MANNINGTON GSP STRATEGIC DEVELOPMENT PLAN

Our network serving communities across the South Coast

Draft for consultation

October 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 have received from stakeholders on their future energy needs from today out to 2050 and translate these requirements into strategic spatial plans of 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 the area that is supplied by Mannington Grid Supply Point (GSP), shown below in Figure 1.

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 Wiltshire, Dorset, Somerset, New Forest and Bournemouth, Christchurch and Poole have been considered in preparation for this plan.

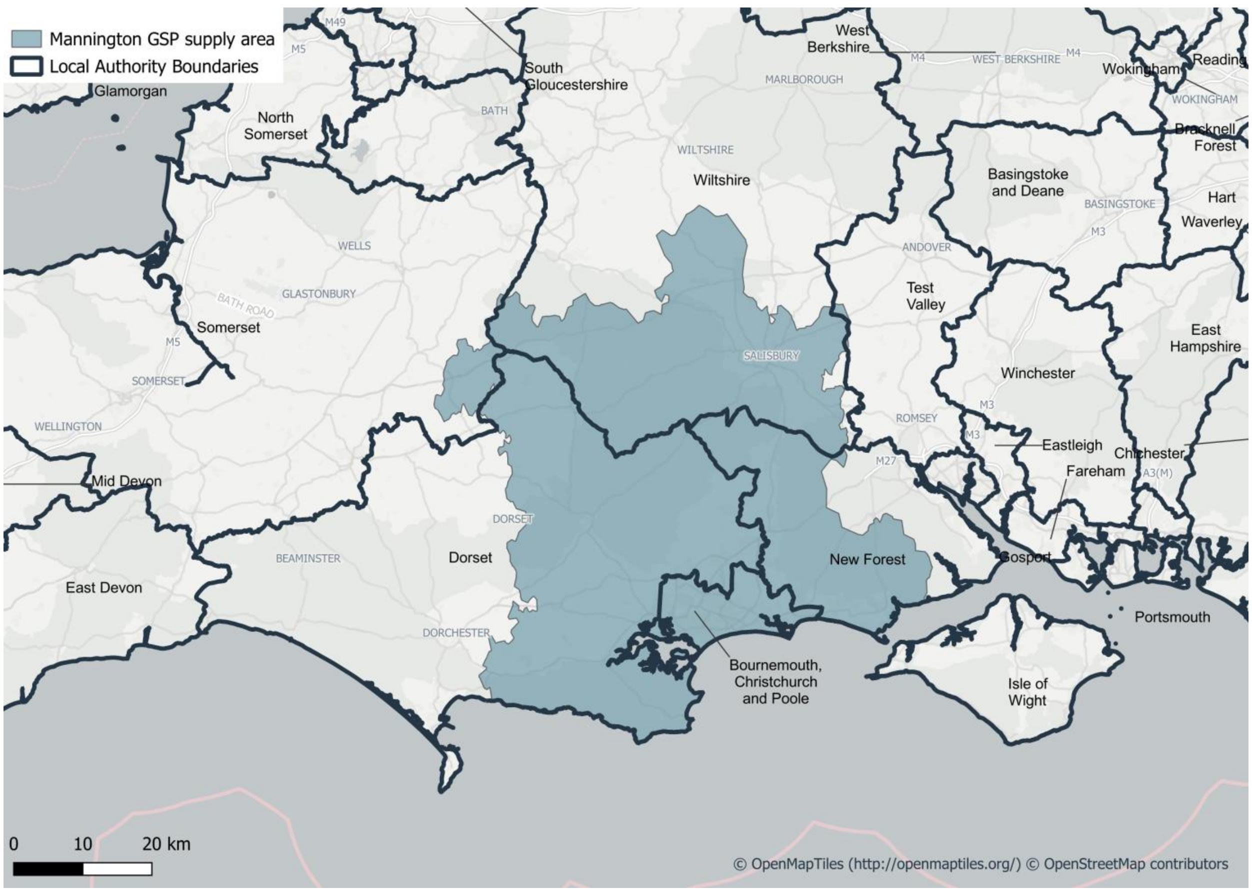

Figure 1 – Geographic area covered by this report.

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 aim of this report is to demonstrate how local, regional, and national targets align with stakeholder ambitions in the area to provide a robust evidence base for load growth out to 2050 across the area served by Mannington Grid Supply Point (GSP). 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, are also considered in our forecasts to ensure that the projected load more accurately reflects what we expect to see in the future.

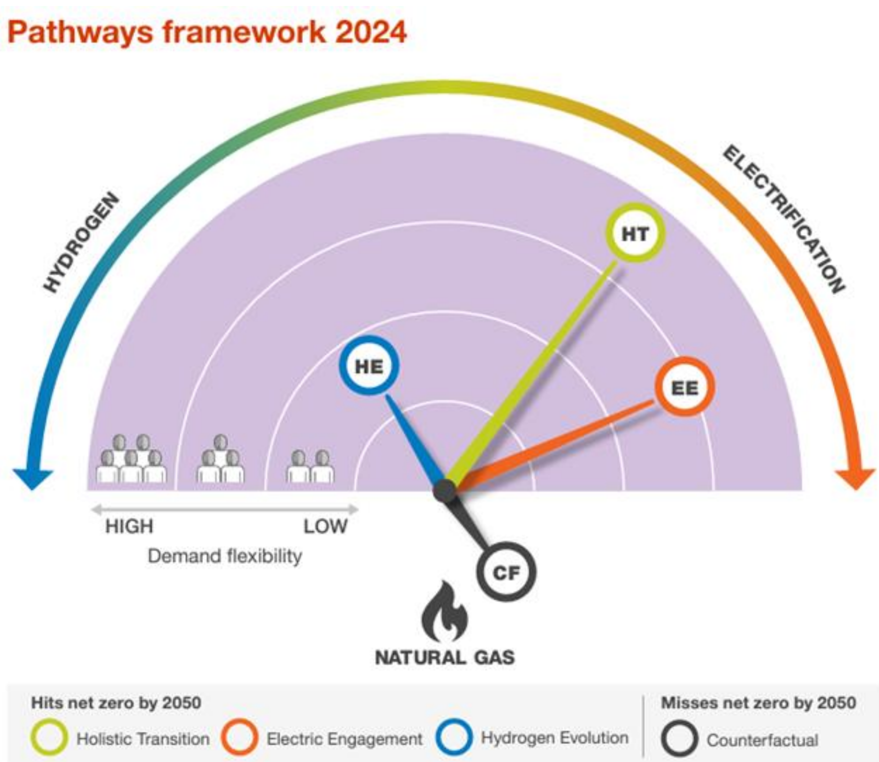

Figure 2 – The FES Scenario framework (source: NESO)

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. We model across the other scenarios alongside Holistic Transition to understand when these needs arise and what network capacity should be planned for in the event each scenario is realised.

The DNOA process provides more detailed optioneering for each of these system needs, improving 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.

3. STAKEHOLDER ENGAGEMENT AND WHOLE SYSTEM CONSIDERATIONS

3.1. Local Authorities and Local Area Energy Planning

The local authorities that are supplied by Mannington GSP include Wiltshire, Dorset, New Forest, Somerset, Bournemouth Christchurch and Poole (BCP) 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.

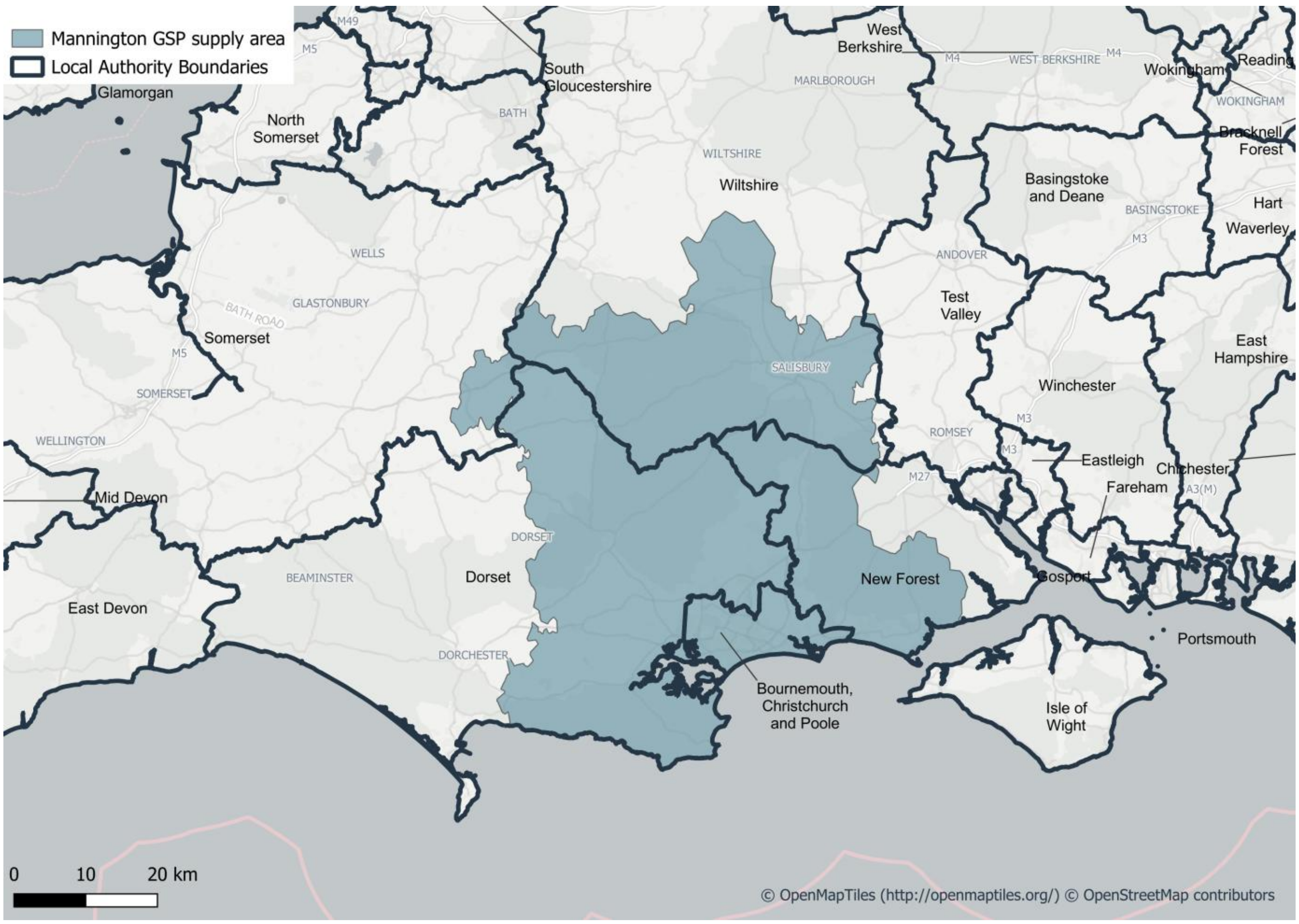

Figure 3 – Mannington GSP supply area and local authority boundaries

3.1.1. Wiltshire Council

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 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.

Delivery plans were put in place in 2022 to set out the steps towards implementation of the strategy. The Carbon Neutral Council Plan 2022-24 and the Climate Strategy Delivery Plan 2022-24 have been reviewed during 2024, both in terms of progress towards carbon reduction and climate adaptation outcomes and performance against the actions that the council committed to.

This plan now sets out the focus for the council's action on climate change for 2025. 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:

- 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.

3.1.2. Dorset Council

Dorset Council issued a Climate declaration in 2019 and adopted their first strategy in 2021. Dorset Council has put tackling climate change and supporting our natural environment as a core priority in their Council plans.
Their strategy set a clear direction with realistic and achievable ambitions to become a carbon neutral council by 2040 and a carbon neutral county by 2050, frontloaded by interim targets. Its importance has got ever clearer since, following publication of the IPCC's Sixth Assessment Report by:

- 2025 a 36% cut in Dorset's emissions and a 40% cut in Council emissions
- 2030 a 59% cut in Dorset's emissions and a 71% cut in Council emissions
- 2035 a 90% cut in Council emissions
- 2040 a 88% cut in Dorset's to be a carbon neutral Council
- 2050 to be a carbon neutral Dorset

Since 2021, they have established an operational programme to cut the emissions they directly control, and a facilitation programme to influence those that they don't. This is supported by a £10m capital programme to fund delivery. As a result, they've seen significant progress, which is now reported on biannually.

Their emissions have declined by over a quarter since their 2019 baseline year as a result, meaning that they're well on track if this is maintained. But the new availability of more complete data for the county shows that whilst Dorset's emissions fell by over a tenth in the two years to 2020, action for the county needs to go faster to reach their targets.

Their 2021 strategy noted critical and fundamental uncertainty on national policy, but there is now far greater clarity thanks to the emergence of the UK Net Zero Strategy, the Environment Act, the new Environment Improvement Plan, and the Climate Change Risk Assessment. There are, as a result, some major national milestones that are now clear. And importantly, many of these are imminent: from heat pumps and boilers to fossil-fuelled vehicles and the decarbonisation of the grid by 2035 – big national changes are rapidly approaching.
They have updated the narrative on the national policy context and tried to better articulate the 'three pillars' of the climate, biodiversity and resilience challenges – and of the interdependencies of decarbonisation, nature recovery and adaptation. Financial pressures are ever more pressing during the UK's cost-of-living crisis which can be an obstacle for organisations and individuals alike. Whilst there remain simple and affordable things that can be done, there is no avoiding the need for creative and innovative partnerships across our organisations and the private sector in order to deliver 2050 targets.

3.1.3. New Forest District Council

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[1]. 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.

Within the Hampshire region New Forest District Council has a higher rate of domestic and industrial emissions due to the limited connected to other regions and the nature of the businesses operating within the premises[2]. New Forest District Council 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.

NFDC is working to produce a new local plan and continues to engage with SSEN and make use of the LENZA tool to aid its planning process.

3.1.4. Bournemouth, Christchurch and Poole (BCP) Council

Bournemouth, Christchurch and Poole (BCP) Council has a 2050 Climate Action Plan aiming to achieve carbon neutrality for the area by 2050, while also aiming for the council's operations to be carbon neutral by 2030. The plan outlines actions for the council, partner organisations, local businesses, and residents to reduce collective carbon emissions. BCP Council formally declared a climate emergency in July 2019. BCP Council pledged to report its progress annually on climate actions and achievements.

The 2050 Climate Action Plan focuses on actions that the entire BCP area can take to reduce emissions, such as improving energy efficiency in homes, reducing waste, and promoting sustainable transportation. This is an extension of their commitment to the Paris Pledge for Action. Their efforts to tackle the climate and ecological emergency are a key objective towards a sustainable environment - one of the priorities of their Corporate Strategy.

The council is working on various initiatives like developing an Urban Forest Strategy, increasing the use of ultra-low emission vehicles in its fleet, and investing in cycling and walking infrastructure. BCP Council recognises that the work they are doing to tackle climate change needs to grow and speed up. The council is constantly seeking input from residents and stakeholders to identify top priorities and ensure the plan effectively addresses the community's needs.
BCP are drawing up plans for their council operations to become carbon neutral by 2030. They are also looking at how early the rest of the Bournemouth, Christchurch and Poole area can become carbon neutral, ahead of the national target of 2050. Reducing the number of cars on the road will be part of the zero-carbon plan; their latest efforts include a bid for the Transforming Cities Fund which will allow them to improve bus and cycling networks and use technology to better monitor and control traffic.

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1 https://www.newforest.gov.uk/article/3113/Greener-Housing-Strategy-2022-to-2032

2 New Forest District Council | Solent Cluster

3.1.5. Somerset Council

Somerset's Climate Emergency Strategy was developed jointly by the five former Somerset local authorities, sector experts and external partners following a public consultation that took place in January 2020. It was formally adopted by all 5 Councils in November 2020.

The aim of our strategy is to reduce carbon emissions in the county and make Somerset a county resilient to the inevitable effects of climate change.

Somerset's strategy provides details explaining what climate change is and what causes it, where carbon emissions arise from globally, nationally and locally and what the impacts will be here in Somerset. It sets ambitious goals to become a carbon-neutral county by 2030. It also outlines what the previous five councils and now Somerset Council intend to do to address the most important issues around the Climate and Ecological Emergency.

This ambitious County-wide Strategy follows the 'One Planet Living Principles' which take a holistic approach to sustainability - going beyond cutting carbon and conservation to enhancing wellbeing, building better communities and businesses, promoting sustainable consumption and production and the need for socially sustainable procurement as well as a move towards a circular economy.

The Strategy demonstrates Somerset's commitment to the UK Government's 2050 target of reducing greenhouse gas emissions to 'Net Zero' and supports the UK's 2015 Paris Agreement pledge to keep global temperatures below 2°C by 2050.

3.2. Whole System Considerations

3.2.1. Specific whole system considerations

As shown in Figure 3, a significant length of coastline is currently supplied by Mannington GSP, including Poole port and Lymington harbour. An important consideration is the future electrification of the maritime industry, and how that may impact demand growth in the area. SSEN should continue to engage with these ports to understand the confidence in the demand projections and NGET to understand how capacity can be released to enable it.

3.2.2. 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 Mannington GSP through regular meetings and working groups.

In the broader Mannington supplied area, National Grid Electricity Transmission (NGET) have referenced in their T3 business plan (2026-2031) that they plan to refurbish a 40km stretch of overhead power line between Mannington and Nursling.

3.2.3. 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 for 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.[3,4]

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.

Areas across Mannington GSP where 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.

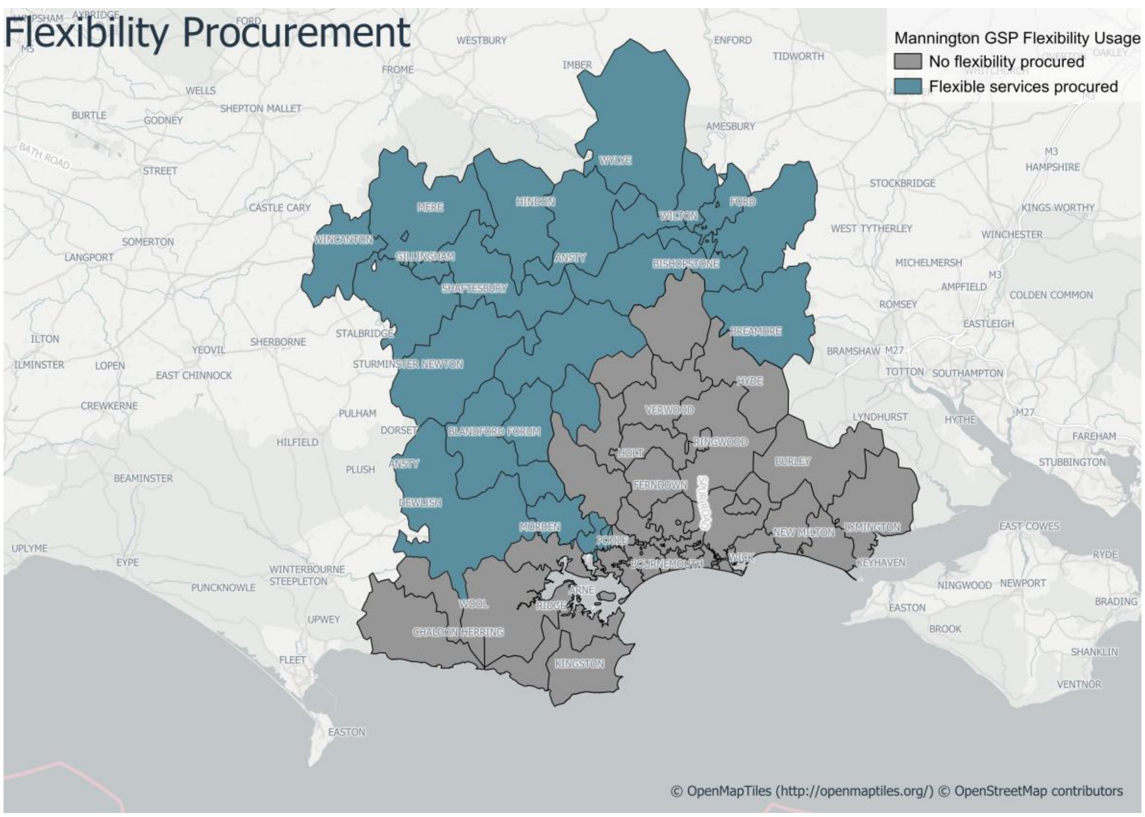

Figure 4 – Flexibility procurement across Mannington GSP

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3 SSEN, Flexibility Services Procurement (Flexibility Services Procurement - SSEN)

4 SSEN, 02/2024, Operational Decision Making (ODM), SSEN Operational Decision Making ODM

4. EXISTING NETWORK INFRASTRUCTURE

4.1. Mannington Grid Supply Point Context

The Mannington GSP network is made up of 132kV, 33kV, 11kV, and LV circuits. It has both areas of urban and rural network but mainly rural, covering densely populated areas such as Bournemouth and Poole. In total the GSP serves approximately 410,000 customers. Table 1 shows the values for the GSP and Bulk Supply Points (BSPs) for information on primary substations please see Appendix A. The peak maximum demand refers to the peak at each individual substation which may not be at a coincident time as the others (meaning we would not expect the values for each BSP to sum to that at the GSP).

Substation Name	Site Type	Number of Customers Served (approximate)	2023/24 Substation Maximum MVA (Season)
Mannington GSP	Grid Supply Point	410,000	593.6 (Winter)
Mannington BSP	Bulk Supply Point	52,000	78.1 (Winter)
Redhill	Bulk Supply Point	41,000	72.1 (Winter)
Christchurch	Bulk Supply Point	50,000	57.1 (Winter)
Bournemouth (Bourne Valley)	Bulk Supply Point	84,000	125.6 (Winter)
Lytchett	Bulk Supply Point	32,000	72.6 (Winter)
Poole (Hamworthy)	Bulk Supply Point	16,000	26.9 (Winter)
Wareham	Bulk Supply Point	17,000	37.0 (Winter)
Shaftesbury	Bulk Supply Point	34,000	52.7 (Winter)
Salisbury	Bulk Supply Point	42,000	58.8 (Winter)
Arnewood	Bulk Supply Point	35,000	43.9 (Winter)

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

4.2. Current Network Topology

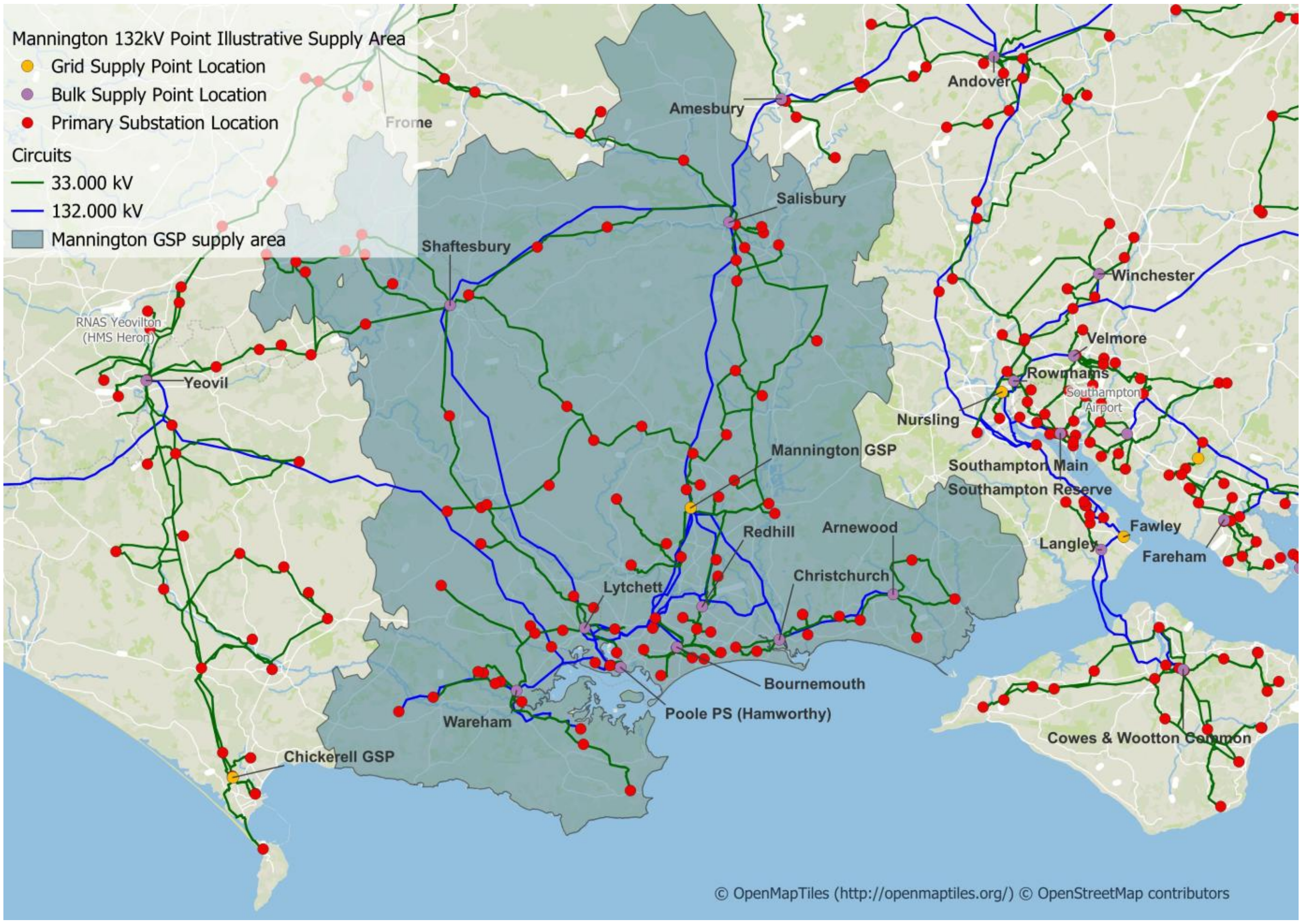


Figure 5 – Current network topology of Mannington GSP

4.3. Current Network Schematic

The existing 132kV network at Mannington GSP is shown below in Figure 6. Additional schematics for the 33kV network fed from Mannington GSP can be found in Appendix B.

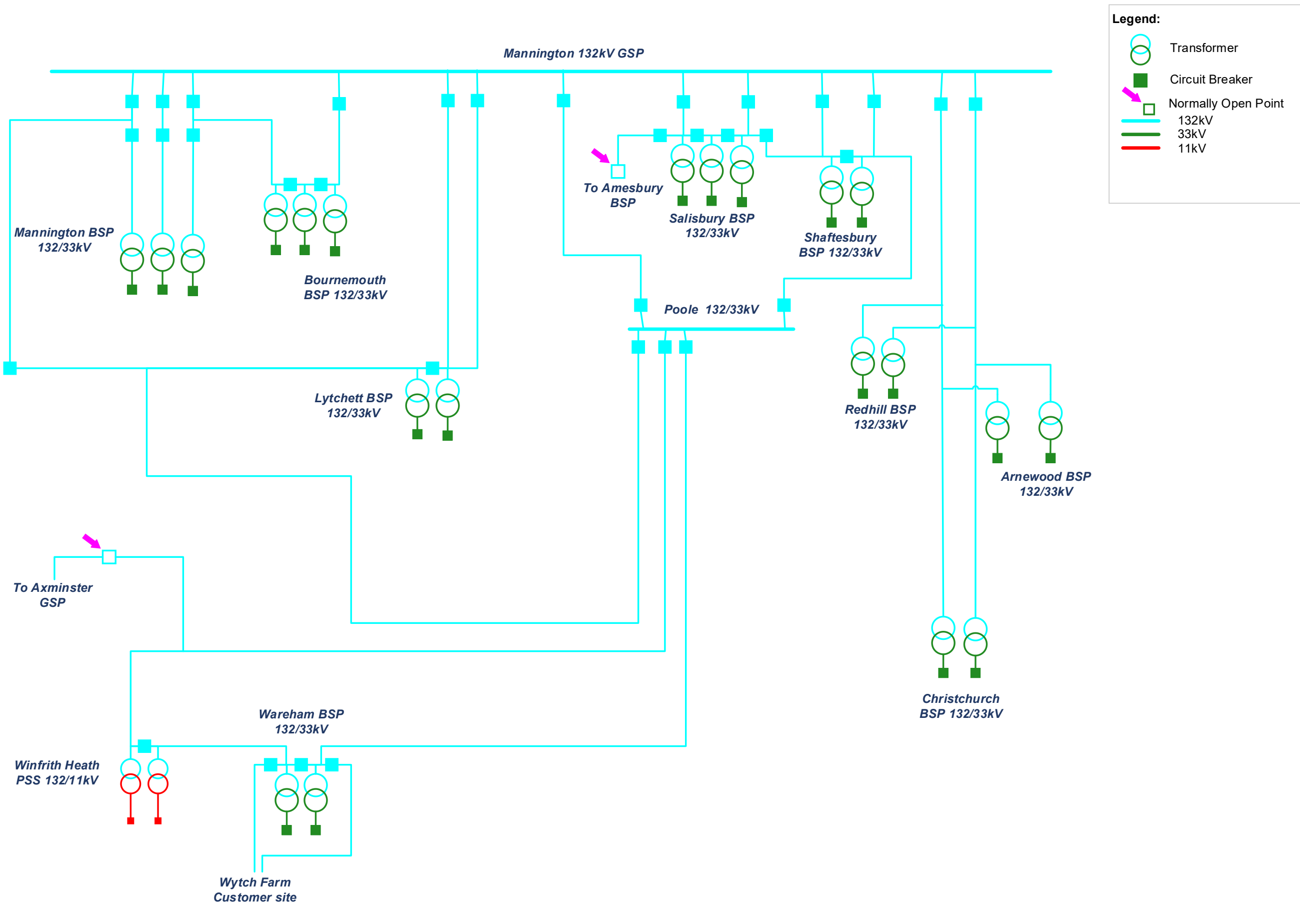


Figure 6 – Existing 132kV network supplied by Mannington GSP

5. FUTURE ELECTRICITY LOAD AT MANNINGTON 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 1 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 represent the coincident maximum demand of the entire system rather than the total sum of all demands.
- For projections specific to individual primary substations or local authorities, please refer to our online dashboard.[5]

5 SSEN DFES Technology Projections - Microsoft Power BI

5.1. Renewable energy and electricity storage

DFES Scenario	Generation capacity				Electricity storage capacity			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	489 MW	959 MW	1633 MW	1911 MW	29 MW	445MW	595 MW	682 MW
Electric Engagement		963 MW	1307 MW	1589 MW		425 MW	531 MW	612 MW
Hydrogen Evolution		875 MW	1222 MW	1443 MW		268 MW	460 MW	503 MW
Counterfactual		729 MW	882 MW	1003 MW		139 MW	291 MW	307 MW

Table 2 – Projected cumulative distribution connected generation capacity and electricity storage capacity across Mannington GSP (MW). Source: *SSEN DFES 2024*

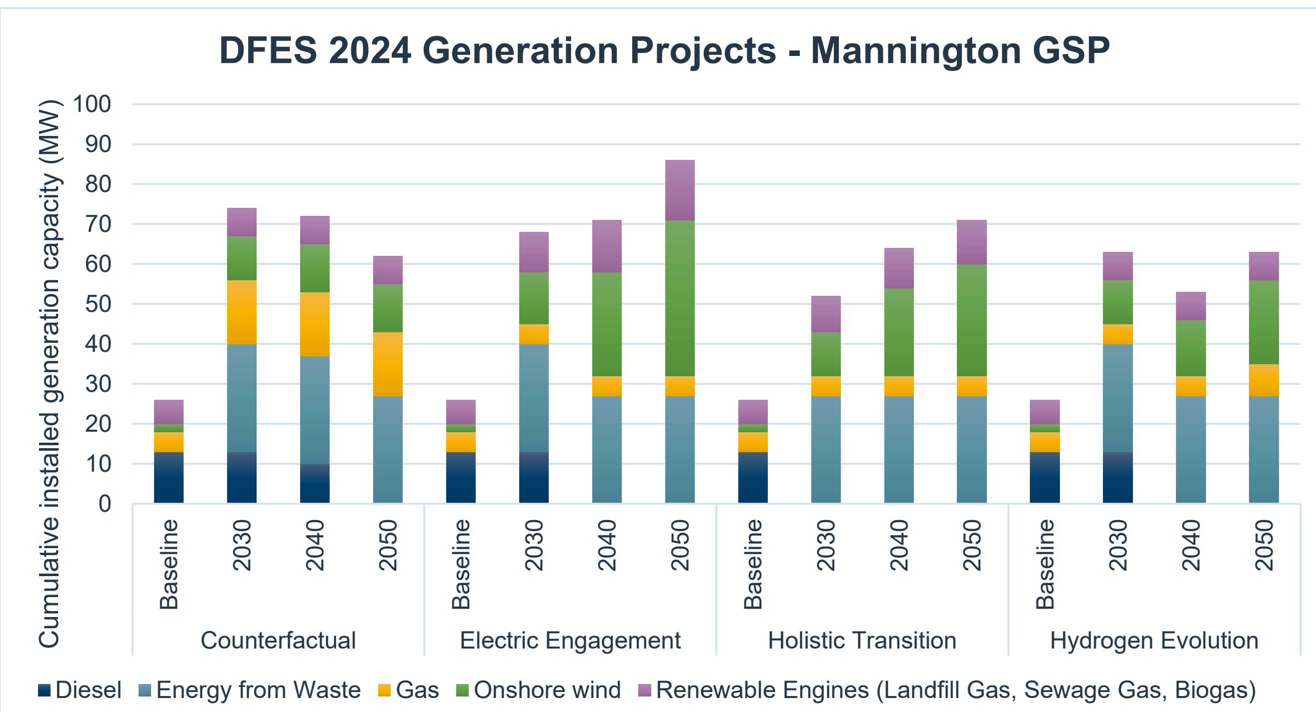


Figure 7 – Projected cumulative distributed generation capacity across Mannington GSP. Source: *SSEN DFES 2024*

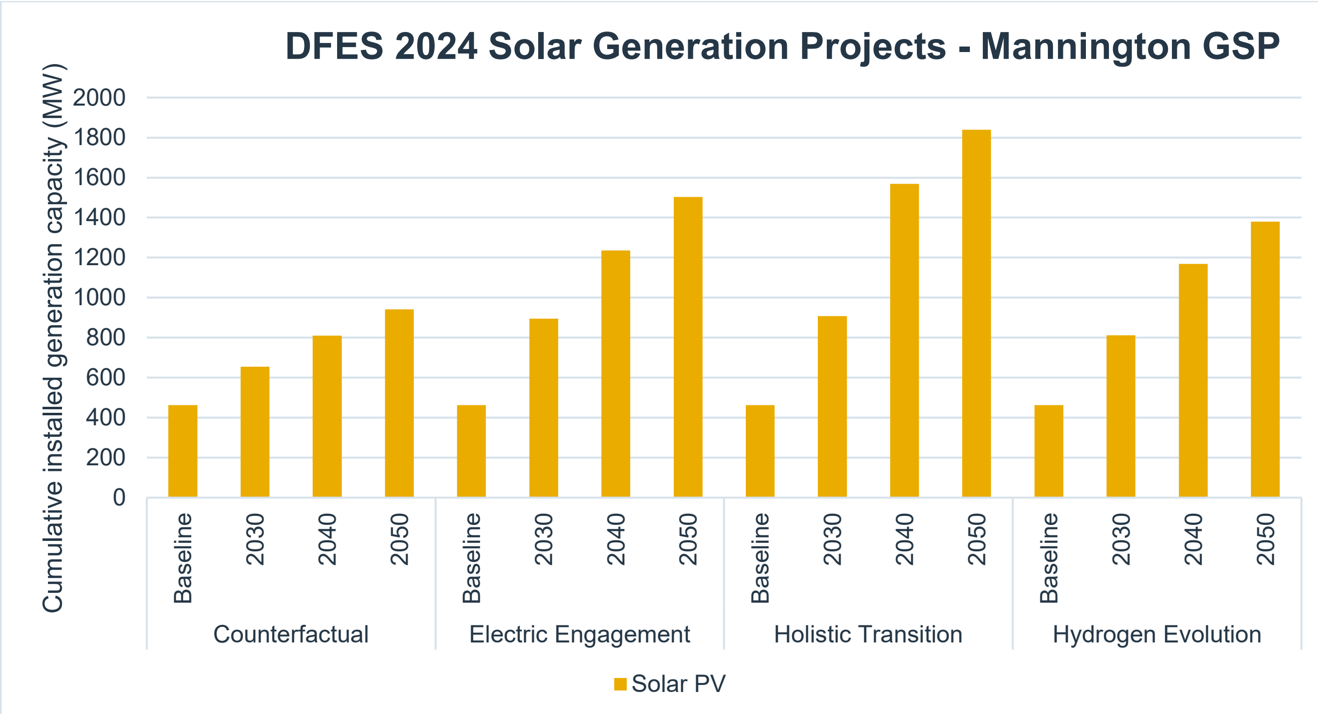


Figure 8 – Projected cumulative solar generation capacity across Mannington GSP. Source: *SSEN DFES 2024*

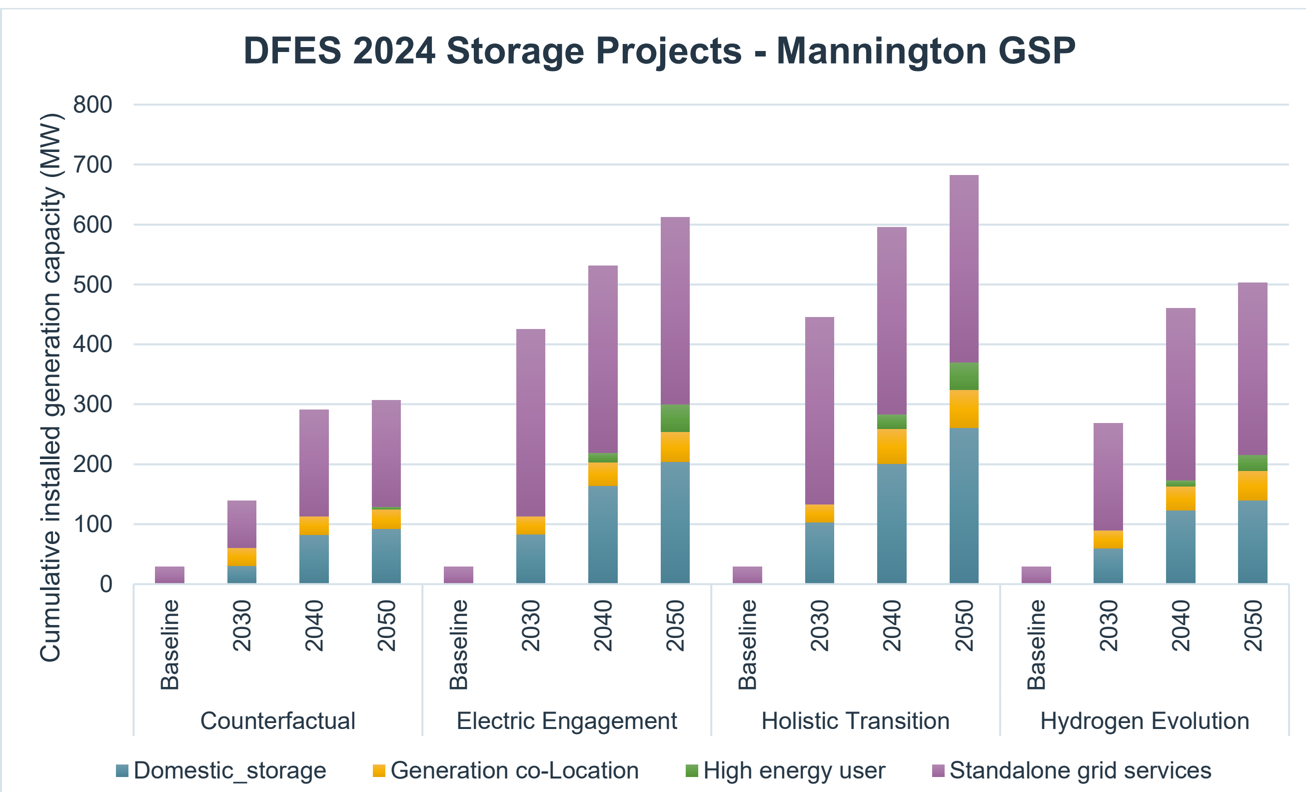


Figure 9 – Projected cumulative storage projects across Mannington GSP. Source: *SSEN DFES 2024*

5.2. Transport Electrification

DFES Scenario	Domestic EV chargers – off-street (number of units)				Non-domestic EV chargers & domestic on-street EV chargers			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	19679 units	90,137	273,749	287,071	3MW	295MW	340MW	765MW
Electric Engagement		147,416	272,944	284,481		102MW	322MW	341MW
Hydrogen Evolution		89,610	271,780	283,346		73MW	322MW	367MW
Counterfactual		73,035	260,588	282,046		26MW	237MW	369MW

Table 3 – Projected cumulative number of domestic EV chargers (off-street) and non-domestic and domestic (on-street) EV charge point capacity across Mannington GSP. *Source: SSEN DFES 2024*

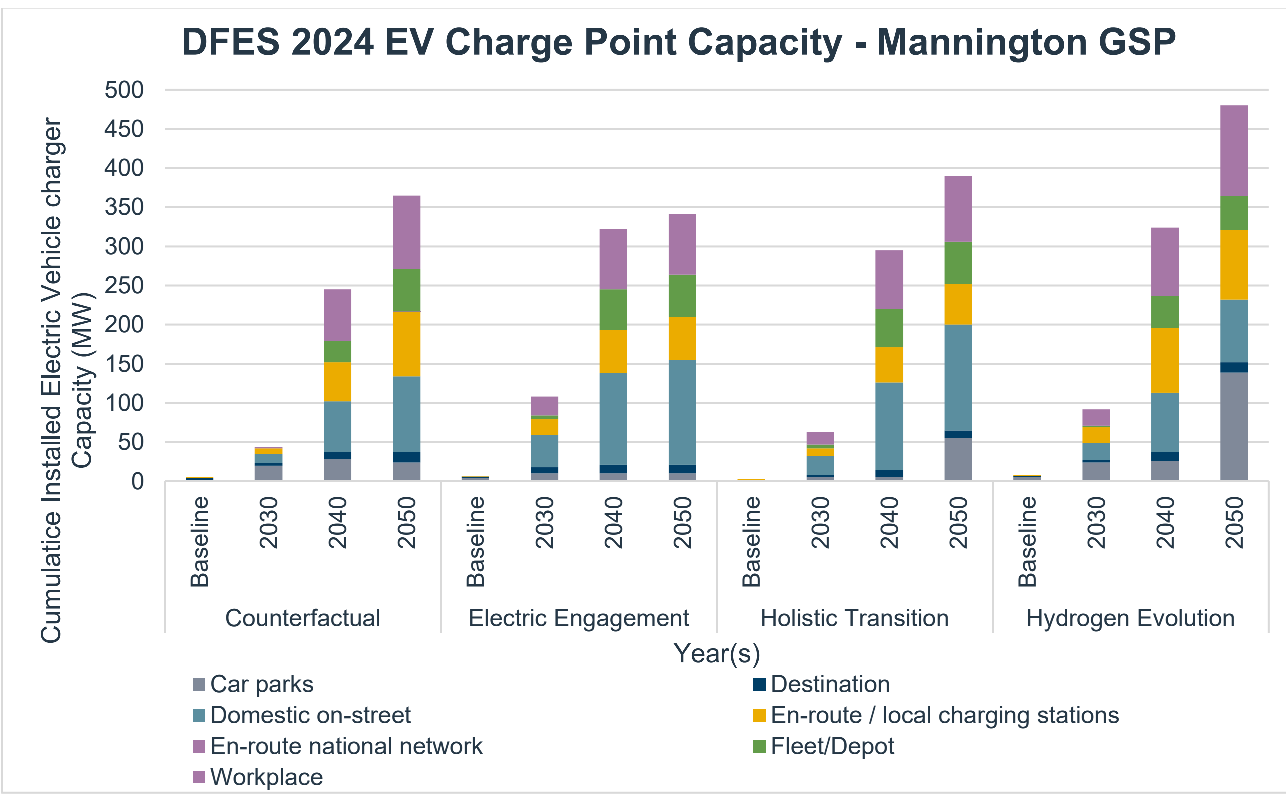


Figure 10 – Projected EV charge point capacity across Mannington GSP Source: *SSEN DFES 2024*

5.3. Electrification of heat

DFES Scenario	Non-domestic heat pumps and resistive electric heating (m^2 of floorspace)				Domestic heat pumps (number of units)			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	1,300,998	3,403,677	6,653,592	8,091,082	4,407	55,368	240,892	331,991
Electric Engagement		3,019,109	6,837,537	8,469,404		51,302	231,419	326,059
Hydrogen Evolution		3,071,801	5,304,429	6,285,108		50,736	207,792	294,150
Counterfactual		2,394,416	3,698,524	4,684,280		24,905	90,012	228,551

Table 4 - Projected non-domestic heat pumps and resistive electric heating floorspace and number of domestic heat pumps across Mannington GSP. *Source: SSEN DFES 2024*

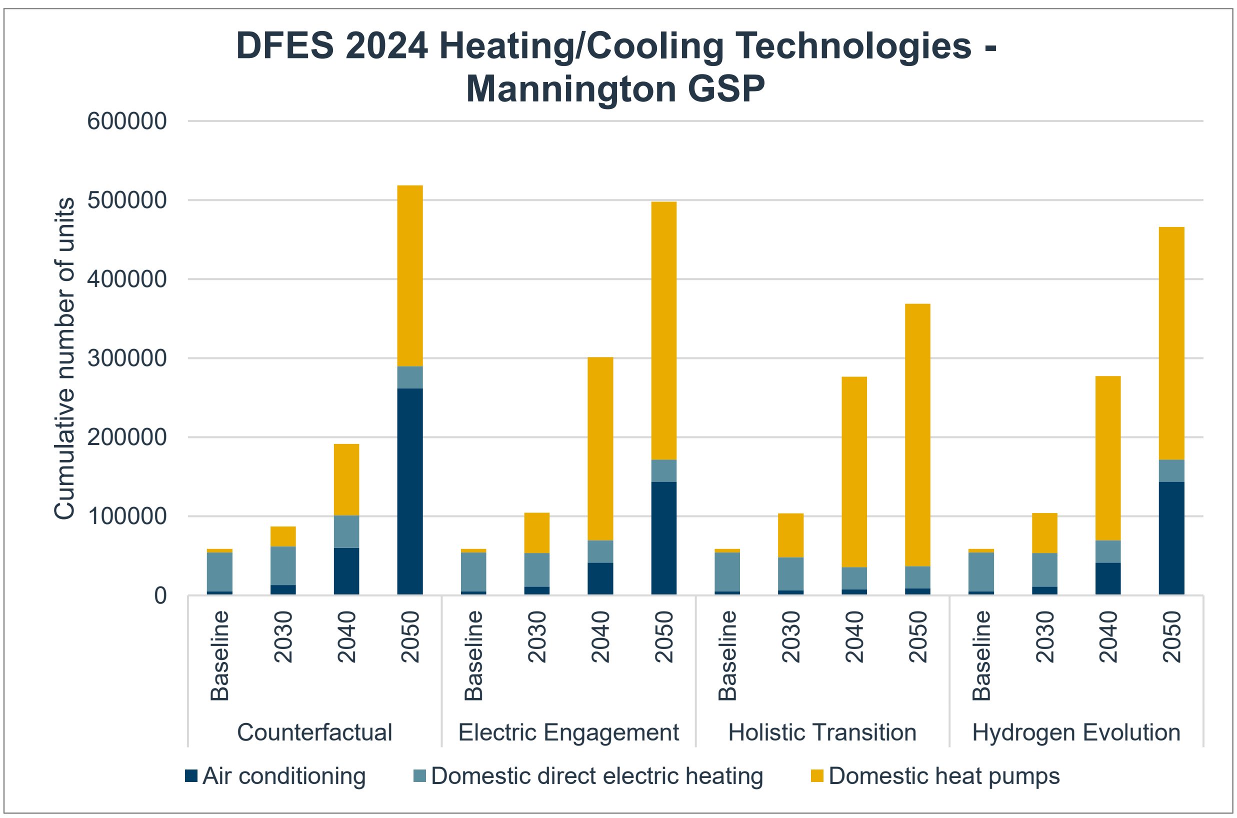


Figure 11 – Projected number of heating/cooling technologies across Mannington GSP. *Source: SSEN DFES 2024*

5.4. New Building Developments

Through engagement with local authorities, we have developed an understanding of new development across our licence areas. This has allowed us to gauge an insight into future electricity demand for new developments ahead of a formal connection application. Below we investigate the non-domestic new developments across the study area for this SDP.

DFES Scenario	New domestic development (number of homes)			New non-domestic development (m^2)		
	2030	2040	2050	2030	2040	2050
Holistic Transition	16,009	33,594	48,088	592,895m^2	945,480m^2	945,480m^2
Electric Engagement	15,124	31,393	43,733	650,532m^2	945,480m^2	945,480m^2
Hydrogen Evolution	15,175	31,415	43,755	650,307m^2	945,480m^2	945,480m^2
Counterfactual	13,081	28,998	39,515	728,368m^2	871,244m^2	945,480m^2

Table 5 – Projected new domestic and non-domestic development across Mannington GSP. *Source: SSEN DFES 2024*

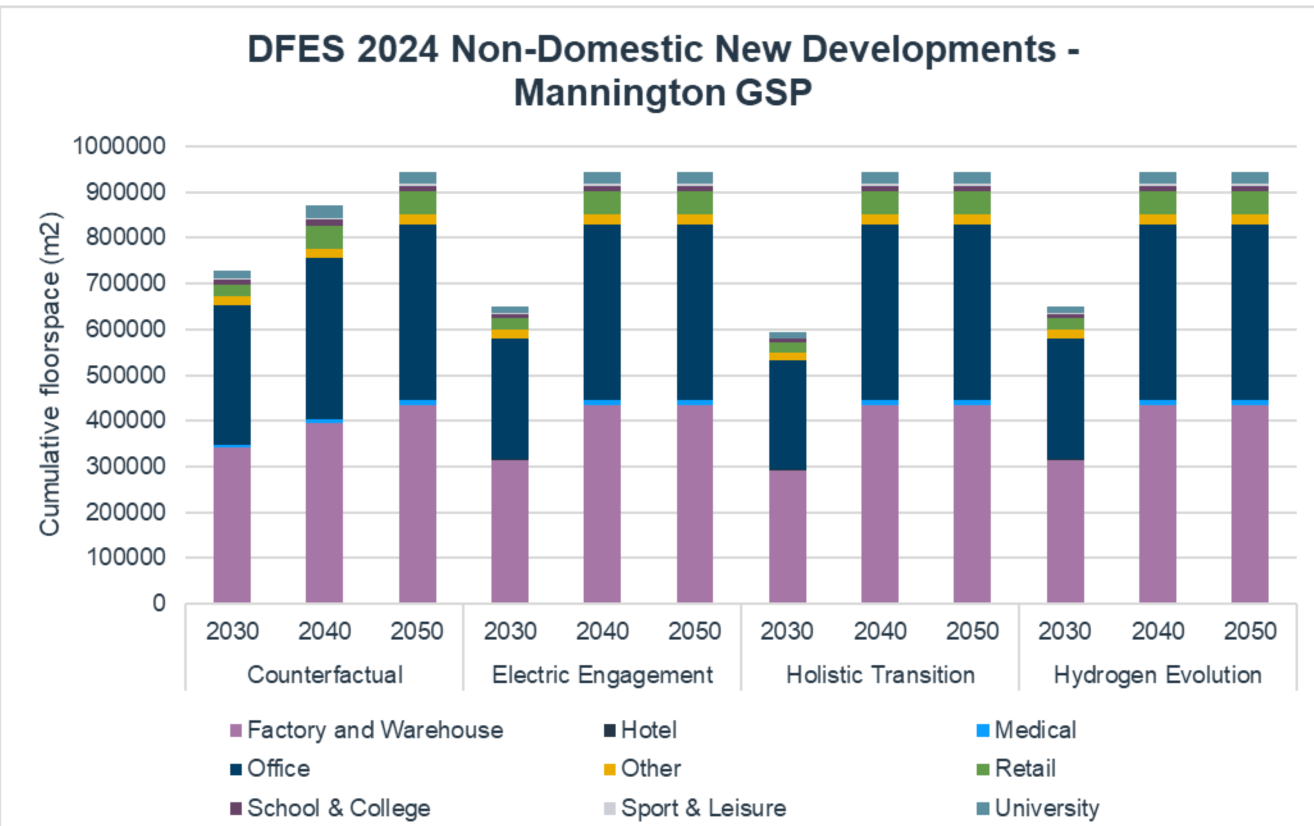


Figure 12 – Projected new non-domestic development across Mannington GSP. *Source: SSEN DFES 2024*

5.5. Commercial and Industrial Electrification

There are several industrial customers connected at the High Voltage level (11kV) across Mannington GSP. In addition to this, there are larger EHV connected customers with examples including Bournemouth Airport and water treatment works. Other important stakeholders include two large NHS hospitals, one in Poole which has a new maternity ward planned and one in Bournemouth, the MoD as well as two large universities and one multi-campus college. SSEN should carry out further targeted engagement with these stakeholders to understand the future energy requirements at these sites. This will ensure that additional capacity requirements can, where appropriate, be factored into our strategic plans.

Bournemouth airport is also supplied by the Mannington GSP. As a strategic transport hub, it is important to continue our working relationship with Bournemouth airport to provide capacity for decarbonisation, modernisation and their planned expansion.

Decarbonisation of the agricultural is an important consideration in this geographic area. SSEN leads the innovation project 'Future Agricultural Resilience Mapping' (FARM) which aims to understand the future energy requirements and means of decarbonising the domestic farming industry[6]. This sector is currently still largely dependent on fossil fuels, and the project will support its investigations into the impact of food production on the electricity distribution system, to work out where reinforcement is needed. A data-driven tool to inform network planning will be devised and through this work, FARM will address the gap between the energy demands for food production and future network planning.

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.[7] This project involves building a 'Navigating Energy Transitions' (NET) tool, which will help ports to plot their most viable pathways for decarbonisation.

6 FARM, SSEN Innovation Project, 09/2025, FARM | SSEN Innovation

7 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 Mannington 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.

A summary of existing works in progress is shown below in Table 6Table 6. The drivers listed in the below table are predominantly where a customer connection application has driven the work or where investment proposals developed through our DNOA process are driving the reinforcement work. Published DNOA outcomes relevant to Mannington GSP are included in Appendix E. 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.[8]

ID	Substation	Description	Driver	Forecast completion	Resolves future strategic needs to 2050?
1	Mannington GSP	New 132kV Gas Insulated Switchgear	DNOA Process	2030	
		Mannington BSP			
2	Mannington BSP	Two new 132/33kV transformers	Asset health replacement	2026	
3	Wimborne PSS	Two new 33/11kV transformers	DNOA Process	2026	
4	Mill Lane PSS	Replace part of circuit between Mill Lane PSS and Fordingbridge PSS	DNOA Process	2026	
5	Mill Lane PSS	New 33kV busbar and 33/11kV transformers	Asset health replacement	2029	

8 DSO Service Statement 2025

Shaftesbury BSP					
6	Shaftesbury BSP	Two new 132kV circuits from Mannington GSP to Shaftesbury BSP	DNOA Process	2030	
7	West Stour PSS	Replace one of the 33/11kV transformers	Asset health replacement	2027	
Christchurch BSP					
8	Christchurch BSP	Two new 132kV circuits from Mannington GSP to Christchurch BSP	DNOA Process	2030	
Lytchett BSP					
9	Lytchett BSP	Replace the existing 132kV circuit between Mannington GSP and Lytchett BSP with a higher rated circuit.	Customer connection	2030	
10	Lytchett BSP	Two new 132/33kV transformers, replacing the existing units.	Customer connection	2027	
11	Lytchett BSP	New 33kV switchboard	DNOA Process	2028	
12	Winterborne Kingston PSS	Two new 33/11kV transformers with a higher rating, two new 33kV circuit breakers, seven new 11kV circuit breakers	Asset health replacement	2026	
Wareham BSP					
13	Wareham BSP	Two new 132/33kV transformers and two new 33kV transformer circuit breakers	Asset health replacement	2026	
14	Wareham Town PSS	Two new 33/11kV transformers and new 33kV circuit breakers	Asset health replacement	2027	
15	Swanage PSS	Two new 33/11kV transformers	DNOA Process	2028	

Salisbury BSP					
16	Salisbury BSP	New 33kV GIS boards at Salisbury BSP	DNOA Process	2028	
17	Petersfinger PSS	New 33kV circuits from Salisbury BSP to Petersfinger PSS and a new 33kV GIS board at Petersfinger PSS	DNOA Process	2029	
18	Netherhampton PSS	New 33kV circuits from Salisbury BSP to Netherhampton PSS and a new 33kV GIS board at Netherhampton PSS	DNOA Process	2029	
Arnewood BSP					
19	Arnewood BSP	Two new 132/33kV transformers	Asset health replacement	2026	
20	Arnewood BSP	Third additional 132/33kV transformer, new 33kV circuit breakers and a new 132kV board	DNOA Process	2030	
21	Arnewood BSP	New 33kV gas insulated switchgear busbar	Customer connection	2026	
22	Milford on Sea PSS	Replace two 33/11kV transformers and 33kV circuit breakers	Asset health replacement	2026	
Redhill BSP					
23	Victoria Park Switching Station	Replacing 6 x 11kV circuit breakers with 33kV circuit breakers	Asset health replacement	2029	
24	Winton PSS	33/11kV transformer reinforcements and a new 11kV board	DNOA Process	2028	
Poole BSP					
25	Poole BSP	Replace the existing 132kV overhead line between Mannington GSP and Poole BSP with a	Customer connection	2030	

		higher rated overhead line.			
26	Hamworthy PSS	New 33kV gas insulated switchgear busbar	Asset health replacement	2028	
27	Poole PSS	Replace 33/11kV transformers and 12 new 11kV circuit breakers	Asset health replacement	2027	
28	Winfrith Heath PSS	Two new 132/11kV transformers	Asset health replacement	2027	
Bournemouth BSP					
29	Bournemouth BSP	New 132/33kV transformer and 132kV transformer circuit breaker	Asset health replacement	2025	
30	Alderney PSS	Two new 33/11kV transformers and new 11kV switchboard	Customer connection	2027	
31	Alderney PSS	New 33kV dual underground cable from Alderney PSS towards Bournemouth BSP	Customer connection	2027	

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

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 aim to provide capacity across the GSP for 2050 based on current projections.

Alongside these asset solutions being deployed, flexibility solutions are also being used to release additional capacity.

6.1. Network Schematic (following completion of above works)

The network schematic below in Figure 13 shows the 132kV network with changes highlighted and referenced to the table above. For the 33kV network future schematics, see Appendix B.

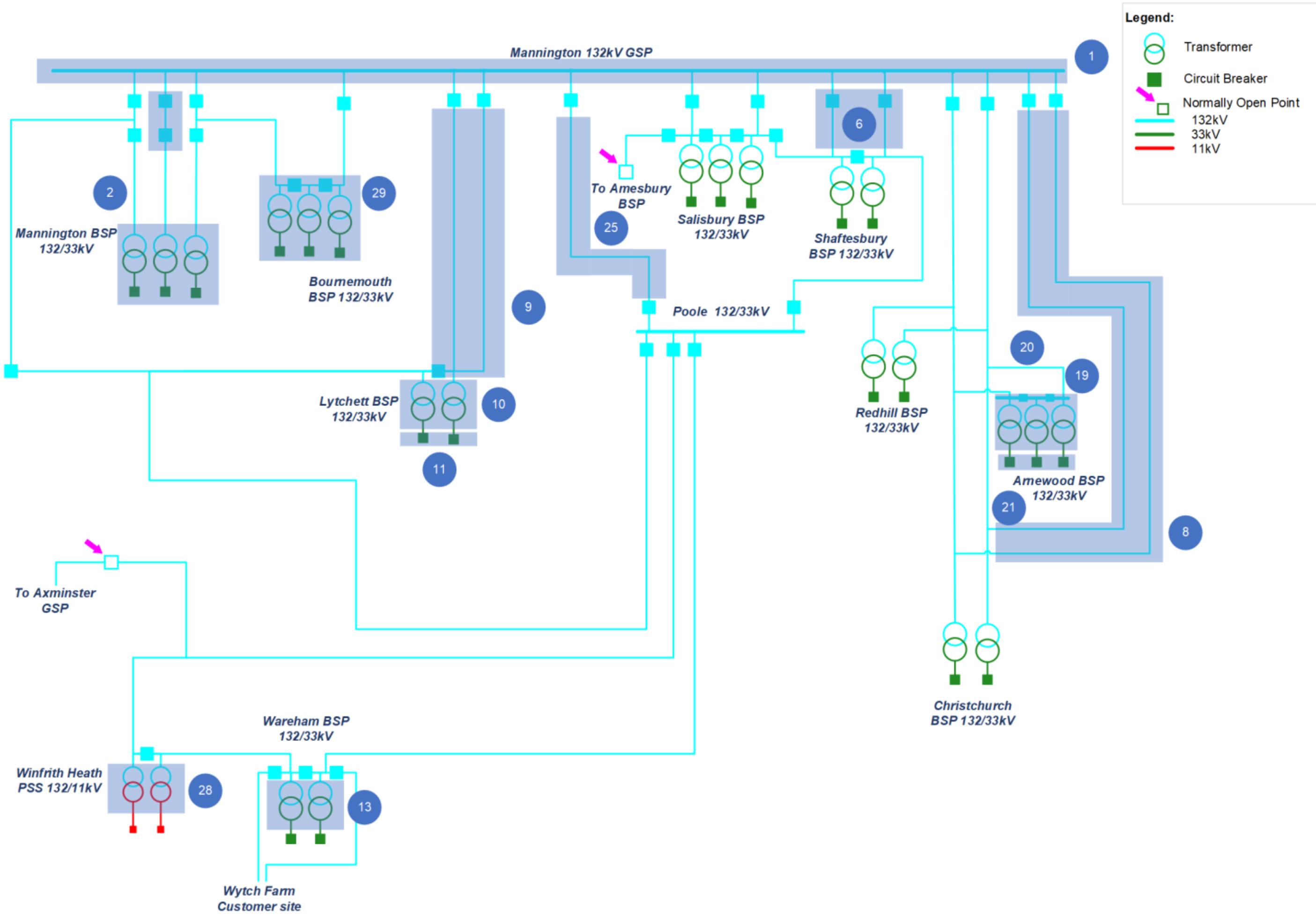


Figure 13 – Mannington Network schematic following completion of triggered works

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 Mannington SDP study area. Darker blue shades indicate that there is a projected capacity shortfall whereas lighter blue shades indicate that there is headroom capacity based on current projections. EHV/HV spatial plans for the other DFES scenarios are presented in Appendix C.

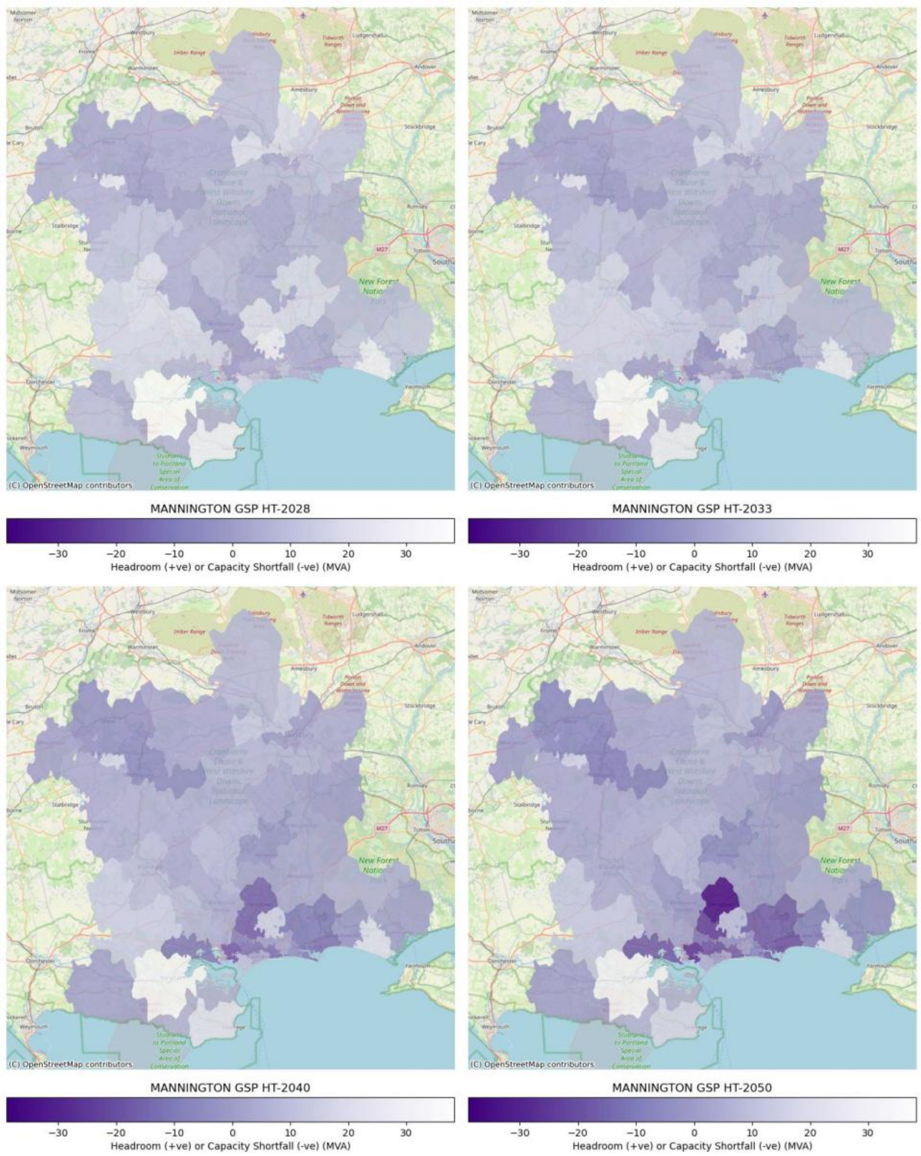


Figure 14 – Mannington GSP – EHV/HV Spatial Plans – Holistic Transition

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 Mannington GSP. It should be noted that the data below is currently drawn from DFES 2024. 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 2024 scenarios are available in Appendix DAppendix D.

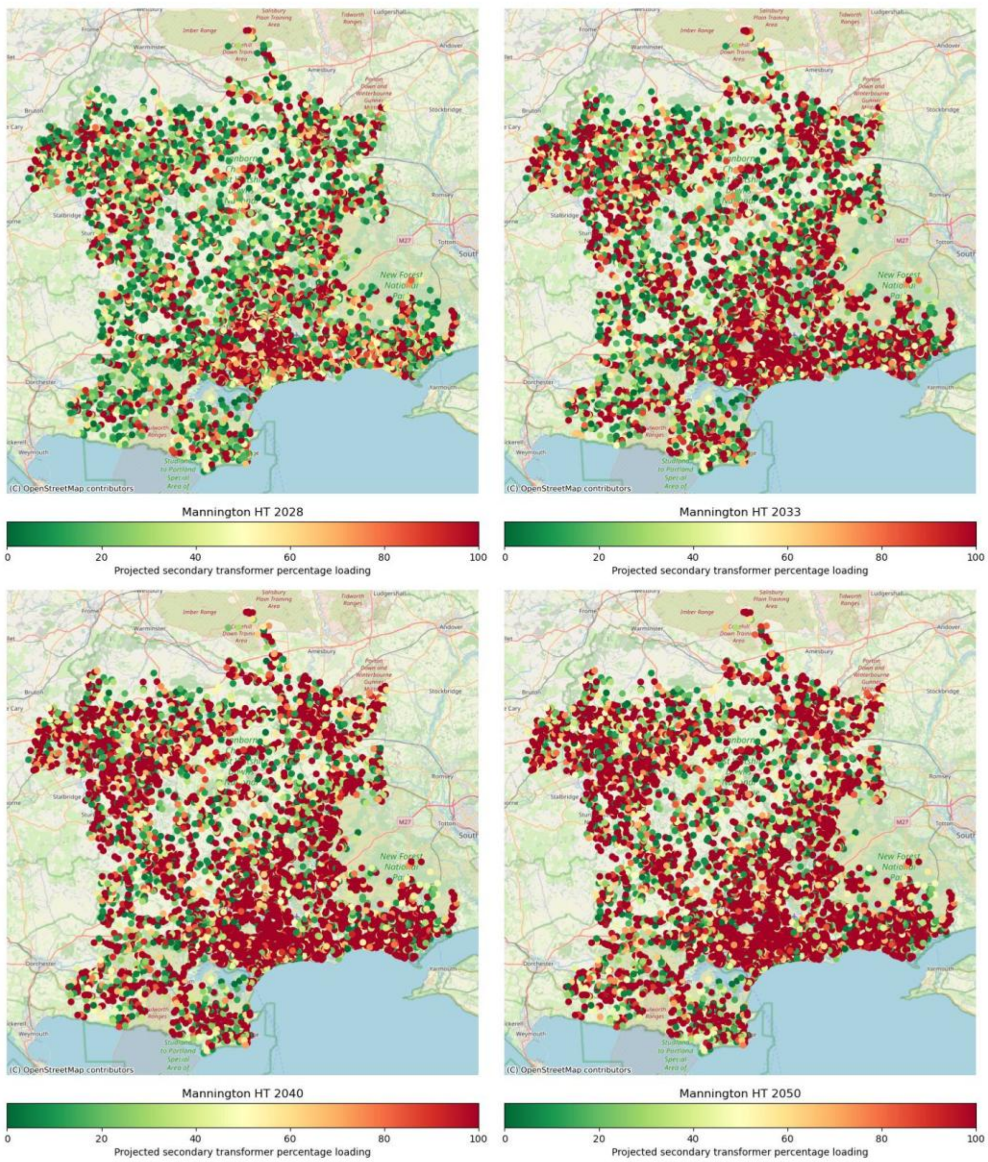


Figure 15 – Mannington GSP – HV/LV Spatial Plans – Holistic Transition

8. SPECIFIC SYSTEM NEEDS AND OPTIONS TO RESOLVE

In this section we summarise the specific needs arising from our future spatial plans. The outputs of the power system analysis in this section show where we may observe the need for further intervention on the distribution network. This could be through asset solutions or flexibility services including access products which may be used to enable connection of projects ahead of reinforcement delivery. We also propose some initial options to resolve the needs forecasted. If required during the next ten years, these will be further developed through the DNOA process.

The section consists of three sets of results:

- Future EHV system needs to 2035 – these needs are more certain and therefore we have more clearly defined options to meet the requirements, and we recommend that these are progressed through the DNOA process. In all cases, we are proposing solutions that meet the projected requirements for 2050 and where appropriate, system needs arising beyond this period are taken into account to ensure a holistic solution.
- Future EHV system needs to 2050 – there is a greater degree of uncertainty of outcomes in this time frame. This also provides more opportunities to work with stakeholders to develop strategic plans, and our outlined solutions reflect this initial phase of the work as we look to engage with interested parties.
- Future HV/LV system needs to 2050 – the future needs of the HV and LV networks are locationally specific but can be considered as an aggregated volume. In this section we provide information on our future forecasts for local HV and LV network needs.

8.1. Overall Dependencies, Risks and Mitigations

There are several 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: Delivery of the currently triggered work is required to enable some of the solutions proposed here.
Risks: Further investigation into the high-level solutions proposed here will allow further options to be identified if necessary
Mitigation: Annual update of this Strategic Development Plan will consider the timeline of delivery and flag if/where additional options may need to be developed.

Dependency: Delivery of the reinforcement work highlighted in the works in progress section (section 6) will be required to enable capacity in the near-term but may also enable the proposed future options in this system needs section.
Risks: Delays or changes to triggered works fail to release capacity in the near-term and/or do not provide flexibility of future investment.
Mitigation: Current reinforcement projects are included in this strategic development plan, and dependencies are identified as part of the DNOA process and form part of the handover of work to delivery teams for consideration. Proposed work should also ensure that it is enabling future network development such as considering space constraints at the site.

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 can lead to damaged distribution network assets.

Mitigation: We should further assess the near-term generation requirements to ensure that we are in a position to facilitate the Clean Power 2030 targets set by DESNZ. Consideration of future fault level to prevent the risk of damaged assets should be considered when designing future schemes.

Dependency: Some of the system needs identified here are far into the future (past 2040), when there is an inherent uncertainty with long term forecasting.
Risks: Unnecessary network investment.
Mitigation: The SDP process means that these plans are updated annually with the most up to date forecasts, this allows us to take a view of system needs at regular intervals and recommend projects for detailed optioneering through the DNOA process when there is enough certainty and evidence for load growth.

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.

8.2. Future EHV System Needs

The following tables details the 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 7, we recommend that these are progressed through the DNOA process so that there is sufficient time for solutions to be designed and delivered. The interactions between possible options have been considered to identify potential synergies and efficiencies. As such, constraints have been grouped to be considered alongside each other and any additional interactions between constraints referenced.

8.2.1. System needs to 2035

ID	Location of proposed intervention	HT Year	EE Year	HE Year	CF Year	Network State	Comments and potential options to resolve the system need
132kV Network							
32	Bournemouth – Mannington 132kV double circuits	2030	2029	2030	2032	N-1: Loss of one parallel Bournemouth – Mannington circuit	There is a 132kV double circuit between Mannington GSP and Bournemouth BSP. Under the N-1 outage of one of these circuit, the opposing circuit is projected to be overloaded. Potential options to resolve this constraint: • Reinforcement of the existing circuits with higher rated conductors. • Transfer some of the Bournemouth demand to a neighbouring BSP
Mannington BSP							
33	Verwood Transformers	2025	2026	2025	2025	N-1: Loss of one Verwood 33/11kV transformer	Verwood PSS has three transformers and feeder circuits that are projected to be constrained under the N-1 outage of a transformer or circuit. Potential options to resolve this constraint are: • In the short term, transfer some of the Verwood demand to a neighbouring PSS or use flexibility services to manage the loading on the Verwood transformers. • Reinforcement of the existing transformers to 20/40MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Reinforcement of the existing circuits with higher rated conductors.
34	Mannington – Verwood 33kV circuits	2033	2029	2032	2035	N-1: Loss of one parallel Mannington – Verwood circuit	
35	Ferndown – Wimborne 33kV circuits	2033	2033	2033	2037	N-1: Loss of one parallel Ferndown – Wimborne circuit	As outlined in Table 6, there are already some planned works to install new Wimborne transformers in 2026. The Ferndown – Wimborne 33kV circuits are projected to be constrained under the N-1 outage of the parallel circuit. Potential option to resolve this constraint: • Reinforcement of the existing circuit with a higher rated conductor to release the full capacity of the transformers.

36	Fordingbridge – Mill Lane Ringwood	2033	2033	2033	2035	N-1: Loss of Rockbourne – Salisbury circuit	As outlined in Table 6, there are already some planned works in this area to be delivered in 2029. However, further sections of these circuits are projected to be constrained a few years later under the N-1 outage of the Rockbourne – Salisbury 33kV circuit. The Fordingbridge 33/11kV transformers are also projected to be constrained under the N-1 outage of the parallel Fordingbridge transformer. Potential options to resolve these constraints are: • Reinforcement of the existing circuit with a higher rated conductor. • Reinforcement of the existing Fordingbridge transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios.
37	Fordingbridge 33/11kV Transformers	2036	2034	2037	2043	N-1: Loss of one Fordingbridge 33/11kV transformer	
Shaftesbury BSP							
38	Bourton – Shaftesbury & Bourton – Gillingham – Shaftesbury circuits	2025	2026	2025	2025	N-1: Loss of parallel circuit	Bourton and Gillingham PSS are fed from Shaftesbury BSP by 2 x 33kV overhead line circuits. These are projected to be constrained under the N-1 outage of the opposing 33kV circuit. The Bourton transformers are also projected to be constrained in a similar timeframe. Due to their proximity, it's suggested that these works are completed together. Potential options to resolve these constraints are: • Reinforcement of the Bourton – Shaftesbury and Gillingham – Shaftesbury circuits with higher rated conductors. • Reinforcement of the existing transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios.
39	Bourton 33/11kV Transformers	2028	2026	2028	2028	N-1: Loss of one Bourton 33/11kV transformer	
40	Shaftesbury 132/33kV BSP Transformers	2033	2027	2032	2034	N-1: Loss of one Shaftesbury 132/33kV transformer	As outlined in Table 6, new Mannington – Shaftesbury 132kV circuits are planned to be delivered in 2030. However, the 132/33kV transformers are also projected to be constrained a few years later. Therefore, it is recommended that these works are considered together. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 120MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Install a 3rd 90MVA transformer at Shaftesbury BSP
41	Tisbury 33/11kV Transformers	2033	2033	2033	2036	N-1: Loss of one Tisbury 33/11kV transformer	Tisbury PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential options to resolve this constraint: • Reinforcement of the existing 8MVA transformers to 7.5/15MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Consider transferring load to a neighbouring PSS
42	Wincanton 33/11kV Transformers	2033	2029	2032	2035	N-1: Loss of one Wincanton 33/11kV transformer	Wincanton PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential option to resolve this constraint: • Reinforcement of the existing transformers from 7.5/15MVA units to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios.

Christchurch BSP							
43	Somerford 33/11kV Transformer 1	2029	2028	2030	2032	N-1: Loss of infeed from one Somerford 33/11kV transformer	Load growth at Somerford primary is forecast to increase sharply until 2050. The two 33/11kV transformers are rated at 20/26MVA. The circuits feeding Somerford from Christchurch BSP are also expected to overload at a similar time. Consider the delivery of these works alongside each other to minimise disruption. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 20/40MVA units would provide sufficient capacity until 2044 under all four DFES scenarios. • Install new circuits to Somerford PSS with higher rated conductors. • Shift load on the 11kV network to a nearby PSS. • As several PSS in the Christchurch area are projected to be overloaded in 2030 – 2040 period, a new primary substation in the area could be constructed.
44	Somerford 33/11kV Transformer 2	2033	2033	2034	2039	N-1: Loss of infeed from one Somerford 33/11kV transformer	
45	Christchurch – Somerford 33kV circuits	2031	2030	2030	2036	N-1: Loss of one parallel Christchurch – Somerford circuit	
46	Christchurch 33/11kV Transformers	2031	2031	2032	2034	N-1: Loss of one Christchurch 33/11kV transformer	Christchurch PSS is situated at Christchurch BSP and consists of two transformers that are projected to be constrained under the N-1 outage of the other transformer. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 20/40MVA units would provide sufficient capacity until 2043 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS. • As several PSS in the Christchurch area are projected to be overloaded in 2030 – 2040 period, a new primary substation in the area could be constructed. • Install a new transformer 15/30MVA transformer at Christchurch PSS.
47	Christchurch 132/33kV BSP Transformers	2032	2032	2033	2037	N-1: Loss of one Christchurch 132/33kV transformer	As outlined in Table 6, new Christchurch – Mannington circuits are planned to be delivered in 2030. However, the Christchurch BSP transformers are projected to be constrained under the N-1 outage of the other 132/33kV transformer. These transformers already highly rated at 90MVA. Potential options to resolve this constraint are: • Install a 3rd 90MVA transformer at Christchurch BSP. This would provide sufficient capacity until beyond 2050 under all four DFES scenarios and provide improved system security. • As there are a few BSP transformers in this geographical area which forecast to reach their capacity between 2030-2040, building of a new BSP should be considered.
48	Southbourne 33/11kV Transformers	2035	2032	2036	2039	N-1: Loss of one Southbourne 33/11kV transformer	Southbourne PSS consists of two transformers that are projected to be constrained under the N-1 outage of a transformer or circuit feeding it. Potential options to resolve this constraint are: • Reinforcement of the existing transformers from 15/20MVA units to 20/40MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS.

							• As several PSS in the Christchurch area are projected to be overloaded in 2030 – 2040 period, a new primary substation in the area could be constructed.
Lytchett BSP							
49	Blandford – Corfe Mullen – Lytchett 33kV circuits	2035	2033	2036	2040	N-1: Loss of parallel Blandford – Corfe Mullen – Lytchett circuit	The circuits from Lytchett BSP feeding Blandford and Corfe Mullen are projected to be constrained under the N-1 outage of the parallel circuit. Potential option to resolve this constraint: • Reinforcement of the Blandford – Corfe Mullen – Lytchett circuits with a higher rated conductor.
Wareham BSP							
50	Wareham – Wareham Town 33kV circuits	2035	2034	2036	2037	N-1: Loss of parallel Wareham – Wareham Town circuit	The Wareham Town transformers are already planned to be replaced; however, the circuits feeding Wareham Town from Wareham are expected to overload a few years later. Potential options to resolve this constraint are: • Reinforcement of the Wareham – Wareham Town circuits with a higher rated conductor. • Shift load on the 11kV network to a nearby PSS such Wareham.
51	Swanage – Wareham Town 33kV circuit	2037	2036	2039	2045	N-1: Loss of Wareham – Wareham Town 2 circuit	Swanage PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential option to resolve this constraint: • Reinforcement of the Swanage – Wareham Town 33kV circuit with a higher rated conductor.
Salisbury BSP							
52	Salisbury 132/33kV BSP Transformer A3MT	2034	2031	2035	2039	N-1: Loss of one Salisbury 132/33kV transformer	There are three 132/33kV transformers connected between Salisbury BSP and the 132kV network, where one transformer is rated lower than the other two. These are forecast to be overloaded for the N-1 outage of the parallel transformer. Potential options to resolve this constraint: • Uprate the lower rated transformer to 60MVA to match the other transformers. • Transfer load from Salisbury BSP to a neighbouring BSP. • Reinforce all three transformers to 90MVA.
53	Salisbury 132/33kV Transformers A1MT & A2MT	2037	2034	2037	2043		

Arnewood BSP							
54	Milford on Sea 33/11kV Transformers	2033	2032	2033	2037	N-1: Loss of one Milford on Sea 33/11kV transformer	Milford on Sea PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential option to resolve this constraint: • Reinforcement of the existing transformers to 15/30MVA units during the planned asset health replacement, would provide sufficient capacity until beyond 2050 under all four DFES scenarios.
Redhill BSP							
55	East Howe 33/11kV Transformers	2033	2029	2032	2036	N-1: Loss of one East Howe 33/11kV transformer	East Howe transformers and 33kV circuits are expected to be overloaded in N-1 conditions. Due to their proximity, it's proposed these works are considered together. Potential options to resolve this constraint are: • Reinforcement of the existing transformers from 15/23MVA units to 20/40MVA units would provide sufficient capacity until 2045 under all four DFES scenarios. In the winter CF and HT scenarios, there is a requirement for the transformers to be capable of managing a load of 50MVA between 2045-2050. In this scenario, installing a third 20/40MVA transformer may also be required. • Shift load on the 11kV network to a nearby PSS such as Redhill or Winton. • As several PSS in the Redhill area are projected to be overloaded in 2028 – 2040 period, a new primary substation in the area could be constructed. • Reinforcement of the circuits between East Howe – Redhill – Winton circuits with higher rated conductors.
56	East Howe – Redhill – Winton 33kV circuits	2034	2033	2035	2040	N-1: Loss of one East Howe – Redhill – Winton 33kV circuit	
Bournemouth BSP							
57	Bourne Valley 33/11kV Transformers	2028	2027	2030	2030	N-1: Loss of one Bourne Valley 33/11kV transformer	Bourne Valley transformers and 33kV circuits are expected to be overloaded in N-1 conditions. Due to their proximity, it's proposed these works are completed together. Potential options to resolve this constraint are: • Reinforcement of the Bourne Valley transformers to 20/40MVA. This would provide sufficient capacity until approximately 2040. After 2040, it is recommended that either a new transformer is installed, or load is shifted on the 11kV network to a neighbouring PSS, such as Parkstone North or Westbourne. • Reinforcement of the existing circuits to match the rating of the new transformers releases the full capacity of these transformers. • As several primary transformers in the area are expected to overload between 2030-2040, building a new primary substation should be considered.
58	Bournemouth – Bourne Valley 33kV circuits	2033	2033	2033	2039	N-1: Loss of one Bournemouth – Bourne Valley 33kV circuit	

59	Central 33/11kV Transformers	2030	2028	2031	2033	N-1: Loss of one Central 33/11kV transformer	Central transformers and 33kV circuits are expected to be overloaded in N-1 conditions. Due to their proximity, it's proposed these works are completed together. Potential options to resolve these constraints are: • Installation of a third transformer at Central. This would provide sufficient capacity until 2050 under all DFES scenarios. • Reinforcement the 2 existing transformers at the site and shift the load on the 11kV network to a neighbouring PSS, such as Boscombe East. • Reinforcement of the existing circuits to release the full capacity of the new or uprated transformers.
60	Bournemouth – Central 33kV circuits	2033	2033	2033	2048	N-1: Loss of one Bournemouth – Central 33kV circuit	
61	Bournemouth – Parkstone North 33kV circuits	2033	2033	2033	2037	N-1: Loss of one Bournemouth – Parkstone North 33kV circuit	Parkstone North transformers and 33kV circuits are expected to be overloaded in N-1 conditions. Due to their proximity, it's proposed these works are completed together. Potential options to resolve this constraint are: • Reinforcement of the existing circuits to match the expected load at Parkstone North. • Install a third 20/40MVA transformer units would provide sufficient capacity until 2050 under all four DFES scenarios. • An alternative option is to reinforce the 2 existing transformers at the site and shift the load on the 11kV network to a neighbouring PSS, such as Parkstone South. • As several PSS in the Bournemouth area are projected to be overloaded in 2030 – 2042 period, a new primary substation in the area could be constructed.
62	Parkstone North 33/11kV Transformers	2037	2035	2038	2045	N-1: Loss of one Parkstone North 33/11kV transformer	
63	Bournemouth BSP 132/33kV Transformers	2035	2034	2035	2041	N-1: Loss of one Bournemouth 132/33kV transformer	There are three 132/33kV transformers connected between Bournemouth BSP and the 132kV network. These are forecast to be overloaded in the N-1 condition following the loss of one Bournemouth transformer. Potential options to resolve this constraint are: • Transfer load from Bournemouth BSP to a neighbouring BSP. • Install a fourth 90MVA 132/33kV transformer at the site. • Reinforce all three transformers to 120MVA.

Table 77 – Summary of system needs identified in this strategy through to 2035 along with indicative solutions

8.2.2. System Needs to 2050

ID	Location of proposed intervention	HT Year	EE Year	HE Year	CF Year	Network State	Comments and potential options to resolve the system need
Mannington BSP							
64	Ferndown 33/11kV Transformers	2036	2037	2037	2041	N-1: Loss of one Ferndown 33/11kV transformer or Ferndown – Mannington circuit	At Ferndown PSS, there are three 33/11kV transformers which are fed by three 33kV circuits connected directly to Mannington BSP. These are all forecast to be overloaded by 2037 in N-1 conditions for the loss of one of the transformers. Potential options to resolve this constraint are: • Reinforcement of the Ferndown 12/24MVA transformers to 20/40MVA. This would provide sufficient capacity until 2050. • Reinforcement of the existing circuits to release the full capacity of the new transformers.
65	Ferndown – Mannington 33kV circuits	2037	2038	2038	2043		
66	Mannington 132/33kV BSP transformer (A1MT)	2038	2035	2038	2043	N-1: Loss of one Mannington 132/33kV transformer	At Mannington BSP, there are three 132/33kV transformers which are fed by three 132kV circuits connected directly to Mannington BSP. These are all forecast to be overloaded by 2040 in N-1 conditions for the loss of one of the transformers. Potential options to resolve this constraint are: • Reinforcement of the Mannington BSP transformers to 120MVA. This would provide sufficient capacity until 2050. • Shift load on the 33kV and 11kV network to neighbouring BSPs.
67	Mannington 132/33kV BSP transformer (A2MT & A3MT)	2040	2039	2040	2048		
Shaftesbury BSP							
68	West Stour 33/11kV Transformers	2035	2032	2034	2038	N-1: Loss of one West Stour 33/11kV transformer	West Stour PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer or feeder circuit. The circuit feeding West Stour PSS from Shaftesbury BSP is also forecast to be constrained a few years later. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS. • Reinforcement of the existing circuit with a higher rated conductor.
69	Shaftesbury – West Stour 33kV circuit	2042	2032	2036	-	N-1: Loss of the Gillingham – Shaftesbury 33kV circuit	
70	Petersfinger 33/11kV Transformers	2040	2036	2040	2046	N-1: Loss of one Petersfinger 33/11kV transformer	Petersfinger PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS.

ID	Location of proposed intervention	HT Year	EE Year	HE Year	CF Year	Network State	Comments and potential options to resolve the system need
71	Shroton 33/11kV Transformers	2042	2040	2043	2050	N-1: Loss of one Shroton 33/11kV transformer	Shroton PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer or feeder circuit. The circuit feeding Shroton PSS from Shaftesbury BSP is also forecast to be constrained a few years later. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS. • Reinforcement of the existing circuit with a higher rated conductor.
72	Shaftesbury – Shroton 33kV circuit	2043	2044	2048	-	N-1: Loss of one Shaftesbury – Shroton 33kV circuit	
						Christchurch BSP	
73	Boscombe East – Christchurch 33kV circuit	2036	2036	2037	2039	N-1: Loss of Boscombe East – Southbourne 33kV circuit	There are multiple 33kV circuits between Boscombe East, Southbourne and Christchurch which are forecasted to be overloaded in N-1 conditions. Due to their proximity, it's proposed these works are assessed and completed together. Potential options to resolve these constraints are: • Reinforcement of the existing circuits with a higher rated conductor. • An alternative option is to investigate the option of shifting the load on the 11kV network to a neighbouring PSS, such as Central PSS once the reinforcement works have completed there.
74	Boscombe East – Southbourne 33kV circuits	2040	2037	2041	2047	N-1: Boscombe East – Christchurch 33kV circuit	
						Lytchett BSP	
75	Creekmoor – Lytchett 33kV circuits	2038	2038	2039	2045	N-1: Loss of one Creekmoor – Lytchett circuit	Creekmoor PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer or Creekmoor – Lytchett circuit. The circuits feeding Creekmoor PSS from Lytchett BSP are also forecast to be constrained a few years later. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS. • Reinforcement of the existing circuits with a higher rated conductor.
76	Creekmoor 33/11kV Transformers	2040	2037	2039	2045	N-1: Loss of one Creekmoor 33/11kV transformer	
77	Winterborne Kingston 33/11kV Transformers	2040	2040	2043	2049	N-1: Loss of one Winterborne Kingston 33/11kV transformer	Winterborne Kingston PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer or feeder circuit. The transformers will need replacing for asset health reasons before 2040. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS.

Wareham BSP							
78	Bushey – Wareham Town 33kV Circuits	2038	2036	2039	2046	N-1: Loss of parallel Wareham – Wareham Town circuit	The Wareham Town transformers are already planned to be replaced; and as reported in Table 7 the Wareham – Wareham Town circuits are also forecast to be overloaded. The circuits feeding Bushey from Wareham are expected to overload a few years later than this, but it is suggested that these works should be considered together. Potential options to resolve this constraint are: • Reinforcement of the Bushey – Wareham circuits with a higher rated conductor. • Shift load on the 11kV network to a nearby PSS such Wareham.
Salisbury BSP							
79	Salisbury Central 33/11kV Transformers	2036	2033	2036	2043	N-1: Loss of one Salisbury Central 33/11kV transformer	Salisbury Central PSS consists of three transformers that are projected to be constrained under the N-1 outage of the parallel transformer or feeder circuit. Two of the transformers are older and lower rated, whilst one has been installed more recently and has a higher rating. Potential options to resolve this constraint are: • Reinforcement of the two lower rated transformers to 15/30MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS.
80	Bemerton – Salisbury 33kV Circuits	2036	2034	2037	2043	N-1: Loss of one parallel Bemerton – Salisbury circuit	The Salisbury – Bemerton – Salisbury Central circuits are projected to be constrained under the N-1 outage of the parallel circuit. Potential options to resolve this constraint are: • Reinforcement the circuits with a higher rated conductor. • Shift load from the Salisbury Central and Bemerton 11kV network to a nearby PSS.
81	Bemerton – Salisbury Central 33kV Circuits	2038	2036	2040	2047	N-1: Loss of one parallel Bemerton – Salisbury Central circuit	
82	Tarrant Rushton 33/11kV Transformers	2038	2035	2039	2045	N-1: Loss of one Tarrant Rushton 33/11kV transformer	Tarrant Rushton PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 10MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS.

Arnewood BSP							
83	New Milton 33/11kV Transformers	2037	2035	2038	2045	N-1: Loss of one New Milton 33/11kV transformer	New Milton PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential options to resolve this constraint are: • Installing a third 15/30MVA transformer would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Reinforcement of the existing transformers to 20/40MVA and shift load on the 11kV network to a nearby PSS.
84	Lymington 33/11kV Transformers	2040	2037	2040	2047	N-1: Loss of one Lymington 33/11kV transformer	Lymington PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. It is fed by two circuits which are connected directly to Arnewood. Potential options to resolve this constraint are: • Reinforcement of the existing transformers to 20/40MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. • Shift load on the 11kV network to a nearby PSS. • Reinforcement of the circuits with a higher rated conductors to release the full capacity of the transformers.
85	Arnewood – Lymington 33kV Circuits	2040	2038	2041	2048	N-1: Loss of one parallel Arnewood – Lymington circuit	
Redhill BSP							
86	Redhill 132/33kV transformers	2037	2034	2038	2044	N-1: Loss of one Redhill 132/33kV transformer	At Redhill BSP, there are two 132/33kV transformers which are fed by 132kV circuits connected to Mannington GSP. These are forecast to be overloaded by 2037 in N-1 conditions for the loss of the other transformer. Potential options to resolve this constraint are: • Reinforcement of the Redhill transformers to 120MVA. This would provide sufficient capacity until 2050. • Install a third 90MVA transformer to improve capacity and site security.
Bournemouth BSP							
87	Westbourne 33/11kV Transformers	2042	2041	-	-	N-1: Loss of one Westbourne 33/11kV transformer	Westbourne PSS consists of two transformers that are projected to be constrained under the N-1 outage of the parallel transformer. Potential options to resolve this constraint are: • Reinforcement of the transformers to 20/40MVA units would provide sufficient capacity until 2050 under all four DFES scenarios. • Installing a third transformer. • Shift load on the 11kV network to a nearby PSS. • As several PSS in the Bournemouth area are projected to be overloaded in 2030 – 2042 period, a new primary substation in the area could be constructed.

Table 88 – Summary of system needs identified in this strategy through to 2050 along with indicative solutions

8.3. 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 are therefore planning on a forecast volume basis, and this section provides further context on this work for both the Mannington GSP high voltage and low voltage network needs to 2050.

8.3.1. 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 have used the load model that is produced by SSEN's Data and Analytics team.[9]

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 primary substations supplied by Mannington 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 where it is projected that without intervention, 52% of secondary transformers will be overloaded under the HT scenario by 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 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.

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

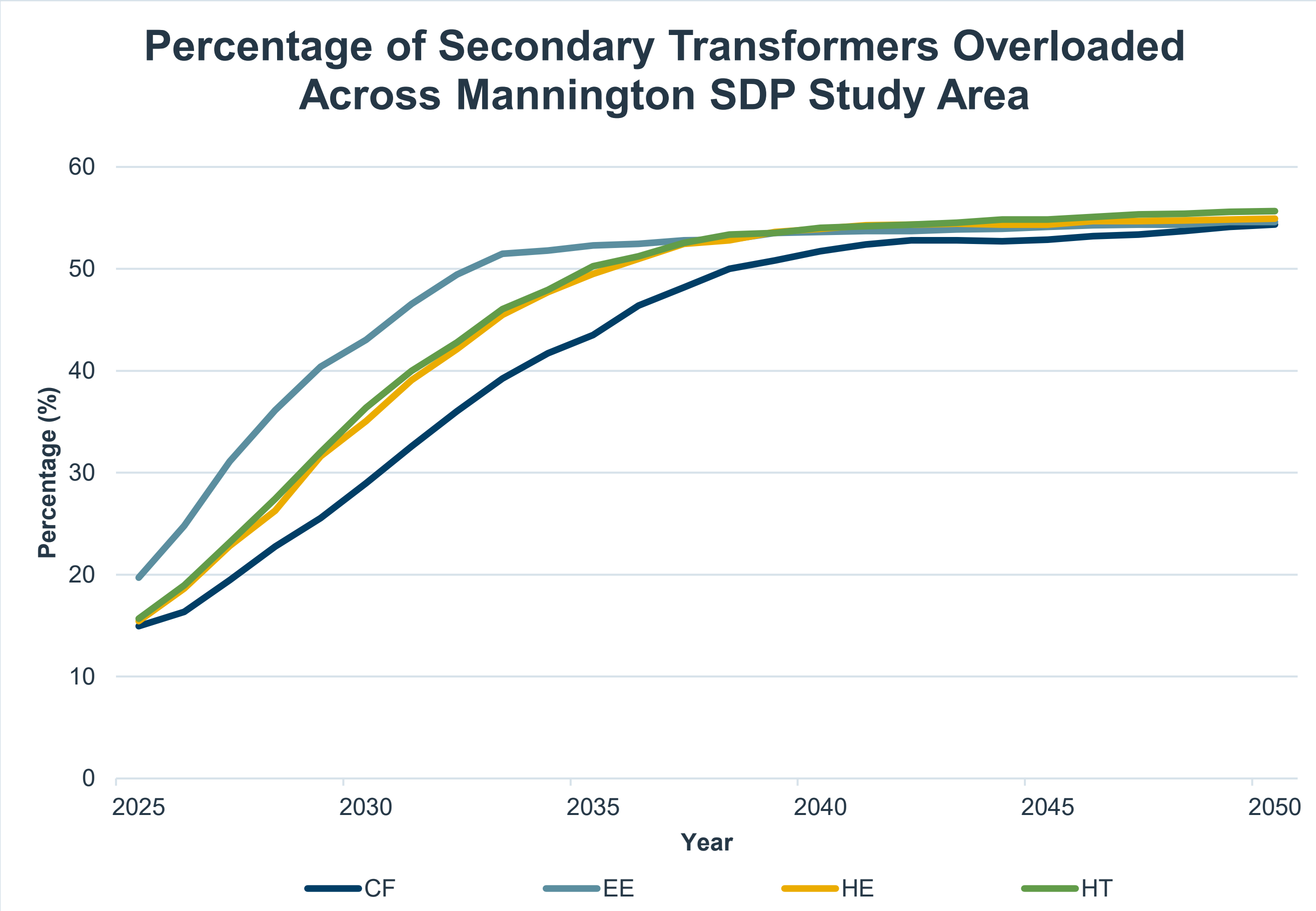


Figure 16 – Mannington GSP Projected secondary transformer loading. *Source: SSEN Load Model*

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 forecasting 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. Inclusion of the use of the VFES also acts as an example of how this data can be used more broadly by SSEN as well as other organisations for spatial planning. For example, it can help us identify areas where energy efficiency mechanisms could help reduce the need for network investment.

One of the outputs from this innovation project was the report produced by the Smith Institute.[10] This work groups LSOAs[11] 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 9.

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

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

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 99 – VFES Groupings

As shown in Figure 17, there are several Lower-layer Super Output Areas (LSOAs) that are category 1, meaning they have been identified as very high vulnerability. From using the load model, we can identify secondary transformers that are projected to be over 100% loaded by 2028. Some of these are also identified as being located within the areas categorised as highly vulnerable. These secondary transformers should be prioritised for load related reinforcement as it will reduce the likelihood of asset failure for load reasons and increase network resilience in these areas.

To understand the vulnerability groupings across Mannington GSP, supply area we have visualised the LSOA categorisation for the study area. By overlaying secondary transformers that are projected to be overloaded by 2028 (under the Holistic Transition scenario), we begin to understand the crossover between network capacity needs and areas categorised as high vulnerability through the VFES work.

The majority of the Mannington GSP area falls into category 3 with high vulnerability. There is a notable cluster of projected overloaded secondary transformers by 2028 under HT around Bournemouth which coincide with areas of very high vulnerability (category 1).

By overlaying the point locations of secondary transformers projected to be overloaded (in 2028 under the Holistic Transition scenario) we identify areas that are categorised as more vulnerable and also may have capacity shortfalls at the secondary network level. More vulnerable groups may have a lower level of adoption of LCTs and therefore provide less ability to manage overloads through flexibility services. Further they may point towards areas of social housing where there could be a more sudden rollout of LCTs such as heat pumps in the future. They may also highlight areas where there is an evidential need for energy efficiency measures.

We recommend the use of these insights to prioritise work in heavily loaded areas of our network ensuring the network remains secure, stable, and resilient in the areas where vulnerable customers would be most disadvantaged by power outages.

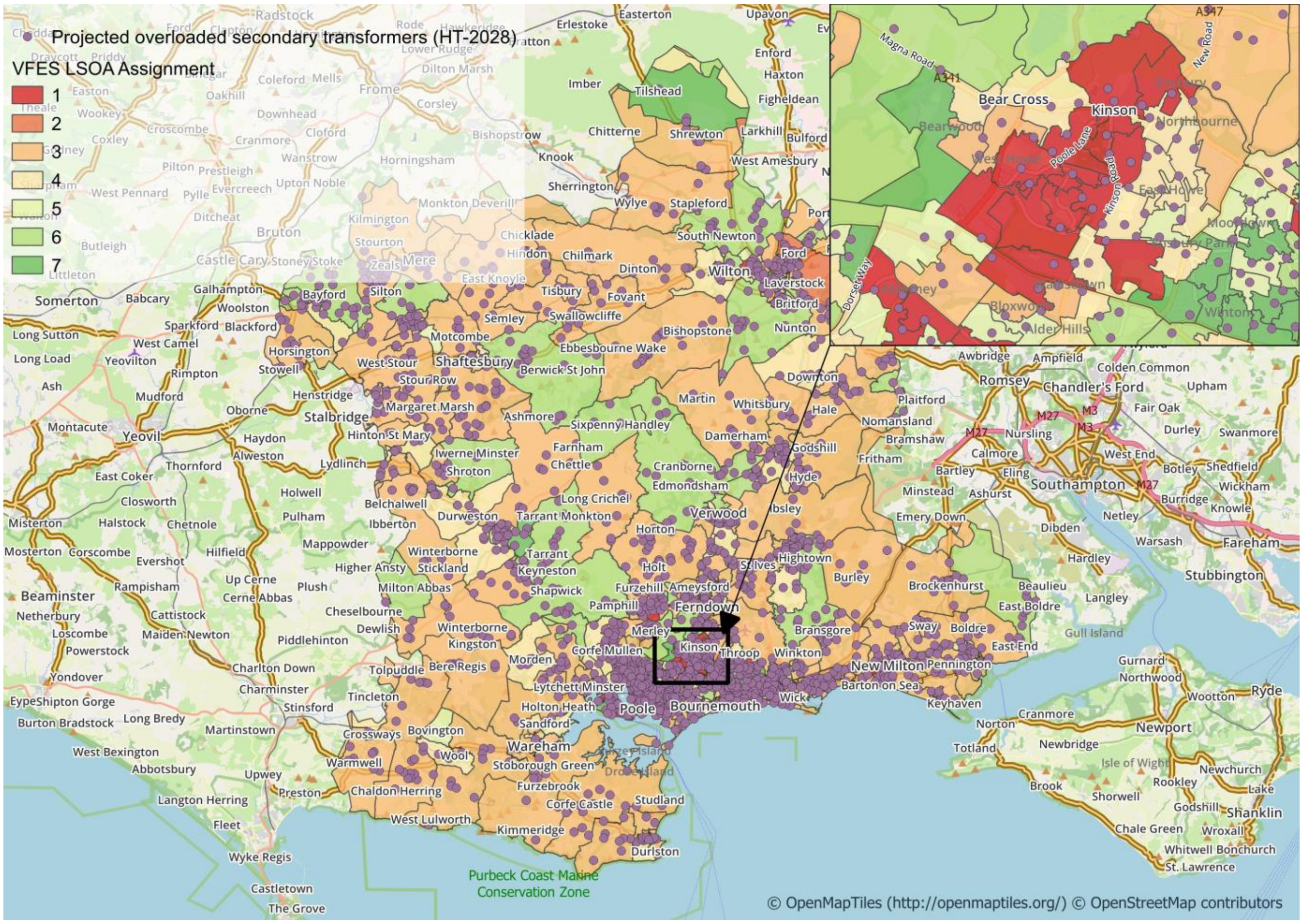


Figure 17 – Mannington 132kV GSP area VFES output with secondary transformer overlay.

8.3.2. Low Voltage Networks

Drivers for interventions in low voltage networks may be either capacity related or be driven by voltage requirements. We are progressing options to resolve both 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 are 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. We are 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 Mannington 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-liner relationship and as such requires more complex analysis. We are currently undertaking analysis to better understand the extent of this future need.

Initial analysis indicates that 35% of low voltage feeders may need intervention by 2035 and 46% by 2050 under the HT scenario as shown in Figure 18**Error! Reference source not found.**. 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.

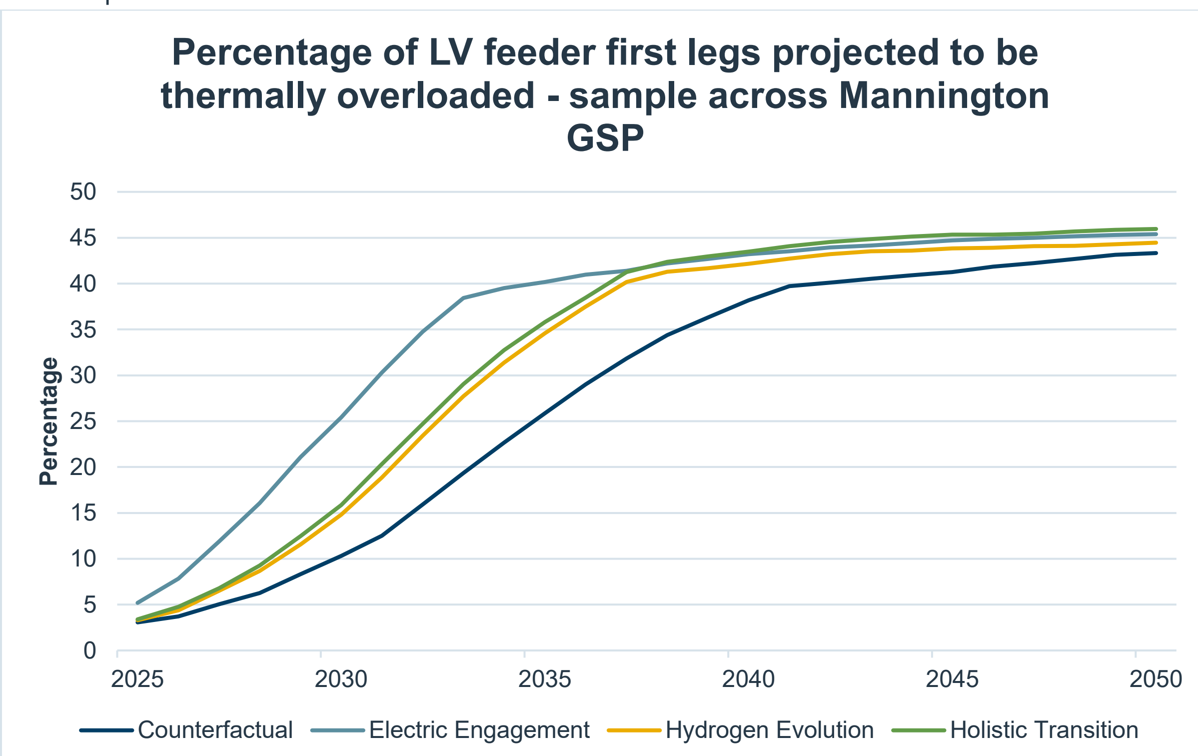


Figure 18 – Percentage of LV feeders projected to be overloaded under Mannington GSP

9. RECOMMENDATIONS

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

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 8.2.

2. Considering the significant load growth expected across Mannington, engagement with NGET and NESO should be proactive to create a long-term plan for the area which includes consideration of future demands at neighbouring GSPs.

3. The decarbonisation of the maritime industry has triggered several asset reinforcements across the Bournemouth and Poole area. It's recommended that SSEN continues to engage closely with the Ports in the area, so the decarbonisation of the maritime industry and the corresponding electricity demands are best understood.

4. With large works in progress and further new substations which could be triggered into the future, early engagement with local authorities and other landowners should be explored to find new substation locations early. Where these are identified early capacity could be released sooner than forecast.

5. Considering the significant growth in DERs expected across Mannington 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.

Appendix A Further detail on existing network infrastructure – Primary Substations

Substation Name	Site Type	Number of Customers Served	2025 Substation Maximum MVA
ALDERNEY	Primary Substation	5265	16.6
BEMERTON	Primary Substation	6671	9.8
BLANDFORD	Primary Substation	9430	13.8
BOSCOMBE EAST	Primary Substation	9535	11.3
BOURNE VALLEY	Primary Substation	16062	20.4
BOURTON	Primary Substation	6620	8.4
BOVINGTON	Primary Substation	2462	5.2
BUSHEY	Primary Substation	840	1.6
CENTRAL	Primary Substation	18615	21.2
CHRISTCHURCH	Primary Substation	14326	19.9
CORFE MULLEN	Primary Substation	8177	10.9
CREEKMOOR	Primary Substation	8623	13.2
EAST HOWE	Primary Substation	15266	16.7
ELECTRIC HOUSE	Primary Substation	5854	15.5
FERNDOWN	Primary Substation	13361	22.8
FORDINGBRIDGE	Primary Substation	4141	6.6
GILLINGHAM	Primary Substation	2729	4.8
GUSSAGE ST MICHAEL	Primary Substation	417	1.2
HAMWORTHY	Primary Substation	10686	13.9
HINCHELSEA	Primary Substation	3268	6.3
HINTON MARTELL	Primary Substation	884	1.6
HOLES BAY	Primary Substation	2726	16.9
HOMINGTON	Primary Substation	1840	5.9
LYMINGTON	Primary Substation	11522	16.7
MANNINGTON	Primary Substation	3355	6.8
MILFORD ON SEA	Primary Substation	7375	8.0
Mill LANE, RINGWOOD	Primary Substation	10209	16.1
MINCHINGTON	Primary Substation	1232	2.2
NETHERHAMPTON	Primary Substation	2816	5.4

NEW MILTON	Primary Substation	13107	15.9
PARKSTONE NORTH	Primary Substation	16548	22.2
PARKSTONE SOUTH	Primary Substation	9252	8.3
PETERSFINGER	Primary Substation	7290	11.3
POOLE	Primary Substation	5986	13.5
REDHILL	Primary Substation	11870	18.5
REDLYNCH	Primary Substation	4639	9.8
ROCKBOURNE	Primary Substation	802	1.6
SALISBURY CENTRAL	Primary Substation	14580	22.0
SHAFTESBURY	Primary Substation	6785	10.2
SHROTON	Primary Substation	5963	14.1
SOMERFORD	Primary Substation	14464	18.1
SOUTHBOURNE	Primary Substation	12220	9.3
STAPLEFORD	Primary Substation	2913	4.7
SWANAGE	Primary Substation	8581	8.9
TARRANT RUSHTON	Primary Substation	1011	3.6
TEFFONT	Primary Substation	1573	3.8
TISBURY	Primary Substation	2510	5.0
VERWOOD	Primary Substation	7184	9.0
WAREHAM TOWN	Primary Substation	5577	10.2
WEST STOUR	Primary Substation	2545	4.6
WESTBOURNE	Primary Substation	12142	13.4
WIMBORNE	Primary Substation	11768	15.3
WIMBORNE ST GILES	Primary Substation	497	0.9
WINCANTON	Primary Substation	4371	8.2
WINFRITH HEATH	Primary Substation	2910	2.6
WINTERBORNE KINGSTON	Primary Substation	3825	5.5
WINTON	Primary Substation	14433	18.9

Table 10 – Primary Substations supplied by Mannington GSP

Appendix B Existing Network Schematics

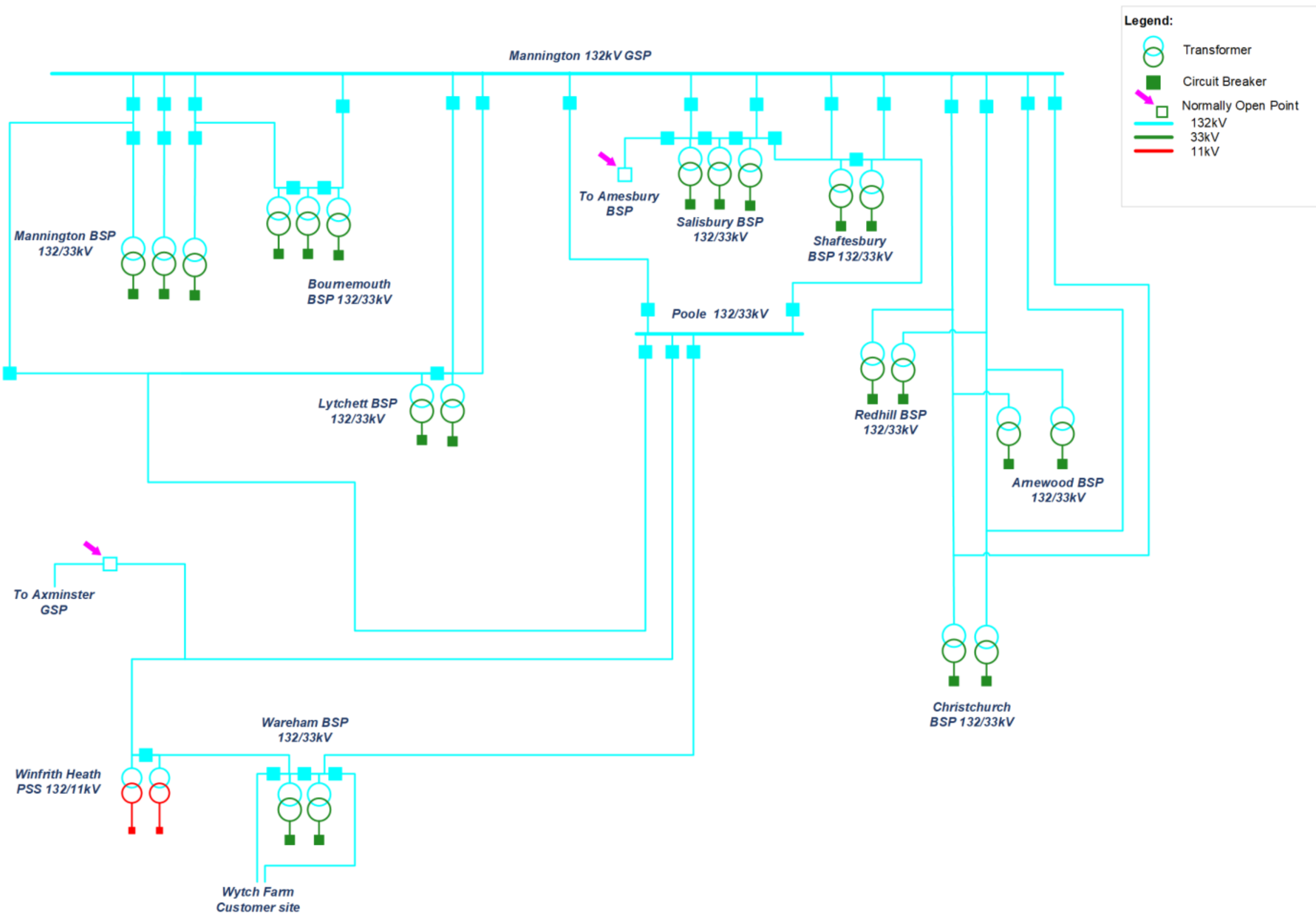


Figure 19 – Mannington 132kV Network Simplified Existing Network Schematic

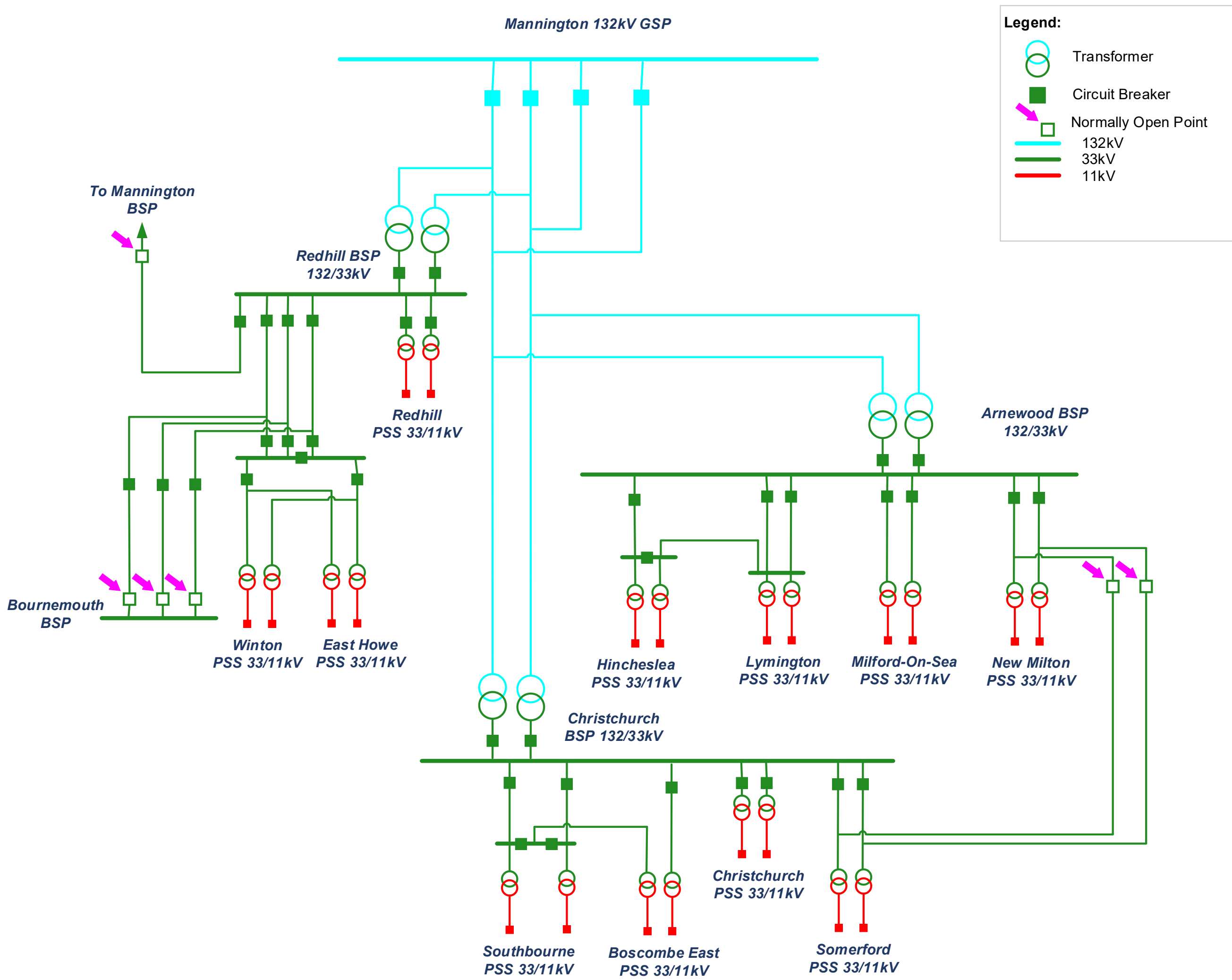


Figure 20 – Arnewood, Christchurch and Redhill Simplified Existing Network Schematic

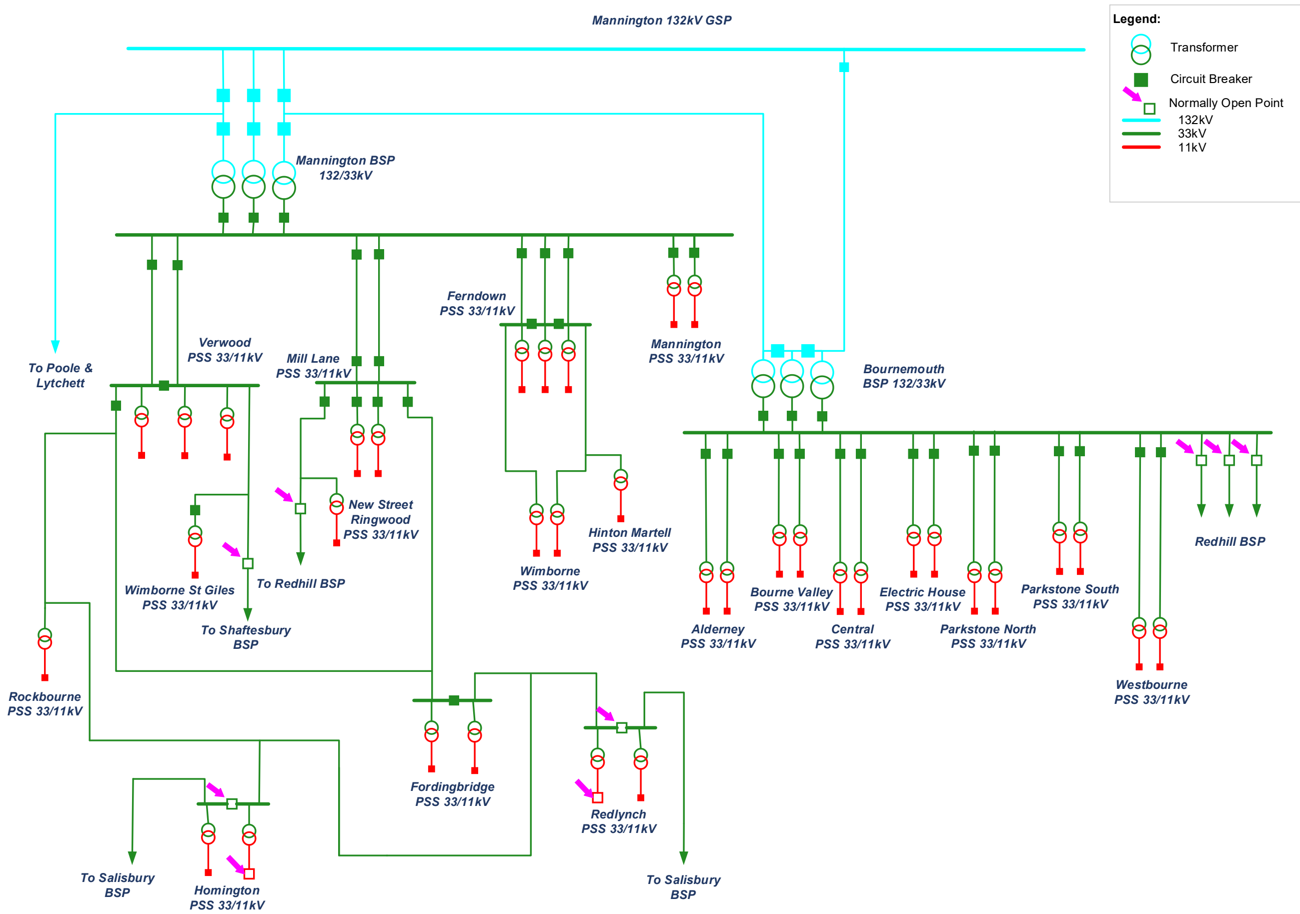


Figure 21 – Bournemouth and Mannington Simplified Existing Network Schematic

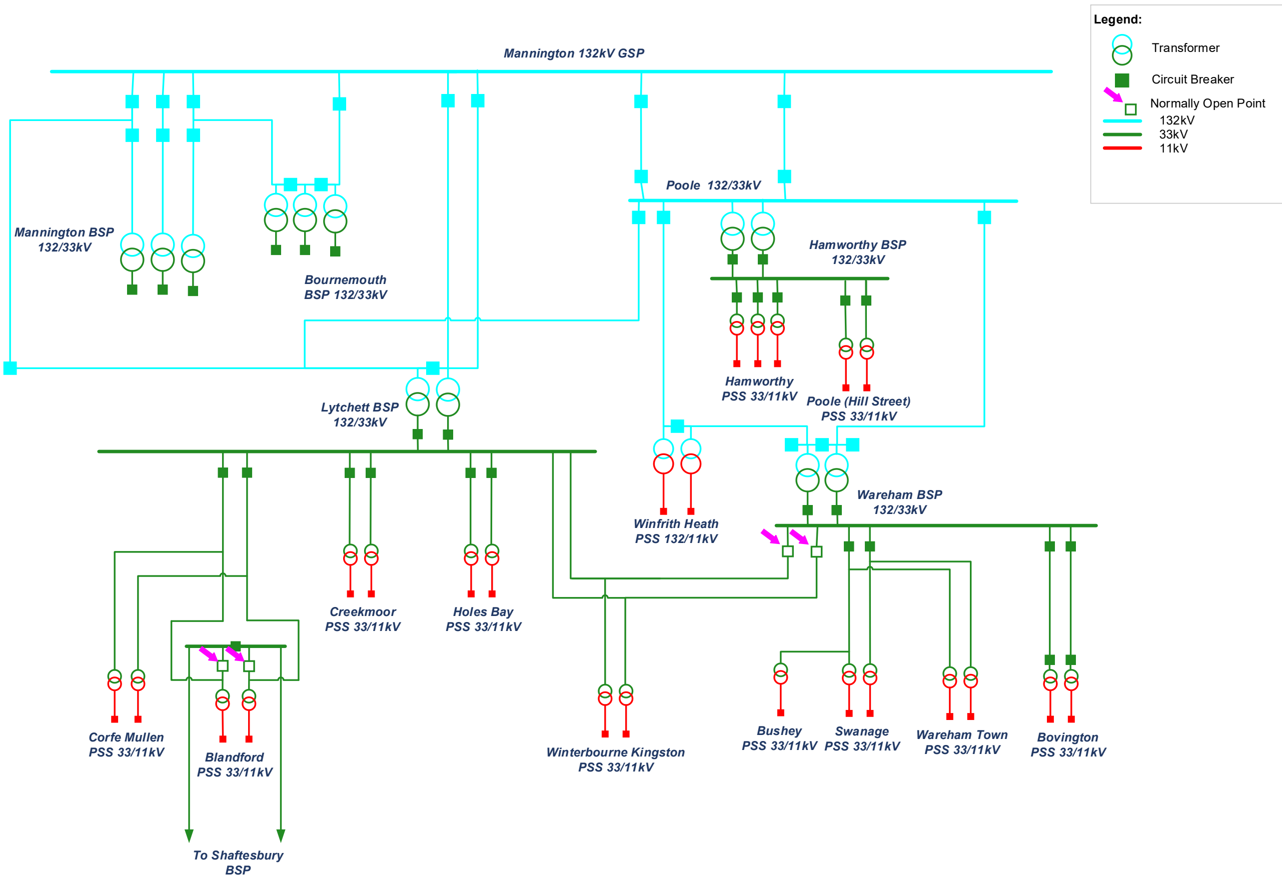


Figure 22 – Lytchett and Wareham Simplified Existing Network Schematic

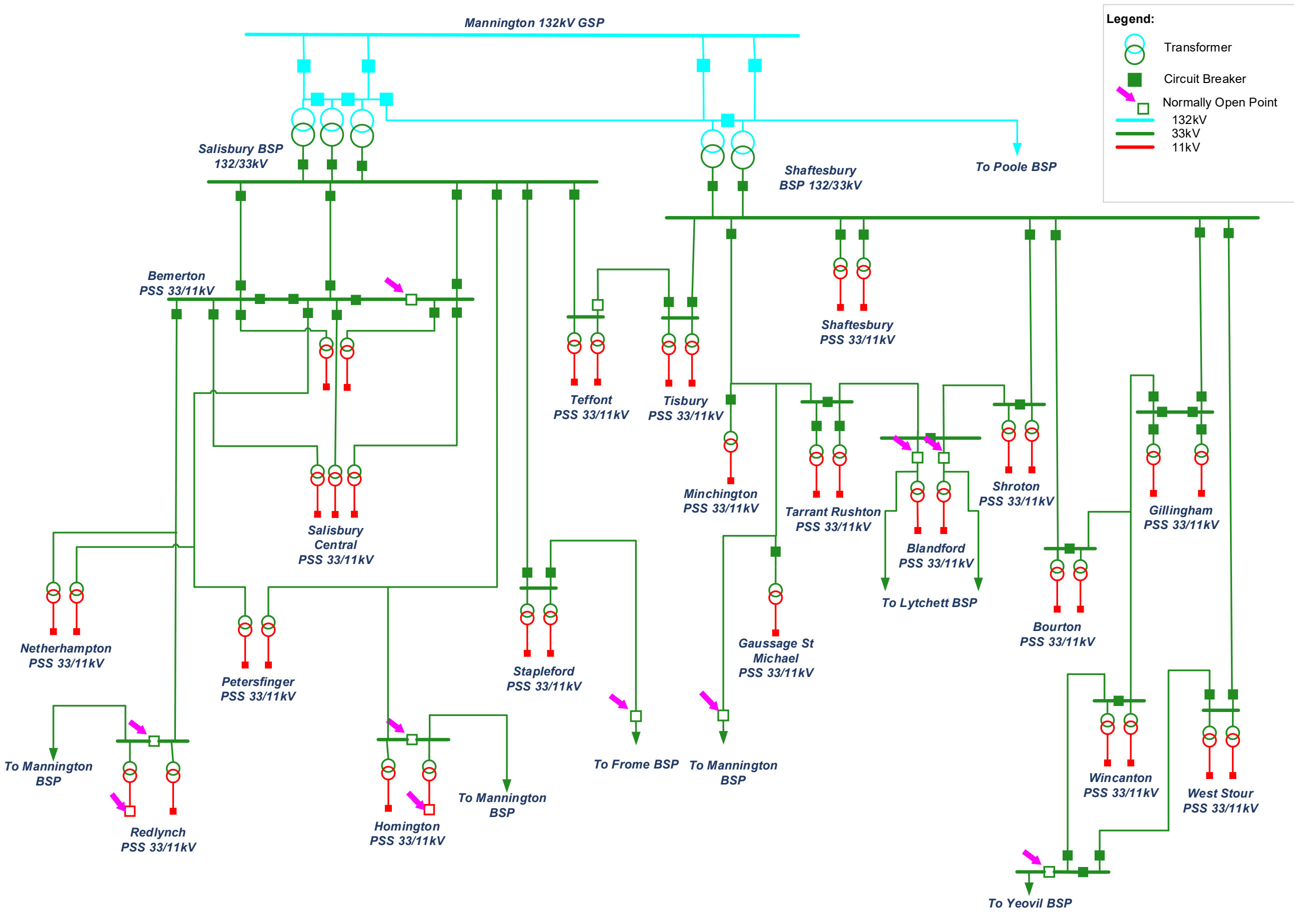


Figure 23 – Salisbury and Shaftesbury Simplified Existing Network Schematic

Appendix C EHV/HV Spatial plans for other DFES scenarios

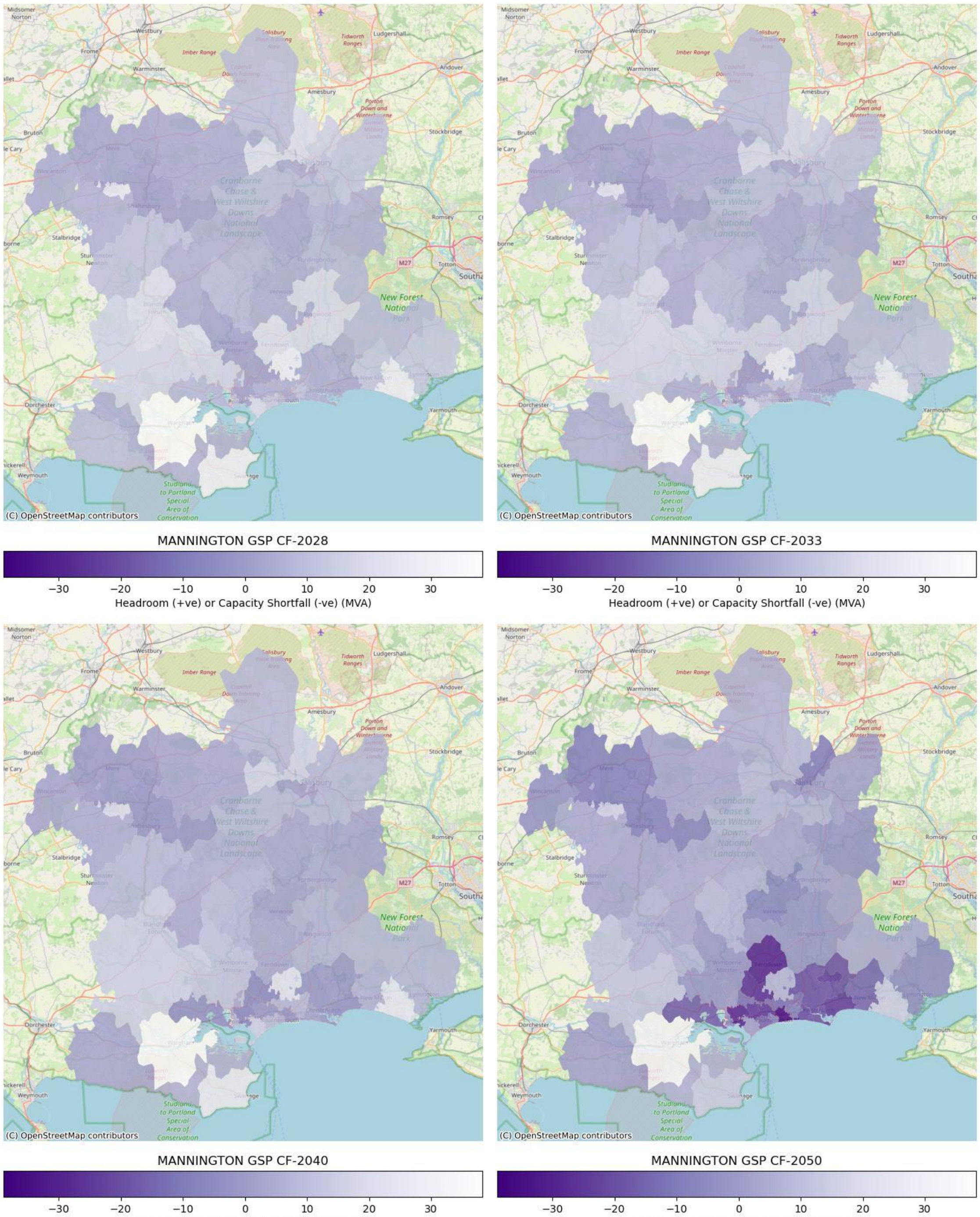


Figure 24 – Mannington GSP – EHV/HV Spatial Plan – Counterfactual

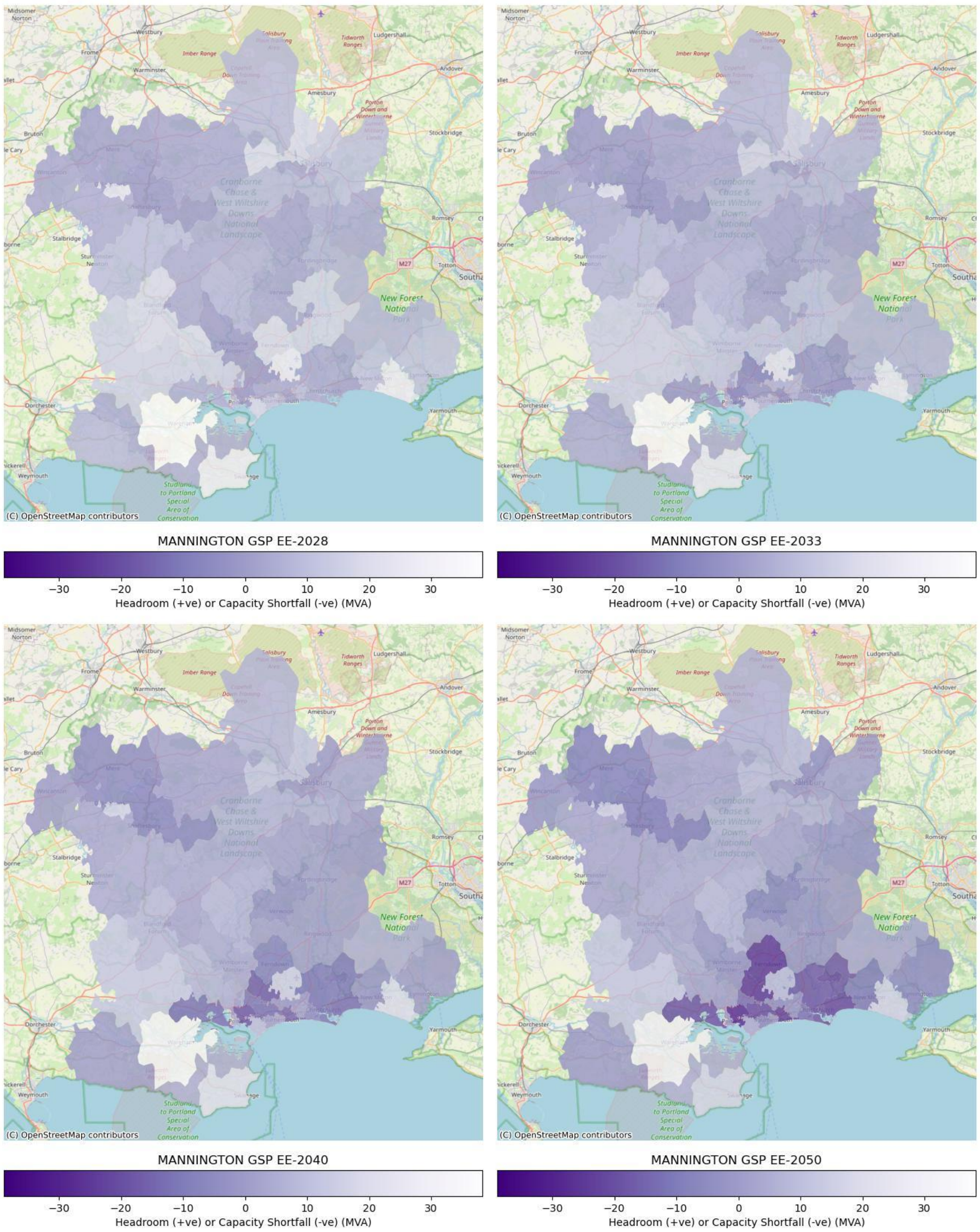


Figure 25 – Mannington GSP – EHV/HV Spatial Plan – Electric Engagement

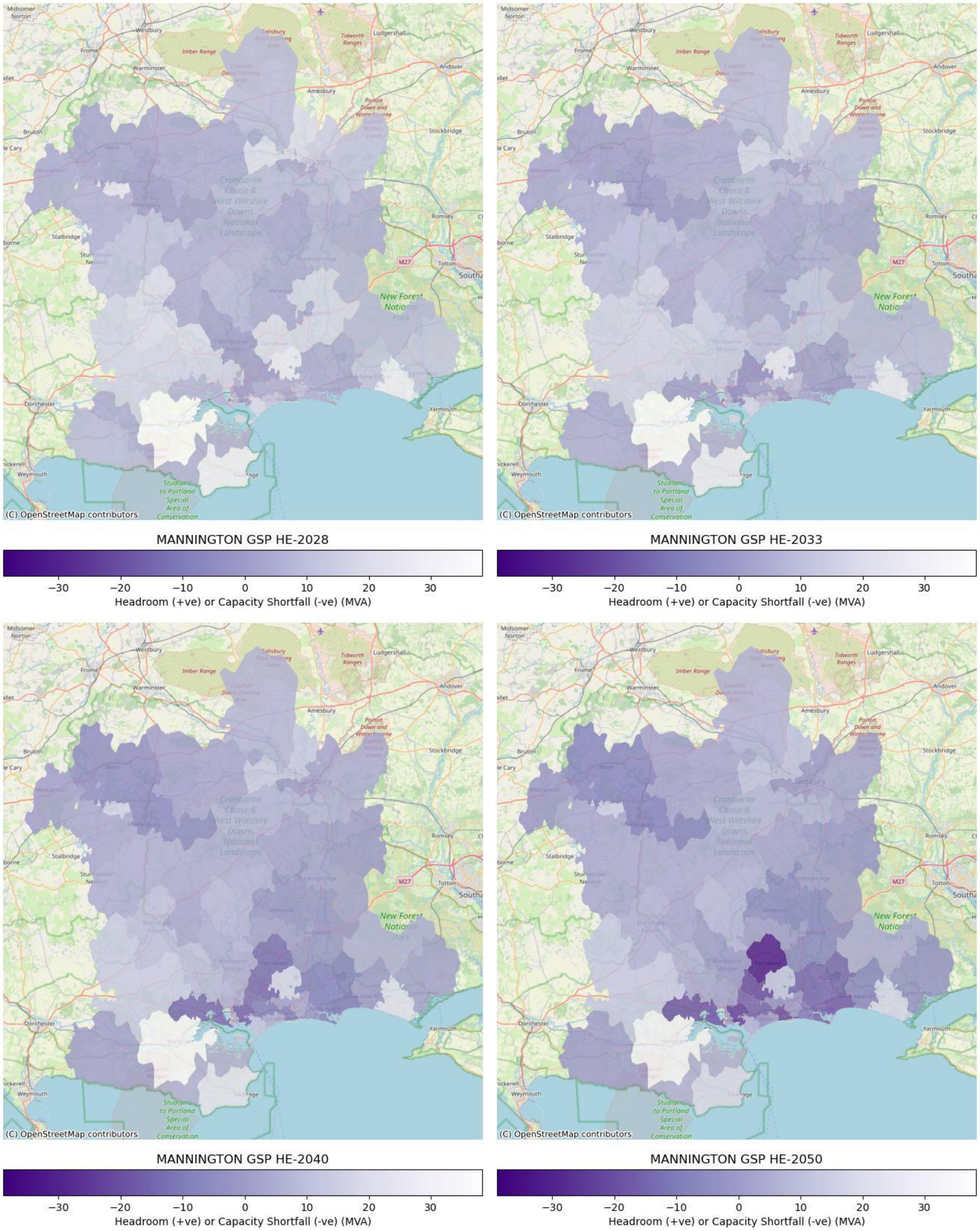


Figure 26 – Mannington 132kV GSP – EHV/HV Spatial Plan – Hydrogen Evolution

Appendix D HV/LV spatial plans for other DFES scenarios

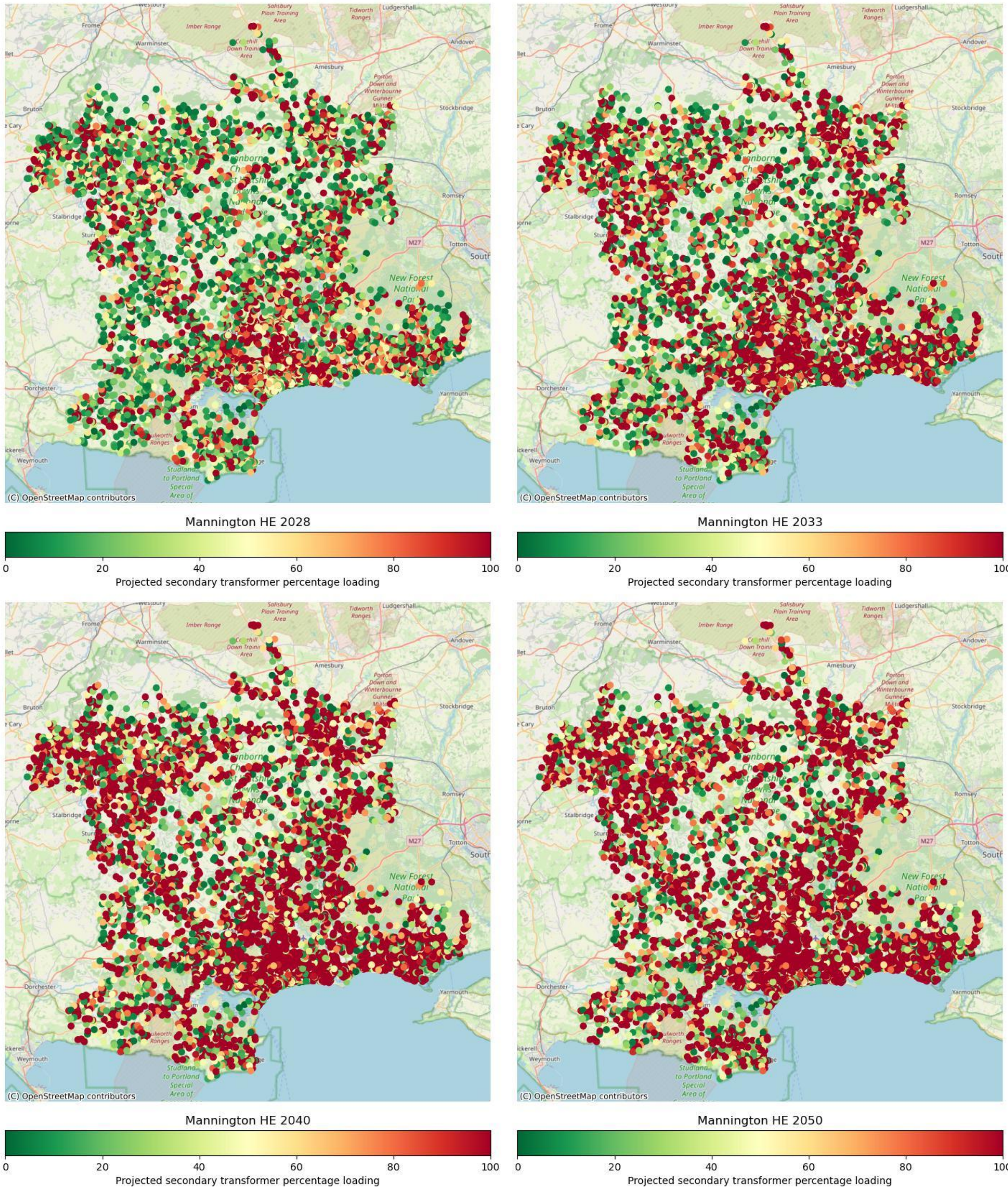


Figure 27 – Mannington GSP – HV/LV Spatial Plan – Hydrogen Evolution

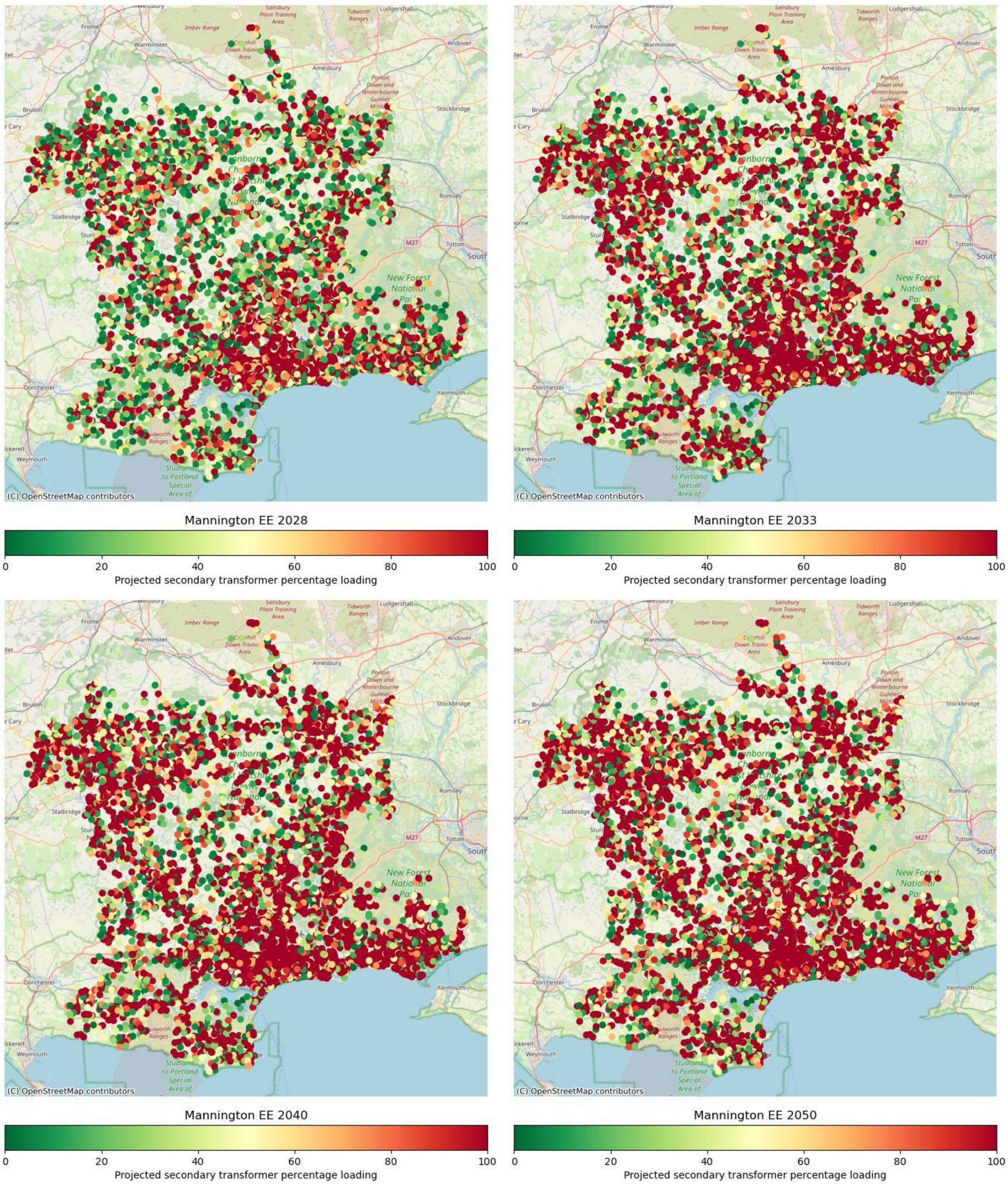


Figure 28 – Mannington GSP – HV/LV Spatial Plan – Electric Engagement

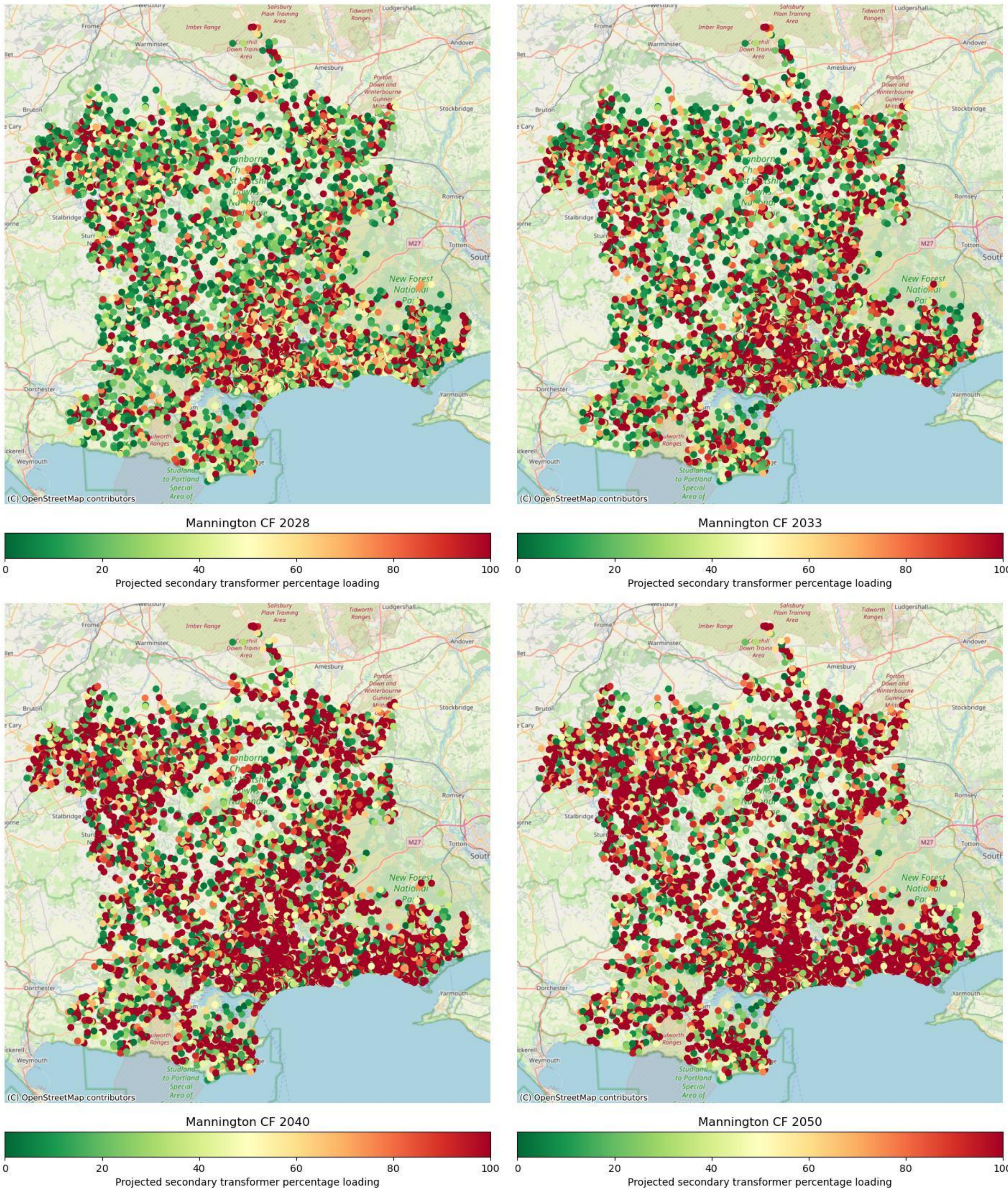
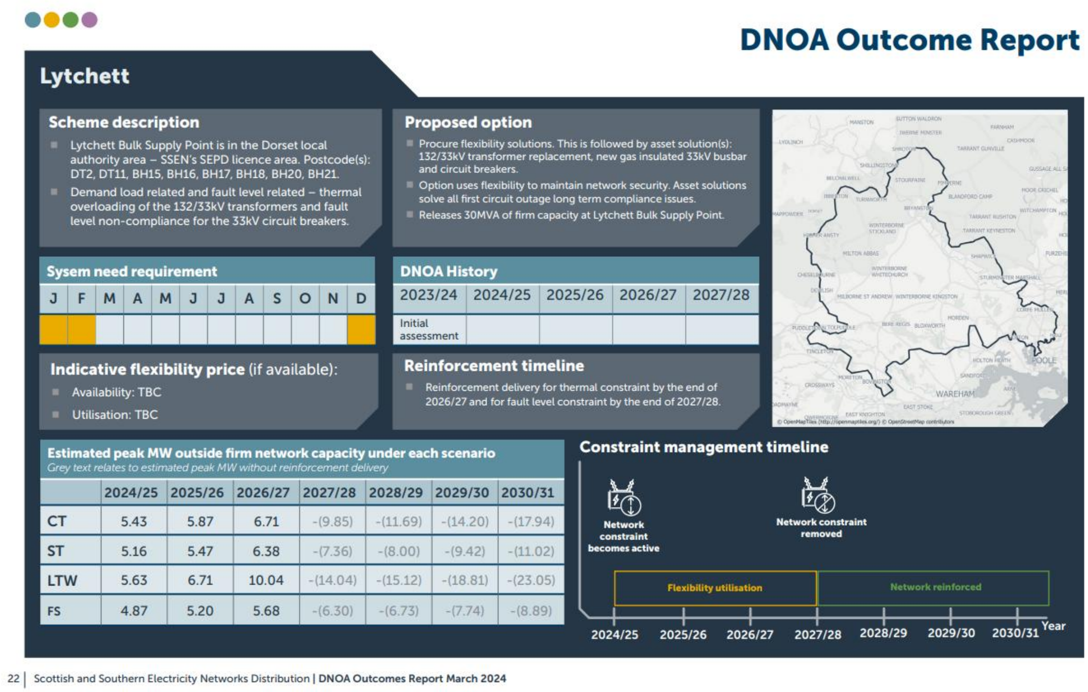


Figure 29 – Mannington GSP – HV/LV Spatial Plan - Counterfactual

Appendix E Relevant DNOA Outcome Reports



DNOA Outcome Report

Lytchett

Scheme description

- Lytchett Bulk Supply Point is in the Dorset local authority area – SSEN's SEPD licence area. Postcode(s): DT2, DT11, BH15, BH16, BH17, BH18, BH20, BH21.
- Demand load related and fault level related – thermal overloading of the 132/33kV transformers and fault level non-compliance for the 33kV circuit breakers.

Proposed option

- Procure flexibility solutions. This is followed by asset solution(s): 132/33kV transformer replacement, new gas insulated 33kV busbar and circuit breakers.
- Option uses flexibility to maintain network security. Asset solutions solve all first circuit outage long term compliance issues.
- Releases 30MVA of firm capacity at Lytchett Bulk Supply Point.

Sysem need requirement

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

DNOA History

2023/24	2024/25	2025/26	2026/27	2027/28
Initial assessment				

Indicative flexibility price (if available):

- Availability: TBC
- Utilisation: TBC

Reinforcement timeline

- Reinforcement delivery for thermal constraint by the end of 2026/27 and for fault level constraint by the end of 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	5.43	5.87	6.71	-(9.85)	-(11.69)	-(14.20)	-(17.94)
ST	5.16	5.47	6.38	-(7.36)	-(8.00)	-(9.42)	-(11.02)
LTW	5.63	6.71	10.04	-(14.04)	-(15.12)	-(18.81)	-(23.05)
FS	4.87	5.20	5.68	-(6.30)	-(6.73)	-(7.74)	-(8.89)

Constraint management timeline

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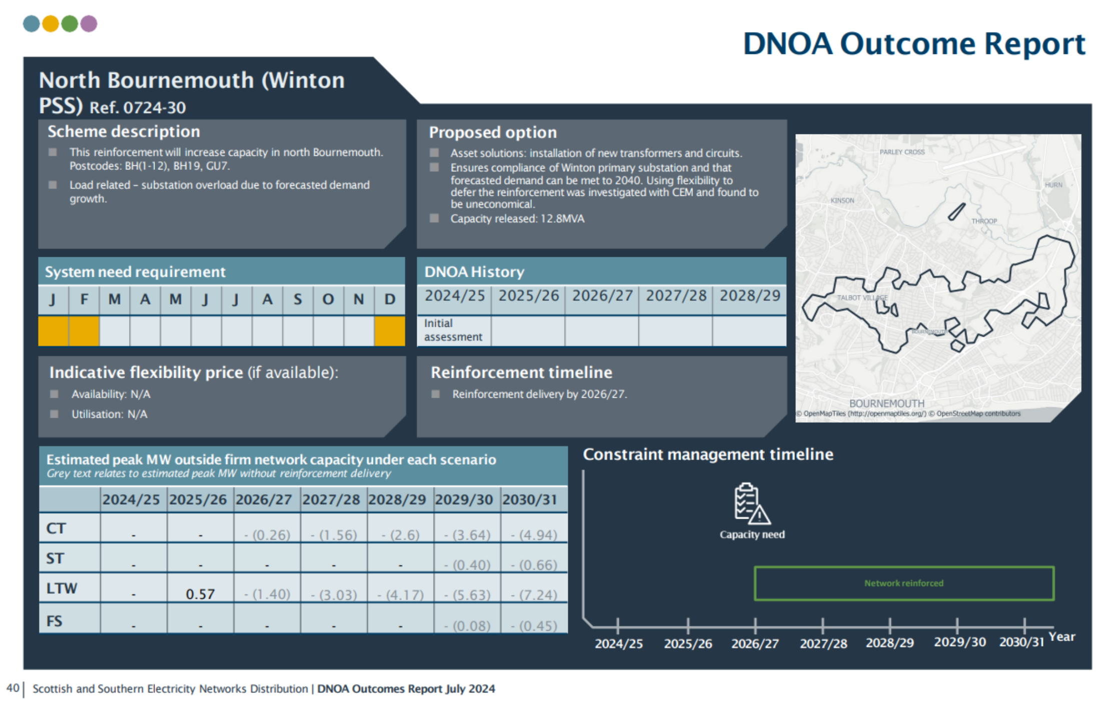
Figure 30 – Lytchett DNOA Outcome Report



DNOA Outcome Report

North Bournemouth (Winton PSS) Ref. 0724-30

Scheme description

- This reinforcement will increase capacity in north Bournemouth. Postcodes: BH(1-12), BH19, GU7.
- Load related - substation overload due to forecasted demand growth.

Proposed option

- Asset solutions: installation of new transformers and circuits.
- Ensures compliance of Winton primary substation and that forecasted demand can be met to 2040. Using flexibility to defer the reinforcement was investigated with CEM and found to be uneconomical.
- Capacity released: 12.8MVA

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: N/A
- Utilisation: N/A

Reinforcement timeline

- Reinforcement delivery by 2026/27.

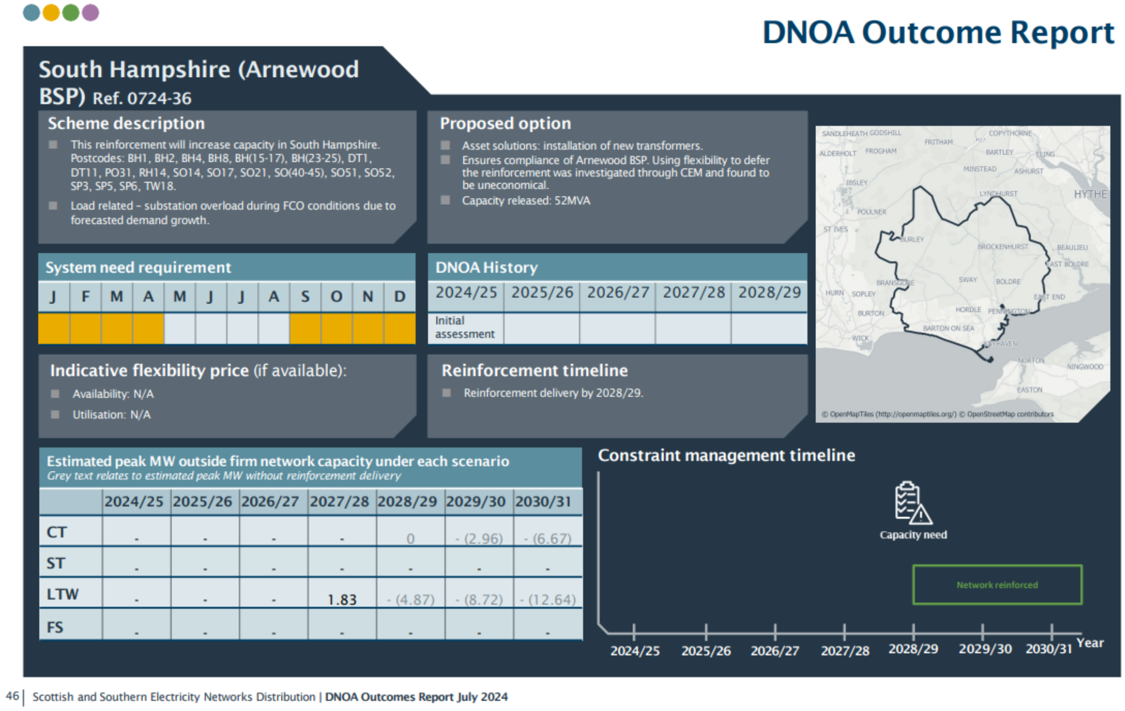
Estimated peak MW outside firm network capacity under each scenario
Grey text relates to estimated peak MW without reinforcement delivery

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
CT	-	-	- (0.26)	- (1.56)	- (2.6)	- (3.64)	- (4.94)
ST	-	-	-	-	-	- (0.40)	- (0.66)
LTW	-	0.57	- (1.40)	- (3.03)	- (4.17)	- (5.63)	- (7.24)
FS	-	-	-	-	-	- (0.08)	- (0.45)

Constraint management timeline

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

Figure 31 – North Bournemouth DNOA Outcome Report



DNOA Outcome Report

South Hampshire (Arnewood BSP) Ref. 0724-36

Scheme description
- This reinforcement will increase capacity in South Hampshire. Postcodes: BH1, BH2, BH4, BH8, BH(15-17), BH(23-25), DT1, DT11, PO31, RH14, SO14, SO17, SO21, SO(40-45), SO51, SO52, SP3, SP5, SP6, TW18.
- Load related – substation overload during FCO conditions due to forecasted demand growth.

Proposed option
- Asset solutions: installation of new transformers.
- Ensures compliance of Arnewood BSP. Using flexibility to defer the reinforcement was investigated through CEM and found to be uneconomical.
- Capacity released: 52MVA

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 2028/29.

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	- (2.96)	- (6.67)
ST	-	-	-	-	-	-	-
LTW	-	-	-	1.83	- (4.87)	- (8.72)	- (12.64)
FS	-	-	-	-	-	-	-

Constraint management timeline

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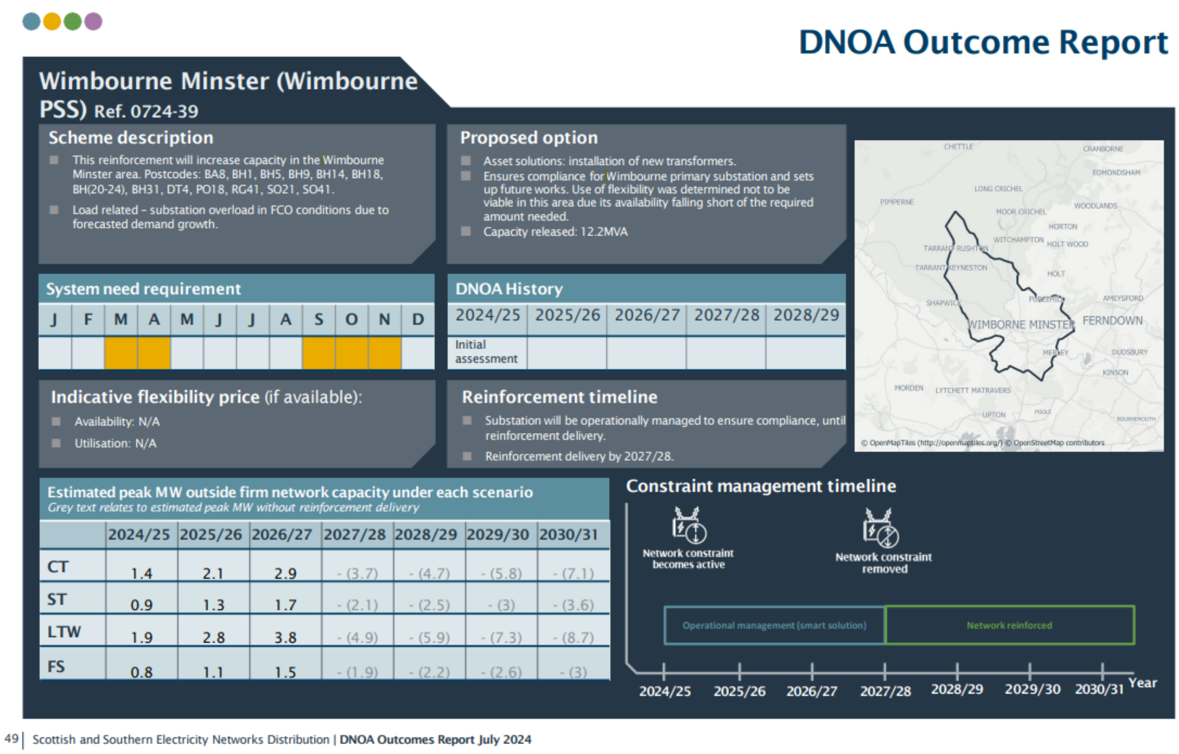
Figure 32 – South Hampshire DNOA Outcome Report



DNOA Outcome Report

Wimbourne Minster (Wimbourne PSS) Ref. 0724-39

Scheme description
- This reinforcement will increase capacity in the Wimbourne Minster area. Postcodes: BA8, BH1, BH5, BH9, BH14, BH18, BH(20-24), BH31, DT4, PO18, RG41, SO21, SO41.
- Load related – substation overload in FCO conditions due to forecasted demand growth.

Proposed option
- Asset solutions: installation of new transformers.
- Ensures compliance for Wimbourne primary substation and sets up future works. Use of flexibility was determined not to be viable in this area due its availability falling short of the required amount needed.
- Capacity released: 12.2MVA

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
- Substation will be operationally managed to ensure compliance, until reinforcement delivery.
- 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	1.4	2.1	2.9	- (3.7)	- (4.7)	- (5.8)	- (7.1)
ST	0.9	1.3	1.7	- (2.1)	- (2.5)	- (3)	- (3.6)
LTW	1.9	2.8	3.8	- (4.9)	- (5.9)	- (7.3)	- (8.7)
FS	0.8	1.1	1.5	- (1.9)	- (2.2)	- (2.6)	- (3)

Constraint management timeline

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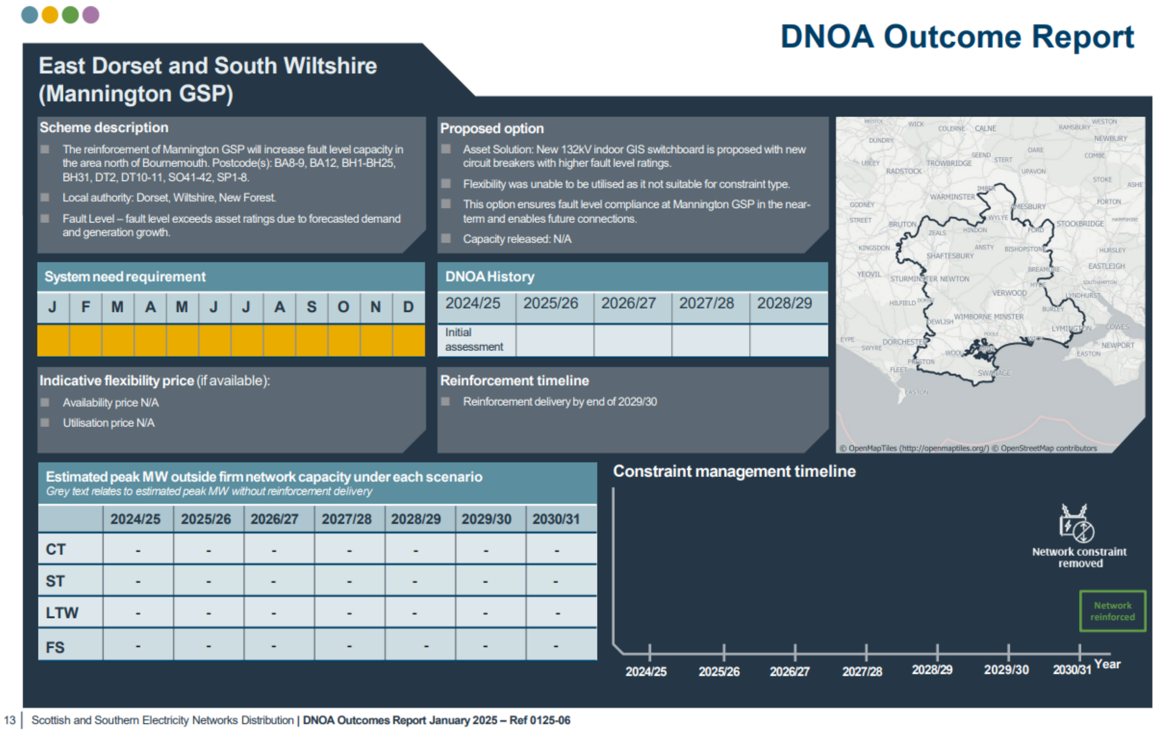
Figure 33 – Wimbourne Minster DNOA Outcome Report



DNOA Outcome Report

East Dorset and South Wiltshire (Mannington GSP)

Scheme description

- The reinforcement of Mannington GSP will increase fault level capacity in the area north of Bournemouth. Postcode(s): BA8-9, BA12, BH1-BH25, BH31, DT2, DT10-11, SO41-42, SP1-8.
- Local authority: Dorset, Wiltshire, New Forest.
- Fault Level – fault level exceeds asset ratings due to forecasted demand and generation growth.

Proposed option

- Asset Solution: New 132kV indoor GIS switchboard is proposed with new circuit breakers with higher fault level ratings.
- Flexibility was unable to be utilised as it not suitable for constraint type.
- This option ensures fault level compliance at Mannington GSP in the near-term and enables future connections.
- 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 price N/A
- Utilisation price N/A

Reinforcement timeline

- Reinforcement delivery by 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	-	-	-	-	-	-	-
ST	-	-	-	-	-	-	-
LTW	-	-	-	-	-	-	-
FS	-	-	-	-	-	-	-

Constraint management timeline

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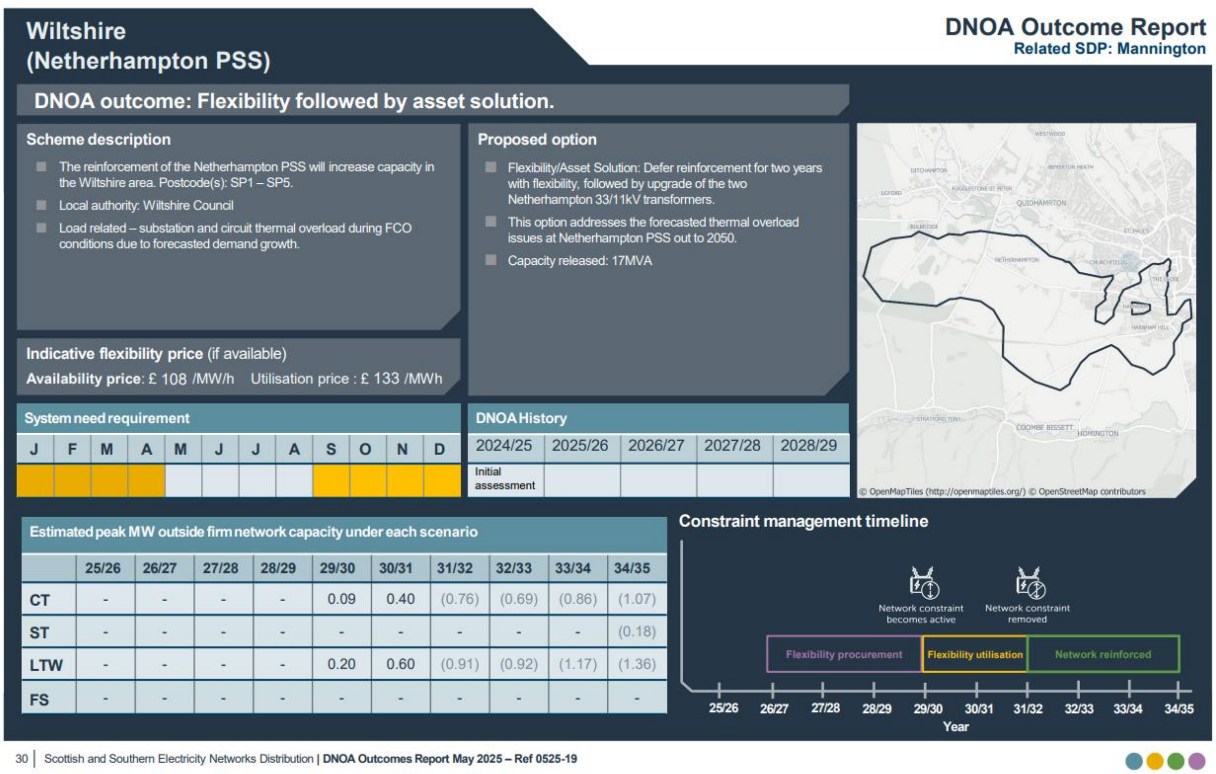
Figure 34 – East Dorset and South Wiltshire DNOA Outcome Report



DNOA Outcome Report

Related SDP: Mannington

Wiltshire (Netherhampton PSS)

DNOA outcome: Flexibility followed by asset solution.

Scheme description

- The reinforcement of the Netherhampton PSS will increase capacity in the Wiltshire area. Postcode(s): SP1 – SP5.
- Local authority: Wiltshire Council
- Load related – substation and circuit thermal overload during FCO conditions due to forecasted demand growth.

Proposed option

- Flexibility/Asset Solution: Defer reinforcement for two years with flexibility, followed by upgrade of the two Netherhampton 33/11kV transformers.
- This option addresses the forecasted thermal overload issues at Netherhampton PSS out to 2050.
- Capacity released: 17MVA

Indicative flexibility price (if available)

Availability price: £ 108 /MW/h Utilisation price : £ 133 /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	-	-	-	-	0.09	0.40	(0.76)	(0.69)	(0.86)	(1.07)
ST	-	-	-	-	-	-	-	-	-	(0.18)
LTW	-	-	-	-	0.20	0.60	(0.91)	(0.92)	(1.17)	(1.36)
FS	-	-	-	-	-	-	-	-	-	-

Constraint management timeline

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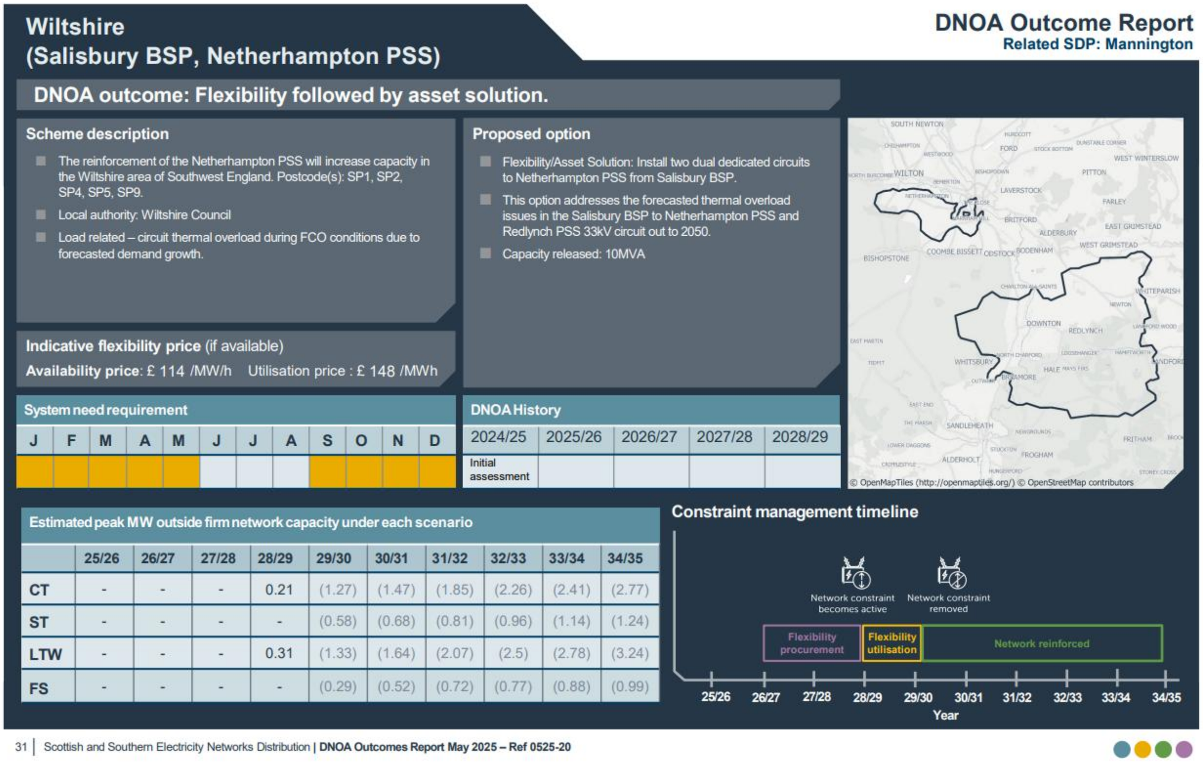
Figure 35 – Wiltshire (Netherampton PSS) DNOA Outcome Report



Wiltshire (Salisbury BSP, Netherhampton PSS)

DNOA Outcome Report
Related SDP: Mannington

DNOA outcome: Flexibility followed by asset solution.

Scheme description

- The reinforcement of the Netherhampton PSS will increase capacity in the Wiltshire area of Southwest England. Postcode(s): SP1, SP2, SP4, SP5, SP9.
- Local authority: Wiltshire Council
- Load related – circuit thermal overload during FCO conditions due to forecasted demand growth.

Proposed option

- Flexibility/Asset Solution: Install two dual dedicated circuits to Netherhampton PSS from Salisbury BSP.
- This option addresses the forecasted thermal overload issues in the Salisbury BSP to Netherhampton PSS and Redlynch PSS 33kV circuit out to 2050.
- Capacity released: 10MVA

Indicative flexibility price (if available)
Availability price: £ 114 /MW/h Utilisation price : £ 148 /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				

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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	-	-	-	0.21	(1.27)	(1.47)	(1.85)	(2.26)	(2.41)	(2.77)
ST	-	-	-	-	(0.58)	(0.68)	(0.81)	(0.96)	(1.14)	(1.24)
LTW	-	-	-	0.31	(1.33)	(1.64)	(2.07)	(2.5)	(2.78)	(3.24)
FS	-	-	-	-	(0.29)	(0.52)	(0.72)	(0.77)	(0.88)	(0.99)

Constraint management timeline

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Figure 36 – Wiltshire (Salisbury BSP) DNOA Outcome Report

Appendix F Glossary

Acronym	Definition
AIS	Air Insulated Switchgear
ANM	Active Network Management
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
FARM	Future Agriculture Resilience Mapping
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
LAEP	Local Area Energy Planning
LCT	Low Carbon Technology
LENZA	Local Energy Net Zero Accelerator
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-ED1/2	Revenue = Incentives + Innovation + Outputs, Electricity Distribution 1 / 2 (regulatory price control periods)
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

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