AXMINSTER GRID SUPPLY AREA: STRATEGIC DEVELOPMENT PLAN

Our network serving communities across Southeast Somerset and North Dorset

Final Publication

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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[1]. The focus area of this SDP is the area that is supplied by Axminster Grid Supply Point (GSP), shown below in Figure 1.

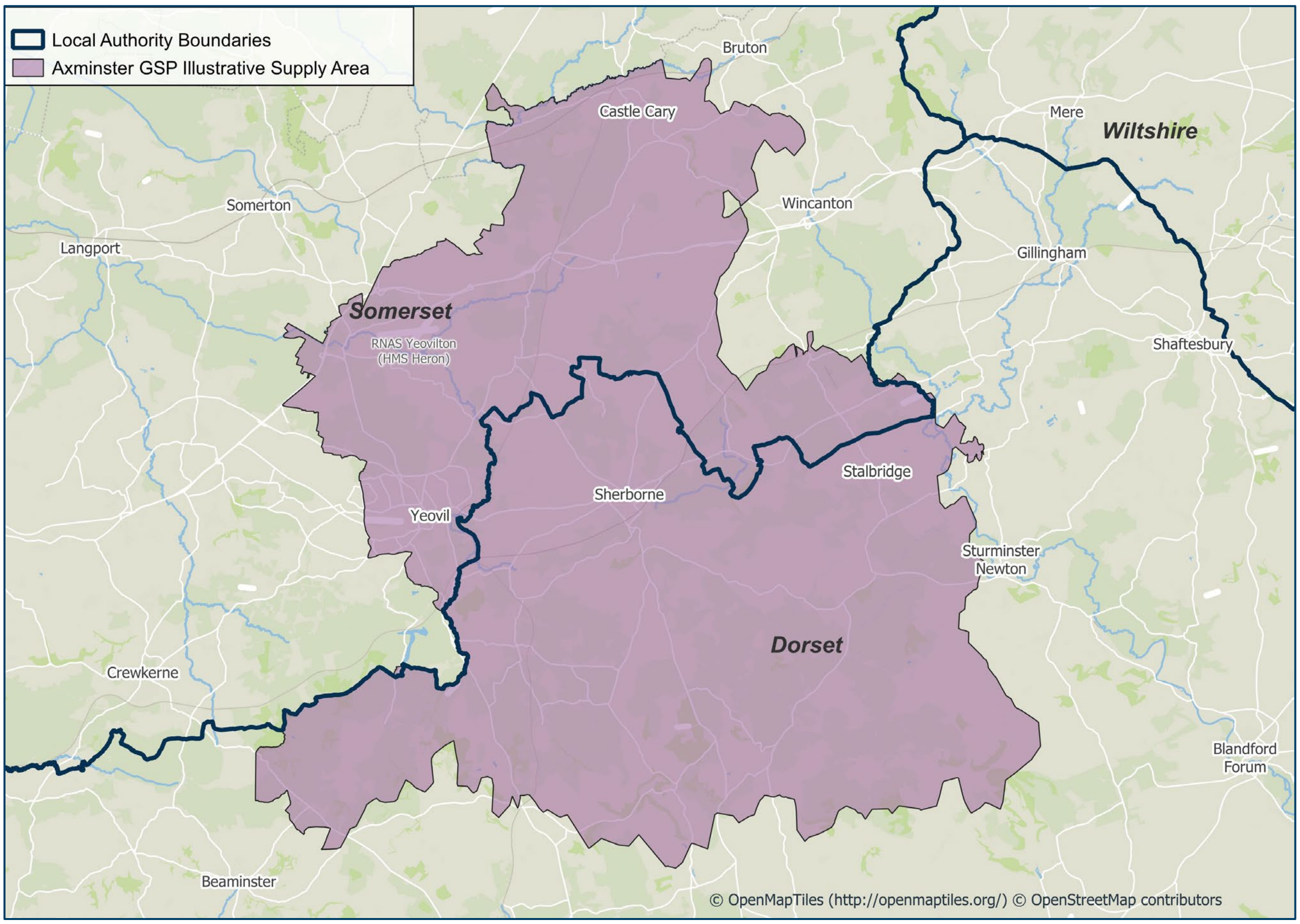

Figure 1 Area covered by this SDP

This report documents the stakeholder led plans that are driving net zero and growth in the local area, the resulting electricity demands, and the network needs arising from this. Plans across Dorset and Somerset have been considered in preparation for this plan.

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.

1 Strategic Development Plan Methodology - January 2025

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 Axminster 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.

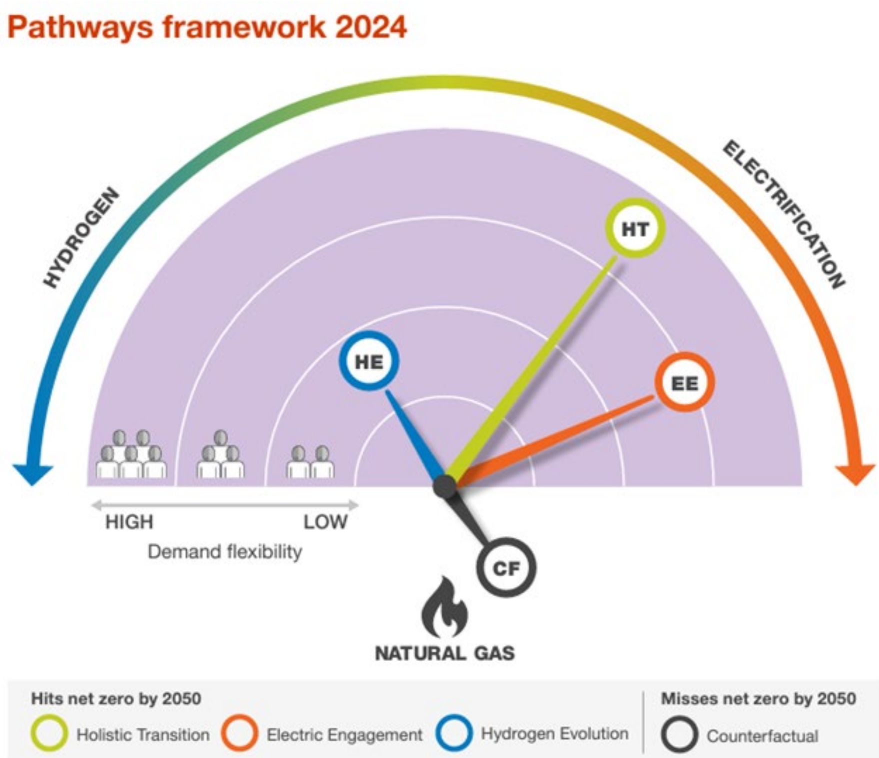

Figure 2 The FES Scenario framework (source: NESO)

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. System needs are identified through power system analysis. We also model across the other scenarios to understand when these needs arise and what network capacity should be planned for in the event each scenario is realised.

The DNOA process will provide 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[2].

2 SSEN Distribution Future Energy Scenarios 2024

3. STAKEHOLDER ENGAGEMENT AND WHOLE SYSTEM CONSIDERATIONS

3.1. Local Authorities and Local Area Energy Planning

The local authorities that are supplied by Axminster GSP include Dorset and Somerset 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.

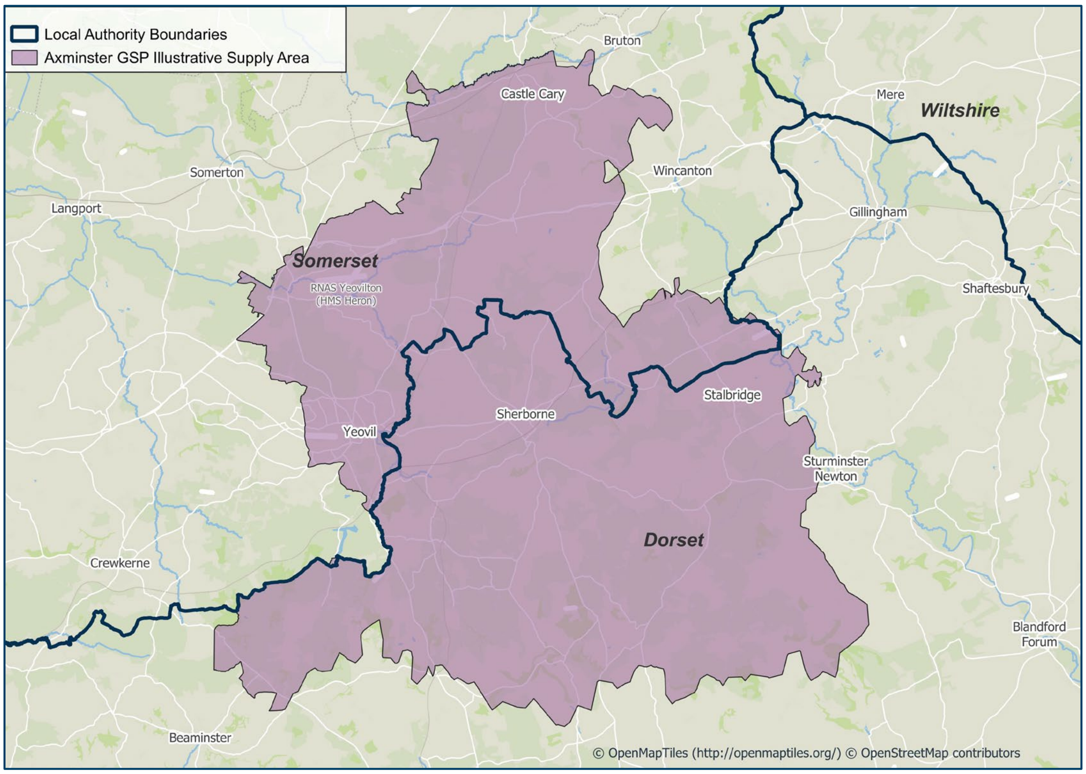

Figure 3 - Axminster GSP supply area and local authority boundaries.

3.1.1. Dorset Council

Dorset Council issued a climate declaration in 2019 and adopted their first Climate and Ecological Emergency Strategy[3]in 2021. Their 2021 strategy laid the foundation for Dorset Council's response to the climate and ecological emergency, setting out a long-term vision and initial actions. Although, the initial strategy noted fundamental uncertainty on national policy, greater clarity has since emerged thanks to the introduction of:

- the UK Net Zero Strategy,
- the Environment Act,
- the new Environment Improvement Plan, and
- the Climate Change Risk Assessment.

3 Dorset Council Climate and Ecological Emergency Strategy 2021

Building on this emergence, the Dorset Council Plan 2024-2029[4] identifies the climate and nature crisis as 1 of 4 key priorities, with a clear commitment to speed up efforts to become a more climate and nature friendly county. The council has brought forward its net-zero targets by 5 years and is now aiming to become a carbon neutral council by 2035 and county by 2045, in response to growing national and international concerns around the urgency of tackling climate change and halting nature loss.

To meet the new targets, the council plans to drastically cut its use of fossil fuels by 2035 through transitioning from petrol and diesel vehicles to electric alternatives, making council buildings and schools greener, and exploring opportunities to generate more renewable energy on council-owned land. To help the wider county reduce carbon emissions by 2045, the council will secure extra funding for green initiatives, collaborate more closely with partners and communities, and develop strategies and policies to guide the county towards a greener future.

Dorset Council has implemented a dual programme approach since 2021 to tackle emissions more effectively: an operational programme targeting emissions within its direct control, and a facilitation programme aimed at influencing those beyond its immediate reach. These programmes are structured around the strategy's three core pillars of climate change mitigation, biodiversity recovery, and climate adaptation. These efforts are supported by a £10 million capital programme to fund delivery, and the progress is now reported biannually.

As a result, the council has achieved more than 25% reduction in emissions compared to its 2019 baseline, putting it on track to meet its targets. However, newly available and more comprehensive data for the wider county reveals that while Dorset's overall emissions dropped by over 10% between 2018 and 2020, county-wide action must accelerate to stay aligned with long-term goals. These developments have set out a series of key national milestones, including the widespread adoption of heat pumps, the phase-out of fossil-fuel vehicles, and the decarbonisation of the electricity grid by 2035.

3.1.2. Somerset Council

Somerset's Climate Emergency Strategy[5]was originally developed by the five former Somerset local authorities in collaboration with sector experts and external partners, following a public consultation in January 2020. It was formally adopted by all five former local authorities in November 2020 and continues to guide climate action under the new unitary authority established in 2023. Their strategy explains what climate change is, its primary causes, the sources of carbon emissions at global, national, and local levels, and its anticipated climate impacts in Somerset. In 2024, Somerset Council published their Energy Investment Plan[6], further reinforcing their commitment to achieving Net Zero and creating a pathway of key milestones until 2050, outlining their delivery strategy with the goal of facilitating the low carbon transition within their local authority area.

The core pillars of the strategy are to significantly reduce emissions from local authority operations and public sector estates, achieve county-wide carbon neutrality by 2030[5], and build resilience to the impacts of climate change. This means transforming how energy is used, how people travel, and how communities are designed and supported, while preparing Somerset's infrastructure and natural environment to withstand climate-related challenges.

Achieving these ambitions will also require tackling major challenges such as securing legislative changes at both national and local levels and establishing clear funding mechanisms and will only be able to overcome

4 Dorset Council Plan 2024-2029

5 Somerset's Climate Emergency Strategy

6 Somerset Energy Investment Plan (Energy)

through collective commitment and a coordinated effort to deliver transformative, sustainable change for the benefit of Somerset.

3.2. Whole System Considerations

3.2.1. Transmission interactions

The NGET T3 currently has no work detailed on reinforcement of Axminster GSP or surrounding circuits. SSEN connecting customers currently have a dependency on NGET works to facilitate an additional 132kV circuit supplying Yeovil BSP. This additional circuit will either come from the existing Axminster GSP or potentially a new site in the area.

3.2.2. Distribution interactions

Our network within Axminster GSP boundary NGED's networks. There is already interconnection between DNOs across this boundary and further work could be undertaken to ensure future optimised use of assets and developments through co-ordination between DNOs.

3.3. Flexibility Considerations

SSEN procures flexibility services from owners, operators, or aggregators of Distributed Energy Resources (DERs) or Consumer Energy Resources (CERs), which can be generators, storage, or demand assets. These services are needed in areas of the network which have capacity constraints at particular times or under certain circumstances. SSEN purchases Flexibility Services from all types of providers (e.g. domestic or commercial). Information on the process 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.[7,8]

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.[2]

Areas across Axminster 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.

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

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

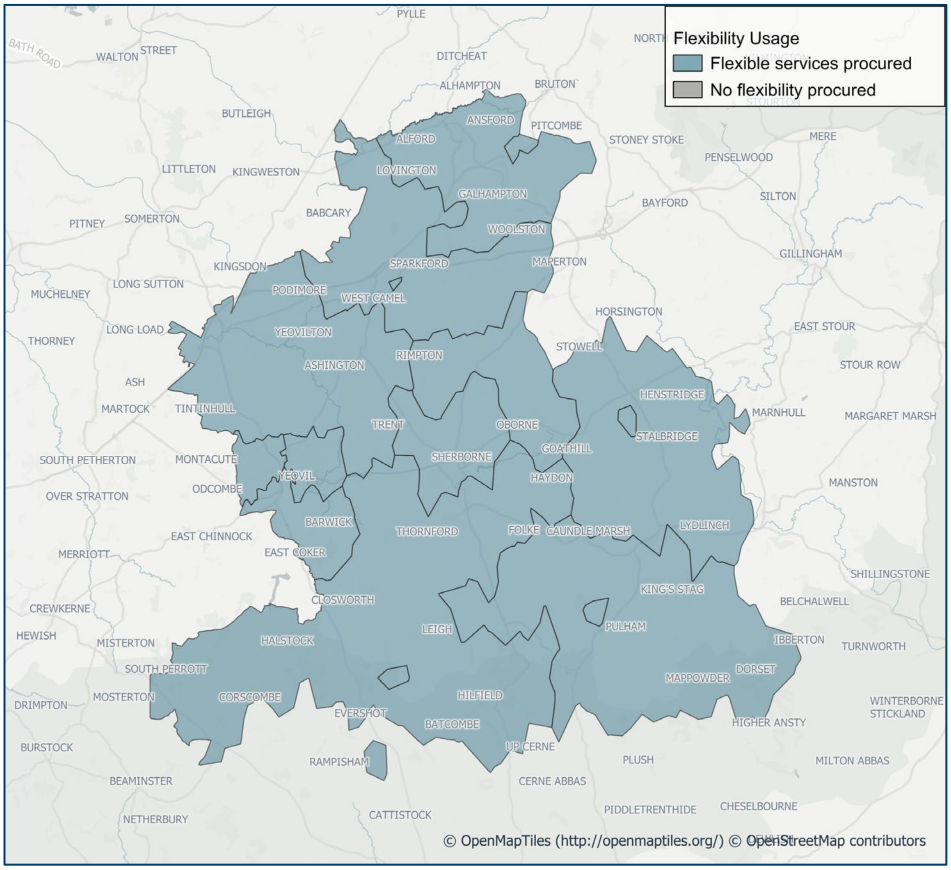

Figure 4 - Flexibility procurement across Axminster GSP

4. EXISTING NETWORK INFRASTRUCTURE

4.1. Axminster Grid Supply Point Context

The Axminster GSP network is made up of 132kV, 33kV, 11kV, and LV circuits. It supplies a predominantly rural area but also includes smaller urban areas for example Yeovil town. In total, the GSP serves approximately 48,300 customers. Table 1 shows the values for the GSP, and the primary substations supplied by the GSP (noting that some sites for single customers are not shown here). 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 all primary substations to sum to that at the GSP).

Substation Name	Site Type	Number of Customers Served (approximate)	2024/25 Substation Maximum demand in MVA (Season)
Axminster	Grid Supply Point	48,300	94.93
Yeovil	Bulk Supply Point	48,300	94.93
Castle Cary	Primary Substation	2,800	5.76
Chilton Cantello	Primary Substation	3,000	8.61
Henstridge	Primary Substation	4,000	8.66
Larkhill	Primary Substation	8,000	9.43
Milborne Port	Primary Substation	2,100	3.83
Pulham	Primary Substation	2,200	3.95
Sherborne	Primary Substation	5,300	7.85
Sparkford	Primary Substation	1,600	3.80
West Hendford	Primary Substation	5,400	17.40
Yeovil	Primary Substation	10,000	24.95
Yetminster	Primary Substation	3,900	6.54

Table 1 Customer number breakdown and substation peak demand readings (2024-2025) for Axminster GSP.

4.2. Current Network Topology

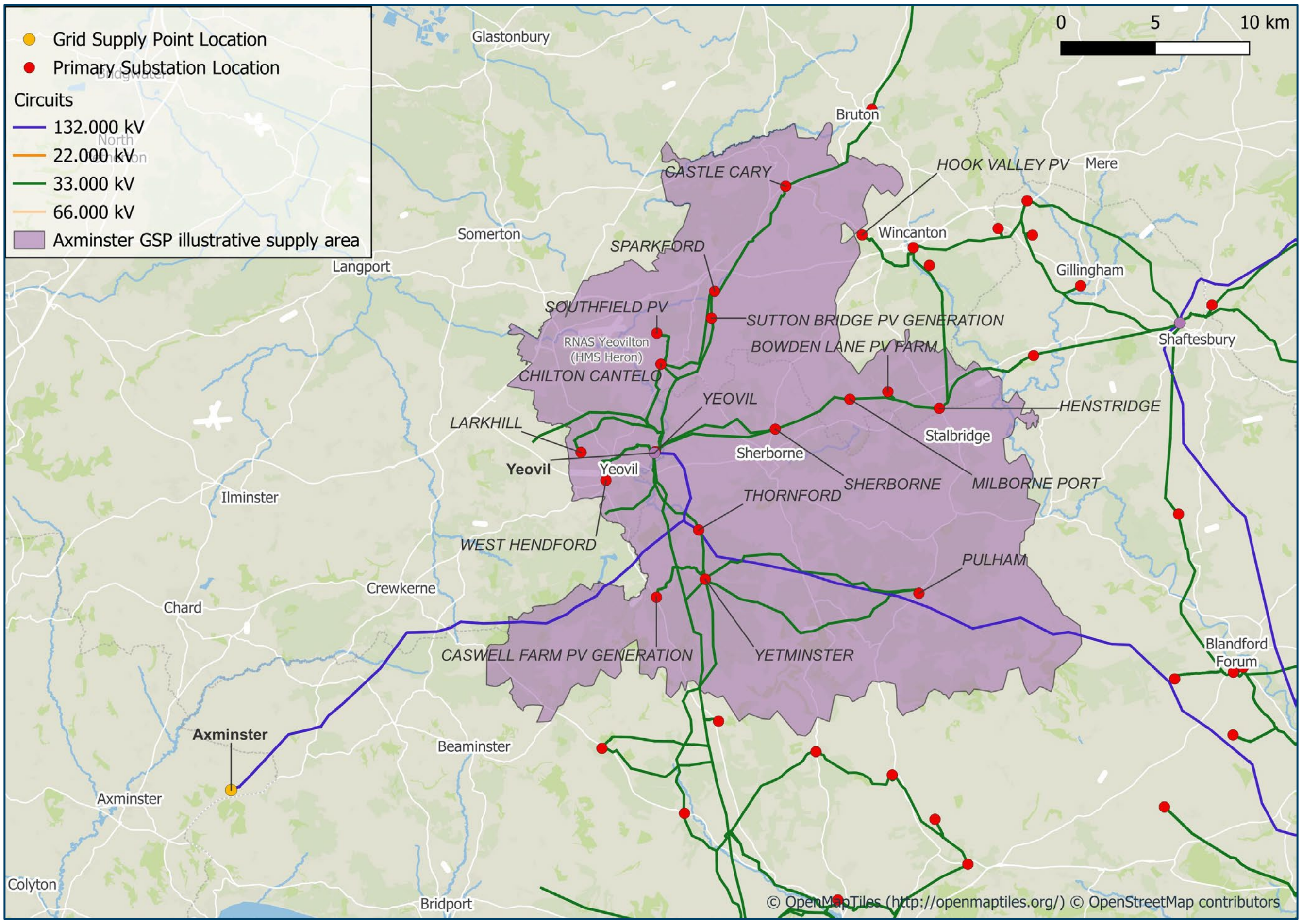

Figure 5 Current network topology of Axminster GSP.

4.3. Current Network Schematic

The existing 132kV network at Axminster GSP is shown below in Figure 6.

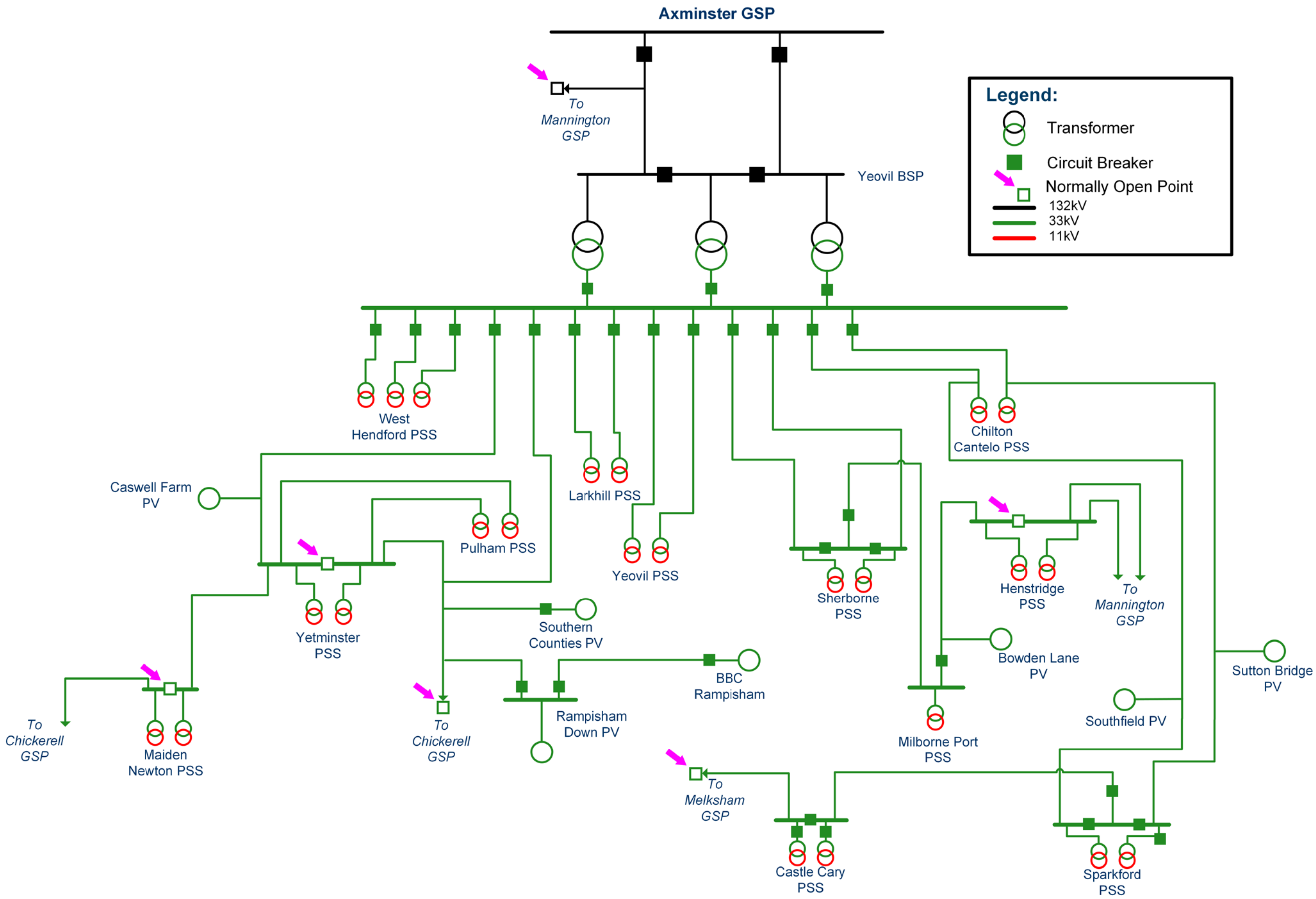

Figure 6 - Existing network supplied by Axminster GSP

5. FUTURE ELECTRICITY LOAD AT AXMINSTER 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.[9]

9 SSEN DFES Technology Projections - Microsoft Power BI

5.1. Generation and Storage

DFES Scenario	Generation capacity				Electricity storage capacity			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	73MW	282MW	342MW	402MW	0MW	18MW	38MW	51MW
Electric Engagement		195MW	274MW	317MW		16MW	28MW	39MW
Hydrogen Evolution		175MW	206MW	261MW		6MW	25MW	31MW
Counterfactual		167MW	187MW	209MW		4MW	14MW	19MW

Table 2 - Projected cumulative distribution connected generation capacity and electricity storage capacity across Axminster GSP (MW). *Source: SSEN DFES 2024*[10]

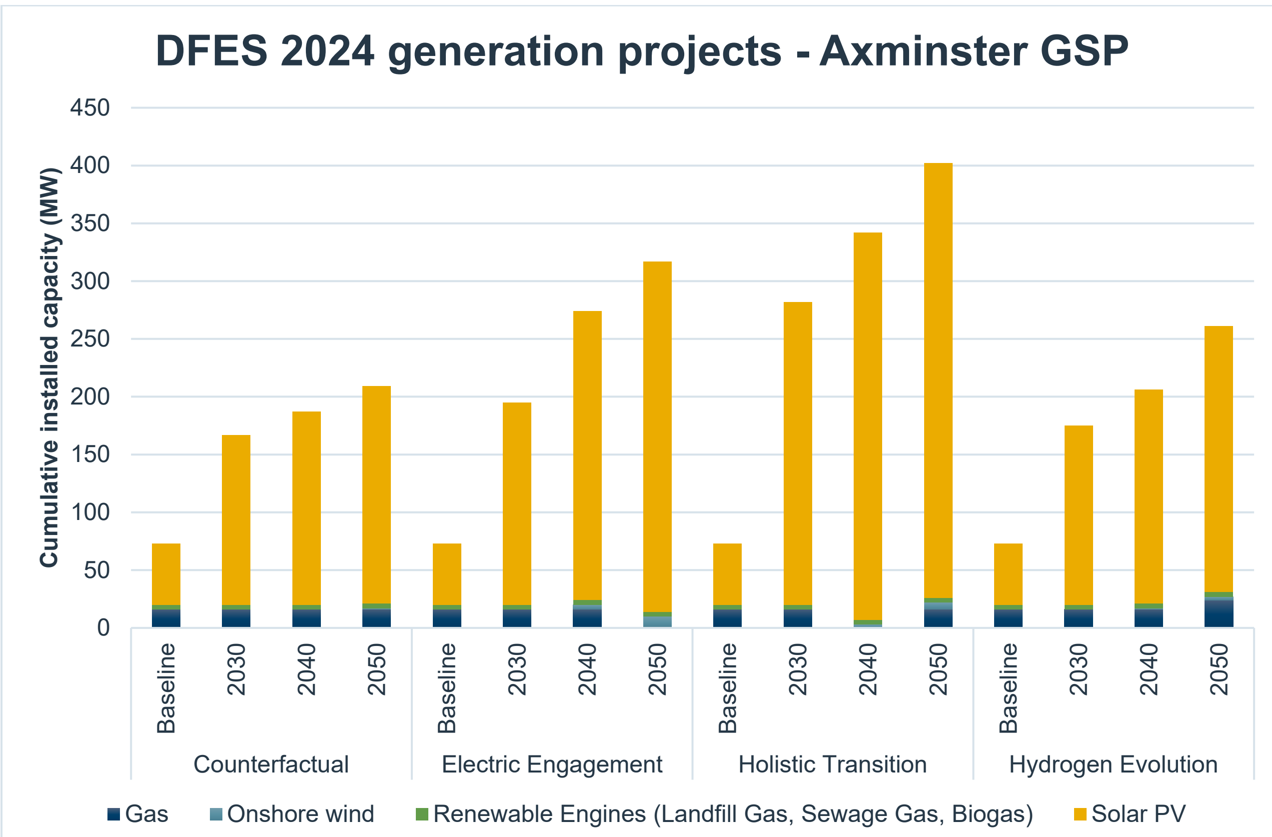

Figure 7 - Projected cumulative distributed generation capacity Axminster GSP (MW). *Source: SSEN DFES 2024*[10]

10 Distribution Future Energy Scenarios Datasets - Data Asset - SSEN Distribution Data Portal

5.2. Transport Electrification

DFES Scenario	Domestic EV chargers – off-street (number of units)				Non-domestic EV chargers & domestic on-street EV chargers (MW)			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	990	9,798	33,135	34,819	2MW	5MW	29MW	36MW
Electric Engagement		17,071	32,956	34,422		10MW	32MW	33MW
Hydrogen Evolution		9,686	32,524	33,978		7MW	34MW	38MW
Counterfactual		7,498	30,670	33,325		2MW	21MW	37MW

Table 3 - Projected cumulative number of domestic EV chargers (off-street) and non-domestic and domestic (on-street) EV charge point capacity across Axminster GSP. *Source: SSEN DFES 2024*[11]

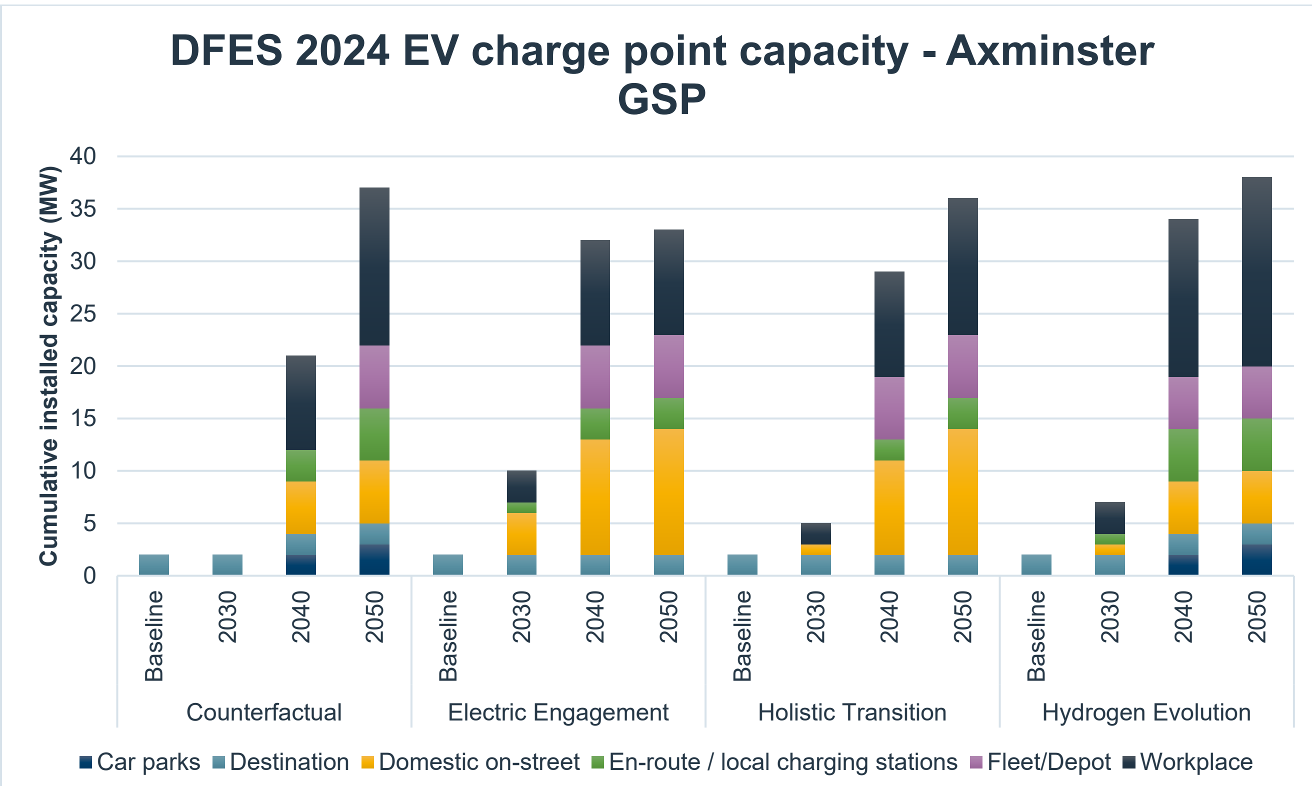

Figure 8 - Projected EV charge point capacity across Axminster GSP. *Source: SSEN DFES 2024*[11]

11 Distribution Future Energy Scenarios Datasets - Data Asset - SSEN Distribution Data Portal

5.3. Electrification of Heat

DFES Scenario	Non-domestic heat pumps and resistive electric heating (m² of floorspace)				Domestic heat pumps (number of units)			
	Baseline	2030	2040	2050	Baseline	2030	2040	2050
Holistic Transition	71,710m²	294,140m²	615,976m²	714,315m²	1,391	8,784	31,637	43,159
Electric Engagement		241,043m²	596,168m²	730,814m²		8,550	31,520	42,809
Hydrogen Evolution		236,186m²	490,537m²	589,952m²		8,579	29,704	39,091
Counterfactual		163,269m²	344,280m²	483,371m²		5,190	15,248	31,071

Table 4 - Projected non-domestic heat pumps and resistive electric heating floorspace and number of domestic heat pumps across Axminster GSP. *Source: SSEN DFES 2024*[12]

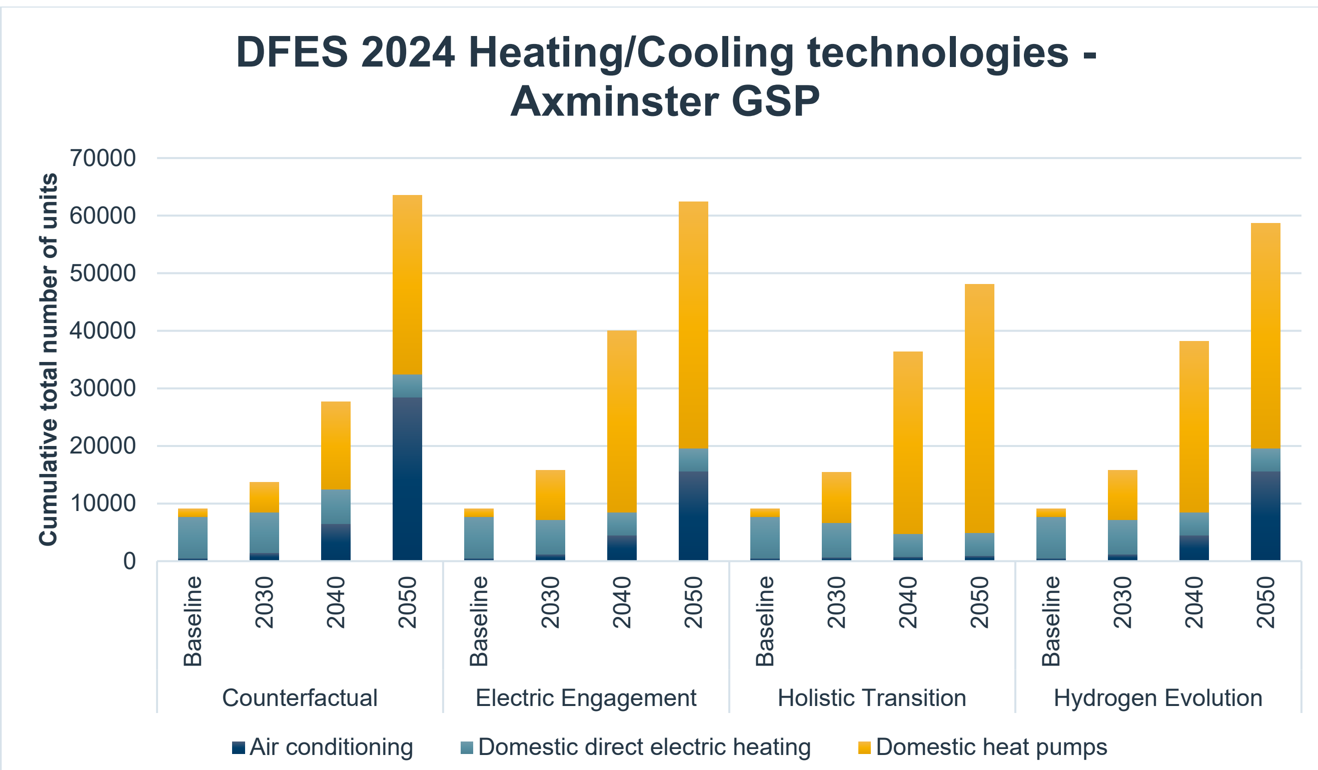

Figure 9 - Projected number of heating/cooling technologies across Axminster GSP. *Source: SSEN DFES 2024*[12]

12 Distribution Future Energy Scenarios Datasets - Data Asset - SSEN Distribution Data Portal

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	2,606	5,127	6,833	33,248m^2	44,647m^2	49,647m^2
Electric Engagement	2,606	4,994	6,434	31,615m^2	44,647m^2	49,647m^2
Hydrogen Evolution	2,607	4,995	6,435	31,560m^2	44,647m^2	49,647m^2
Counterfactual	2,199	4,897	6,153	29,266m^2	44,647m^2	49,647m^2

Table 5 - Projected new domestic and non-domestic development across Axminster GSP. *Source: SSEN DFES 2024*[13]

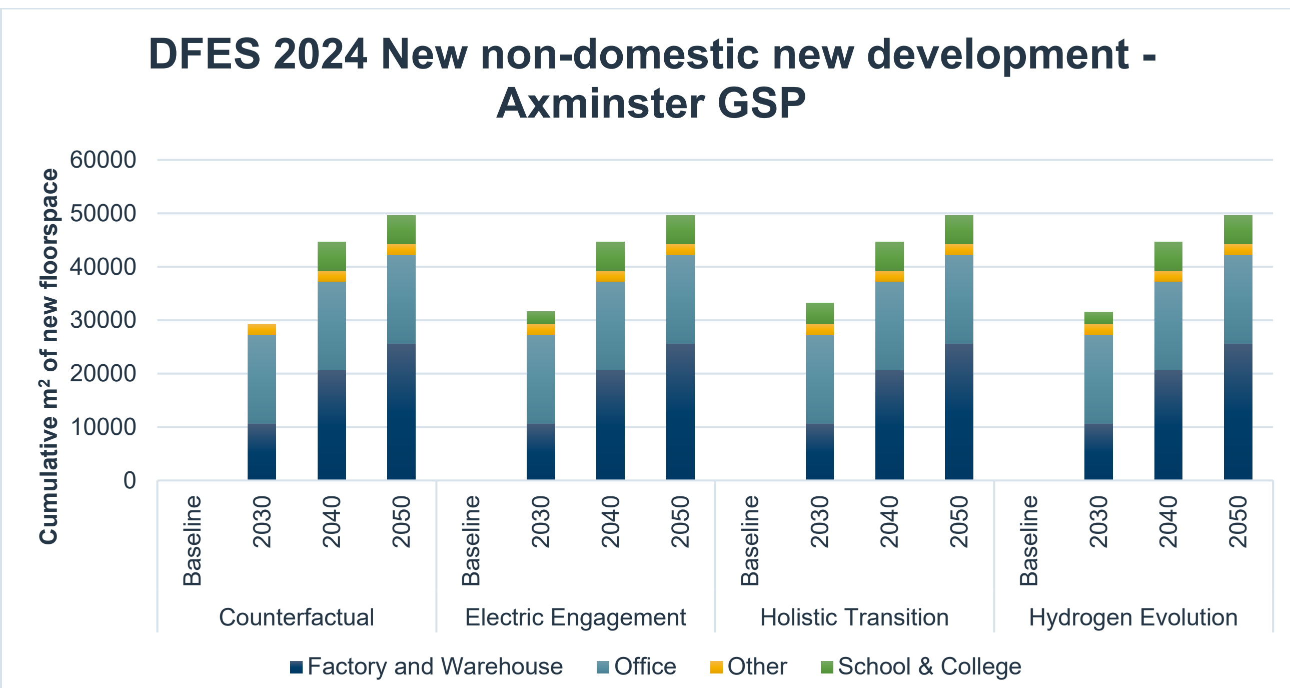

Figure 10 - non-domestic new development under Axminster GSP. *Source: SSEN DFES 2024*[13]

13 Distribution Future Energy Scenarios Datasets - Data Asset - SSEN Distribution Data Portal

5.5. Commercial and Industrial Electrification

Decarbonisation of the agricultural sector 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. 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.

6. WORK 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 Axminster GSP these drivers have already triggered network interventions that have now progressed to detailed design and delivery. For this report, these works are assumed to be complete, with any resulting increase in capacity considered to be released. The drivers listed in the below table are predominantly where a customer connection application has driven the work or where investment proposals developed through our DNOA process are driving the reinforcement work. The work included here is all work that has passed through the ID2 gate of our Distribution Governance and Investment Framework (DGIF), further information on this process is available in the DSO service statement 2025.[14] The network considered for long-term modelling is shown in Figure 11. Summary of existing works shown below in Table 6

ID	Substation	Description	Driver	Forecast completion	Resolves future strategic needs to 2050?
132kV and 132/33kV Network					
1	Axminster GSP to Yeovil BSP 132kV circuit	Reinforcement of various sections of the two existing 132kV circuits from Axminster GSP to Yeovil BSP.	Customer Connections	2028 for initial phases of work then 2030	
2	Yeovil BSP	Reinforcement of two existing 132/33kV transformers from 60MVA to 90MVA to match the third existing transformer. Addition of a third 132kV circuit supplying Yeovil BSP – dependent on NGET work for the source of this circuit.	Customer Connection	2037	
3	Winterbourne Abbas to Yeovil BSP	Installation of a 30km 33kV circuit from Yeovil BSP to Winterbourne Abbas 33kV busbar. Provides interconnection between Chickerell and Axminster GSPs and security of supply under SCO conditions.	Customer Connection	2028	

Table 6 - Works already triggered through customer connections, asset replacement, and the DNOA process.

Where the above works are marked as not providing sufficient capacity for 2050 peak demands, it is important to note that this relates to the individual primary substation's firm capacity. When considering the further works identified in this report, the holistic plans 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.

14 DSO Service Statement 2025

Network Schematic (following completion of above works)
The network schematic below in Figure 11 shows the Axminster network with changes highlighted and referenced in Table 6.

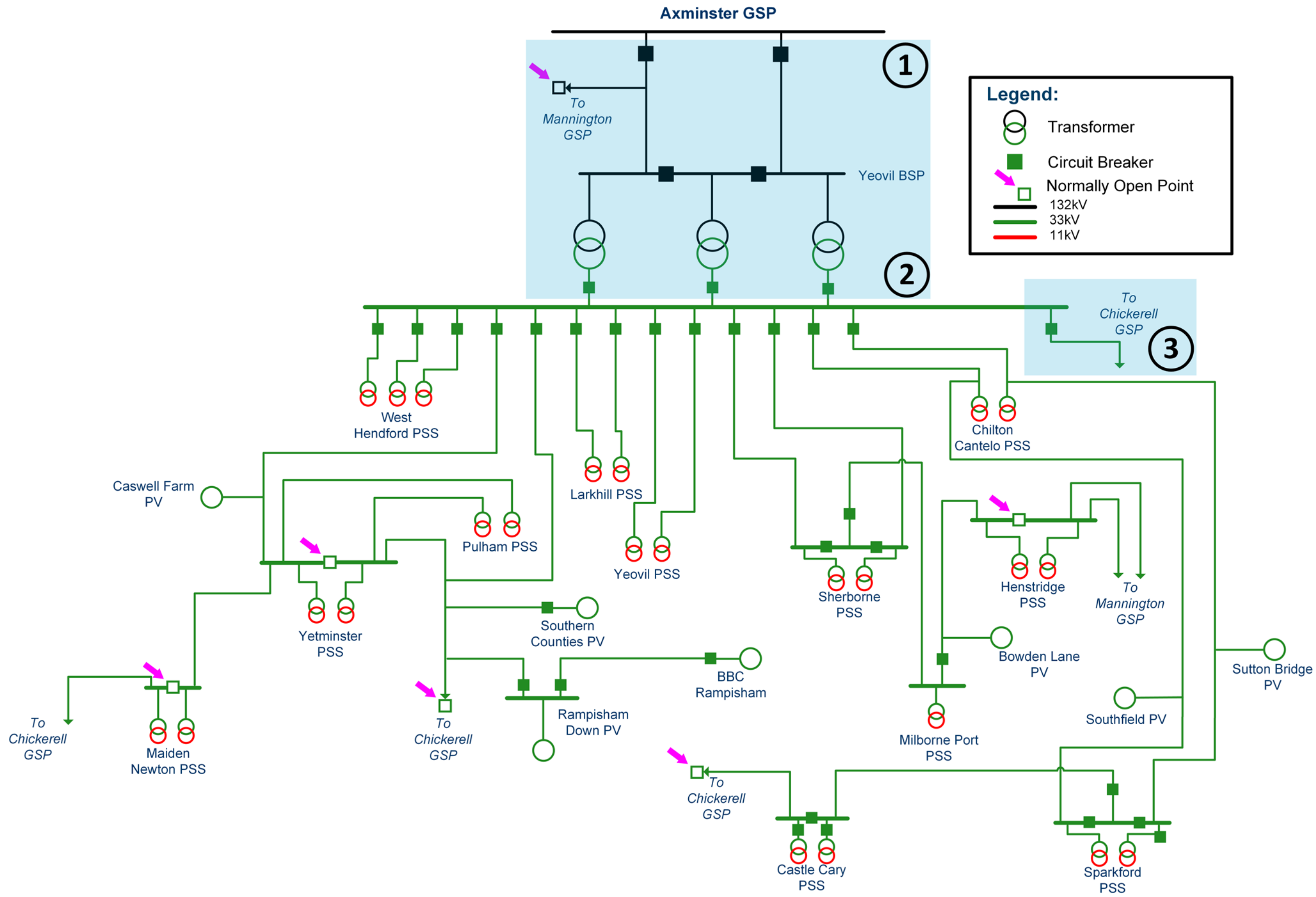

Figure 11 - Axminster Network schematic following completion of triggered works.

7. SPATIAL PLAN OF FUTURE NEEDS

7.1. Extra High Voltage / High Voltage Spatial Plans

The EHV/HV spatial plan shown below in Figure 12 shows the projected headroom or capacity shortfall due to demand increases at primary substations across the Axminster SDP study area. Darker 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 A.

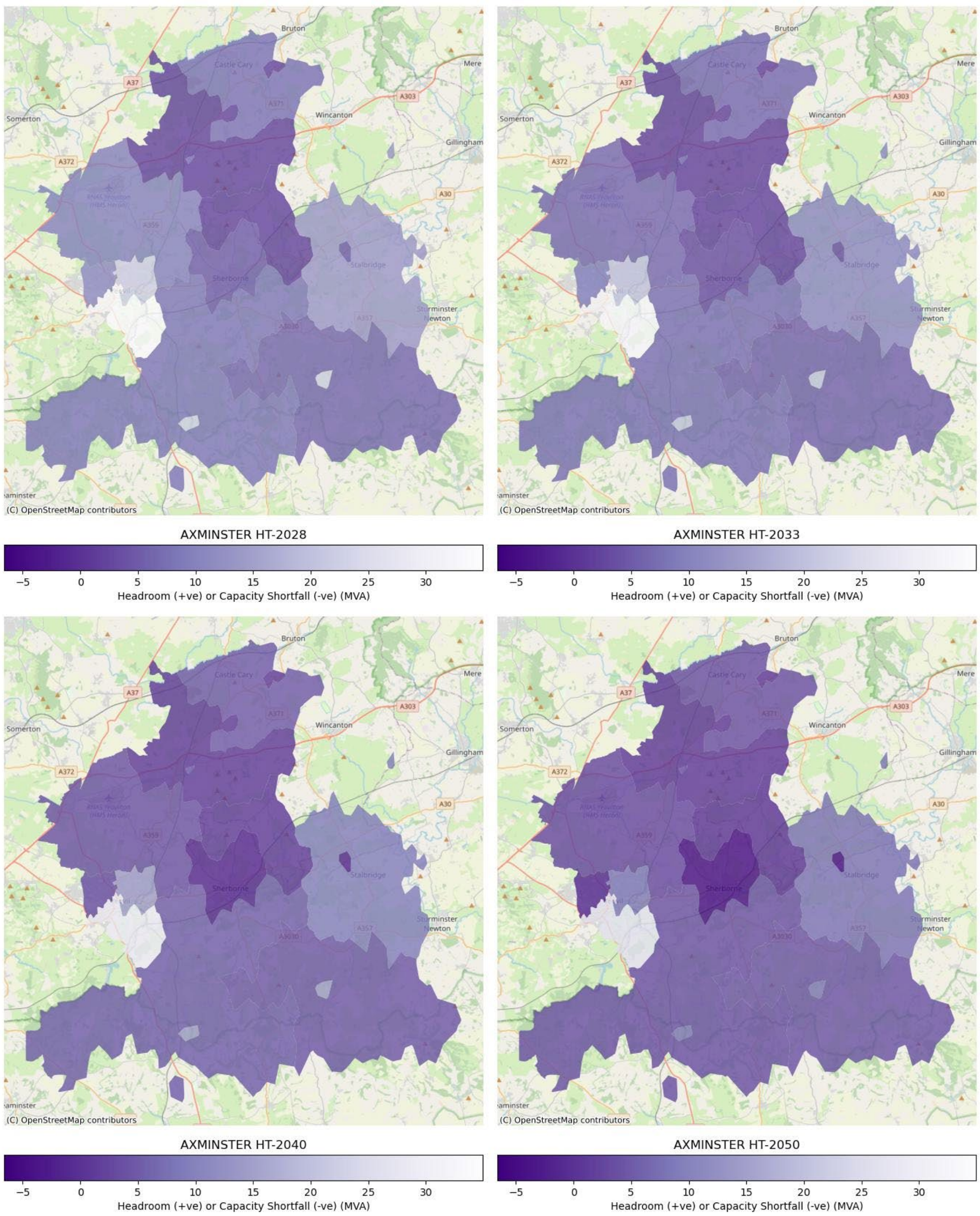

Figure 12 - Axminster GSP - EHV/HV Spatial Plans – Holistic Transition

7.2. HV/LV Spatial Plans

The HV/LV spatial plans shown below in Figure 13 show the point locations of secondary transformers supplied by Axminster GSP. The points are colourised based on the projected percentage loading with red meaning higher percentage loading and green being lower percentage loading. The HV/LV spatial plans for the other DFES 2024 scenarios are available in Appendix B.

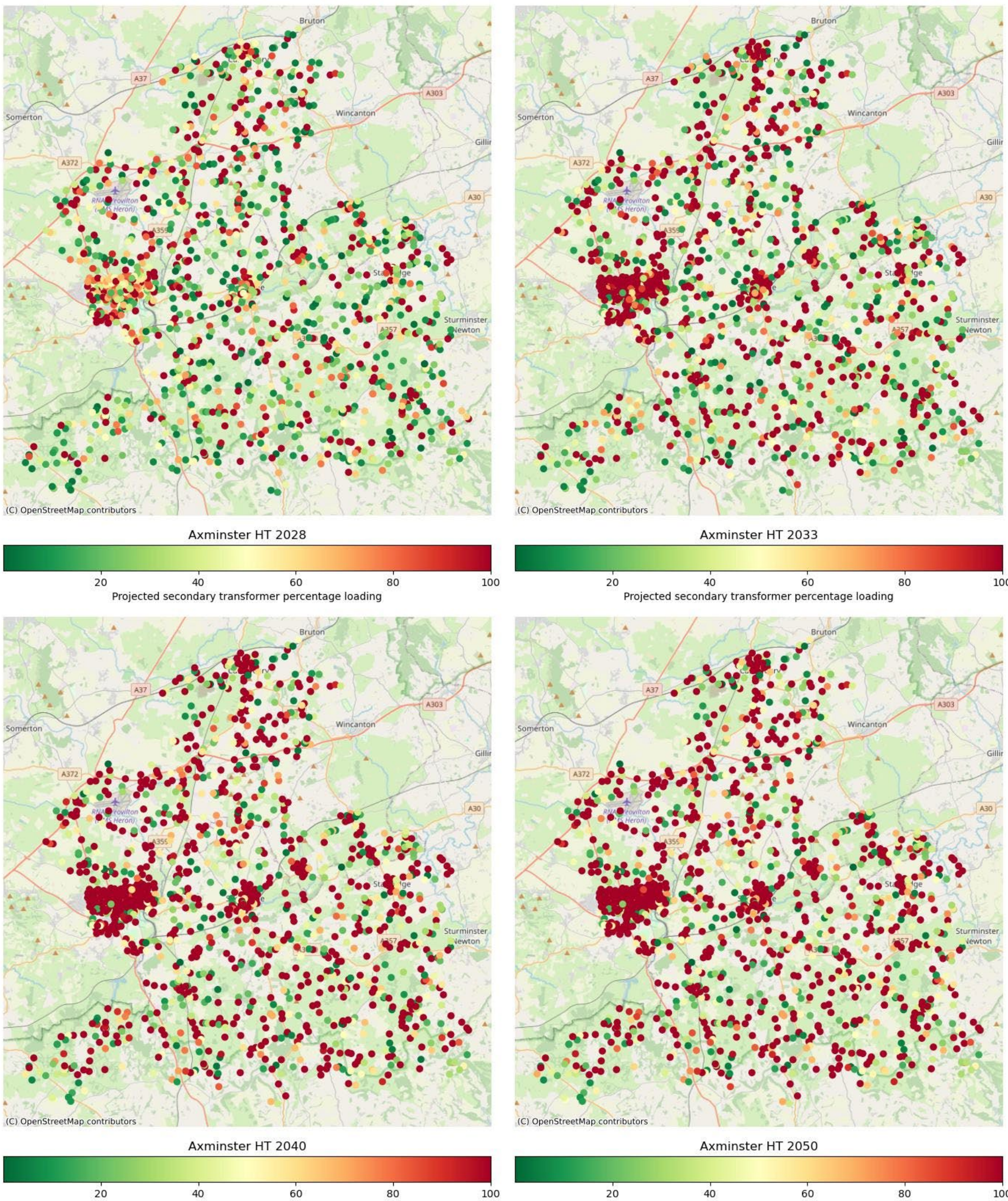

Figure 13 - Axminster GSP - HV/LV Spatial Plans – Holistic Transition

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, 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 considered to ensure a holistic solution. We also provide a summary of more strategic elements that also need to be considered in these timeframes.
- 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: There is a dependency on some NGET works for the delivery of the third 132kV supply circuit to Yeovil BSP.
Risks: This additional circuit will facilitate connections and ensure security of supply on the SSEN distribution network. Delays to this will reduce network security.
Mitigation: Collaborate with NGET on development of options to enable the work.

8.2. Future EHV System Needs

The following table details the near-term to medium-term distribution network system needs that have been identified through power system analysis. While asset solutions are described in the table below it is important to note that the use of flexibility will be evaluated for all schemes to ensure the best possible solution is progressed.

For the projects shown in Table 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
33kV Network							
1	Yeovil BSP to Sherbourne PSS 33kV circuit	2031	2031	2031	2033	N-1: Loss of either Yeovil BSP to Sherbourne PSS 33kV circuit.	• Reinforcement of the existing circuits to higher rated conductors would release capacity in this part of the network. Requirement to confirm whether the existing pole structures are suitable for a heavier conductor. • Alternatively, an additional 33kV circuit could be constructed from Yeovil BSP to Sherborne PSS.
2	Chilton Cantello PSS 33/11kV transformers	2031	2031	2031	2033	N-1: Loss of either Chilton Cantello 33/11kV transformer.	• Reinforcement of the two existing 33/11kV transformers to higher rated units. Installation of 30MVA units would be sufficient out to 2050 and beyond.
3	From Frome BSP to Bruton PSS 33kV circuit (in Melksham GSP, used for backfeed of Castle Cary)	2032	2032	2033	2036	N-1: Loss of Sparkford PSS to Castle Cary 33kV circuit.	• Reinforcement of the existing circuit with a higher rated conductor would provide additional backfeed capacity. • This option should be considered alongside work presented in the Melksham GSP Strategic Development Plan so that solutions are complimentary.
4	Milborne Port PSS 33/11kV transformer	2032	2032	2033	2036	Intact: Single transformer site – loss of 33/11kV transformer requires restoration through the 11kV network.	• Installation of a second transformer at the site (potential rating of 7.5/15MVA) and reinforcement of the existing transformer to the same rating would increase security of supply at the site and remove the dependence on support through the 11kV network under an outage. • Alternative option would be to reinforce the existing transformer to 7.5/15MVA and develop additional 11kV interconnection to Sherborne PSS (closest geographically) to enhance security of supply under an outage.
5	Pulham PSS 33/11kV transformers	2033	2032	2034	2036	N-1: Loss of either 33/11kV transformer.	• Reinforcement of the two existing transformers with higher rated units. Current projections suggest that 7.5/15MVA units would be sufficient until beyond 2050.
6	Yeovil BSP to Chilton Cantello PSS to Sparkford PSS 33kV meshed network	2033	2032	2033	2035	N-1: Loss of either Yeovil BSP to Chilton Cantello PSS 33kV circuit (other outages	• Chilton Cantello PSS to Sparkford PSS circuit 2 has a rating that is almost double that of circuit 1. • Subject to the possibility for expansion of Yeovil BSP 33kV busbar, there is potential for the addition of an additional circuit from Yeovil BSP to Chilton

ID	Location of proposed intervention	HT Year	EE Year	HE Year	CF Year	Network State	Comments and potential options to resolve the system need
						result in overloads in later years).	Cantello PSS. This would require installation of a 33kV busbar at Chilton Cantello. • Alongside the above, reinforcement of the Chilton Cantello PSS to Sparkford PSS circuit 1 to an equivalent rating of circuit 2 would also need to be carried out. • Completion of the above would future proof this meshed 33kV network until 2050. • It should be noted that not all of the circuit sections are projected to be overloaded in 2033, so work could be phased over an extended time period. Deferral of initial works through flexibility should also be investigated.

Table 7 - 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
33kV Network							
7	Sparkford PSS 33/11kV transformers	2037	2035	2037	2040	N-1: Loss of either Sparkford 33/11kV transformer.	• Reinforcement of the existing transformers to 7.5/15MVA units would prevent this system need from being realised ahead of 2050.
8	Yeovil PSS 33/11kV transformers	2037	2036	2037	2041	N-1: Loss of either Yeovil PSS 33/11kV transformer.	• Reinforcement of the existing transformers to 20/40MVA units would provide sufficient capacity until beyond 2050 under all four DFES scenarios. This would also require replacement of the existing 11kV board due to limitations of the transformer circuit breakers.
9	Yeovil BSP to Yetminster PSS 33kV circuits	2037	2038	2039	2042	N-1: Loss of either Yeovil BSP to Yetminster PSS 33kV circuit.	• Reinforcement of the existing circuits with higher rated conductors (up to 16km of 33kV circuit). Existing pole structures (H-poles) should be strong enough for a higher rated conductor. • Alternatively, construction of a third Yeovil BSP to Yetminster PSS 33kV circuit (approximately 9km) would also provide additional security. This is subject to the potential to install new 33kV circuit breakers at Yeovil BSP. A new 33kV circuit breaker would also need to be installed on the 33kV busbar at Yetminster 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
10	Sherborne PSS 33/11kV transformers	2037	2037	2037	2042	N-1: Loss of either Sherborne PSS 33/11kV transformer.	• Reinforcement of the existing transformers at the site to higher rated 30MVA units would provide sufficient capacity at Sherborne until 2050. • If the option described in ID 4 for 11kV interconnection to Milborne Port PSS is progressed, then the sizing the new transformers at Sherborne PSS proposed here would provide additional security and ability to back feed Milborne Port under an outage.
11	Sherborne PSS to Milborne Port PSS 33kV circuits	2039	2039	2040	2043	Intact: Single 33kV circuit from Sherborne PSS to Milborne Port PSS.	• Reinforcement of the existing circuit with a higher rated conductor, approximately 5km of circuit would require reinforcement. • Alternative option would be to construct a new 33kV circuit from Sherborne PSS to Milborne Port PSS, this would require new 33kV circuit breakers at Sherborne PSS and Milborne Port PSS. This option would improve network security more than the previous option.
12	Yeovil BSP to Larkhill PSS 33kV circuits and later Larkhill PSS 33/11kV transformers.	2041	2042	2042	2044	N-1: Loss of either 33kV supply circuit or 33/11kV transformer at Larkhill	• Uncertainty over whether this system need will be realised due to long-term load projection. • Earlier reinforcement at Yeovil PSS (see ID 8) may allow for load transfers through the HV network to mitigate the requirement for reinforcement of Larkhill PSS 33/11kV transformers and 33kV supply circuits.
13	Yetminster PSS 33/11kV transformers	2043	2042	2043	2045	N-1: Loss of either Yetminster 33/11kV transformer.	• Potential requirement for installation of higher rated transformers 7.5/15MVA units would be sufficient out to 2050 under the majority of the DFES scenarios.
14	Yetminster PSS to Pulham PSS 33kV circuit.	2043	-	-	-	N-1: Loss of either 33kV circuit from Yetminster PSS to Pulham PSS.	• System need only projected to arise under the Holistic Transition scenario. • Existing 33kV circuits are approximately 13km. Propose continued monitoring of load growth in the area.

Table 8 - 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 Axminster 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.[15]

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 10 primary substations supplied by Axminster 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 14 demonstrates how this percentage changes under each DFES scenario from now to 2050 where it is projected that without intervention, 48% of secondary transformers will be overloaded under the HT scenario.

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.

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

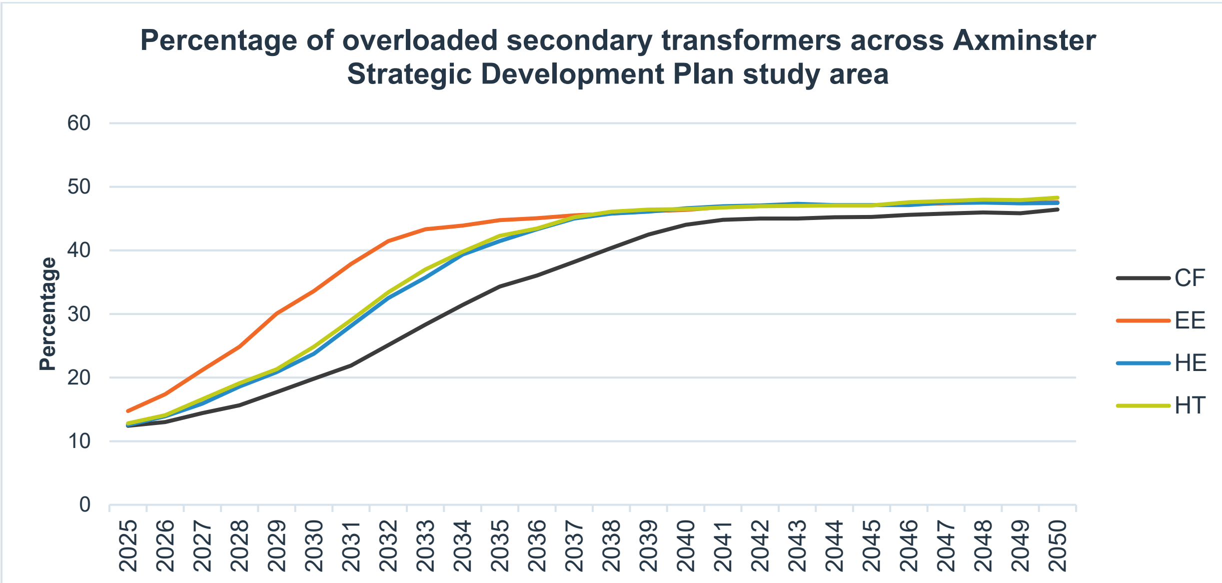

Figure 14 - Axminster GSP Projected secondary transformer loading. *Source: SSEN Load Model*

Considering the Just Transition in HV development

SSEN are building on the findings from the Vulnerability Future Energy Scenarios (VFES). This innovation project investigated how the use of new foresighting techniques, along with data analytics and expert validation could be used to identify and forecast consumers in vulnerable situations as we move toward net zero. Use of the outputs from the VFES enable SSEN to develop the network in a way that truly accounts for the levels of vulnerability their 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.[16] This work groups LSOAs[17] 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.

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.

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

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

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

Table 9 - VFES Groupings

As shown in Figure 15, there are several Lower-layer Super Output Areas (LSOAs) that are class 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 classed 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.

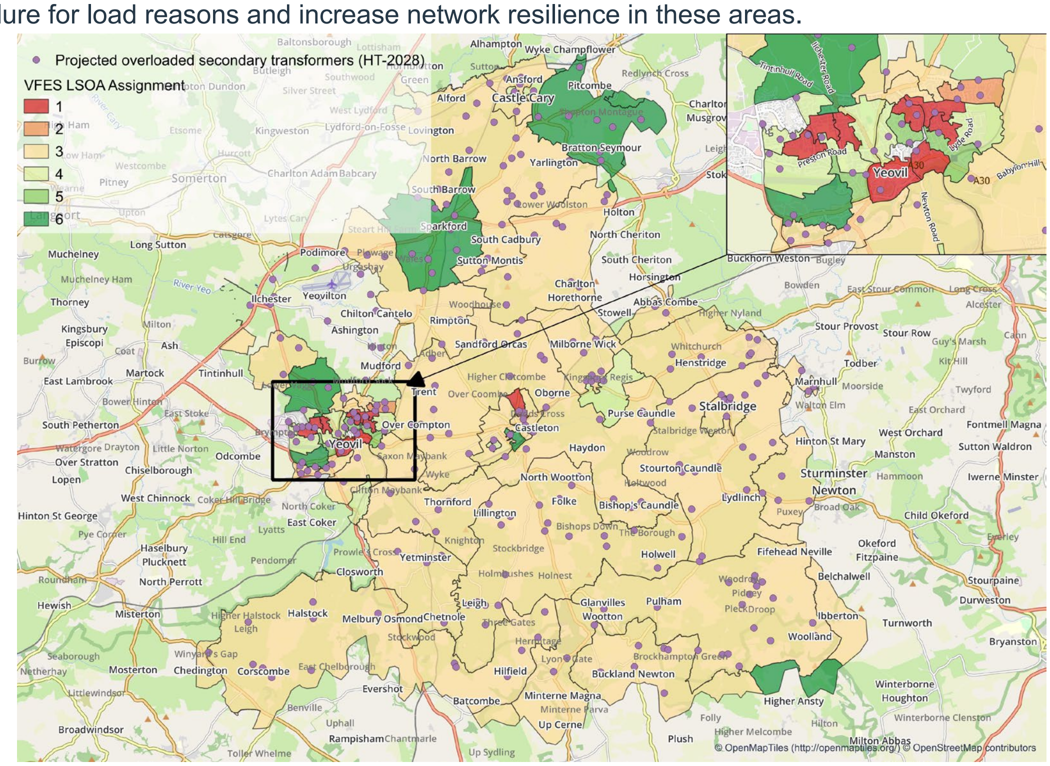

Figure 15 - Axminster GSP VFES heat map with overloaded secondary transformers.

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 together. 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 Axminster 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 across Axminster GSP 31% of low voltage feeders may need intervention by 2035 and 44% by 2050 under the HT scenario as shown in Figure 16. 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.

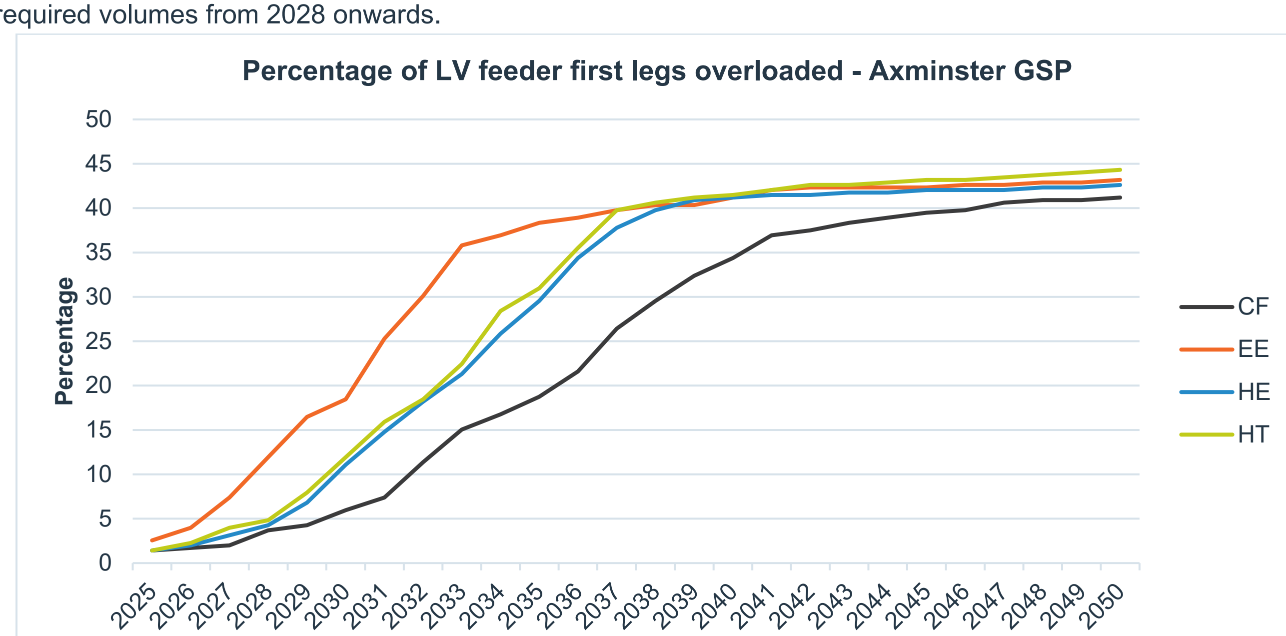

Figure 16 - Percentage of LV feeders projected to be overloaded under Axminster GSP

9. RECOMMENDATIONS

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

The findings from this report have provided evidence for 4 key recommendations:

1. Where we have identified work that is required in the next 10 years, this should be progressed through the DNOA process. Through detailed study we will understand the network requirements in more detail and progress these where appropriate. This includes the following system needs which are forecasted to arise ahead of 2035:

    a. Yeovil BSP to Sherborne PSS 33kV circuit
    b. Chilton Cantello PSS 33/11kV transformers
    c. Yetminster PSS 33/11kV transformers
    d. Milborne Port PSS 33/11kV transformer
    e. Pulham PSS 33/11kV transformers
    f. Yeovil BSP to Chilton Cantello PSS to Sparkford 33kV meshed network.

    It is possible that some of the above constraints may not have a near term system need based on actual load growth and therefore will not initially result in a DNOA outcome. Annual reassessment will enable us to confirm whether these system needs are likely to arise. When carrying out this annual reassessment the delivery timelines of the work should be considered alongside the potential for flexibility services to manage network capacity.

2. Continued collaboration with NGET to investigate routes to enable construction of the third 132kV circuit supplying Yeovil BSP. This will ensure SSEN’s network remains compliant with security of supply standards in the medium to long term.

3. SSEN should continue to monitor load growth in these rural areas, where research has shown rural communities maybe slower to adopt EVs, it is important that SSEN is an enabler of net zero by ensuring there is sufficient capacity in these areas.[18]

Actioning these recommendations will allow SSEN to develop a network that supports local net zero ambitions and enables growth in the local economy. By doing so, this will ultimately contribute to net zero targets at a national level.

18 Full article: Understanding the rural demographics need for electric vehicles

Appendix A EHV/HV spatial plans for other DFES scenarios

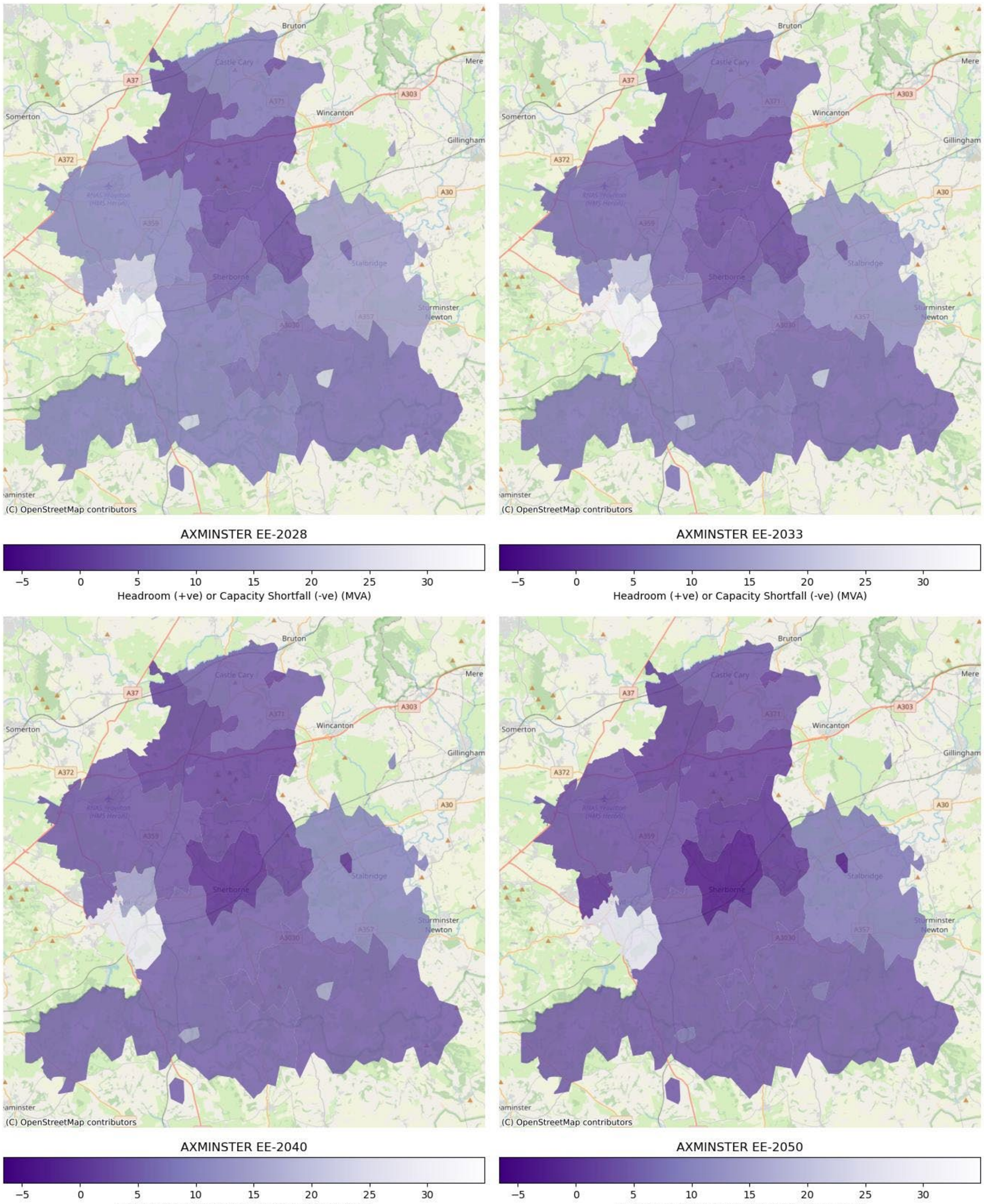

Figure 17 Axminster GSP - EHV/HV Spatial Plan - Electric Engagement

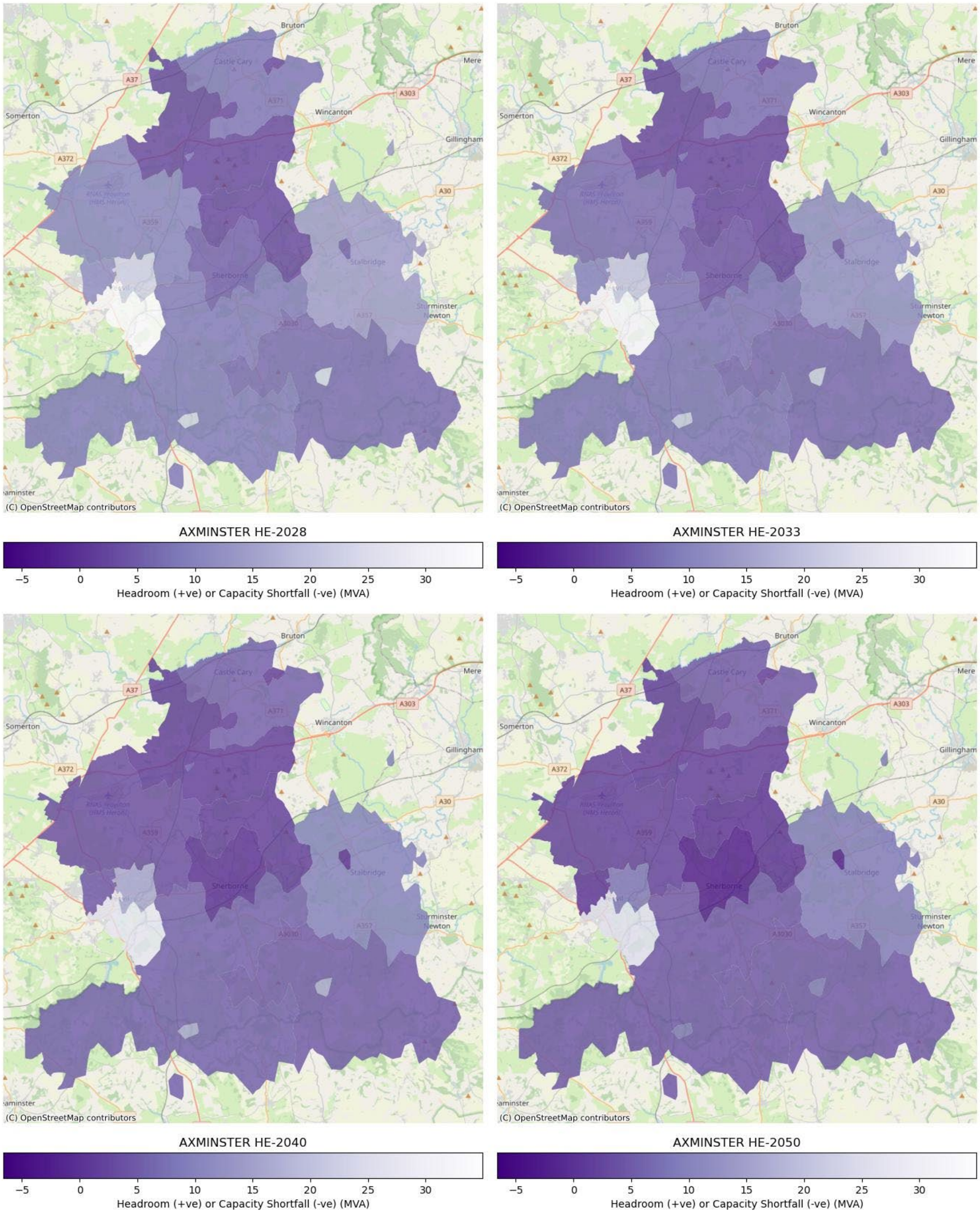

Figure 18 Axminster GSP - EHV/HV Spatial Plan – Hydrogen Evolution

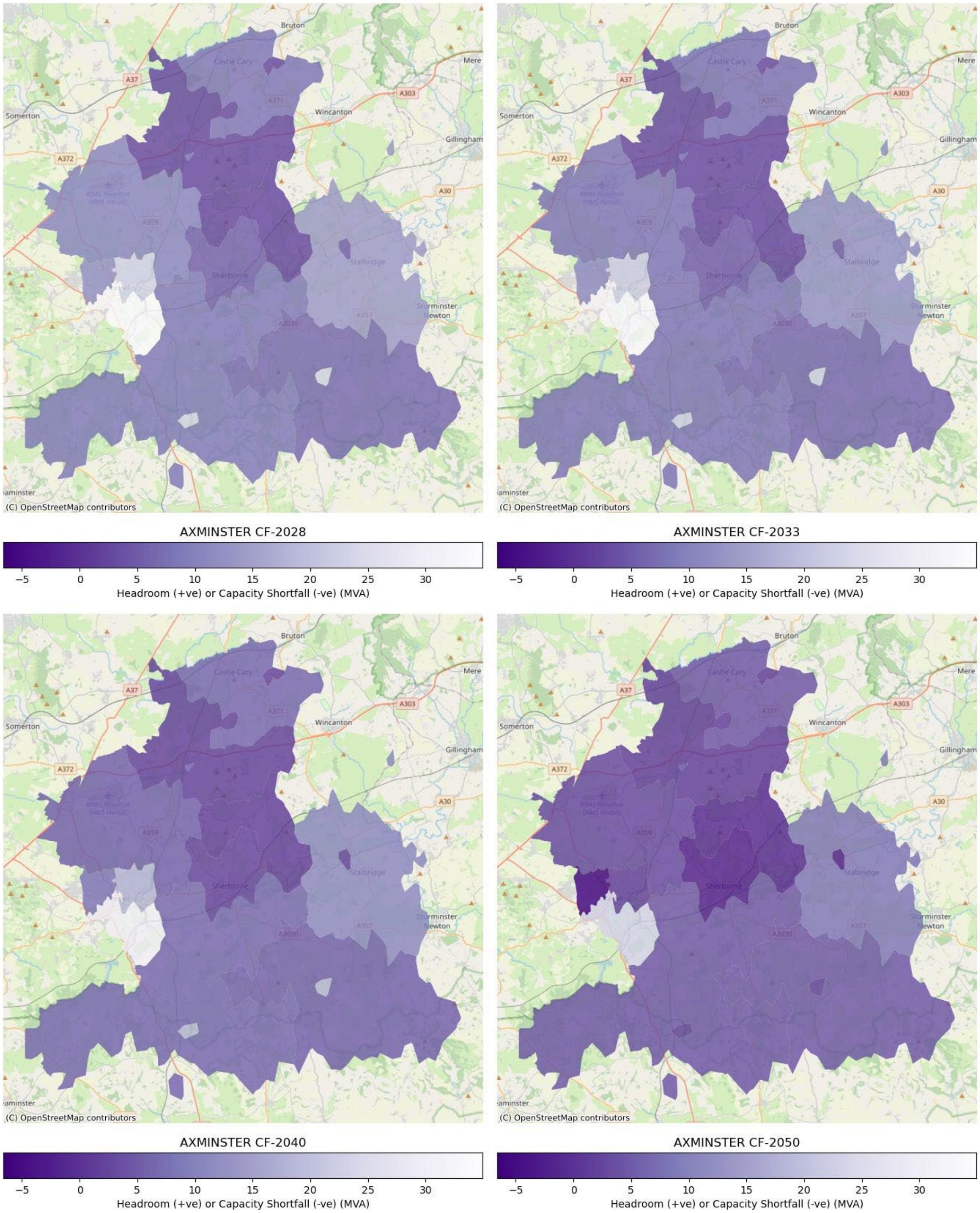

Figure 19 Axminster GSP - EHV/HV Spatial Plan – Counterfactual

Appendix B HV/LV spatial plans for other DFES scenarios

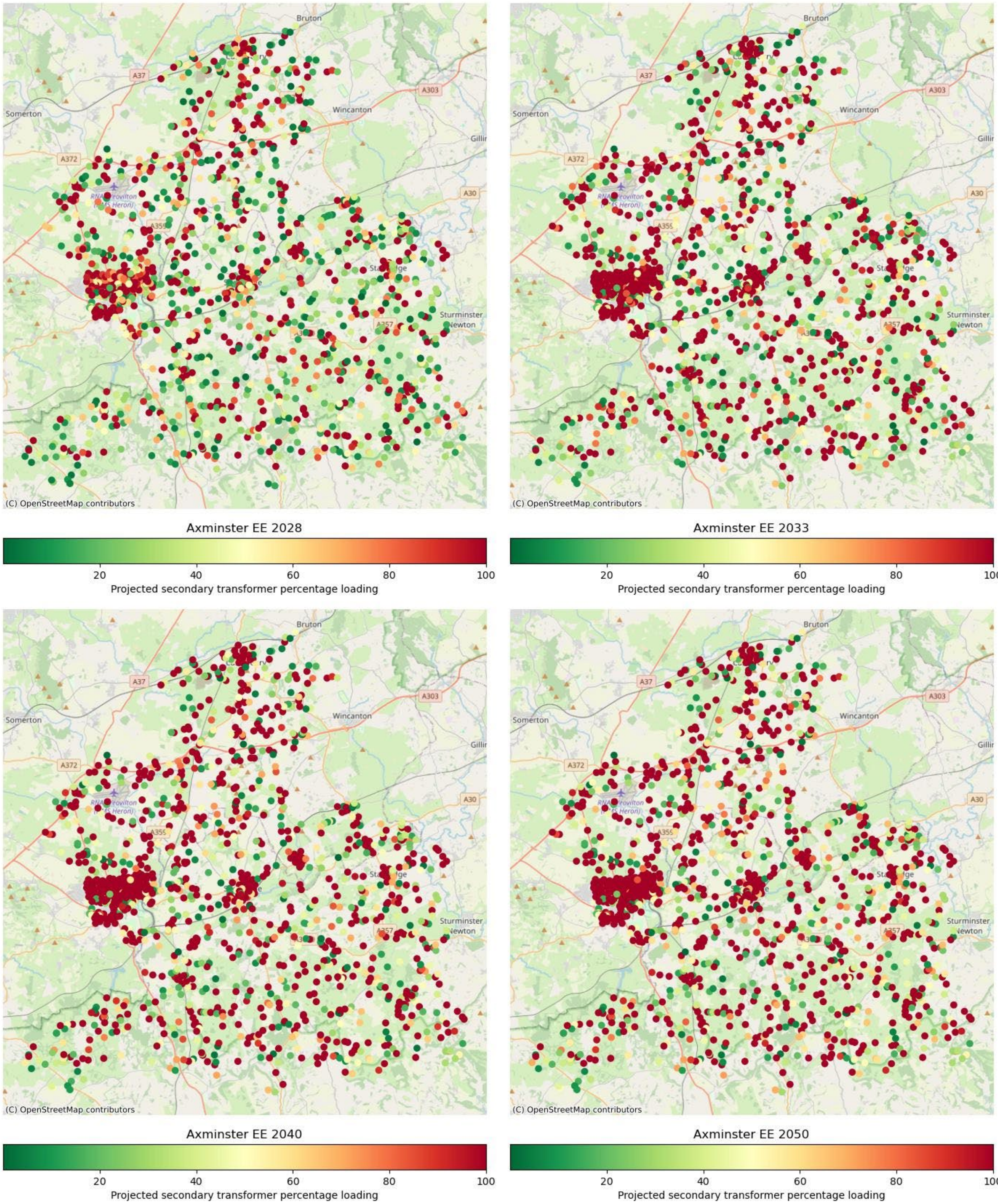

Figure 20 Axminster GSP - HV/LV Spatial Plan – Electric Engagement

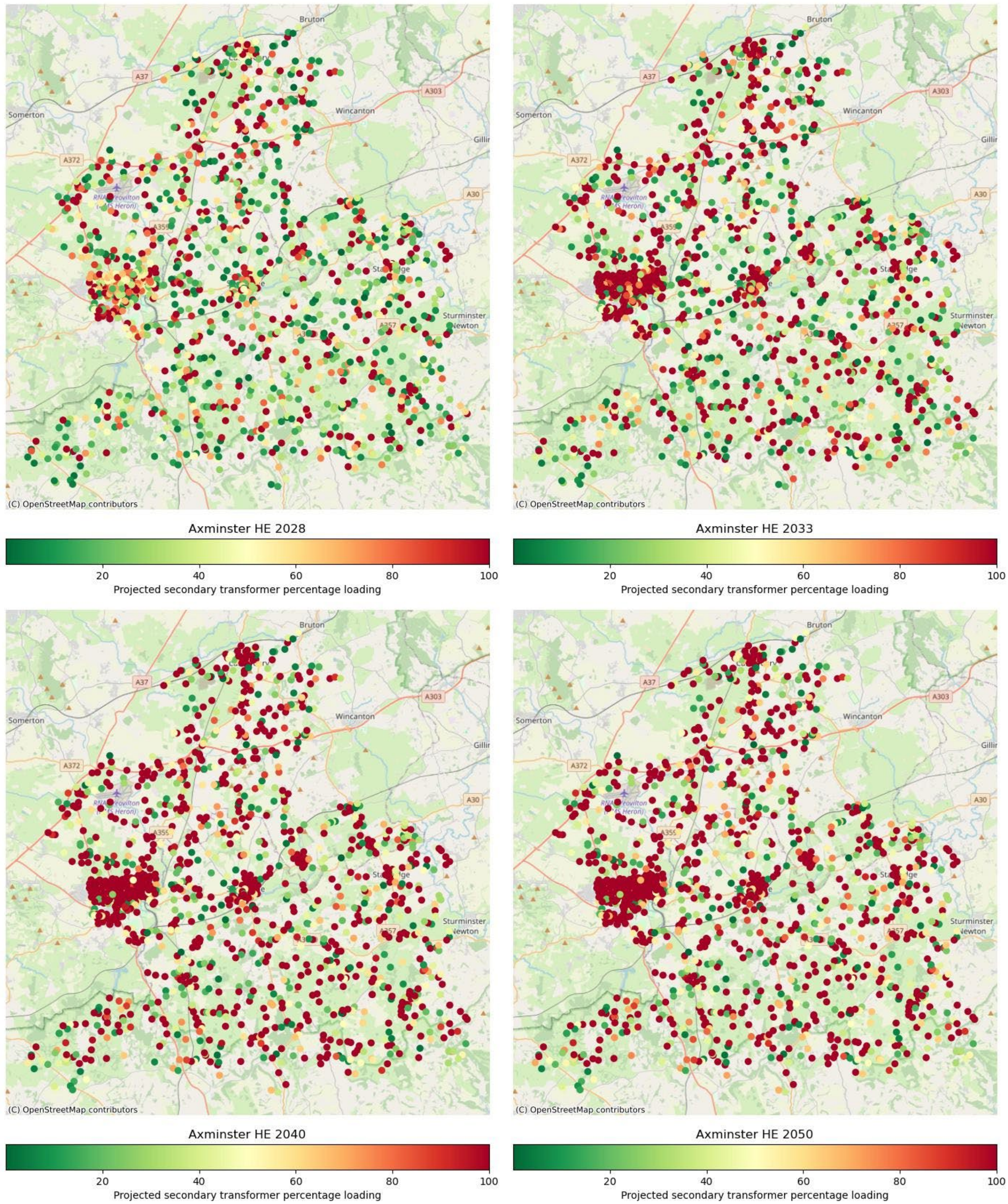

Figure 21 Axminster GSP - HV/LV Spatial Plan – Hydrogen Evolution

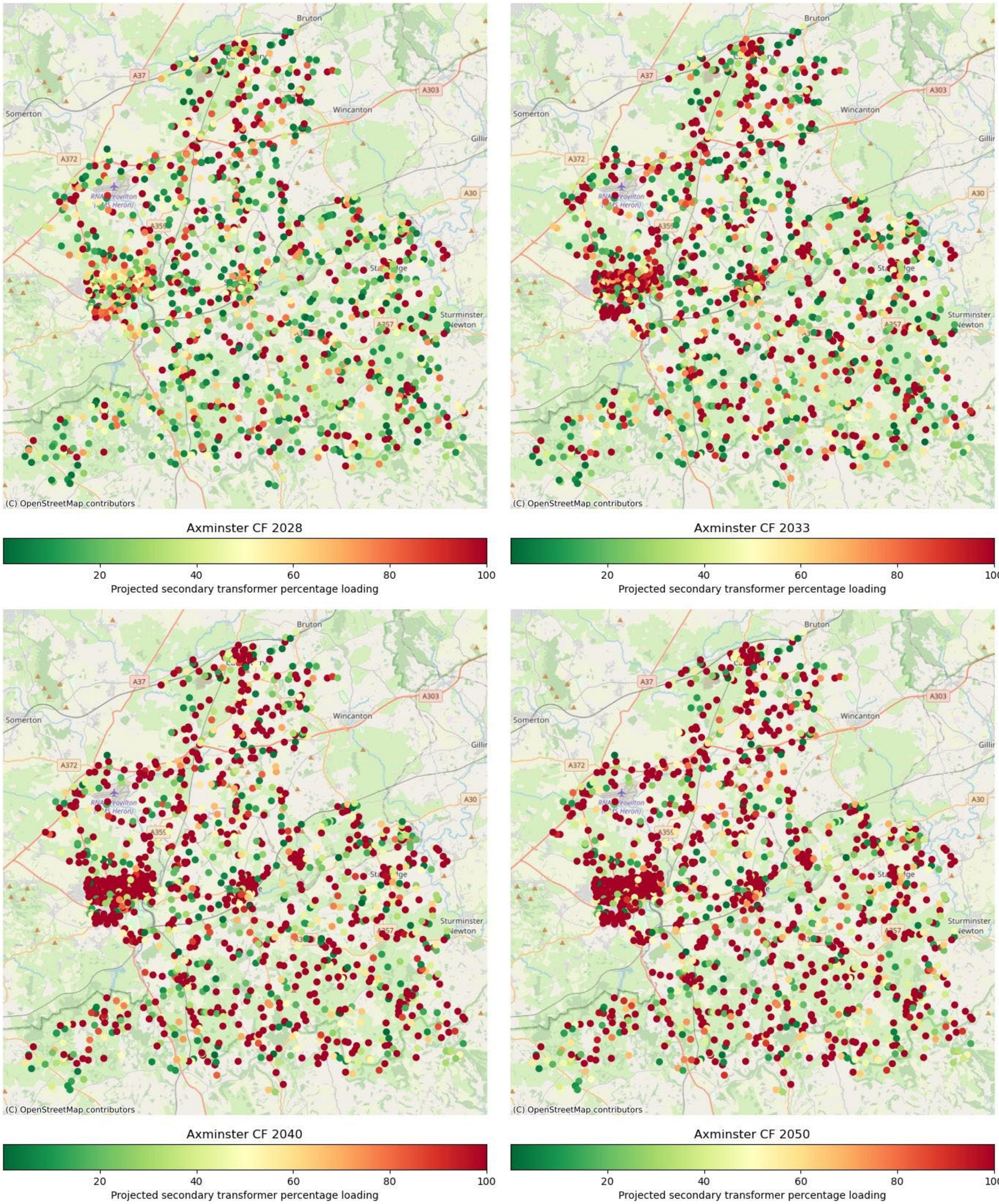

Figure 22 Axminster GSP - HV/LV Spatial Plan - Counterfactual

Appendix C 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
CF	Counterfactual
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
EE	Electric Engagement
EHV	Extra High Voltage
EJP	Engineering Justification Paper
ER P2	Engineering Recommendation P2
NESO	National Energy System Operator
NGET	National Grid Electricity Transmission
ENA	Electricity Networks Association
EV	Electric Vehicle
FES	Future Energy Scenarios

FS	Falling Short
GIS	Gas Insulated Switchgear
GSPs	Grid Supply Point
HE	Hydrogen Evolution
HT	Holistic Transition
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 Networks
ST	System Transformation
UM	Uncertainty mechanism
VFES	Vulnerability Future Energy Scenarios

Appendix D Amendments Following Stakeholder Consultation Process

The draft Axminster SDP was published earlier this year inviting stakeholder feedback. This annex details the amendments made to this Strategic Development Plan following consultation feedback.

Ref.	Section (SDP)	Feedback	Action
1.	3.1.1	Align to updated 2035 (council) and 2045 (area) net-zero targets with milestones; reconcile EVCP capacity forecasts and dashboard units; sense-check heat pump and non-domestic heat electrification baselines and adjust if conservative.	Updated section 3.1.1 to align with the councils net zero targets.
	3.1.5	Under 3.1.5 you will be able to make reference to the Somerset Energy Investment Plan.	Added cross reference in section 3.1.5.
2.	5.0, 8.2	The document's technical complexity and limited visual/contextual clarity make it challenging for non-technical stakeholders.	We have added a link to SSEN's Open Data Portal, giving stakeholders direct access to the underlying raw data for further exploration. We also plan to improve the overall user-friendliness of the document in future editions. In addition, SSEN is developing a heatmap tool that will present this information more visually; we will share updates with stakeholders once it becomes available.

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