NURSLING GRID SUPPLY POINT: STRATEGIC DEVELOPMENT PLAN

Our network serving communities in Southampton and across South Hampshire.

Draft for consultation

September 2025

Scottish & Southern Electricity Networks

CONTENTS

1. EXECUTIVE SUMMARY

SSEN is taking a strategic approach in the development of its distribution networks. This will help to enable the net zero transition at a local level to the homes, businesses, and communities we serve. Our Strategic Development Plans (SDPs) take the feedback we've received from stakeholders on their future energy needs to 2050 and translate these requirements into strategic spatial plans for the future distribution network needs. This helps us transparently present our future conceptual plans and facilitate discussion with local authorities and other stakeholders. The overall methodology and how it fits into our wider strategic planning process is presented in the Strategic Development Plan methodology.

The focus area of this SDP is that supplied by our Nursling Grid Supply Point (GSP), shown below.

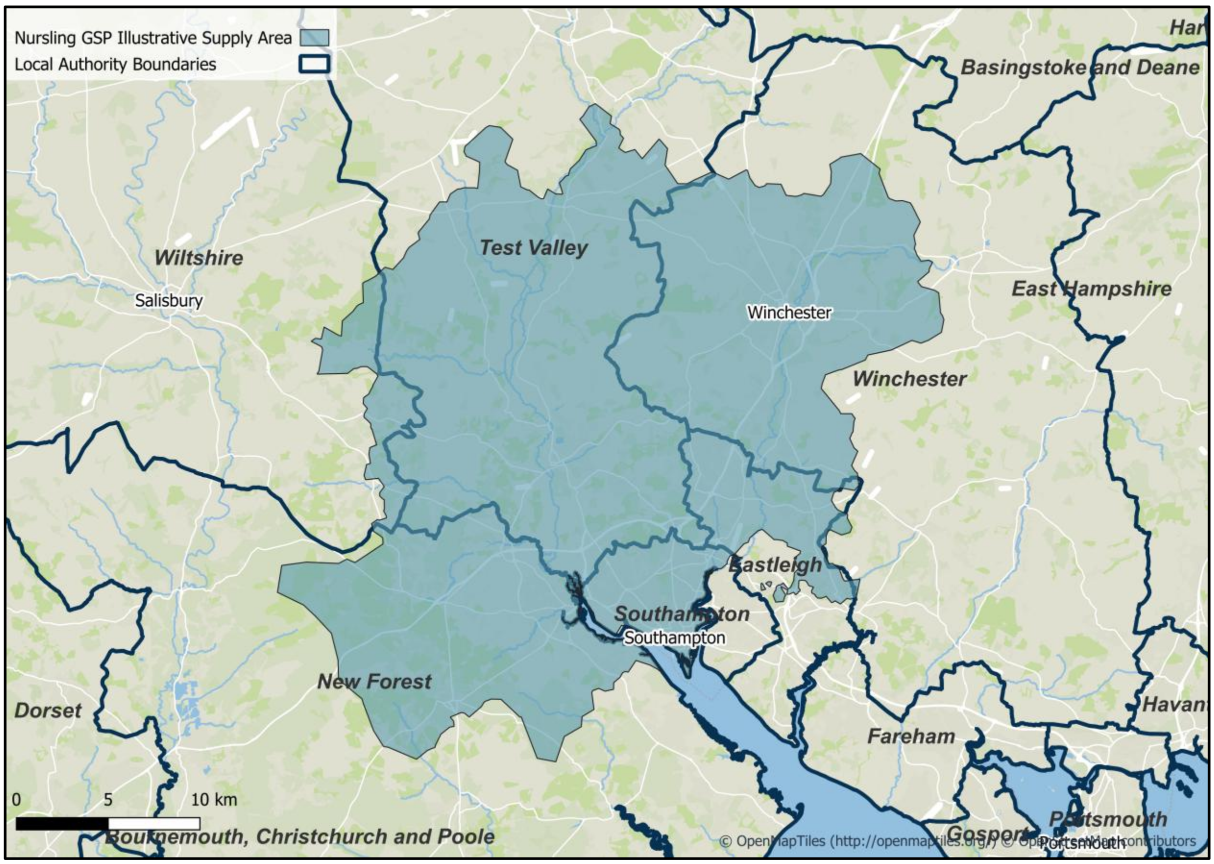

Figure 1 Area of focus for this SDP.

This report documents the stakeholder led plans that are driving net zero and growth in the local area, the resulting electricity demands, and the network needs arising from this. Plans across Hampshire and areas of industrial growth such as the Southampton ports have been considered in preparation of this plan. Some reinforcement work has been triggered in this area through the Distribution Network Options Assessment (DNOA) process.

This SDP utilises the Distribution Future Energy Scenarios (DFES) to understand the pathways to a 2050 network that can support net zero and growth in the local economy. Recommendations from this report outline the initial steps that we believe should be taken on that pathway to develop the network in an efficient and stakeholder-led way.

2. INTRODUCTION

The report demonstrates how local, regional, and national targets align with stakeholder perspectives in the area to provide a robust evidence base for load growth out to 2050 across the Nursling Grid Supply Point (GSP) area. A GSP is an interface point with the national transmission system where SSEN Distribution then takes power to local homes and businesses within a geographic area. Context for the area this represents is shown above in Figure 1.

To identify the future requirements of the electricity network, SSEN commissions Regen to produce the annual Distribution Future Energy Scenarios (DFES). The DFES analysis is based on the National Energy System Operator (NESO) Future Energy Scenarios (FES), while incorporating more granular stakeholder insights from agencies such as local authorities and new demand and generation connection applications. The DFES provides a forward-looking view of how demand and generation may evolve under different scenarios as we move towards the national 2050 net zero target. These scenarios are summarised in Figure 2. SSEN uses Holistic Transition as the central case scenario, reviewing this position annually. Any more recent unforeseen demand changes, for example customer connection requests, is also considered in our forecasts to ensure that the projected load more accurately reflects what we expect to see in the future.

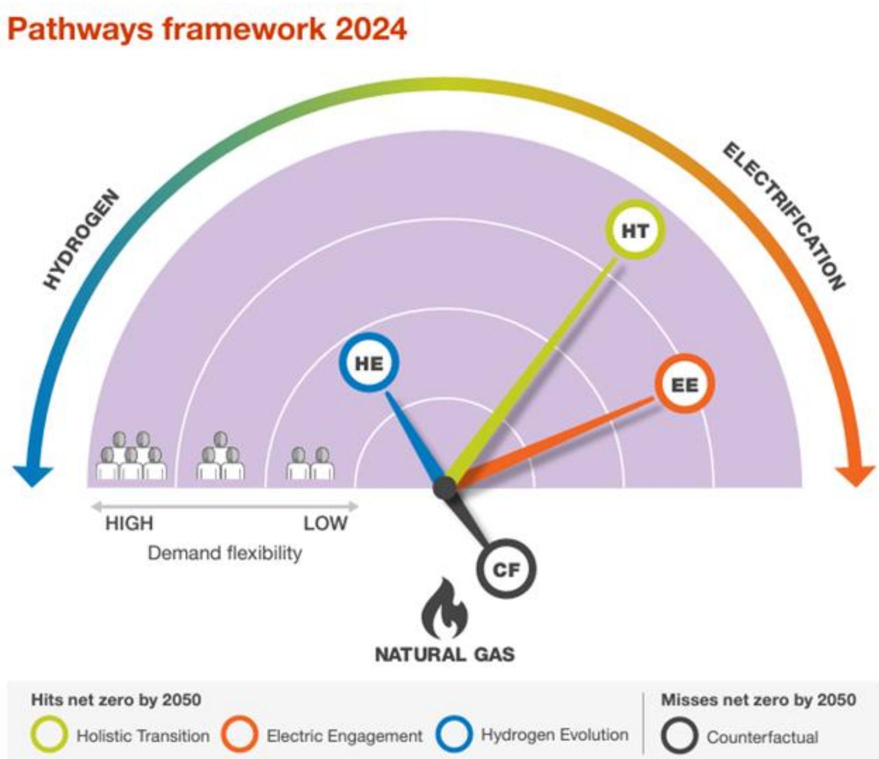

Figure 2: The FES Scenario framework (source: NESO)

Using the DFES, power system analysis has been carried out to identify the future system needs of the electricity network. These needs are summarised by highlighting the year the need is identified under each of the scenarios, and the projected 2050 load. System needs are identified through power system analysis using the Holistic Transition Pathway scenario, in alignment with evidence gathered in preparation for the SSEN ED3 business plan. We also model across the other scenarios to understand when these needs arise and what demand projections should be planned for in the event each scenario is realised.

The DNOA process provides more detailed optioneering for each of these reinforcements, ensuring stakeholder visibility of the strategic planning process. Opportunities for the procurement of flexibility are also highlighted in the DNOA to cultivate the flexibility markets.

Further information on the FES framework can be found in the DFES 2024 introductory report.[1]

1 SSEN Distribution Future Energy Scenarios 2024

3. STAKEHOLDER ENGAGEMENT AND WHOLE SYSTEM CONSIDERATIONS

3.1. Local Authorities and Local Area Energy Planning

The main local authorities that are supplied by Nursling GSP are Eastleigh, New Forest, Southampton, Test Valley, Wiltshire, Winchester, and Hampshire County Council, as shown in Figure 3**.** The development plans for these local authorities will have a significant impact on the potential future electricity load growth on SSEN's distribution network**.** As such, it is vital for SSEN to engage with these plans when carrying out strategic network investment.

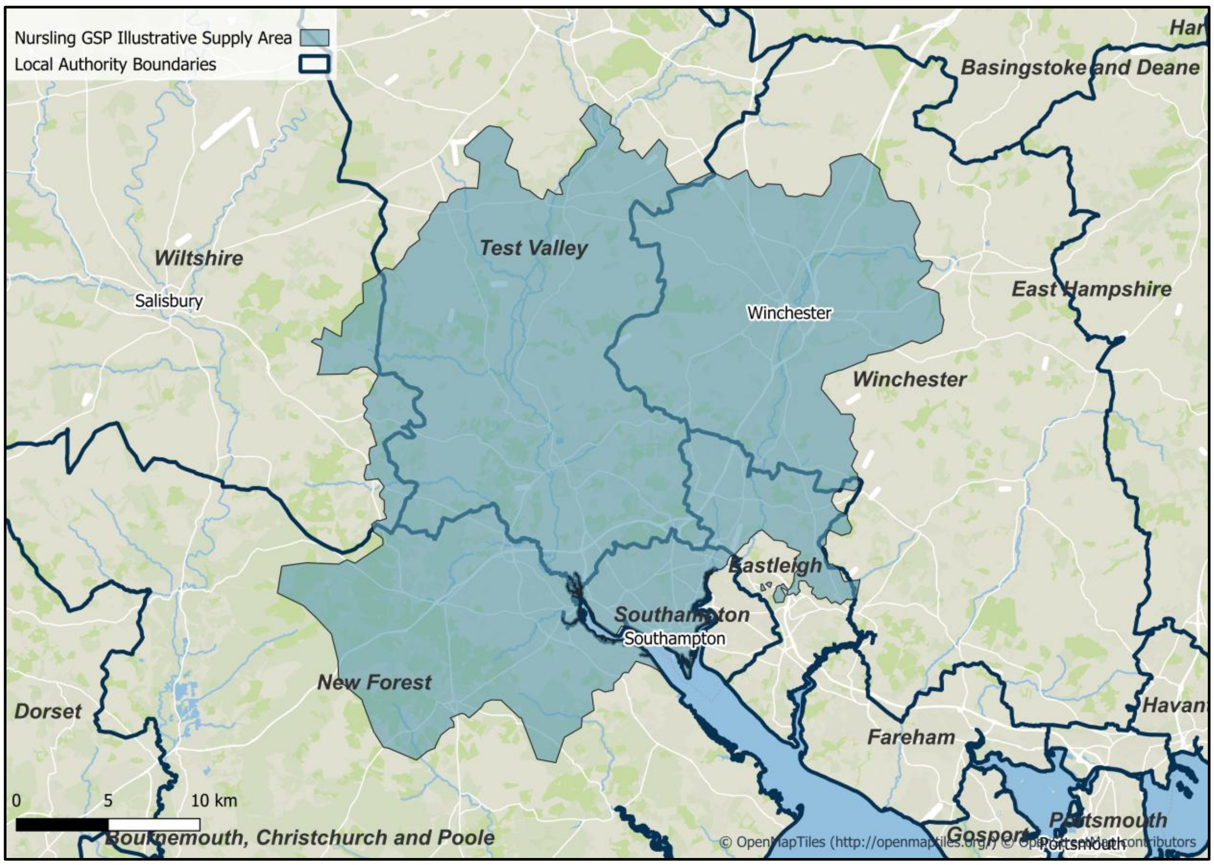

Figure 3 Nursling GSP Supply Area and Local Authority Boundaries.

3.1.1. Eastleigh

Eastleigh Borough Council has a target of being carbon neutral by 2025 and to support communities and businesses across the borough to achieve carbon neutrality by 2030. They plan to develop a green energy scheme at One Horton Heath which will include a solar farm and a ground source heat pump network[2]. The Council belongs to the Warmer Homes consortium[3], which has been granted national funding through 2025 to subsidise the rollout of energy efficiency measures across domestic residences. This includes heat pumps and solar panels. Eastleigh Borough is also developing plans to expand its network of public electric vehicle charge points[4].

3.1.2. New Forest

In October 2021, New Forest District Council declared a Climate Change and Nature Emergency, pledging to be a carbon neutral district by 2030 including both production and consumption emissions[5]. Since then, it has partnered with Community Energy South for a two-year initiative to deliver community-owned renewable energy and the council has increased the EV charging network within the local authority area. The Greener Housing Strategy lays out various means by which housing stock is decarbonised, focusing on electric vehicle charging points, photovoltaic panels and renewable energy heat sources including heat pumps, all of which will have an impact on the electricity distribution network.[6]

Within New Forest District Council's area is part of the Solent Freeport with the purpose of creating additional economic activity. Aims include pioneering approaches to climate change adaptation and decarbonisation and accelerating the transition to a Net Zero economy.

3.1.3. Southampton

Southampton City Council aims for the city to be net zero by 2035, as detailed in their Climate Change Strategy[7]. New developments will be required to generate a certain fraction of their energy demand from on-site renewable generation[8]. The Council has also initiated several projects to expand electric vehicle infrastructure in support of this target, including an electric vehicle trial for private hire cars and taxis[9]; ongoing rollout of electric vehicle charge points across the city; electrification of the council's vehicle fleet[10]; and a commitment to zero emissions from public transit by 2030 as detailed in their Green City Plan 2030[11]. They have also installed solar panels on

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2 Cabinet approves exciting programme of green energy projects

3 Helping Eastleigh residents stay warm

4 What the Council is doing on climate

5 New Forest District Council, January 2023, Climate Change and Nature Emergency Report and Action Plan 2023.

6 New Forest District Council, July 2022, Greener Housing Strategy.

7 Southampton City Council Climate Change Strategy 2023-2030

8 Southampton City Council Energy Guidance for New Developments 2021-2025

9 Electric vehicles

10 More electric Vehicles added to our fleet

11 Green City Plan 2030

the Sea City Museum as part of the Council's Corporate Assets Decarbonisation Scheme[12]. This scheme aims to decarbonise all corporate assets by 2030.

The City Council's Renaissance board is looking to navigate future socio-economic challenges and driving investments in people, infrastructure, and the fabric of the city[13]. The Board includes representatives from organisations such as Southampton City Council, Associated British Ports, and the city's Universities and Hospital. Net zero is highlighted as being central to the boards remit[14] with increased electricity demand needed to facilitate this.

Southampton City Council is also keen to expand and decarbonise the city centre's 18km district heating scheme which has been operational since 1984[15], and are looking into deep geothermal to potentially do this[16]. They are also rolling out plans to decarbonise their social housing portfolio.

3.1.4. Test Valley

Test Valley Borough Council declared a climate emergency and committed to investigate clear and effective options to become a carbon neutral organisation. The Council was awarded funds through the UK Shared Prosperity Fund to support decarbonisation projects in partnership with Community Energy South and part of this is set to be used for a Net Zero Business Service to support rural businesses to decarbonise[17]. Additionally, the Council has secured funding through the Public Sector Decarbonisation Scheme to decarbonise heating in council-owned buildings[18].

The Council are developing their new local plan with development for the most part split between the Andover area in the North and the Romsey area in the South[19]. They anticipate the largest site allocation to be approximately 1,100 dwellings. They have also received funding to progress feasibility studies for a heat network in Andover town centre and are looking at the possibility of a wider heat network zone[20].

3.1.5. Wiltshire

Wiltshire Council acknowledged a climate emergency in February 2019 and committed to becoming carbon neutral as an organisation by 2030. The council also committed to seeking to make the county of Wiltshire carbon neutral in the same timeframe. The council adopted its Climate Strategy in February 2022, which sets out

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12 Sea City Museum solar panels

13 About The Southampton Renaissance Board

14 mgConvert2PDF.aspx

15 Heat networks

16 Heat Network Zoning Opportunity Report: Southampton

17 Council unlocks £1M to deliver major projects across borough | Test Valley Borough Council

18 TVBC secures funding to further commitment to making council-owned buildings carbon neutral | Test Valley Borough Council

19 Local Plan | Test Valley Borough Council

20 Cabinet report

objectives and 'areas of focus' to decrease greenhouse gas emissions and increase resilience to climate change for the county of Wiltshire for the period 2022 - 2027[21].

Whilst this plan sets out priorities for one year, it also includes medium and longer-term implementation steps that will be necessary and puts this into context of where we are in relation to the long-term goals (pathways to Net Zero by 2050).
The Climate Strategy Objectives for a 'Carbon Neutral Council' are[22]:

- To become carbon neutral as an organisation by 2030,
- Provide leadership locally and nationally, Wiltshire Council has committed to achieving carbon neutrality from our own operations by 2030, focusing on cutting direct emissions (Scope 1 and 2), and
- Tackling Scope 3 emissions by scrutinising our outsourced services and purchases.

3.1.6. Winchester

Winchester City Council set aims for the district to be carbon neutral by 2030[23], and to make the Council's own corporate estate net zero by the end of 2024. It has a Carbon Neutrality Action Plan that sets out a number of interventions to reduce carbon emissions[24].

Transport interventions include working with local businesses and procurement teams to decarbonise freight fleets and investing in EV charge points to decarbonise private cars. The EV strategy proposes locations for 46 charge points in council car parks, and so far, 35 have been installed[25]. The Council has also recently launched its first electric waste vehicle. Instavolt also launched the UK's largest rapid-only EV charging Super Hub off the A34 in Winchester in March 2025[26]. It will be powered by on-site PV and energy storage.

The Council has also committed to developing a local area energy plan (LAEP) as a priority action and is in the process of creating the first digital LAEP in collaboration with Scottish and Southern Electricity Networks Distribution and Advanced Infrastructure Technology Limited, using the Local Net Zero Accelerator (LENZA) tool[27]. Part of this will include the development of a renewable energy generation plan. The Carbon Neutrality Action Plan sets an objective to develop an additional 203MW of renewable energy across the Winchester district.

3.1.7. Hampshire County Council

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21 Climate strategy and delivery plans - Wiltshire Council

22 DRAFT_Climate_Delivery_Plan_2025.pdf

23 Climate Emergency - Winchester City Council

24 Carbon Neutrality Action Plan - Winchester City Council

25 Electric vehicle charging - Winchester City Council

26 InstaVolt EV Charging Station | Winchester Super Hub - InstaVolt

27 Planning for Winchester's future energy needs - Winchester City Council

Hampshire County Council has two targets: to be carbon neutral by 2050 and to build resilience to a two-degree rise in temperatures. The Council has published a strategy, action plan and strategic framework for action to achieve its carbon neutral aims and details numerous steps it has planned to electrify various sectors of the local economy[28].

In its strategic framework, the Council lays out plans to develop and roll out an electric vehicle strategy across the county and development of an electric vehicle charge point strategy is underway, supported by the LEVI fund[29]. A retrofit programme for privately owned residential properties has been identified and the Solar Together programme for group buying solar PV and battery storage has already taken place[30].

3.2. Whole System Considerations

3.2.1. Port of Southampton

As shown in Figure 3, Nursling GSP supplies the city of Southampton, and the busiest port for deep sea trade in the UK run the by the Associated British Ports[31] (ABP). The Shipping sector is a large electricity customer, and the UK's target of achieving zero-emissions shipping by 2050 will lead to a substantial increase in the demand for electricity across the maritime industry.

As well as ABP, Red Funnel, a passenger and vehicle ferry service also has plans to decarbonise with the company recently announcing its plans for its first 100% electric ferry between the South Coast and the Isle of Wight[32]. There has also recently been a consultation into expanding the UK Emissions Trading Scheme (ETS) through to the maritime sector in 2026 highlighting the need for the sector to decarbonise[33], leading to increased electricity use.

3.2.2. Solent Freeport

The Solent Freeport area is made up of 7 tax sites and 2 custom sites, designed to incentivise investment and economic growth[34]. The sites are spread across Nursling, Fawley, Botley Wood, and Lovedean GSPs, with 2 of the sites coming under the Nursling GSP. The sites under the Nursling GSP are:

- Southampton Water – ABP Redbridge tax site.
- Southampton Water Solent Gateway custom site and the Southampton Water Marchwood site.

28 Climate change strategy and action plan | Environment | Hampshire County Council

29 Strategic priorities | Environment | Hampshire County Council

30 Solar buying scheme | Environment | Hampshire County Council

31 Associated British Ports | Southampton

32 Artemis Technologies | Red Funnel and Artemis Technologies announce the first 100% electrc high-speed vessel between the South Coast and the Isle of Wight

33 UK ETS scope expansion: maritime sector - GOV.UK

34 Homepage - Solent Freeport

3.2.3. Other large industrial consumers

As well as the Port of Southampton and the Solent Freeport there are a number of other large demand consumers served by the Nursling GSP which have long-term decarbonisation plans that will require increased electricity demand. These are the two universities in Southampton, University of Southampton and Southampton Solent University, Southampton airport, and University Hospital Southampton.

3.2.4. Voltage rationalisation

Under Nursling GSP, there are some primary substations that still operate legacy voltage levels such as 6.6kV. As more network moves to being the UK standard 11kV, replacing network will become less economical than the 11kV parts due them being more readily available. Under Nursling GSP there are 4 33/6.6kV primary substations:

- Bevois Valley PSS.
- Chapel PSS.
- Old Docks PSS.
- Woodmill Lane PSS.

3.2.5. Transmission interactions

SSEN regularly engages with both National Grid Electricity Transmission (NGET) and the National Energy System Operator (NESO) to understand the interactions between the distribution and transmission networks in the area. Currently SSEN is working together with NGET to release capacity at Nursling GSP through regular meetings and working groups, with triggered works estimated for completion in 2036/37.

Nursling GSP will be split into two separate GSPs Nursling A and B with two new 132kV indoor switchboards to resolve fault level issues at the GSP. NGET is expected to reinforce the super-grid transformers with two additional 460MVA transformers, delivered in 2031 and 2037 respectively, and uprating of the one of 3 existing 240MVA transformers to 460MVA each year from 2034 to 2037. Continued engagement will ensure works are delivered in a coordinated and efficient way. However, it should be noted that these projects may be subject to change due to the impact of connections reform and Clean Power 2030.

3.3. Flexibility Considerations

SSEN procures Flexibility Services from owners, operators, or aggregators of Distributed Energy Resources (DERs) or Consumer Energy Resources (CERs), which can be generators, storage, or demand assets. These services are needed in areas of the network which have capacity constraints at particular times or under certain circumstances. SSEN purchases Flexibility Services from all types of providers (e.g. domestic or commercial). Information on the process of procurement and how to participate are published on the Flexibility Services website and information on real time decision making on which providers are dispatched can be found in the Operational Decision-Making document.[35,36]

SSEN regularly recruits new Flexibility Services providers and increases the procured Flexibility Services with the latest bidding round for long term requirements held in May 2025 and recruitment through the Mini-Competition process most recently opening in mid-July 2025.[36]

Across the Nursling GSP supply area 55MW[37] of peak contracted capacity has already been procured, with more expected to be needed in the future. The areas where this flexibility has been procured is shown below in Figure 4. This map shows all Flexibility Services procured, which covers requirements beyond those identified for managing the deferral of reinforcement.

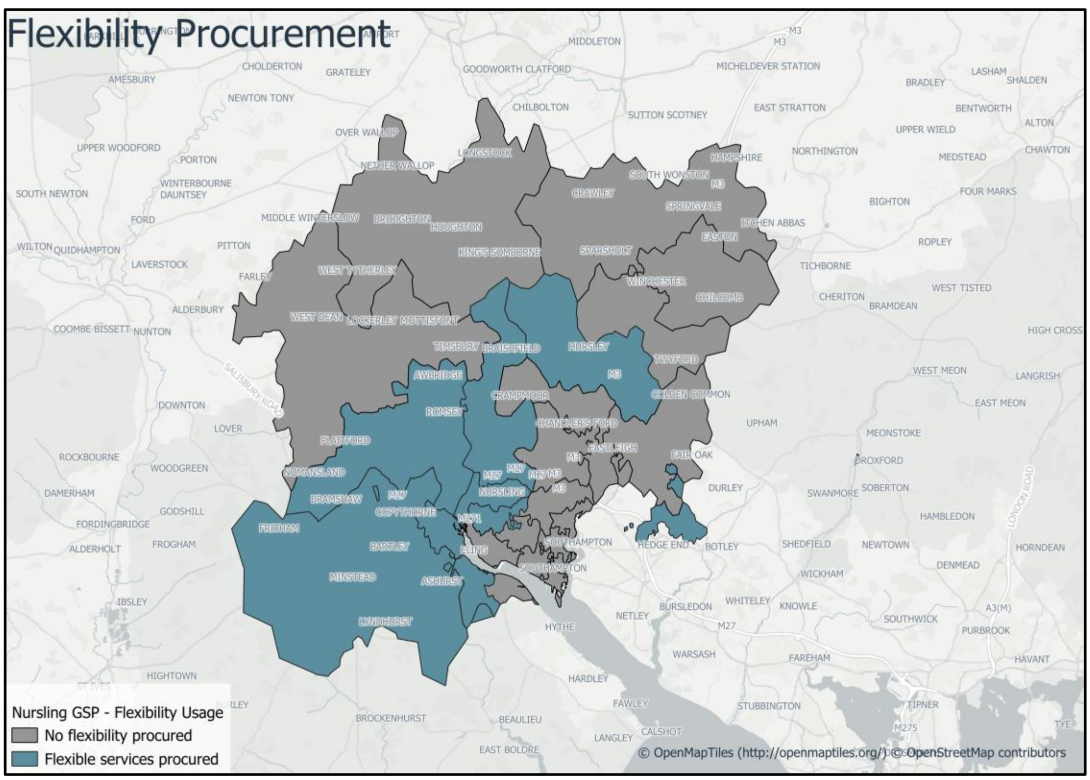

Figure 4 - Flexibility procurement across the Nursling GSP supply area.

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35 SSEN, Flexibility Services Procurement ([Flexibility Services Procurement - SSEN]())

36 SSEN, Operational Decision Making (ODM), [SSEN Operational Decision Making ODM]()

37 SSEN, Flexibility Services Contract Register [Flexibility Services Document Library - SSEN]()

4. EXISTING NETWORK INFRASTRUCTURE

4.1. Nursling Grid Supply Point Context

The Nursling GSP network is made up of 132kV, 33kV, 11kV, and LV circuits. It has both areas of urban and rural network, covering densely populated areas such as Southampton and Winchester, but also a large rural area along the South coast. In total, the GSP serves approximately 191,000 customers. Table 2 shows the values for the GSP and Bulk Supply Points (BSPs). For information on primary substations please see Appendix A. The peak demand at the Nursling GSP is different to the sum of the peak demand at the BSPs due these peaks not being at coincident times and the individual loads of large industrial customers directly connected to the GSP being removed.

Substation Name	Site Type	Number of Customers Served	2023 Substation Maximum MVA (Season)
Nursling	Grid Supply Point	191,000	331.5
Rownhams	Bulk Supply Point	57,000	80.4
Southampton (2 x 60)	Bulk Supply Point	17,000	47.7
Southampton (2 x 90)	Bulk Supply Point	34,000	57.9
Velmore BSP	Bulk Supply Point	49,000	80.3
Winchester	Bulk Supply Point	35,000	84.7

Table 1 Customer number breakdown and substation peak demand readings (2023)

4.2. Current Network Topology

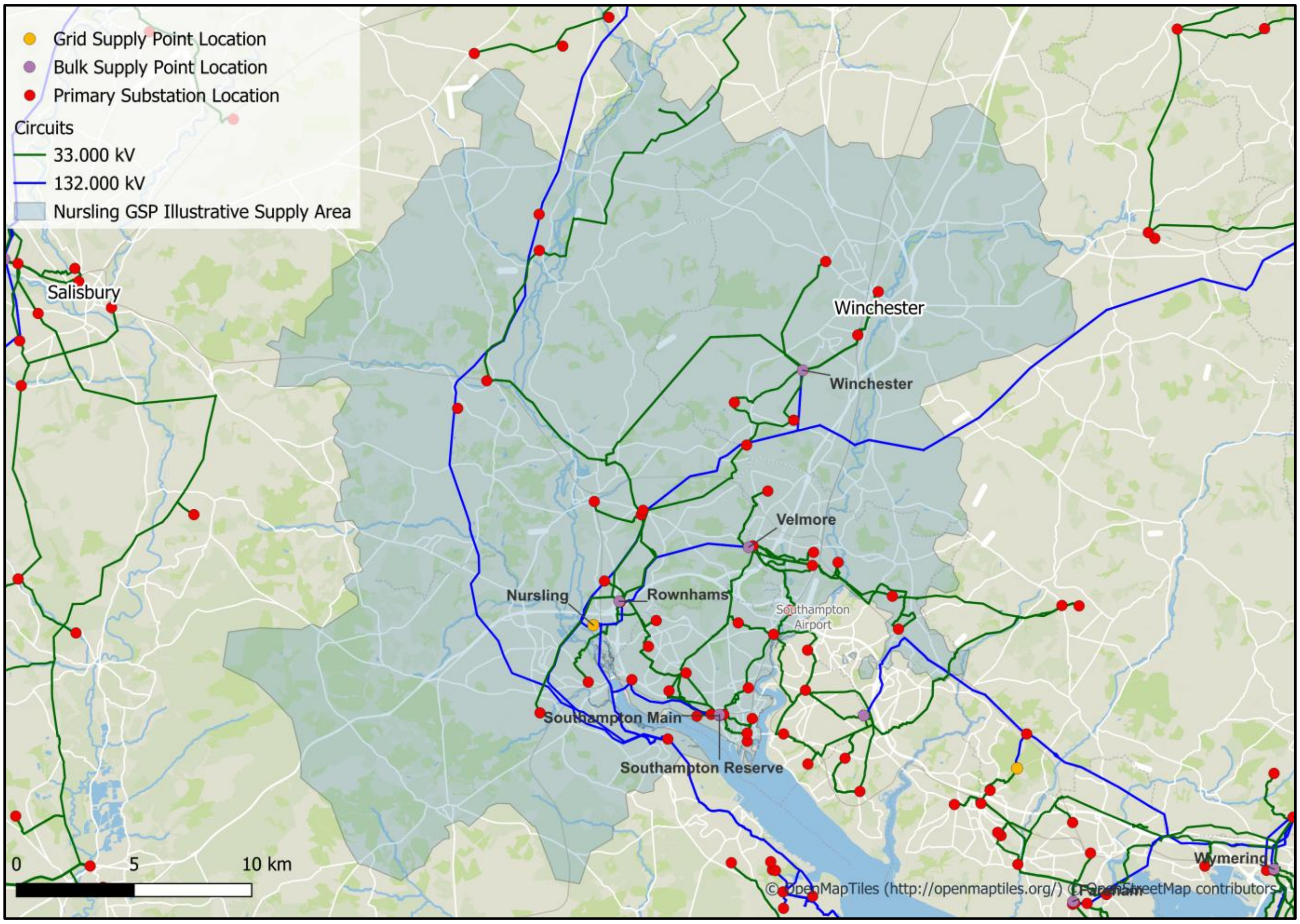

Figure 5 Geographic Information System view of Nursling GSP electricity network.

4.3. Current Network Schematic

The existing 132kV network at Nursling GSP is shown below in Figure 6, network schematics for the 33kV network are shown in appendix B.

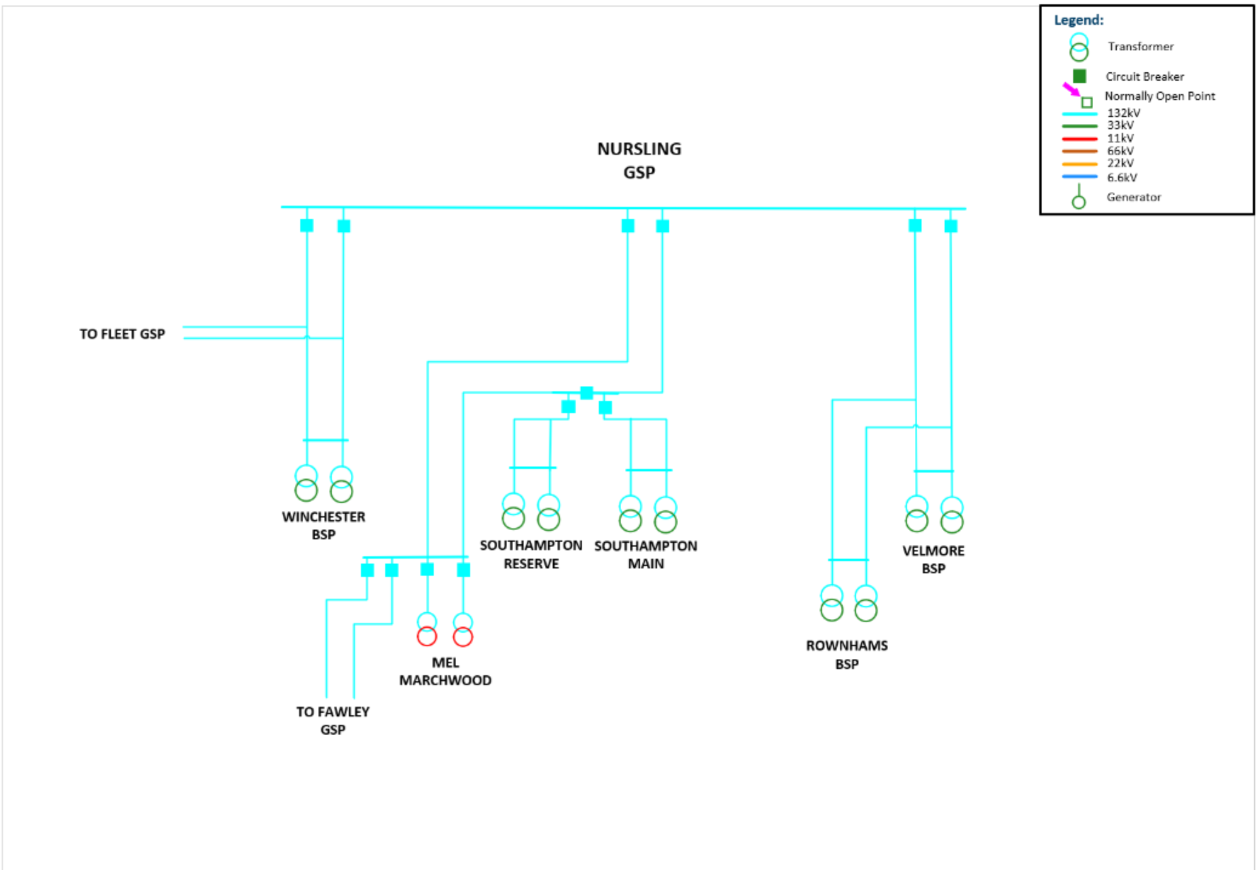

Figure 6 Nursling GSP 132kV Network – Existing network.

5. FUTURE ELECTRICITY LOAD AT NURSLING GSP

The following section details load growth across the technologies projected in the Distribution Future Energy Scenarios. There are important notes on the values presented here:

- This SDP and the analysis conducted has been completed ahead of any changes arising from Clean Power 2030.
- These projections relate to the GSP supply area highlighted in Figure 3 and are not directly aligned to a particular local authority.
- Where MW values are presented in this section, they represent **total installed capacity*.*** When conducting network studies these values are appropriately diversified to reflect the likely peak demand experienced on the network. Diversifying load values accounts for the fact that not all demand load connected to the network peaks at the same time and so provides a more realistic total expected peak power.
- For projections specific to individual primary substations or local authorities, please refer to our online dashboard.[38]

5.1. Distributed Energy Resource

Generation

DFES Scenario	Electricity generation capacity (MW)				Electricity storage capacity (MW)			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	253MW	583MW	806MW	975MW	30MW	536MW	604MW	650MW
Electric Engagement		604MW	786MW	940MW		530MW	581MW	614MW
Hydrogen Evolution		521MW	687MW	815MW		422MW	456MW	480MW
Counterfactual		349MW	554MW	591MW		45MW	219MW	227MW

Table 2 Projected electricity generation and storage capacity across the Nursling GSP area.

38 SSEN DFES Technology Projections - Microsoft Power BI

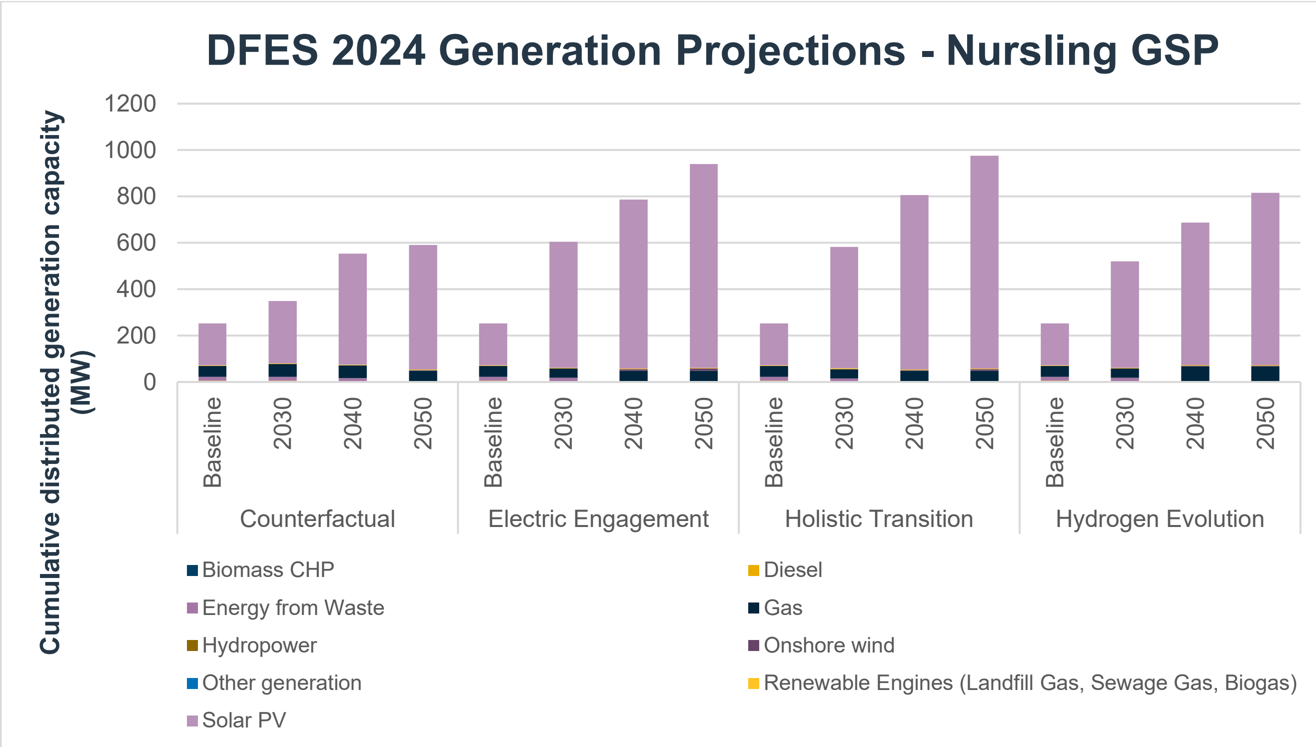

Figure 7 Projected cumulative distributed generation capacity across Nursling GSP (MW). *Source: SSEN DFES 2024*

Storage

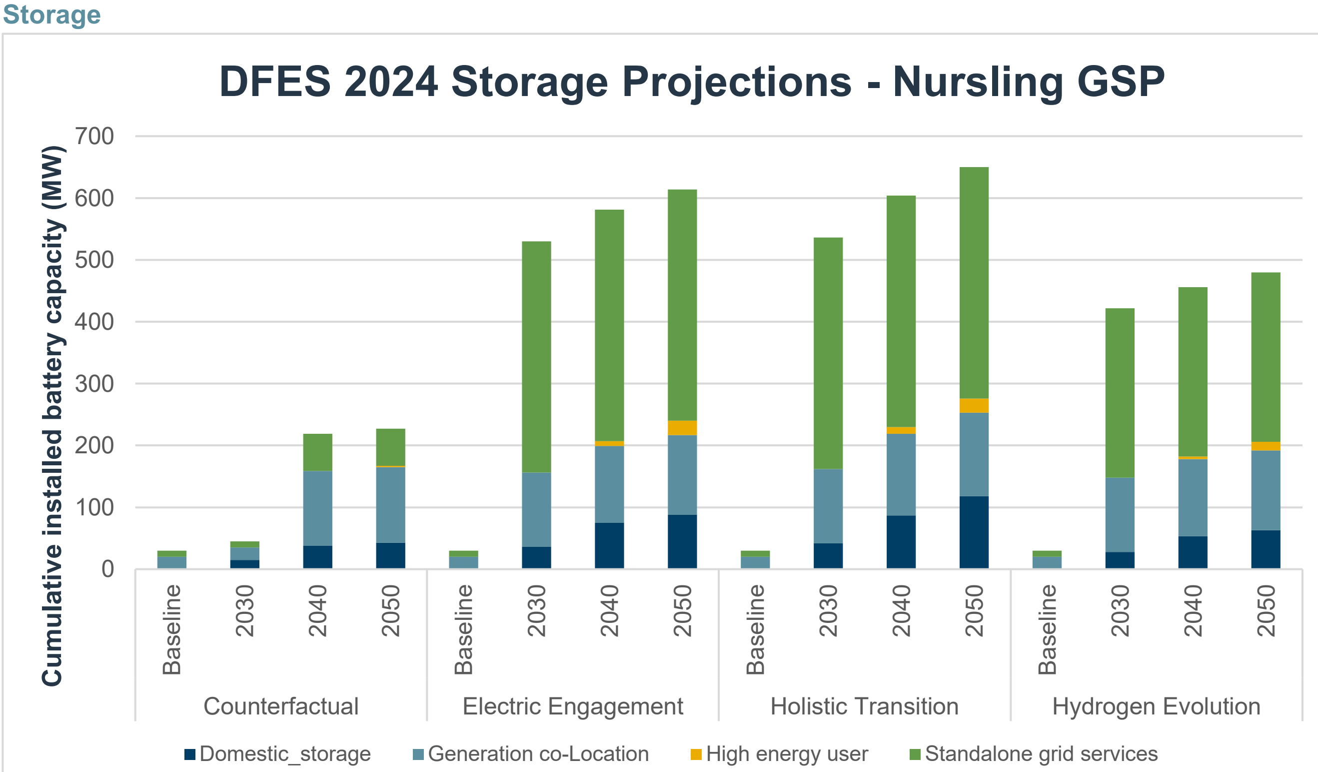

Figure 8 Projected battery storage capacity across the Nursling GSP (MW). *Source: SSEN DFES 2024*

5.2. Transport Electrification

DFES Scenario	Chargers - domestic off-street (unit)				Chargers – nondomestic and domestic on street (MW)			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	7690	37,600	116,000	121,000	6MW	47MW	219MW	253MW
Electric Engagement		61,800	115,000	120,000		80MW	239MW	256MW
Hydrogen Evolution		37,500	115,000	120,000		55MW	254MW	288MW
Counterfactual		30,300	110,000	119,000		27MW	169MW	279MW

Table 3 Projected electric vehicle chargers for domestic off-street installations (units) and nondomestic and domestic on street installations (MW).

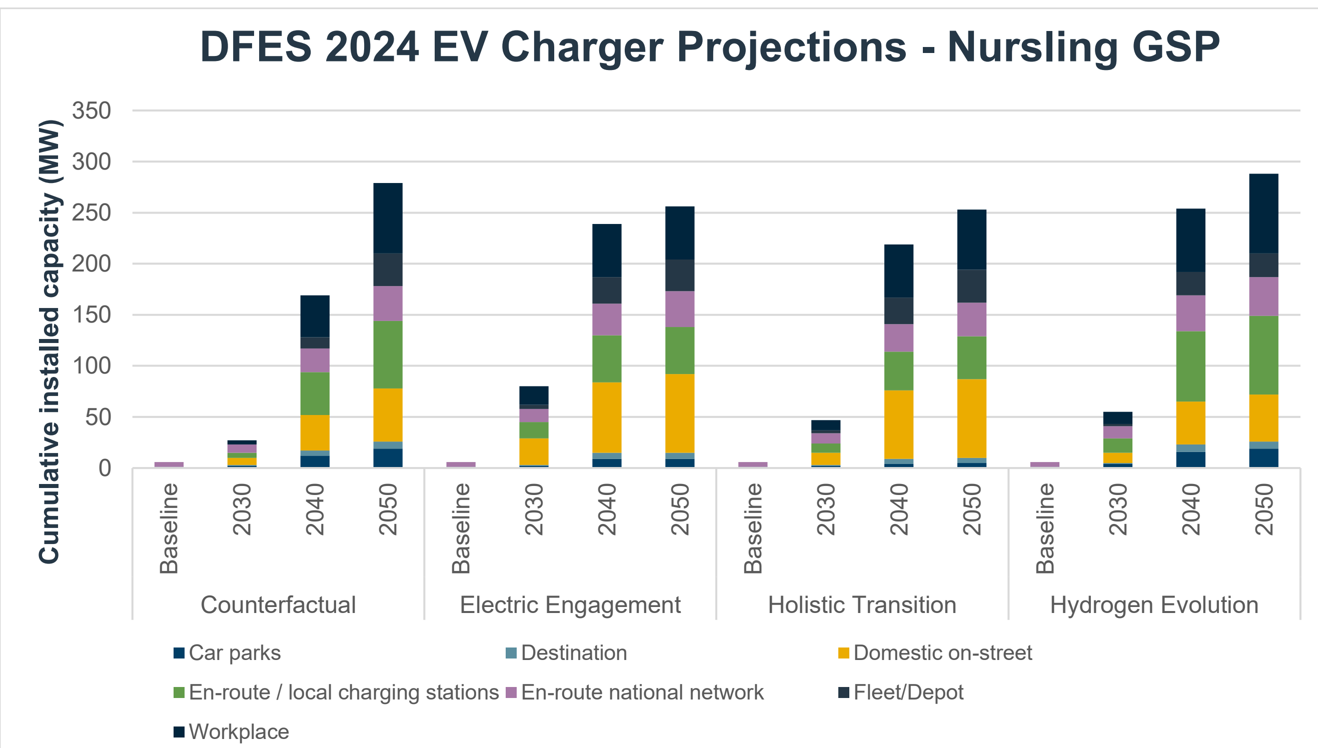

Figure 9 Projected EV charge capacity across the Nursling GSP. *Source: SSEN DFES 2024*

5.3. Electrification of heat

DFES Scenario	Non-domestic electrification of heat (floorspace m2)				Domestic electrification of heat (units)			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	1,560,000	3,710,000	6,520,000	7,360,000	34,000	57,000	138,000	193,000
Electric Engagement		3,240,000	6,790,000	7,920,000		57,000	152,000	266,000
Hydrogen Evolution		3,100,000	5,310,000	5,950,000		57,000	142,000	246,000
Counterfactual		2,440,000	4,040,000	5,170,000		49,000	102,000	269,000

Table 4 Projected figures for the non-domestic electrification of heat (floorspace m2) and the domestic electrification of heat.

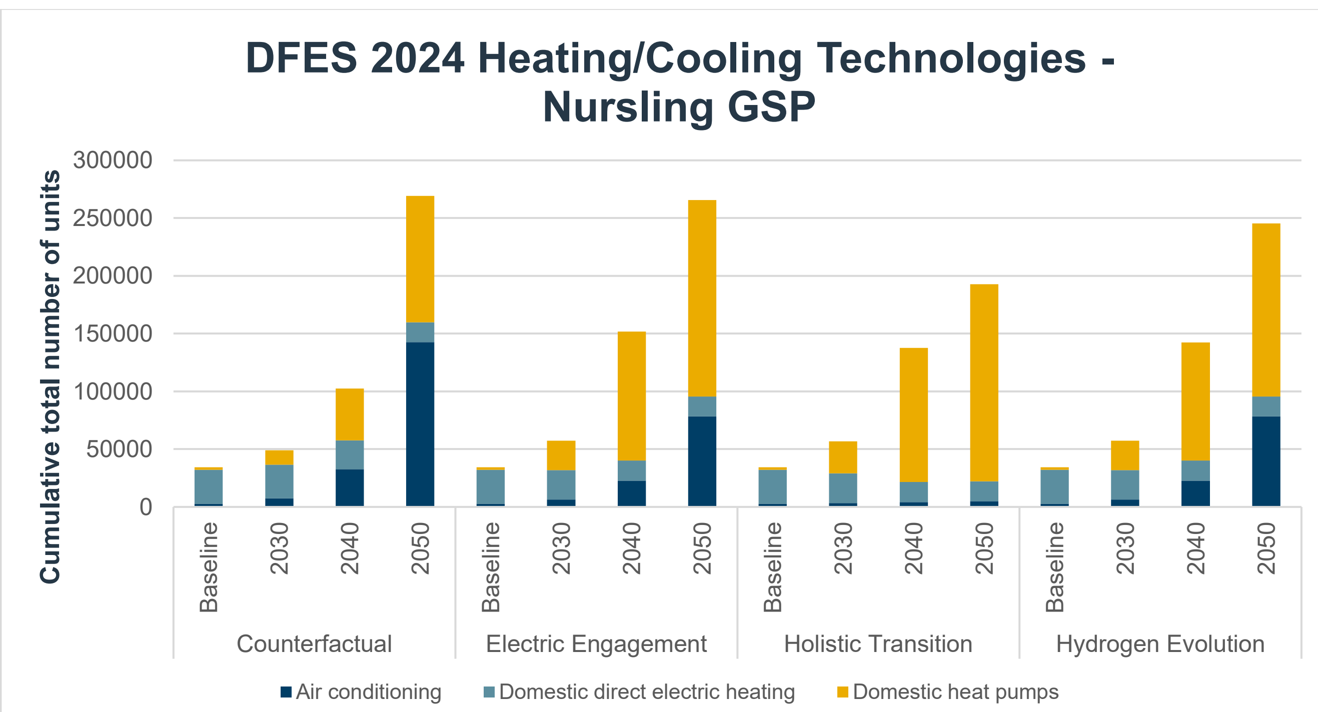

Figure 10 Projected number of heating/cooling technologies across Nursling GSP. *Source: SSEN DFES 2024*

5.4. New building developments

DFES Scenario	New domestic development (number of homes)			New non-domestic development (m^2)		
	2030	2040	2050	2030	2040	2050
Holistic Transition	10,600	23,400	31,600	284,000	674,000	674,000
Electric Engagement	9400	22,100	29,100	227,000	674,000	674,000
Hydrogen Evolution	9400	21,700	28,700	226,000	674,000	674,000
Counterfactual	8200	20,300	26,600	186,000	602,000	674,000

Table 5 Projected number of new domestic developments and floorspace of non-domestic developments.

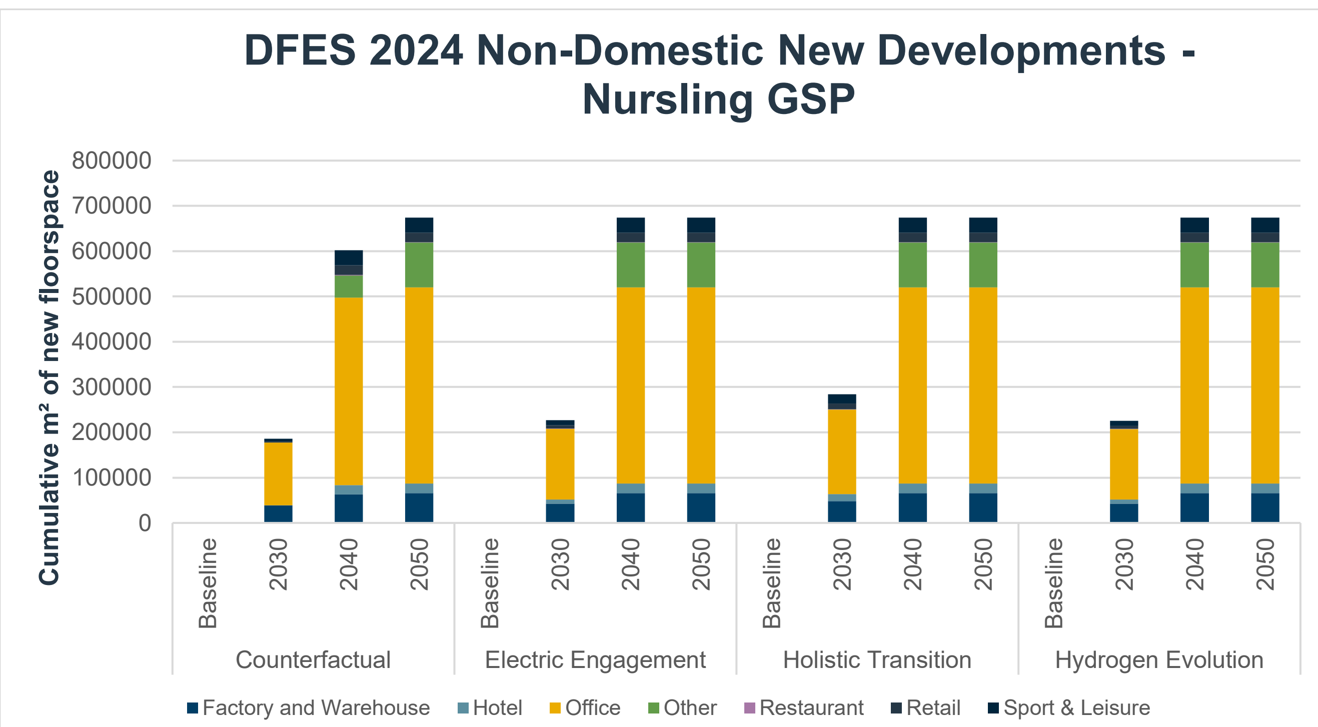

Figure 11 Projected non-domestic new development across Nursling GSP. *Source: SSEN DFES 2024*

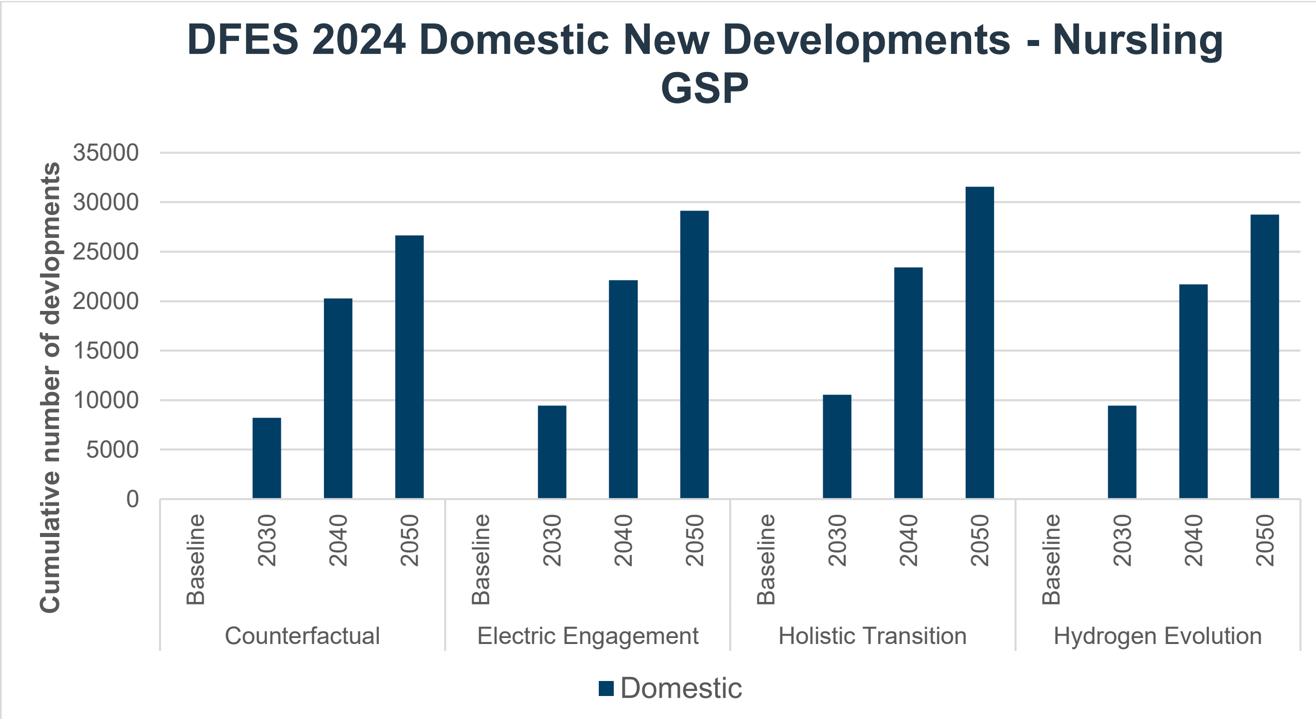

Figure 12 Projected domestic new development across Nursling GSP. *Source: SSEN DFES 2024*

5.5. Commercial and industrial electrification

5.5.1. Port of Southampton

Engagement with the Port of Southampton has taken place to determine what the potential increase in demand could be out to 2030 and has already been incorporated into projections and reinforcement plans. The port has two substations owned and operated by ABP which are fed directly from the Southampton BSP. These substations are:

- Old Docks PSS.
- New Docks PSS.

As well as this, SSEN leads an innovation project aimed at better understanding the potential electricity demands arising from the maritime industry, so assets and network in the area can be sized appropriately. SSEN's SeaChange innovation project has been funded through the Strategic Innovation Fund.[39] This project involves building a 'Navigating Energy Transitions' (NET) tool, which will help ports to plot their most viable pathways for decarbonisation.

39 SeaChange, SSEN Innovation Project, 10/2024, SSEN's nature and shipping innovation projects win £1m in new development funding - SSEN

6. WORKS IN PROGRESS

Network interventions can be caused by a variety of different drivers. Examples of common drivers are load-related growth, specific customer connections, and asset health. Across Nursling GSP these drivers have already triggered network interventions that have now progressed to detailed design and delivery. For this report, these works are assumed to be complete, with any resulting increase in capacity considered to be released. The drivers listed in the below table are predominantly where a customer connection application has driven the work or whether investment proposals developed through our DNOA process is driving the reinforcement work. The work included here is all work that has passed through the ID2 gate of our Distribution Governance and Investment Framework (DGIF), further information on this process is available in the DSO service statement 2025.[40] Summary of existing works is tabulated below:

ID (Schematic Reference)	Substation	Description	Driver	Forecast completion	Fully resolves future strategic needs to 2050?
Nursling GSP 132kV works					
1	Nursling GSP.	Indooring of the existing 132kV busbar, and the separation of Nursling GSP into Nursling A and B, connected via interconnectors.	DNOA Process.	2030	
2	Southampton BSP	Phase 1: Indooring of the 33kV board for both main and reserve, creating space at the substation site for the construction of the new BSP. An interim arrangement will then be used until the new BSP is installed. Phase 2: Construction of the additional site at Southampton BSP, including the installation of 3 additional 90MVA transformers and a new 132kV switchboard. Additional dual 132kV 9.76km circuit installed between Nursling GSP and the new Southampton BSP.	DNOA Process.	Phase 1: 2028 Phase 2: 2030	

40 DSO Service Statement 2025

3	Rownhams BSP.	Additional 3rd 90MVA transformer installed, along with a new 132kV indoor double busbar, and 9 new circuit breakers. And the installation of approximately 1.9km of new circuit connecting Rownhams BSP directly to Nursling GSP.	Customer Connection.	2030	
4	Velmore BSP.	Additional 3rd 90MVA transformer installed along with a new 132kV AIS busbar, and circuit breakers. Furthermore, a section of 132kV circuit between Nursling GSP and Velmore BSP will also be reinforced.	Customer Connection.	2028	
5	Winchester BSP.	Additional 3rd 90MVA transformer installed at Winchester BSP, new 132kV indoor busbar, and new circuit breakers. Reinforcement of the 132kV circuits between Nursling GSP and Winchester BSP.	Customer Connection.	2029	
6	Winchester BSP to Alton Fernhurst BSP Circuits.	Reinforcement of the 132kV backfeed circuit between Winchester BSP and Alton Fernhurst BSP.	Customer Connection.	2029	
Southampton BSP 33kV works					
7	Chapel PSS.	Reinforcement of the existing transformers at Chapel PSS from 15MVA to 24MVA.	Customer Connection.	2027	
8	Central Bridge PSS	Indooring of the 33kV switchboard at Central Bridge PSS.	Environmental Reporting.	2029	

9	Central Bridge PSS to Old Docks PSS Circuits.	Reinforcement of the dual 33kV 0.54km circuits between Central Bridge PSS and Old Docks PSS.	DNOA Process.	2028	
10	Southampton BSP to Bevois Valley PSS Circuits.	Reinforcement of 2.5km of the Southampton BSP to Bevois Valley PSS 33kV circuits.	Environmental Reporting.	2027	
11	Southampton BSP to Central Bridge PSS Circuits.	Reinforcement of the 3 existing 33kV 1.93km circuits between Southampton BSP and Central Bridge PSS.	DNOA Process.	2028	
12	Southampton BSP to Western Esplanade PSS Circuits.	Reinforcement of the circuits between Southampton BSP to Western Esplanade PSS.	Environmental Reporting.	2027	
13	Southampton BSP to Woodmill Lane PSS Circuits.	Reinforcement of 4.9km the Southampton BSP to Woodmill Lane PSS 33kV dual circuits.	Customer Connection.	2027	
Rownhams BSP 33kV works					
14	Rownhams BSP to North Baddesley PSS 33kV Circuits.	Reinforcement and undergrounding of 8km of 33kV circuits between Rownhams BSP and North Baddesley.	DNOA Process.	2026	
15	Romsey PSS.	Reinforcement of the two existing transformers at Romsey PSS from 16MVA to 40MVA units, and the installation of 2 x 33kV CBs.	DNOA Process.	2027	
16	North Baddesley PSS.	Reinforcement of the two existing transformers at North Baddesley PSS from 15MVA to 30MVA, and the replacement of the 11kV switchboard.	DNOA Process.	2026	
Velmore BSP 33kV works					

17	Bishopstoke PSS to Hedge End PSS.	Reinforcement of 3.5km of 33kV overhead line between Bishopstoke PSS and Hedge End PSS.	Customer Connection.	2027	
18	Velmore BSP to Bishopstoke PSS.	Additional 33kV 4.7km circuit installed between Velmore BSP and Bishopstoke PSS.	Customer Connection.	2027	

Table 6 Works already triggered through customer connections and the DNOA process.

Where the above works are marked as not providing sufficient capacity for 2050 peak demands, it is important to note that this relates to the individual primary substation's firm capacity. When considering the further works identified in this report, the holistic plans provide capacity across the GSP for 2050.
Alongside these asset solutions being deployed, flexibility solutions are also being used to release additional capacity.

6.1. Network Schematic (following the completion of above works)

The 132kV network at Nursling GSP following the completion of works is shown below in Figure 13, network schematics for the 33kV network are shown in appendix C.

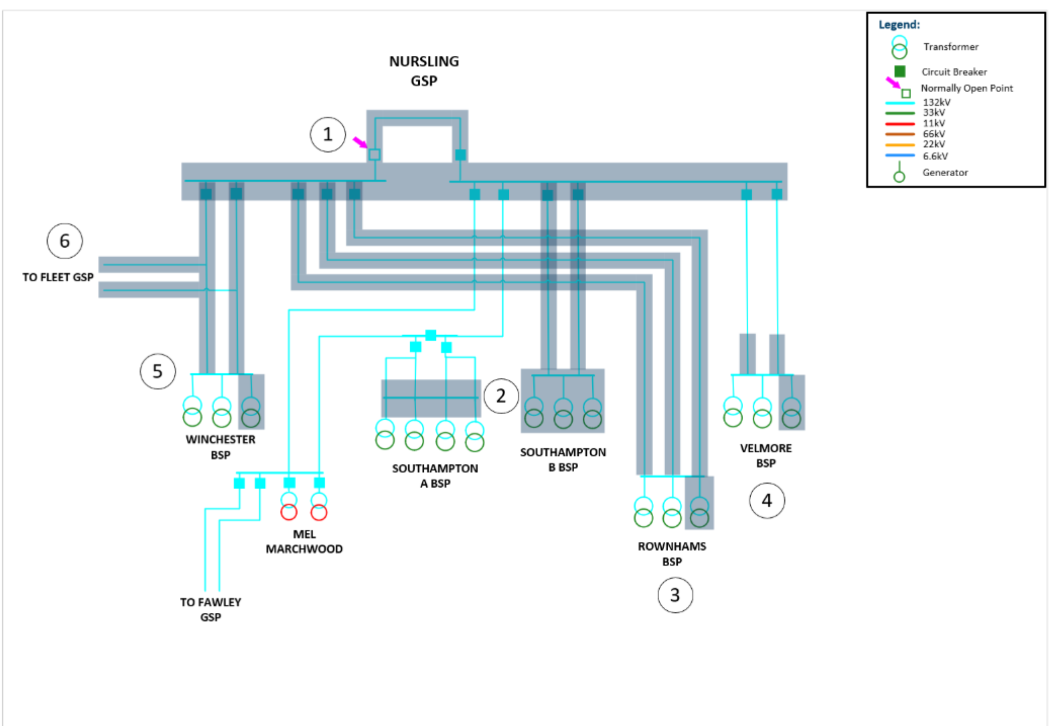

Figure 13 Nursling GSP 132kV Network – Following completion of triggered works.

7. SPATIAL PLANS OF FUTURE NEEDS

7.1. Extra High Voltage / High Voltage spatial plans

The EHV/HV spatial plan shown below in Figure 14 shows the projected headroom or capacity shortfall due to demand increases at primary substations across the Nursling SDP study area. Darker purple shades indicate that there is a projected capacity shortfall whereas lighter shades indicate that there is headroom capacity based on current projections. EHV/HV spatial plans for the other DFES scenarios are presented in appendix D. The values are taken from the Network Scenario Headroom report (NSHR), part of the Network Development Plan (NDP). It should be noted that the NSHR is produced annually and was last published in May 2025, where work has been triggered between this date and the time of publication of this report, future capacity may not be reflected.

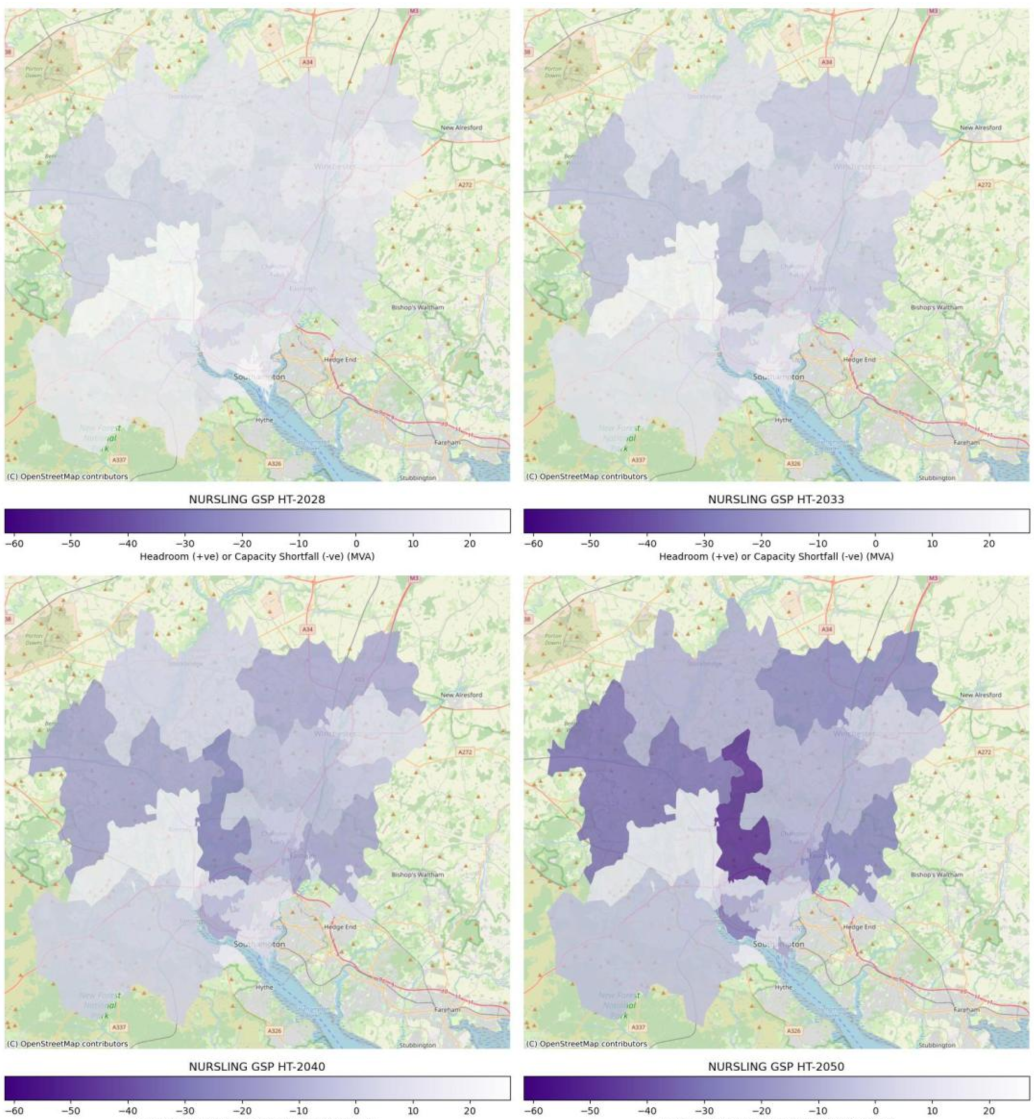

Figure 14 Example EHV network spatial plans for 2028, 2033, 2040, and 2050.

7.2. HV/LV spatial plans

The HV/LV spatial plans shown below in Figure 15 show the point locations of secondary transformers supplied by Nursling GSP. The points are colourised based on the projected percentage loading with red meaning higher percentage loading and green being lower percentage loading. The HV/LV spatial plans for the other DFES pathways are available in appendix E.

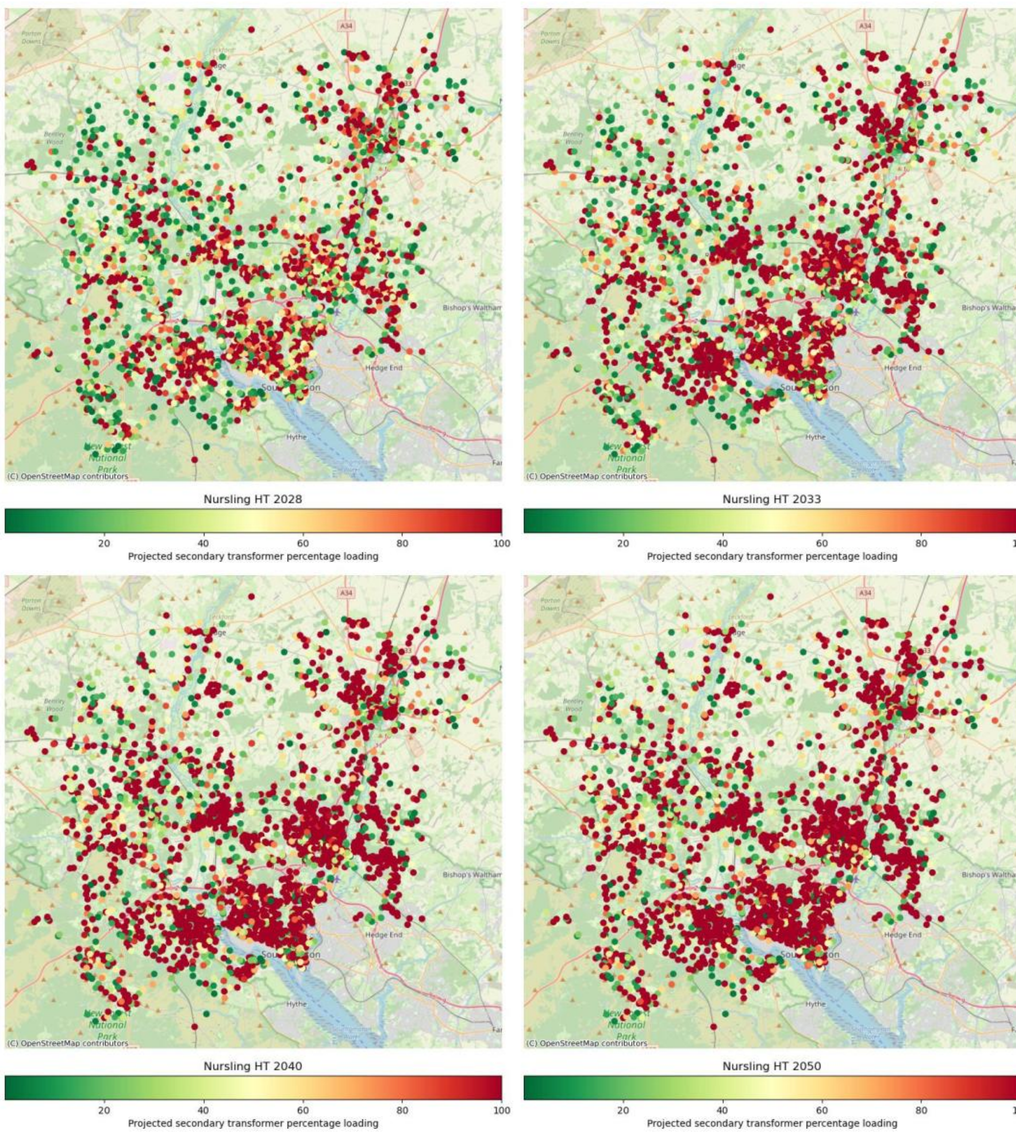

Figure 15 Example HV/LV spatial plans for 2028, 2033, 2040, and 2050.

8. SPECIFIC SYSTEM NEEDS AND OPTIONS TO RESOLVE

8.1. Overall dependencies, risks, and mitigations

There are a number of overarching risks to the delivery of our strategic plan. Below we list these alongside proposed mitigating actions. We will work with stakeholders to develop these mitigating actions further.

Dependency: Some of the works proposed here are dependent on the completion of works carried out by National Grid Electricity Transmission (NGET).
Risks: Works delay potential interventions downstream and/or do not provide flexibility of future investment.
Mitigation: Continue productive engagement with NGET to enable planning and coordination of works to release capacity at the GSP efficiently.

Dependency: Connections reform process, which is taking place this year, is likely to change the number and composition of generation/storage projects currently in the connections queue.
Risks: The reinforcements currently planned, that have been triggered by generation connections, may not be necessary if the generation projects drop out of the connections queue.
Mitigation: Works triggered by generation projects that have a level of uncertainty have not been included in the works in the progress or the network modelling, meaning the worst-case demand scenario is accounted for. Network models will be rerun when there is more clarity.

Dependency: Growth of generation in the area may begin to cause reverse power flow on the network. It should be ensured that the assets currently on the network are able to handle the projected levels of reverse power flow and increased fault level.
Risks: Further reinforcement than identified here is required to enable connection of generation. Increasing fault levels leads to damaged distribution network assets.
Mitigation: We should further assess the near-term generation requirements to ensure that we're in a position to facilitate the Clean Power 2030 (CP2030) targets set by the Department for Energy Security and Net Zero (DESNZ). Plans for the split of the Nursling GSP into Nursling A and B will resolve fault level out to 2050, however this should continue to be reassessed as generation grows on the network.

Dependency: Significant reinforcement work is projected to be required across densely populated areas such as Southampton, there may be associated delivery considerations.
Risks: Delivery of work may result in some disruption in the local area.
Mitigation: Early scoping of all work requirements driven by load out to 2050 has been identified through this work. This allows us to develop a suitable programme to complete the work with minimal disruption to residents.

Dependency: The future works described in this section are only indicative and further detailed study through the DNOA will be required when delivery of the work needs to be initiated.
Risks: Changes in forecasts and/or practical considerations may result in changing the scope of the high-level solutions detailed here.
Mitigation: The purpose of this section is to highlight the long-term requirements based on current forecasts, annual update of the SDP and more detailed assessment in the DNOA will ensure proposed work that is passed from DSO to the asset owner is appropriate.

8.2. Generation impacts on the EHV network.

There is an increasing amount of distribution connected generation projected to connect as we approach 2050. This has the potential to result in a significant shift on the power flows observed on the network and potentially drive some future system needs. The effect connections reform and CP2030 will have on generation projects connecting to the network has not yet been concluded, therefore, more detailed assessment on generation impacts will need to take place once this has been finalised.

8.3. Future EHV System Needs to 2035.

The following table details the near-term to medium-term distribution network system needs that have been identified through power system analysis. While asset solutions are described in the table below it is important to note that the use of flexibility will be evaluated for all schemes to ensure the best possible solution is progressed. For the projects shown in Table 8 we recommend that these are progressed through the DNOA process so that there is sufficient time for solutions to be designed and delivered.

<table>
<tr><th>Location of proposed intervention</th><th>HT Year</th><th>HE Year</th><th>EE Year</th><th>CF Year</th><th>Asset Loading (%)</th><th>Network State (see glossary)</th><th>Proposed option(s) to resolve</th></tr>
<tr><td colspan="8">Nursling GSP 33kV works.</td></tr>
<tr><td>Winchester BSP to Dunbridge PSS 33kV circuits (section).</td><td>2025 - 2030</td><td>2025 - 2030</td><td>2025 - 2030</td><td>2025 - 2030</td><td>101</td><td>N-1, outage of the Dunbridge PSS circuits.</td><td rowspan="3">Dunbridge PSS consists of two transformers of different ratings. The lower rated transformer is projected to be overloaded 3 years before the second so will therefore be reinforced together. Furthermore, sections of the 33kV circuits between Winchester BSP and Dunbridge PSS are projected to be thermally overloaded and experience voltage issues. Additional sections of the circuits are projected to be overloaded by 2031 – 2035. There are also projected sections being overloaded in 2041 – 2045. Potential options to resolve both these constraints are:
• Reinforce the 33kV circuits feeding Winchester from Dunbridge.
• Feed Dunbridge either directly from Rownhams BSP or use the existing circuits through North Baddesley PSS. This solution will likely require new network or network upgrades but may be cheaper as Rownhams BSP is geographically closer than Winchester BSP.</td></tr>
<tr><td>Dunbridge PSS transformers.</td><td>2031 - 2035</td><td>2031 - 2035</td><td>2031 - 2035</td><td>2031 - 2035</td><td>114</td><td>N-1, outage of a transformer.</td></tr>
<tr><td>Winchester BSP to Dunbridge PSS 33kV circuits (section).</td><td>2031 - 2035</td><td>2025 - 2030</td><td>N/A</td><td>N/A</td><td>123</td><td>N-1, outage of the Dunbridge PSS circuits.</td></tr>
</table>

							• Feed Houghton PSS directly from Winchester BSP, reducing load on the 33kV network.
Eastleigh North PSS transformers.	2025 - 2030	2025 - 2030	2025 - 2030	2025 - 2030	102	N-1, outage of a transformer.	Eastleigh North PSS consists of two transformers that are projected to both be constrained under N-1 conditions. Furthermore, the circuits from Velmore BSP are also projected to be overloaded in the 2031 – 2035 period. Potential options to resolve this constraint are: • Reinforce the existing transformers and circuits feeding Eastleigh PSS with those of a higher rating. • Shift load on the 11kV network perhaps over to Bishopstoke PSS. • As the circuits feeding Bishopstoke from Velmore are also projected to be overloaded in 2031 – 2035, another option would be a new primary substation could be constructed in the area.
Velmore BSP to Eastleigh PSS 33kV circuits.	2031 - 2035	2031 - 2035	2025 - 2030	2031 - 2035	102	N-1, outage of Eastleigh PSS circuits.	
Maybush PSS transformers	2025 - 2030	2025 - 2030	2025 - 2030	2031 - 2035	101	N-1, outage of a transformer.	Maybush PSS consists of two transformers of different ratings. The lower rated transformer is projected to be overloaded in 2025 - 2030 while the higher rated transformer will be overloaded in 2031 - 2035. As it's projected the transformers will need replacing within 3 years of each other, the reinforcement should take place at the same time. Potential options to resolve this constraint are: • Reinforce the existing transformers at Maybush PSS, either by adding additional assets or uprating the existing ones. • Shift load on the 11kV network over to Shirley PSS or Lordshill PSS depending on capacity.
North Baddesley PSS transformers.	2031 - 2035	2031 - 2035	2036 - 2040	2041 - 2045	102	N-1, outage of North Baddesley circuits.	North Baddesley PSS consists of two transformers that are projected to be constrained under the N-1 outage of the circuits feeding it. There is also projected

Rownhams BSP to North Baddesley PSS 33kV circuits.	2031 - 2035	2031 - 2035	2031 - 2035	2041 - 2045	102		to be constraints on the dual circuits feeding the primary. Potential options to resolve this constraint are: • Reinforce the existing circuits and transformers at North Baddesley, either by adding additional assets or uprating the existing ones. • Feed Romsey PSS, which is currently fed through the North Baddesley circuits, directly from Rownhams BSP. To relieve constraints of the transformers, load could be shifted on the 11kV network to Romsey or reinforce the transformers there.
Winchester BSP to Harestock PSS 33kV circuits.	2031 - 2035	2031 - 2035	2031 - 2035	2031 - 2035	109	N-1, outage of Harestock PSS circuits.	The two 33kV circuits between Winchester BSP and Harestock PSS and the transformers at Harestock PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing circuits and transformers at Harestock PSS, either by adding additional assets or uprating the existing ones. • Shift load on the 11kV network over to Gordon Road PSS or St Cross PSS. • As nearby networks are also projected to be congested, a new primary substation in the area could be constructed.
Harestock PSS transformers.	2031 - 2035	2031 - 2035	2031 - 2035	N/A	104	N-1, outage of a transformer.	
Silkstead PSS transformers.	2031 - 2035	2025 - 2030	2025 - 2030	2031 - 2035	104	N-1, outage of a transformer.	Silkstead PSS consists of two transformers that are projected to both be constrained under N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing transformers at Silkstead, either by adding additional assets or uprating the existing ones. • Shift load on the 11kV network over to St Cross PSS.
Regents Park PSS transformers.	2031 - 2035	2031 - 2035	2031 - 2035	2046 - 2050	102	N-1, outage of a transformer.	The two 33kV circuits between Southampton A BSP and Regents Park PSS and the transformers at Regents

Southampton BSP to Regents Park PSS circuits.	2031 - 2035	2031 - 2035	2031 - 2035	2046 - 2050	109	N-1, outage of Regents Park PSS circuits.	Park PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing circuits and transformers at Regents Park PSS, either by adding additional assets or uprating the existing ones. • Shift load on the 11kV network to Shirley PSS. • As Shirley PSS is projected to be overloaded in 2036 – 2040 period, a new primary substation in the area could be constructed.
Velmore BSP to Bishopstoke PSS 33kV circuits.	2031 - 2035	2031 - 2035	2031 - 2035	2036 - 2040	100	N-1, outage of Bishopstoke PSS circuits.	The two 33kV circuits between Velmore BSP and Bishopstoke PSS are expected to be overloaded in N-1 conditions, as are the circuits from Bishopstoke PSS to Hedge End PSS in 2036 – 2040. Due to proximity, it's proposed these works are completed together. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuits to Bishopstoke PSS and Hedge End PSS, either by adding additional assets or uprating the existing ones. • Shift load of the 11kV network to Eastleigh North if capacity has been created there. • Add new circuits feeding Hedge End PSS directly from Velmore, as they the currently using the same circuits as the Bishopstoke PSS. This would create capacity at both Bishopstoke PSS and Hedge End PSS. • Add a new primary in the area as suggested for the Eastleigh North PSS.
Bishopstoke PSS to Hedge End PSS 33kV circuits.	2036 - 2040	2036 - 2040	2031 - 2035	2041 - 2045	107	N-1, outage of Hedge End PSS circuits.	
Fletchwood PSS transformers.	2031 - 2035	2031 - 2035	2031 - 2035	2036 - 2040	102	N-1, outage of a transformer.	The two 33kV circuits between Rownhams BSP and Fletchwood PSS and the transformers at Fletchwood PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing transformers at Fletchwood PSS, either by adding additional
Rownhams BSP to Fletchwood PSS 33kV circuits.	2031 - 2035	2031 - 2035	2031 - 2035	2036 - 2040	102	N-1, outage of Fletchwood PSS circuits.	

							assets or uprating the existing ones. • Shift load on the 11kV network over to Totton PSS. • As Totton is projected to be overloaded under N-1 within the same period and Rownhams BSP is geographically close, a new primary in the area could be constructed.
Velmore PSS transformers.	2031 - 2035	2031 - 2035	2031 - 2035	2036 - 2040	100	N-1, outage of a transformer.	Velmore PSS consists of two transformers that are projected to both be constrained under N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing transformers at Velmore PSS, either by adding additional assets or uprating the existing ones. • Shift load on the 11kV network over to Chandler's Ford PSS or Eastleigh North PSS depending on capacity. • As Eastleigh North and Bishopstoke are also projected to have constraints, a new primary in the area could be constructed.
Gordon Road PSS transformers.	2031 - 2035	2031 - 2035	2031 - 2035	2036 - 2040	103	N-1, outage of a transformer.	The transformers at Gordon Road PSS and St Cross PSS are both projected to be overloaded in N-1 conditions, as are the 33kV circuits between the two primaries. Due to their proximity, it's proposed these works are completed together. Potential options to resolve this constraint are: • Reinforce the existing transformers at Gordon Road PSS and St Cross PSS and the circuits between them, either by adding additional assets or uprating the existing ones. • Build new 33kV circuits feeding Gordon Road PSS directly from Winchester BSP and reinforce existing transformers. • Shift load on the 11kV network over to Harestock PSS, however
St Cross PSS transformers.	2031 - 2035	2036 - 2040	2031 - 2035	N/A	101	N-1, outage of a transformer.	
St Cross PSS to Gordon Road PSS circuits.	2036 - 2040	2036 - 2040	2036 - 2040	2041 - 2045	103	N-1, outage of St Cross PSS circuits.	

							this primary is projected to have constraints. • The construction of a new primary in the area to relieve load.
Central Bridge PSS to Chapel PSS circuits.	2031 - 2035	2031 - 2035	2031 - 2035	2036 - 2040	101	N-1, outage of a transformer.	The two 33kV circuits between Central Bridge switching station and Chapel PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuits to Chapel PSS, either by adding additional assets or uprating the existing ones. • Shift load on the 6.6kV network over to Bevois Valley. • It should also be noted that any upgrades at Chapel PSS should also be considered alongside voltage rationalisation works in the area.
Totton PSS.	2031 - 2035	2036 - 2040	2031 - 2035	2036 - 2040	104	N-1, outage of a transformer.	The two 33kV circuits between Rownhams BSP and Totton PSS and one of the two transformers at Totton PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing circuits to Totton PSS, either by adding additional assets or uprating the existing ones. The transformer that is overloaded should be reinforced to the same rating as the second transformer. • Shift load on the 11kV network over to Fletchwood PSS however this is also projected to be a constrained primary. • The construction of a new primary in the area to relieve load.
Rownhams BSP to Totton PSS 33kV circuits.	2036 - 2040	N/A	N/A	N/A	104	N-1, outage of Totton PSS circuits.	

Table 7 Summary of system needs identified in this strategy through to 2035 along with indicative solutions.

8.4. Future EHV System Needs to 2050.

Location of proposed intervention	HT Year	HE Year	EE Year	CF Year	Asset Loading (%)	Network State (see glossary)	Proposed option(s) to resolve
Nursling GSP 132kV works.							
Velmore BSP transformers.	2036 - 2040	2036 - 2040	2036 - 2040	2036 - 2040	125	N-1, outage of Velmore transformers.	The transformers at Velmore BSP are expected to be overloaded in N-1 conditions. Sections of the dual 132kV circuits feeding Vemore BSP from Nursling GSP are also expected to be overloaded between 2036 – 2045. It is therefore suggested that these works are grouped together. Potential options to resolve this constraint are: • Reinforce the existing circuits to and transformers at Velmore BSP, either by adding additional assets or uprating the existing ones. • Transfer load on the 33kV network to a different BSP, either to Rownhams or Winchester.
Nursling GSP to Velmore BSP 132kV circuits (section).	2036-2040	2036-2040	2036-2040	2046-2050	102	N-1, outage of one of the circuits.	
Nursling GSP to Velmore BSP 132kV circuits (section).	2041-2045	2041-2045	2041-2045	N/A	113	N-1, outage of one of the circuits.	
Southampton BSP to Velmore BSP 33kV circuits.	2036-2040					N-2, outage of both 132kV lines feeding Velmore BSP.	After the outage of the 132kV lines feeding Velmore BSP, the 33kV backfeed lines from Southampton BSP experience P2 security of supply issues. Potential options to resolve this constraint are: • Reinforce the existing circuits between Southampton BSP and Velmore BSP, either by adding additional assets or uprating the existing ones. • Add a new circuit, either a new 33kV circuit from Rownhams or another 132kV circuit from Nursling.
Rownhams BSP to Winchester BSP 33kV circuits (sectons).	2036-2040					N-2, outage of both 132kV circuits feeding Rownhams BSP.	After the outage of the 132kV lines feeding Rownhams BSP or the separate 132kV lines feeding Winchester BSP, the 33kV lines between Rownhams BSP and Winchester BSP become overloaded.

Rownhams BSP to Winchester BSP 33kV circuits (sectons).	2041-2045					N-2, outage of both 132kV lines feeding Winchester BSP.	Potential options to resolve this constraint are: • Reinforce the existing circuits between Rownhams BSP and Winchester BSP, either by adding additional assets or uprating the existing ones. • Add a new circuit, either a new 33kV circuit potentially from Velmore BSP.
Nursling GSP to Winchester BSP circuits.	2041-2045	2036-2040	2041-2045	2046-2050	102	N-1, outage of one of the circuits.	The 132kV circuits between Nursling GSP and Winchester BSP are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the lower rated sections of the circuits to Winchester BSP or add a third circuit. • Shift load on the 33kV network by shifting primary substations over to Rownhams BSP.
Nursling GSP 33kV works.							
Southampton B BSP to Central Bridge PSS 33kV circuits.	2036 - 2040	2031 - 2035	2036 - 2040	2041 - 2045	102	N-1, outage of Central Bridge PSS circuits.	The three 33kV circuits between Southampton B BSP and Central Bridge PSS and the transformers at Central Bridge PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing circuits to and transformers at Central Bridge PSS, either by adding additional assets or uprating the existing ones. • Shift load on the 11kV network over to Western Esplanade PSS.
Central Bridge PSS transformers.	2041 - 2045	2036 - 2040	2041 - 2045	2046 - 2050	102	N-1, outage of Central Bridge PSS circuits.	
Velmore BSP to Chandlers Ford PSS 33kV circuits.	2036 - 2040	2031 - 2035	2031 - 2035	2036 - 2040	107	N-1, outage of Chandlers Ford PSS circuits.	The 33kV circuits between Velmore BSP and Chandlers Ford PSS and the transformers at Chandlers Ford PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuits and transformers, either by adding additional assets or uprating the existing ones.
Chandlers Ford PSS transformers.	2036 - 2040	2036 - 2040	2031 - 2035	2041 - 2045	106	N-1, outage of a transformer.	

							- Shift load of the 11kV network over to Eastleigh North or Velmore PSS. - The rest of the primaries in the area are also projected to have constraints therefore a new primary may be the most efficient approach.
Houghton PSS transformers.	2036 - 2040	2031 - 2035	N/A	N/A	101	N-1, outage of a transformer.	The transformers Houghton PSS are both projected to be overloaded in N-1 conditions, as is the 33kV circuit between Dunbridge and Houghton primaries. Due to their proximity, it's proposed these works are completed together. Potential options to resolve this constraint are: - Reinforce the existing transformers at Houghton PSS and the circuits between them, either by adding additional assets or uprating the existing ones. - Build new 33kV circuits feeding Houghton PSS directly from either Winchester or Rownhams BSP and reinforce existing transformers. - Move Houghton PSS to be fed from Melksham GSP and reinforce existing transformers.
Dunbridge PSS to Houghton PSS 33kV circuits.	2041 - 2045	2036 - 2040	N/A	N/A	102	Intact.	
Shirley PSS transformers.	2036 - 2040	2041 - 2045	2036 - 2040	2046 - 2050	100	N-1, outage of the Shirley PSS circuits.	Shirley PSS consists of two transformers that are projected to both be constrained under N-1 conditions. Potential options to resolve this constraint are: - Reinforce the existing transformers at Shirley PSS, either by adding additional assets or uprating the existing ones. - Shift load on the 11kV network over to Maybush PSS or Western Esplanade PSS depending on capacity. - The construction of a new primary in the area to relieve load in a constrained area.
Rownhams BSP to IBM Hursley /	2036 - 2040	2031 - 2035	2031 - 2035	2036 - 2040	102	N-1, outage of the IBM	The 33kV circuit section between Rownhams BSP and IBM Hursley PSS and between IBM Hursley PSS and

Silkstead PSS 33kV circuits (section).						Hursley PSS circuits.	Silkstead PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuit sections, either by adding additional assets or uprating the existing ones. • Shift load of the 11kV network over to Eastleigh North or Velmore PSS. • The rest of the primaries in the area are also projected to have constraints therefore a new primary may be the most efficient approach.
IBM Hursley PSS to Silkstead PSS 33kV circuits.	2041 - 2045	2036 - 2040	2036 - 2040	2041 - 2045	100	N-1, outage of a transformer.	
Rownhams BSP to Maybush PSS 33kV circuits.	2041 - 2045	2046 - 2050	2041 - 2045	N/A	101	N-1, outage of Maybush PSS circuits.	The two 33kV circuits between Rownhams BSP and Maybush PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuits to Maybush PSS, either by adding additional assets or uprating the existing ones. • Shift load of the 11kV network over to Lordshill PSS or Shirley PSS.
North Baddesley PSS to Romsey PSS 33kV circuits.	2041 - 2045	N/A	2046 - 2050	N/A	100	N-1, outage of the Romsey PSS circuits.	The two 33kV circuits between North Baddesley PSS and Romsey PSS are expected to be overloaded in N-1 conditions. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuits to Romsey, either by adding additional assets or uprating the existing ones. • Add new circuits that feed Romsey PSS directly from Rownhams BSP. This was also suggested earlier to remove a constraint on the North Baddesley. This therefore may be the best whole systems solution. • Shift load of the 11kV network over to North Baddesley PSS.
Southampton A BSP to Shirley PSS circuits.	2046 - 2050	N/A	N/A	N/A	103	N-1, outage of Shirley PSS circuits.	The two 33kV circuits between Southampton A BSP and Shirley PSS are expected to be overloaded in N-1

							conditions. Potential options to resolve this constraint are: • Reinforce the existing 33kV circuits to Romsey, either by adding additional assets or uprating the existing ones. • Shift load of the 11kV network over to Basset PSS or Lordshill PSS. • The construction of a new primary in the area to relieve load in a constrained area.

Table 8 Summary of system needs identified in this strategy through to 2050 along with indicative solutions.

8.5. Future requirements of the High Voltage and Low Voltage Networks

Our HV/LV spatial plans have shown that there is no clear pattern to future demands on these lower voltage networks. We're therefore planning on a forecast volume basis, and this section provides further context on this work for both the Nursling GSP's high voltage and low voltage network needs to 2050.

8.5.1. High Voltage Networks

As well as the EHV system needs identified in the previous section, increased penetration of low carbon technologies (LCTs) connecting to the distribution network will result in system needs on the High Voltage (HV) and Low Voltage (LV) networks. To provide a view on the impact of these technologies on the distribution network here we've used the load model that is produced by SSEN's Data and Analytics team.[41]

The load model is a machine learning product which estimates a half-hourly annual demand profile for each household based on a series of demographic, geographic and heating type factors. This enables us to estimate capacity on the electricity network while protecting individual customers data privacy by using modelled data. These views are then aggregated up the network hierarchy based on the combinations of customers associated with each asset. This view is supplemented with the DFES to highlight the projected impact of LCTs on the network.

For the 30 primary substations supplied by Nursling GSP, the percentage of secondary substations where projected peak loading exceeds the nameplate rating of the secondary transformer was taken from the load model data. Figure 16 demonstrates how this percentage changes under each DFES scenario from now to 2050.

To satisfy these requirements a variety of solutions will need to be investigated. It is likely that a combination of flexibility and asset replacement will be employed to resolve the projected HV system needs. It is important to

41 SSEN Open Data Portal, 2023, SSEN Secondary Transformer – Asset Capacity and Low Carbon Technology Growth.

note that for HV needs, flexibility is likely to be provided through Distributed Energy Resources (DER), Consumer Energy Resources (CER), and domestic/commercial Demand Side Response (DSR). One of the challenges associated with procuring flexibility to High Voltage and Low Voltage system needs is that only a small number of customers can provide a flexible service due to the requirement to be supplied by a specific secondary transformer. As the role of aggregators develops, we may see a shift in the potential for flexibility in an area. Where the magnitude of an overload is too large for flexibility to be feasible, addition of new assets or asset replacement will be necessary.

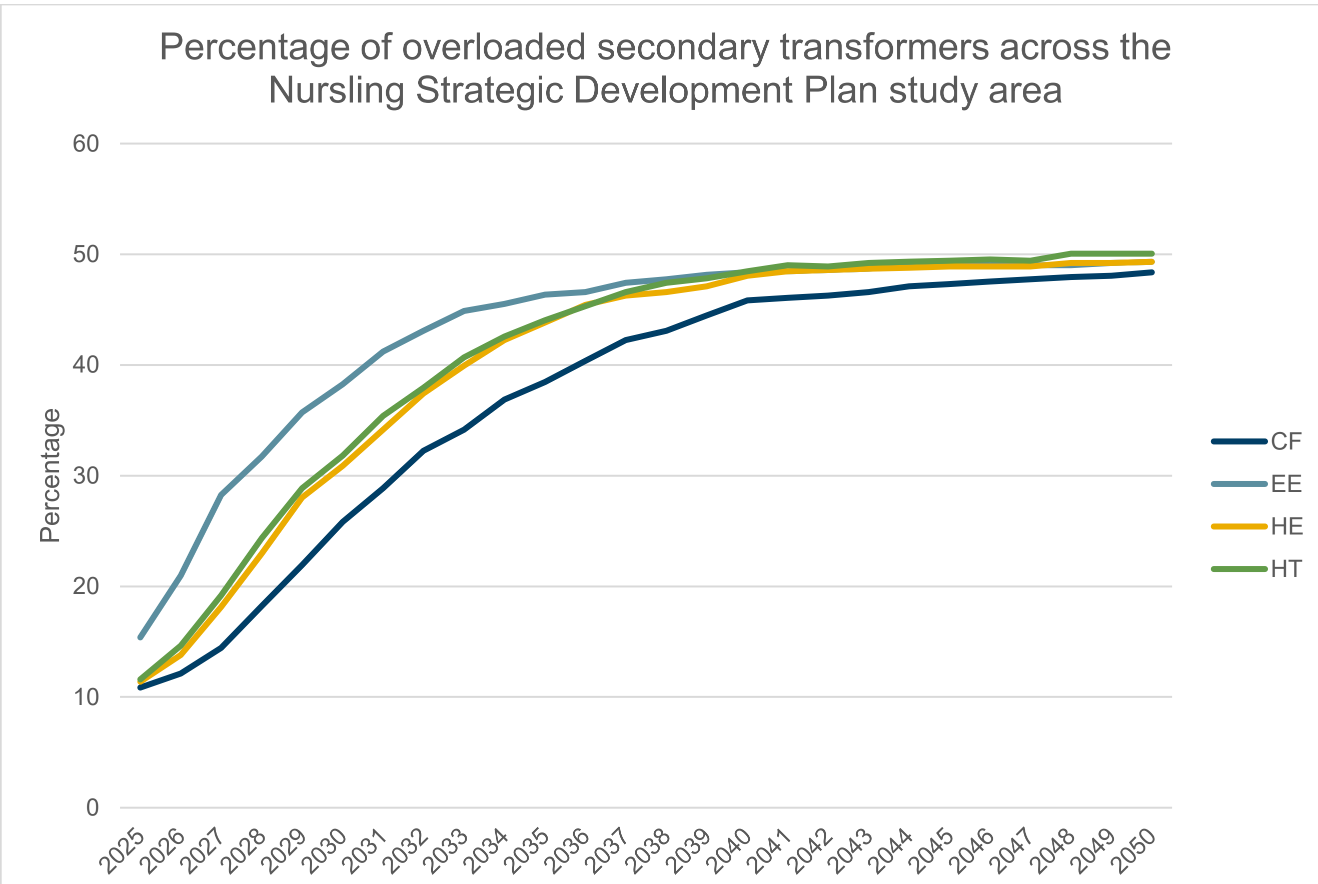

Figure 16 Nursling GSP projected secondary transformer loading. Source: SSEN Load Model

Considering the Just Transition in HV development

SSEN are building on the findings from the Vulnerability Future Energy Scenarios (VFES). This innovation project investigated how the use of new foresighting techniques, along with data analytics and expert validation could be used to identify and forecast consumers in vulnerable situations as we move toward net zero. Use of the outputs from the VFES enable SSEN to develop the network in a way that truly accounts for the levels of vulnerability our customers in different locations face.

One of the outputs from this innovation project was the report produced by the Smith Institute.[42] This work groups LSOAs[43] that share similar drivers of vulnerability. The groupings were informed by mathematical analysis of demographic data and of SSEN's priority service register, using machine learning to model the complex relationships that exist between the two. The resulting group numbers and descriptions are shown in Table 10.

Group Number & Level of Vulnerability	Description of Group
1 – Very high	Driven up by higher levels of poor health and disability/mental health benefit claimants, reduced by smaller household sizes.
2 – High	Driven up by larger household sizes, reduced by lower elderly population levels.
3 – High	Driven up by larger elderly population levels, reduced by lower levels of disability and mental health benefit claimants.
4 – Slightly higher than average	Driven up by larger elder population levels and moderately higher provision of care, reduced by smaller household sizes.
5 – Slightly lower than average	Driven down by lower elderly population levels and larger levels of ethnic diversity, increased by higher household sizes and greater provision of care.
6 – Low	Driven down by lower level of bad health and disability/mental health benefit claimants, increased by moderate elderly population levels and household sizes.
7 – Very low	Driven down by substantially lower elderly population levels, less provision of care and a higher level of households in private rented dwellings.

Table 9 VFES Groupings

As shown in Figure 17, all the VFES groupings defined in the table above are present across the area supplied by Nursling GSP. There are also areas that the VFES has identified as very high vulnerability that are also served by several secondary transformers that are projected to be overloaded by 2028 under the Holistic Transition pathway. Proactive reinforcement of these assets will ensure that those in the area are less likely to be left behind in the energy transition while also improving the resilience of the network in these areas.

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42 VFES Machine Learning Discovery of Vulnerability Signatures Report, Smith Institute, 08/11/2022, (NIA SSEN 0063: VFES – Vulnerability Future Energy Scenarios | SSEN Innovation)

43 Lower layer Super Output Areas (LSOAs) (Statistical geographies - Office for National Statistics)

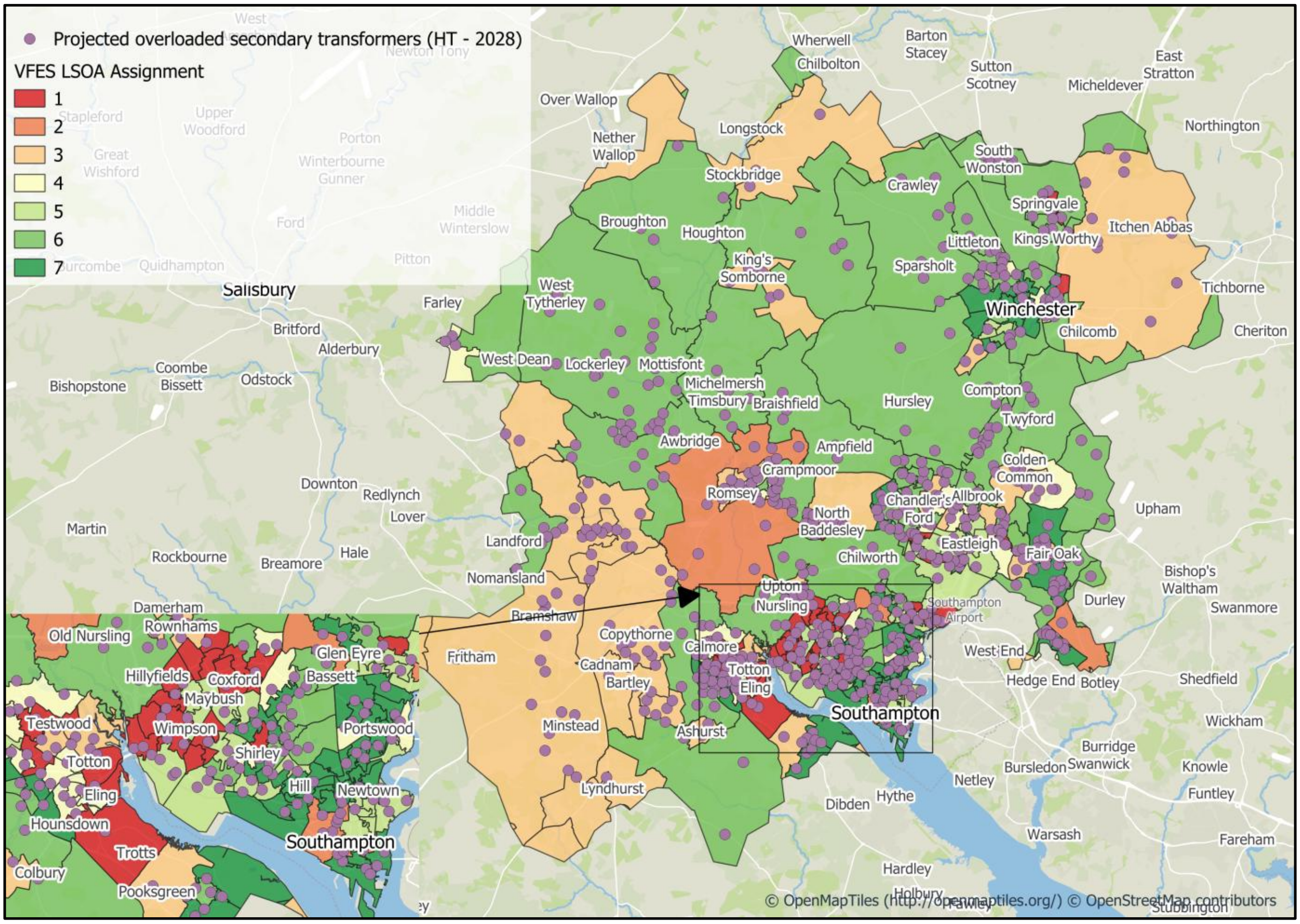


Figure 17 Nursling GSP supply area VFES output with secondary transformer overlay.

8.5.2. Low Voltage Networks

Drivers for interventions in low voltage networks may be either capacity related or be driven by voltage requirements. We're progressing options to resolve both of these drivers. From a network perspective the solution typically involves upgrading the number of LV feeders to split/ balance the load and improve voltage or to install another substation at the remote end of the LV network to balance load and improve voltage. In both instances, flexibility at a local level, especially voltage management products linked to battery export and embedded generation such as solar is likely to be required alongside traditional reinforcement.

We're leveraging recent innovation work through Project LEO (Local Energy Oxfordshire) and My Electric Avenue to inform this strategy. Enhanced network visibility through Smart meter data analytics and low-cost substation feeder monitoring is also necessary to enable appropriate dispatch of services and network reconfiguration.

Capacity driven needs – Thermal constraints tend to materialise in the sections of cable leading to the substation (transformer) where multiple customer loads join together. We're modelling requirements out to 2050 leveraging low voltage monitoring and metering equipment combined with analytical techniques. This will demonstrate how the magnitude of the system need of the LV network across Nursling changes across scenarios and years out to 2050.

Voltage driven needs – Generally, connection of Low Carbon Technology and large loads such as heat pumps is limited by voltage constraints before thermal constraints when located more than around 150m from the local secondary transformer. Increased loading on our low voltage networks can reduce the voltages to consumer premises. This is a non-linear relationship and as such requires more complex analysis. We're currently undertaking analysis to better understand the extent of this future need.

Initial analysis indicates that 36% of low voltage feeders may need intervention by 2035 and 47% by 2050 under the HT pathway as shown in Figure 18. The need is unlikely to be triggered until 2028 onwards. However, due to the timeline to grow workforce, with jointing skills taking typically 4 years to be fully competent, it is necessary to start recruitment and initiate programmes ahead of need to be able to deliver the required volumes from 2028 onwards.

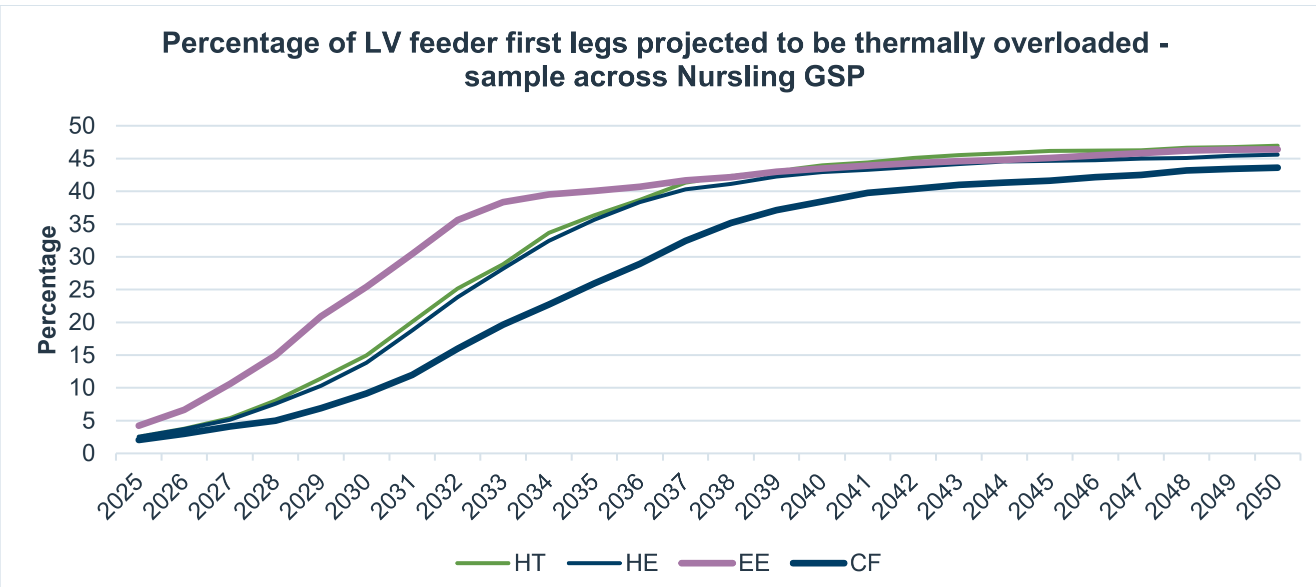


Figure 18 Percentage of LV feeders projected to be overloaded under example GSP

9. RECOMMENDATIONS

The review of stakeholder engagement and the SSEN 2024 DFES analysis provides a robust evidence base for load growth across Nursling GSP group in both the near and longer term. Drivers for load growth across Nursling GSP arise from multiple sectors and technologies. These drivers impact not only our EHV network but will drive system needs across all voltage levels.

Across the Nursling GSP supply area, a significant volume of work has already been triggered through the DNOA process and published in DNOA Outcomes Reports. This delivers a significant amount of additional capacity in the area over the next decade. These are driven by customer connections and system needs that will arise this decade but are being developed to meet 2050 needs.

The findings from this report have provided evidence for 5 key recommendations:

1. System needs that have been identified at earlier timescales (ahead of 2035) should be studied in more detail and these should be progressed through the DNOA process. This relates to the assets tabulated in section 8.3.

2. The primaries with 6.6kV legacy voltage network should be rationalised to 11kV network, alongside the works suggested through the DNOA process above. This will standardise the voltages of the network operated by SSEN and will align with the voltage rationalisation work happening in West London.

3. The decarbonisation of the maritime industry has triggered a number of asset reinforcements across the Southampton area. It's recommended that SSEN continues to engage closely with ABP and Red Funnel, so the decarbonisation of the maritime industry and the corresponding electricity demands are best understood.

4. Industrial decarbonisation across the Nursling GSP will increase the electricity demand out to 2050. Continued engagement with the Solent Freeport and the two individual sites is needed to gain a better understanding on the load that will be required and when it will be needed. Further engagement with the University of Southampton, Southampton Solent University, and University Hospital Southampton is also recommended so their capacity needs out to 2050 can be included in network plans.

5. Considering the significant growth in DERs expected across Nursling GSP supply area, engagement with NGET and NESO should be proactive creating a long-term plan for the area which incorporates the outputs of CP2030 and connections reform.

Actioning these recommendations will allow SSEN to develop a network that supports local net zero ambitions. By doing so, contributing to net zero targets at a national level.

APPENDICES

Appendix A Further detail on existing network infrastructure – Primary Substations

Substation Name	Site Type	Number of Customers Served (approximate)	2023 Substation Maximum demand in MVA
Bassett	Primary Substation	8093	14.8
Bevois Valley	Primary Substation	7535	12.8
Bishopstoke	Primary Substation	112	5.9
Central Bridge	Primary Substation	5785	14.7
Chandlersford	Primary Substation	10552	12.5
Chapel	Primary Substation	3864	11.1
Dunbridge	Primary Substation	3674	7.9
Eastleigh North	Primary Substation	17504	25.9
Fletchwood	Primary Substation	11011	14.8
Gordon Road	Primary Substation	9691	19.8
Harestock	Primary Substation	9015	15.1
Hedge End	Primary Substation	3866	8.6
Houghton	Primary Substation	2679	6.6
IBM Hursely	Primary Substation	N/A	N/A
Lordshill	Primary Substation	5810	11
Maybush	Primary Substation	11505	15.9
Mel Marchwood	Primary Substation	2065	#N/A
New Docks	Primary Substation	1	12.8
North Baddesley	Primary Substation	8129	13.6
Regents Park	Primary Substation	5081	12.3
Romsey	Primary Substation	7985	12.9
Shirley	Primary Substation	12016	12.9

Silkstead	Primary Substation	3777	7.2
Southampton NR (C12L5)	Primary Substation	N/A	10
Southampton NR (C2L5)	Primary Substation	N/A	8.8
St Cross	Primary Substation	9709	12.7
Totton	Primary Substation	8440	14.4
Velmore	Primary Substation	8380	19.8
Western Esplanade	Primary Substation	10097	23.5
Woodmill Lane	Primary Substation	6892	8.5

Table 10 Nursling GSP primary substations, customer counts, and peak demand 2023/24.

Appendix B Existing network schematics (33kV network)

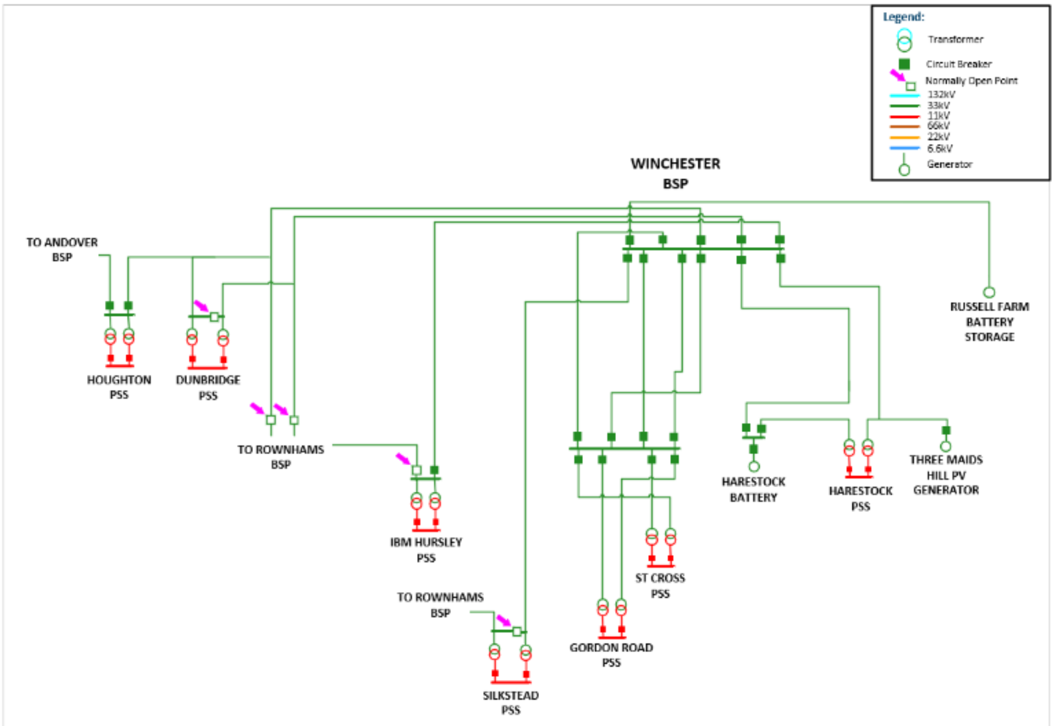


Figure 19 Winchester BSP – Existing network schematic.

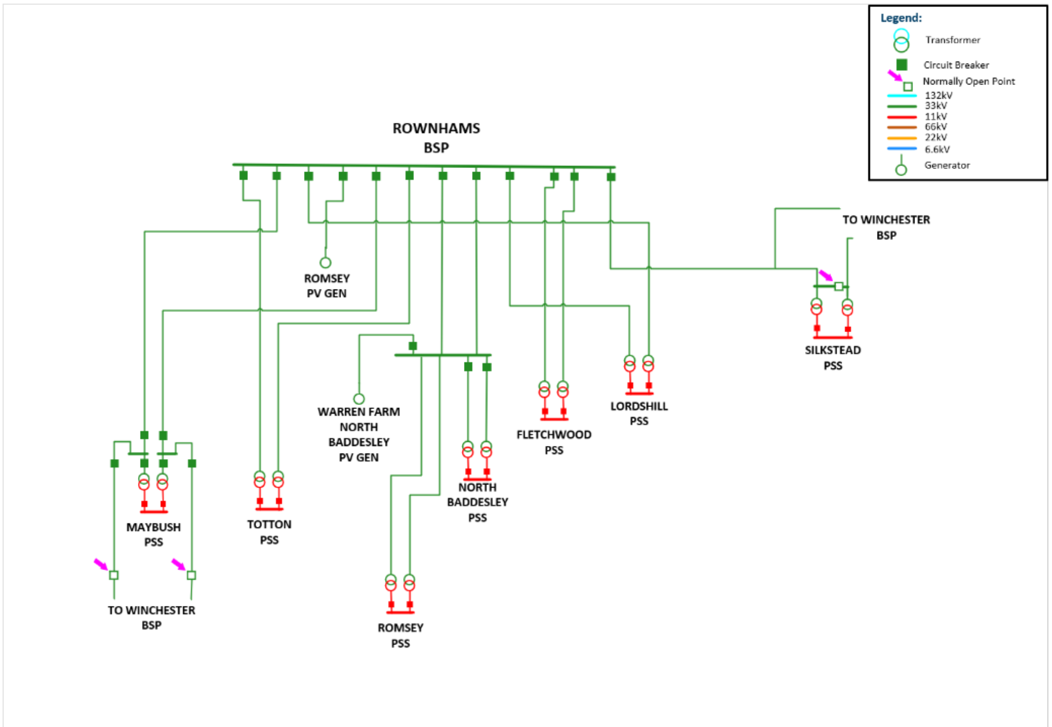


Figure 20 Rownhams BSP – Existing network schematic.

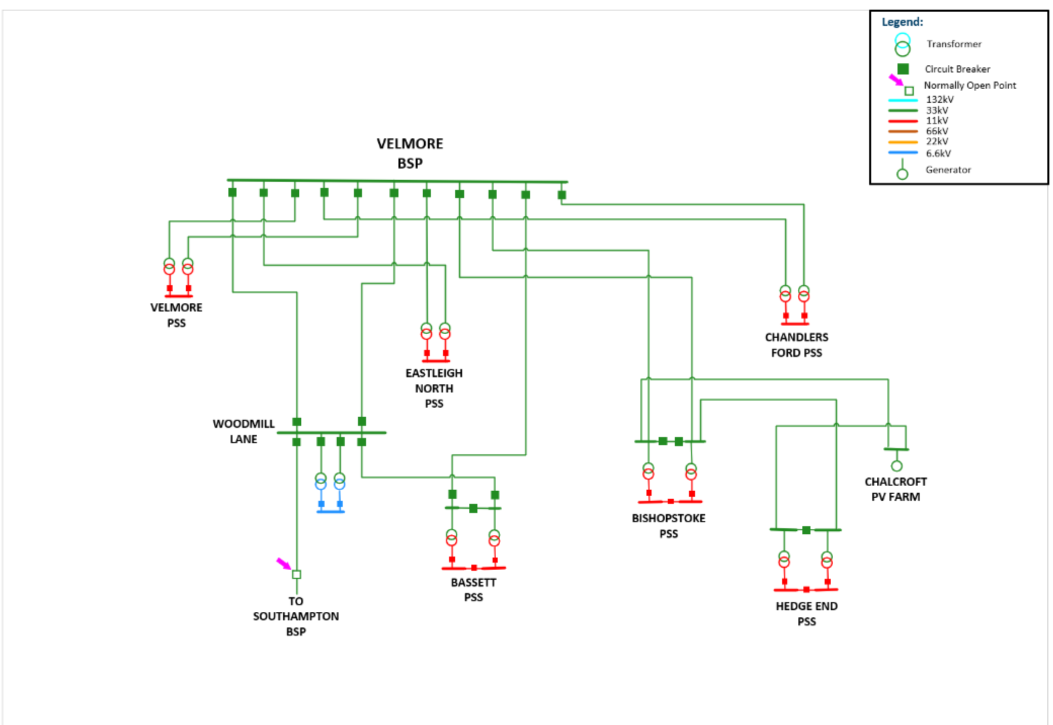


Figure 21 Velmore BSP – Existing network schematic.

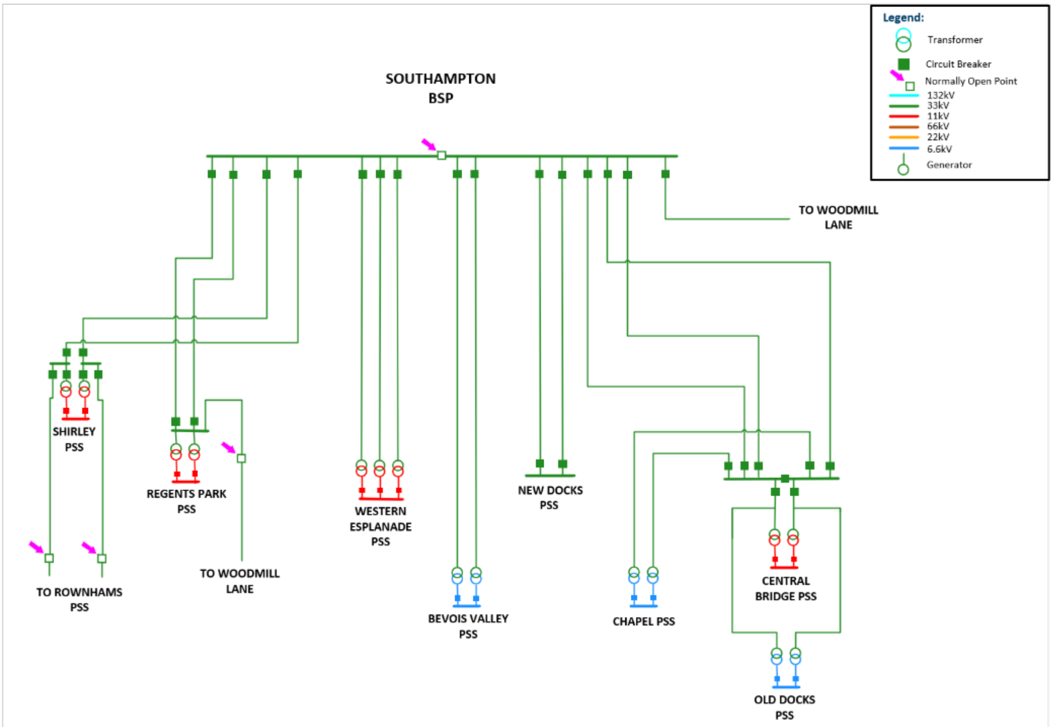


Figure 22 Southampton BSP Existing network schematic

Appendix C Future network schematics following completion of triggered works (33kV network)

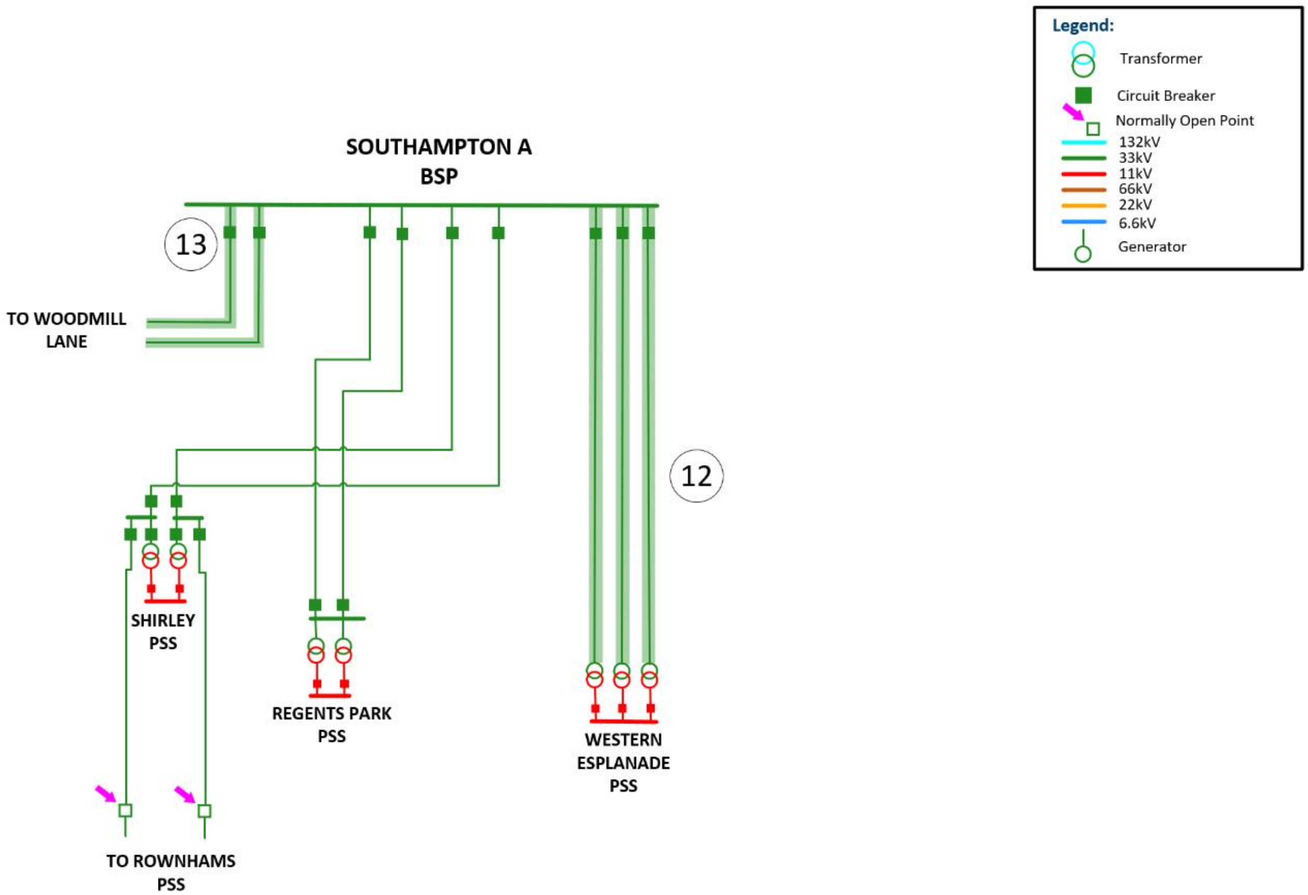


Figure 23 Southampton A BSP – Following the completion of triggered works.

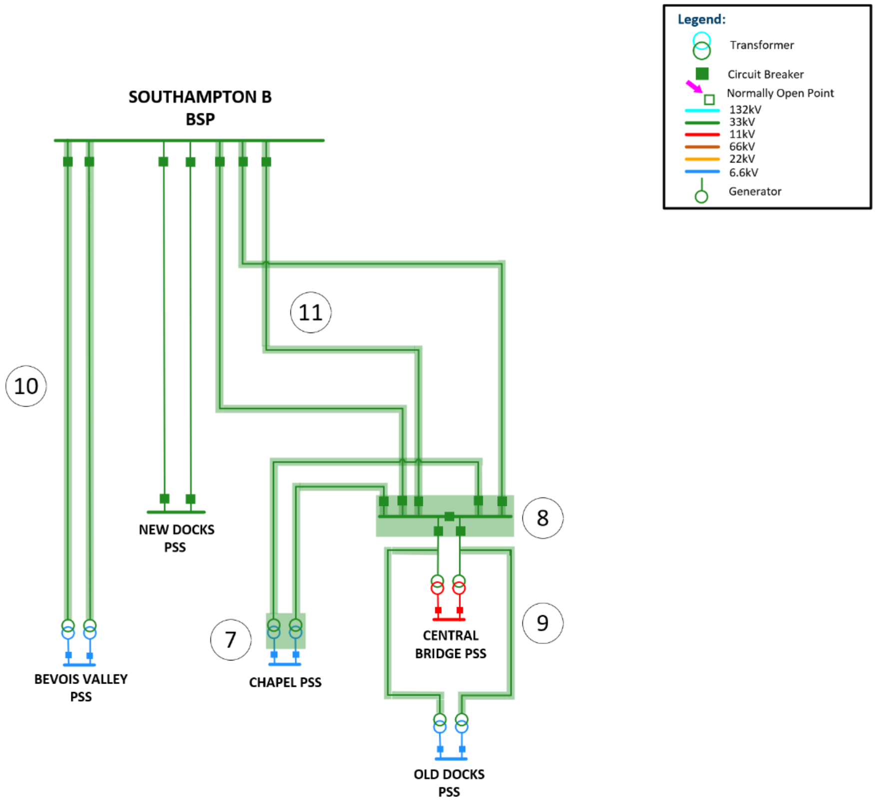


Figure 24 Southampton B BSP – Following the completion of triggered works.

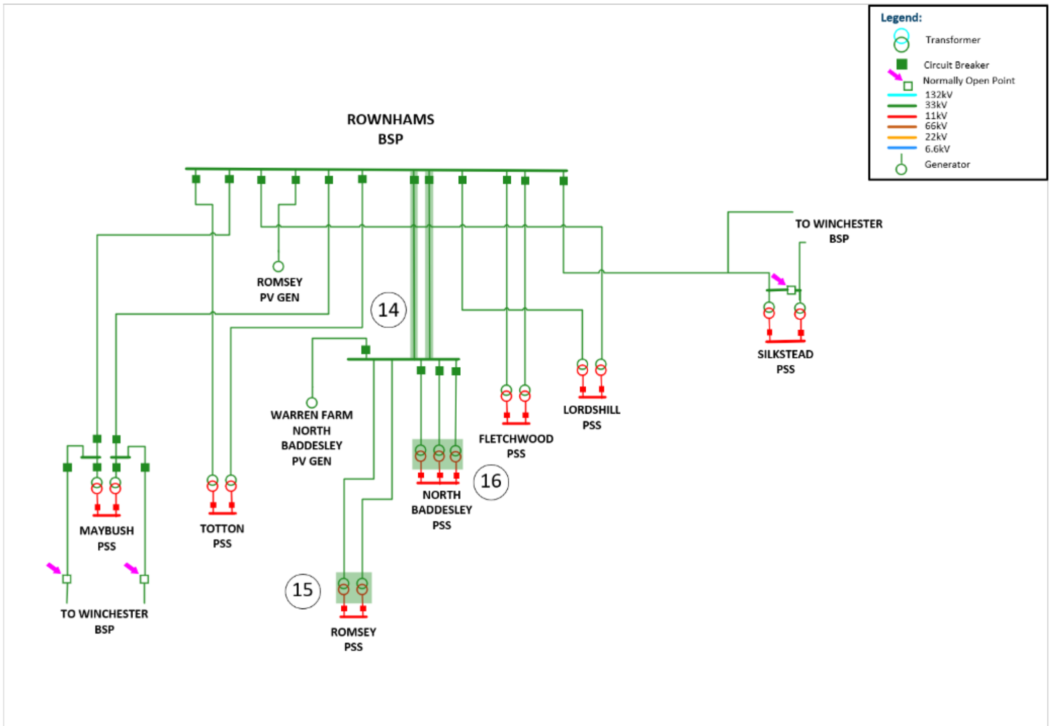


Figure 25 Rownhams BSP – Following the completion of triggered works.

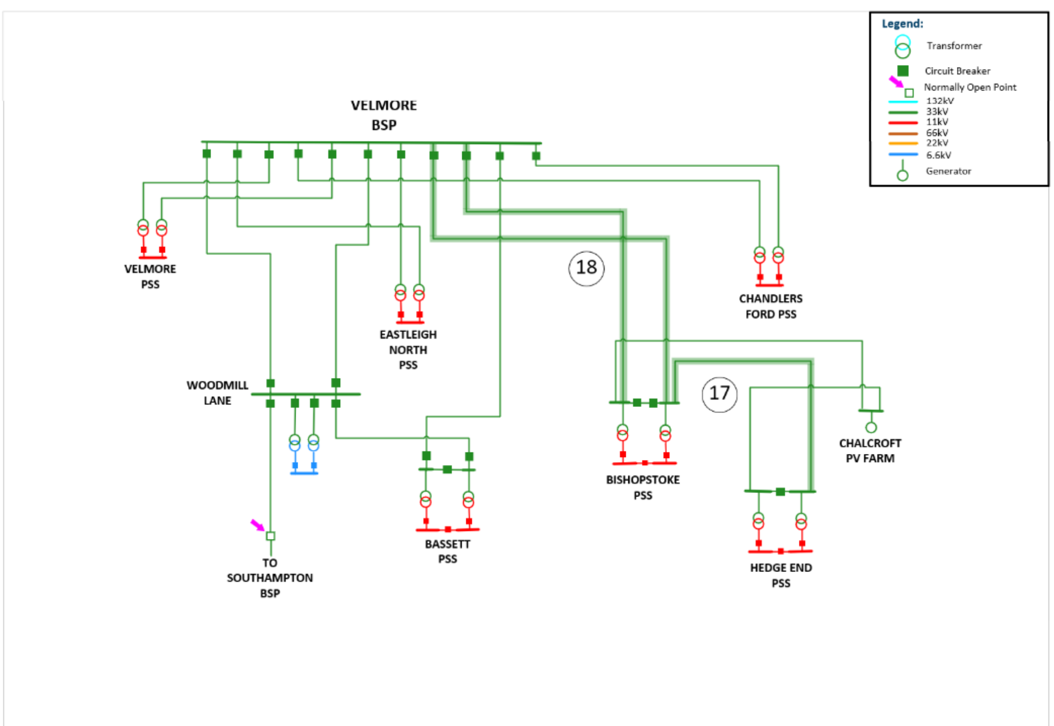


Figure 26 Velmore BSP – Following the completion of triggered works.

Appendix D Additional EHV/HV plans for other DFES scenarios

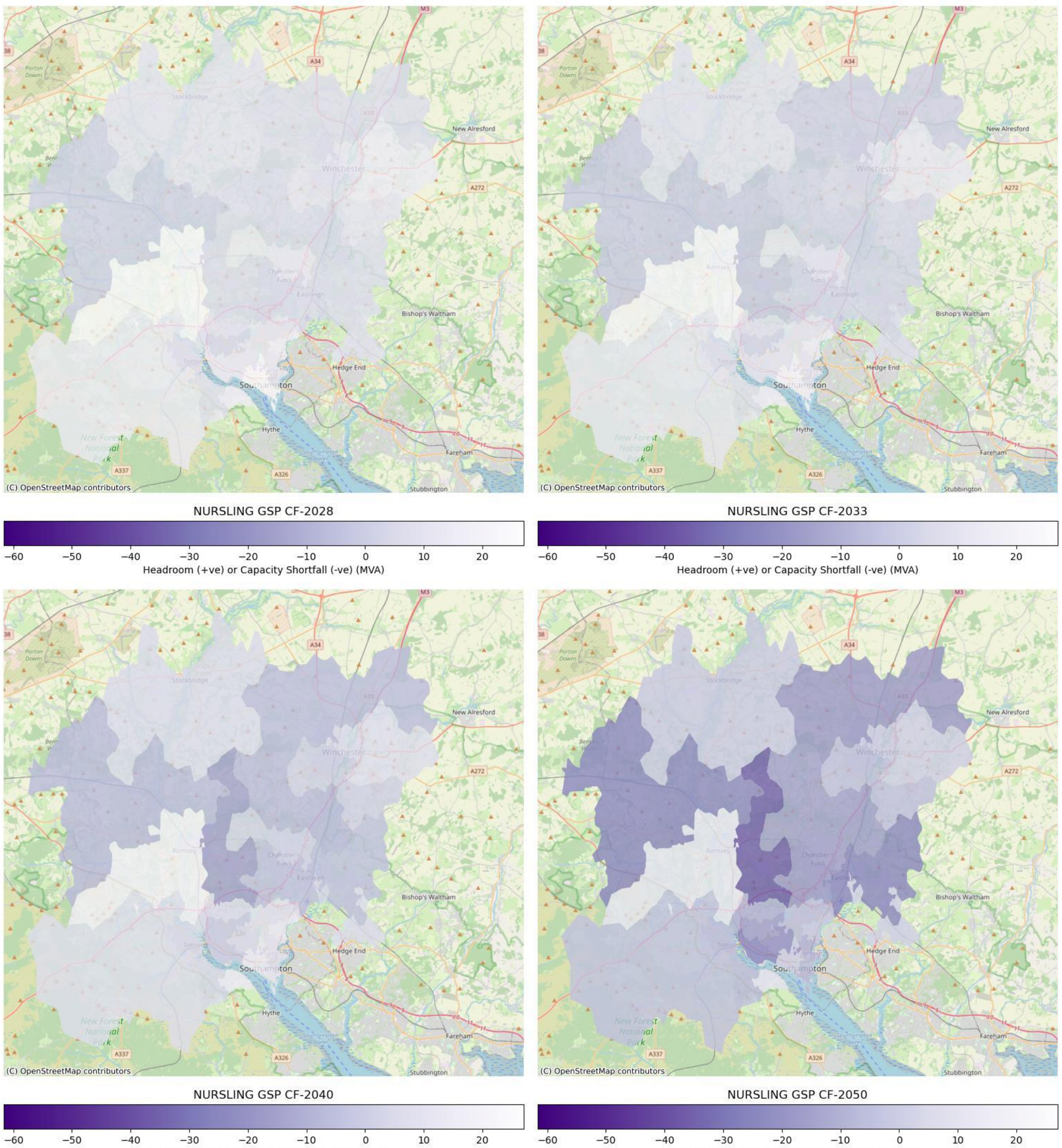


Figure 27 Nursling GSP – EHV/HV Spatial Plan – Counter Factual.

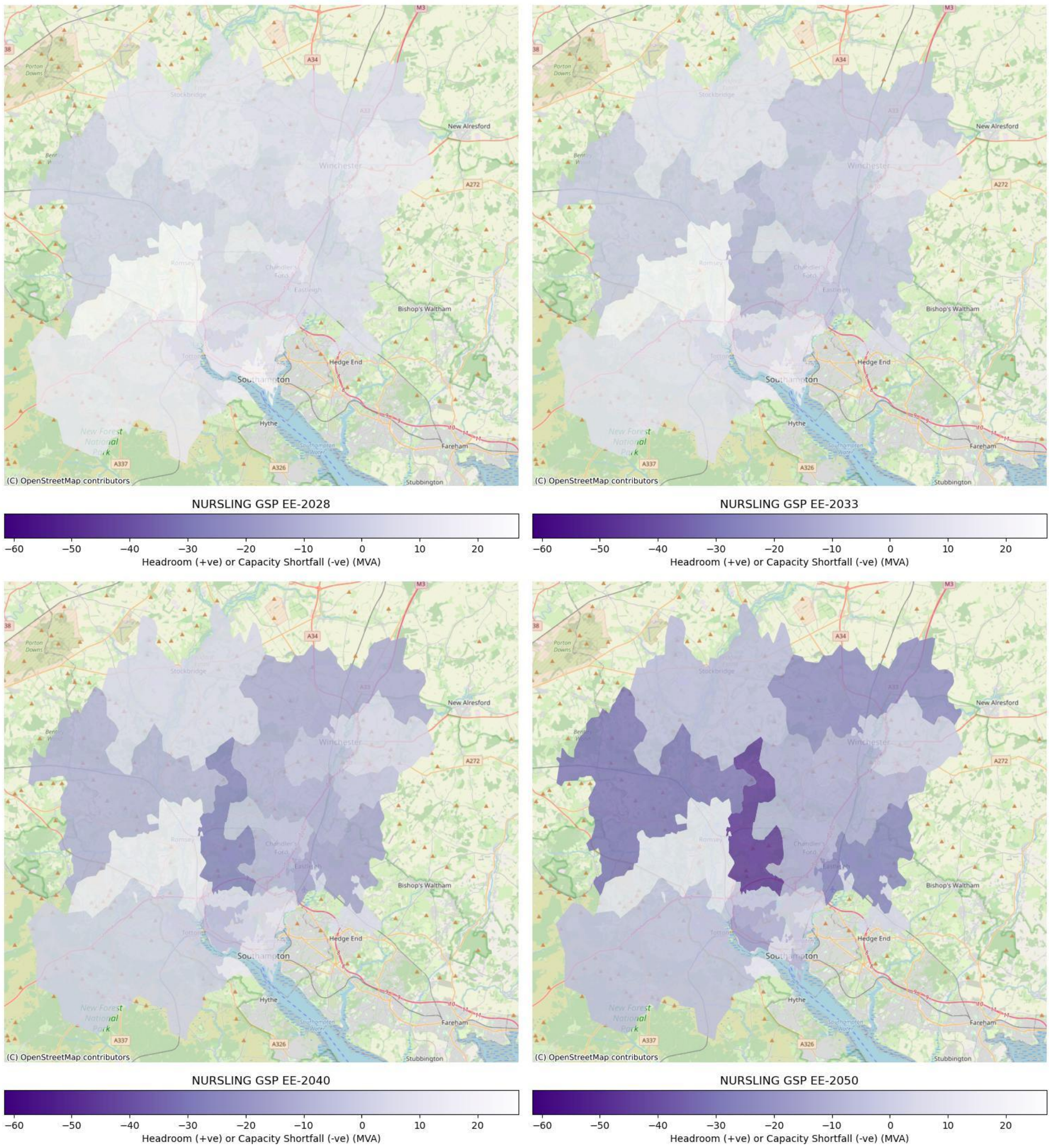


Figure 28 Nursling GSP – EHV/HV Spatial Plan – Electric Engagement.

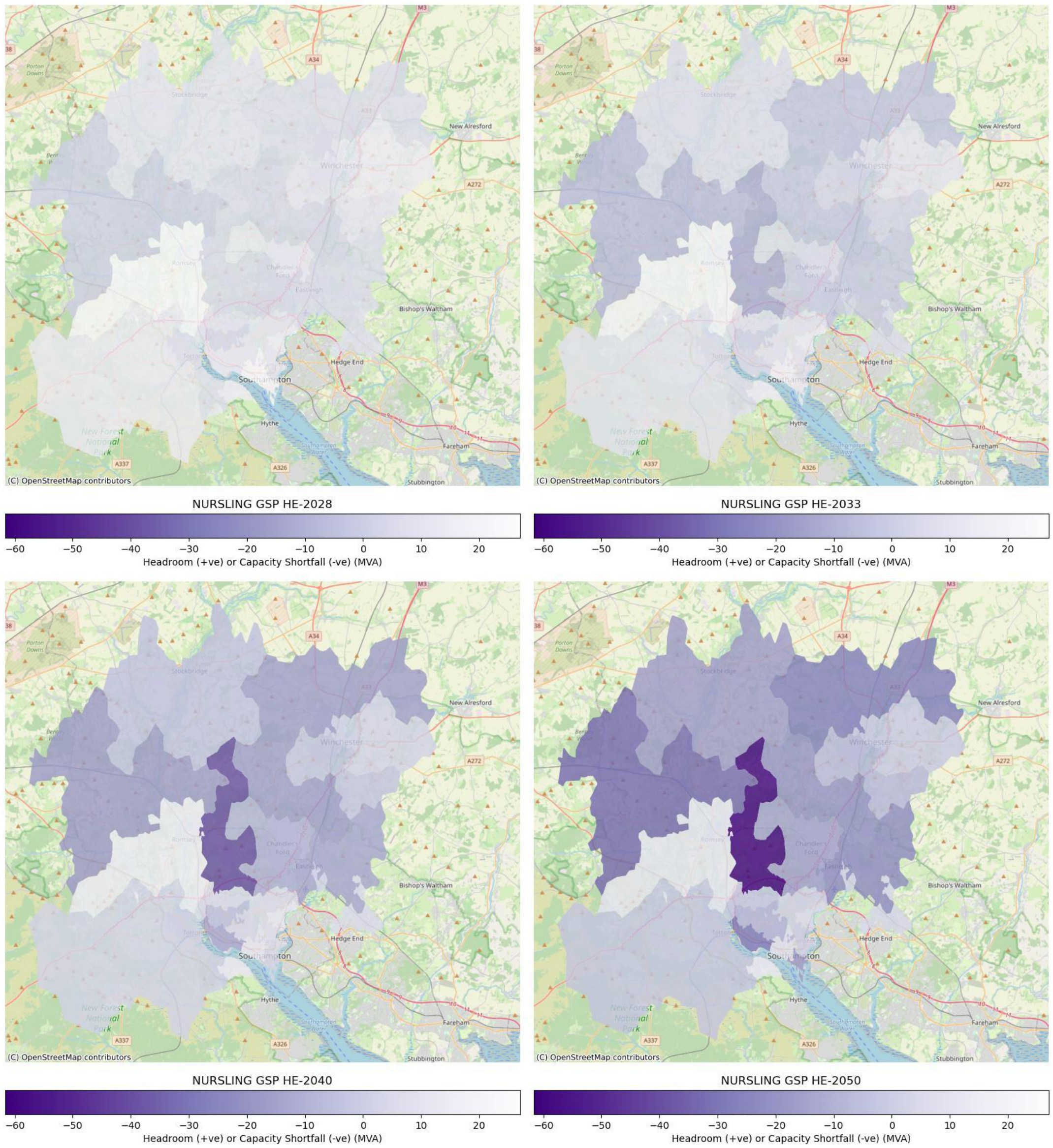


Figure 29 Nursling GSP – EHV/HV Spatial Plan – Hydrogen Evolution.

Appendix E Additional HV/LV plans for other DFES scenarios

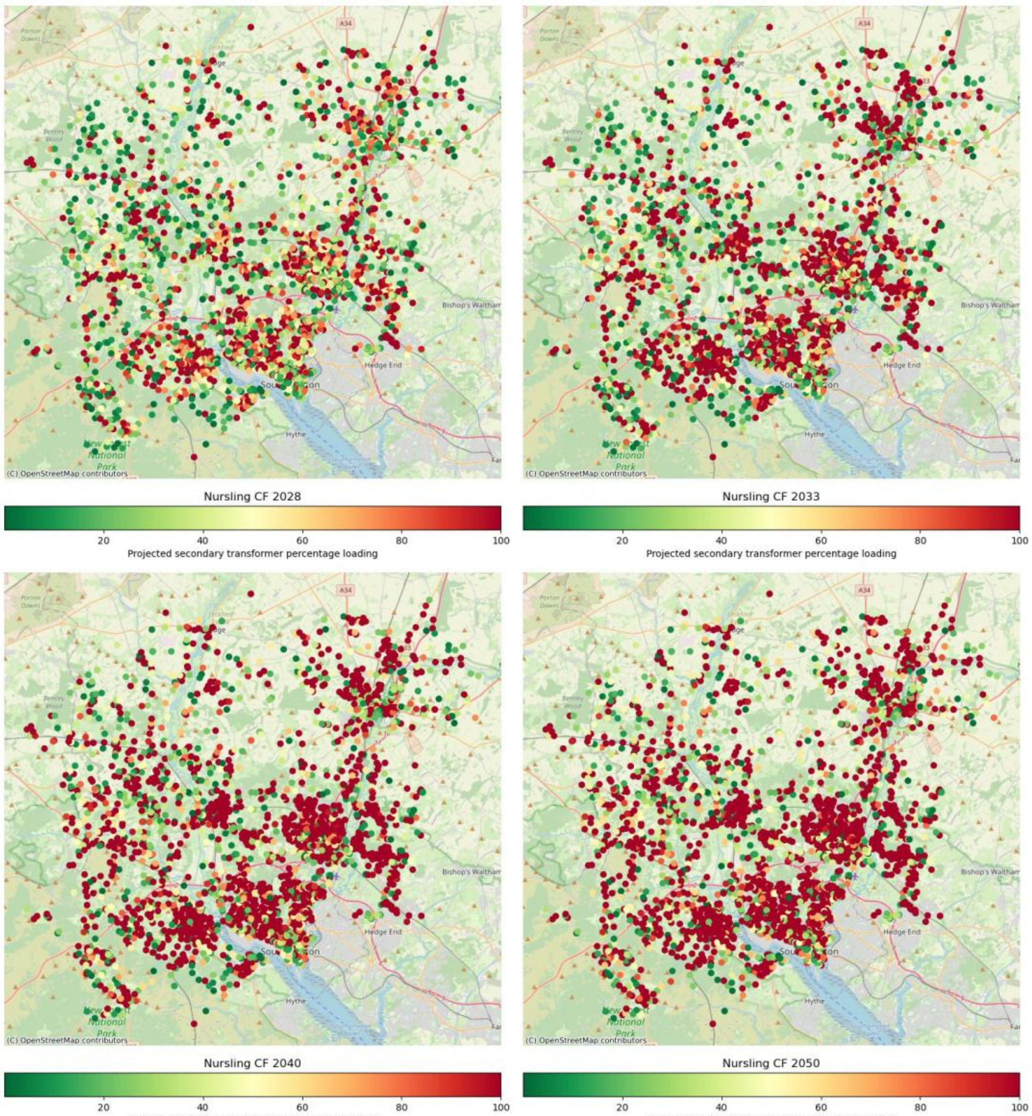


Figure 30 Nursling GSP – HV/LV Spatial Plan – Counterfactual.

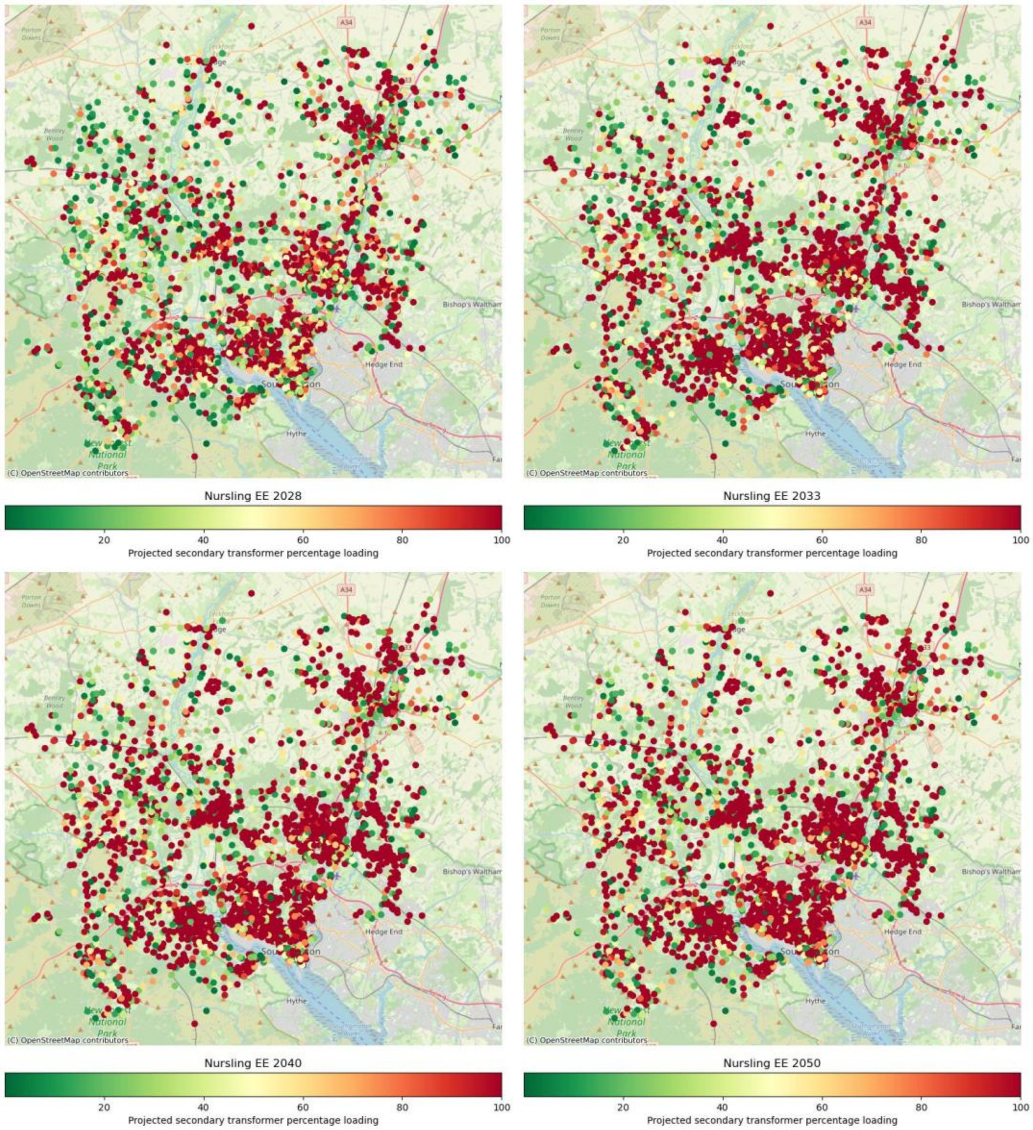


Figure 31 Nursling GSP – HV/LV Spatial Plan – Electric Engagement.

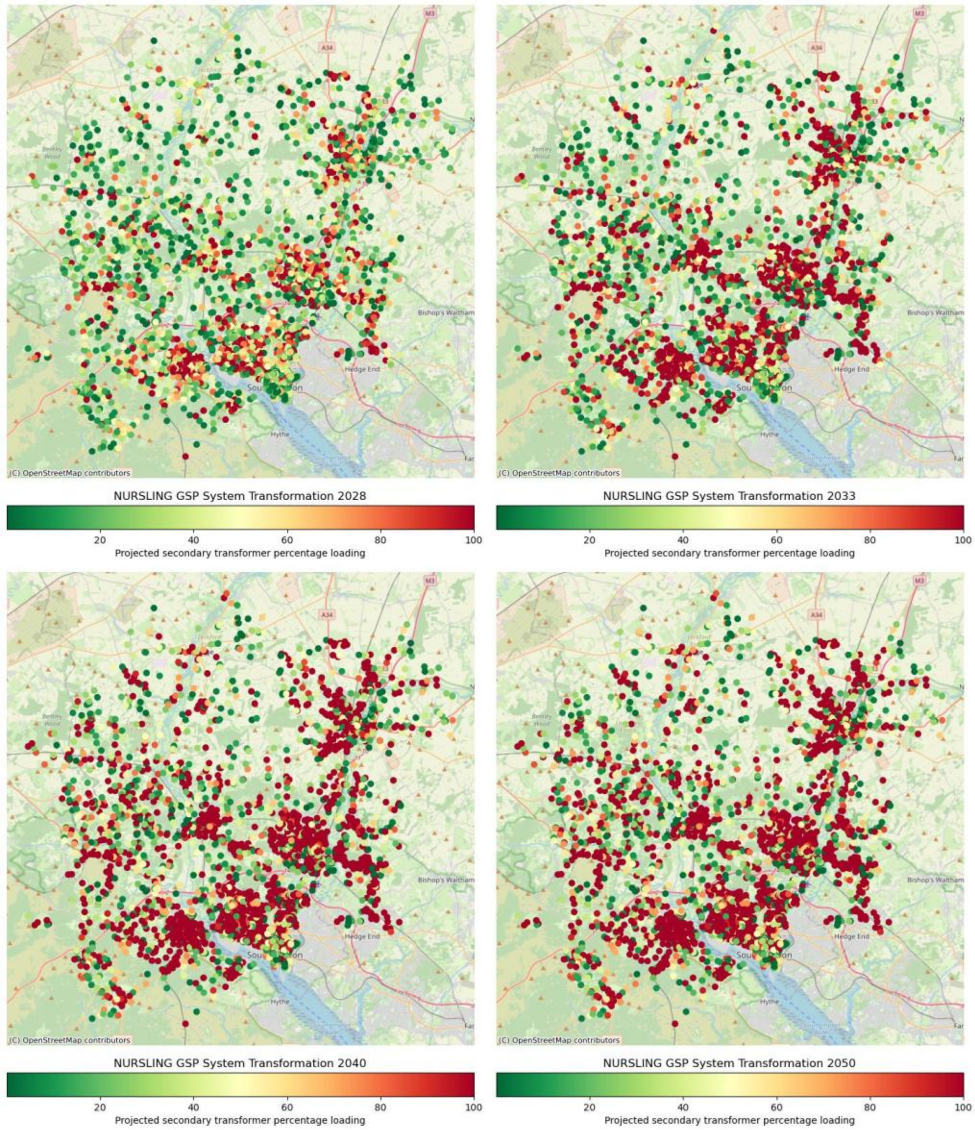


Figure 32 Nursling GSP – HV/LV Spatial Plan – Hydrogen Evolution.

Appendix F Relevant DNOA outcome reports

DNOA Outcome Report

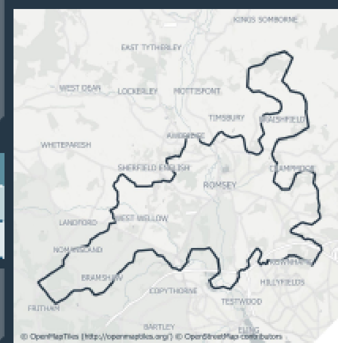
Romsey (Rownhams 33kV circuits) Ref. 0724-22

Scheme description

- Romsey and North Baddesley primary substations supply the town of Romsey to the north of Southampton. Postcode(s): SO16, SO43, SO51, SO52.
- Load related – Projected exceedance of the thermal rating of the 33kV circuit from Rownhams BSP to North Baddesley primary substation under an FCO condition.

Proposed option

- Flexibility solution used to defer reinforcement for 3 years followed by an asset solution. Addition of a third 33kV circuit from Rownhams BSP to Romsey primary substation.
- Option provides benefit of deferral through flexibility and long-term solution through asset reinforcement.
- Capacity released: 46.8MVA



System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Indicative flexibility price (if available):

- Availability: £113/MW/h
- Utilisation: £145/MWh

Reinforcement timeline

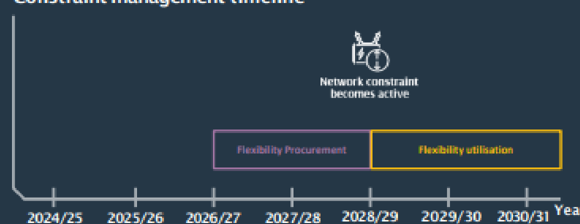
- Flexibility in 2028/29, 2029/30, and 2030/31.
- Reinforcement delivery by 2031/32.

Estimated peak MW outside firm network capacity under each scenario

Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	-	-	-	-	0.70	2.25	4.07
ST	-	-	-	-	-	-	-
LTW	-	-	-	-	2.96	5.05	7.26
FS	-	-	-	-	-	-	-

Constraint management timeline



32 | Scottish and Southern Electricity Networks Distribution | **DNOA Outcomes Report July 2024**

DNOA Outcome Report

Romsey (Romsey PSS)

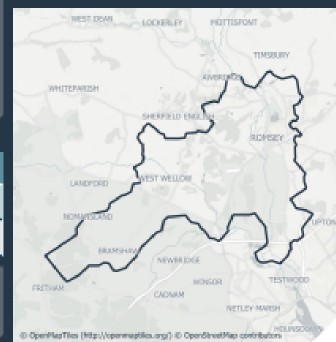
Ref. 0724-21

Scheme description

- Romsey primary substation supplies the town of Romsey to the north of Southampton. This primarily interacts with the Test Valley Borough Council area. Postcode(s): SO16, SO43, SO51.
- Load related – substation overload during FCO conditions due to forecasted demand growth.

Proposed option

- Flexibility solutions used to mitigate thermal overload for 3 years followed by asset solutions. Replace existing transformers with 2 new 20/40MVA rated 33/11kV transformers. Install 2 new 33kV outdoor transformer circuit breakers.
- Option provides benefit of deferral through flexibility and long-term solution through asset reinforcement.
- Capacity released phase 1: 8.1MVA



System need requirement

J	F	M	A	M	J	J	A	S	O	N	D
■	■	■	■					■	■	■	■

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Indicative flexibility price (if available):

- Availability: £113/MW/h
- Utilisation: £145/MWh

Reinforcement timeline

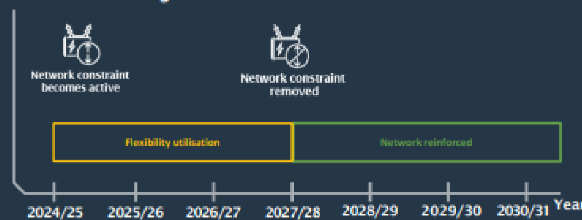
- Flexibility in 2024/25, 2025/26, and 2026/27.
- Reinforcement delivery by 2027/28.

Estimated peak MW outside firm network capacity under each scenario

Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	1.73	1.94	2.11	-(2.63)	-(3.46)	-(4.34)	-(5.42)
ST	1.67	1.85	2.05	-(2.30)	-(2.49)	-(2.72)	-(2.93)
LTW	1.59	1.80	2.48	-(3.50)	-(4.46)	-(5.67)	-(6.96)
FS	1.43	1.56	1.74	-(1.93)	-(2.10)	-(2.30)	-(2.49)

Constraint management timeline



31 | Scottish and Southern Electricity Networks Distribution | **DNOA Outcomes Report July 2024**

DNOA Outcome Report

Winchester (Winchester BSP)

Ref. 0724-38

Scheme description

- Winchester Bulk Supply Point supplies Winchester and the area to the west of the city. Postcode(s): SP5, SO20, SO21, SO22, SO23, S051.
- Fault level related – Fault level issue arises on the 33kV busbar, caused by forecasted generation growth.

Proposed option

- Asset solution to establish a new 33kV indoor double busbar.
- Flexibility solution is not utilised as it cannot be used to defer/prevent the fault level issue.
- This option offers a long-term solution to the fault level issue at the Winchester 33kv busbar, facilitating large-scale customer connections and downstream network reinforcement.
- Capacity released: N/A

System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Indicative flexibility price (if available):

- Availability: N/A
- Utilisation: N/A

Reinforcement timeline

- Reinforcement delivery by 2029/30.

Estimated peak MW outside firm network capacity under each scenario

Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LTW	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FS	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Constraint management timeline

DNOA Outcome Report

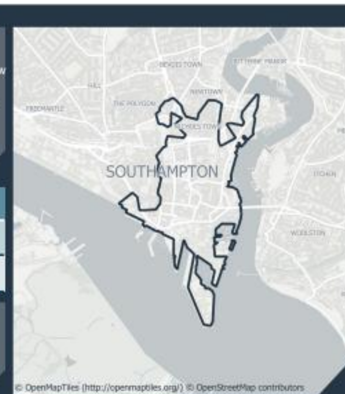
Southampton City Centre (Central Bridge 33kV circuits)

Scheme description

- Reinforce circuits from Central Bridge to Old Docks PSS and install three 33kV circuits from Central Bridge switching station to the new Southampton BSP. This will increase capacity in the city centre area. Postcode(s): SO14, SO15.
- Local authority: Southampton
- Load related – circuit thermal overload during FCO conditions due to forecasted demand growth.

Proposed option

- Smart/Asset solution: Reinforce existing circuits from Central Bridge to Old Docks. Install three new circuits from Central Bridge 33kV switchboard to the new Southampton BSP.
- Flexibility was unable to be utilised as it was shown to be uneconomical through use of the CEM tool.
- This option addresses the forecasted thermal issues on this part of the EHV network out to 2047.
- Capacity released: 60.1MV



System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Indicative flexibility price (if available):

- Availability price: N/A
- Utilisation price: N/A

Reinforcement timeline

- Reinforcement delivery by the end of 2027/2028.

Estimated peak MW outside firm network capacity under each scenario

Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	-	4.61	5.83	6.29	- (6.82)	- (7.47)	- (8.35)
ST	-	4.43	5.45	5.67	- (5.85)	- (6.04)	- (6.26)
LTW	-	4.88	6.27	6.89	- (7.43)	- (8.29)	- (9.27)
FS	-	4.02	4.98	5.16	- (5.33)	- (5.54)	- (5.79)

Constraint management timeline

28 | Scottish and Southern Electricity Networks Distribution | **DNOA Outcomes Report November 2024 – Ref. 1124-20**

DNOA Outcome Report

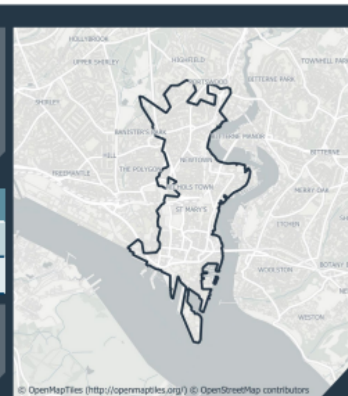
Southampton City Centre (Southampton BSP)

Scheme description

- The construction of a new BSP in Southampton will increase capacity in the city centre area. Postcode(s): SO14, SO15, SO17.
- Local authority: Southampton
- Load related – substation thermal overload during FCO conditions due to forecasted demand growth.

Proposed option

- Smart/Asset solution: Relocate the existing 33kV busbar to create space at the site. Construct new 132kV and 33kV busbars and install three new 132/33kV transformers. New dual underground 132kV circuit to connect the new BSP to Nursling GSP. Install 33kV dual interconnection between the existing BSP and the new BSP.
- Flexibility was unable to be utilised as it was shown to be uneconomical through use of the CEM tool.
- This option addresses the forecasted issues at Southampton BSP out to 2048.
- Capacity released: 180MVA



System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Indicative flexibility price (if available):

- Availability price: N/A
- Utilisation price: N/A

Reinforcement timeline

- Reinforcement delivery by the end of 2029/30.

Estimated peak MW outside firm network capacity under each scenario
Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	-	9.49	26.96	32.90	33.87	43.31	- (44.79)
ST	-	9.10	26.48	32.14	32.58	41.31	- (41.79)
LTW	-	9.97	27.96	34.39	35.54	45.50	- (47.40)
FS	-	8.46	25.43	30.86	31.18	39.90	- (40.39)

Constraint management timeline

DNOA Outcome Report

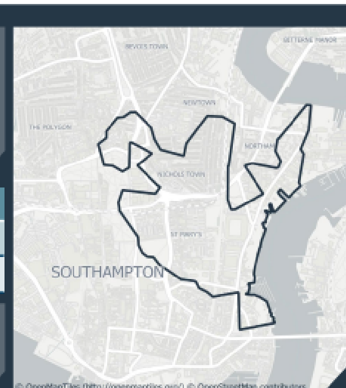
Southampton City Centre (Chapel PSS)

Scheme description

- Reinforce the existing switchboard at Chapel PSS and reinforce a portion of the existing 33kV supply circuit to increase capacity in the city centre area. Postcode(s): SO14, SO15.
- Local authority: Southampton.
- Load related – circuit thermal overload during FCO conditions due to forecasted demand growth.

Proposed option

- Flexibility/Asset solutions: Use of flexibility ahead of two stage reinforcement. Initially, reinforce the existing transformer breakers and bus section breakers with higher rated units. Later reinforce section of the 33kV circuit.
- This option addresses the forecasted security of supply issues on this part of the EHV network out to 2044.
- Capacity released: 17.3MVA



System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Indicative flexibility price (if available):

- Availability price: £108/MW/h
- Utilisation price: £133/MWh

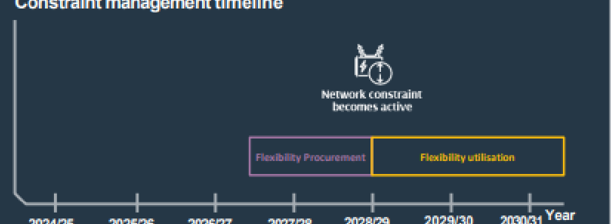
Reinforcement timeline

- Flexibility solution utilised from start of 2028/29 until end of 2032/33 for the switchboard and later in 2033/34 for the 33kV circuit.
- Reinforcement delivery by end of 2031/32 for the switchboard and 2033/34 for the 33kV circuit reinforcement.

Estimated peak MW outside firm network capacity under each scenario
Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	-	-	-	-	0.07	0.31	0.62
ST	-	-	-	-	-	-	-
LTW	-	-	-	0.04	0.26	0.58	0.95
FS	-	-	-	-	-	-	-

Constraint management timeline



Southampton and Winchester (Nursling GSP)

DNOA Outcome Report
Related SDP: Nursling

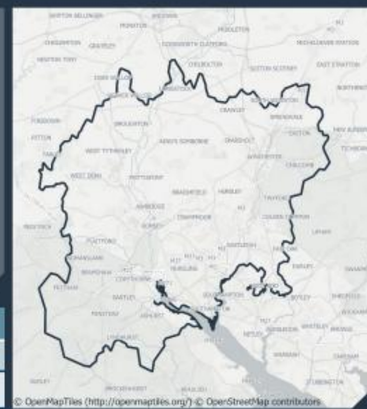
DNOA outcome: Asset solution.

Scheme description

- The reinforcement of the Nursling GSP will increase capacity in the Southampton and Winchester area. Postcode(s):. BH23, BH31, SO14-24, SO30-32, SO40-45, SO50-53, SP11, SP3, SP5.
- Local authority: Eastleigh, New Forrest, Southampton, Test Valley, Winchester.
- Load related – substation fault level issue during FCO conditions due to forecasted demand growth

Proposed option

- Asset Solution: Nursling GSP is forecast to exceed the nominal rating of existing plant. To mitigate this, two new indoor GIS switchboards will replace the existing single AIS board.
- Flexibility was unable to be utilised due to not being technically suitable for constraint type.
- This option addresses the forecasted fault level issue at Nursling GSP out to 2050.



Indicative flexibility price (if available)

Availability price: £ N/A /MW/h   Utilisation price : £ N/A /MWh

System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

Estimated peak MW outside firm network capacity under each scenario

	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35
CT	-	-	-	-	-	-	-	-	-	-
ST	-	-	-	-	-	-	-	-	-	-
LTW	-	-	-	-	-	-	-	-	-	-
FS	-	-	-	-	-	-	-	-	-	-

Constraint management timeline

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Appendix G: Glossary

Acronym	Definition
ABP	Associated British Ports
AIS	Air Insulated Switchgear
ANM	Active Network Management
ARC	Advanced Research Computing
BAU	Business as Usual
BSP	Bulk Supply Point
CB	Circuit Breaker
CBA	Cost Benefit Analysis
CER	Consumer Energy Resources
CMZ	Constraint Managed Zone
CT	Consumer Transformation
DER	Distributed Energy Resources
DESNZ	Department for Energy Security and Net Zero
DFES	Distribution Future Energy Scenarios
DNO	Distribution Network Operator
DNOA	Distribution Network Options Assessment
DSO	Distribution System Operation
DSR	Demand Side Response
EHV	Extra High Voltage
EJP	Engineering Justification Paper
ER P2	Engineering Recommendation P2
NESO	National Energy System Operator
NGET	National Grid Electricity Transmission
ENA	Electricity Networks Association
EV	Electric Vehicle

FES	Future Energy Scenarios
FS	Falling Short
GIS	Gas Insulated Switchgear
GSPs	Grid Supply Point
HV	High Voltage
kV	Kilovolt
kWp	Peak power in kilowatts
LAEP	Local Area Energy Planning
LCT	Low Carbon Technology
LENZA	Local Energy Net Zero Accelerator
LEO	Local Energy Oxfordshire
LV	Low Voltage
LW	Leading the Way
OHL	Overhead Line
PSS	Primary Substation
PV	Photovoltaic
NSHR	Network Scenario Headroom Report (part of the Network Development Plan)
MW	Megawatt
MVA	Mega Volt Ampere
ODM	Operational Decision Making
RESOP	Regional Energy System Operation Planning
RIIO-ED2/3	Revenue = Incentives + Innovation + Outputs, Electricity Distribution 2 / 3 (Regulatory price control periods RIIO-ED2 and RIIO-ED3)
SDP	Strategic Development Plan
SEPD	Southern Electric Power Distribution
SLC	Standard Licence Condition
SSEN	Scottish and Southern Electricity Network
ST	System Transformation

UM	Uncertainty mechanism
VFES	Vulnerability Future Energy Scenarios
WSC	Worst Served Customers
ZCOP	Zero Carbon Oxfordshire Partnership

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