 when we start preparing for RIIO-ED3). The capacity headroom results (Part 2) provide an indication of potential future intervention needs for the period between 2028-2031, for the range of scenarios.

The full suite of Engineering Justification Papers (EJP) for each RIIO-ED2 intervention is available on our website[11]. These are the technical and cost appraisals undertaken to develop robust, efficient, and fully justified intervention plans for our load and non-load plans.

In reviewing the planned network interventions, it is worth noting that he timing and type of network intervention may vary, depending on the rate of change in stakeholder requirements influenced by regional and national policies, requirements for emerging new connections, and further development of flexibility markets.

2.1.1 Types of constraints

There are three main types of network constraint. These are:

Thermal constraints – where network current would exceed equipment thermal ratings. Thermal constraints can affect any type of asset at any voltage level. High loadings on certain assets may simply reduce their life, however significant overloading introduces safety risk. For example, an overhead line conductor will sag more if it is overloaded – this may risk the statutory minimum safety clearance distances outlined in the ESQCR.

The thermal loading on each asset is considered against its capability under normal and fault/outage conditions. Equipment thermal ratings are considered to vary seasonally with temperature through the year. Cyclic thermal ratings of assets are used when assessing the network under fault/outage conditions. The cumulative time exposure to overloads, and whether equipment has sufficient cool back periods are considered. We prioritise interventions when the network assets are at risk of exceeding 100% of their thermal rating.

Voltage constraints – where network voltage would be in breach of statutory limits. Network voltages can be too low (usually caused by excess demand), too high (usually caused by excess generation), or change too quickly (instantaneous change in voltage due to planned/unplanned outages). Voltage excursions can cause damage to customer equipment and network assets, or introduce safety risks.

We have a duty to maintain voltages within the statutory limits at each voltage level. We prioritise interventions when the network is at risk of breaching these limits.

Fault current constraints – where the network fault current would exceed the fault current rating of switchgear. If this happened, it would represent a serious safety risk as the network could not be safely isolated in the event of a fault. Fault current constraints can affect equipment at any voltage level.

Circuit breakers may be called upon to disconnect faulting equipment from the network; or energise onto faulty or earthed equipment. A range of types of fault (including 3-phase and single-phase faults) are assessed under make and break fault duties. Where substations are approaching switchgear capability or operationally managed, detailed assessments of the maximum fault flows through each individual breaker are undertaken. Substation infrastructure such as busbars, supporting structures, flexible connections, current transformers, and terminations must be capable of withstanding the mechanical forces associated with the passage of high magnitude fault current i.e. through-current withstand duty. Where switchgear is in excess of 95% of equipment or design rating we consider the substation to be constrained.

These constraints can occur together or independently. In all cases, these network constraints are a result of there being insufficient network capacity to accommodate customer power flows.

[11] Our RIIO-ED2 Business Plan - SP Energy Networks

2.1.2 Types of interventions

To resolve constraints we consider a range of flexible, energy efficient, smart, innovative, and conventional intervention solutions. Table 1 shows the six main categories of interventions to add capacity. They are not mutually exclusive, so can be combined to provide capacity.

	Intervention Type	Description
	**Asset intervention**	Where we permanently increase network capacity by replacing existing assets or adding more assets – for example, a new substation.
	**Flexibility Services**	Where customers agree to actively manage their demand/generation to help avoid constraints (see Section 2.1.3 for more information)
	**Innovative Solutions**	
	Smart Network Interventions	Where we look to get more out of existing network capacity.
	Using Enhanced Network Asset Ratings	Where we seek to increase the thermal capacity of individual existing network assets without having to replace them.
	Network Reconfiguration	Where we temporarily or permanently adjust the topography of the network to better match existing network capacity with customer power flows.
	Energy Efficiency	Where customers have agreed to passive measures to manage their demand to help avoid constraints.

Table 1: Types of intervention

2.1.3 Flexibility

Flexibility services are where our customers agree to actively manage their demand or generation to help us manage capacity constraints on our network. Flexibility services can help us defer or avoid new network capacity, can be deployed more quickly than reinforcement interventions, and can help democratise and bring competition to the energy sector. They provide an agile smart means of managing our network, and are complementary to reinforcement solutions by providing short-term solutions where we need to act quickly or manage uncertainty. They will play a key part in helping to manage the pace of the Net Zero transition.

Given this, we tender for flexibility for all viable network constraints. This helps us understand the availability and cost of flexibility, which we use in our options assessment. When we tender for flexibility we state the location, service product (see Table 2), service window and time (e.g. 4-6pm weeknights between October and March), required magnitude (MW/MVArs), and any other necessary technical parameters (e.g. response time). In some cases we will also send ceiling price information.

Flexibility Product	Timeframe	Product Description
Sustain	**Pre-fault** *Scheduled*	• Sustain will be scheduled in advance of the service window to support security of supply during system intact conditions. • Utilisation fee payable for the service provided in response to the scheduled notice. • No availability fee payable.
Secure	**Pre-fault** *Scheduled or dispatched*	• Secure can be dispatched or scheduled to manage peak loading on the network and pre-emptively reduce network loading. • Utilisation fee payable for the service provided in response to the scheduled notice. • Arming fee is payable.
Dynamic	**Post-fault** *Dispatched*	• Used to support the network in the event of specific fault conditions. • Providers declare availability one week ahead. • Dispatch instruction issued if service is required. • Utilisation fee payable if service is provided. • Availability fee is payable once availability has been accepted.
Restore	**Post-fault** *Dispatched*	• Used to help with restoration following rare fault conditions. • Providers declare availability one week ahead and declarations automatically accepted. • Dispatch instruction if service is required following a network event. • Utilisation fee payable for the service provided.

Reactive Power *(aligned with Secure)*	**Pre-fault** *Scheduled or dispatched*	• Reactive Power can be dispatched or scheduled to support the management of voltage constraints. • Utilisation fee payable for the service provided in response to the scheduled notice. • Arming fee is payable.

Table 2: Flexibility products

We will continue to test every viable network constraint for flexibility. Regular flexibility tenders will allow us to understand the scope for flexibility solutions to network constraints. This will have several beneficial effects including improving service provider confidence, challenging market costs, and increasing certainty on the level of flexibility we can procure in the coming years.

Subject to requirements, we run two competitive tender rounds per year (Spring and Autumn). This timetable, along with documents detailing our flexibility processes are published at the following website: https://www.flexiblepower.co.uk/.

2.1.4 Summary of interventions

Figure 2 summarises the interventions by driver (i.e. why we need to make the them). Figure 3 summarises the interventions by type (i.e. how we are making them). As a reminder, these graphs only show interventions on primary substations upwards given the scope of the NDP. This means they exclude interventions on the LV and HV networks, which account for the vast majority of the interventions we need to make to provide capacity.

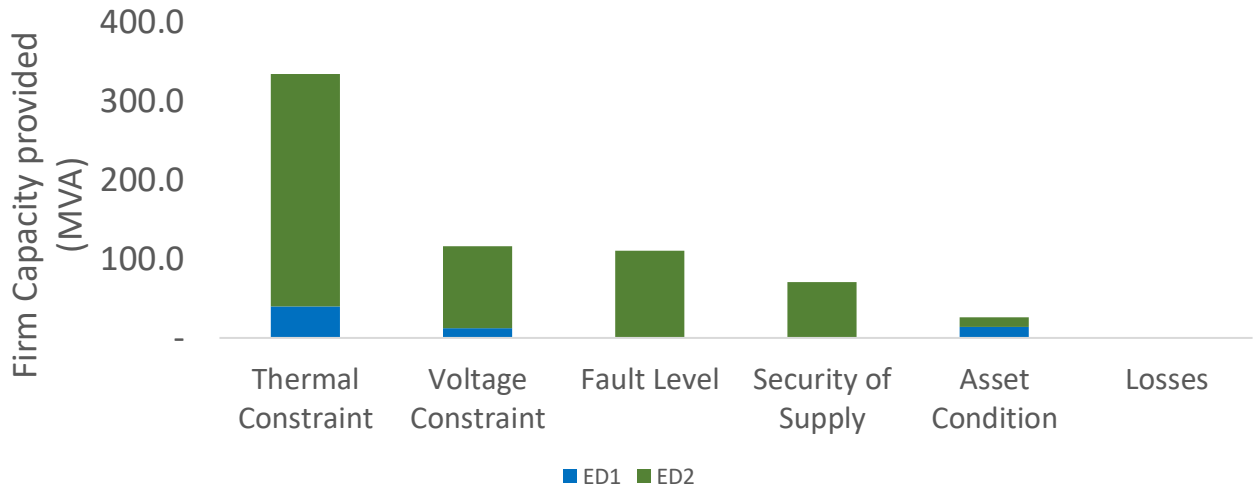


Figure 2: SP Distribution summary of interventions by driver to 2028

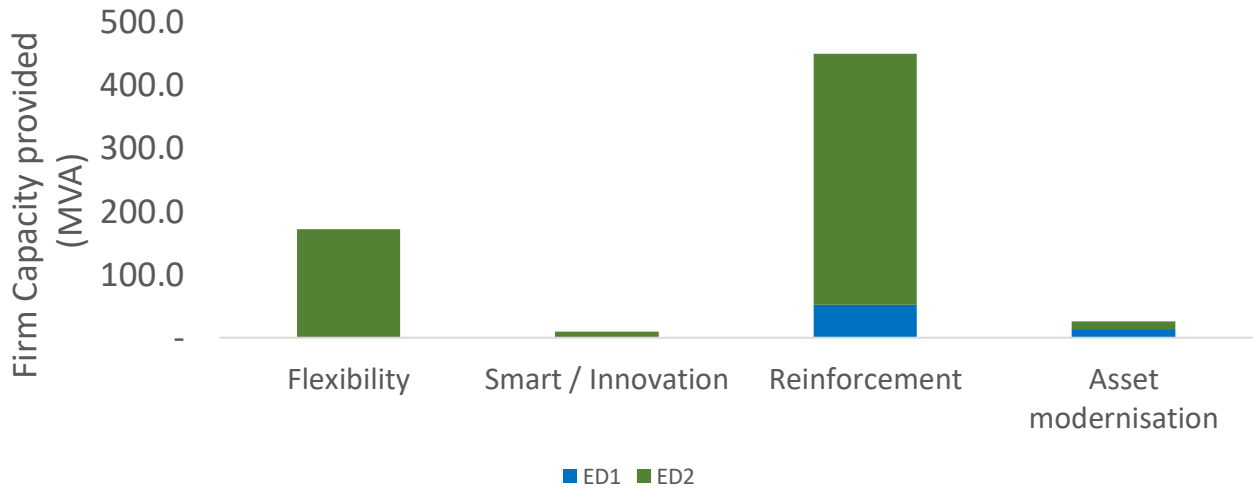


Figure 3: SP Distribution summary of interventions by type to 2028

Figure 2 shows that the need to provide thermal capacity is the main driver of interventions. Figure 3 shows that reinforcements and flexibility account for the great majority of the interventions we will make to provide capacity.

Our load and non-load intervention plans are both designed to be adaptable so they can respond to emerging customer needs. This means the interventions we actually deliver may differ slightly from those we currently plan to deliver. We will only make changes to the delivery plan where it is in customers' interests.

2.2 Network Capacity Headroom results (NDP Part 2)

Future Network capacity headroom is indicated for all SP Distribution primary substations (33/11kV) in terms of demand and generation. For further details on the process to forecast capacity headroom see our NDP Methodology Statement.

2.2.1 Demand headroom

To calculate the demand headroom, we consider the expected increase in demand from the baseline, low and high scenarios, up to 2050, and compare these with the firm capacity of the group, including all planned interventions that increase capacity and flexibility services. A positive number indicates spare capacity and a negative number indicates a forecast constraint.

In reviewing the capacity headroom results, it is worth noting:

- The firm capacity is the maximum load the substation can support whilst keeping the network operating safely within limits. For primary substations this is generally the capacity available during single circuit outage conditions.
- When calculating the firm capacity, we consider the season of most onerous demand (typically winter). This is because the ratings of some equipment differ seasonally.
- For multi-transformer substations, the firm capacity considers only the capacity that can be available through automatic processes (e.g. parallel operation of the transformers or automatic changeover schemes).
- For single-transformer substations, the firm capacity values include the capacity that will be available through both automatic and manual switching processes, provided these can be carried out within the time constraints specified in Engineering Recommendation P2.
- In the headroom calculations we consider demand for developments that are due to connect, including that of Green Recovery schemes.

2.2.2 Generation headroom

To calculate the generation headroom, we consider the expected increase in generation from the baseline, low and high scenarios, up to 2050, and compare these against the reverse power flow capability of the substation/substation group, and the fault level limits.

The fault levels are calculated under the most onerous network conditions to yield the maximum anticipated fault currents. The most onerous network condition is considered to be when the following conditions occur concurrently:

- all generating apparatus is in service;
- all transformers are set to nominal tap position;
- the system is intact (N); and
- fault level contributions are included from all independent generators.

Fault contributions from synchronous generators and converter connected generators are treated differently. Typical fault current contributions from synchronous generators and converter connected generators are used to determine the available fault level headroom when considering forecast generation.

2.2.3 Further considerations

In reviewing the capacity headroom results, it is worth noting:

- Headroom results take account of planned interventions, as outlined in Section 4 of this document. A negative headroom result changing to a positive result is indicative of a planned intervention taking place or a decrease in demand.

- Headroom results do not take account of the additional capacity provided through the rollout of Constraint Management Zones (CMZs) or other flexible connection arrangements - see Section 3 of this document.
- Generation headroom at a substation/group may be limited by upstream constraints beyond our network boundary. These upstream constraints are flagged in column E within the Part 2 spreadsheets, but are not reflected within the capacity headroom values. Any new generation connections where there are upstream constraints beyond our network boundary will be subject to detailed network assessments to determine the actual generation capacity headroom.
- Demand and generation forecasts are subject to factors which can change over time and influence pre-determined plans.
- The timing and type of network interventions may vary, depending on the rate of change in stakeholder requirements influenced by regional and national policies, and requirements for emerging new connections.
- We have taken all reasonable endeavors to ensure the accuracy of the results using information available at the time of publishing. We are not responsible for any loss that may be attributed to the use of the information presented in this report and the capacity headroom results.

3 Constraint Management Zones (CMZ)

In addition to load and non-load interventions which increase capacity, we will deliver DSO tools and capabilities. These are outside the scope of the NDP, but are relevant as they help make better use of existing capacity, better target load-driven interventions, and increase the range of tools we have available to create capacity – these all help provide the capacity our customers need.

Insufficient network capacity is a well-known barrier to new renewable generation, especially at the more remote locations where onshore wind farms are typically built. Prospective developers are faced with reinforcement works, which add expense, can significantly delay projects, and can have adverse visual impact.

To help address this, we are currently developing three constraint management zones (CMZs). These are at Dumfries & Galloway, Berwick, and Coylton. These fulfil a number of functions, one of which is active network management (ANM). ANM enables renewable generators to connect more quickly and at lower cost where they would otherwise trigger capacity reinforcements. It does this by ramping down their output during periods where network constraints would otherwise occur. This keeps network power flows within safe limits. The Aberystwyth is unusual in that it is also managing transmission constraints. In short, these help renewable generators connect and increase utilisation of the existing network.

In RIIO-ED2 we will deliver 10 more CMZs and we will extend their functionality to help our control team manage the increasingly complex and interactive network. This next generation of CMZs will coordinate and dispatch operational solutions – using network models, live data from network monitors, and automated analysis, they can make better decisions in shorter timescales than humans can to keep network power flows within limits and defer the need for reinforcement.

CMZs, along with the ANM platform, are a key component of enable a smarter and more flexible network that safely makes best use of existing network capacity. For more information see our DSO Strategy[12].

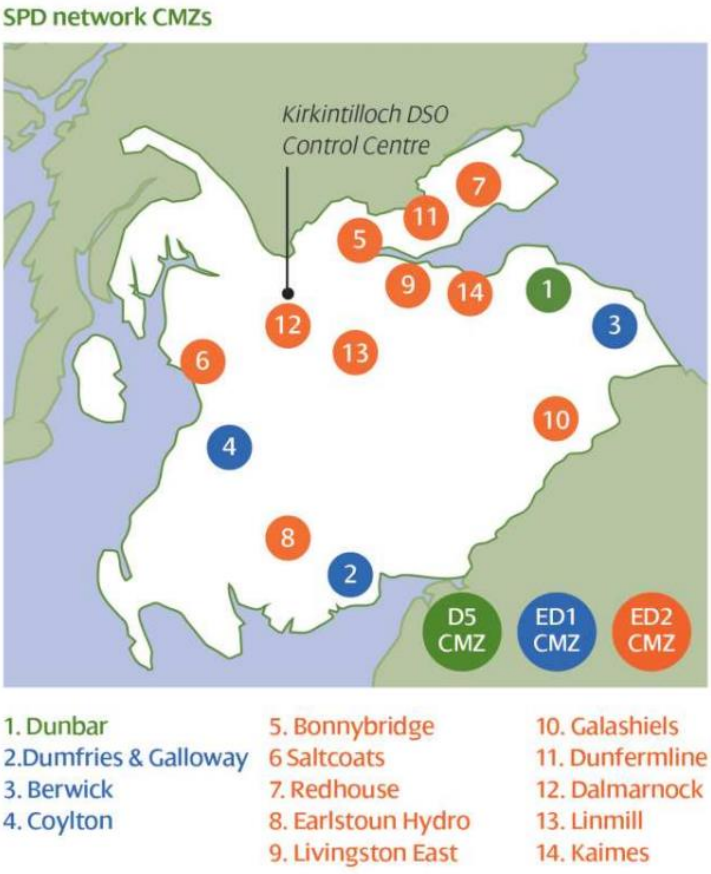


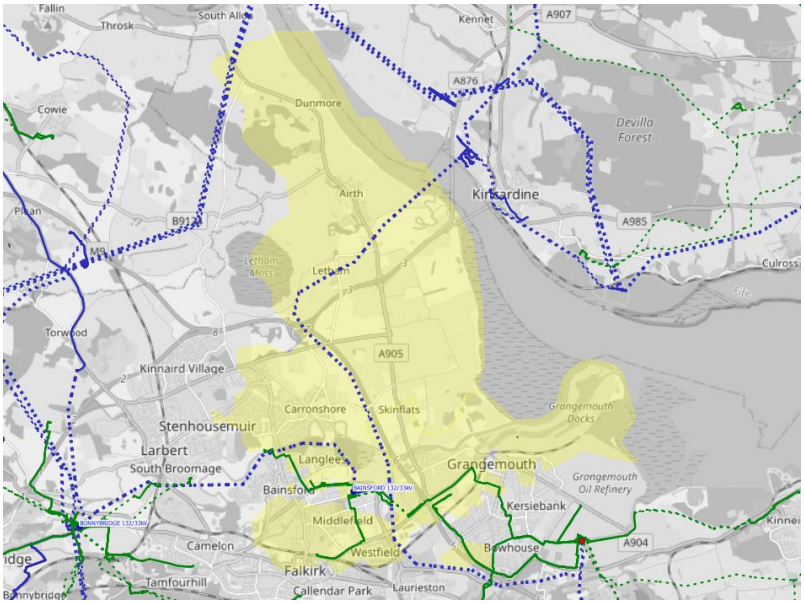
Figure 4: Existing and planned CMZs

[12] Annex 4A.3 - DSO Strategy

4 Part 1 – Network Development Information

4.1 Overview

Our NDP Part 1 outlines the specific details of all the interventions we are planning in the SP Distribution network that increase network capacity. This means we have also included in our NDP Part 1 losses-driven and asset management-driven interventions which increase network capacity even though this isn't the primary reason for the intervention. This section provides a detailed breakdown of our 10-year intervention plans, arranged by GSP and disaggregated by intervention driver. The information provided is as follows:

<table>
<tr><td rowspan="4"> 

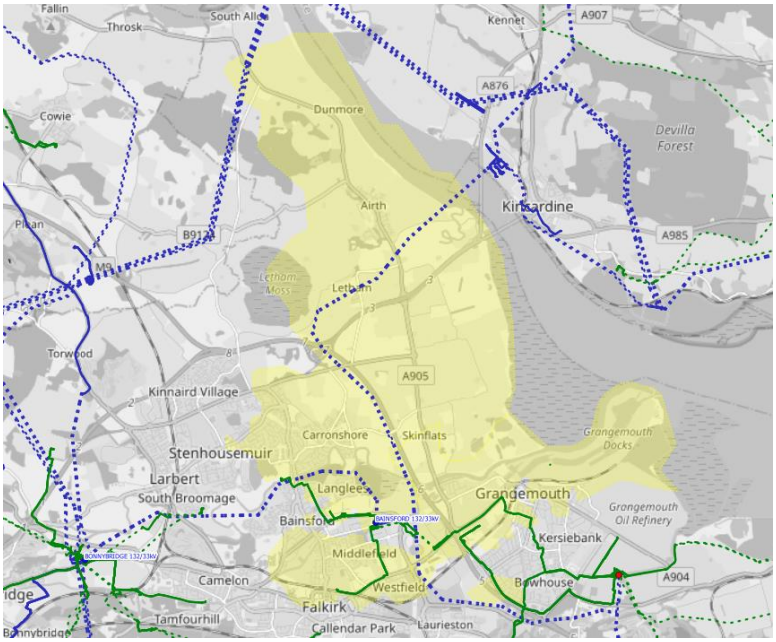
Description of the geographic area supplied by the GSP and the total customers in the electrical area.</td><td colspan="2">Summary graph of network groups with interventions in the GSP group, split by voltage.</td></tr>
<tr><td colspan="2">Total firm capacity to be released (MVA) by all interventions in the GSP group</td></tr>
<tr><td colspan="2">Total MW of flexibility services to be employed in the GSP group</td></tr>
<tr><td>Pre-fault</td><td>Pre-fault</td></tr>
<tr><td>- MW</td><td>- MW</td></tr>
</table>

For each individual intervention the following information is summarised:

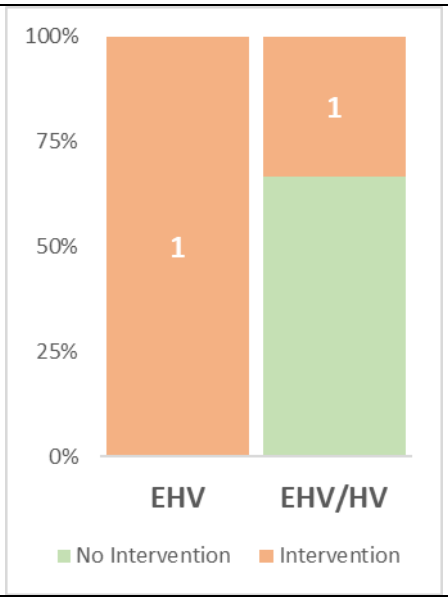
- Network Area: Name of the network group where the intervention is to be carried out.
- Driver: Primary driver for the intervention (thermal, voltage, fault level, asset modernisation, etc.).
- Type: Type of intervention (Section 2.1.2).
- Solution: Brief description of the intervention.
- Flexibility: Flexible capacity to be employed in MW.
- Increase in firm capacity: Capacity change resulting from the intervention in MVA.
- Expected by: Expected intervention completion year.
- Status: Whether the intervention is in delivery or planned. RIIO-ED2 interventions contain a link to the relevant Engineering Justification Paper (EJP) for the intervention.

In addition to the list of interventions summarised in the following sections, we are planning to install enhanced voltage control at a number of primary (33kV/HV) sites during RIIO-ED2 (1 April 2023 - 31 March 2028).

4.2 Bainsford



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 16,000 customers in Bainsford and some neighbouring areas.



0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

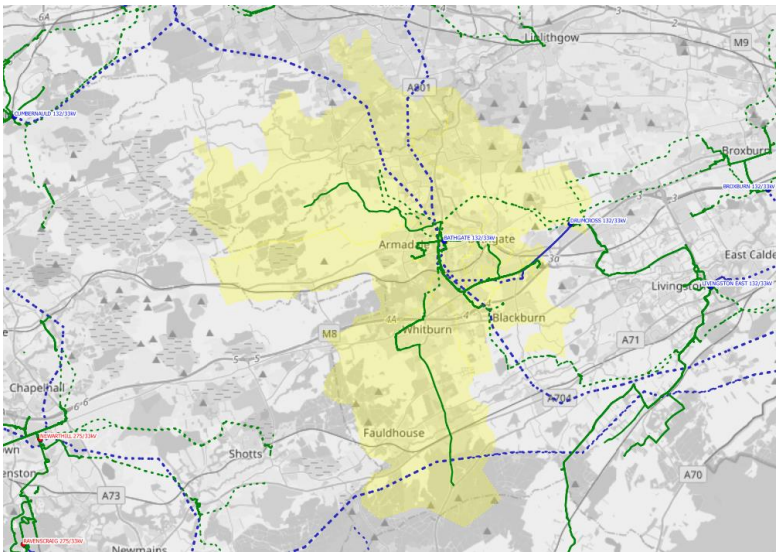
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Bainsford GSP	Fault level		**Switchgear Reinforcement** Replacement of 33kV switchboard at Bainsford GSP with higher rated assets.	-	*	2022/23	Delivery

*These interventions could increase generation hosting capacity.

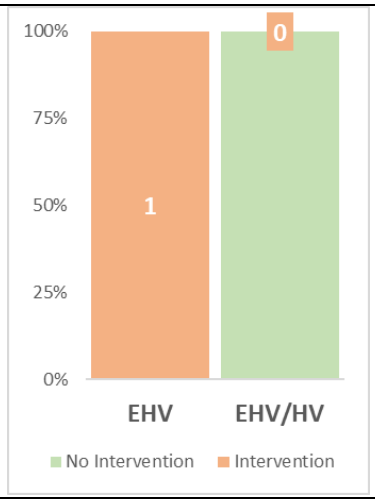
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Callendar Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.3 Bathgate



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 29,000 customers in Bathgate and some neighbouring areas.

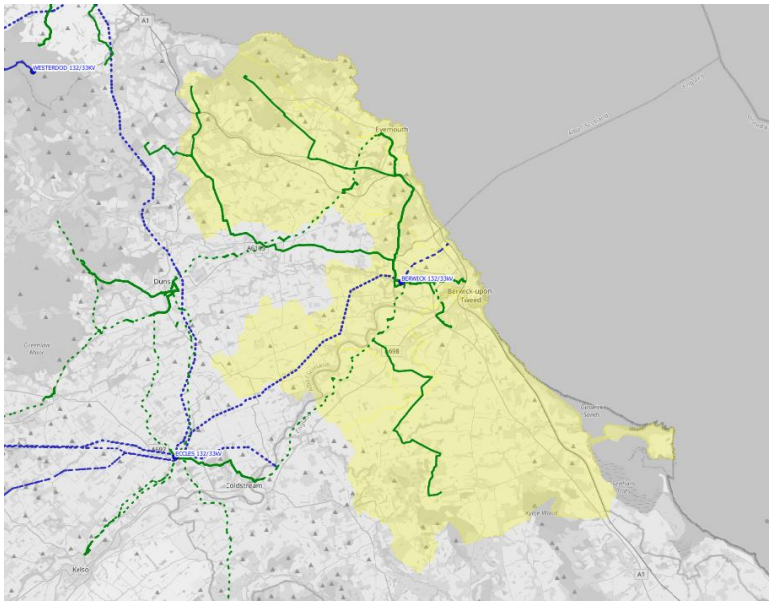


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

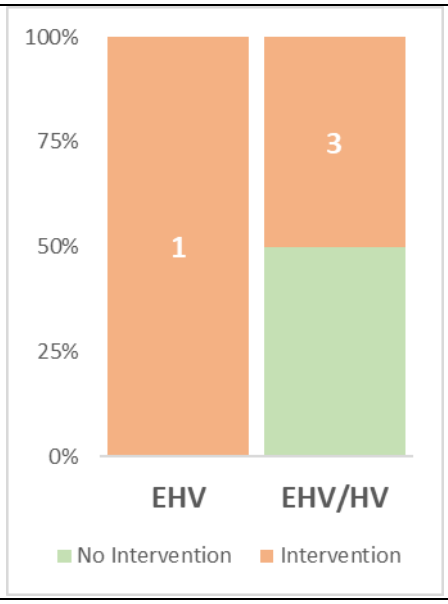
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Bathgate GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Bathgate.	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.4 Berwick



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 15,000 customers in Berwick and some neighbouring areas.



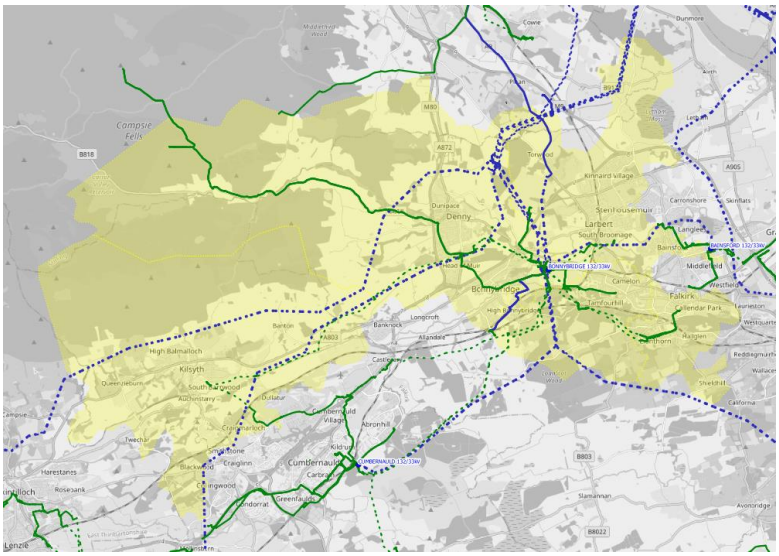
13.2 MVA Capacity Released	
5.0 MW of Flexibility	
Pre-fault	**Post-fault**
5.0 MW	**0.0 MW**

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Eccles Grid	Thermal		**Circuit Reinforcement** Uprating of the Eccles to Duns 33kV circuit		8.2	2022/23	Delivery

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Coldstream Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	1.5	-	2025/26 to 2027/28	Planned (ED2)

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Ayton Primary	Thermal		**Ayton Primary Reinforcement** Replacement of existing Ayton 33/11kV 2 x 5MVA transformers with 10MVA units along with interim constraint management (in the year 2023/24 and 2024/25) via flexibility services.	-	5.0	2025/26	Planned (ED2)
		 Secure	Flexibility services to manage the network risk during delivery of reinforcement.	3.5	-	2023/24 to 2025/26	Planned (ED2)

4.5 Bonnybridge



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 40,000 customers in Bonnybridge and some neighbouring areas.

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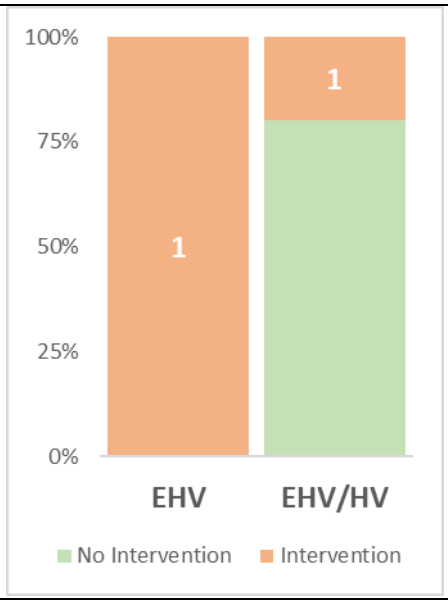


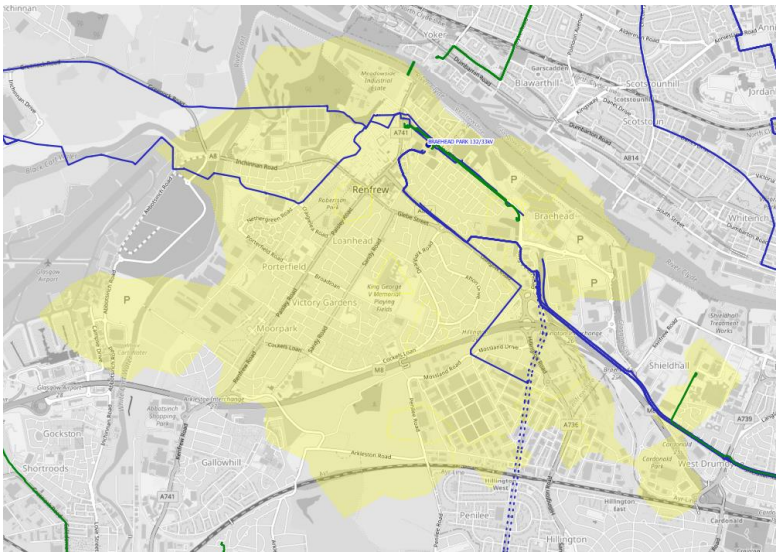
5.4 MVA Capacity Released	
2.8 MW of Flexibility	
Pre-fault	**Post-fault**
2.8 MW	**0.0 MW**

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Bonnybridge GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Bonnybridge	-	*	2025/26	Planned (ED2)

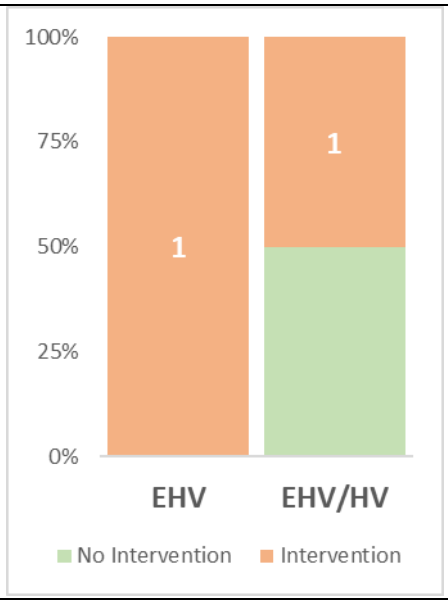
*These interventions could increase generation hosting capacity.

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Larbert Primary	Thermal		**33kV Circuit upgrades** Uprate sections of 33kV circuit supplying Larbert Primary	-	5.4	2027/28	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	2.8	-	2023/24 to 2025/26	Planned (ED2)

4.6 Braehead Park



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 12,000 customers in Braehead and some neighbouring areas.



0.0 MVA Capacity Released

8.2 MW of Flexibility

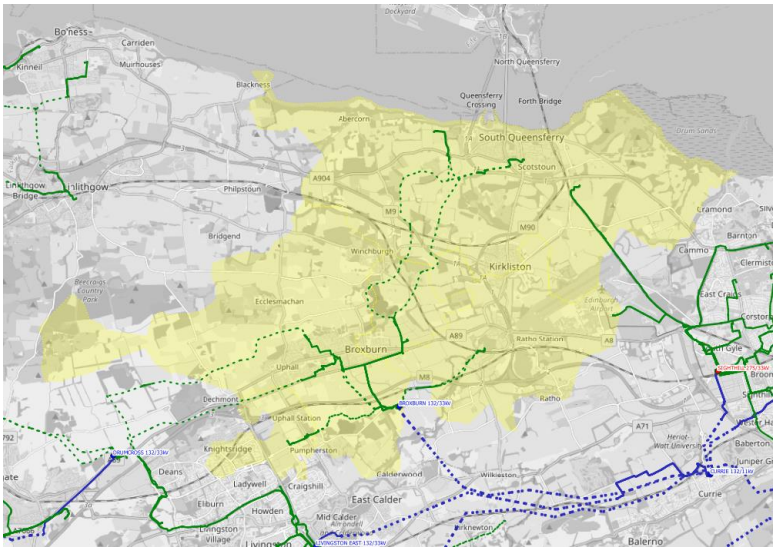
Pre-fault	Post-fault
0.0 MW	8.2 MW

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Braehead Park GSP	Thermal	Restore	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	8.2	-	2023/24 to 2027/28	Planned (ED2)

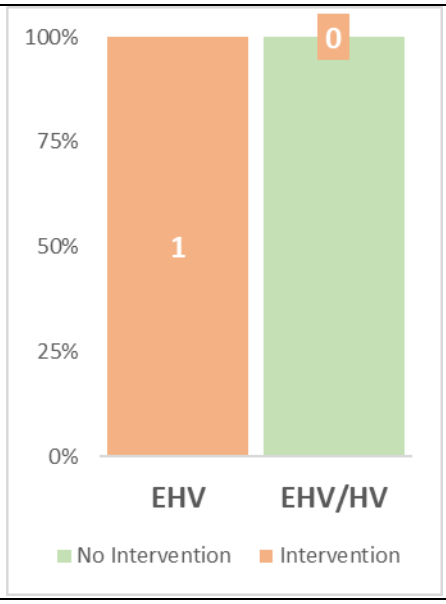
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Renfrew Ferry	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Renfrew	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.7 Broxburn



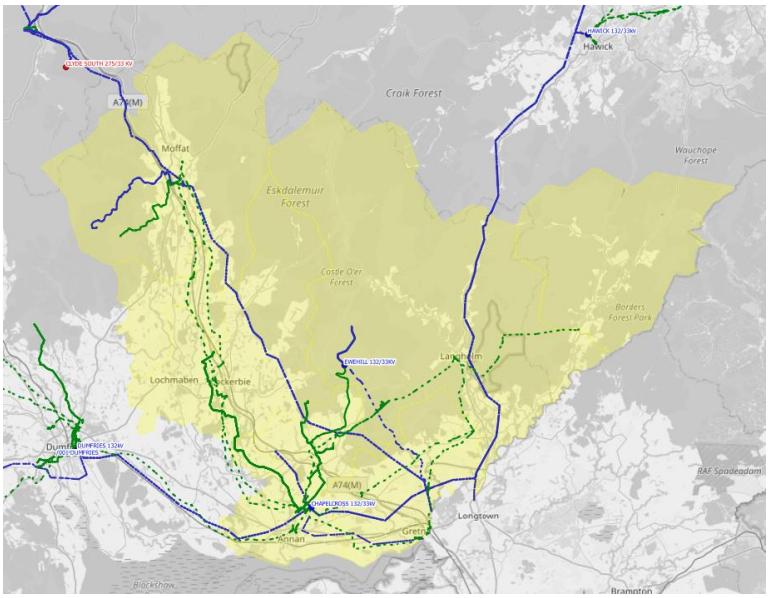
This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 20,000 customers in Broxburn and some neighbouring areas.



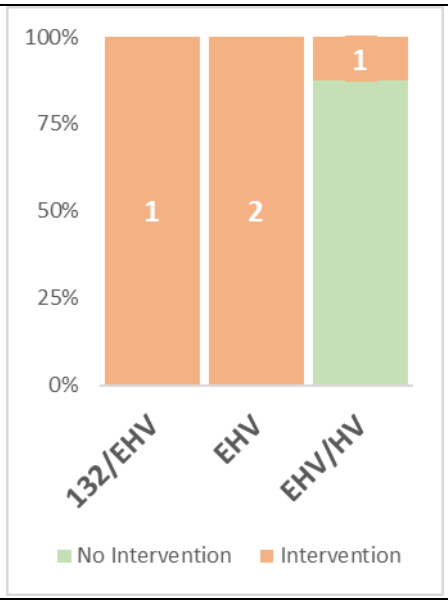
25.5 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Broxburn	Thermal		**Circuit Reinforcement** Two additional 33kV circuits (at least 400mm2 Al. XLPE) from Broxburn to pick up East Mains Primary substation, a distance of ~ 2km.	-	25.5	2022/23	Delivery

4.8 Chapelcross



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 21,000 customers in Chapelcross and some neighbouring areas.



65.0 MVA Capacity Released	
9.4 MW of Flexibility	
Pre-fault	**Post-fault**
9.4 MW	**0.0 MW**

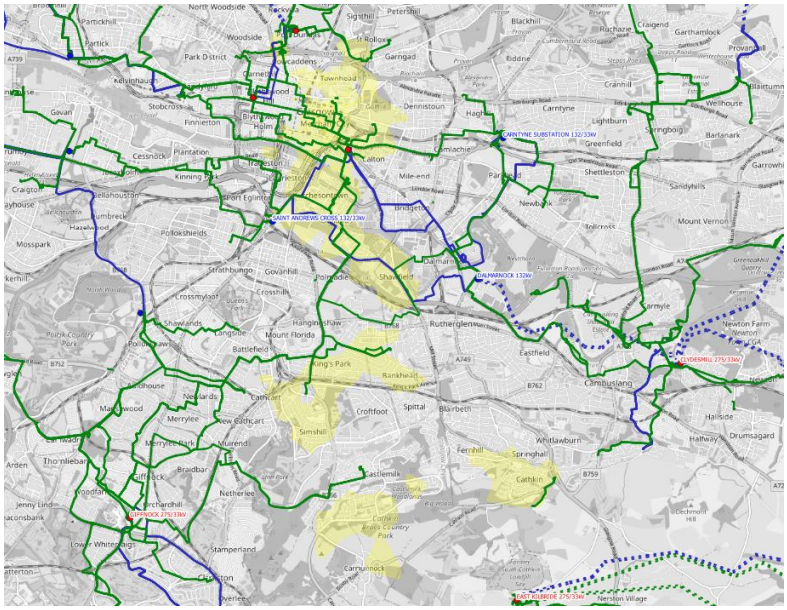
132kV/EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Moffat GSP	Voltage/ Thermal		**New Moffat GSP** New 132/33kV 2x 60MVA Moffat grid supply point near Moffat primary.	-	60	2024/25	Planned (ED2)

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Newcastleton Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	5	2023/24	Planned (ED2)

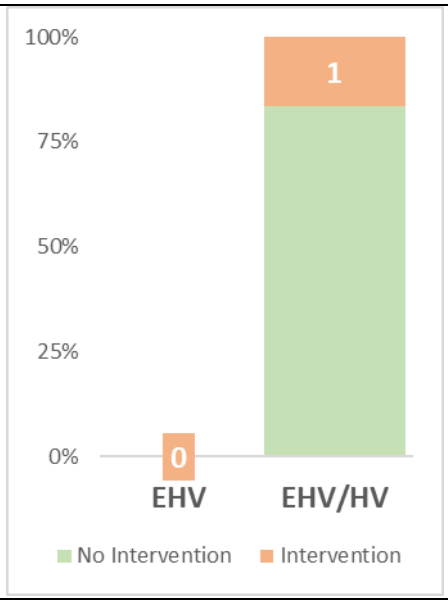
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Chapelcross GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Chapelcross	-	*	2025/26	Planned (ED2)
Lockerbie Group	Thermal	 Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	9.4	-	2023/24 to 2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.9 Charlotte Street



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 28,000 customers in Glasgow City Centre and some neighbouring areas.



0.0 MVA Capacity Released

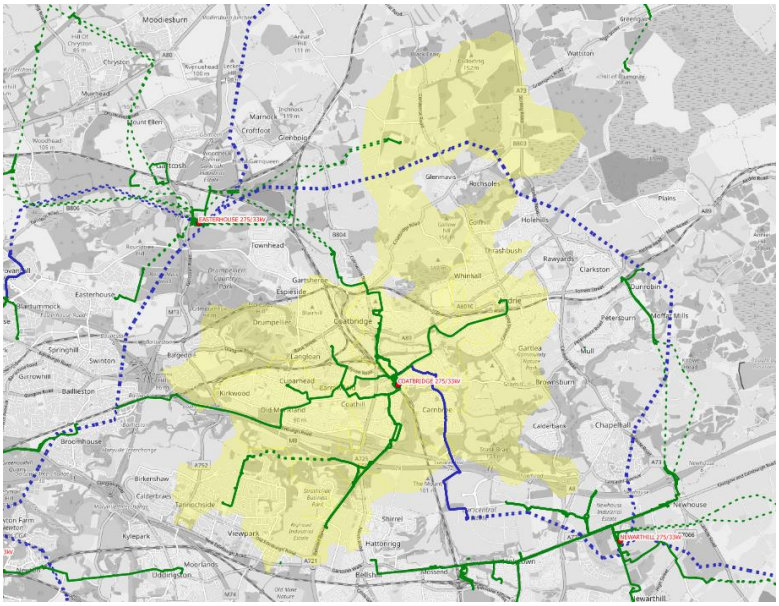
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

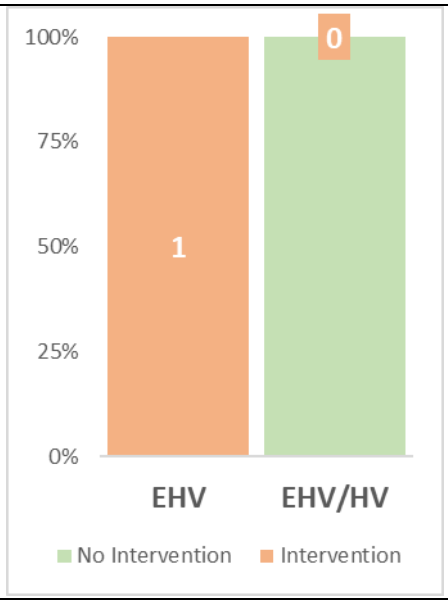
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Hunter Street Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.10 Coatbridge



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 35,000 customers in Coatbridge and some neighbouring areas.

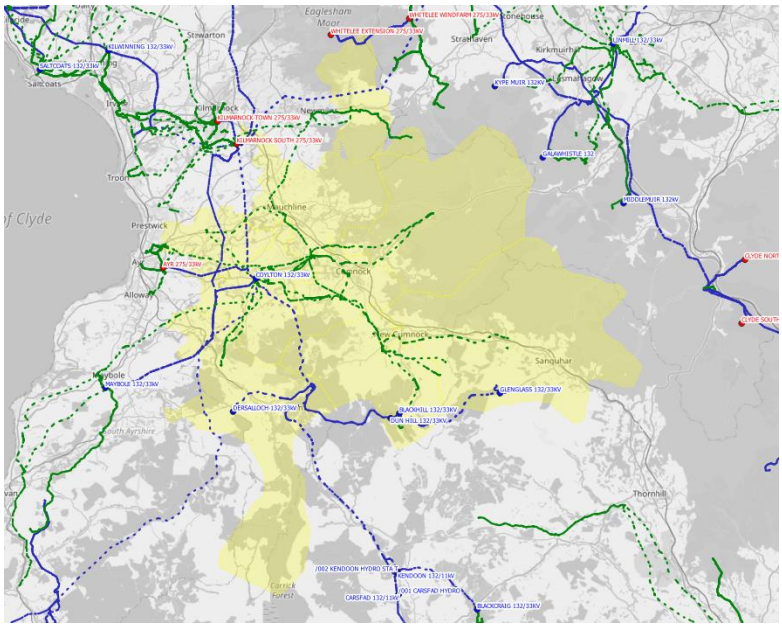


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	0.0 MW

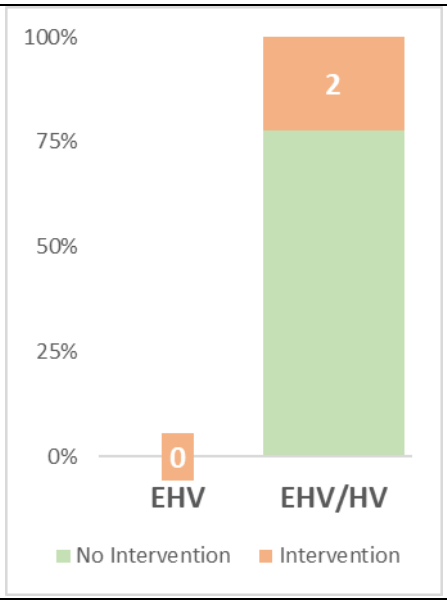
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Coatbridge GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Coatbridge,	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.11 Coylton



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 28,000 customers in Coylton and some neighbouring areas.

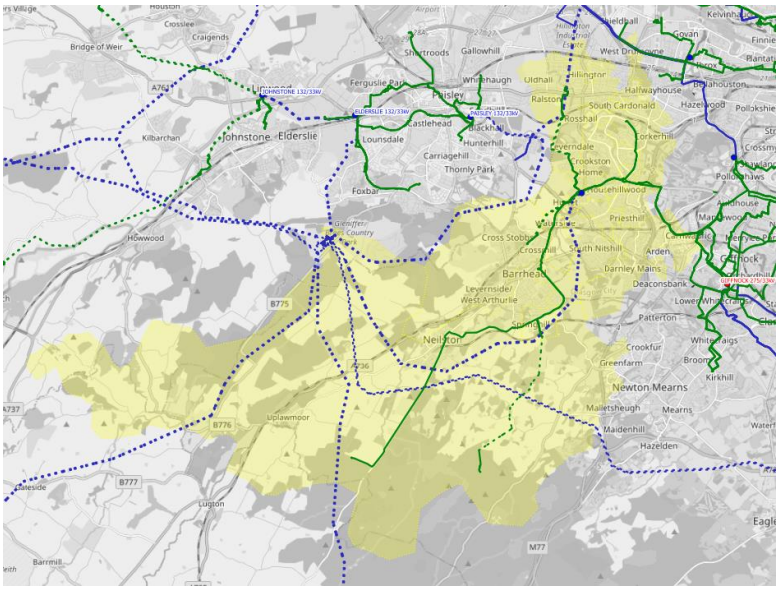


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

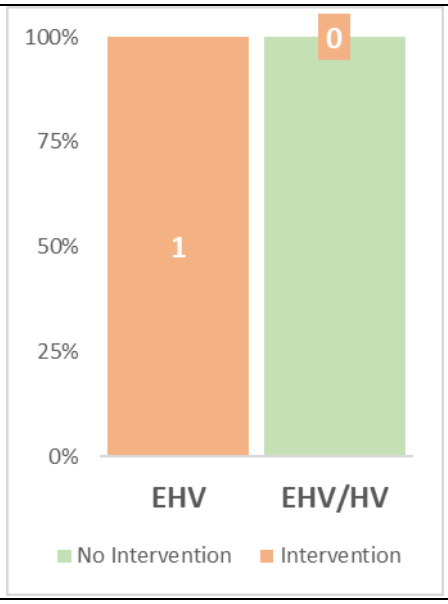
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Darvel Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2025/26	Planned (ED2)
Mauchline Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.12 Crookston



This section of network is fed via four 60MVA 132/33kV GT. This group supplies around 42,000 customers in Crookston and some neighbouring areas.

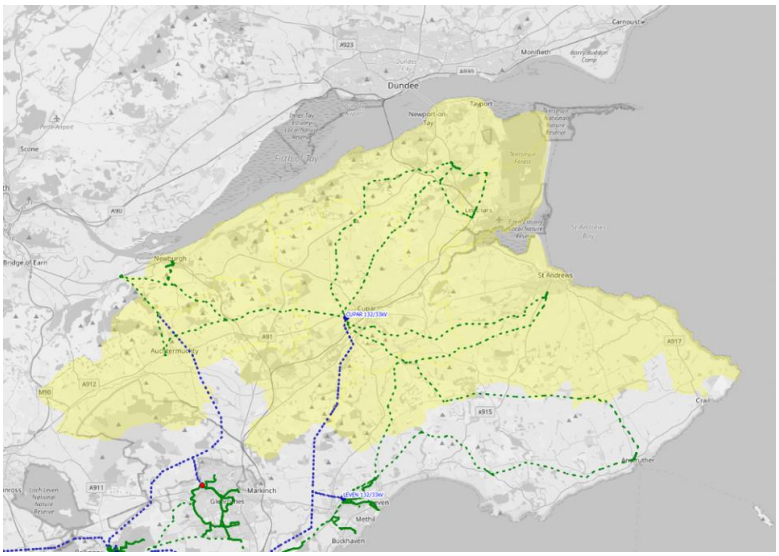


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

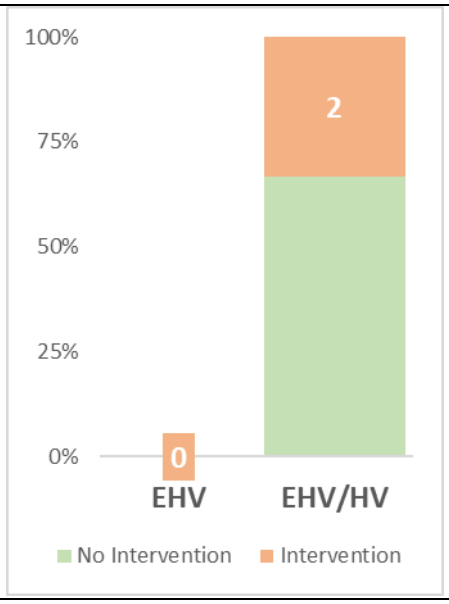
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Crookston A and B	Fault level		**Switchgear Reinforcement** Replace the existing Crookston 'A' and 'B' G.S.P. 33kV switchgear with higher rating	-	*	2022/23	Delivery

*Fault level driven intervention could increase generation hosting capacity.

4.13 Cupar



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 31,000 customers in Cupar and some neighbouring areas.



37.0 MVA Capacity Released

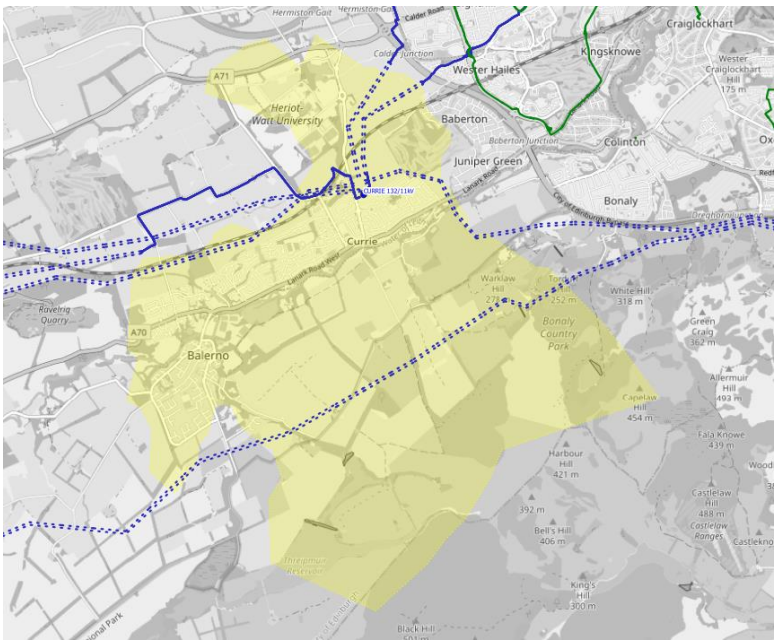
8.0 MW of Flexibility

Pre-fault	Post-fault
8.0 MW	0.0 MW

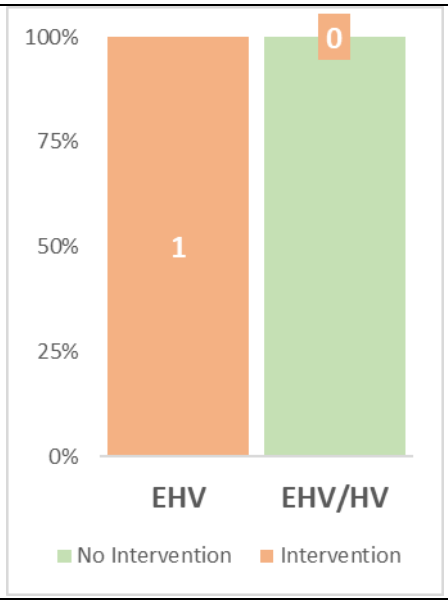
EHV/HV Interventions

Network Area	Driver	Type	Solution	Flexibility (MW)	Increase in Firm Capacity (MVA)	Expected By	Status
St Andrews	Voltage		**St Andrews Primary Reinforcement** New 33kV circuits from Cupar GSP to supply new 33/11kV 2 x 32MVA primary substation at Guardbridge along with interim constraint management via flexibility services.	-	32.0	2027/28	Planned (ED2)
	Security of Supply	Secure	Flexibility services to manage the network risk during delivery of reinforcement.	8.0	-	2023/24 to 2026/27	Planned (ED2)
Newburgh Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	5	2024/25	Planned (ED2)

4.14 Currie



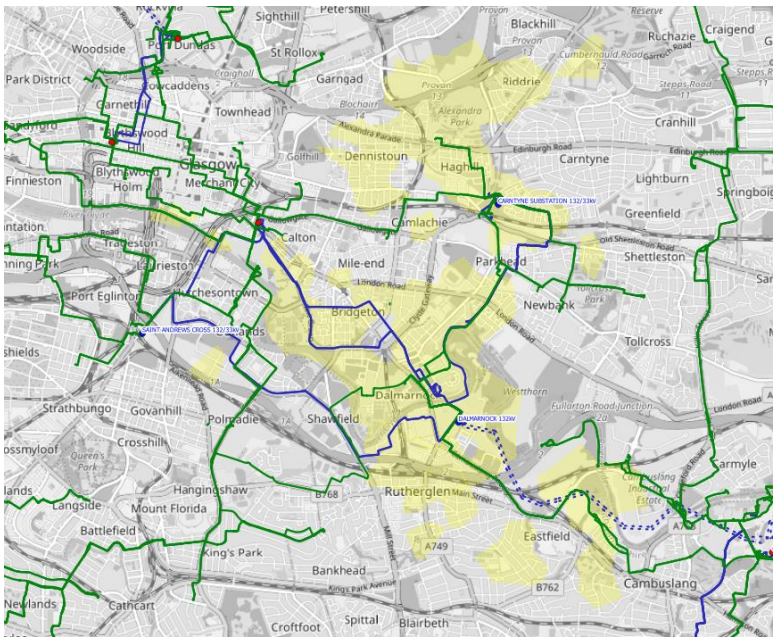
This section of network is fed via two 30MVA 132/11kV GT. This group supplies around 6,000 customers in Currie and some neighbouring areas.



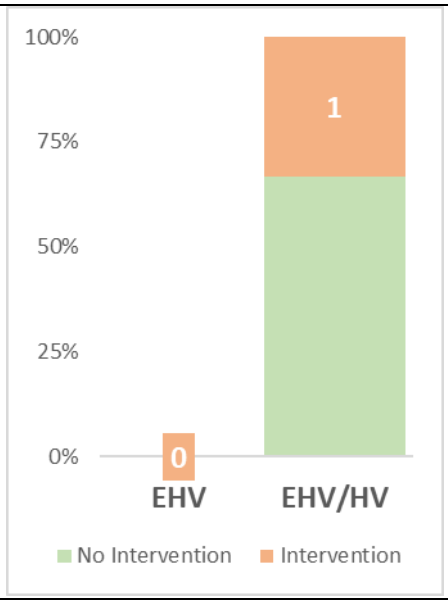
30.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

132kV/EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Currie GSP	Fault Level		**Currie GSP Fault Level Mitigation** New 132/33kV 2 x 60MVA Currie GSP and new 33/11kV 2 x 20MVA Currie primary substation.	-	30	2025/26	Planned (ED2)

4.15 Dalmarnock



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 20,000 customers in Dalmarnock and some neighbouring areas.

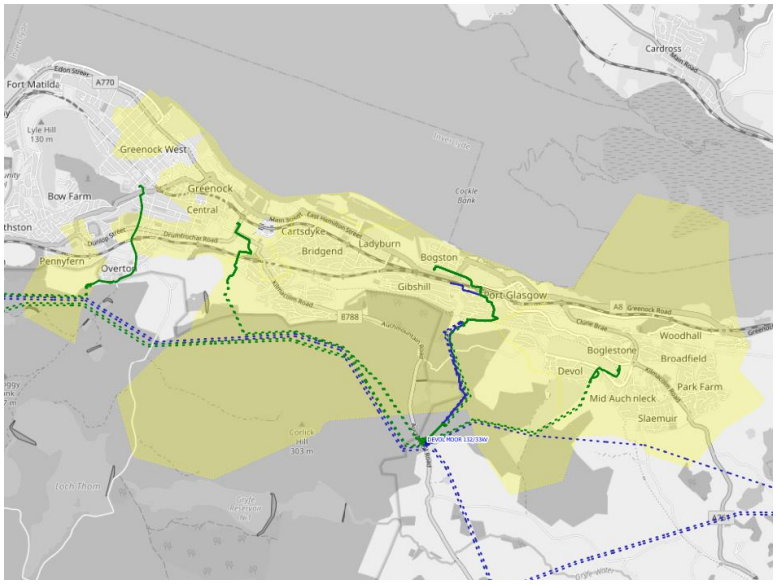


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

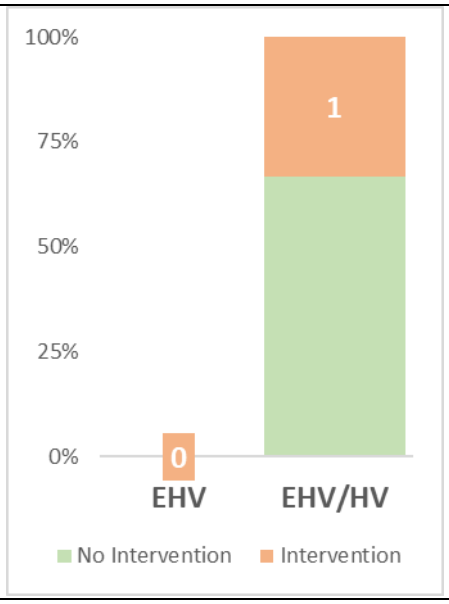
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Ashgrove Street Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.16 Devol Moor



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 19,000 customers in Greenock and Port Glasgow.

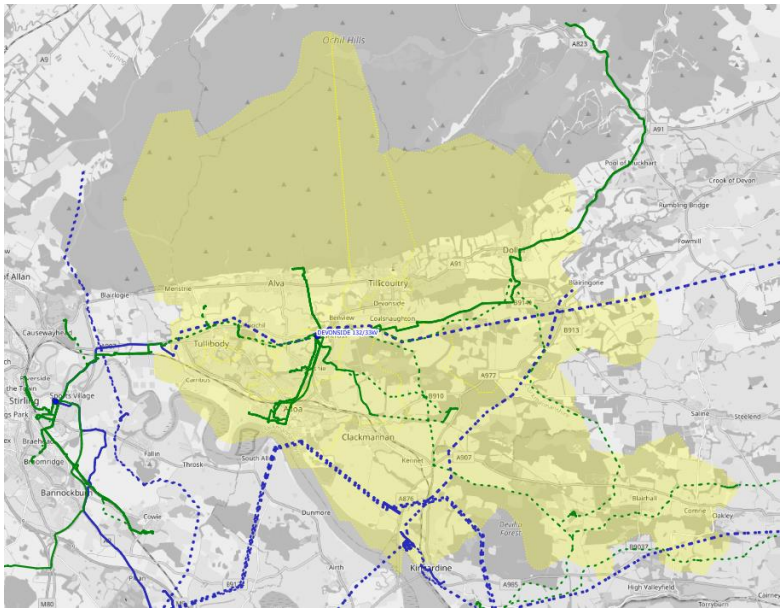


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

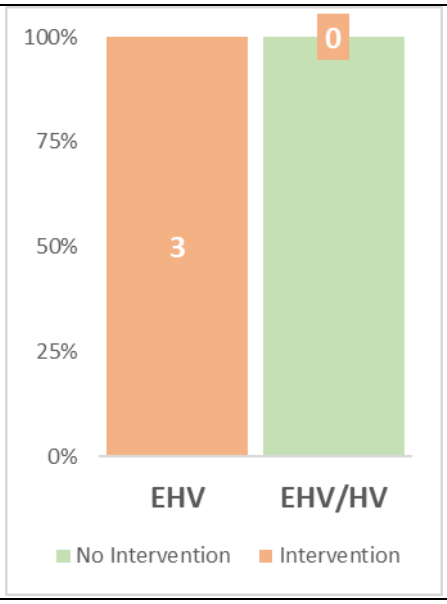
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Port Glasgow Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.17 Devonside



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 27,000 customers in Devonside and some neighbouring areas.

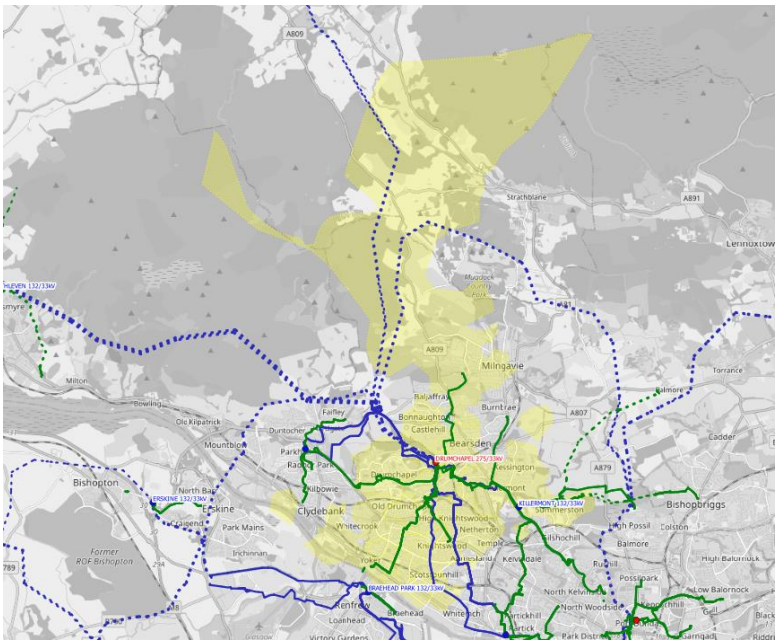


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

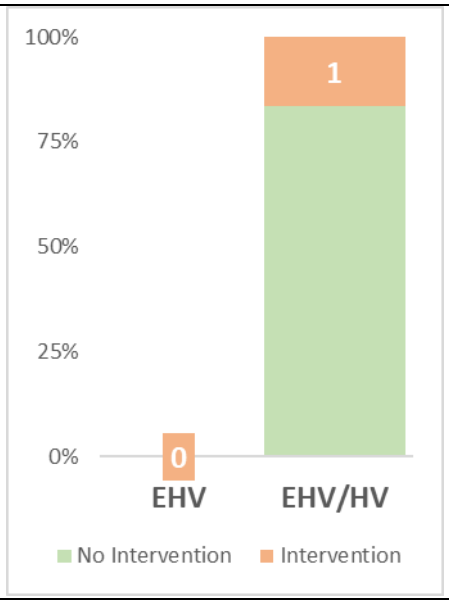
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Devonside GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Devonside	-	*	2023/24	Planned (ED2)
Gartarry	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2027/28	Planned (ED2)
Weir Pumps Alloa	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.18 Drumchapel



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 47,000 customers in Drumchapel and its neighbouring areas.

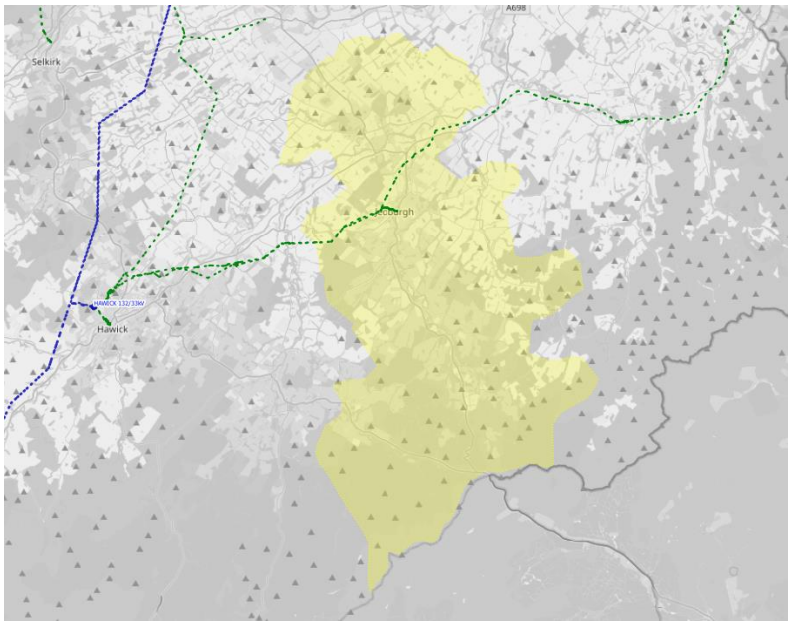


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

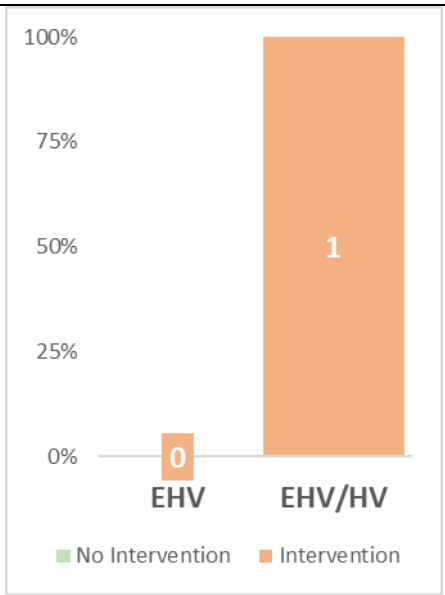
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Westerton Primary	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Westerton	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.19 Drumcross



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 6,000 customers in Drumcross and some neighbouring areas.

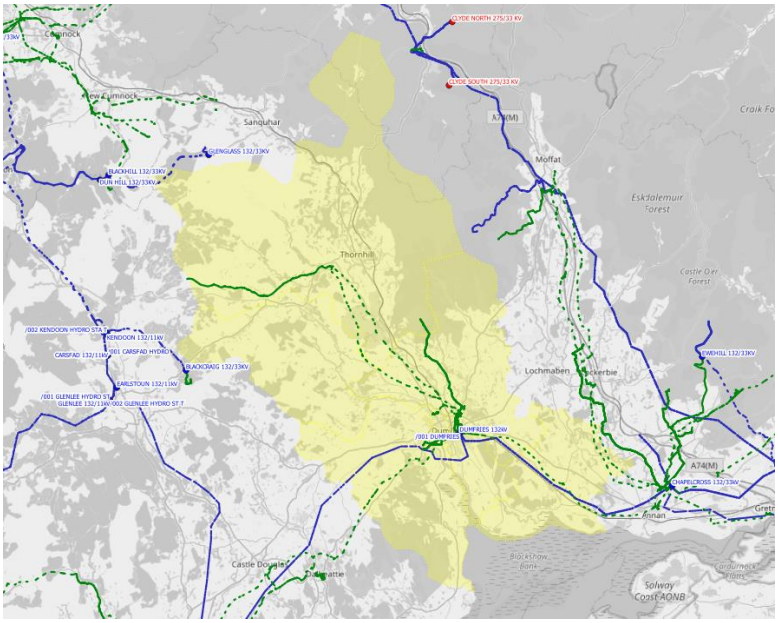


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	0.0 MW

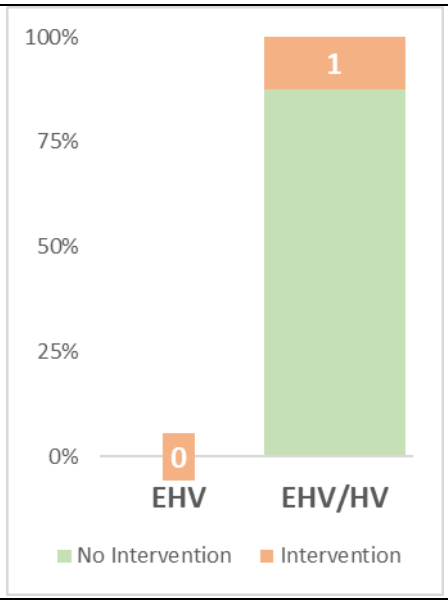
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Deans Primary	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Deans	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.20 Dumfries



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 30,000 customers in Dumfries and some neighbouring areas.

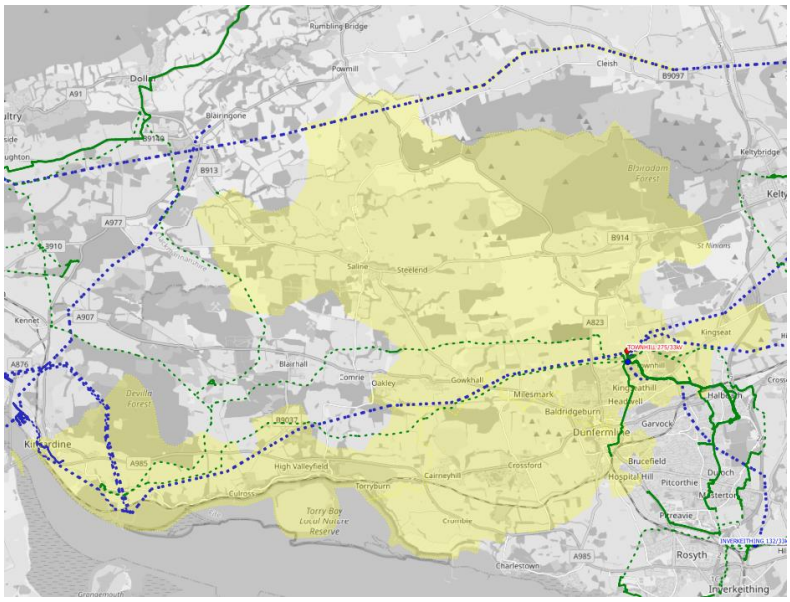


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

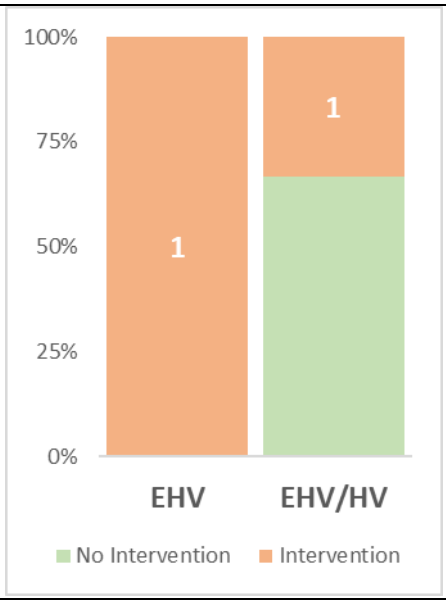
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Penpont Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.21 Dunfermline



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 20,000 customers in Dunfermline and some neighbouring areas.



0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

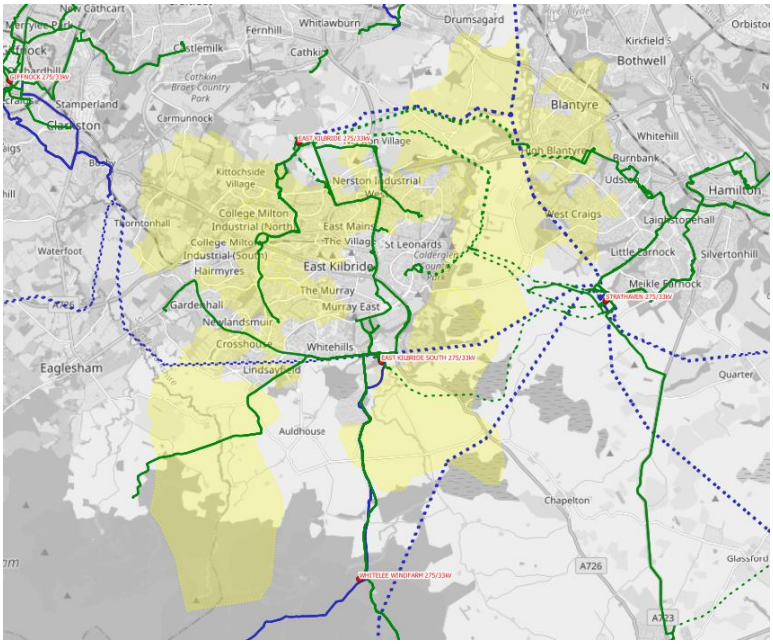
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Dunfermline GSP	Fault level		**Switchgear Reinforcement** Replace the existing 33kV switchboard installed at Dunfermline GSP. The main driver for this project is due to fault level and the limitations of the existing board.	-	*	2022/23	Delivery

*These interventions could increase generation hosting capacity.

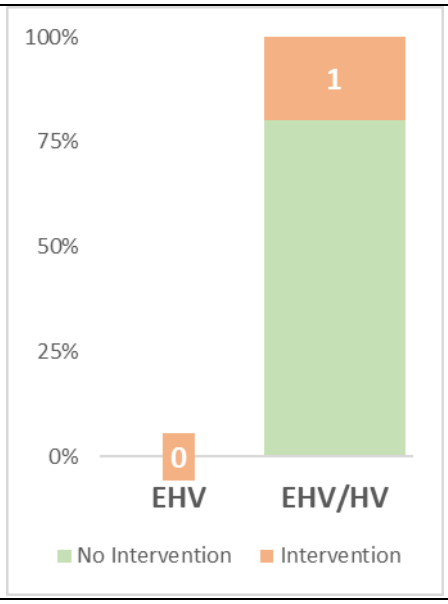
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Longannet Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.22 East Kilbride



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 30,000 customers in East Kilbride and some neighbouring areas.

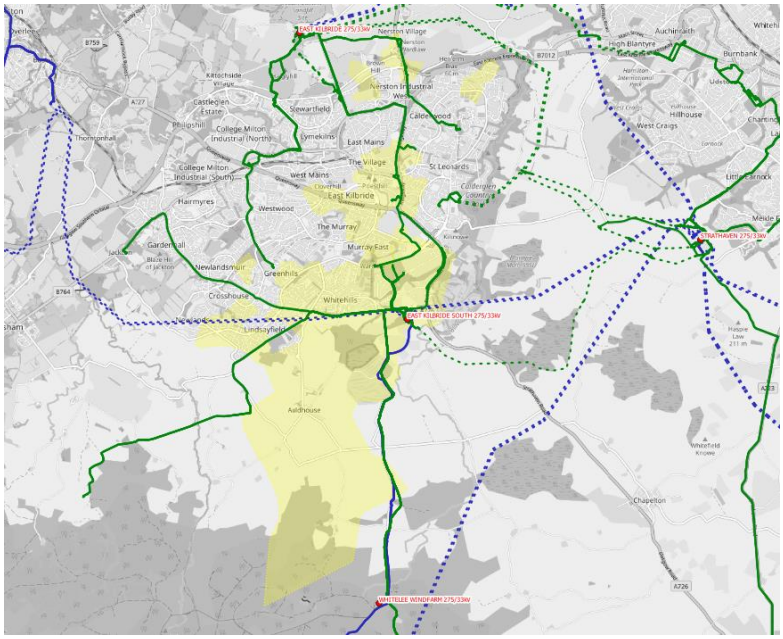


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

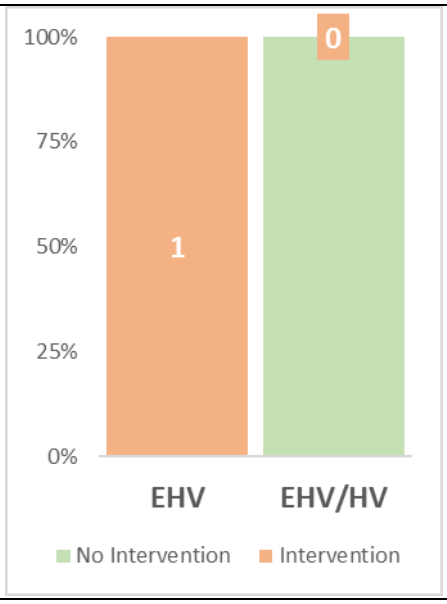
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
High Blantyre Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.23 East Kilbride South



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 12,000 customers in East Kilbride and some neighbouring areas.

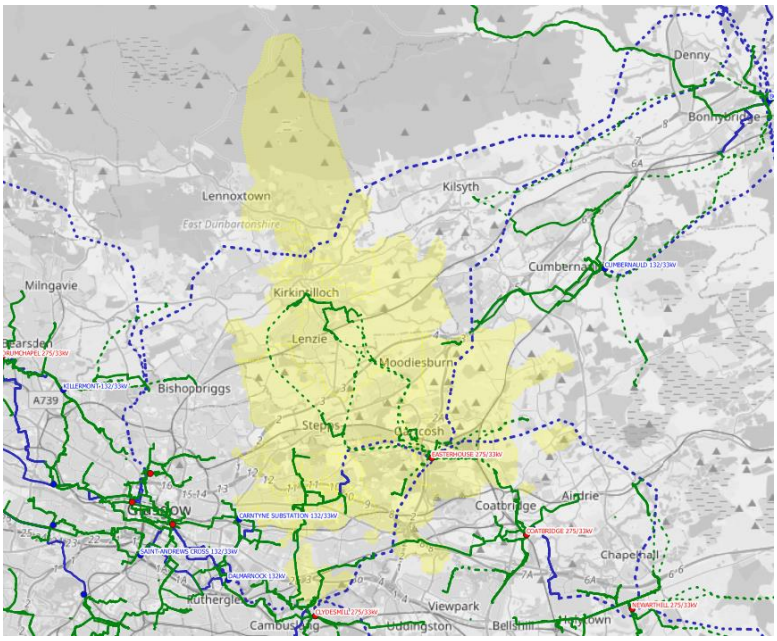


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	0.0 MW

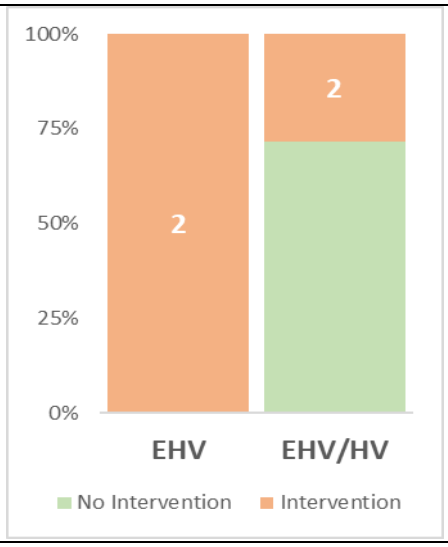
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
East Kilbride South	Fault level		**Switchgear Reinforcement** Installation of bus-section, current limiting reactor		*	2022/23	Delivery

*These interventions could increase generation hosting capacity.

4.24 Easterhouse



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 49,000 customers in Easterhouse and some neighbouring areas.



0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

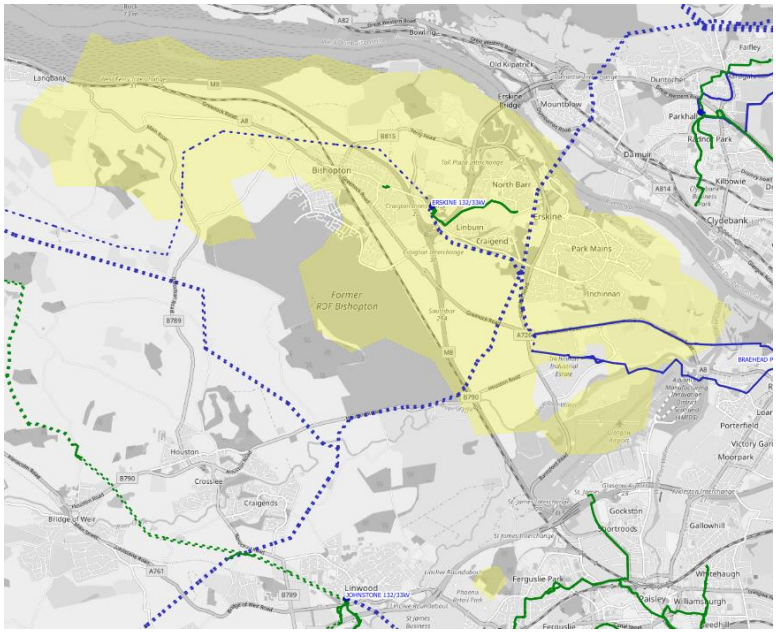
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Easterhouse GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Easterhouse	-	*	2024/25	Planned (ED2)
Bartiebeith Road 33kV	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

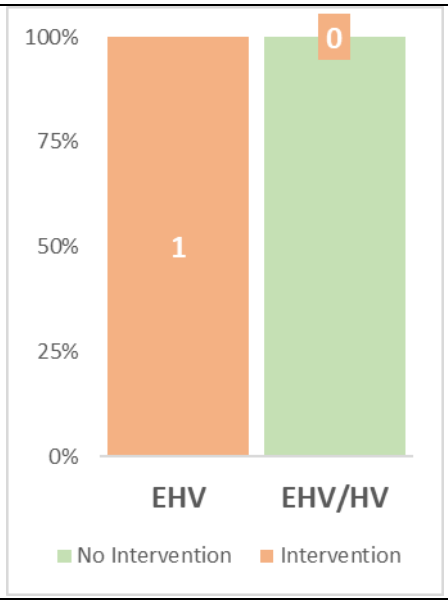
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Bishop Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)
Stepford Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.25 Erskine



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 10,000 customers in Erskine and some neighbouring areas.

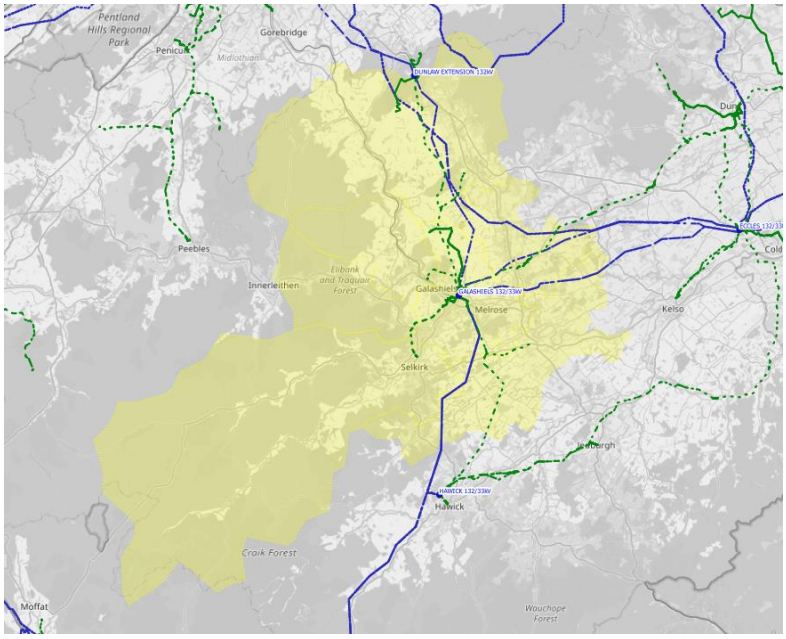


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

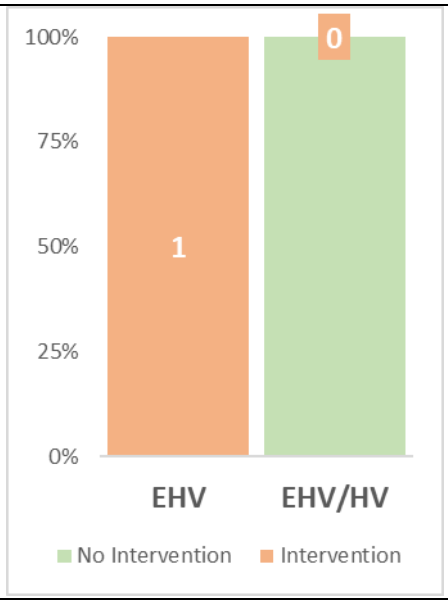
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Erskine	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Erskine	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.26 Galashiels



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 27,000 customers in Galashiels and some neighbouring areas.



7.5 MVA Capacity Released

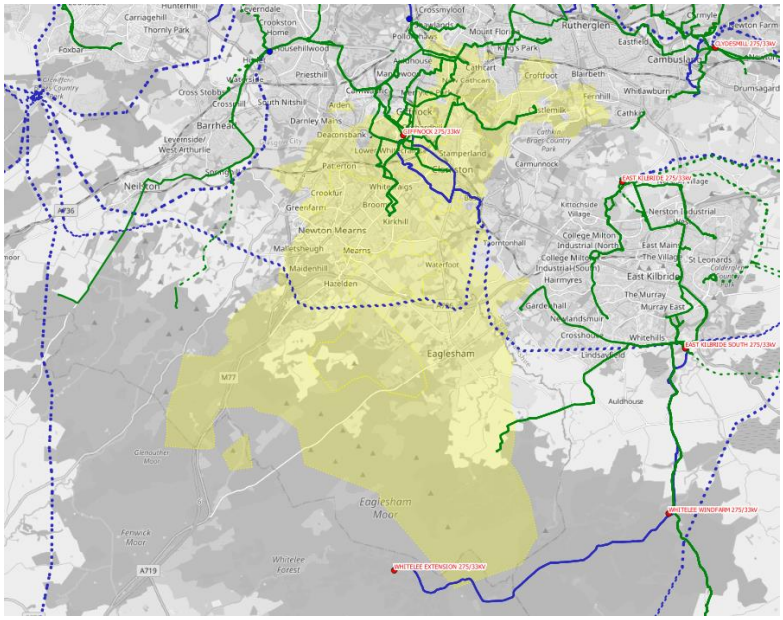
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

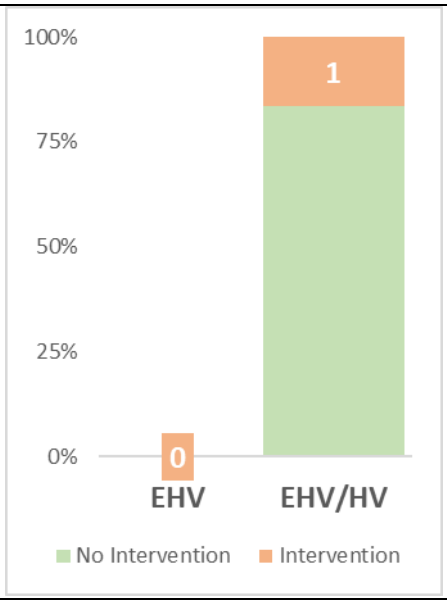
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Yair Bridge	Security of Supply		**Yair Bridge Primary Reinforcement** New EHV circuit to secure Innerleithen demand	-	7.5	2025/26	Planned (ED2)
	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.27 Giffnock



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 46,000 customers in Giffnock and some neighbouring areas.



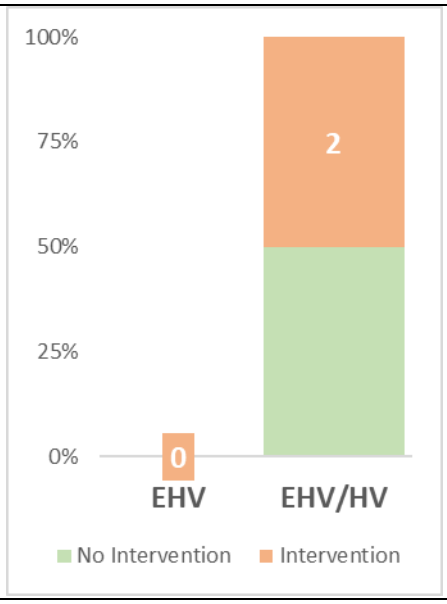
0.0 MVA Capacity Released
5.0 MW of Flexibility

Pre-fault	Post-fault
5.0 MW	**0.0 MW**

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Castle Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	5.0	-	2025/26 to 2027/28	Planned (ED2)

4.28 Glenniston

This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 17,000 customers in Glenniston and some neighbouring areas.



0.0 MVA Capacity Released

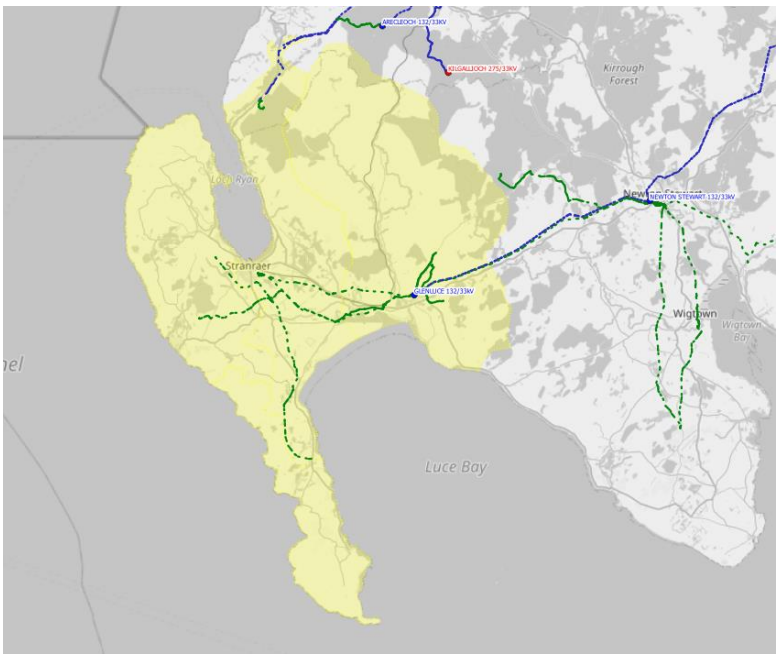
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

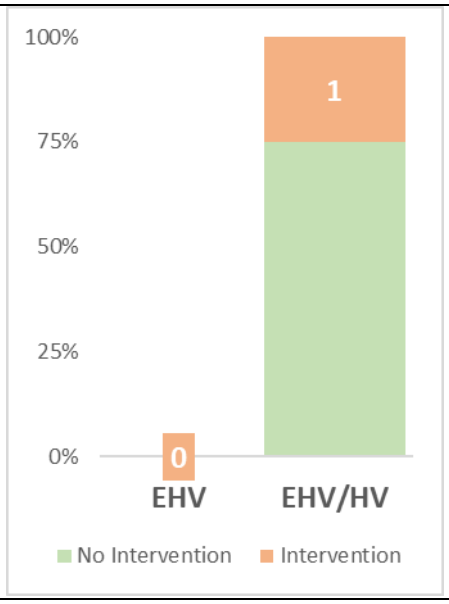
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Cluny Road Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2026/27	Planned (ED2)
Raith Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.29 Glenluce



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 10,000 customers in Glenluce and some neighbouring areas.



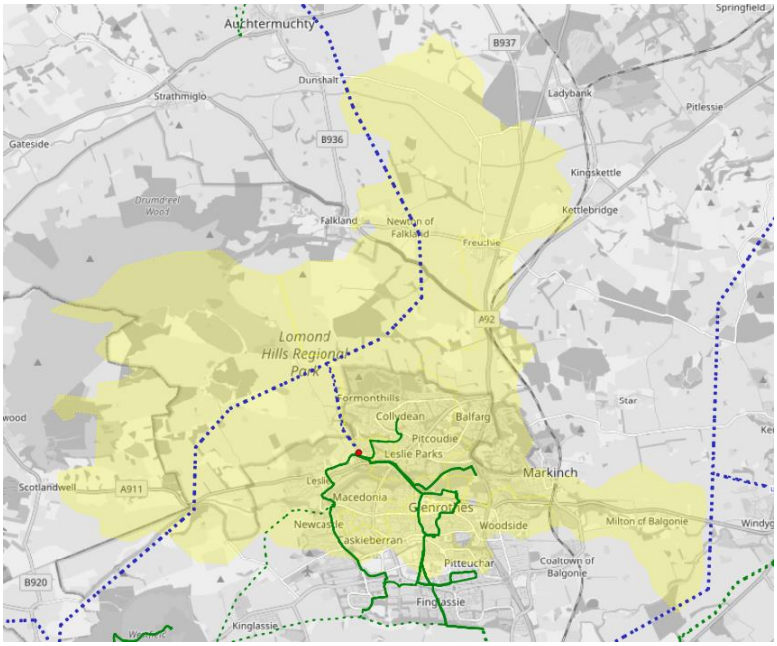
7.8 MVA Capacity Released

3.4 MW of Flexibility

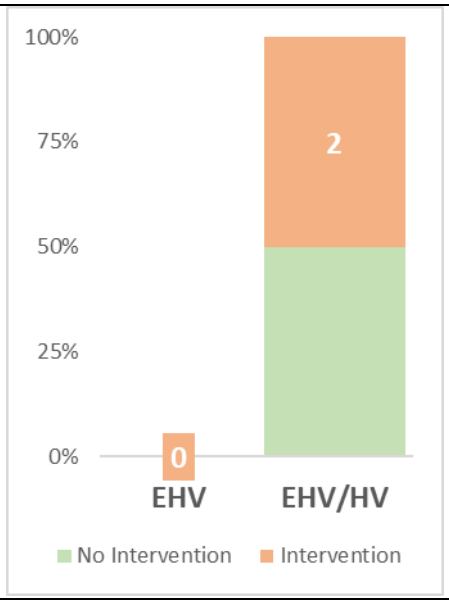
Pre-fault	Post-fault
3.4 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Stranraer Primary	Voltage		**Stranraer Primary Reinforcement** ±7.5MVAr STATCOM at Stranraer primary.	-	7.8	2027/28	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	3.4	-	2023/24 to 2026/27	Planned (ED2)

4.30 Glenrothes



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 20,000 customers in Glenrothes and some neighbouring areas.



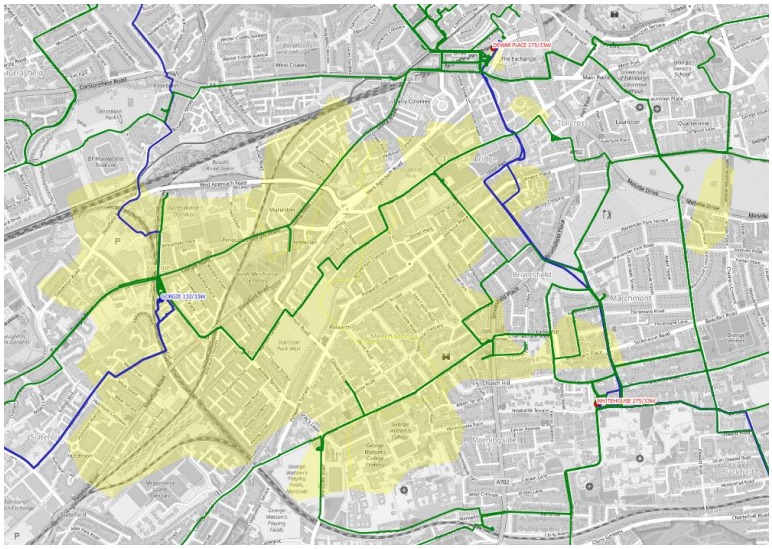
2.0 MVA Capacity Released

6.7 MW of Flexibility

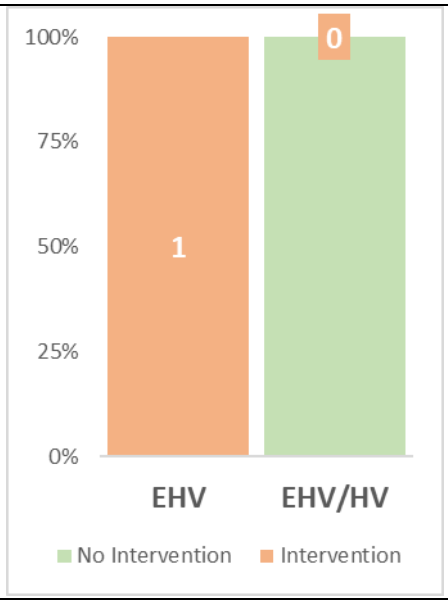
Pre-fault	Post-fault
6.7 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**T ype**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Warout Road Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	6.7	-	2023/24 to 2027/28	Planned (ED2)
Queensway Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	2.0	2026/27	Planned (ED2)

4.31 Gorgie



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 18,000 customers in the City of Edinburgh.

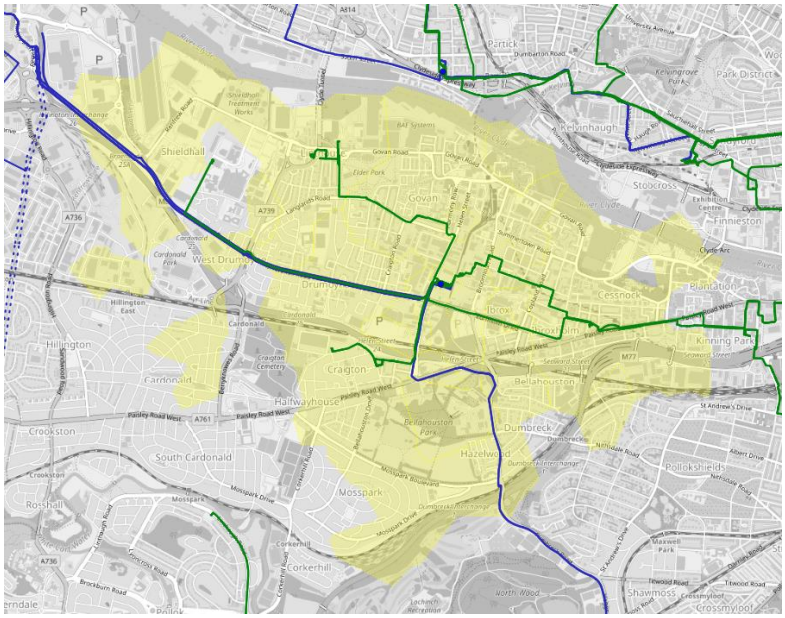


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

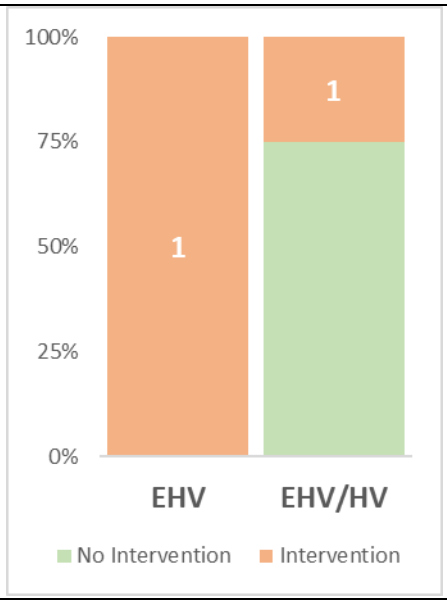
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Gorgie GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.32 Govan



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 18,000 customers in Govan and some neighbouring areas.



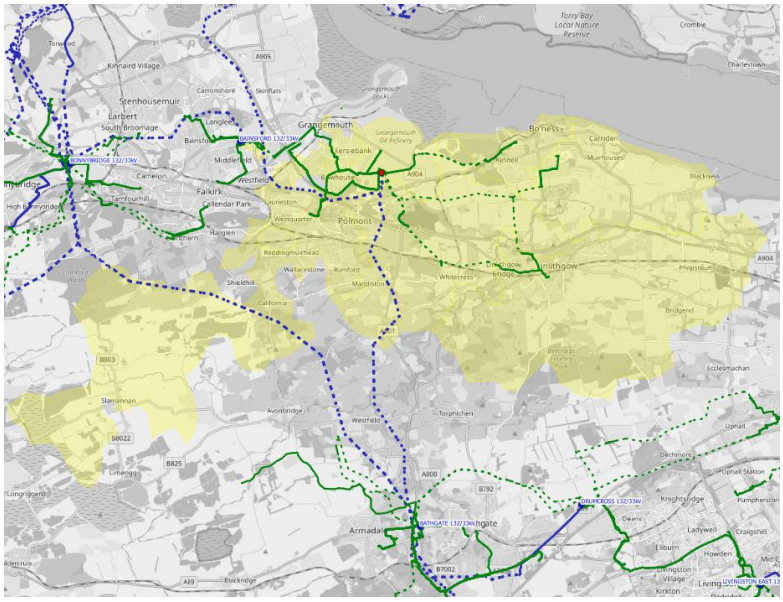
21.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Govan GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Govan	-	*	2025/26	Planned (ED2)

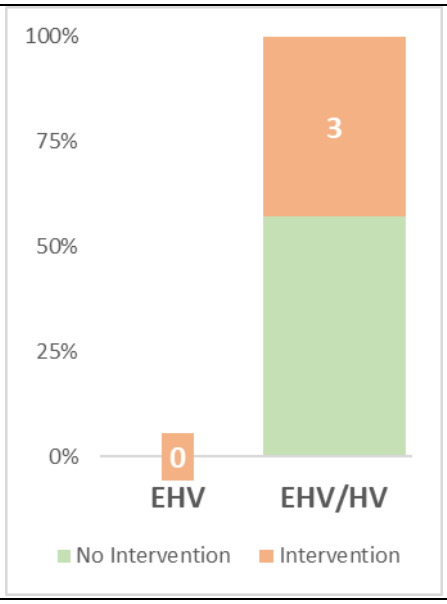
*These interventions could increase generation hosting capacity.

HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Admiral St, Elizabeth St & St Andrews Cross	Thermal		**Govan - St. Andrews Cross 6.6kV Upgrade** Voltage uprating of Govan to 11kV. Uprating of Admiral St/Elizabeth St & removal of St Andrews Cross primary substations	-	21.0	2026/27	Planned (ED2)

4.33 Grangemouth



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 33,000 customers in Grangemouth and some neighbouring areas.



0.0 MVA Capacity Released

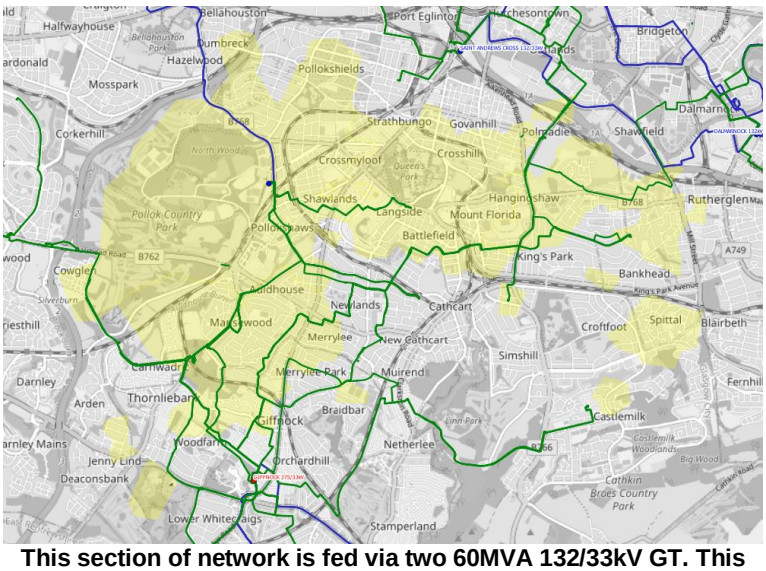
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

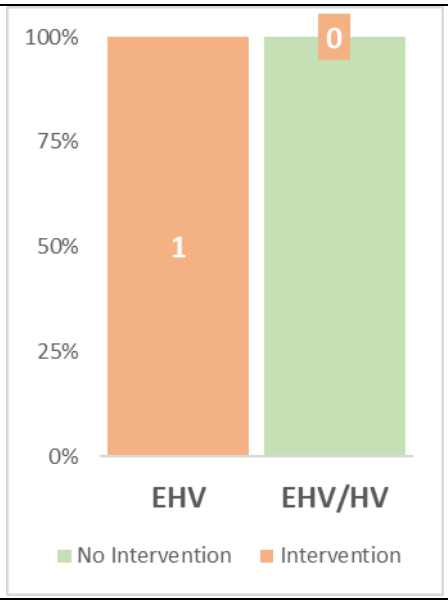
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Polmont Primary	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Polmont	-	*	2024/25	Planned (ED2)
Linlithgow Buildings Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2024/25	Planned (ED2)
Loanstone Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.34 Haggs Road



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 31,000 customers in the South Side of Glasgow.

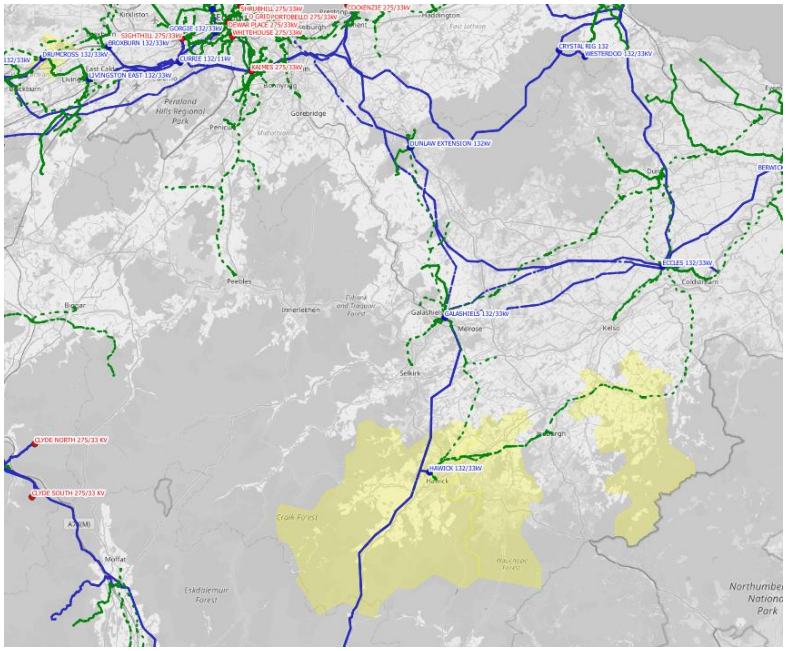


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

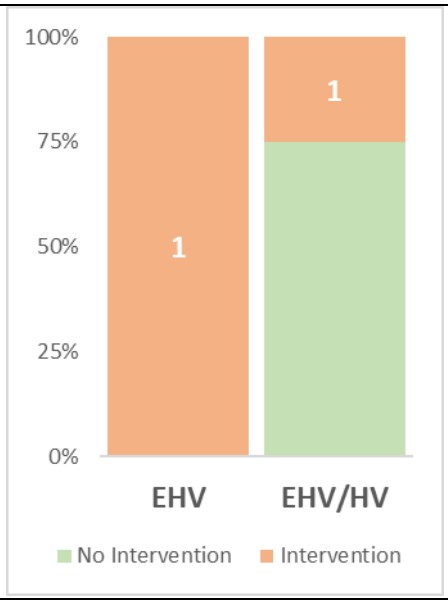
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Haggs Road GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.35 Hawick



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 15,000 customers in Hawick and some neighbouring areas.



8.3 MVA Capacity Released

2.0 MW of Flexibility

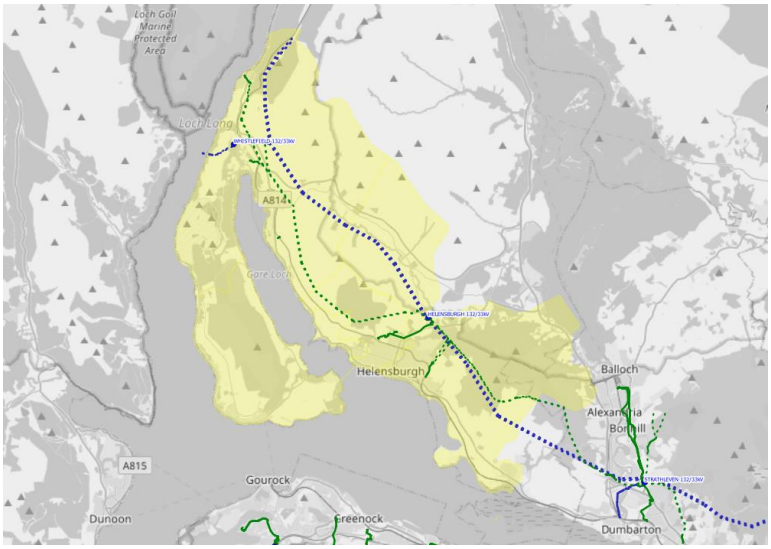
Pre-fault	Post-fault
2.0 MW	0.0 MW

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Hawick GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2025/26	Planned (ED2)

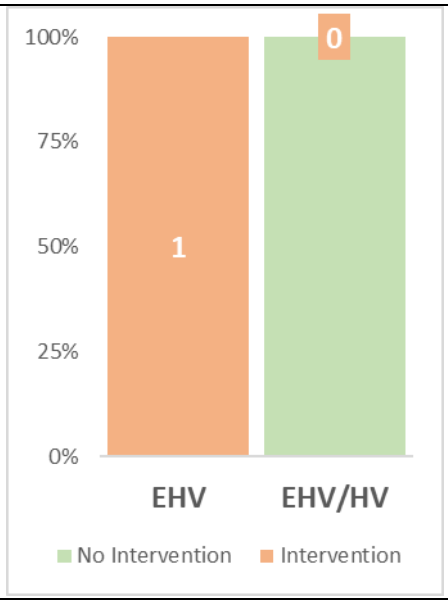
*These interventions could increase generation hosting capacity.

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Commercial Road Primary	Thermal		**33kV Circuit upgrades** Uprate sections of 33kV circuit supplying Commercial Road Primary	-	8.3	2027/28	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	2.0	-	2023/24 to 2025/26	Planned (ED2)

4.36 Helensburgh



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 12,000 customers in Helensburgh and some neighbouring areas.

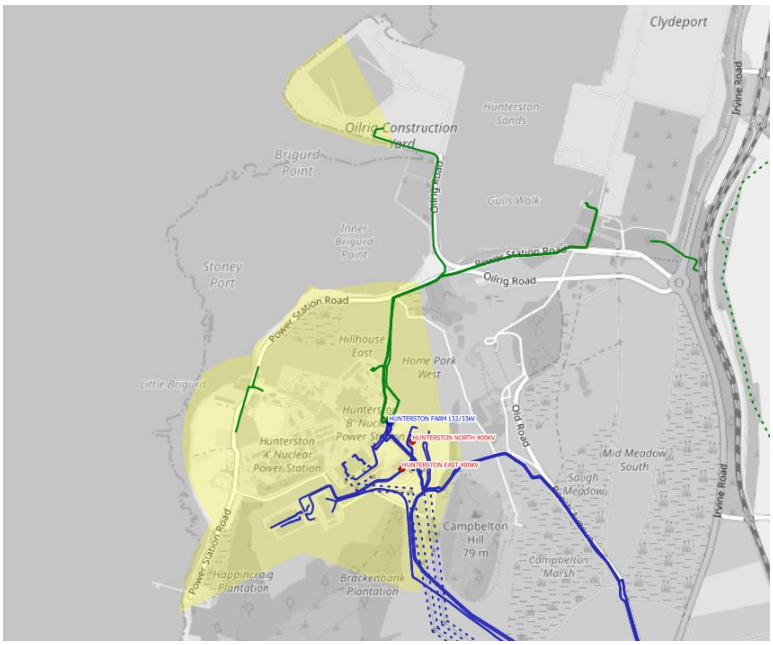


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

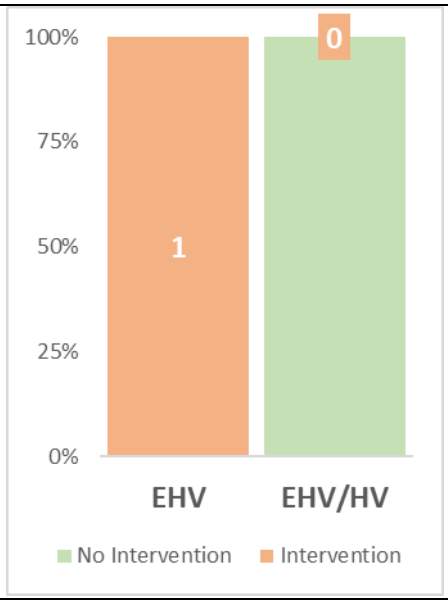
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Helensburgh GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.37 Hunterston Farm



This section of network is fed via two 60MVA 132/33kV GT. This group supplies 2 customers in Hunterston.

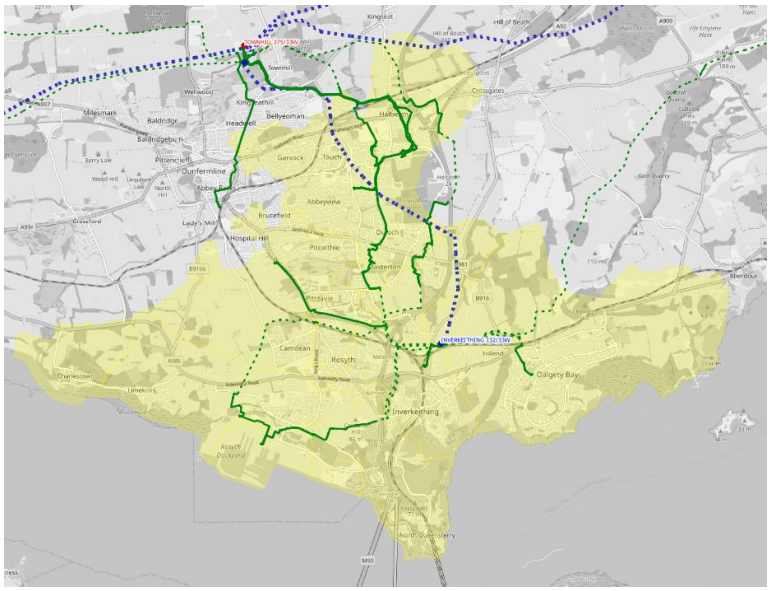


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

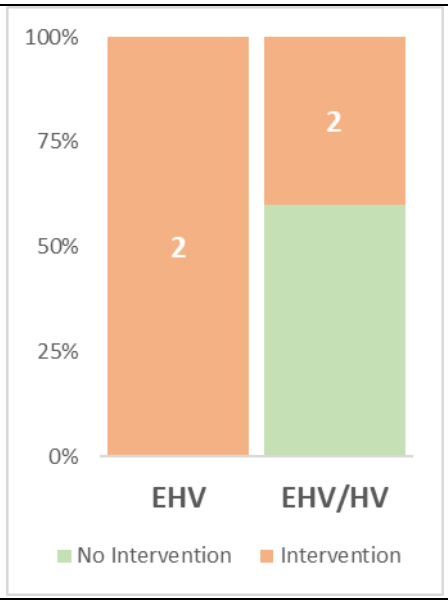
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Hunterston Farm GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Hunterston Farm	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.38 Inverkeithing



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 28,000 customers in Inverkeithing and some neighbouring areas.



0.0 MVA Capacity Released

12.4 MW of Flexibility

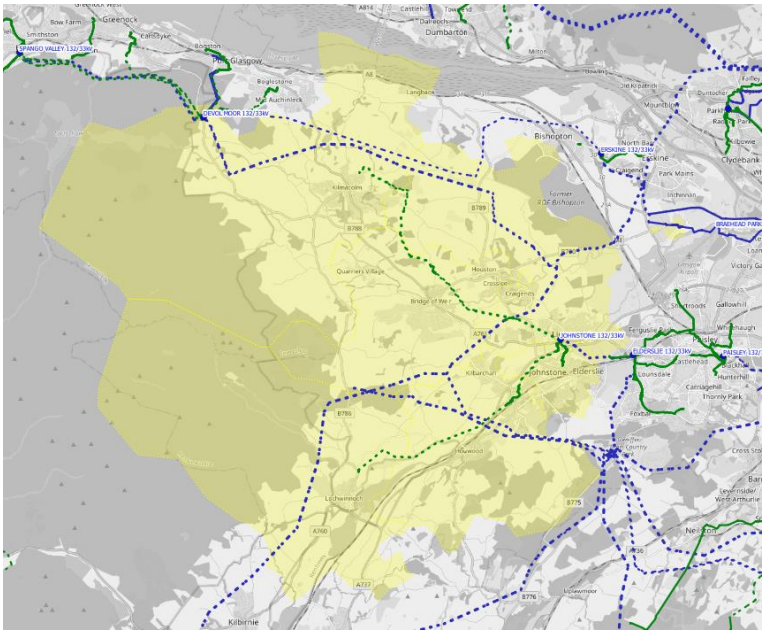
Pre-fault	Post-fault
12.4 MW	0.0 MW

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Castlandhill Primary/Pitreavie Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	3.6	-	2025/26 to 2027/28	Planned (ED2)
Inverkeithing GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2024/25	Planned (ED2)

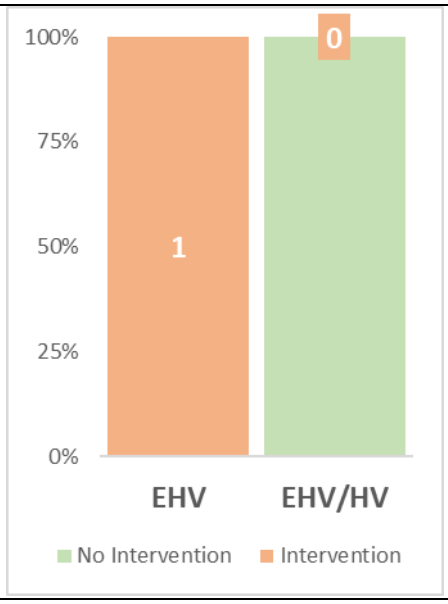
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Calais Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	8.8	-	2024/25 to 2027/28	Planned (ED2)
Castlandhill	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.39 Johnstone



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 28,000 customers in Johnstone and some neighbouring areas.

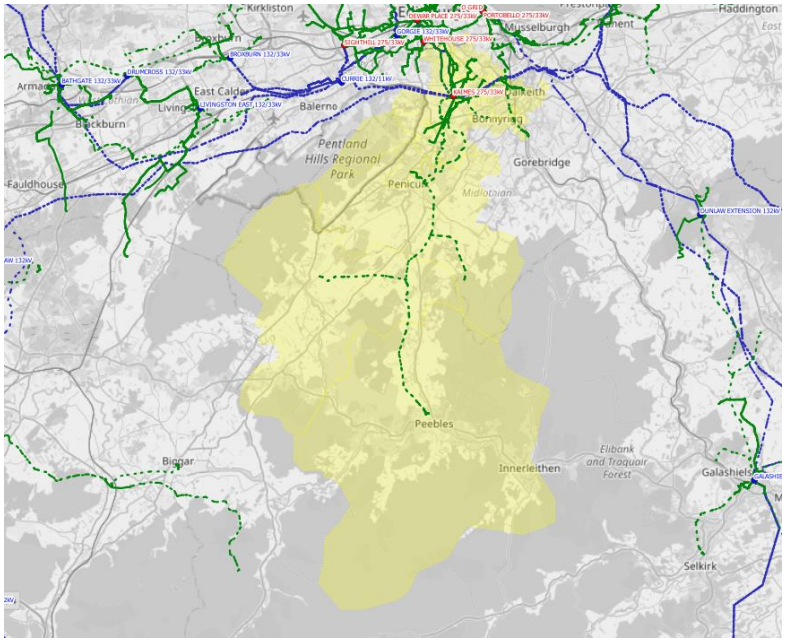


12.4 MVA Capacity Released
0.0 MW of Flexibility

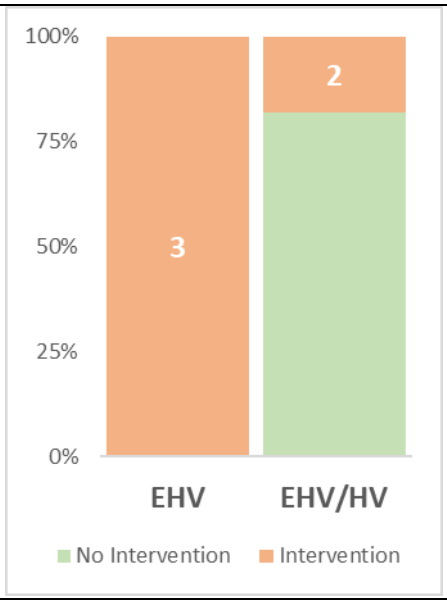
Pre-fault	Post-fault
0.0 MW	**0.0 MW**

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Johnstone	Voltage and Thermal		**Circuit Reinforcement** Installation of 33kV interconnection between Johnstone GSP and Erskine GSP	-	12.4	2022/23	Delivery

4.40 Kaimes



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 54,000 customers in Kaimes and some neighbouring areas.



30.4 MVA Capacity Released

24.7 MW of Flexibility

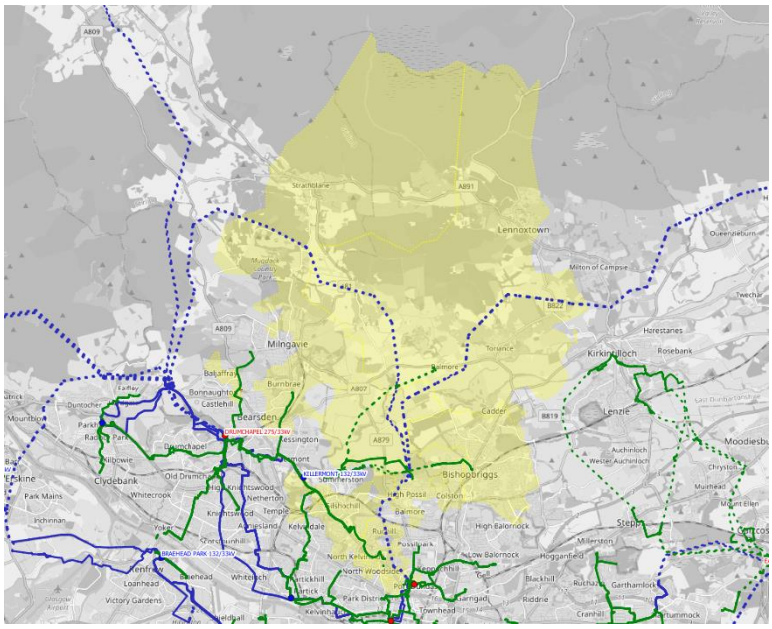
Pre-fault	Post-fault
24.7 MW	0.0 MW

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Kaimes GSP	Thermal		**Kaimes GSP Reinforcement** New 33kV circuits to reconfigure Kings Buildings and Lugton primary substation to be supplied from Whitehouse GSP.	-	30.4	2026/27	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	17.8	-	2024/25 to 2025/26	Planned (ED2)
Kingsland - West Linton – Loanstone	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	3.4	-	2026/27 to 2027/28	Planned (ED2)
Kaimes 33kV Network	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	1.8	-	2026/27 to 2027/28	Planned (ED2)

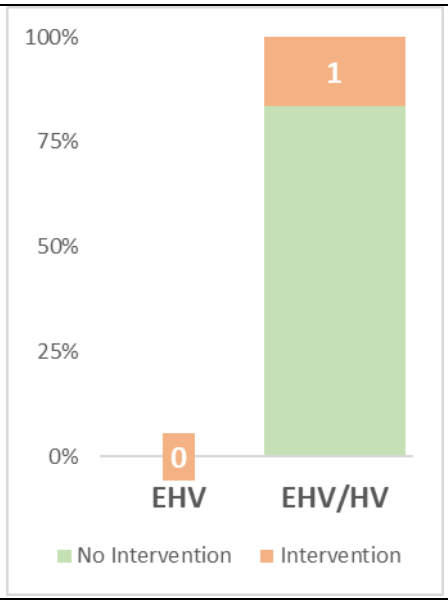
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Kingsland Primary	Thermal	 Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	1.7	-	2026/27 to 2027/28	Planned (ED2)
Kings Buildings	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.41 Killermont



This section of network is fed via two 90MVA 132/33kV SGT. This group supplies around 43,000 customers in Killermont and some neighbouring areas.

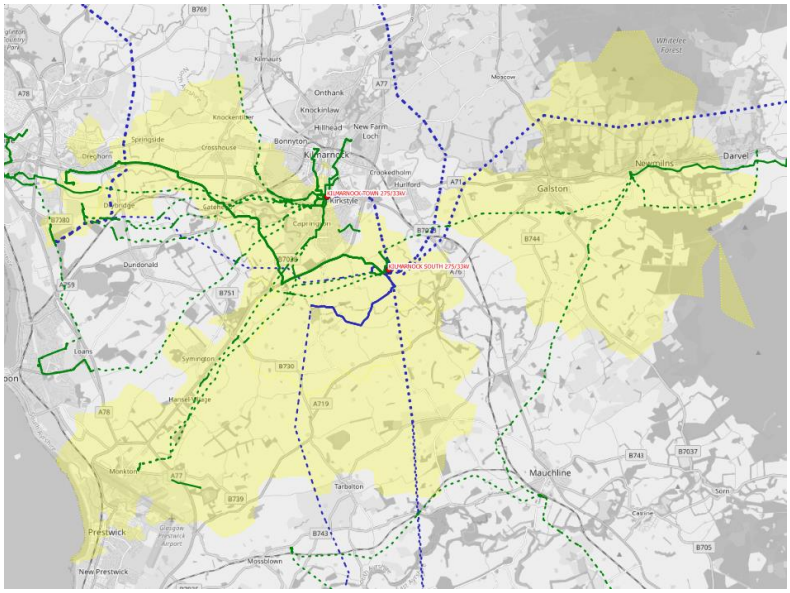


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

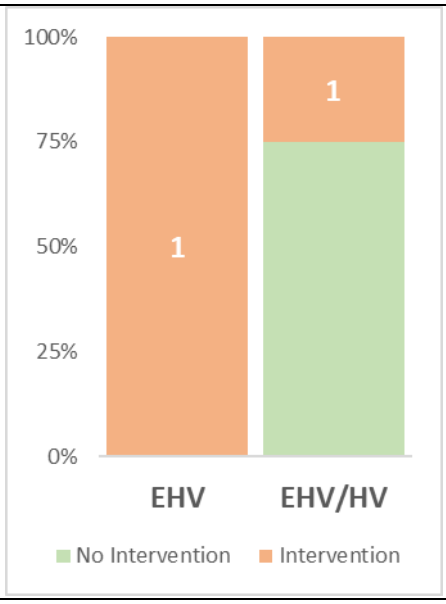
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Balmore B/Vilage Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.42 Kilmarnock South



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 18,000 customers in Kilmarnock South and some neighbouring areas.



0.0 MVA Capacity Released

0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

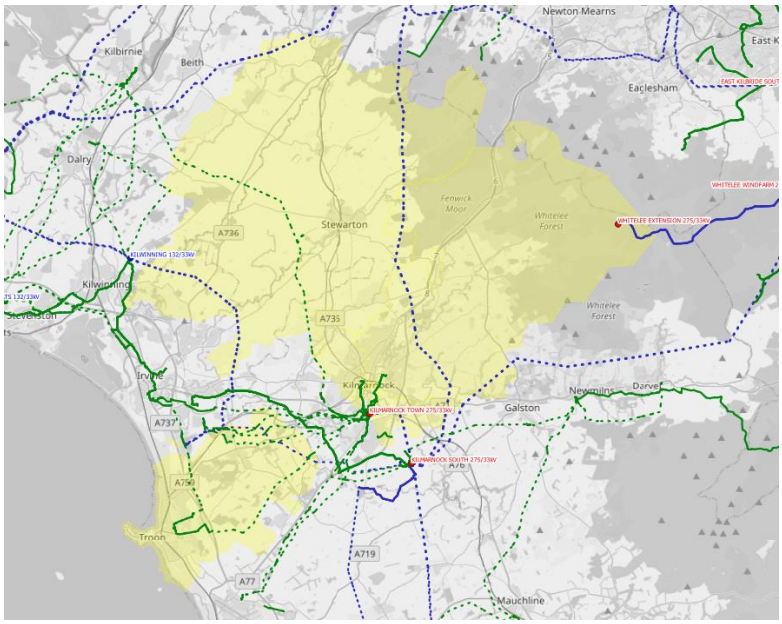
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Kilmarnock South GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Kilmarnock	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity. .

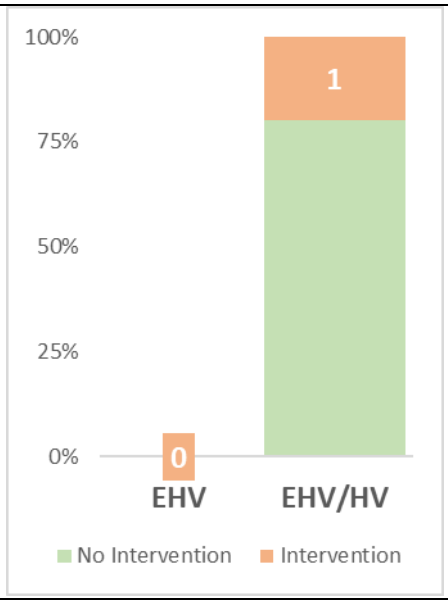
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Monkton Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.43 Kilmarnock Town



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 37,000 customers in Kilmarnock Town and some neighbouring areas.



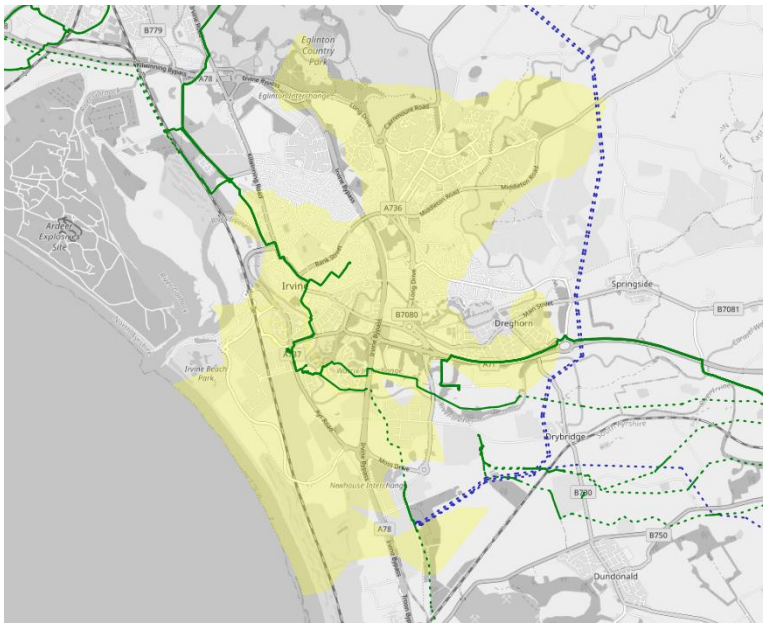
4.2 MVA Capacity Released

1.5 MW of Flexibility

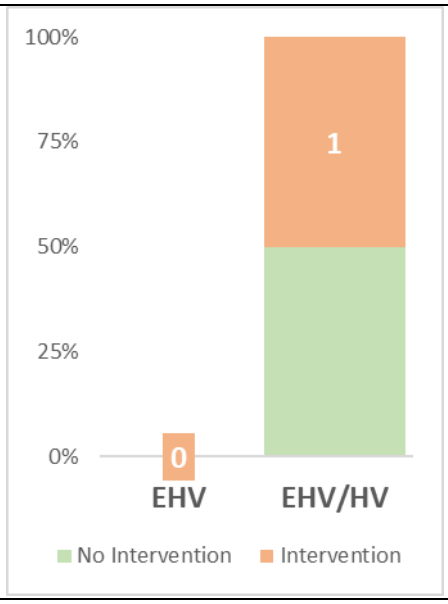
Pre-fault	Post-fault
1.5 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Troon Primary	Thermal		**33kV Circuit upgrades** Uprate sections of 33kV circuit supplying Troon Primary	-	4.2	2027/28	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	1.5	-	2024/25 to 2025/26	Planned (ED2)

4.44 Kilwinning



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 12,000 customers in Kilwinning and some neighbouring areas.



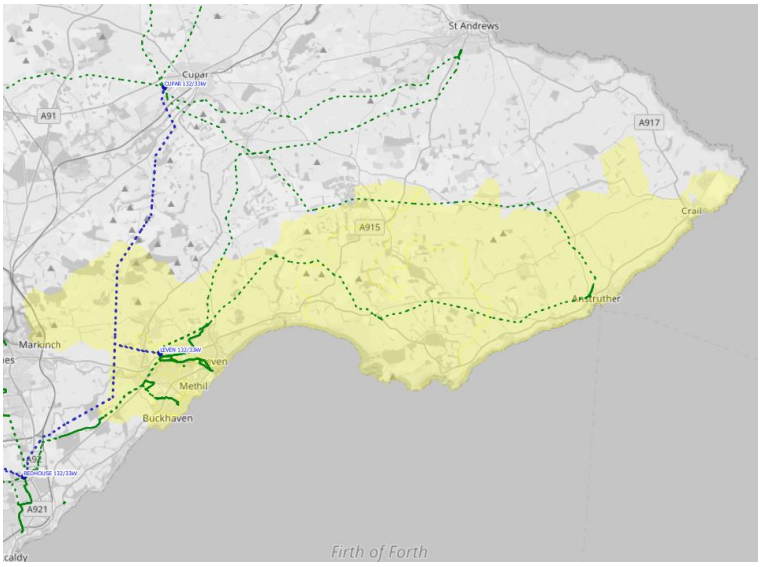
0.0 MVA Capacity Released

2.1 MW of Flexibility

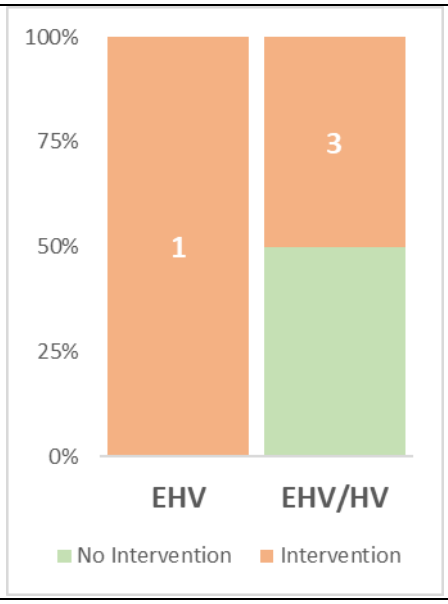
Pre-fault	Post-fault
2.1 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Irvine primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	2.1	-	2023/24 to 2027/28	Planned (ED2)

4.45 Leven



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 27,000 customers in Leven and some neighbouring areas.



30.0 MVA Capacity Released

3.4 MW of Flexibility

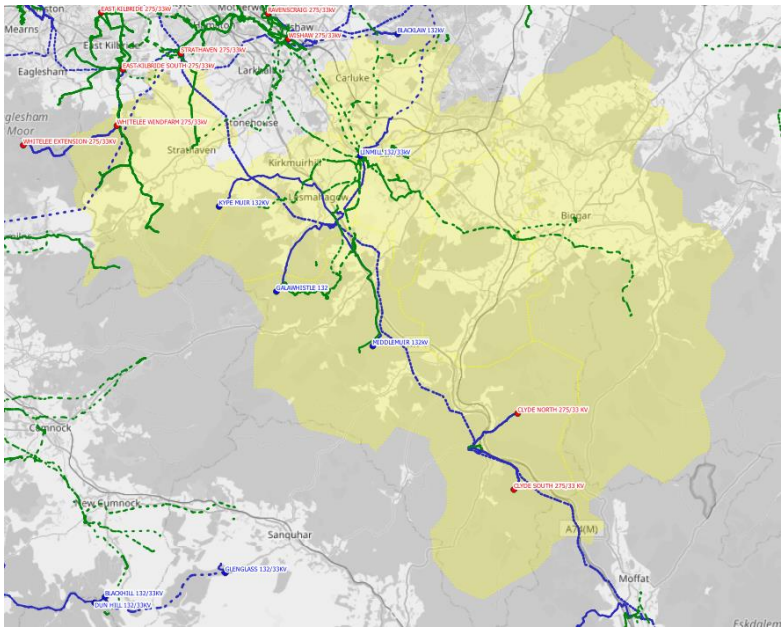
Pre-fault	Post-fault
3.4 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Leven Primary	Fault Level		**Leven Primary Fault Level Mitigation** New 33/11kV 2 x 20MVA primary substation at Leven supplied from Leven GSP.	-	20	2026/27	Planned (ED2)
Levenbank Primary	Thermal		**Levenbank Primary Reinforcement** Replacement of existing Levenbank 33/11kV 2x 10MVA transformers with 20MVA units.	-	10	2024/25	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	3.2	-	2023/24 to 2024/25	Planned (ED2)
Anstruther Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	0.2	-	2027/28	Planned (ED2)

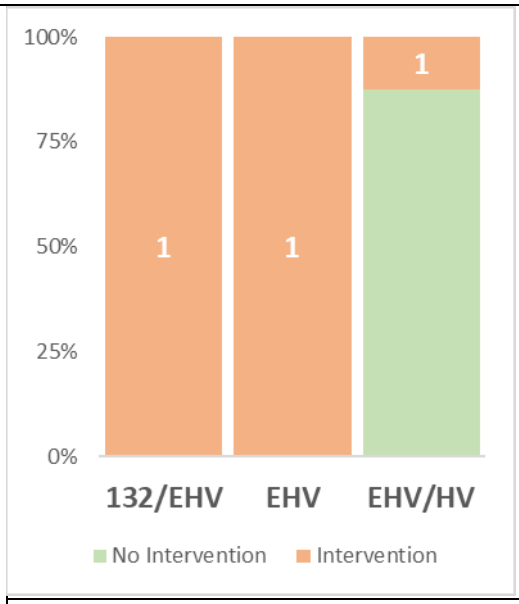
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Leven GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Leven	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.46 Linnmill



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 29,000 customers in Linnmill and some neighbouring areas.



66.5 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

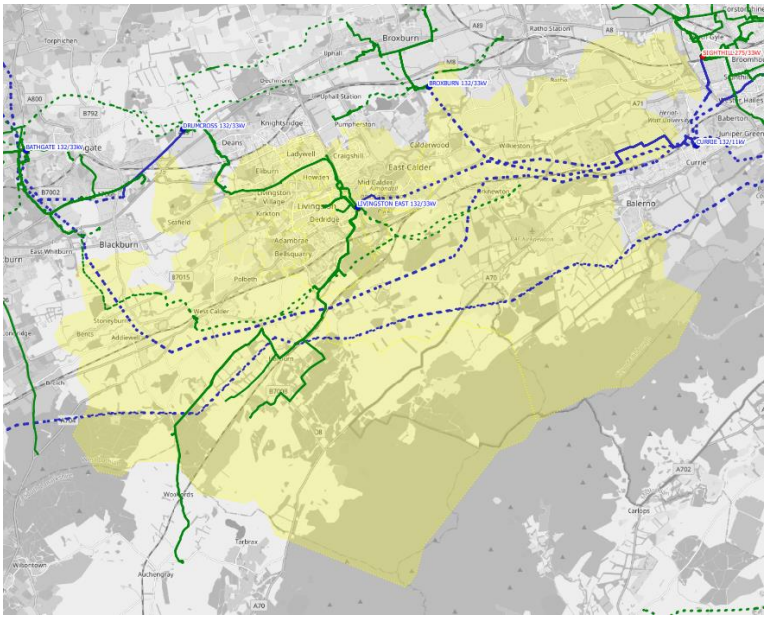
132kV/EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Lesmahagow GSP	Fault Level		**New Lesmahagow GSP** New 132/33kV 2 x 60MVA Lesmahagow grid supply point into Coalburn 132kV transmission network.	-	60	2024/25	Planned (ED2)

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Linnmill GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2026/27	Planned (ED2)

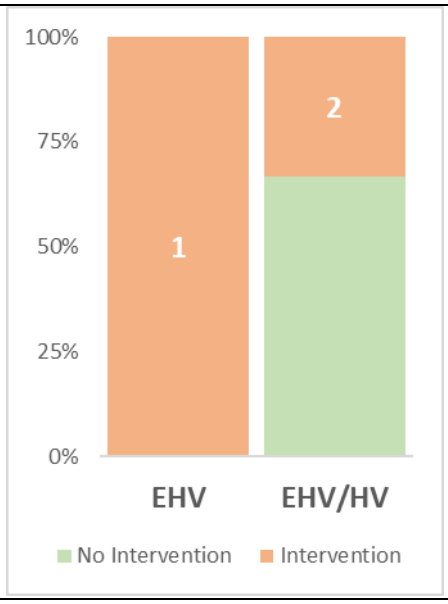
*These interventions could increase generation hosting capacity.

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Lesmahagow Primary	Thermal		**Primary Reinforcement** Replace the two 10MVA primary transformers with two 12/24 MVA rated transformers at Lesmahagow.		6.5	2022/23	Delivery

4.47 Livingston East



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 29,000 customers in Livingston and some neighbouring areas.



10.0 MVA Capacity Released

3.7 MW of Flexibility

Pre-fault	Post-fault
3.7 MW	0.0 MW

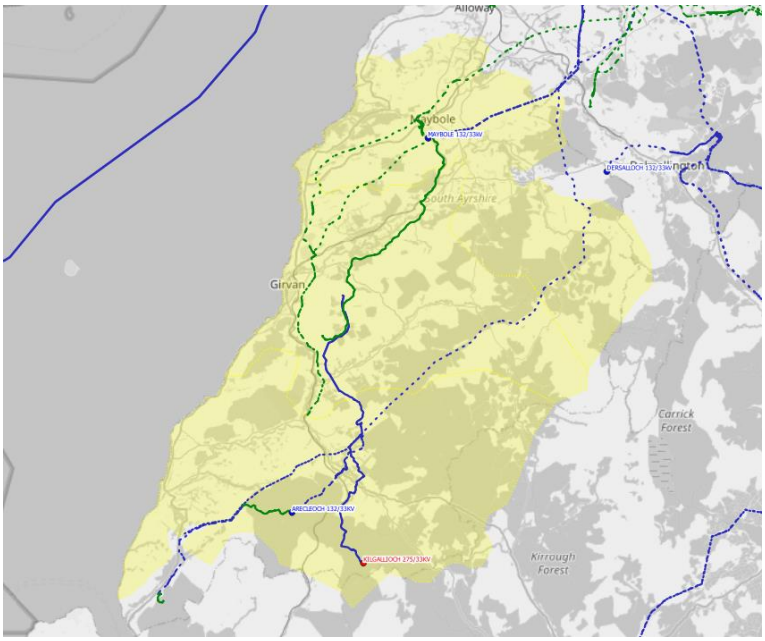
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Livingston	Fault level		**Switchgear Reinforcement** At Livingston East GSP, adjacent to the existing 33 kV compound, an 18-panel fixed pattern switchboard will be installed within a new pre-fabricated housing built on concrete foundations	-	*	2022/23	Delivery

*These interventions could increase generation hosting capacity.

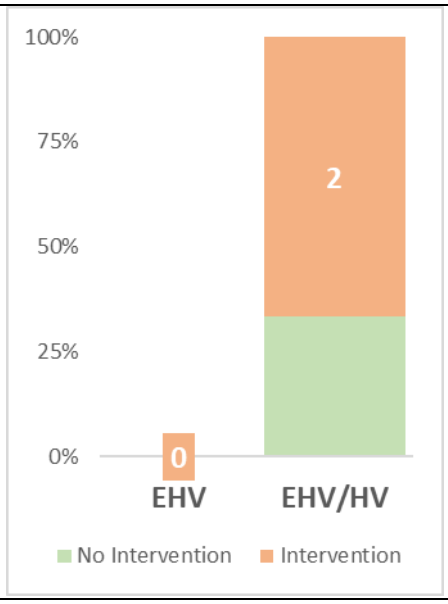
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Contracted Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Kirknewton Primary	Security of Supply		**Kirknewton Primary Reinforcement** Replace the two 10MVA transformers with 20MVA units. Provide a dedicated connection to Kirkbank via two new 33kV cable circuits.	-	10	2024/25	Planned (ED2)
		 Secure	Flexibility services to manage the network risk during delivery of reinforcement.	3.7	-	2023/24 to 2024/25	Planned (ED2)
Cousland Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.48 Maybole



This section of network is fed via two 30MVA 132/33kV GT. This group supplies around 11,000 customers in Maybole and some neighbouring areas.



0.0 MVA Capacity Released

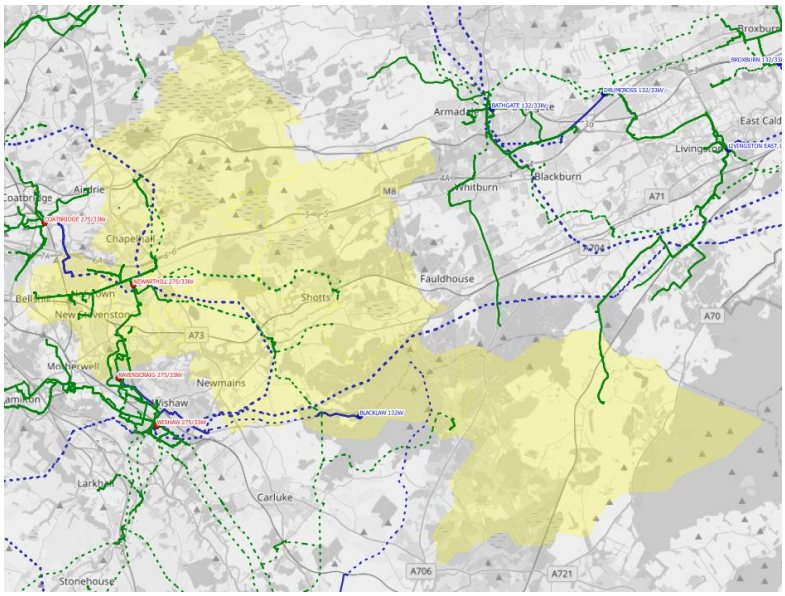
0.3 MW of Flexibility

Pre-fault	Post-fault
0.3 MW	0.0 MW

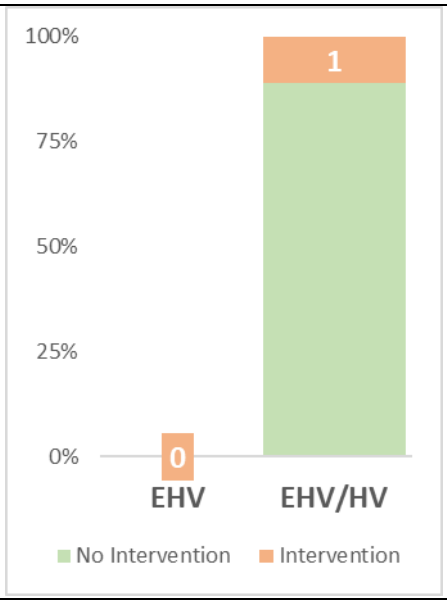
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Girvan Primary	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Girvan	-	*	2025/26	Planned (ED2)
Maybole Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	0.3	-	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.49 Newarthill



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 45,000 customers in Newarthill and some neighbouring areas.



0.0 MVA Capacity Released

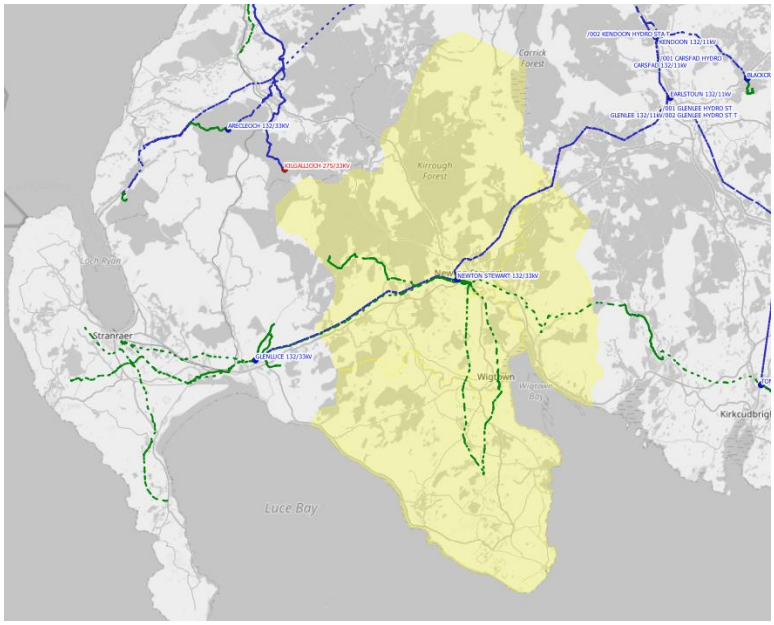
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

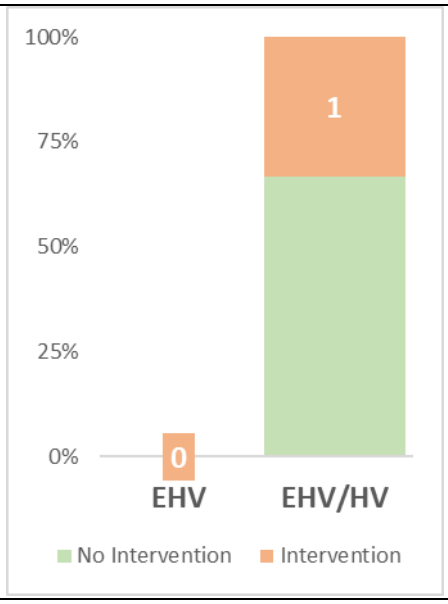
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Newhouse	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Newhouse	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.50 Newton Stewart



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 8,000 customers in Newton Stewart and some neighbouring areas.



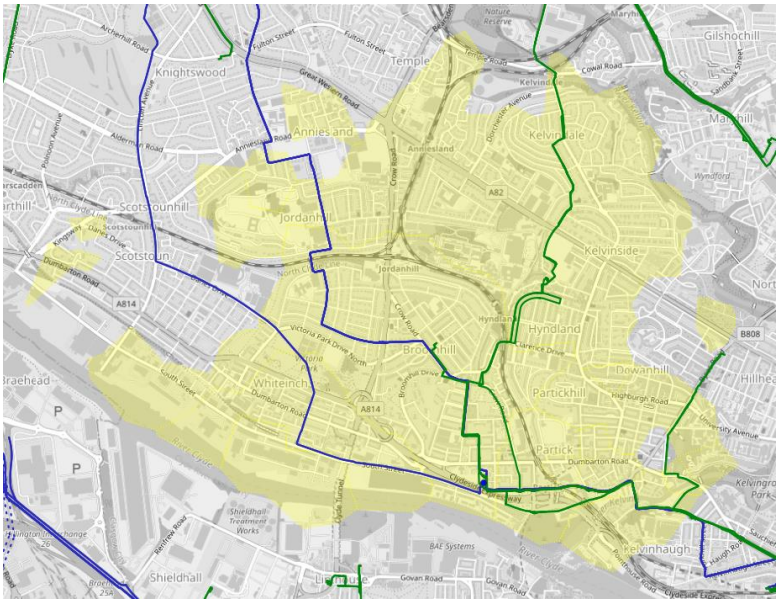
14.0 MVA Capacity Released

0.0 MW of Flexibility

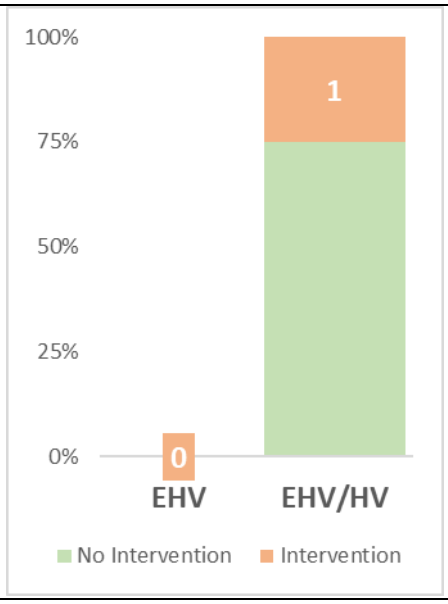
Pre-fault	Post-fault
0.0 MW	0.0 MW

EH/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Newton Stewart	Health Index		**Primary Reinforcement** Replacing the primary substation 12/24MVA 33/11kV transformers.	-	14.0	2022/23	Delivery

4.51 Partick



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 29,000 customers in Partick and some neighbouring areas.



0.0 MVA Capacity Released

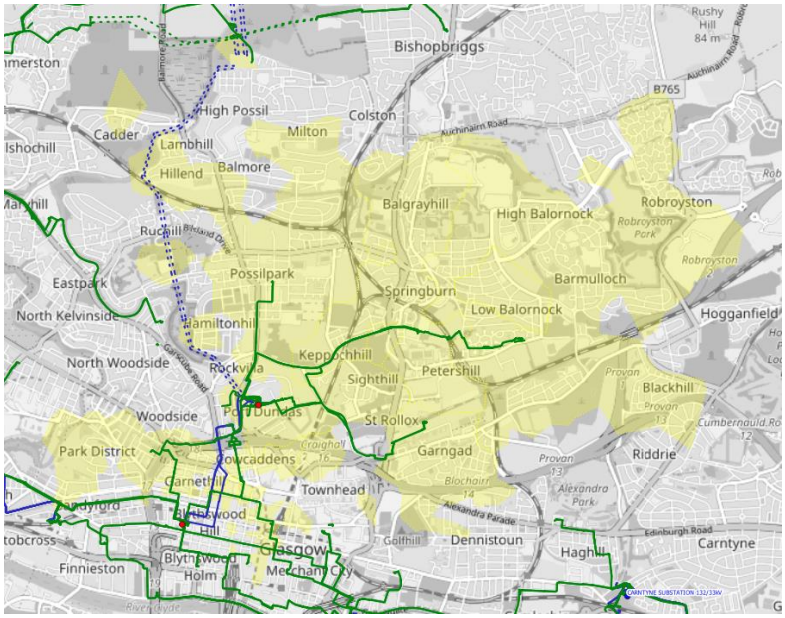
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

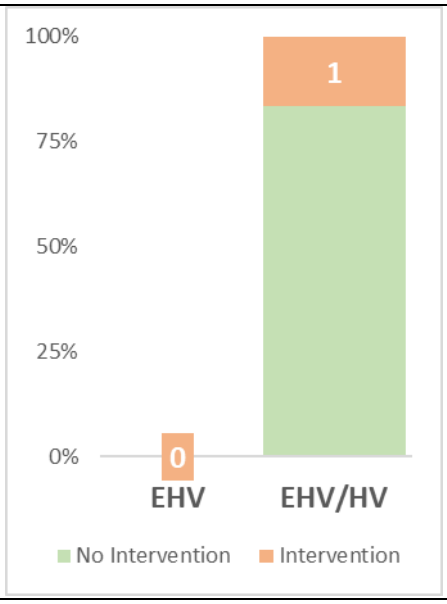
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Meadow Road Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.52 Port Dundas



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 29,000 customers in Port Dundas and some neighbouring areas.



0.0 MVA Capacity Released

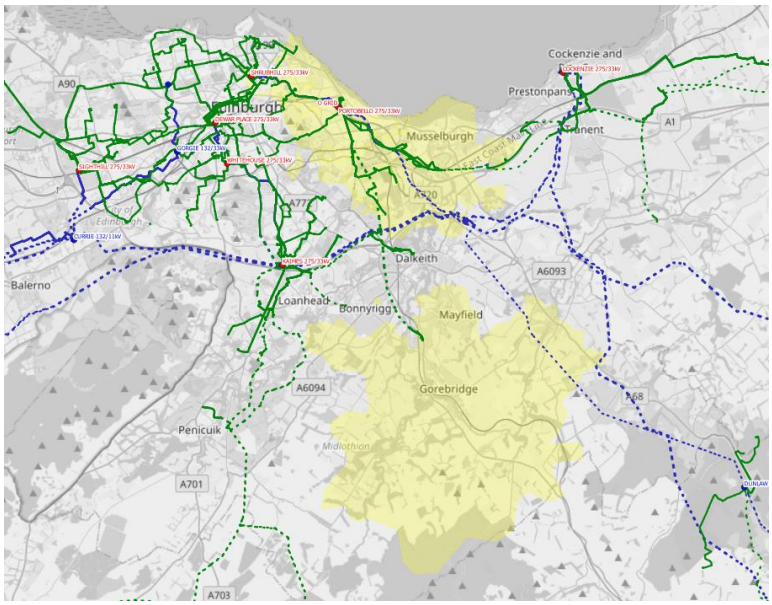
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

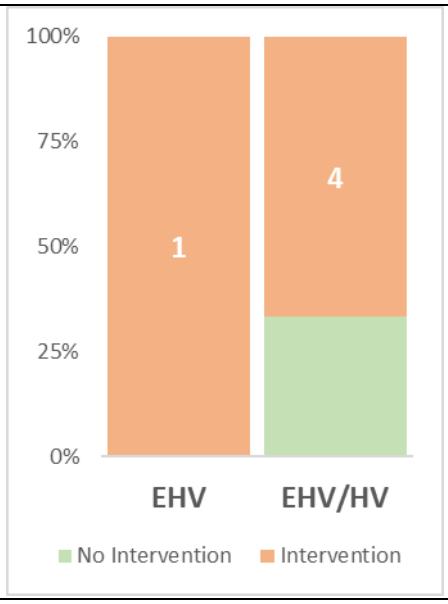
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Flemington Street Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.53 Portobello



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 61,000 customers in Portobello and some neighbouring areas.



42.0 MVA Capacity Released

44.7 MW of Flexibility

Pre-fault	Post-fault
44.7 MW	0.0 MW

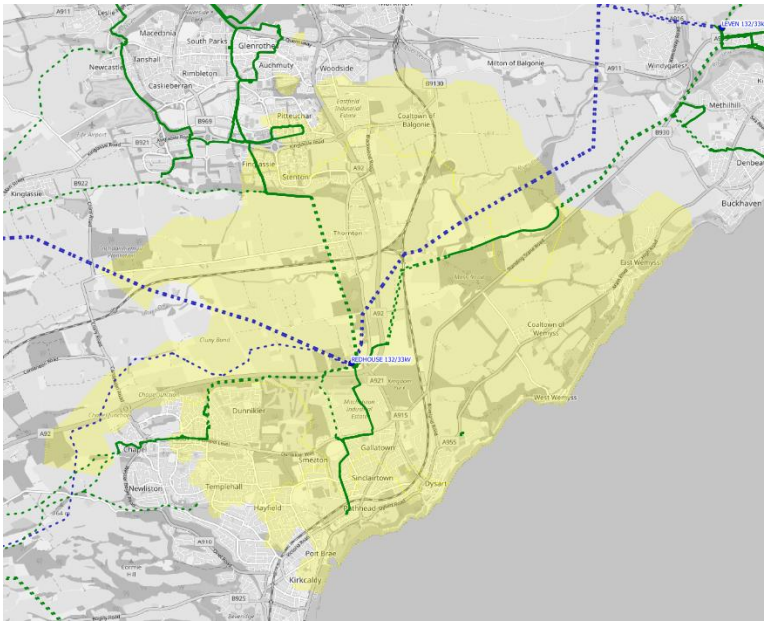
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Portobello GSP	Fault level		**Switchgear Reinforcement** Replacement of 33kV switch board and installation of a bus section reactor and associated control scheme and the rationalisation of the Portobello GSP substation to a standard two section busbar arrangement to resolve the fault level issue.		*	2022/23	Delivery
	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	7.9	-	2026/27 to 2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

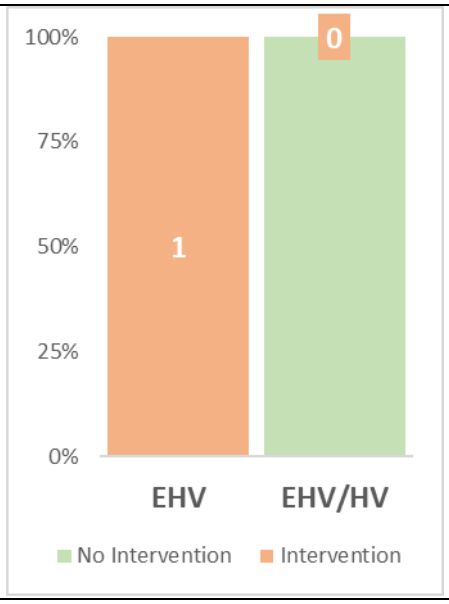
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Monktonhall - Tranent	Thermal		**Monkton Hall – Tranent Primary Reinforcement** New 33kV circuits from Cockenzie GSP to supply new 33/11kV 2x 32MVA primary substation at Musselburgh.	-	32.0	2027/28	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	21.1	-	2023/24 to 2026/27	Planned (ED2)
Easter Road - Lower London Road - Lochend Quadrant	Supply Security		**Reinforcement of Single Primary Transformer Sites** Establish double transformer primary substations, to increase security of supply, at interconnected single transformer sites with significant HV customer numbers and legacy protection systems.	-	10.0	2027/28	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	5.1	-	2023/24 to 2027/28	
Portobello Primary	Fault level		**Portobello Primary Fault Level Mitigation** Install two new 33/11kV transformers and two new 11kV switchboards to replace the existing legacy rated 11kV switchboard.	-	*	2027/28	Planned (ED2)
	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	10.6	-	2026/27 to 2027/28	Planned (ED2)
Lower London Road Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.54 Redhouse



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 23,000 customers in Redhouse and some neighbouring areas.



0.0 MVA Capacity Released

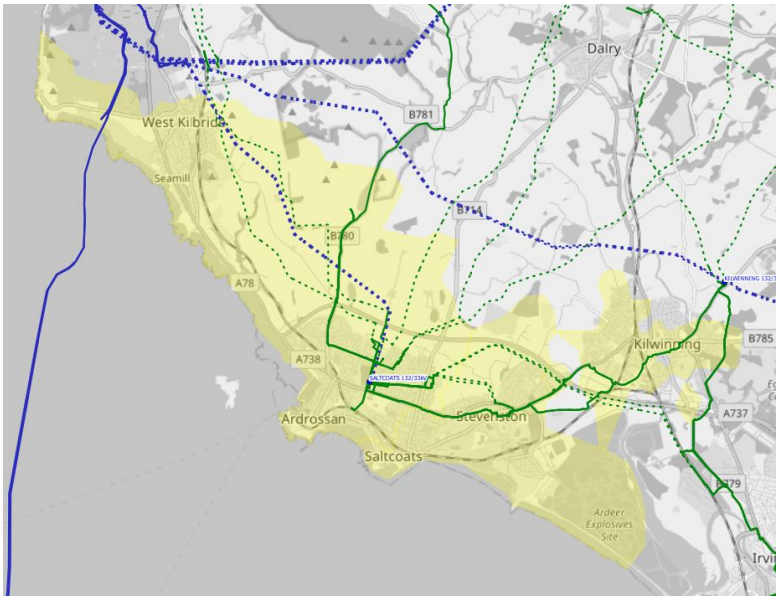
12.7 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	12.7 MW

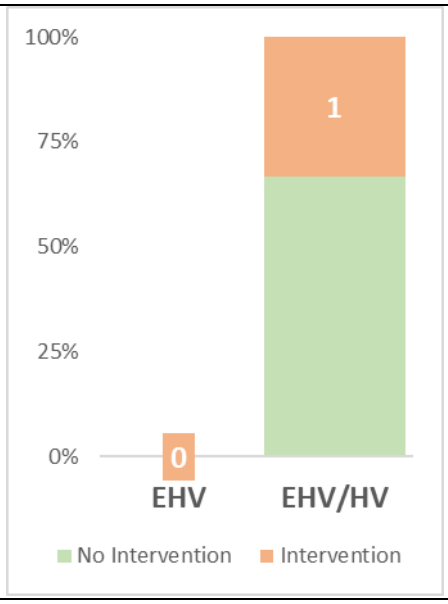
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Redhouse GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Redhouse	-	*	2024/25	Planned (ED2)
	Thermal	Dynamic	**Redhouse GSP Reinforcement** Flexibility Services	12.7	-	2023/24 to 2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.55 Saltcoats A



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 26,000 customers in Saltcoats and some neighbouring areas.

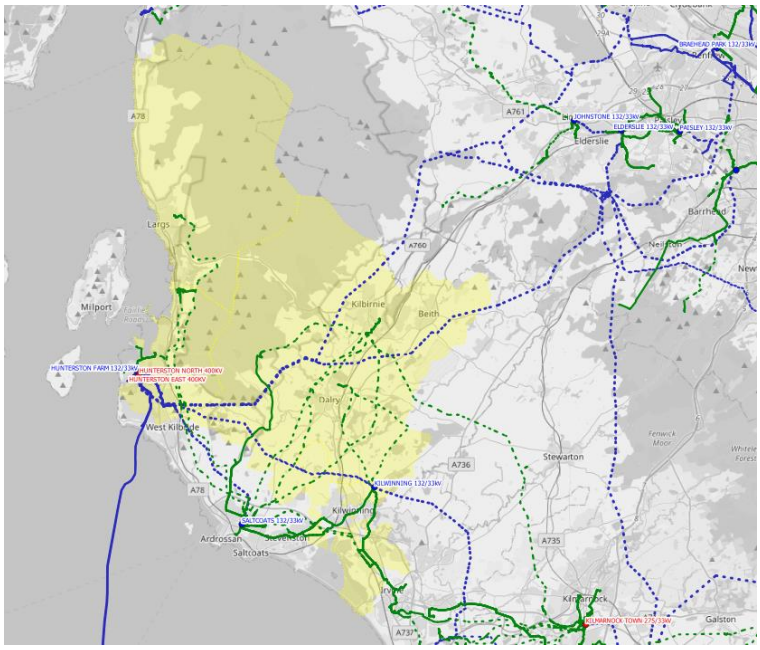


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

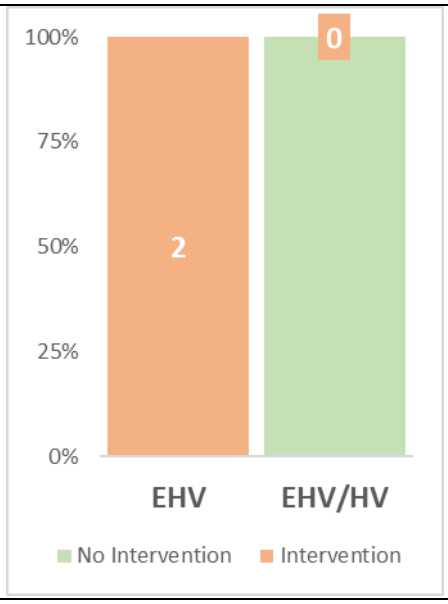
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Saltcoats Main Primary	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Saltcoats Main	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.56 Saltcoats B



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 27,000 customers in Saltcoats and some neighbouring areas.



0.0 MVA Capacity Released

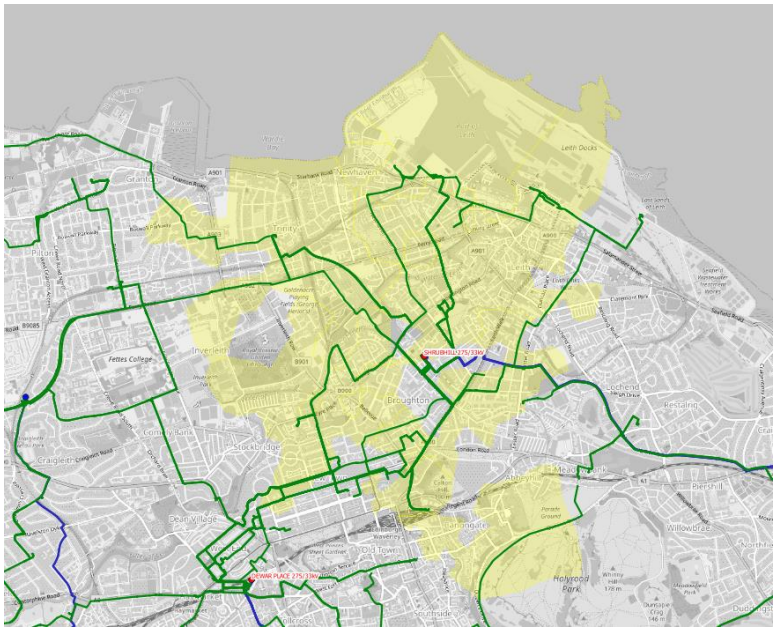
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

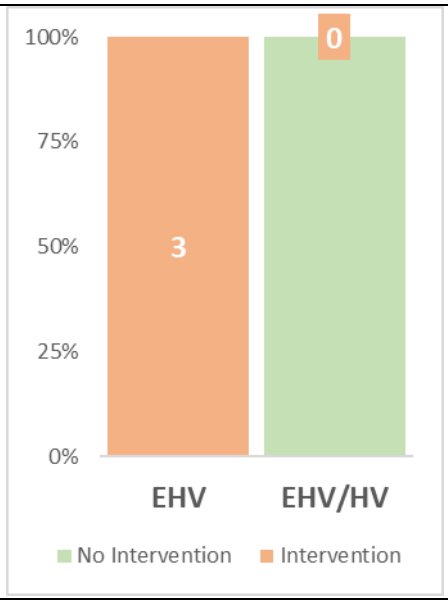
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Kilbirnie	Fault level		**Switchgear Reinforcement** The 33kV AIB and associated circuit breakers in Kilbirnie Primary substation shall be replaced with a nine-panel, fixed pattern, 33kV switchboard (Schneider CBGS-O) installed in a housing.		*	2022/23	Delivery
Saltcoats B GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.57 Shrubhill



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 40,000 customers in Shrubhill and some neighbouring areas.

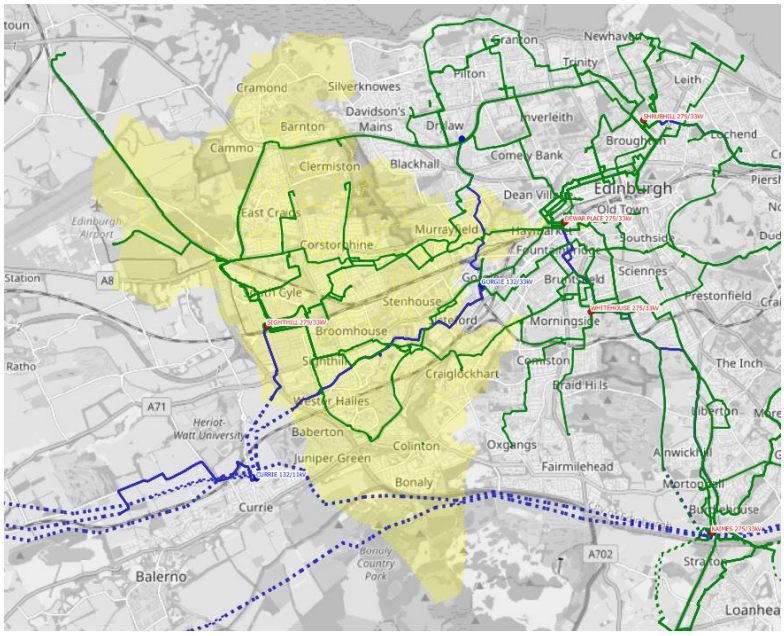


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	0.0 MW

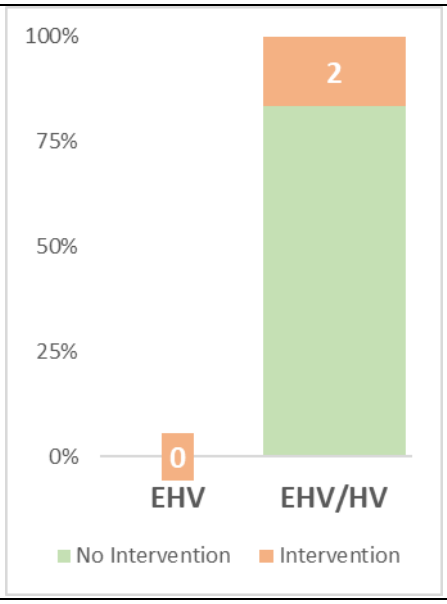
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Shrubhill GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment and Active Fault Level Monitoring equipment at Shrubhill	-	*	2024/25	Planned (ED2)
Annfield 33kV	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2026/27	Planned (ED2)
Edinburgh Dock North 33kV	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.58 Sighthill



This section of network is fed via two 180MVA 275/33kV SGT. This group supplies around 50,000 customers in Sighthill and some neighbouring areas.



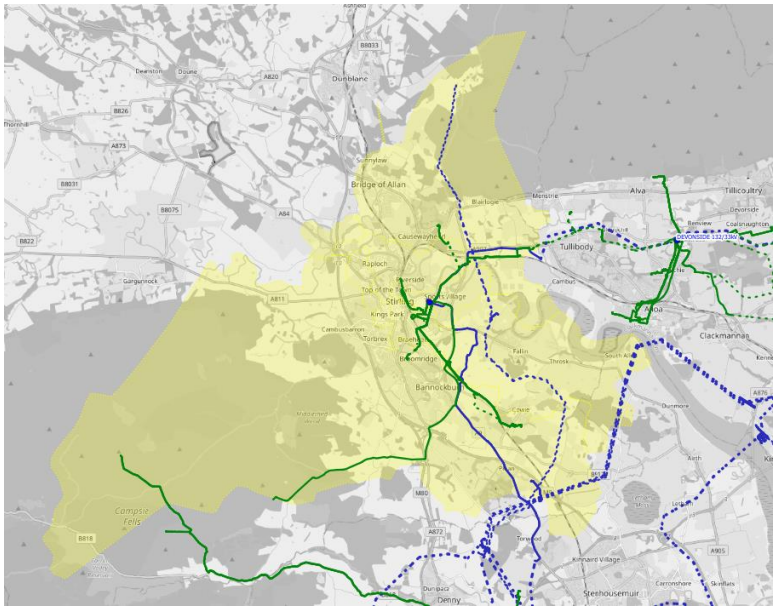
40.0 MVA Capacity Released

0.0 MW of Flexibility

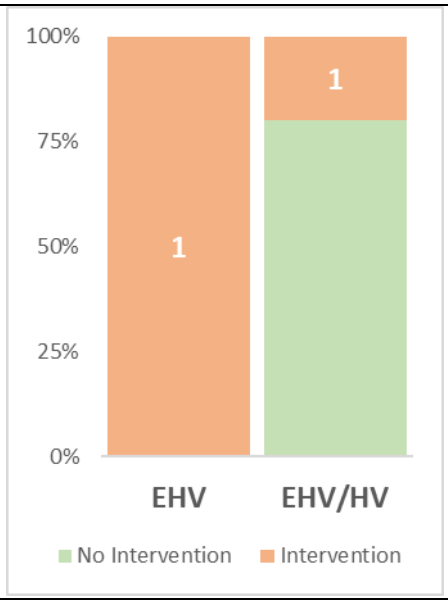
Pre-fault	Post-fault
0.0 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Balgreen Primary	Supply Security		**Reinforcement of Single Primary Transformer Sites** Establish double transformer primary substations, to increase security of supply, at interconnected single transformer sites with significant HV customer numbers and legacy protection systems.	-	20	2027/28	Planned (ED2)
Roseburn Primary				-	20		

4.59 Stirling



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 28,000 customers in Stirling and some neighbouring areas.



4.2 MVA Capacity Released

2.3 MW of Flexibility

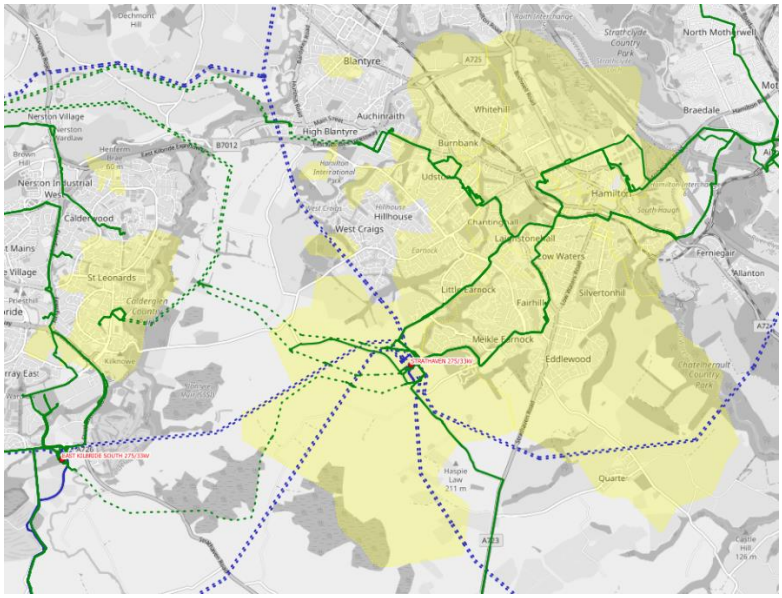
Pre-fault	Post-fault
2.3 MW	0.0 MW

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Stirling GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2027/28	Planned (ED2)

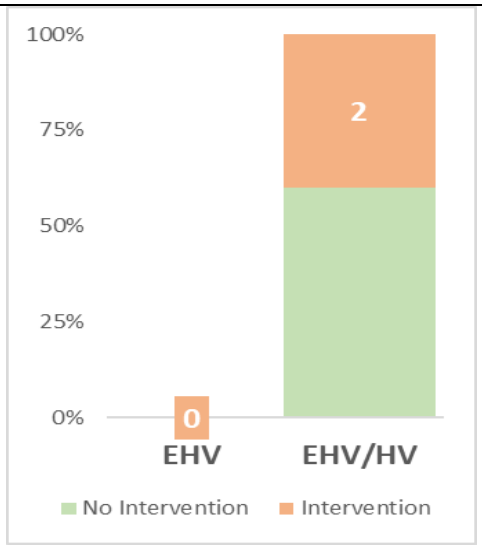
*These interventions could increase generation hosting capacity.

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
St Ninians Cornhill Primary	Thermal		**33kV Circuit upgrades** Uprate sections of 33kV circuit supplying St Ninians Cornhill Primary	-	4.2	2027/28	Planned (ED2)
		 Secure	Flexibility services to manage the network risk during delivery of reinforcement.	2.3	-	2024/25 to 2025/26	

4.60 Strathaven



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 35,000 customers in Strathaven and some neighbouring areas.



2.0 MVA Capacity Released

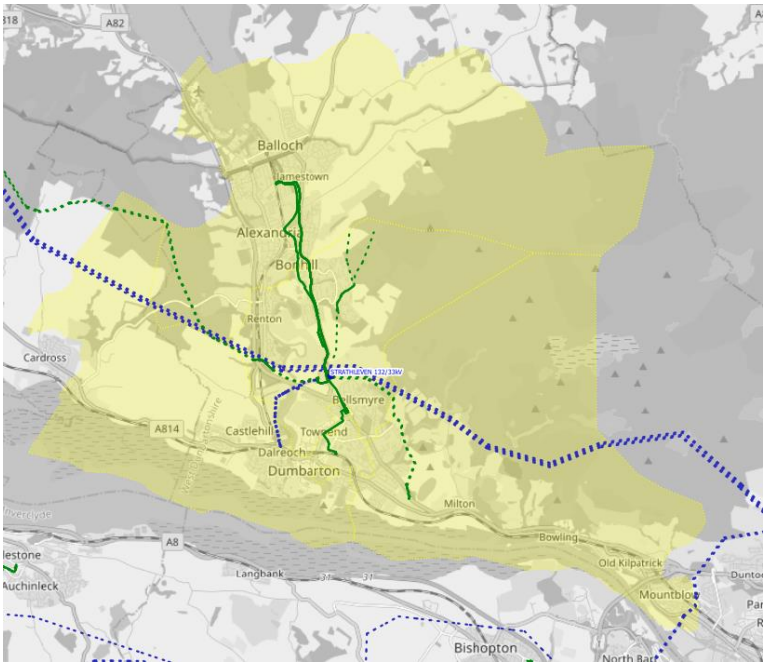
8.3 MW of Flexibility

Pre-fault	Post-fault
8.3 MW	0.0 MW

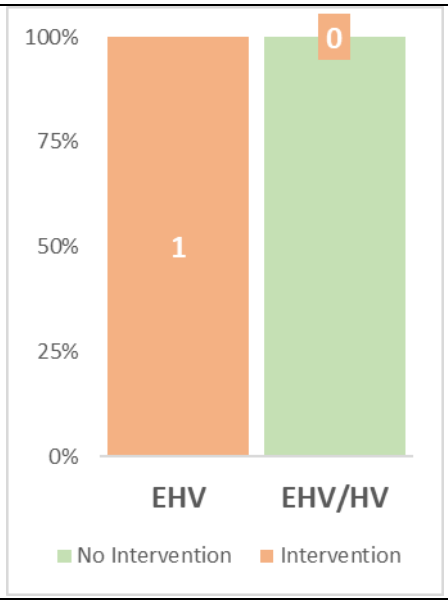
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Hamilton Primary	Thermal		**Hamilton Primary Reinforcement** Upgrade HV feeders and use HV automation for load transfer	-	2.0	2023/24	Planned (ED2)
		Secure	Flexibility services to manage the network risk during delivery of reinforcement.	8.3	-	2023/24 to 2027/28	Planned (ED2)
Burnbank Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.61 Strathleven



This section of network is fed via two 90MVA 132/33kV GT. This group supplies around 27,000 customers in Dumbarton, Milton, Balloch and some neighbouring areas.

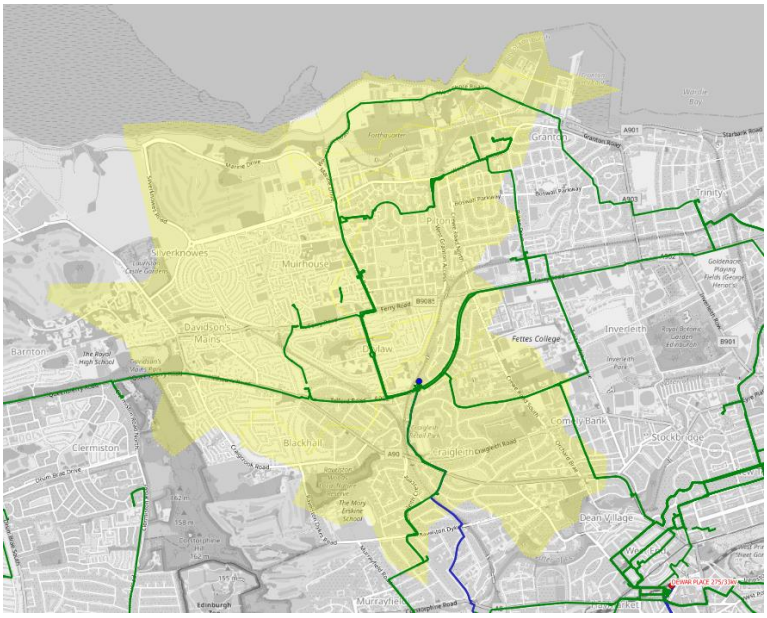


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

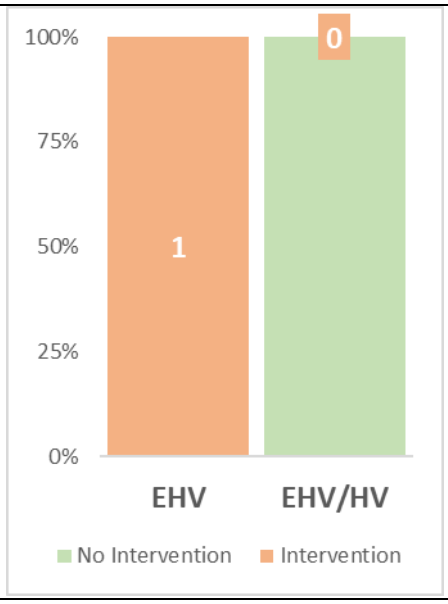
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Strathleven GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

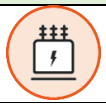
4.62 Telford Road



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 12,000 customers in the City of Edinburgh

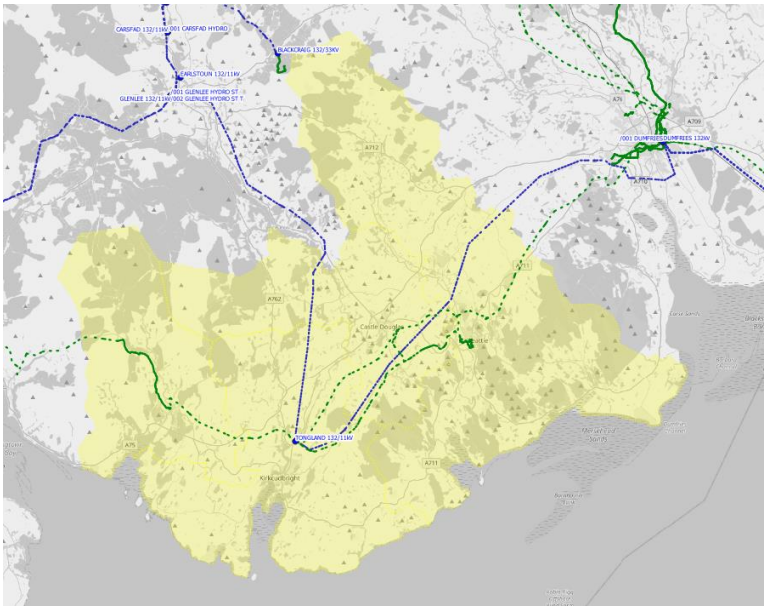


0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	**0.0 MW**

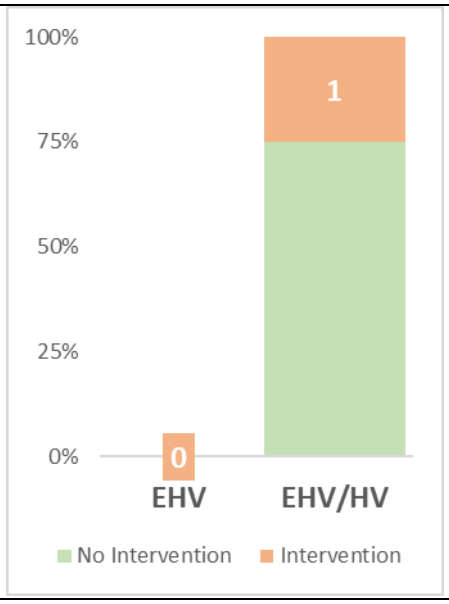
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Telford Road GSP	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.63 Tongland



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 10,000 customers in Tongland and some neighbouring areas.



0.0 MVA Capacity Released

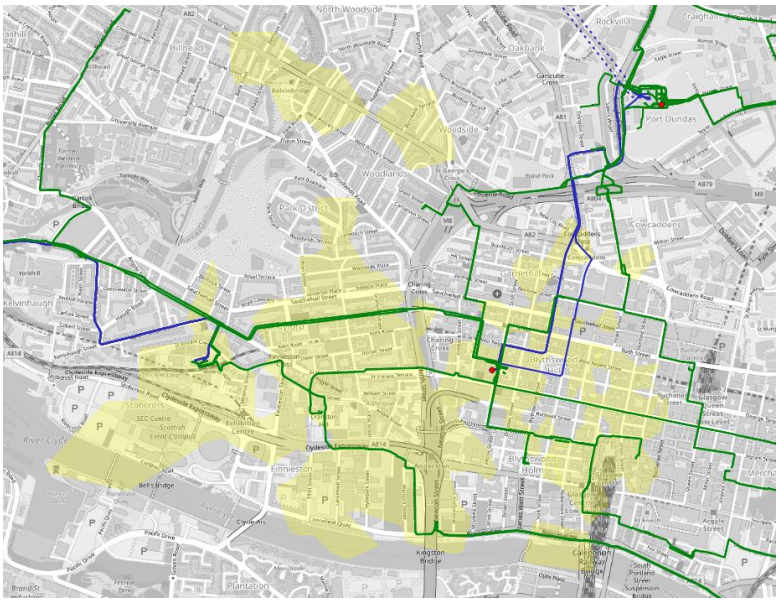
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

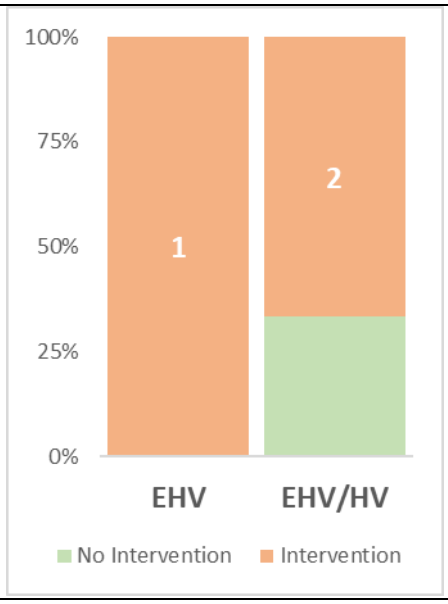
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Castle Douglas Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2023/24	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.64 West George Street



This section of network is fed via a 120MVA 275/33kV SGT and a 90MVA 275/33kV GT. This group supplies around 10,000 customers in Glasgow City Centre and neighbouring areas.



0.0 MVA Capacity Released	
3.4 MW of Flexibility	
Pre-fault	**Post-fault**
3.4 MW	**0.0 MW**

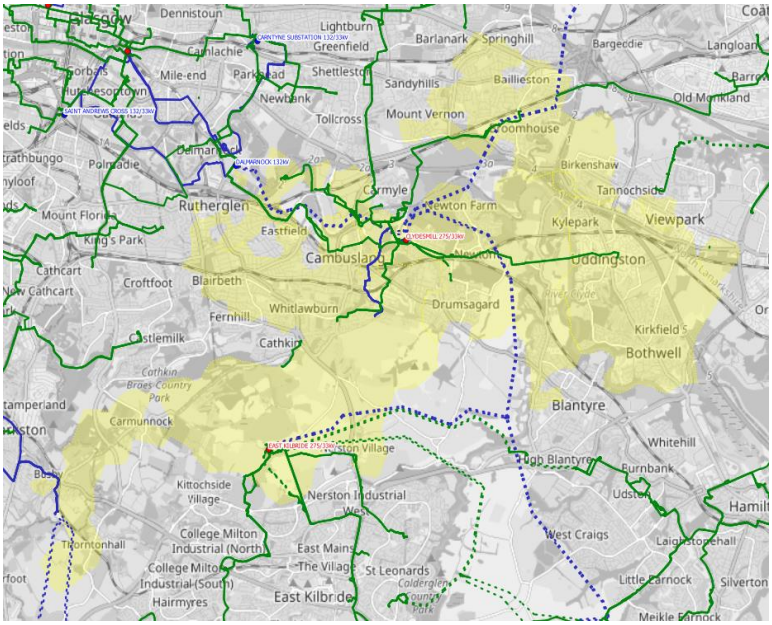
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
West George Street GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at West George St	-	*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

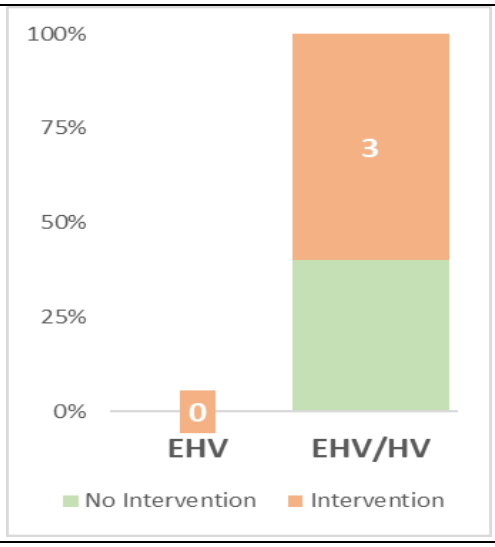
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
West George Street	Fault Level		**West George Street Primary Fault Level Mitigation** Replacement of 11kV switchboard at West George Street primary.	-	*	2025/26	Planned (ED2)
Mitchell Street Primary	Thermal	 Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	3.4	-	2023/24 to 2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.65 Westburn Road (Clyde's Mill)



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 46,000 customers in Cambuslang and neighbouring areas.



0.0 MVA Capacity Released

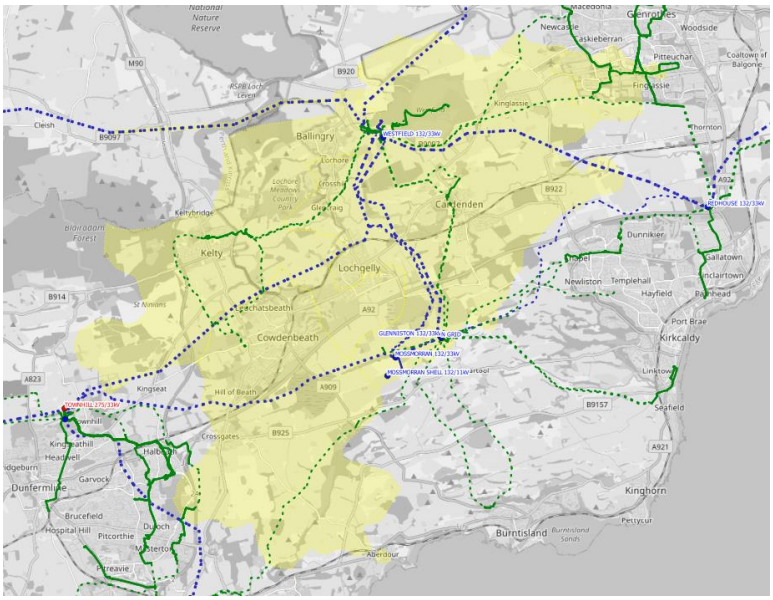
0.0 MW of Flexibility

Pre-fault	Post-fault
0.0 MW	0.0 MW

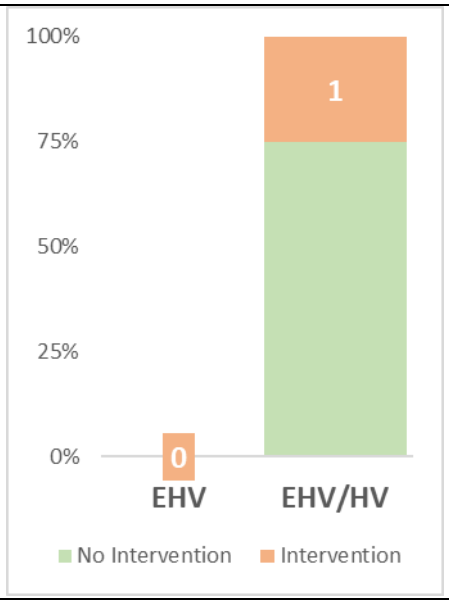
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Whitlawburn Primary	Fault Level		**Whitlawburn Primary Fault Level Mitigation** Establish Cathkin primary substation with two 20MVA 33/11kV transformers and a 9-panel 11kV switchboard. Replace Whitlawburn 20/40MVA units with 20MVA transformers.	-	*	2027/28	Planned (ED2)
Westburn Road Primary	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Westburn Road	-	*	2024/25	Planned (ED2)
Frankfield Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2027/28	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.66 Westfield



This section of network is fed via two 60MVA 132/33kV GT. This group supplies around 21,000 customers in Westfield and some neighbouring areas.



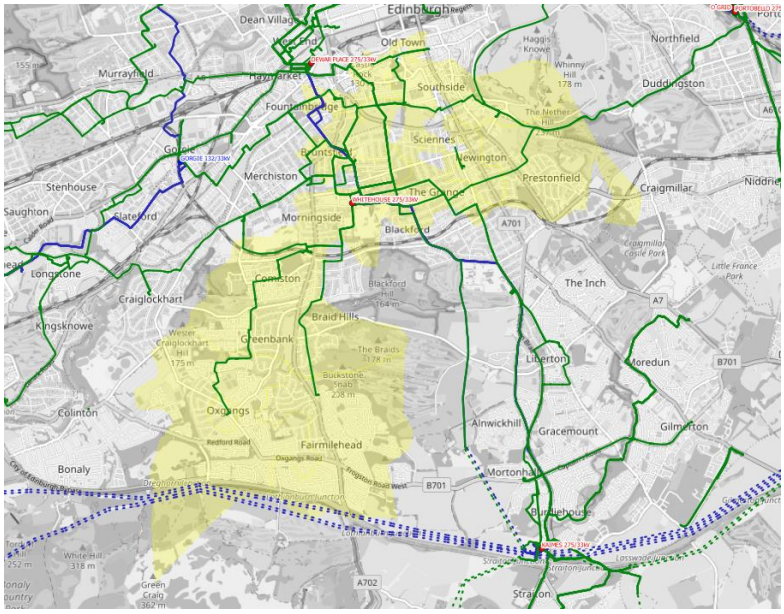
0.0 MVA Capacity Released

0.5 MW of Flexibility

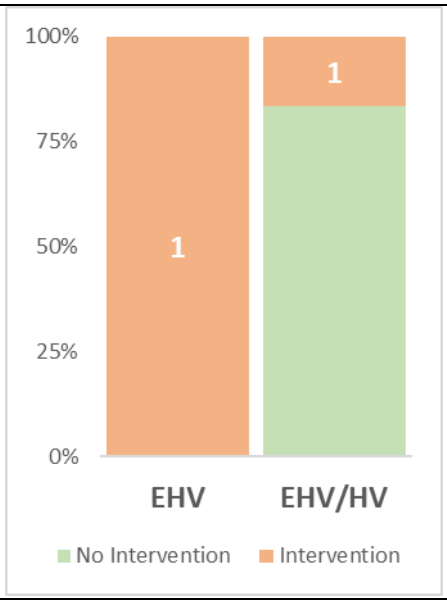
Pre-fault	Post-fault
0.5 MW	0.0 MW

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Bowhill Primary	Thermal	Secure	**Flexibility Services for High Utilisation Groups** Flexibility services to manage thermal constraints.	0.5	-	2027/28	Planned (ED2)

4.67 Whitehouse



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 36,000 customers in Whitehouse and some neighbouring areas.



0.0 MVA Capacity Released	
0.0 MW of Flexibility	
Pre-fault	**Post-fault**
0.0 MW	0.0 MW

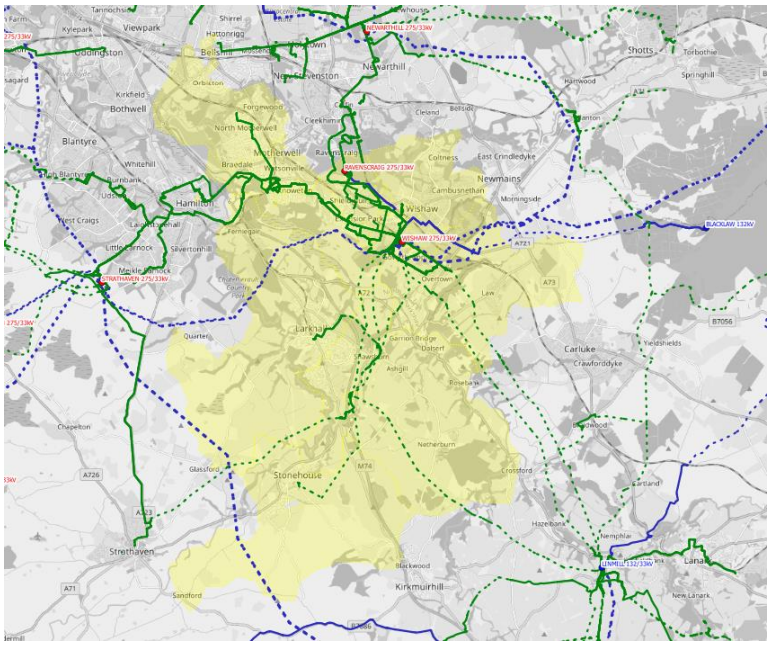
EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Whitehouse GSP	Fault Level		**Whitehouse GSP Fault Level Mitigation** Replacement of 33kV switchboard at Whitehouse GSP.		*	2025/26	Planned (ED2)

*These interventions could increase generation hosting capacity.

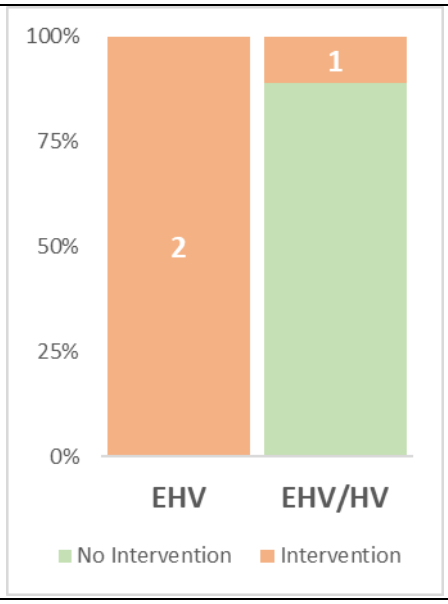
EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
George Square Lane Primary	Asset Mod.		**EHV Transformer Condition Modernisation Programme** Replace transformer(s)	-	*	2024/25	Planned (ED2)

*These interventions could increase generation hosting capacity.

4.68 Wishaw



This section of network is fed via two 120MVA 275/33kV SGT. This group supplies around 49,000 customers in Wishaw and some neighbouring areas.



6.0 MVA Capacity Released

1.5 MW of Flexibility

Pre-fault	Post-fault
1.5 MW	0.0 MW

EHV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Wishaw GSP	Fault level		**Fault Level Monitoring and Management** Installation of Real Time Fault Level Monitoring equipment at Wishaw	-	*	2024/25	Planned (ED2)
Larkhall 33kV	Asset Mod.		**EHV Switchgear Condition Modernisation Programme** Replace Switchgear	-	*	2026/27	Planned (ED2)

*These interventions could increase generation hosting capacity.

EHV/HV Interventions							
Network Area	**Driver**	**Type**	**Solution**	**Flexibility (MW)**	**Increase in Firm Capacity (MVA)**	**Expected By**	**Status**
Stonehouse Primary	Thermal		**Stonehouse Primary Reinforcement** New 11kV interconnector between Stonehouse and Strathaven primary substations.	-	6.0	2024/25	Planned (ED2)
		 Secure	Flexibility services to manage the network risk during delivery of reinforcement.	1.5	-	2023/24	

5 Part 2 – Network Development Information

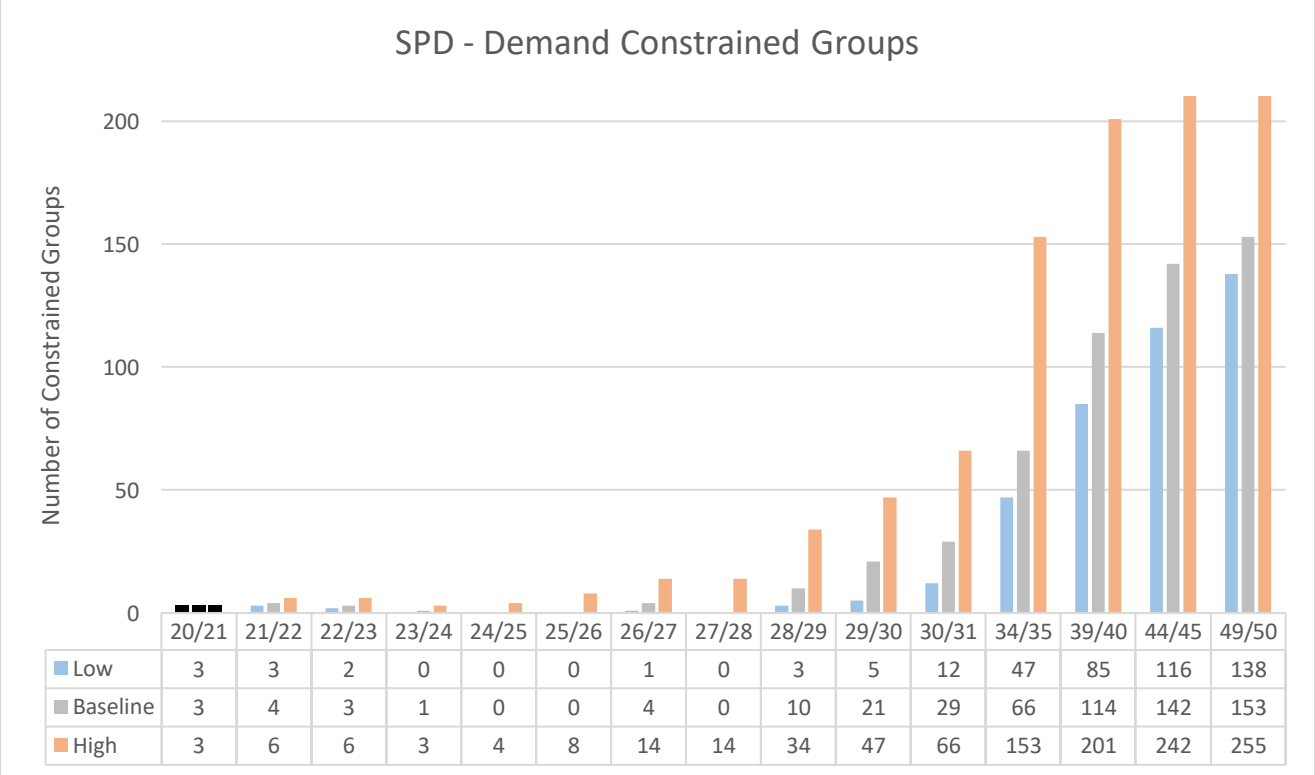
This section provides a forecast of post-intervention headroom across all network groups out to 2050. We've calculated this post-intervention headroom by combining our existing network model, our scenario forecasts, and our known intervention plans.

Our NDP Capacity Headroom spreadsheet data files provide this information for each primary (33kV/HV) substation for each year for the first ten years and every five years thereafter through to 2050. Given the forecast uncertainty in future pathways to achieve Net Zero, we have done this for each of the low, baseline, and high scenarios (see NDP Methodology Statement). We provide our headroom calculation for demand and generation separately as the constraints limiting each can be different (see Section 2.22.1.1).

5.1 Demand headroom results

Demand growth is increasing from now out to 2050 due to the decarbonisation of heat and transport. This isn't fully reflected in Figure 5, which shows the number of constrained primary groups only increasing after 2028, as this constraint data incorporates our planned RIIO-ED1 and RIIO-ED2 investments (i.e. there are few constraints up to 2028 as we have planned interventions to resolve these rather than because there is no demand increase). Constraints increase after this point, as we haven't yet planned interventions for that period (we will start this in 2025 when we start preparing for RIIO-ED3).

The difference in constraints pre-2028 and post-2028 illustrates an important point: we can provide the interventions our customers need to decarbonise providing Ofgem authorise the investment. However if the interventions aren't made then the network will suffer from widespread constraints. These would make 2050 Net Zero target unachievable, and the network would be overloaded, exposing customers to safety risks, supply interruptions, and higher overall costs. It is absolutely in our customers' interests for us to deliver additional capacity.



	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	34/35	39/40	44/45	49/50
Low	3	3	2	0	0	0	1	0	3	5	12	47	85	116	138
Baseline	3	4	3	1	0	0	4	0	10	21	29	66	114	142	153
High	3	6	6	3	4	8	14	14	34	47	66	153	201	242	255

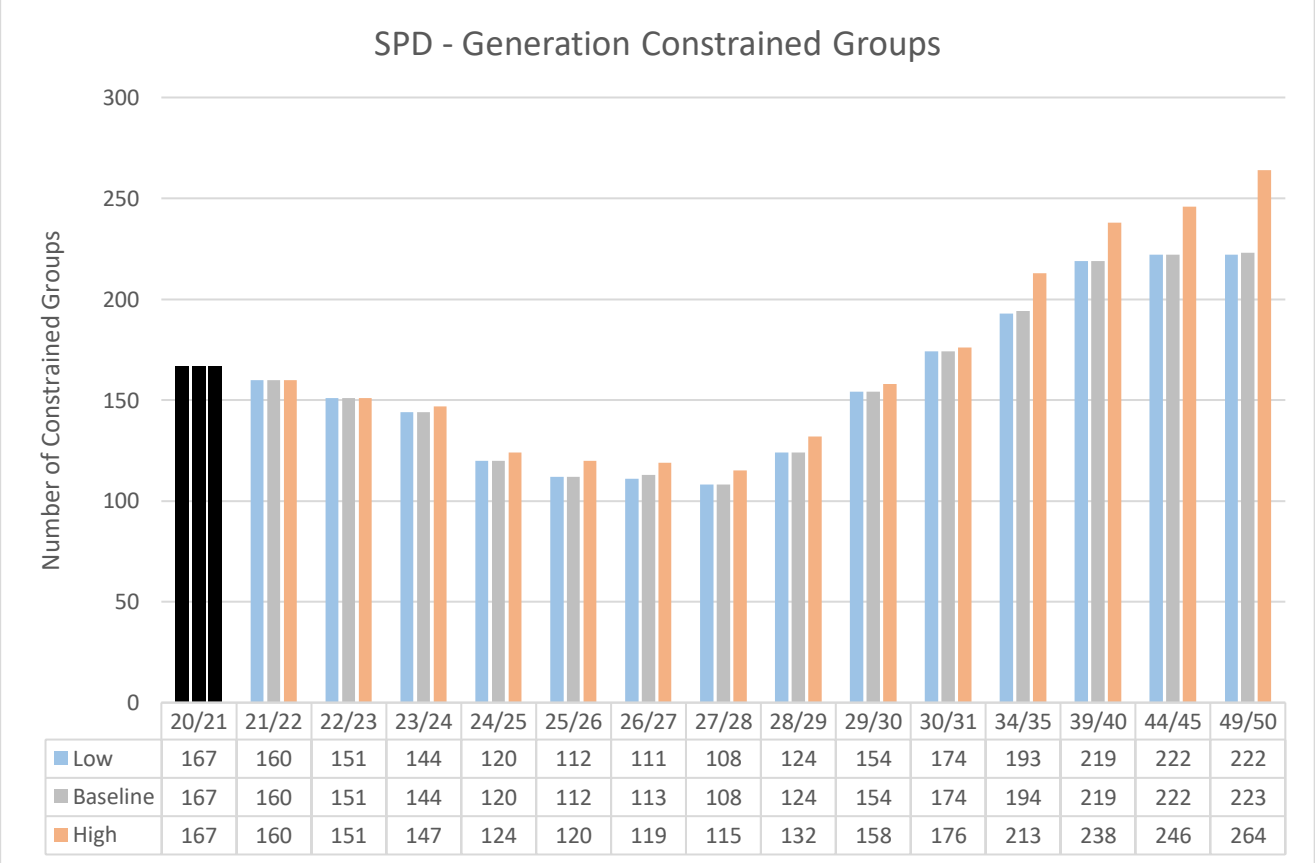
Figure 5: SP Distribution number of demand constrained primary substation groups

5.2 Generation headroom results

Generation growth is increasing from now out to 2050. This isn't fully reflected in Figure 6, which shows the number of constrained primary groups only increasing after 2028, as this constraint data incorporates our planned RIIO-ED1 and RIIO-ED2 investments (i.e. there are reducing constraints up to 2028 as we have already planned interventions to resolve these). Constraints increase after this point as we haven't yet planned interventions for that period (we will start this in 2025 when we start preparing for RIIO-ED3).

These figures show that we are not reducing all known generation constraints within RIIO-ED2. Some key points:

1. Figure 6 shows the number of primary substation groups with no spare firm capacity. However we are enabling generation to connect to some of these primary substation groups through flexible connection arrangements such as ANM and AFLM.
2. As these show constrained primary substations, these constraints will likely not impede larger-scale generation where this connects to 33kV or 132kV network assets.
3. These constraints will likely not impede domestic-scale (<50kW) generation given its minimal contribution to network constraints.
4. Figure 6 does not incorporate upstream constraints beyond our network boundary. However these are flagged within the Part 2 spreadsheets.



	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	34/35	39/40	44/45	49/50
Low	167	160	151	144	120	112	111	108	124	154	174	193	219	222	222
Baseline	167	160	151	144	120	112	113	108	124	154	174	194	219	222	223
High	167	160	151	147	124	120	119	115	132	158	176	213	238	246	264

Figure 6: SP Distribution number of generation constrained primary substation groups

6 Glossary

Constraint Management Zone (CMZ) – CMZs are areas of network we have an automated control system to coordinate and dispatch different operational solutions.

Customer – means anyone connected to our network and who depends on us for an electricity supply. This includes demand, generation, and storage sites, and IDNO networks.

Decarbonisation – the process to reduce the amount of carbon dioxide (CO2) and other greenhouse gas emissions by introducing new low carbon alternatives and technologies. Much of the UK's decarbonisation strategy is based on switching carbon energy vectors (e.g. petrol/diesel for transport, and natural gas and oil for heating) to electricity and powering them with renewable generation.

Decentralisation – this reflects the extent to which generation is sited closer to demand consumption (or is even undertaken by consumers themselves) via the use of smaller-scale technologies such as solar PV and local energy storage. A less decentralised system would be characterised by fewer, larger-scale generators sited further from where the electricity is ultimately consumed (demand); a more decentralised system would be characterised by more smaller-scale generators sited closer to demand.

Distribution Future Energy Scenarios (DFES) – detailed forecasts we publish annually for our two distribution networks. We work with an external party to determine and produce them. They cover a range of demand and generation metrics (e.g. EVs, heat pumps, different generation technologies) out to 2050. https://www.spenergynetworks.co.uk/pages/distribution_future_energy_scenarios.aspx

Distributed Generation (DG) – generation connected to the distribution network, as opposed to the transmission network.

Distribution network – in England and Wales this consists of overhead lines, underground cables and other network infrastructure that operate at 132kV and below; in Scotland this is the infrastructure that operates at 33kV and below. Nearly all demand in GB is connected to the distribution network; only very large demand users (e.g. the rail network) are connected to the transmission network. Nearly all medium-scale and smaller scale generation in GB is connected to the distribution network; typically only large fossil fuel power stations, offshore generation, and large onshore generation are connected to the transmission network.

Electricity System Operator (ESO) – the company responsible for operating the GB transmission network. They have two main operational functions: balancing the total demand and generation on the system to maintain system frequency at 50Hz, and ensuring transmission power flows remain within transmission network capability and statutory limits.

Extra high voltage (EHV) – all distribution voltages greater than 22kV.

Flexibility – the ability of a consumer or generator to change their operation (i.e. their generation/consumption levels) in response to an external signal. With the push towards the electrification of heat and transport, being able to flexibly utilise demand and generation will help minimise the amount of additional network capacity required, balance the system, and provide system stability – these can all help reduce customer electricity bills.

Grid Supply Point (GSP) – the interface substations between the transmission and distribution network.

GW – equal to 1,000 MW.

High voltage (HV) – all voltages above 1kV up to and including 22kV.

Low carbon technologies (LCTs) – means the range of customer technologies that are needed to deliver decarbonisation. For example, EVs, heat pumps, storage, and renewable generation.

Low voltage (LV) – all voltages up to and including 1kV.

MVAr – mega volt amps (reactive) is a unit of reactive power. It can be useful to help manage network voltage levels. It can describe both the amount of reactive power that a user is importing (e.g. this generator is importing 1MVAr of reactive power"), and the amount of reactive power that a user is exporting (e.g. "this generator is exporting 1MVAr of reactive power").

MW – megawatt is a unit of power (not energy). It can describe both the amount of power that a demand user is consuming (e.g. "this town's peak demand has increased by 3MW due to an increase in EVs and heat pumps"), and the amount of power that a generator is producing (e.g. "3MW of solar PV generation has been installed in this area").

Minimum demand – the point in the year, typically during the summer months, when our distribution network as a whole sees the lowest demand. It is an important study condition (along with peak demand) as a network with low demand can experience voltage control issues.

Net Zero – means the legislated target of reducing greenhouse gas emissions to net zero. For the UK, there are three Net Zero targets:

i. The UK Government has introduced the Climate Change Act 2008 (2050 Target Amendment) Order 2019. This legislation introduces a legally binding target for the UK to have net zero greenhouse gas emissions by 2050. The legislation is available at: http://www.legislation.gov.uk/ukpga/2008/27/contents

ii. The Scottish Government has introduced the Scottish Climate Change (Emissions Reduction Targets) Act 2019. This legislation introduces a legally binding target for Scotland to have net zero greenhouse gas emissions by 2045. The legislation is available at: http://www.legislation.gov.uk/asp/2019/15/contents/enacted

iii. The Welsh Government has introduced The Environment (Wales) Act 2016 (Amendment of 2050 Emissions Target) Regulations 2021. This introduces a legally binding target for Wales to have net zero greenhouse gas emissions by 2050. The legislation is available at: https://www.legislation.gov.uk/anaw/2016/3/contents

Open Networks – this is a pan-industry project involving transmission and distribution network companies, the ESO, the Department for Business, Energy, and Industrial Strategy (BEIS), Ofgem, and other stakeholders. It has done much work developing DSO models, the customer experience, whole electricity system planning and distribution to transmission data exchange, and flexibility services.

Peak demand – the point in the year, typically during the winter months, when our distribution network as a whole sees the highest demand. It is an important study condition (along with minimum demand) as it places the greatest need on network capacity – our network must be able to accommodate peak demand.

Primary substation – see 'Substation'.

RIIO-ED2 – means the distribution network price control period which runs from 1st April 2023 to 31st March 2028. Before this period starts, we will agree with Ofgem the outputs we will deliver during this period, and the funding, incentives, and penalties for delivering those outputs.

Services (aka DER services or flexibility services) – DER can change its import/export position in a controlled manner in response to a signal. This capability can be utilised for the benefit of the network or wider system (e.g. a DER reducing their import to reduce the overall level of demand the network must supply). Where we utilise this capability, the DER is providing us with a 'service'. See also 'Flexibility' and 'Distribution energy resources'.

SP Transmission (SPT) – the Transmission Network Owner for Central and Southern Scotland, that owns the transmission network at 132kV, 275kV and 400kV.

SP Distribution (SPD) – the Distribution network Operator for Central and Southern Scotland, that owns the distribution network at 33kV, 11kV and LV up to customers' meters.

SP Manweb (SPM) – the Distribution Network Operator for Merseyside, Cheshire, North Shropshire, and North Wales, that owns the distribution network at 132kV, 33kV, 11kV and LV up to customers' meters.

Substation – a building or outdoor compound which contains one or more transformers and switchgear protection. The primary purpose of a substation is to change the network power flow from one voltage level to another. In a primary substation the highest voltage is EHV (primary substations are typically 33kV/11kV); in a secondary substation the highest voltage is HV (secondary substations are typically 11kV/LV).

Transmission Network – the high voltage electricity network used for the bulk transfer of electrical energy across large distances. The transmission network takes electricity from large generators (e.g. coal, gas, nuclear and offshore wind) to supply large industrial customers and the distribution network.

7 APPENDIX A – Flexibility by year

Network Area	Flexible Capacity (MW)				
	2023/24	2024/25	2025/26	2026/27	2027/28
Castle primary	0.0	0.0	0.7	1.4	2.9
Warout Road primary	0.7	1.2	1.6	1.3	1.9
Coldstream primary	0.0	0.0	0.1	0.5	0.9
Calais primary	0.0	0.3	0.9	3.7	3.9
Portobello primary	0.0	0.0	0.0	1.8	8.8
Kingsland primary	0.0	0.0	0.0	0.3	1.4
Irvine primary	0.3	0.3	0.2	0.3	1.0
Anstruther primary	0.0	0.0	0.0	0.0	0.2
Bowhill primary	0.0	0.0	0.0	0.0	0.5
Maybole primary	0.0	0.0	0.0	0.0	0.3
Mitchell Street primary	0.6	0.6	0.1	1.3	0.8
Lower London / Lochend Quadrant	1.1	1.0	1.0	1.0	1.0
Levenbank Primary	1.4	1.8	0.0	0.0	0.0
Hamilton Primary	0.6	1.1	1.7	2.2	2.7
Ayton Primary	1.0	1.5	1.0	0.0	0.0
Commercial Road primary	0.3	0.7	1.0	0.0	0.0
Larbert primary	0.4	0.9	1.5	0.0	0.0
Troon primary	0.0	0.5	1.0	0.0	0.0
St Ninians Cornhill primary	0.0	0.7	1.6	0.0	0.0
Monktonhall Primary	0.6	1.5	5.7	4.5	0.0
Tranent Primary	0.8	1.3	2.8	3.9	0.0
Kirknewton primary	1.5	2.2	0.0	0.0	0.0
Stonehouse primary	1.5	0.0	0.0	0.0	0.0
Stranraer primary	0.3	0.6	0.9	1.6	0.0
St Andrews Primary	1.2	1.6	2.2	3.0	0.0
Castlandhill & Pitreavie unbanking	0.0	0.0	0.3	1.3	2.0
Kingsland - West Linton - Loanstone 33kV	0.0	0.0	0.0	0.6	2.8
Portobello GSP	0.0	0.0	0.0	2.4	5.5
Kaimes GSP	0.0	3.6	14.2	0.0	0.0
Lockerbie Group	2.1	3.1	4.2	0.0	0.0
Braehead Park GSP	1.6	1.6	1.6	1.7	1.7
Redhouse GSP	1.6	2.1	2.1	3.0	3.9
Kaimes 33kV OHL uprating	0.0	0.0	0.0	0.3	1.5

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