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Hampshire Strategic Report

Issue 2 - Final

28/05/2026

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Acronyms

Acronym	Definition	Acronym	Definition
ADMD	After Diversity Maximum Demand	LCCC	Low Carbon Contracts Company
AI	Artificial Intelligence	LCT	Low Carbon Technology
AR	Allocation Round	LTDS	Long Term Development Statement
BESS	Battery Energy Storage System	LV	Low Voltage
BSP	Bulk Supply Point	MW / GW / GWh	Mega Watt / Giga Watt / Giga Watt hours
CFD	Contract for Difference	NESO	National Energy System Operator
CHP	Combined Heat and Power	NGET	National Grid Electricity Transmission
COD	Commercial Operation Date	NRC	Nations and Regions Context
CPA	Common Planning Assumption	NZ	Net Zero
CSNP	Centralised Strategic Network Plan	PSS	Primary Substation
DER	Distributed Energy Resources	PV	Photovoltaic
DFES	Distribution Future Energy Scenarios	REPD	Renewable Energy Planning Database
DNO	Distribution Network Operator	RIIO-ED3	Revenues = Incentives + Innovation + Outputs - Electricity Distribution period 3

Acronyms

Acronym	Definition	Acronym	Definition
ECR	Embedded Capacity Register	RIIO-ET3	Revenues = Incentives + Innovation + Outputs - Electricity Transmission period 3
EHV	Extra High Voltage	SDP	Strategic Development Plan
EV	Electric Vehicle	SG2	Solent Gateway 2 Project
GSP	Grid Supply Point	SSEN	Scottish & Southern Electricity Networks
HP	Heat Pump	SSEP	Strategic Spatial Energy Plan
HT	Holistic Transition Distribution Future Energy Scenario	TO	Transmission Owner
HV	High Voltage	tRESP / RESP	Transitional Regional Energy Strategic Plan / Regional Energy Strategic Plan

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Introduction

Study Context

- Jacobs has been tasked to perform an Energy Infrastructure Gap Analysis for Hampshire County Council. This is to understand the constraints of the existing electricity network infrastructure in order to facilitate regional economic growth alongside the transition to a low-carbon future.
- These objectives include:
  - Gaining a **holistic understanding** of Hampshire's **current energy baseline and infrastructure**.
  - **Assessing constraints on the network** against **forecasted energy scenarios** and identifying key mitigation interventions for County Council / Local Authority officers.
  - **Forecasting energy demand**, evaluate grid capacity **constraints**, and assessing the region's **renewable energy potential**.
  - **Providing Strategic Recommendations** to support better planning for development, transport, and renewable energy.
  - **Stakeholder Collaboration**: engage where possible with network operators by actively involving in the review process to promote alignment and mutual understanding.
  - **Capacity Building:** Provide Local Authorities and officers with the knowledge and resources necessary to champion and implement impactful energy strategies.

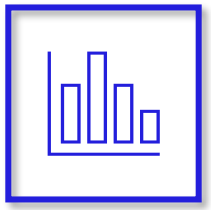
Study Workflow Process

Inputs

1. Previous infrastructure condition reports
2. Energy demand data
3. Renewable resource maps
4. Future demand: development plans for large energy users
5. Spatial planning documents

Analysis

Review published information to understand the network in the region, its constraints and the planned infrastructure upgrades.



Forecast future energy demand and evaluate how much of it can be met through existing infrastructure.

Discuss the implications of grid constraints, renewable energy potential, and future demand scenarios.

Outputs

1. Grid Constraints Report
2. Strategic Report

Stakeholder Collaboration and Knowledge Sharing

- A key part of the project was interaction with key stakeholders in Hampshire County Council, respective Local Authorities and the distribution network operator, Scottish and Southern Electricity Networks (SSEN).
- We undertook the following stakeholder engagement and knowledge sharing as part of this project.

Event	Date	Attendees
Hampshire Grid Constraints - Stakeholder Workshop #1	13/03/2026	County Council and Local Authority representatives
Meeting with SSEN's modelling team	16/04/2026	SSEN's Whole Systems Modelling team
Hampshire Grid Constraints - Stakeholder Workshop #2	17/04/2026	County Council and Local Authority representatives
Hampshire Strategic Report - Stakeholder Workshop	08/05/2026	County Council and Local Authority representatives

Highlighted Hampshire Regions

- After reviewing SSEN's Strategic Development Plan (SDP), the team selected 3 grid supply points (GSP) for further examination as case studies:

1. **Nursling (September 2025 issue)**
   - 5th highest GSP by demand
   - Requires major works to standardise 11kV network for primary substations connected to Nursling GSP
2. **Fleet (June 2025 issue)**
   - Highest GSP by demand
   - Requires transition of supplied areas and expansion of generation connections
3. **Lovedean (February 2026 issue)**
   - 3rd highest GSP by demand
   - Potential large increase in Solar PV generation and BESS, investigate Clean Power targets to ensure grid development is on track

Strategic Report

- The Strategic Report builds on the Grid Constraints Report (see Appendix A) and details our final recommendations from the Energy Infrastructure Gap Analysis.
- The report reviews:
  - How energy policy is informing energy plans in the county to meet 2030 and 2050 net zero targets,
  - SSEN's energy infrastructure plans (where known), and
  - Planning for future development in Hampshire.
- Recommendations are made for how Hampshire County Council can inform energy infrastructure development to support their net zero and economic development ambitions in the short and longer terms.

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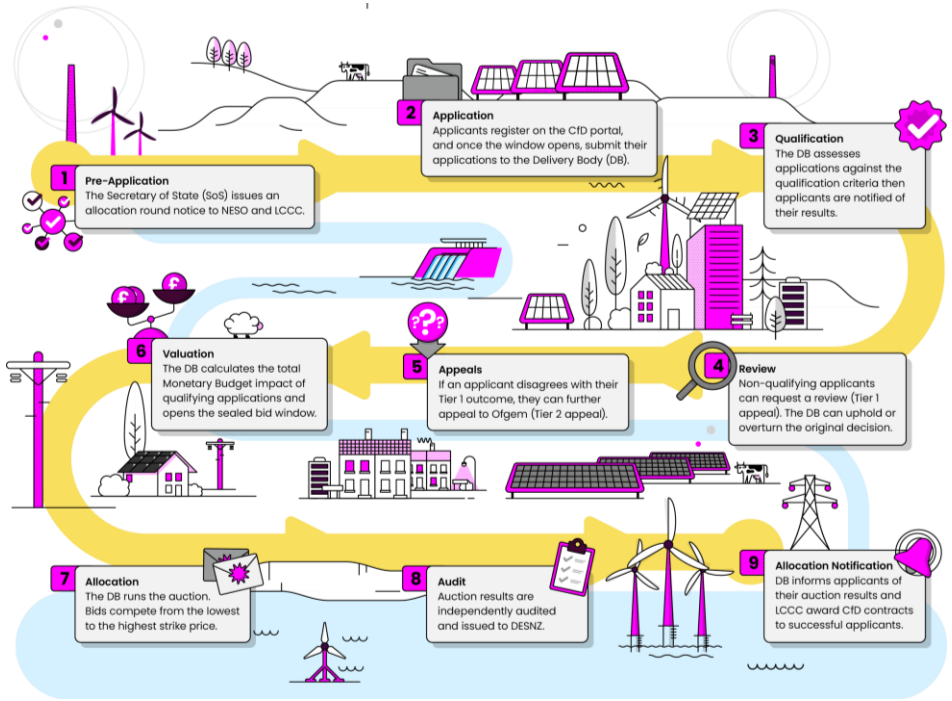
Policy Analysis

Contracts for Difference (CfD)



- The CfD scheme incentivises the development of low carbon energy. It was introduced in 2014 to derisk investment to attract private sector funding to help bring down the cost of renewable energy.
- A CfD is a contract between a low-carbon electricity generator (wind, solar, etc) and the Low Carbon Contracts Company (LCCC).
- Developers of new clean energy projects bid into a competitive auction, or allocation round (AR), for a contract which guarantees a fixed strike price for the electricity they generate over a 15-year term:
  - Where the strike price < market price the LCCC pays the generator the difference.
  - Where the strike price > market price the generator pays LCCC the difference.

- **AR7 secured 14.7GW of clean energy in 2025 and AR8 opens in July 2026 offering a 20-year contract and strongly incentivising the use of local supply chains to offer wider economic benefits.**
- **With AR9 also planned, distributed renewable energy remains the cornerstone of the UK's decarbonisation plans.**

Connections Reform

By 2024 the Generation connection queue in the UK had approximately four times the capacity of generation required for the 2030 demand forecast scenarios, and double that of 2050 scenarios.

Many projects in the queue were not progressing and were delaying other, ready to build projects.

In 2025 the National Energy System Operator (NESO) launched their Connections Reform Programme to prioritise projects that are ready and needed, with three strategic aims:

1. **Clearing the Gridlock:** Unlocking 381.5GW of capacity that's ready-to-build, paving the way for Britain's clean energy future and fuelling economic growth across Great Britain.
2. **Certainty, not Delay:** Prioritising shovel-ready projects aligned with national energy targets, giving certainty to our customers, developers and investors clarity.
3. **Driving Investment:** Unlocking up to £40bn of annual energy investment, creating jobs, supercharging supply chains and enabling tomorrow's technologies.

New connection applications were paused in January 2025 and only projects that met the following criteria were allowed to retain their connection date:

- already under construction,
- having a connection date in 2025/6, or
- With protected status.

All others had to reapply under the new process:

Connections Reform (continued)

Under connection reform the DNOs and NESO assess connection applications and assign each project a status based on their readiness and strategic alignment with the UK's energy goals:

- **Gate 1** applies to projects that do not meet the Gate 2 criteria. These projects will receive a Gate 1 offer or have the option to agree to terminate their connection request. Gate 1 projects will not be assigned a confirmed connection date but may progress through future windows if readiness is demonstrated.
- **Gate 2** applies to projects that meet the new requirements for readiness (Secured Land Rights, Progressed Planning Status, De Minimis Requirements) and Strategic Alignment.

Gate 2 offers are currently being issued[1]. As these are received by developers, timelines for renewable energy projects in Hampshire will become more certain.

1. https://www.neso.energy/industry-information/connections-reform/connections-reform-timeline

RIIO Price Control - Anticipatory Transmission Network Investment

In previous price controls Ofgem has been generally cautious about allowing network companies to undertake strategic or anticipatory investment. The next regulatory price control periods are notable for a marked shift of emphasis towards Anticipatory Investment:

- Recognising that grid capacity must grow rapidly to meet increased demand from electrification, Ofgem is shifting from a "just-in-time" investment model to a proactive, "low-regret" approach.
- For the Transmission networks four key principles of investment have been outlined for **RIIO-ET3** (April 2026 – March 2031):

1. **Scale and Speed:** The investment aims to address network growth at a level not seen since the 1960s/70s, enabling a 50% reduction in transmission emissions.
2. **Strategic Spatial Energy Plan (SSEP):** Investment is not ad-hoc; it is driven by centrally planned, strategic needs identified by NESO.
3. **Low-Regret Approach:** Focuses on investments that are deemed necessary across multiple Net Zero scenarios, reducing the risk of wasted capital.
4. **Economic Growth Duty:** The regulator has introduced a statutory duty requiring investment to support sustainable economic growth, influencing how transmission owners (TOs) build their plan.

RIIO Price Control - Anticipatory Distribution Network Investment

- For the distribution networks, following the **RIIO-ED3** framework consultation (April 2028 – March 2033) Ofgem's Framework Decision, 30 April 2025 states that ED3 will contribute towards the delivery of four key consumer outcomes:

  1. **Networks for Net Zero:** a proactive approach to network investment meaning that DNOs will need to plan and deliver investment ahead of longer-term network needs to achieve net zero targets.
  2. **Responsible and Sustainable Business:** demonstrable value added through meeting the planned high growth in electrification demand and renewable generation connections and through sustainable financial investment.
  3. **Resilient Networks:** ensuring DNOs build reliable networks which can withstand current and future risks and threats, such as climate change and cyber-attacks.
  4. **Smarter Networks:** drive proactive investment planning with a focus on delivering wider system benefits, e.g. through digitisation, innovation, optimising network voltage, reducing losses, providing system visibility and accelerating connections.

RIIO Price Control - Anticipatory Distribution Network Investment (continued)

- In keeping with ET3's anticipatory investment emphasis, The ED3 Framework Decision goes on to state:

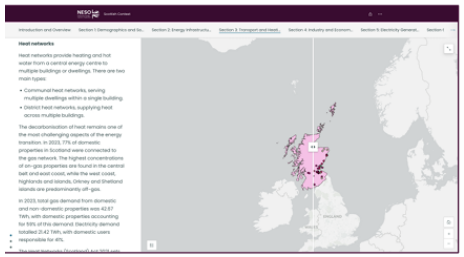
  "Incentivising the delivery of short-term outputs could come at the cost of the investment required to meet the needs of future generations. Instead, we want ED3 to encourage a longer-term, more consistent and holistic approach to network planning. We will design the price control so that we retain a regime that has the stability and predictability critical for attracting investors, but compared to RIIO-ED2, DNOs will be more strongly held to account for the quality and subsequent delivery of their plans."

- It should be expected, then, that strategic investment – particularly where it allows network companies to facilitate the above customer outcomes – will be more readily permissible in the next price control periods.

- This is accompanied by other reforms, including the introduction of Strategic Planning processes such as the **Centralised Strategic Network Plan (CSNP – Due for publication by 15/12/2028)** and the **Regional Energy Strategic Plans (RESPs – Due for publication by the end of 2028)** to ensure that local needs, future national priorities, and network plans are aligned.

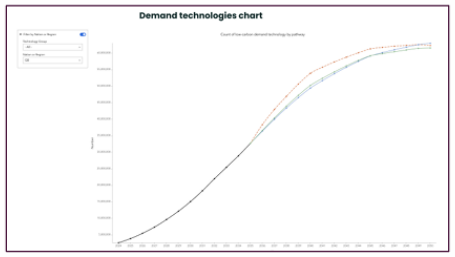
Transitional Regional Energy Strategic Plan (tRESP)

- The tRESP published in January 2026 by NESO aimed at transforming and improving energy infrastructure at a local level.
- The tRESPs provide the evidence base for Ofgem's ED3 and inform future network investments by DNOs as they prepare business plans for the next price control period (2028-2033).
- The tRESPs will identify areas where proactive network investments would enable the delivery of local projects and drive local investment. High impact technologies such as EVs and HPs are prioritised.
- NESO will use the 11 tRESPs for the delivery of its new holistic Full RESP role in late 2028.



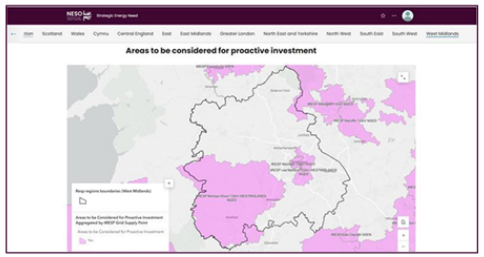
Nations and Regions Contexts

Our digital output for Nations and Regions Contexts provides a consistent view across key energy topics relevant to electricity distribution network planning for each nation and region.



Pathways and CPAs

Our Pathways and Consistent Planning Assumptions set a consistent, strategic direction from which electricity DNOs will plan their networks.



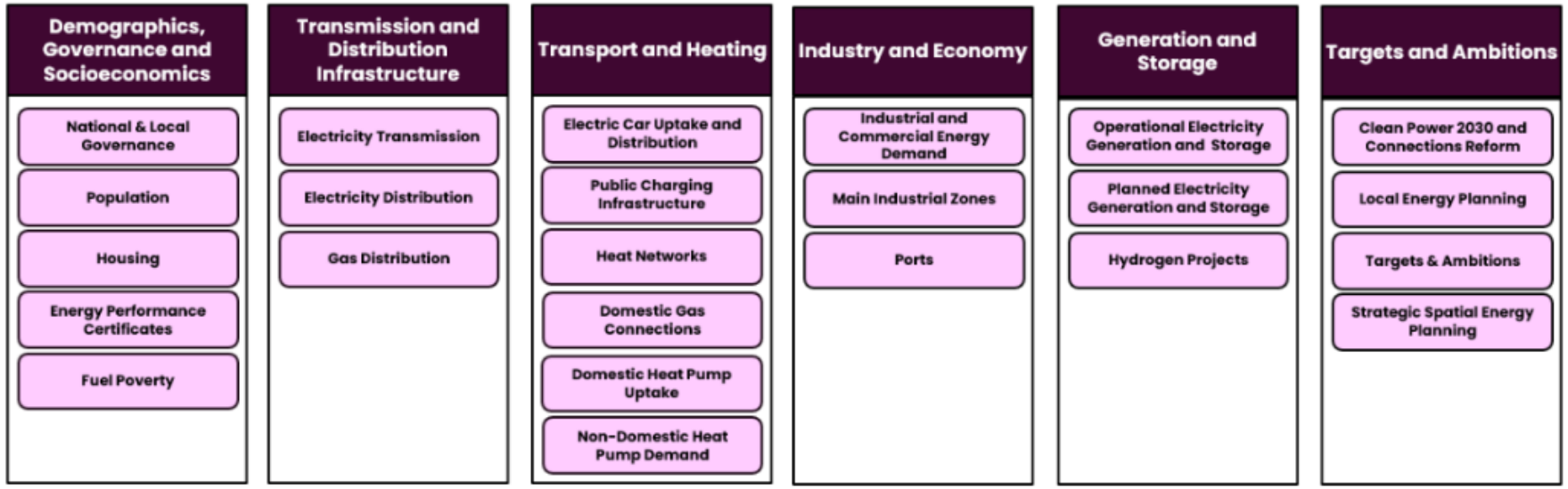
Strategic Energy Need

Strategic Energy Need maps out geographic areas where we have identified there is a strategic approach required to electricity network investment, ahead of certain need.

Source: NESO's Exec Summary slideshow

tRESP Southeast Region Context

- Nations and Regions Contexts (NRCs) highlight key challenges and opportunities across each RESP region, providing a consistent view across key themes and topics.
- Each region has individual qualitative and quantitative data themes:



- Hampshire is within the SE Region and further detail of the challenges and oppourtunities can be found at [tRESP - Nations and Regions Context].

tRESP Pathways and Consistent Planning Assumptions (CPA)

- NESO has created the tRESP Pathways to support DNOs develop network plans for ED3. These are provided by datasheets for local authorities as well as GSPs. Below is the HT scenario for predicted GSP demand and generation for the three case-study GSPs.

GSP area	2026 Demand (GWh)	2030 Demand (GWh)	2050 Demand (GWh)
Nursling	9.8	26.4	71.3
Fleet	16.0	47.1	254.5
Lovedean	15.9	37.4	208.1

GSP area	2026 Generation (MW)	2030 Generation (MW)	2050 Generation (MW)
Nursling	243.9	307.7	848.7
Fleet	346.3	487.9	1074.6
Lovedean	340.6	480.5	1073.8

- The tRESP website also includes a datasheet for all consistent planning assumptions (CPAs) which outlines the complete modelling process for deriving demand from EVs and residential heat pumps.

Source: Pathways

tRESP Strategic Energy Needs (SEN)

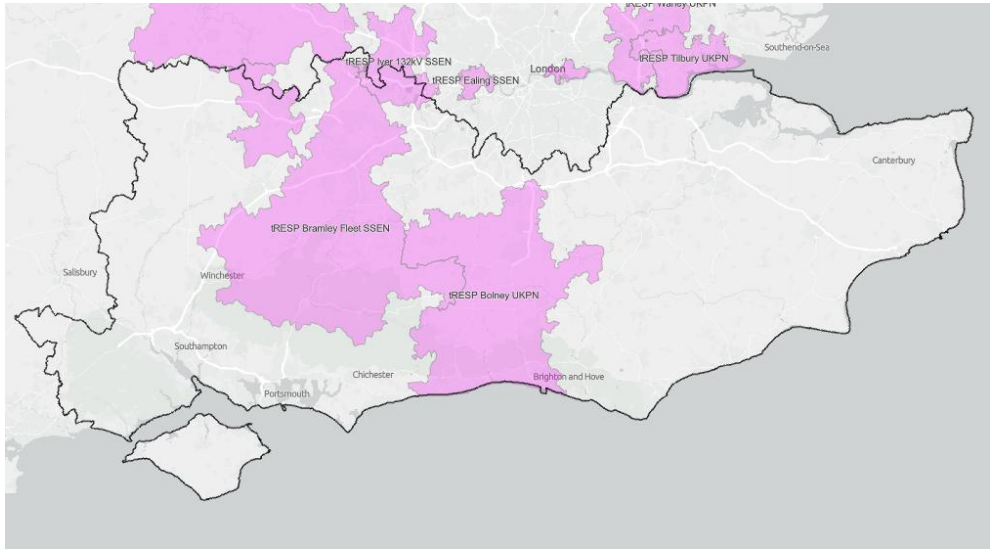
NESO has broken down GSP areas to identify areas of strategic energy need that may require further proactive investment.

- This has highlighted Fleet as an area to be considered for proactive investment by 2034 due to housing.
- Nursling has the highest proposed increase in demand, requiring 31% of additional capacity (0.46 GW). Fawley was second at 16%.

South East Needs Assessed

Grid supply point area	Electricity Distribution Network Operator	Future related additional capacity required in gigawatts	Percentage of the related additional capacity required
Nursling	Scottish and Southern Electricity Networks	0.46 GW	31%
Fawley	Scottish and Southern Electricity Networks	0.24 GW	16%
Iver	Scottish and Southern Electricity Networks	0.20 GW	14%
Richborough	UK Power Networks	0.18 GW	12%
Bolney	UK Power Networks	0.09 GW	6%

GSP Areas to Be Considered for Proactive Investment



Source: Strategic Energy Need

RIIO-ED3 and tRESP Conclusions

- ED3 requires DNO's to plan for the ED3 price control period (2028-2033) and anticipate the needs of future periods in order to achieve 2030 and 2050 decarbonisation targets.
- To support ED3, NESO has developed tRESP which is a framework used by DNO's and energy stakeholders that standardises and evidences the forecasting of generation and demand needs in a region:
  - Regions have individual qualitative and quantitative data themes.
  - The SE Regional Pathway will allow SSEN to develop Hampshire's network plans for 2030 and beyond.
  - The Fleet GSP areas are considered Strategic Energy Needs, enabling proactive network investment.
  - Nursling GSP has the highest proposed increase in demand, partly due to plans to transition load from Fawley GSP to Nursling and therefore a strategic development need for SSEN.
- **The ED3 planning process and tRESP are adding clarity on how Hampshire's electricity infrastructure will be evolved to support 2030 and 2050 Net Zero targets will become clearer. Ofgem's indicative timeline is as follows:**
  - December 2026: SSEN will submit their final business plans to Ofgem.
  - December 2027: Ofgem is expected to publish its Final Determinations, which will set the baseline revenue companies can recover from consumers.
  - April 2028: The ED3 framework takes effect, and the newly determined costs will begin being socialised across network charges.

Hampshire County Council Climate Change Framework of Strategic Programmes

Residential and Energy		
Programme	**Description**	**Outcomes**
Hampshire wide retrofit programme	Addressing residential emissions county-wide through the development of a retrofit programme for privately owned able-to-pay homes, to improve energy efficiency and household resilience.	Establishment of a viable business case and delivery model for a one-stop-shop programme for retrofit in Hampshire.
Planning and Infrastructure	Using planning policies and guidance to ensure that growth and development in Hampshire is sustainable and resilient, maximising opportunities to reduce carbon emissions and enhancing the natural environment.	1. Climate change is embedded in all planning policies and guidance. Considering infrastructure delivery at every step in our infrastructure delivery projects. 2. Procurement of contractors and ensuring that climate change and natural environment are given high weighting during the procurement process and selection of suppliers
Developing a local area energy strategy	Work with partners to understand the requirements for renewable energy generation and distribution across Hampshire, alongside ensuring greater energy efficiency.	Development of a Hampshire-wide energy strategy to aid the transition to a clean energy network while ensuring maximum benefits are felt locally.
'Support and Scale' Community energy programme	Enabling communities to build their own capacity for renewable energy.	Allocating revolving community energy fund to all eligible community energy groups.

Hampshire County Council Climate Change Framework of Strategic Programmes

- Hampshire County Council declared a climate emergency in June 2019, and are working towards the following targets:
  - Becoming carbon neutral by 2050
  - Preparing to be resilient to the impact of a 2° rise in temperature
- In pursuit of these targets, several studies have been undertaken by the University of Southampton in 2021. These studies aim to better understand the potential for generating renewable energy in Hampshire and its coastline and identify what constraints will limit this potential:
  - An updated assessment of the technical and economic potential for renewable electricity generation in the pan-Hampshire area
  - An assessment of the wider Hampshire distribution network capacity and potential constraint points for renewable generation
- **Hampshire's Climate Change Framework of Strategic Programmes identifies the key role renewable energy will play in decarbonising the county.**
  - **However, grid constraints are slowing the development of utility scale renewable energy projects.**
  - **Domestic low carbon technology (solar PV, BESS, heat pumps, EV chargers) is not subject to the same grid connection constraints and could play a role in meeting early decarbonisation targets.**

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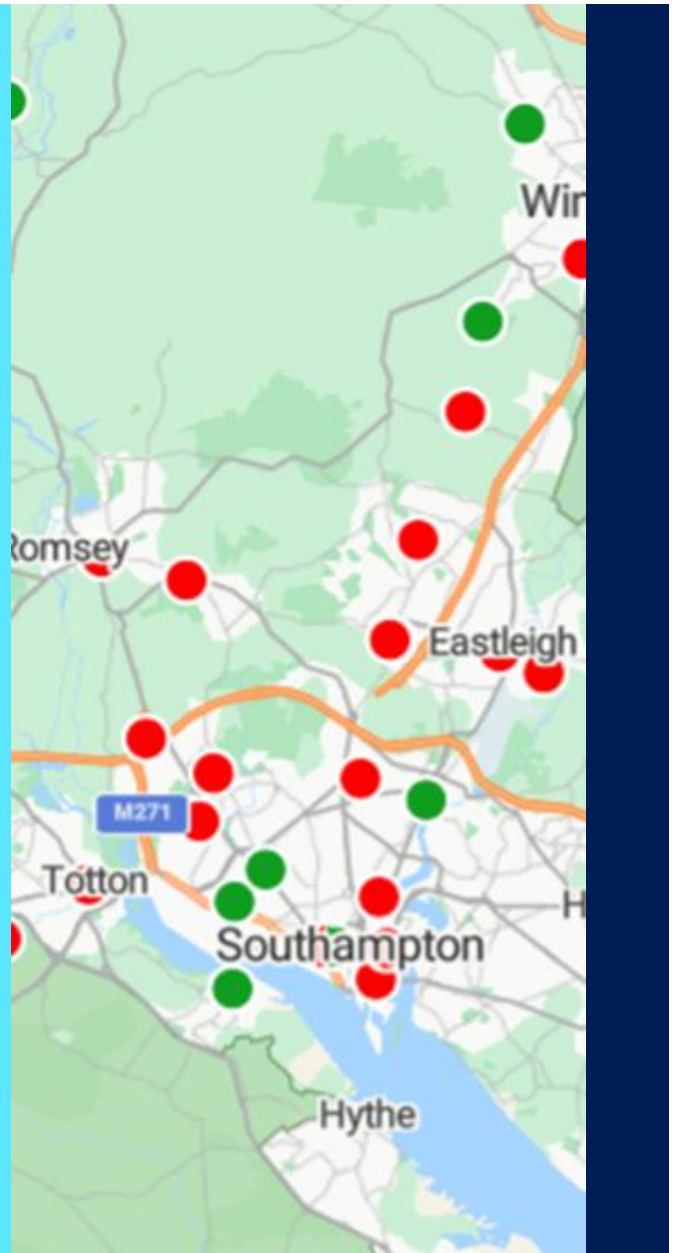
High Level Spatial Analysis



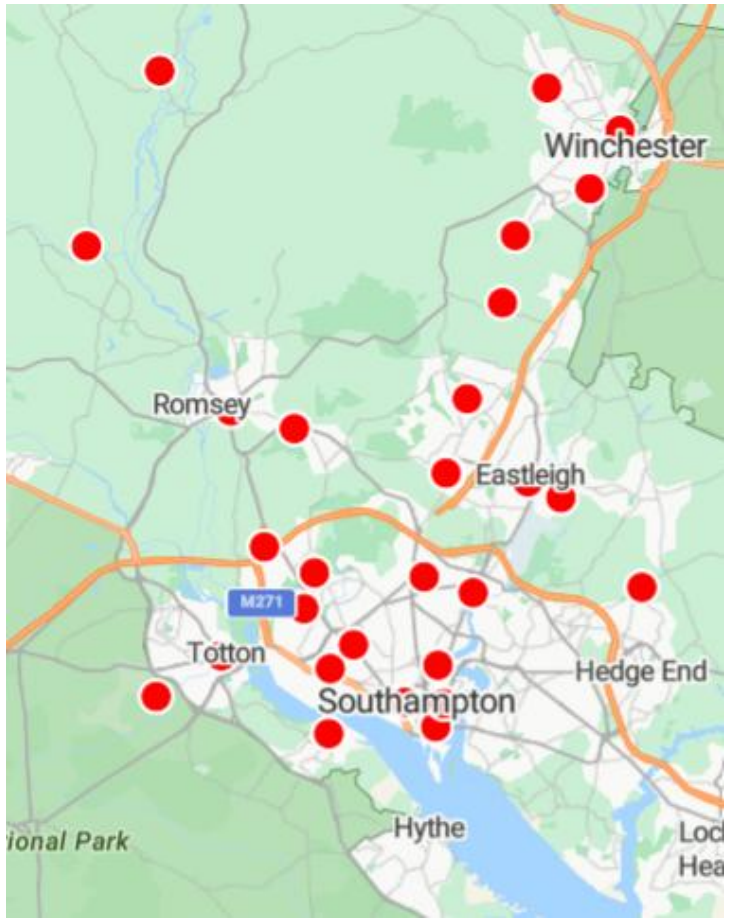
High-level Spatial Analysis

- Using SSEN headroom data, a spatial map has been developed for the Hampshire region, illustrating available generation and demand headroom across substations.
- The analysis reflects current conditions for 2026 and will support Hampshire in understanding the scale of network reinforcements required to enable the Net Zero transition.
- Generation headroom indicates the ability for new generation developments to connect at each substation, while demand headroom highlights whether the existing network can accommodate forecast demand within each area.

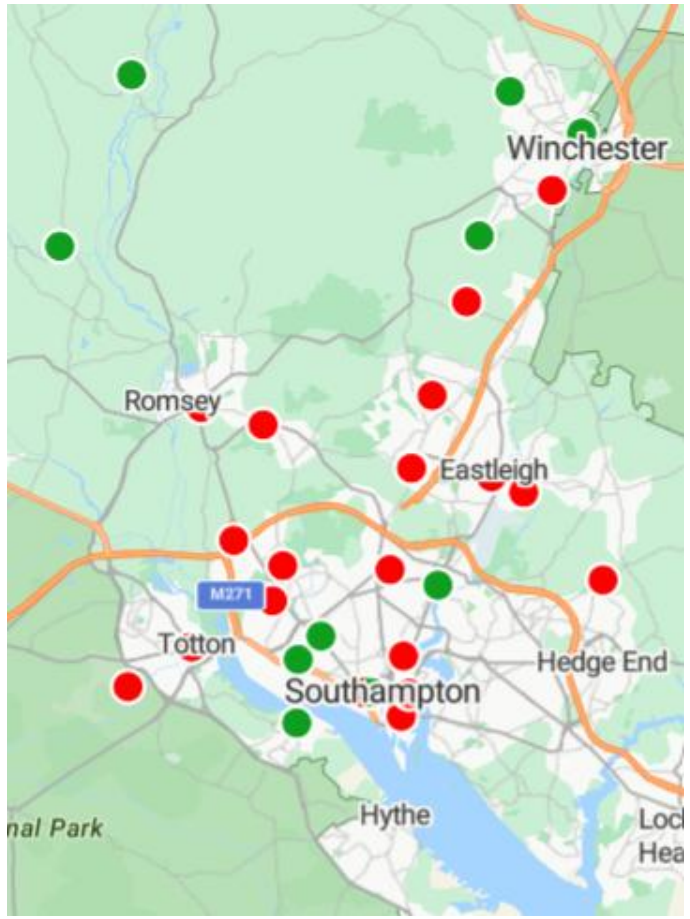
<u>List of Local Authorities affected by each spatial map:</u>

- Nursling:
  - Eastleigh
  - New Forest
  - Test Valley
  - Winchester
  - Southampton
- Fleet:
  - Basingstoke and Deane
  - East Hampshire
  - Hart
  - Rushmoor
  - Winchester
- Lovedean:
  - East Hampshire
  - Fareham
  - Gosport
  - Havant
  - Winchester
  - Portsmouth

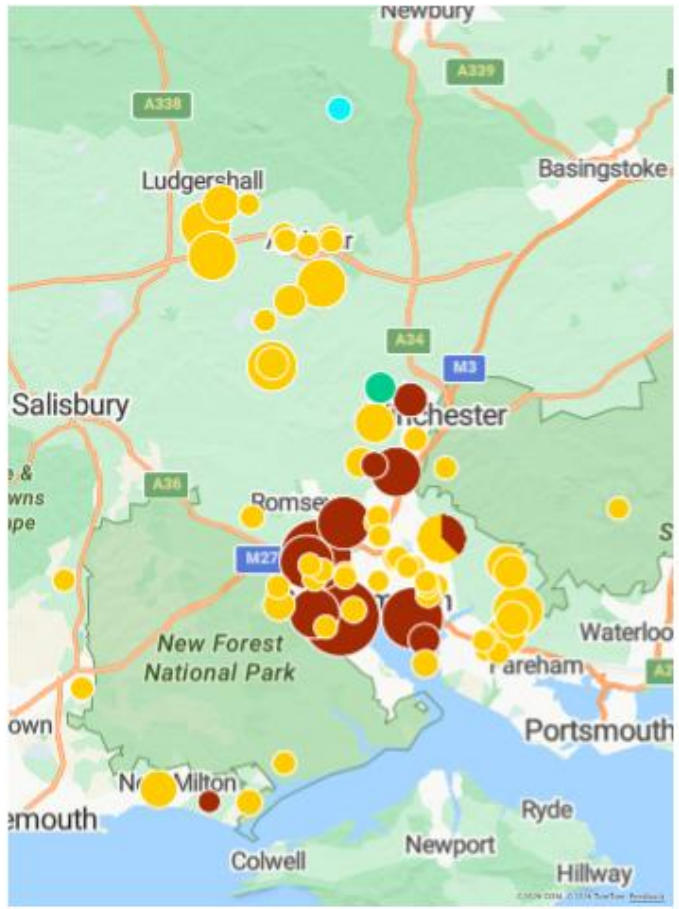
High-level Spatial Analysis - Nursling



Generation Headroom Spatial Map – by substation (Nursling)



Demand Headroom Spatial Map – by substation (Nursling)

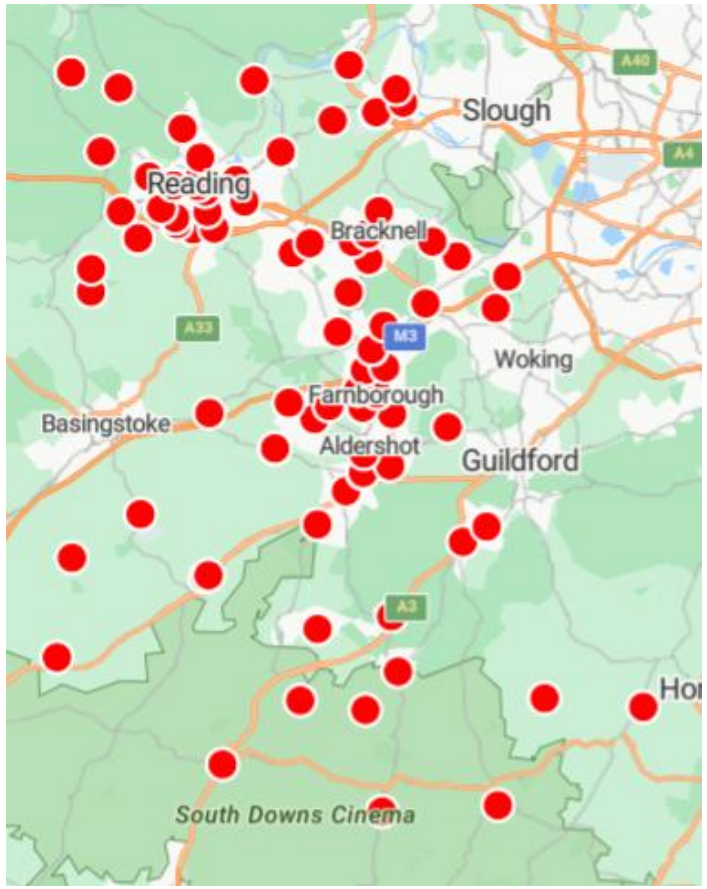


REPD - Renewable Projects subject to planning permission (Nursling)

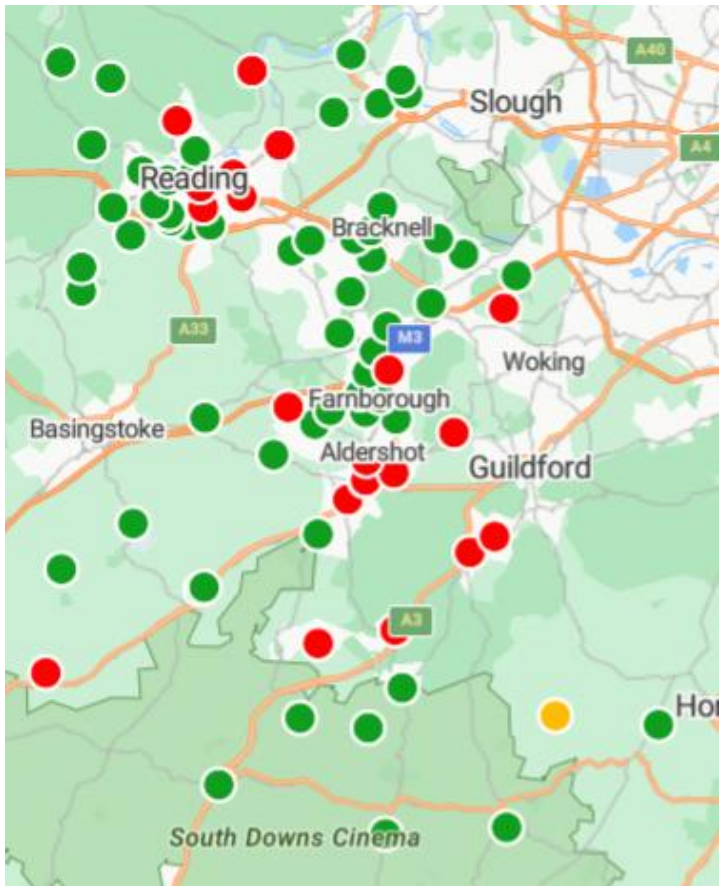
Key Areas of Impact - Nursling

- Capacity across Nursling substations is constrained – affecting all substations for generation and the majority for demand – the most impacted local authorities are:
  - **Southampton:** Although demand constraints are limited to a small number of substations, the wider network is unable to accommodate the significant volume of proposed solar and battery storage developments. Solent Gateway 2 (not shown on the spatial map) is also likely to be affected by these network limitations, subject to future demand requirements.
  - **Eastleigh:** Both rising demand and planned developments are constrained by the existing network. Domestic demand is a key driver, with a high concentration of demand reflected in the dwelling data (refer to the Grid Constraints Report in Appendix A).
- There are a significant number of renewable energy projects on the Planning Database in the Nursling area (mainly solar PV and BESS but also onshore wind), and these are unlikely to get a near-term grid connection agreement.

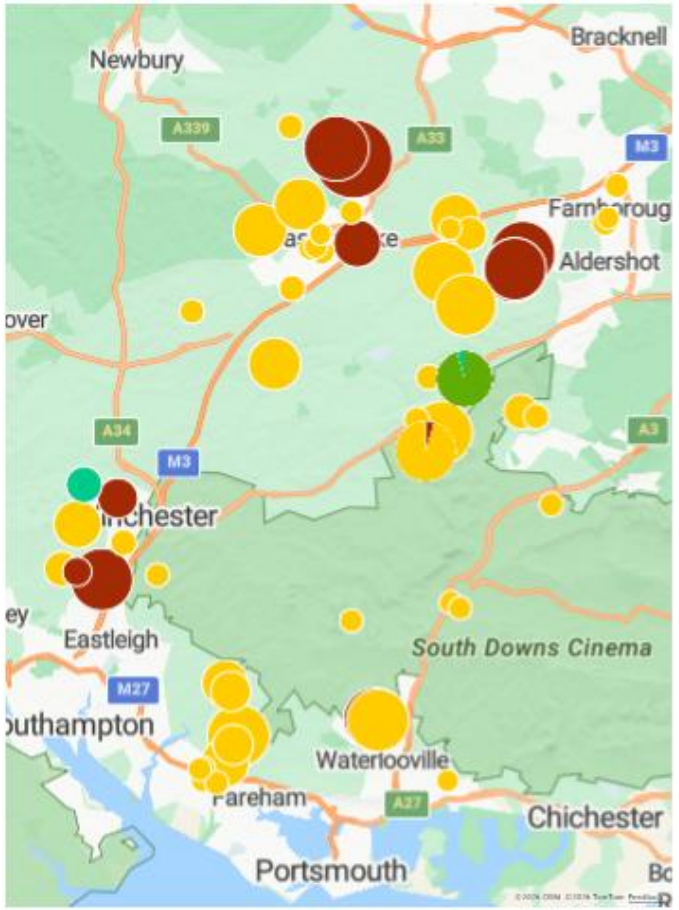
High-level Spatial Analysis - Fleet



Generation Headroom Spatial Map – by substation (Fleet)



Demand Headroom Spatial Map – by substation (Fleet)



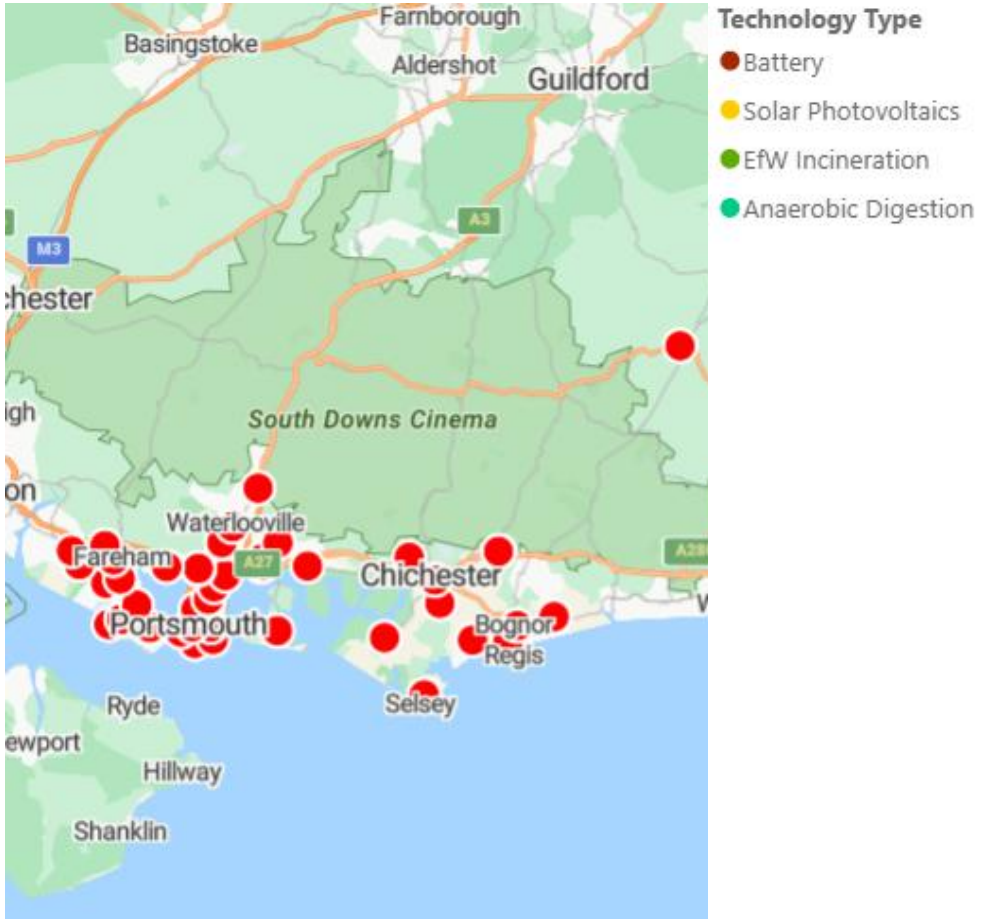
REPD - Renewable Projects subject to planning permission (Fleet)

Key Areas of Impact - Fleet

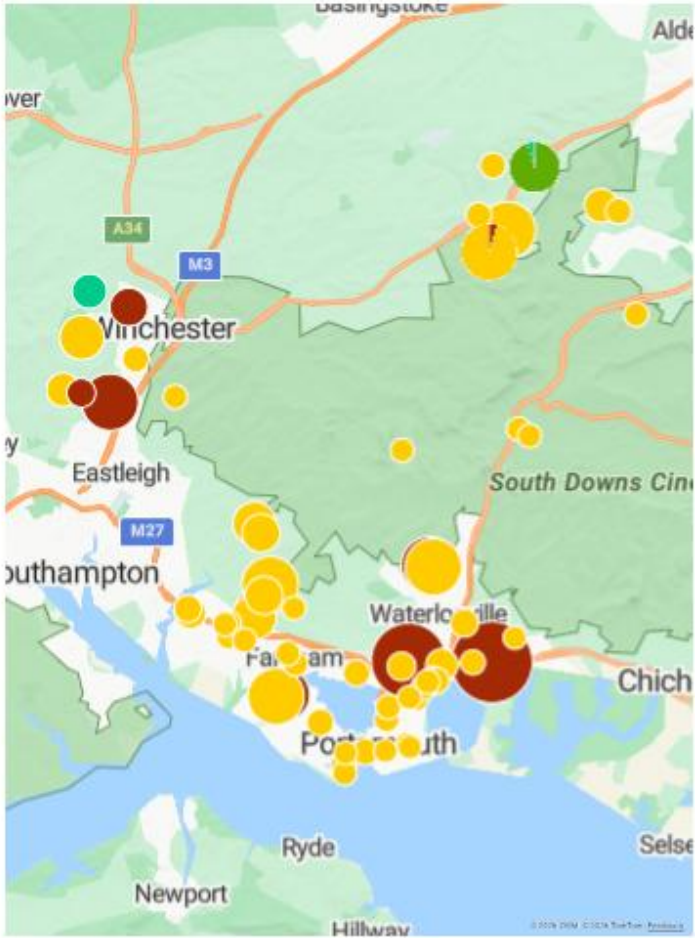
- Generation capacity across Fleet substations is constrained – there is more headroom for demand available. The most impacted local authorities are:
  - **Rushmoor**: The network is highly constrained due to significant existing demand. While much of Aldershot is currently unable to support AI data centre developments without major reinforcement, limited capacity at Tongham substation may allow small AI data centres to connect. Larger schemes would still require substantial network upgrades to be viable.
  - **Winchester**: SSEN is undertaking substation upgrades which may release limited capacity suitable for small-scale data centres. However, this additional headroom is unlikely to be sufficient to accommodate larger AI data centre requirements.
- There are a significant number of renewable energy projects on the Planning Database in the Fleet area (mainly solar PV and BESS), and these are unlikely to get a near-term grid connection agreement.

High-level Spatial Analysis - Lovedean

Generation Headroom Spatial Map – by substation (Lovedean)



Demand Headroom Spatial Map – by substation (Lovedean)



REPD - Renewable Projects subject to planning permission (Lovedean)

Key Areas of Impact - Lovedean

- Whilst both generation and demand capacity across Lovedean substations is constrained, the most impacted local authorities are:
  - **Portsmouth**: A significant number of projects are planned within the area. However, the current electricity network does not have enough capacity to support this level of development. Major grid upgrades will be needed before these projects can move forward.
  - **Fareham**: The existing network cannot support the proposed 50 MW solar farm without significant upgrades. Data on housing growth also shows high levels of domestic electricity use, which adds further pressure to the network and increases the need for reinforcement works.
- There are a significant number of renewable energy projects on the Planning Database in the Lovedean area (mainly solar PV and BESS), and these are unlikely to get a near-term grid connection agreement.

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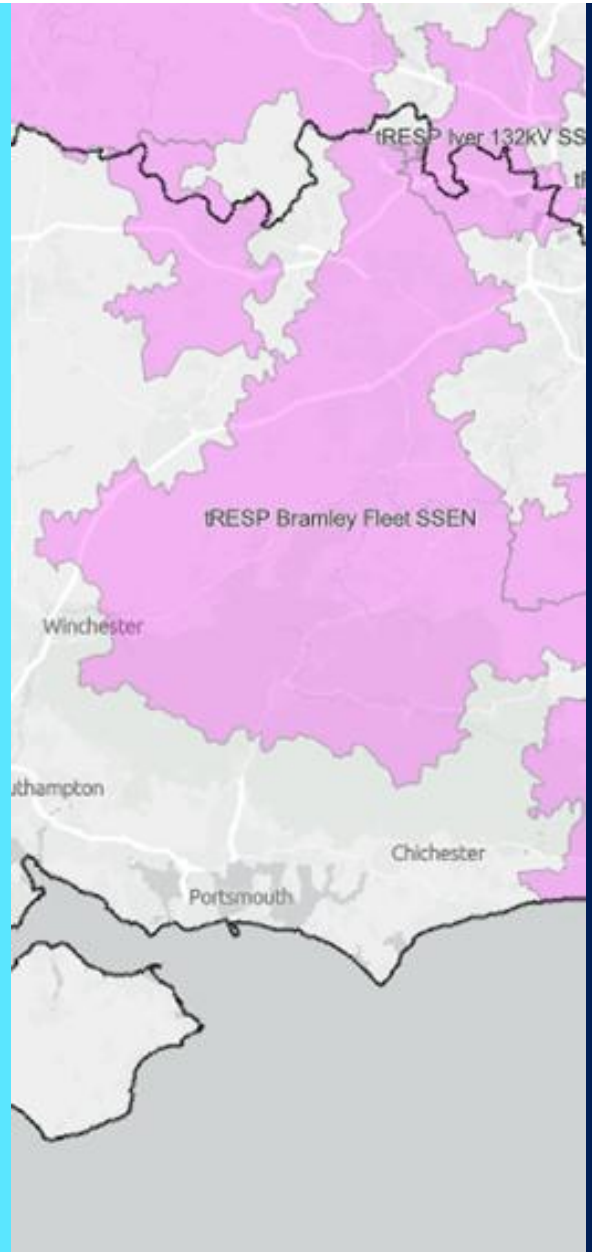
Concluding Remarks



Strategic Report Conclusions

- There is insufficient network capacity to accommodate sufficient distributed generation connections in Hampshire. To achieve 2030 and 2050 HT scenarios significant network reinforcement works are required to enable further renewable generation deployment across Hampshire.
- There are insufficient utility scale renewable energy projects in the RE Planning Database to meet the forecast 2050 generation requirements for Hampshire (see Grid Constraints Report in Appendix A).
- There is limited demand capacity available at Nursling and Fleet GSPs and no demand headroom currently available at Lovedean GSP. To achieve 2030 and 2050 HT scenarios major network upgrades are necessary to support the forecasted growth in electricity demand (EVs, heat pumps, etc).
- Both domestic and utility scale distributed renewable energy is key to achieving 2030 and 2050 NZ targets, as demonstrated by:
  - CfD will continue to incentivise new utility projects,
  - Incentives such as grants, VAT relief and zero-interest loan schemes reduce upfront costs for domestic retrofitting of low carbon technologies, and
  - Planning Authorities and Building Regulations require LCT to be fitted in new build houses.

Strategic Report Conclusions (continued)

- The growth in LCT uptake at domestic level is key to meeting all DFES scenarios and supporting near term targets. Their implementation is typically not subject to utility scale grid application process and protracted timeline.
- Grid Connection Gate 2 offers are currently being issued. As these are received by developers, certainty around utility scale renewable energy projects in Hampshire and their timeline will improve.
- RIIO-ED3 is intended to facilitate decarbonisation over the next price control period, through the use of anticipatory investment. This investment is linked to strategic planning processes such as the Centralised Strategic Network Plan (CSNP) and the Regional Energy Strategic Plans (RESPs) ensuring that local needs, future national priorities, and network plans are aligned.
  - SSEN, local authorities and energy users have an opportunity to engage in the RESP process,
  - The Fleet GSP supply area is considered for proactive investment in the NESO Strategic Energy Need assessment, and
  - Nursling GSP has the highest proposed increase in demand and is therefore assessed as a strategic development need.

Practical Solutions

Based on the findings of this study, listed below are some practical solutions to support Hampshire's near-term energy decarbonisation aspirations whilst recognising the distribution network is constrained:

- Future generation and demand headroom are currently uncertain due to the industry reform on network planning. **Flexible and phased approaches** will therefore be critical in the short to medium term.
- Short term decarbonisation measures could involve:
  - Prioritising the **development of domestic solar PV, BESS and EV charge points.** Whilst prior notification of installation to the DNO is required through the "Connect Direct" portal, to ensure connections are safe and to allow the DNO to correctly model their network connection refusal or delay are unlikely.
  - In highly constrained areas, consideration of **microgrids** and **behind the meter energy resources** could be considered to reduce network impacts and reduce development timescales. This is particularly relevant for large housing sites and data centres that struggle to secure timely grid connections.

Practical Solutions (continued)

- Medium term decarbonisation measures could involve:
  - Opening and maintaining **proactive dialogue with SSEN.**
  - **Prioritising the consideration of energy supply when developing local authority and County development strategies**. DNOs offer “Connection Surgeries” to allow discussion of possible connection arrangements, costs and timescales.
  - **Aligning energy and local transport electrification planning** such that transport electrification projects in areas where network capacity can be made available in the project timescales is prioritised grid and other projects subject to grid constraints are identified early and managed in a coherent way with SSEN.

National Alignment

Maximising the benefits of grid investment in Hampshire requires local strategies to be closely aligned with the national and local electricity network reforms:

- Align local strategies with national and regional energy strategic plans :
  - Ensure Hampshire's Local Energy Strategy, transport electrification plans, and spatial planning policies are aligned with national and regional energy plans, such as the NESO Strategic Spatial Energy Plan and Regional Energy Strategic Plans.
- Identify development opportunities from DNO and TO investment programmes:
  - Track transmission and distribution network investment plans to identify areas where upcoming investment could unlock connection of new renewable generation, transport electrification or large loads. DNO reinforcement investment plans are described in SSEN Strategic Development Plans and the Network Development Report.
- Ensure Hampshire is ready to benefit from policy and funding changes:
  - Maintain up-to-date evidence on future demand, generation potential and constraints to quickly respond to new funding, regulatory or market opportunities as they emerge.

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Appendix A

Grid Constraints Report

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Hampshire Grid Constraints Report

Issue 2 – Final

20/04/2026

Table of contents

Context

- Jacobs has been tasked to perform an Energy Infrastructure Gap Analysis for Hampshire County Council. This is to understand the constraints of the existing electricity network infrastructure in order to facilitate regional economic growth alongside the transition to a low-carbon future.
- These objectives include:
  - Gaining a **holistic understanding** of Hampshire's **current energy baseline and infrastructure**.
  - **Assessing constraints on the network** against **forecasted energy scenarios** and identifying key mitigation interventions for County Council / Local Authority officers.
  - **Forecasting energy demand**, evaluate grid capacity **constraints**, and assessing the region's **renewable energy potential**.
  - **Providing Strategic Recommendations** to support better planning for development, transport, and renewable energy.
  - **Stakeholder Collaboration**: engage where possible with network operators by actively involving in the review process to promote alignment and mutual understanding.
  - **Capacity Building:** Provide Local Authorities and officers with the knowledge and resources necessary to champion and implement impactful energy strategies.

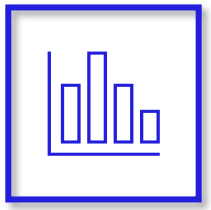
Workflow Process

Inputs

1. Previous infrastructure condition reports
2. Energy demand data
3. Renewable resource maps
4. Future demand: development plans for large energy users
5. Spatial planning documents

Analysis

Review published information to understand the network in the region, its constraints and the planned infrastructure upgrades.



Forecast future energy demand and evaluate how much of it can be met through existing infrastructure.

Discuss the implications of grid constraints, renewable energy potential, and future demand scenarios.

Outputs

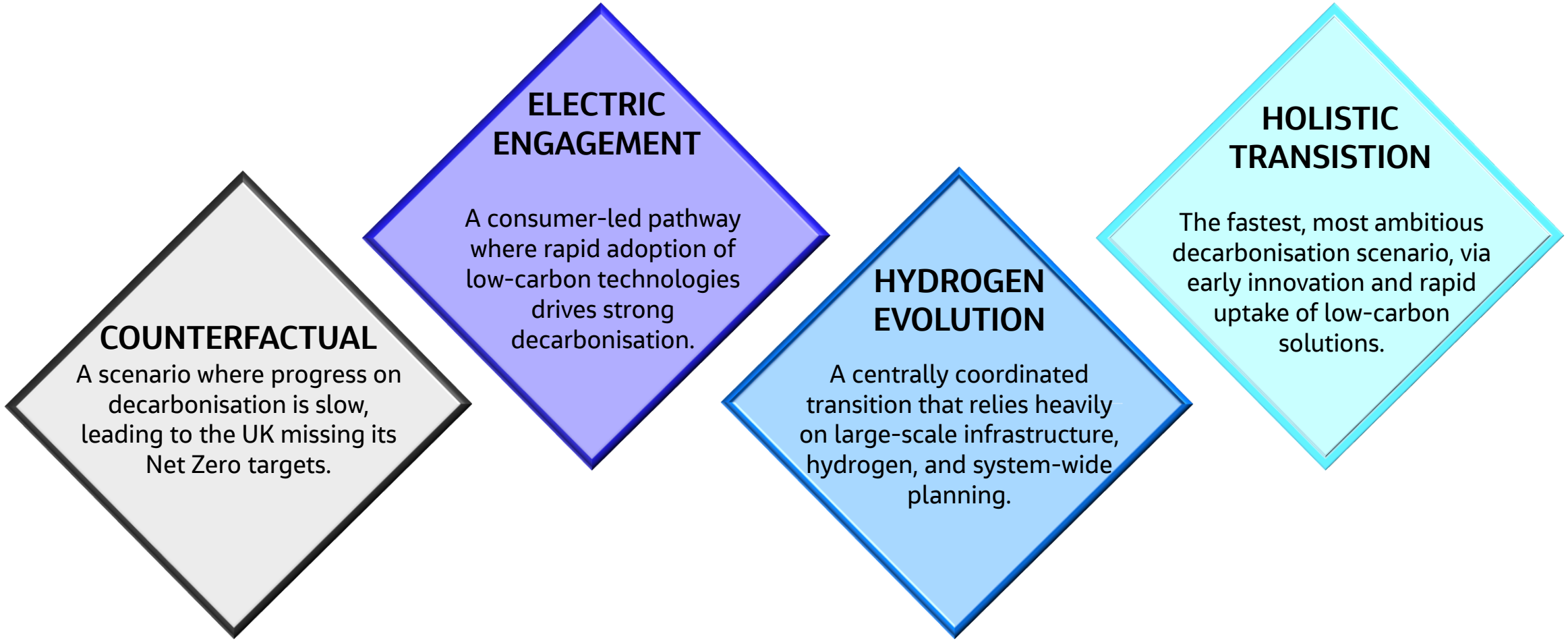
1. Grid constraints report
2. Strategic Report

Acronyms

Acronym	Definition	Acronym	Definition
ADMD	After Diversity Maximum Demand	HV	High Voltage
BESS	Battery Energy Storage System	LTDS	Long Term Development Statement Tables
BSP	Bulk Supply Point	LV	Low Voltage
COD	Commercial Operational Date	NESO	National Energy System Operator
CPA	Common Planning Assumption	PSS	Primary Substation
DER	Distributed Energy Resources	REPD	Renewable Energy Planning Database
DFES	Distribution Future Energy Scenarios	SDP	Strategic Development Plan
ECR	Embedded Capacity Register	SG2	Solent Gateway 2
EHV	Extra High Voltage	SSEN	Scottish & Southern Electricity Networks
EV	Electric Vehicle	tRESP	Transitional Regional Energy Strategic Plan
GSP	Grid Supply Point		
HP	Heat Pump		

DFES explained

The Distribution Future Energy Scenarios (DFES) presents 4 pathways of system requirements to 2050.



Highlighted Hampshire Regions

- After reviewing SSEN's Strategic Development Plan (SDP), the team have selected 3 GSPs for further examination for case studies;

1. **Nursling**
   - 5th highest Grid Supply Point (GSP) demand
   - Requires major works to standardize 11kV network for primary substations connected to Nursling

2. **Fleet**
   - Highest GSP demand
   - Requires transition of supplied areas and expansion of generation connections

3. **Lovedean:**
   - 3rd highest GSP demand
   - Potential increase of Solar PV and BESS, investigate Clean Power targets to ensure grid development is on track

Case studies scenarios selected

NURSLING	FLEET	LOVEDEAN
- Southampton Water Solent Gateway 2 custom site is under Nursling GSP	- Fleet supplies Winchester, Aldershot and Petersfield - These are three areas of interest for AI growth [1]	- Solar development has been highlighted in SDP (Conrad Energy (Developments) - Large 49.9 MW solar panel planning application submitted
Chosen scenario: *Solent Gateway 2*	Chosen scenario: *AI growth zone*	Chosen scenario: *Solar development*

[1] *AI Growth Zone – Supporting Document Hampshire and the Solent*

Presentation methodology

- High level spatial analysis and key impact areas
- A comprehensive analysis of current grid capacity and constraints across Hampshire
- Current Energy Generation Analysis
- Identification of areas with the highest renewable energy potential and the greatest grid limitations.
- Current Energy Demand Analysis
- Assessment of how much of Hampshire’s energy demand can be met under current infrastructure.

Assumptions

Below are a list of assumptions used for this report:

1. All renewable developments found in the GSP supply region are connected to the GSP. No offshore technology was added in the generation analysis.
2. Analysis uses indicative GSP supply area and local authorities on maps.
3. Any DFES years that are not 2026 will be linearly interpolated to a 2026 value.
4. Renewable Energy Planning Database (REPD) scenario modelling is based on current data, which has been extrapolated to reflect 2030 and 2050 projections. Connections for all known DERs currently under construction or with planning permission are assumed to achieve a COD by 2030. Connections for all known DERs currently subject to planning permission are assumed to be agreed to achieve a COD by 2050.
5. The Embedded Capacity Register (ECR) modelling includes a target energisation date for all technologies, which has been used in this study to determine the COD.

Assumptions (continued)

6. Renewable Energy Planning Database:
   a. As the database is based on past and current planning (with no indication of future data), the data was extrapolated to model a 2030 and 2050 scenario. This was done by determining the average duration between planning phases, per technology, using the 2025 data.
   b. These durations were applied to each project, and their development statuses were updated in each scenario
   c. Once a project is operational, it is assumed that it will remain operational indefinitely.
   d. The modelling assumes that no further projects will be introduced post 2025, due to lack to data available.
7. Embedded Capacity Register:
   a. The register contains a forward-looking target energisation date, which provides clarity on how current projects progress over time. Each phase (i.e. planning permission grant to construction, construction to operational) is assumed to have a duration of 5 years.
   b. The register doesn't account for any new projects post 2026, and so the model assumes that there will be no new projects introduced.
   c. Some projects had no available data across categories such as installed capacity or technology type – these were filtered out of the modelling.

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Case study 1: Nursling

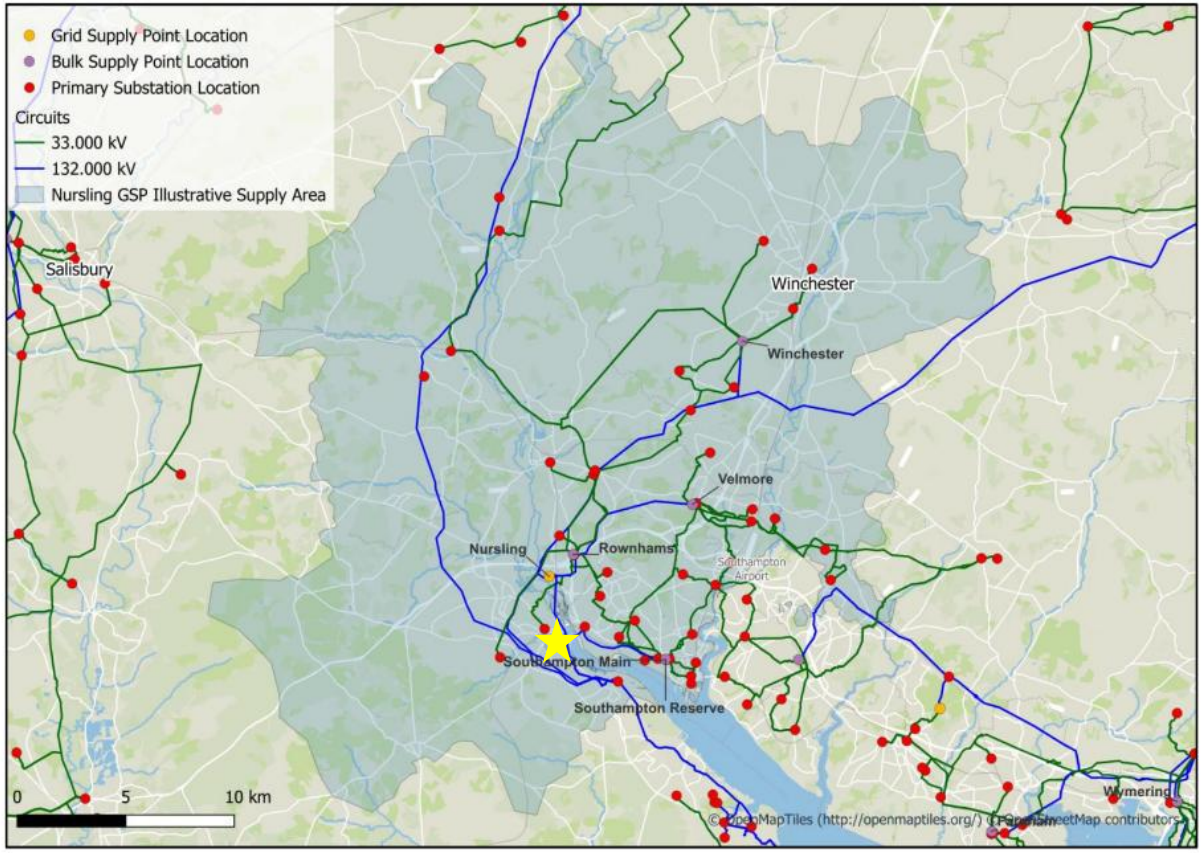
Scenario used: Solent Gateway 2

c/o: Solent Gateway 2 - Solent Gateway 2

Nursling overview

- Located in Nursling and Rownhams, Test Valley District
- Impacting Test Valley, Eastleigh, New Forest, Winchester local authorities
- Some of SDP solutions include:
  - Reinforcing circuits, i.e. overhaul of 6kV to 11kV network for primary substations connected to Nursling
  - Distributed Energy Resources (DERs) expansion and economic growth should be monitored closely

Solent Gateway operates the 83-hectare Marchwood Port on the River Test opposite the Port of Southampton; they plan for an extension named Solent Gateway 2 (SG2)



Nursling GSP supply area

Source: nursling-grid-supply-point---strategic-development-plan-for-consultation.pdf

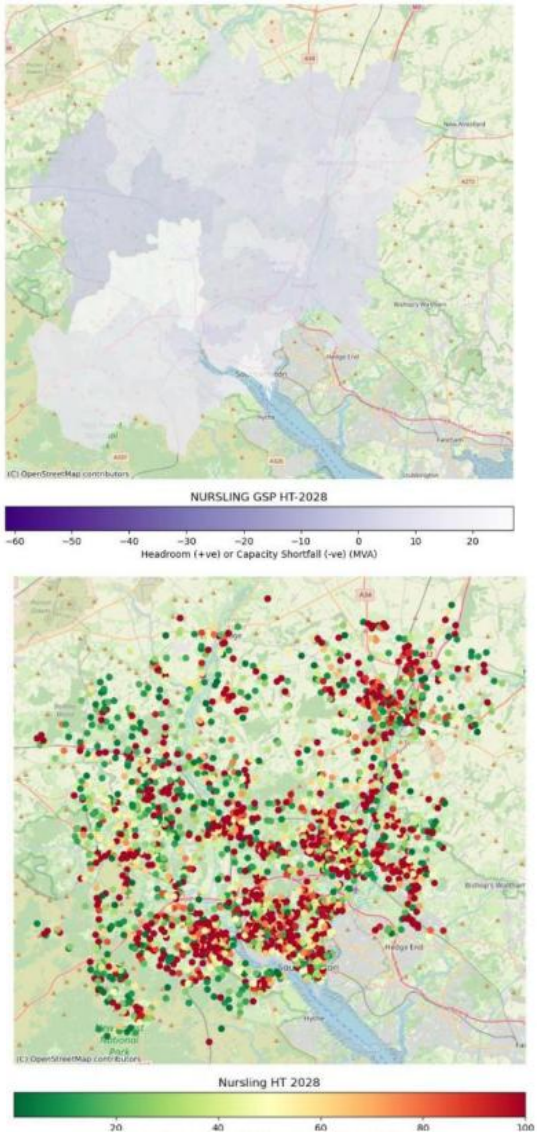
Near Future Constraint Points

Nursling SDP includes a two spatial maps

1. Capacity shortfall spatial map (EHV/**HV**): darker blue indicates that the PSS does not have the required operating capacity.
2. Transformer loading map (HV/**LV**): Green indicates that the transformer is underloaded whilst red indicates that the transformer is overloaded. Standard transformer loading would be between 50-80%.

From this comparison;

Current EHV/HV infrastructure has capacity, but secondary substations are heavily overloaded.



Nursling GSP spatial plan 2028

Source: nursling-grid-supply-point---strategic-development-plan-for-consultation.pdf

Current Constraint Points

- N-1 analysis was done by SSEN (loss of one major unit), below is a list of near-term needs by 2035 regardless of DFES scenario

Transformers overloaded

- Dunbridge PSS
- Eastleigh North PSS
- Maybush PSS
- Harestock PSS
- Silkstead PSS

Circuits overloaded

- Winchester BSP to Dunbridge PSS
- Velmore BSP to Eastleigh PSS
- Winchester BSP to Harestock PSS

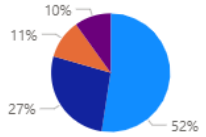
Generation Analysis: Renewable Energy Planning Database – Nursling

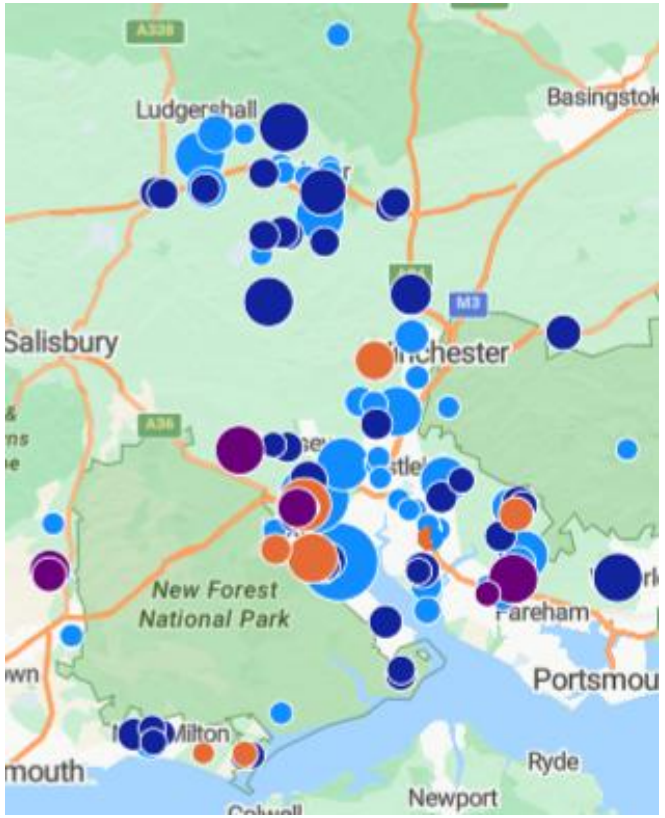
- Using the Renewable Energy Planning Database, operational renewable plants were mapped in the Nursling supply area

Capacity (MW) by Development Status

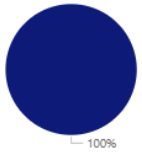
Development Status
- Planning Permission Granted
- Operational
- Planning Application Submitted
- Under Construction

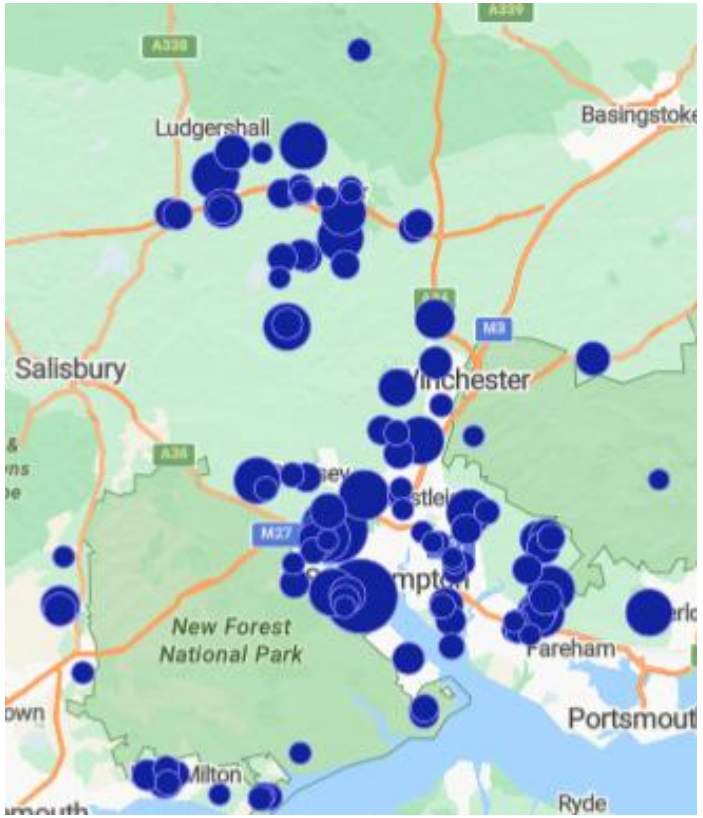
2025



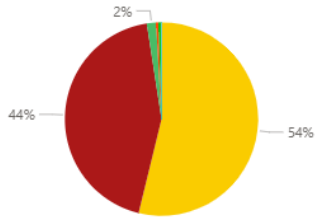


2030/2050

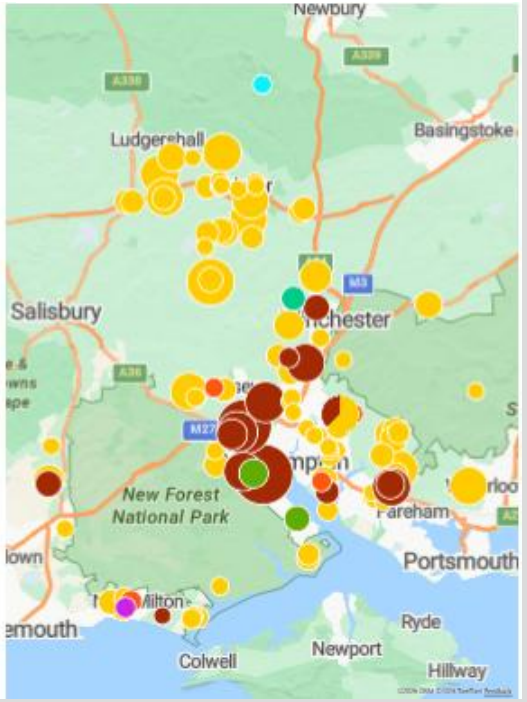




Capacity (MW) by Technology



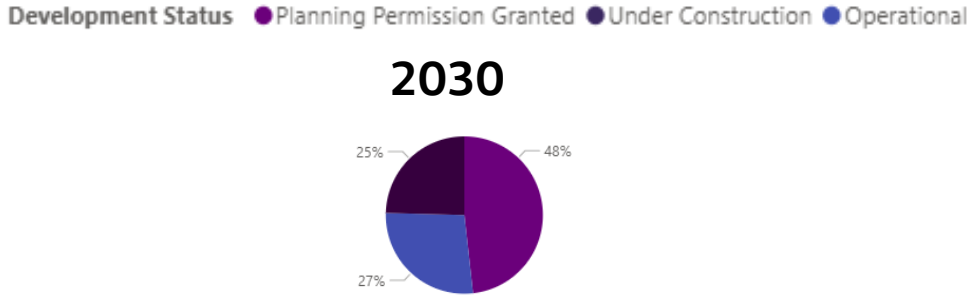
Technology Type
- Solar Photovoltaics
- Battery
- EfW Incineration
- Landfill Gas
- Anaerobic Digestion
- Biomass (dedicated)
- Wind Onshore

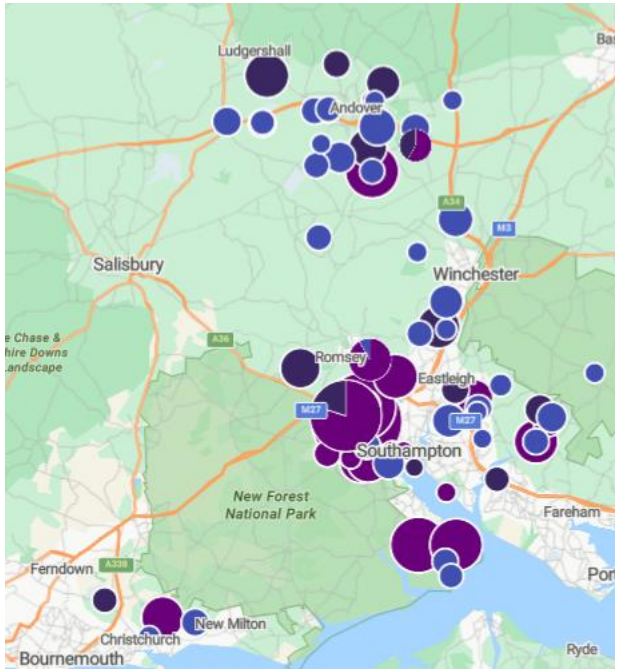


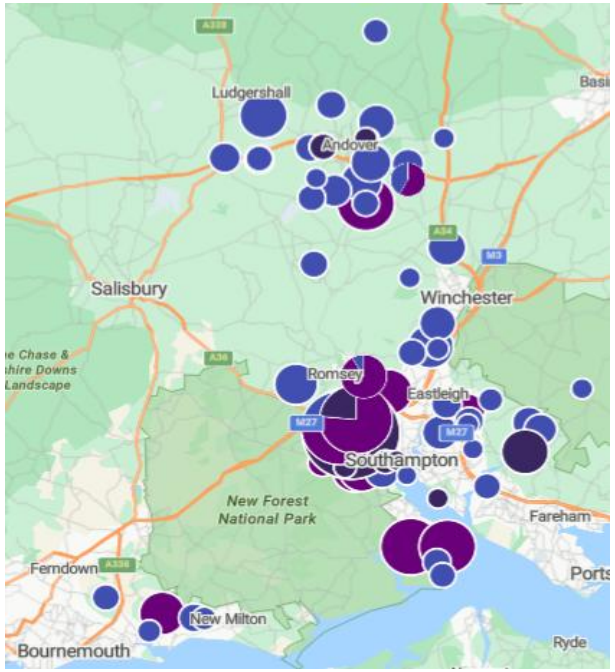
Generation Analysis: Embedded Capacity Register – Nursling

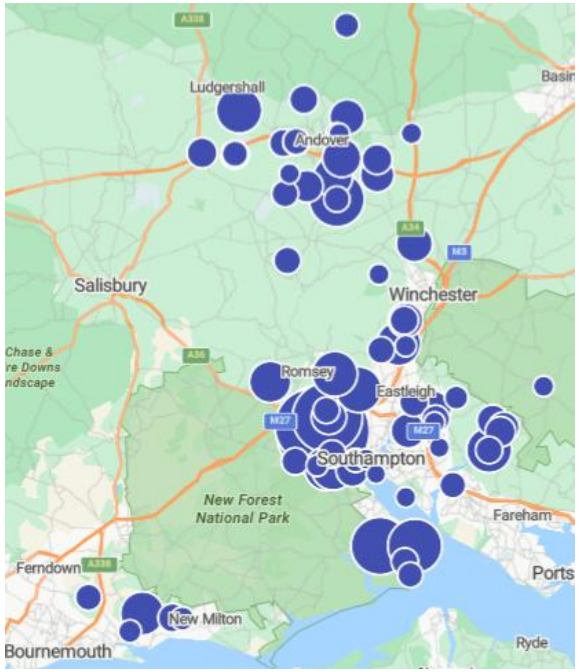
- Using the Embedded Capacity Register, both renewable and non-renewable plants were mapped in the Nursling supply area

Capacity (MW) by Development Status

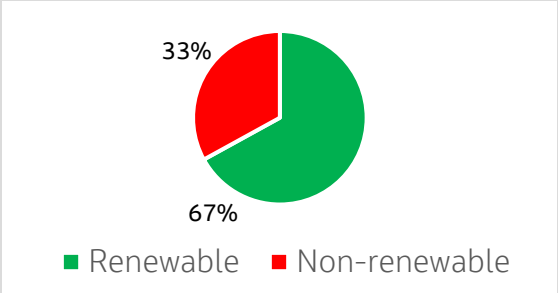


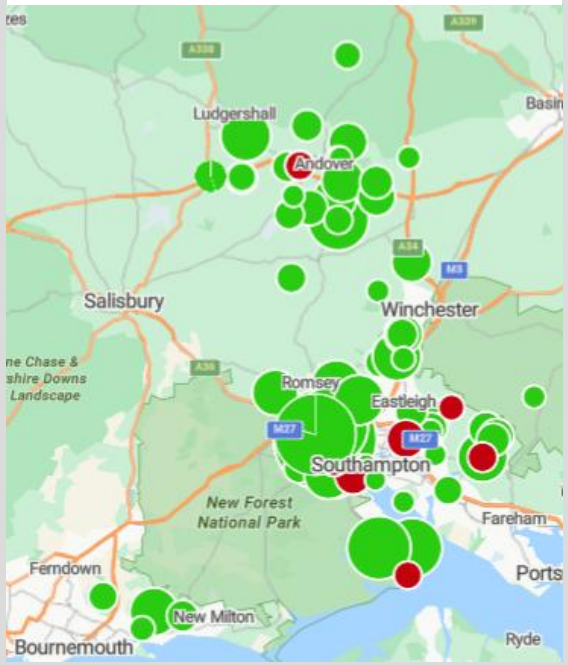






Capacity (MW) by Technology



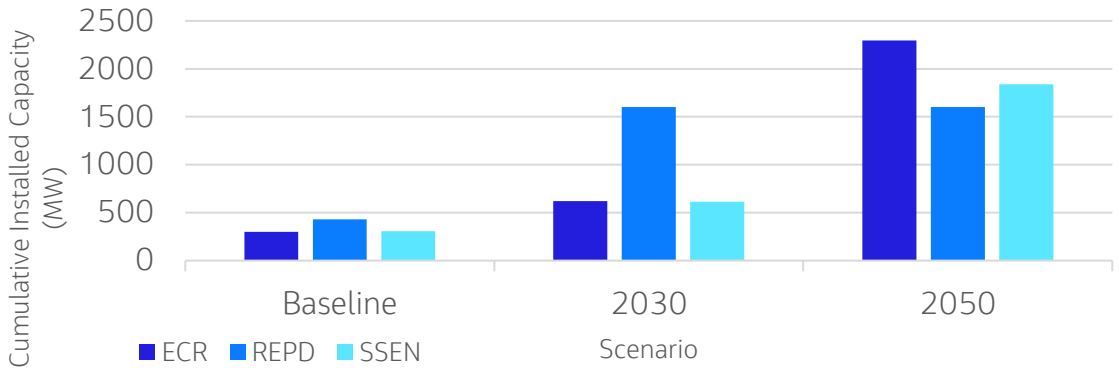


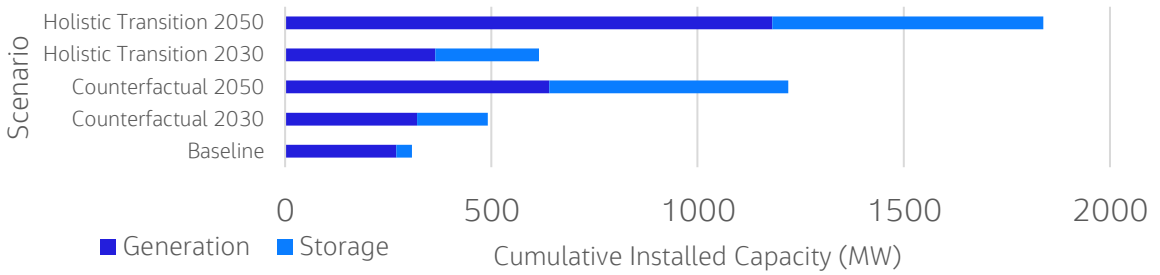
Generation Analysis: SSEN DFES Projections – Nursling

CASE STUDY 1

- The Distributed Energy Resource table outlines SSEN's projected generation capacity across 2030 and 2050, listed under the counterfactual (BAU) and holistic transition (ambitious) scenarios
- The data is subject to uncertainty because the grid connections reform mandate may change how DERs are connected
- Addressing discrepancies between planning data and SSEN:
  - The accuracy of the planning data is subject to modelling assumptions, which may differ to DFES projections
  - The SSEN Data is based on Grid Supply Points, which may only include a portion of a Local Authority
  - SSEN Data is subject to Net Zero policy mandates
- The ECR is greater than both planning and SSEN's holistic transition pathway, suggesting not all generation will be energised

Distributed Energy Resource (SSEN DFES 2025)					
Units - MW	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Generation					
Biomass CHP	0.4	0.5	0.8	0.5	0.9
Energy from Waste	16	16	0	16	0
Hydropower	0.0	0.0	0.0	0.0	0.0
Solar PV	195	239	505	301	945
Diesel	6.6	6.6	0	2.1	0
Gas	49	56	49	42	48
Onshore Wind	0.1	0.1	0.1	0.1	0.1
Renewable Engines	2.2	2.2	2.2	2.4	2.4
Hydrogen Electrolysis	0	0	83	0	185
Other Generation	0	0	0	0	0
TOTAL	269.3	320.4	640.1	364.1	1180.5
Storage					
Domestic Storage	5.4	11	32	20	85
Generation co-Location	0	21	224	21	239
High energy user	3.7	6.1	11	7.3	20
Standalone	29	133	313	203	313
TOTAL	38.1	171.1	580	251.3	657

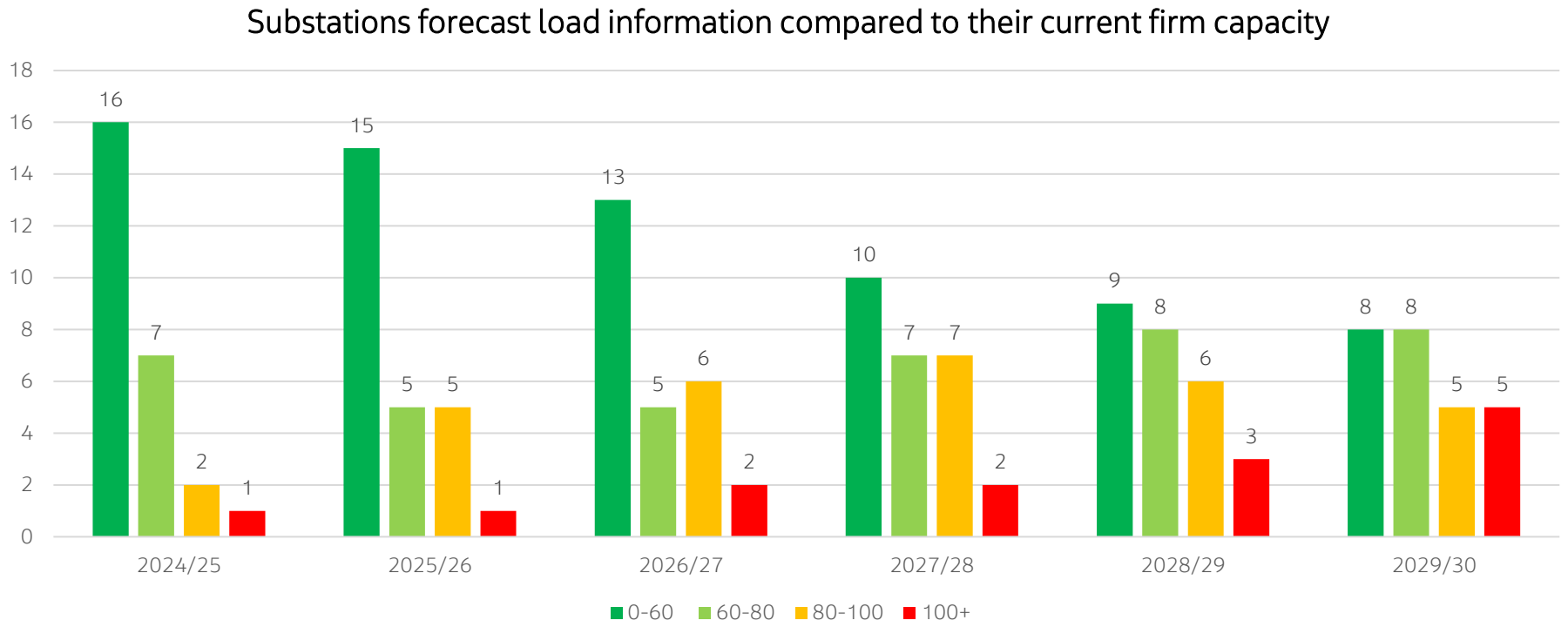




Current Energy Demand Analysis

Nursling GSP has a peak recorded demand of 345 MW and has 26 substations

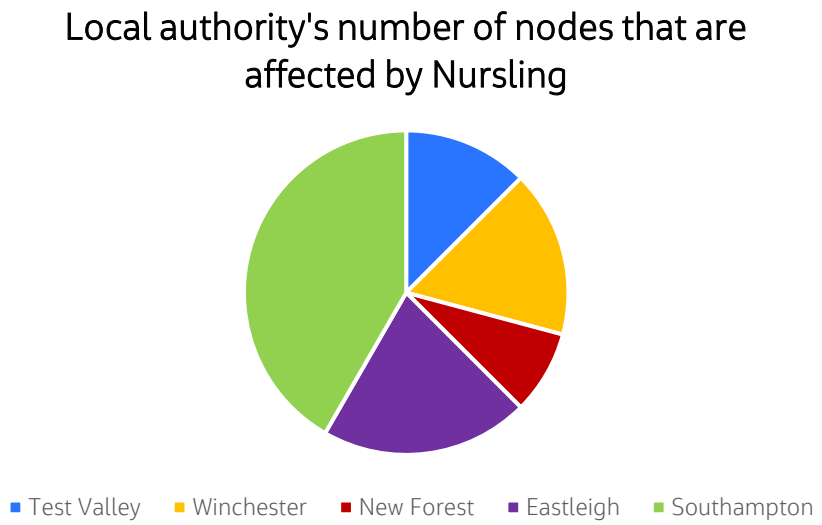
Summation of all substation's 2024 capacity is 651 MW

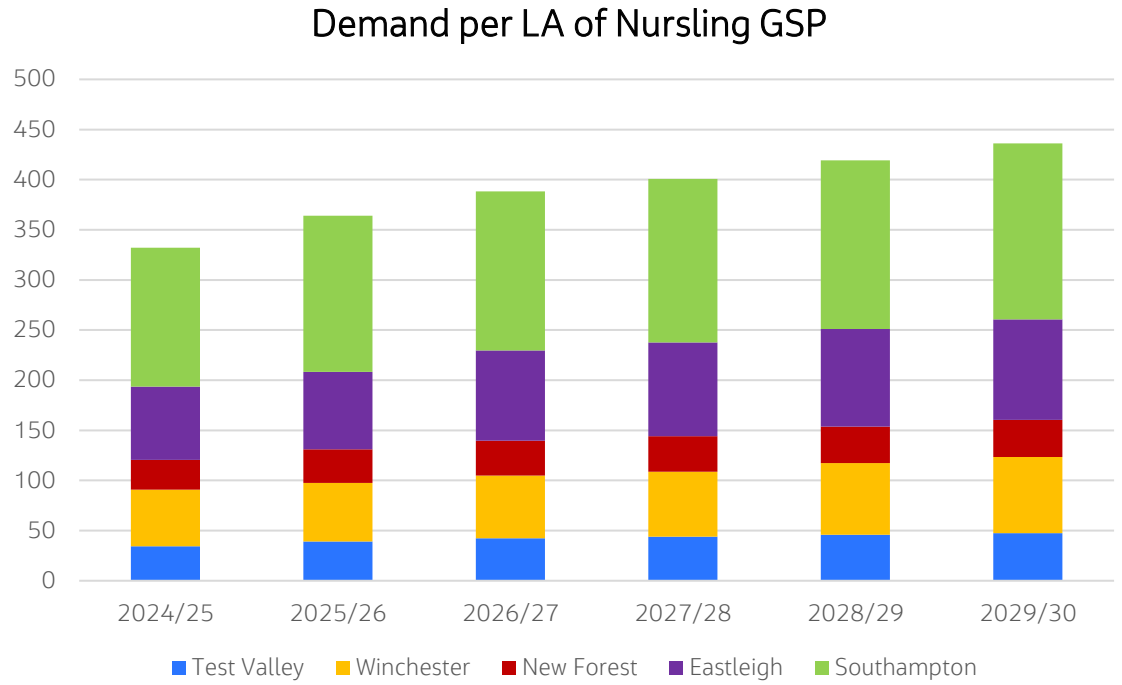


Southern Electric Power Distribution Long Term Development Statement Tables – November 2025

Current Energy Demand Analysis

- Majority of Nursling's connected substations are in Southampton
- Overall demand for Nursling GSP will increase by 34% by 2030 (345 MW → 461 MW)

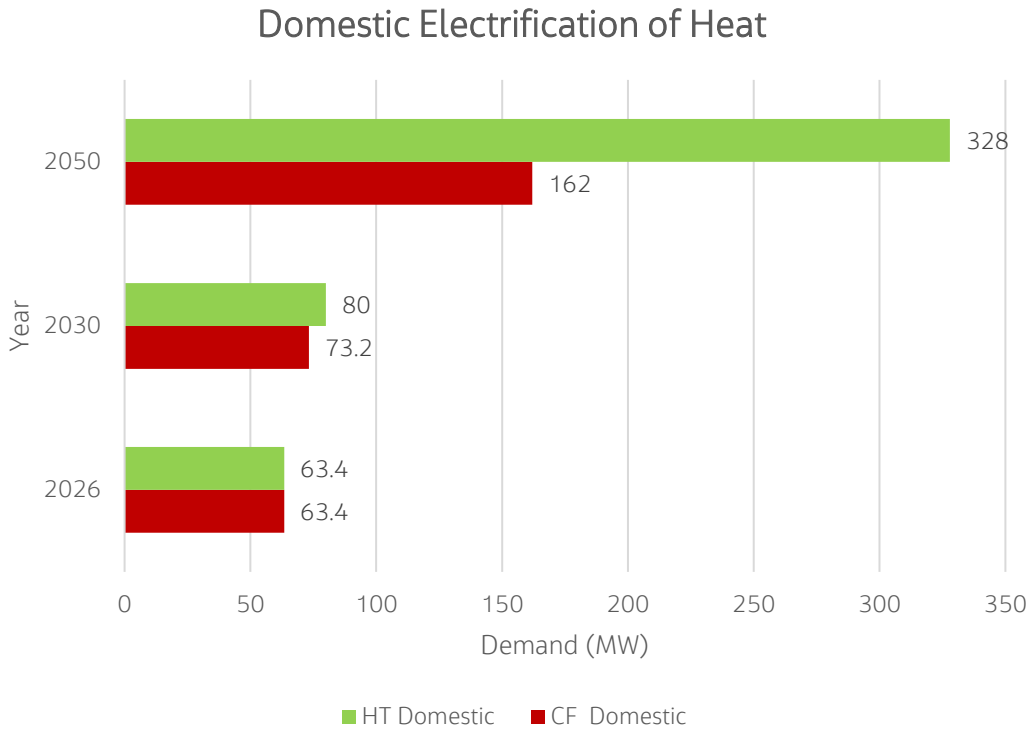


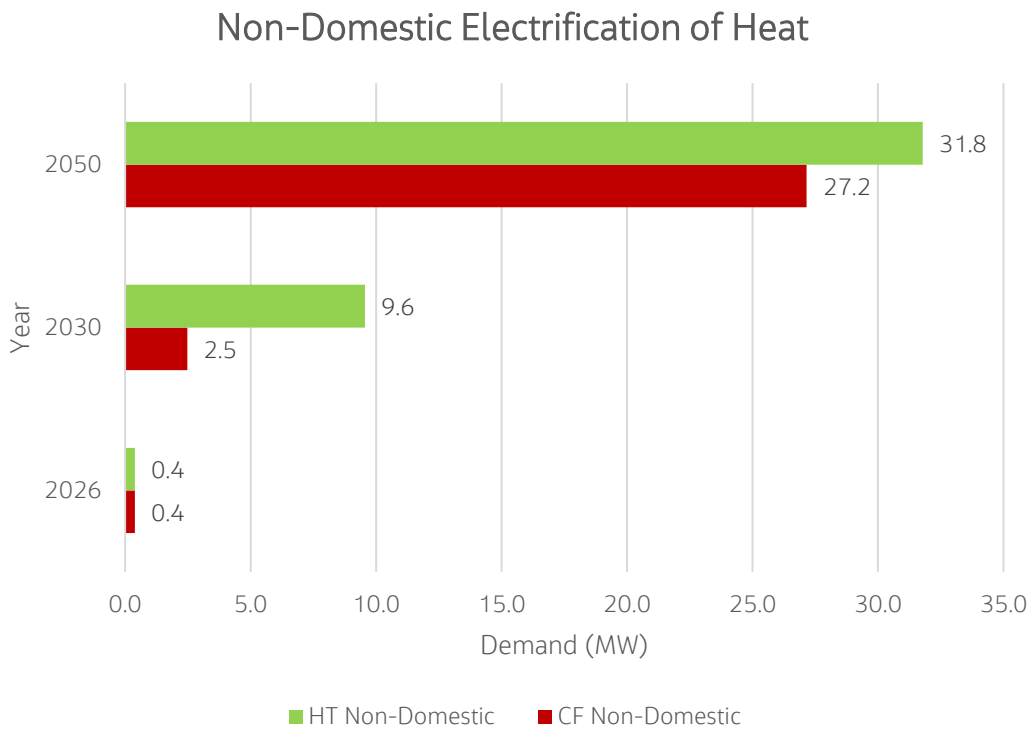


Southern Electric Power Distribution Long Term Development Statement Tables – November 2025

Heat Pumps Peak Demand Analysis

- We have converted the Heat Pump SDP data to the impact on peak demand (MW)
  - See appendix for SDP table and assumptions



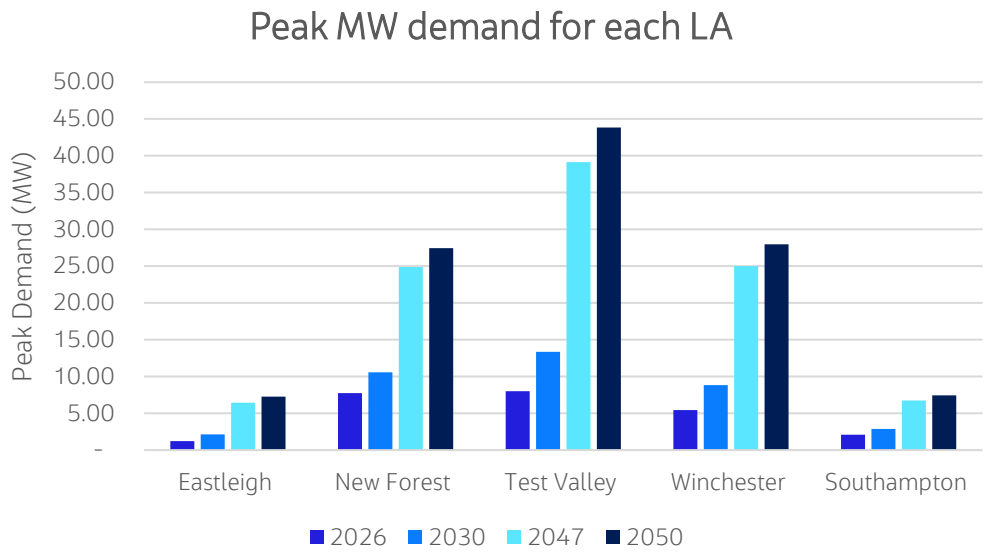


Heat Pumps Demand Findings

1. The data shows forecasted electric heating technology
2. Domestic heat pump forecasted demand is significantly greater than non-domestic.
   a. Non-domestic heat pumps had higher efficiencies assumed due to the figures being presented in m^2
3. To achieve Holistic Transition scenario:
   a. *There must be an increased uptake of domestic heat pumps by 2050*
   b. *There must be an increased uptake of non-domestic heat pumps by 2030*
4. Assuming that all new dwellings contain Heat Pumps would only account for **16%** of the forecasted domestic HPs in 2030
5. All areas will be impacted but HP trend will follow spatial demand trend (shown in spatial analysis slides)

EV Peak Demand Analysis

- EV data was calculated using methodology and the data is displayed below. The percentage of EVs compared to total cars on road was by using Zapmap's current statistics and UK goals for EVs [1] [2]
  - See appendix for SDP table and assumptions



Sources:

[1] UK ev market share 2026: latest electric car registration stats | zapmap

[2] Pathway for zero emission vehicle transition by 2035 becomes law - GOV.UK

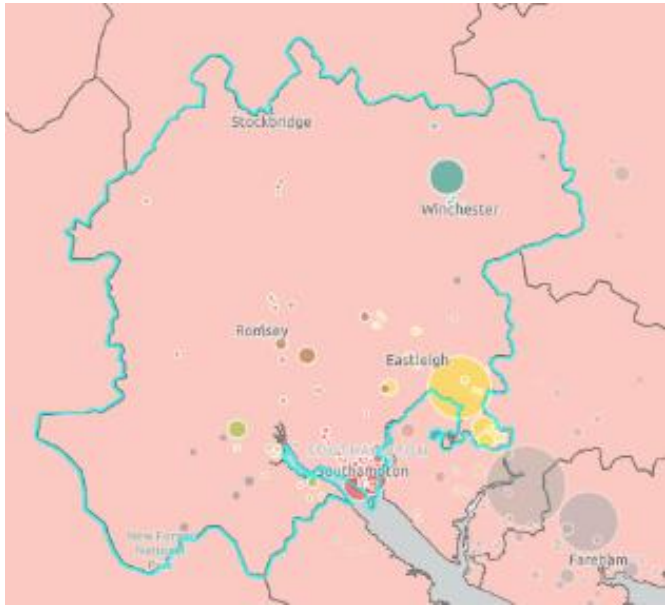
EV Demand Findings

1. The data shows forecast EV charging peak demand, which is independent of the SPD forecast. These findings focus on the number of potential EVs in the supply region. We have assumed that all households with an EV would all have a7kW EV charger and that the peak demand would be equal to 70% being in use at the same time.
2. If all local authorities had their peak demands at the same time, the sum would be 37.8 MW in 2030 and 114.0 MW in 2050. The SDP report indicates that the Nursling GSP supply network can accommodate the required number of public EV charge points to meet demand if the recommendations are implemented.
3. **Test Valley** is the area most requiring network reinforcement in the Nursling GSP supply area to meet the EV charging demands.
4. SSEN has the available capacity for this area currently but should reinforce for 2050 demands.

Spatial Analysis for Nursling

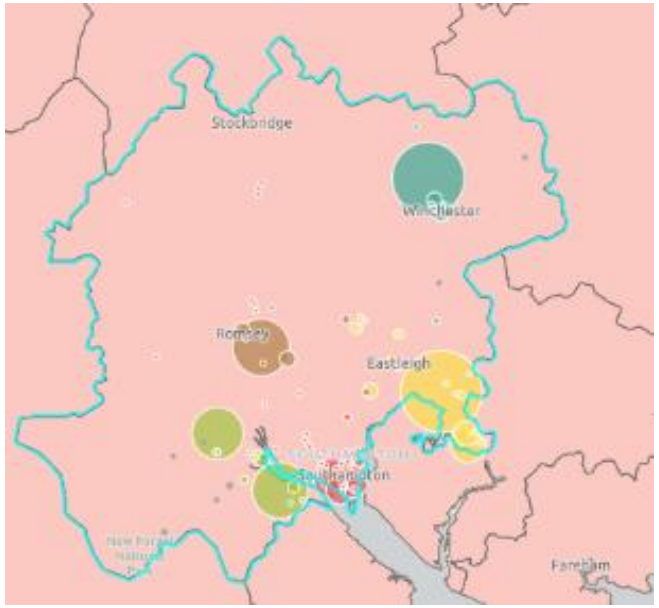
- Residential demand was calculated using provided dwelling information from the Hampshire Spatial Analysis team.

2030 dwelling data



24 MW After Diversity Maximum Demand

2050 dwelling data



46 MW After Diversity Maximum Demand

Local Authority	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Eastleigh	7.7	11.2
New Forest	1.1	8.3
South Downs National Park	0.1	0.1
Southampton	9.5	14.2
Test Valley	2.8	5.9
Winchester	2.5	6.3
TOTAL	23.7	46.1

- See appendix for table and assumptions

Spatial Analysis Findings

1. The data shows forecasted residential demand in 2030 and 2050 – the growth is shown by the size of the location.
2. This dwelling calculation does not include heat pumps but includes domestic EVs and minimal heating as it is required for new builds
3. Largest areas of growth are **Winchester**, **Eastleigh** and **Southampton**.
4. Winchester BSP has two circuits overloaded and Eastleigh North PSS has two transformers overloaded by 2035. Reinforcements to address these constraints are planned.

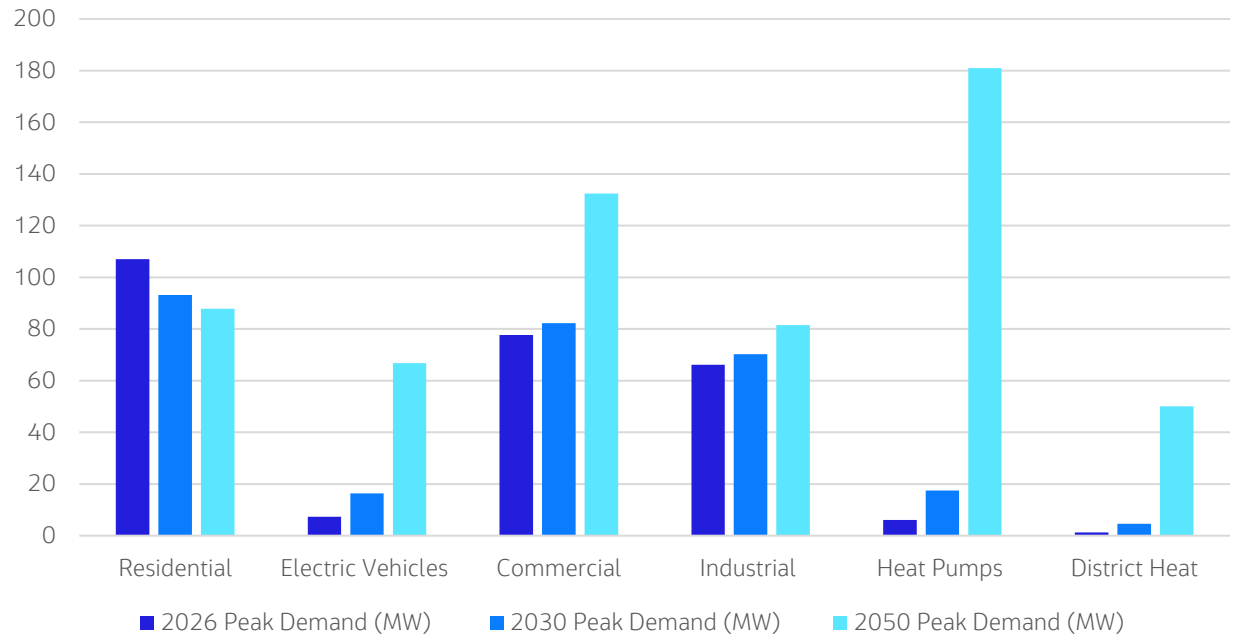
Conclusion to Demand Analysis

- There is some variance between the Jacobs, LTDS and DFES forecast demand estimates.
- Jacobs forecasts are more closely aligned to the DFES forecasts, with the LTDS figures being substantially higher.
- The Jacobs estimate does not consider all demand types that are included in the DFES forecasts. Current dwellings are not added to our value so we would assume the value to be a 100-200 MW higher than calculated.

DFES Demands

Demand type - HT	2026 Peak Demand (MW)	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Residential	107.1	93.2	87.9
Electric Vehicles	7.4	16.3	66.8
Commercial	77.7	82.2	132.4
Industrial	66.1	70.2	81.5
Heat Pumps	6.1	17.5	180.9
District Heat	1.2	4.6	50.0
Total	**265.6**	**284**	**599.5**
LTDS data	**385.4**	**470.8**	
Initial estimate		**164.2**	**549.9**

Nursling DFES Demand types



SSEN Information – transitional Regional Energy Strategic Plan (tRESP)

- With a consistent baselining approach across GB, NESOs tRESP Pathways use inputs from the DNOs, the DFES and other datasets, and an alignment review framework, to ensure the final tRESP Pathways balance consistency and reflect differences between nations and regions
- Uses common planning assumptions (CPAs) across all GB regions, avoiding DNO-to-DNO inconsistency and creates one value forecast
- This is recent (Jan 2026), however can be used once technology has matured
- Demand mainly consists of HP and EV tech

Table 1: Increase to peak demand and energy consumption in 2035 and 2050 of future demand components (heat pumps, electrified transport, electrolysers, industry) as a percentage of underlying residential and commercial demand (Northern Powergrid 2023 DFES – Best View scenario). Source: Energy Networks Association[4].

	Contributions to peak demand MW		Contributions to energy consumption MWh	
Category	Additional at 2035 - % of underlying (peak demand MW)	Additional at 2050 - % of underlying (peak demand MW)	Additional at 2035 - % of underlying (energy consumption MWh)	Additional at 2050 - % of underlying (energy consumption MWh)
Heat pumps - domestic	6.6%	53.6%	5.1%	41.5%
Heat pumps - I & C	2.2%	17.9%	1.5%	11.7%
EV - cars & vans	16.3%	21.2%	22.2%	28.8%
Electric HGVs	4.2%	6.8%	10.1%	16.5%
Electric Buses	0.2%	0.4%	1.4%	2.1%
Electrolysers	8.5%	21.4%	14.2%	36.0%
Large industry Fuel Switching	4.7%	10.0%	7.9%	16.9%

tRESP unit	2026 Peak Demand (MW)	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Demand (GWh)	9.8	26.4	71.3
LCT connections (GWh)	92.2	95.8	116.4

Case Study Impact

Currently, SG2 does not have a defined MW requirement. Below are potential connections points and the impact to their capacity.

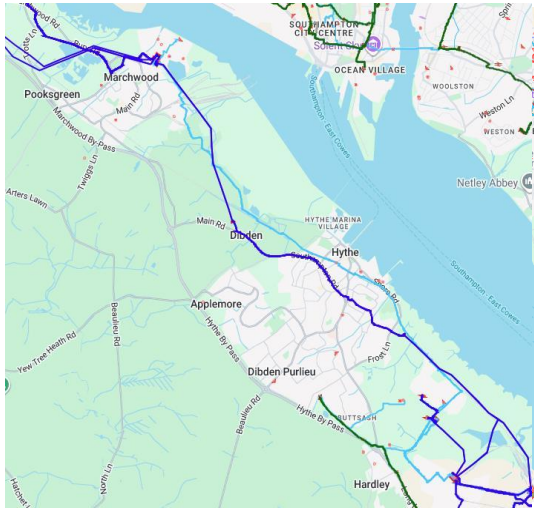
Less than 10 MW demand – Connection to Marchwood 132/11 kV BSP

This solution would connect SG2 to Marchwood at 11 kV. The distribution status is currently unconstrained (capacity at 20%) and transformers in the area are not overloaded. 2024 Peak demand is 3.1 MW and capacity is 15.53 MW.

More than 10 MW demand – Direct connection to Lynes Common, Fawley North or Langley BSP)

Jacobs estimate that 50 MW would be able to directly connect to the 132kV circuit that passes the site. Fawley North and Lynes Common are 132/11 kV substations which do not have downstream constraints. Further discussions with SSEN would be required as these are not reviewed in the relevant SDP as it excludes Fawley Petrochemical. Langley is further away but has a capacity of 15 MW. For 2024, the capacity was at 75% so reinforcements would be required.

Indicative model of Solent Gateway 2
Source: Solent Gateway 2 - Solent Gateway 2



Hythe area and current circuit

Source of loads: Network Maps

Jacobs Challenging today. Reinventing tomorrow.

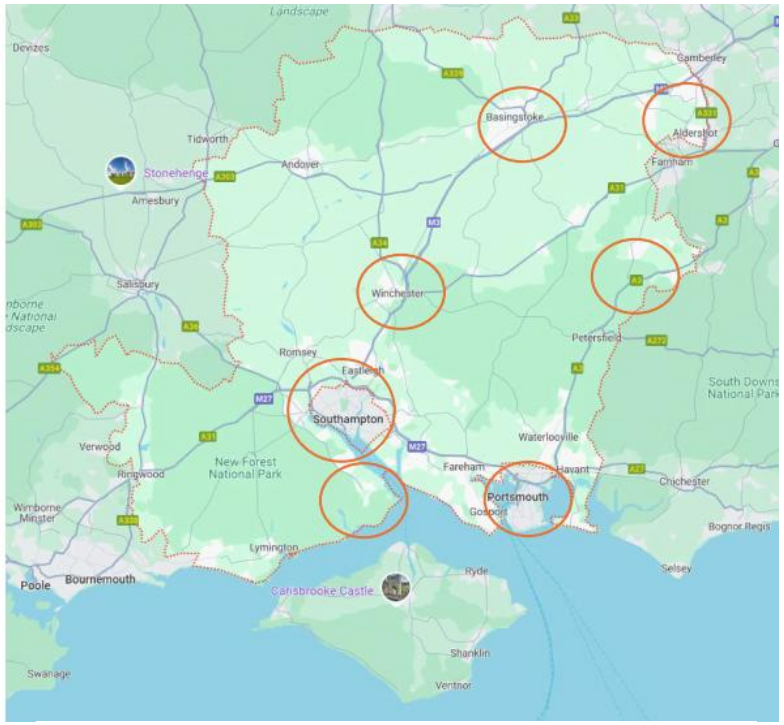
Case study 2: Fleet

Scenario used: AI Growth Zone

Fleet overview

- Located in Crondall, Hart District
- Impacting Rushmoor, Hart, East Hamps, Basingstoke and Deane, Winchester local authorities
  - Fleet will be decreasing the area supplied by 2030 with Bramley GSP expanding
  - Increase of BESS in this region therefore engagement with NGET is required
  - Areas of concern for 2030 are Bordon, Frimley, Bracknell (mainly due to primary transformers overloading)

Winchester, Aldershot and Petersfield are marked as AI Growth Zones



AI areas of interest in Hampshire
Source: *AI Growth Zone: Supporting Information*

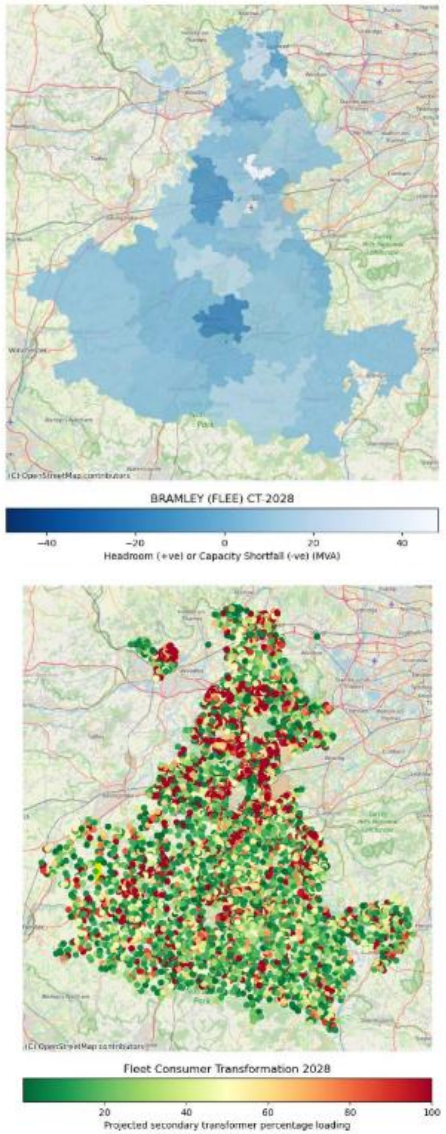
Near Future Constraint Points

Fleet SDP includes a two spatial maps

1. Capacity shortfall spatial map: darker blue indicates that the PSS does not have the required operating capacity
2. Transformer loading map: Green indicates that the transformer is underloaded whilst red indicates that the transformer is overloaded. Standard transformer loading would be between 50-80%.

From this comparison:

There is an overlap of where HV and LV systems are overloaded.



Fleet GSP spatial plan 2028

Source: fleet-gsp-strategic-development-plan---draft-for-consultation

Current Constraint Points

- N-1 analysis was done by SSEN (loss of one major unit), below is a list of near-term needs by 2035 regardless of DFES scenario

Transformers overloaded

- Frimley PSS
- Queensmead PSS
- Peacock Farm PSS

Circuits overloaded

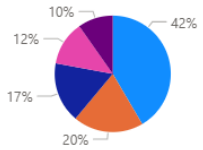
- Camberley Reserve to multiple PSS
- Bracknell BSP to Warfield-Maidenhead tee
- Bracknell BSP to Warfield – Knowl Hill tee

Generation Analysis: Renewable Energy Planning Database – Fleet

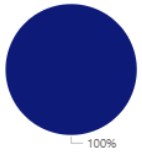
- Using the Renewable Energy Planning Database, operational renewable plants were mapped in the Fleet supply area

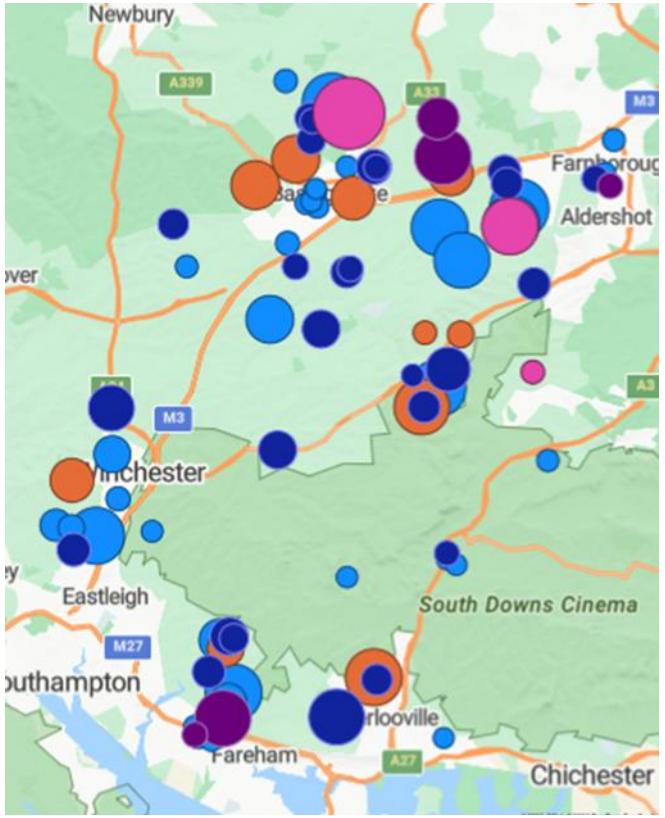
Capacity (MW) by Development Status

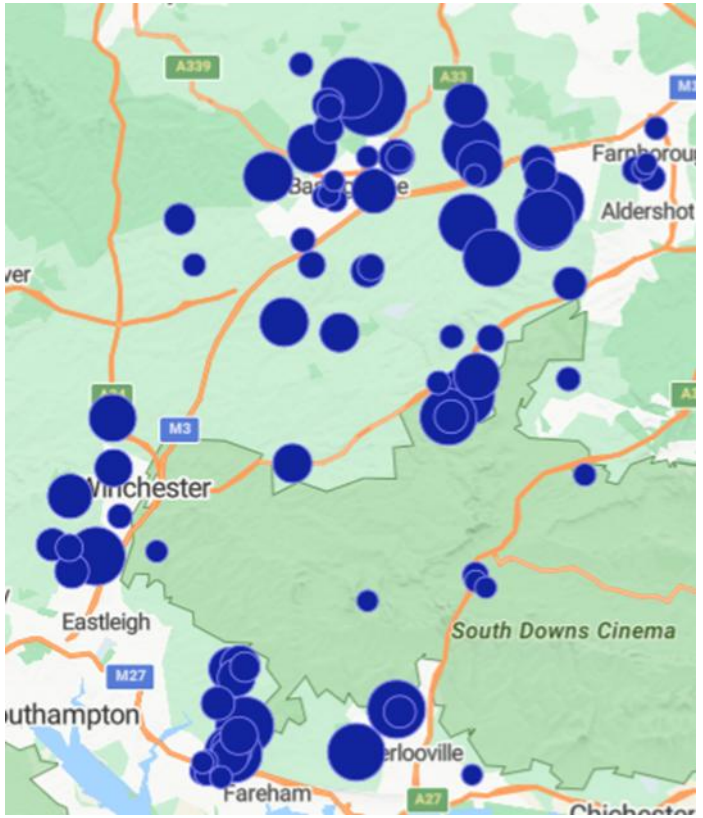
2025



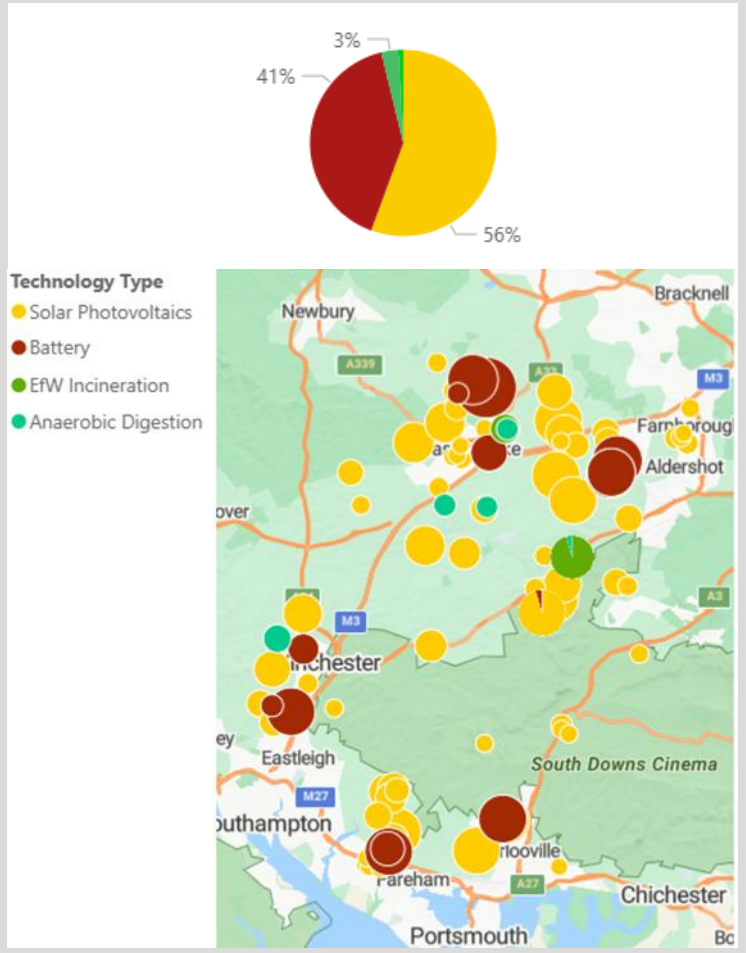
2030/2050







Capacity (MW) by Technology



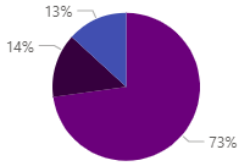
Generation Analysis: Embedded Capacity Register – Fleet

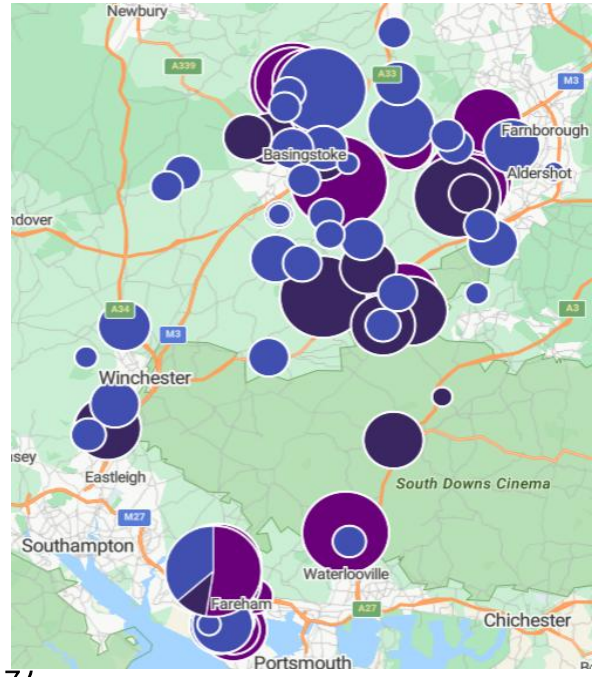
- Using the Embedded Capacity Register, both renewable and non-renewable plants were mapped in the Fleet supply area

Capacity (MW) by Development Status

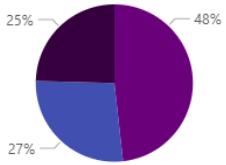
Development Status ● Planning Permission Granted ● Under Construction ● Operational

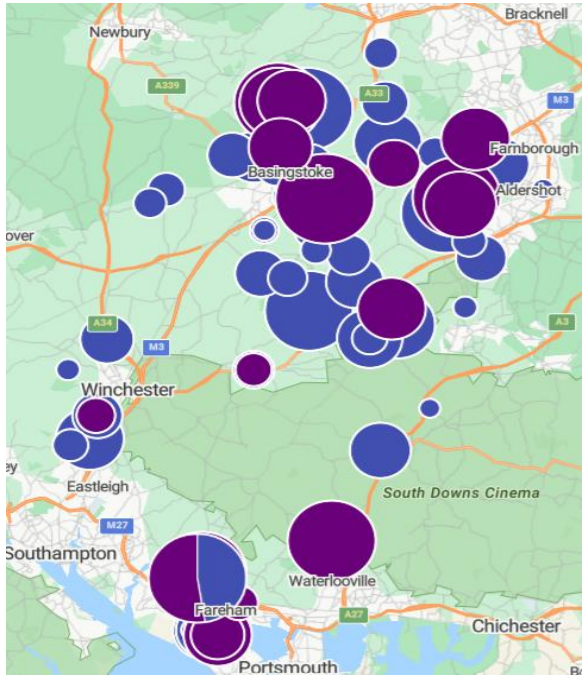
2026



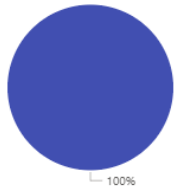


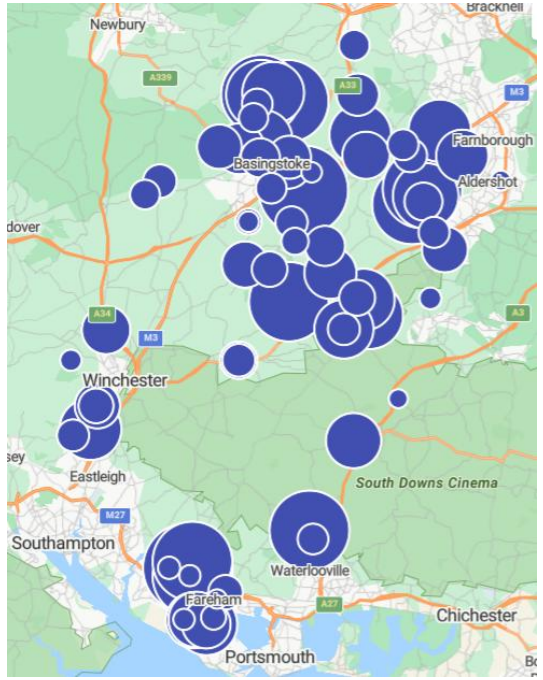
2030



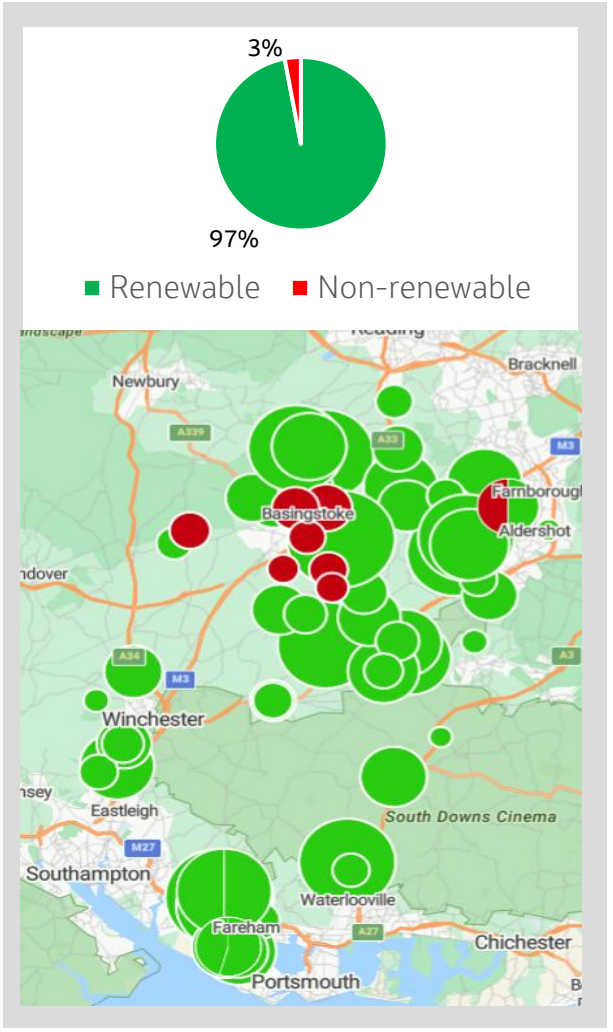


2050





Capacity (MW) by Technology

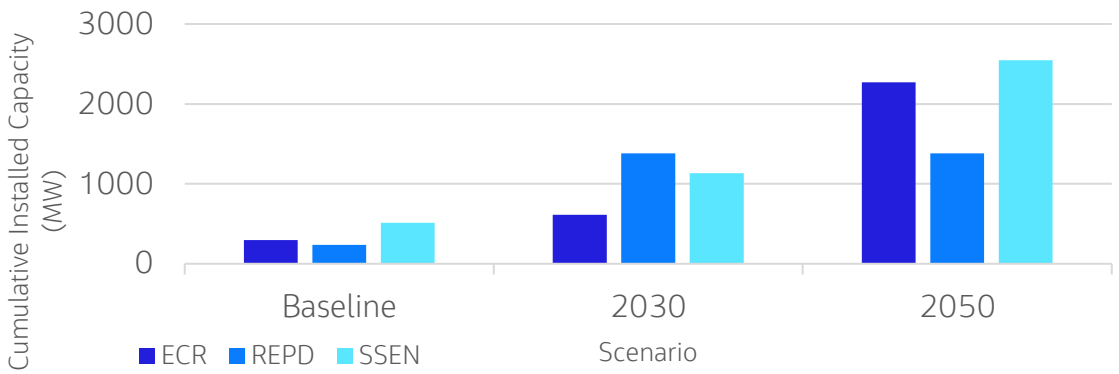


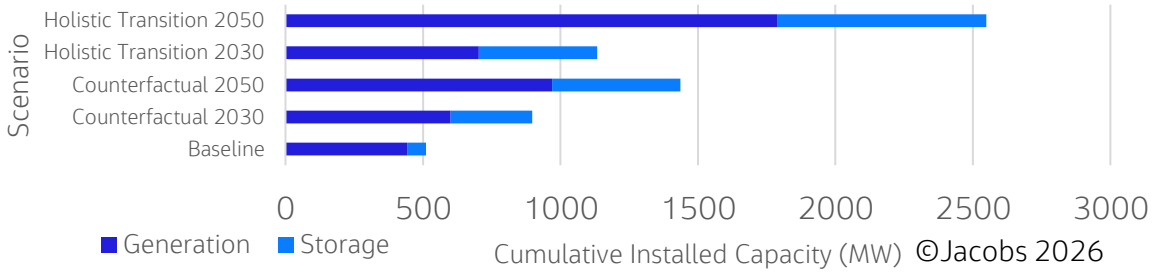
Generation Analysis: SSEN DFES Projections – Fleet

CASE STUDY 2

- The DER table outlines SSEN's projected generation capacity across 2030 and 2050, listed under the counterfactual and holistic transition scenarios
- The data is subject to uncertainty because the grid connections reform mandate may change how DERs are connected
- Addressing discrepancies between planning data and SSEN:
  - The accuracy of the planning data is subject to modelling assumptions, which may differ to DFES projections
  - The SSEN Data is based on Grid Supply Points, which may only include a portion of a Local Authority
  - SSEN Data is subject to Net Zero policy mandates
- The ECR is less than SSEN's holistic transition pathway, suggesting a potential supply shortfall in 2030 & 2050

Distributed Energy Resource (SSEN DFES 2025)					
Units - MW	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Generation					
Biomass CHP	0	0	0	0	0
Energy from Waste	0	0	0	0	0
Hydropower	0.5	0.5	0.5	0.5	0.6
Solar PV	330	490	890	620	1700
Diesel	23	23	0	1.4	0
Gas	68	70	64	62	68
Onshore Wind	0.0	0.0	0.0	0.0	0.0
Renewable Engines	20	17	15	19	21
Hydrogen Electrolysis	0	0	0	0	0
Other Generation	0.3	0.3	0.3	0.3	0.3
TOTAL	441.8	600.8	969.8	703.2	1789.9
Storage					
Domestic Storage	14	28	82	54	226
Generation co-Location	0	104	110	104	139
High energy user	15	19	28	21	43
Standalone	40	146	246	251	351
TOTAL	69	297	466	430	759

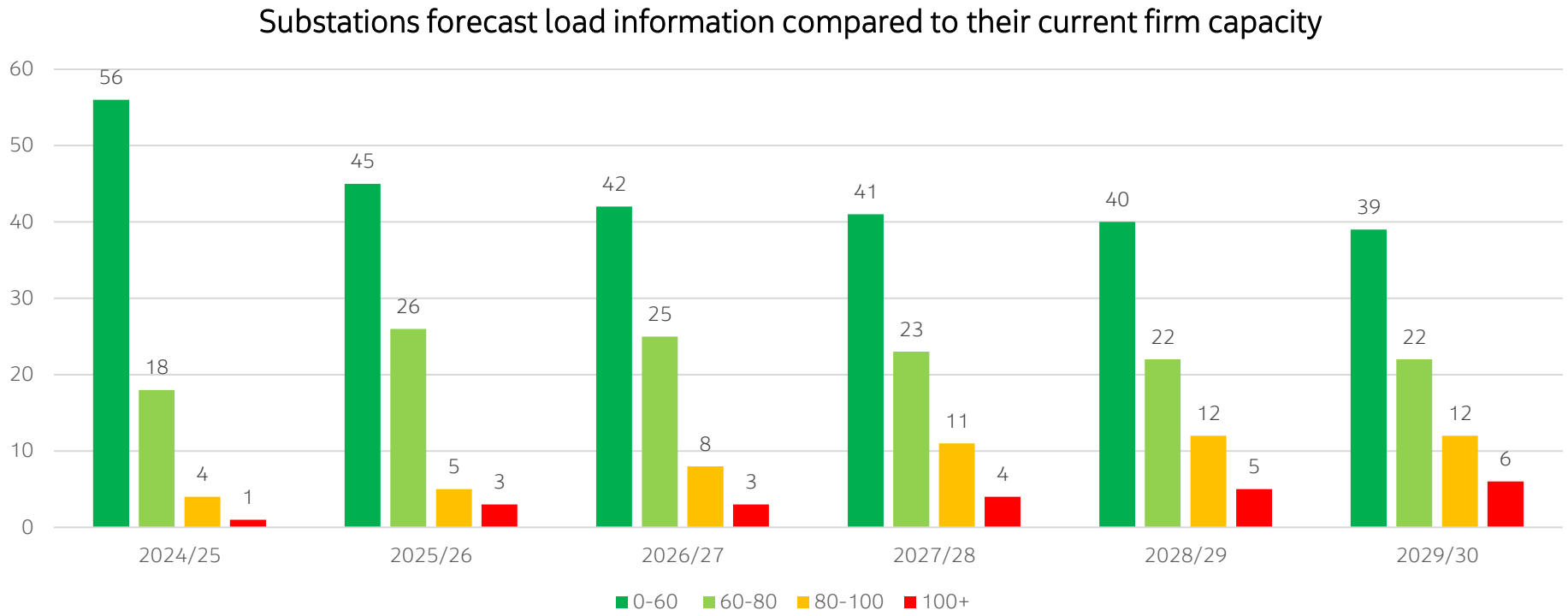




Current Energy Demand Analysis

Fleet GSP has a peak recorded demand of 948 MW and has 79 substations

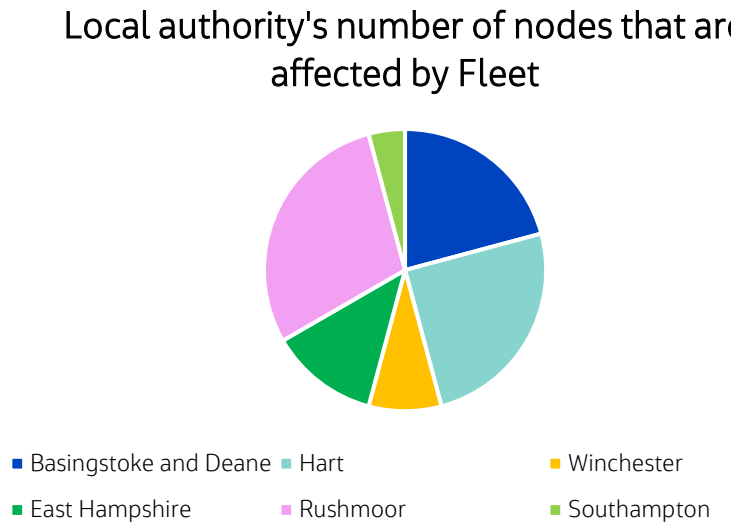
Summation of all substation's 2024 capacity is 1,949 MW

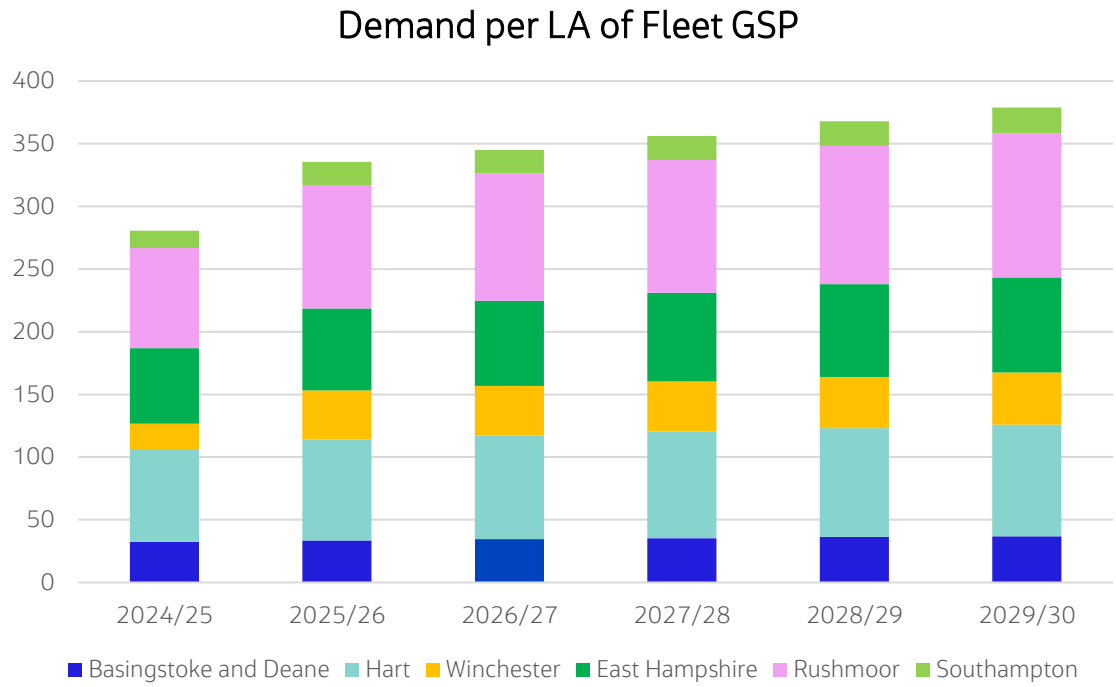


Southern Electric Power Distribution Long Term Development Statement Tables – November 2025

Current Energy Demand Analysis

- Majority of Fleet's connected substations are in Rushmoor
- Overall demand for Fleet GSP will increase by 30% by 2030 (980 MW → 1,279 MW)

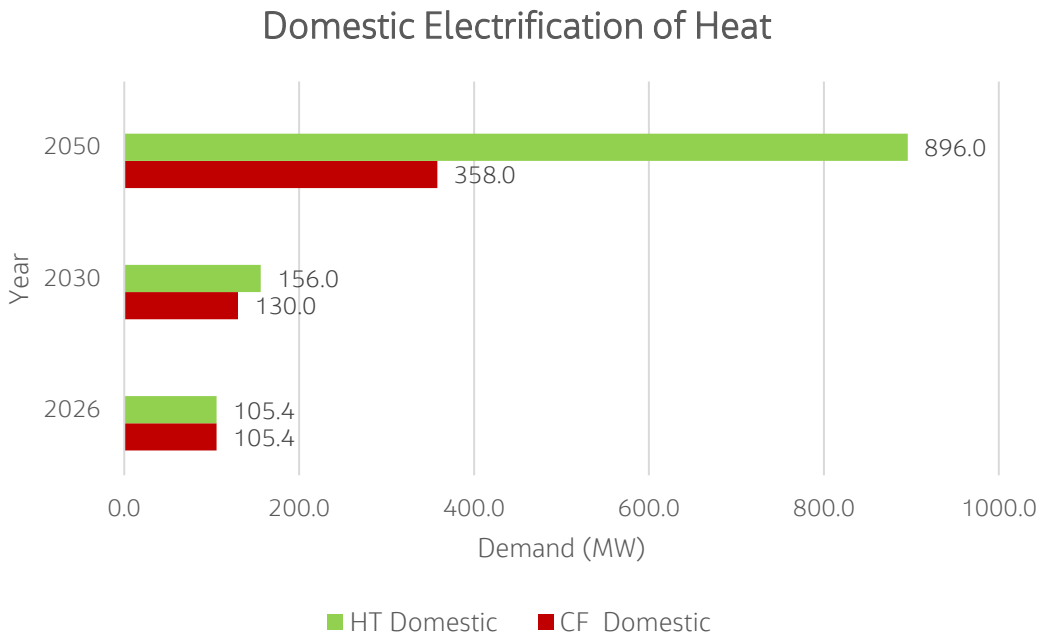


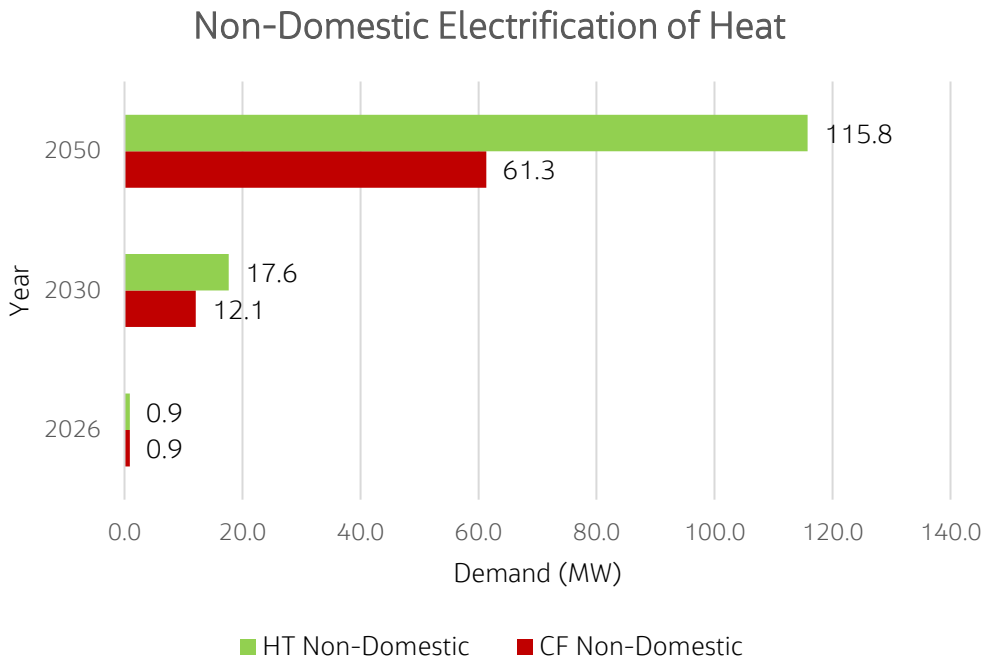


Southern Electric Power Distribution Long Term Development Statement Tables – November 2025

Peak Demand Analysis for Heat Pumps

- We have converted the Heat Pump SDP data to the impact on peak demand (MW)
  - See appendix for SDP table and assumptions



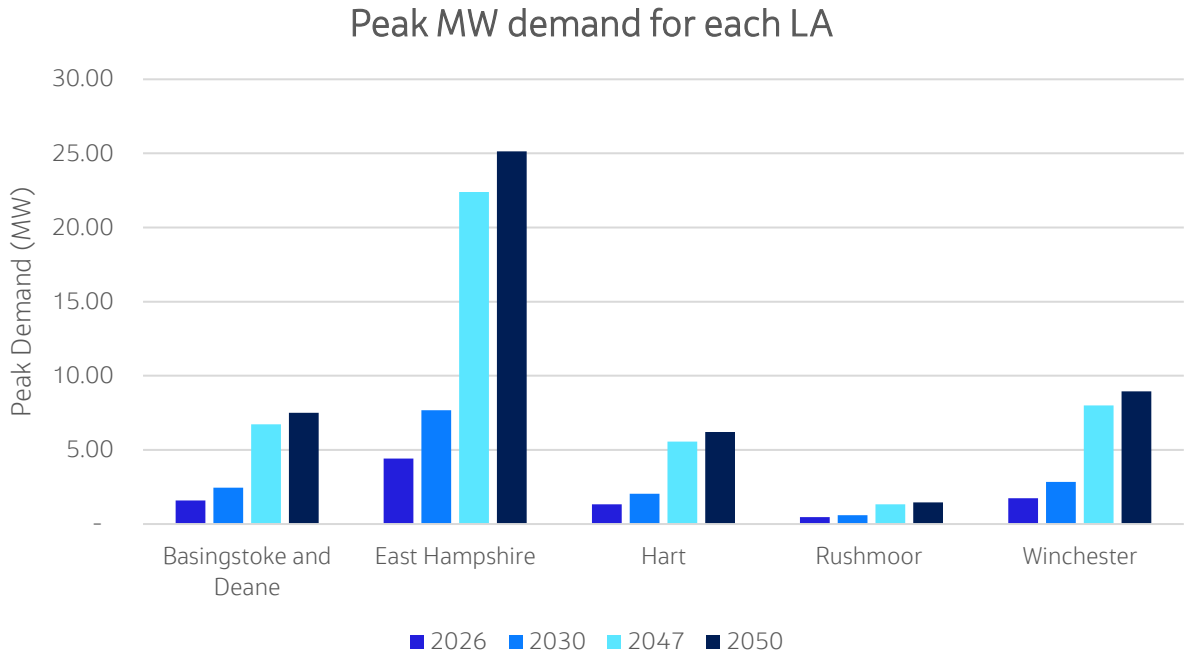


Heat Pumps Demand Findings

1. The data shows forecasted electric heating technology
2. Domestic heat pump forecasted demand is significantly greater than non-domestic.
   a. Non-domestic heat pumps had higher efficiencies assumed due to the figures being presented in m^2
3. To achieve Holistic Transition scenario:
   a. *There must be an increased uptake of domestic heat pumps by 2050.*
   b. *There must be an increased uptake of non-domestic heat pumps by 2050.*
4. Assuming that all new dwellings contain Heat Pumps would account for all of the forecasted domestic HPs in 2030, thus this demand **can** be achieved by using heat pumps in new dwellings.
5. All areas will be impacted but HP trend will follow spatial demand trend (shown in spatial analysis slides)

Peak Demand Analysis for EV

- EV data was calculated using methodology, data displayed below. The percentage of EVs compared to total cars on road was by using Zapmap's current statistics and UK goals for EVs [1] [2]



Sources:

[1] UK ev market share 2026: latest electric car registration stats | zapmap

[2] Pathway for zero emission vehicle transition by 2035 becomes law - GOV.UK

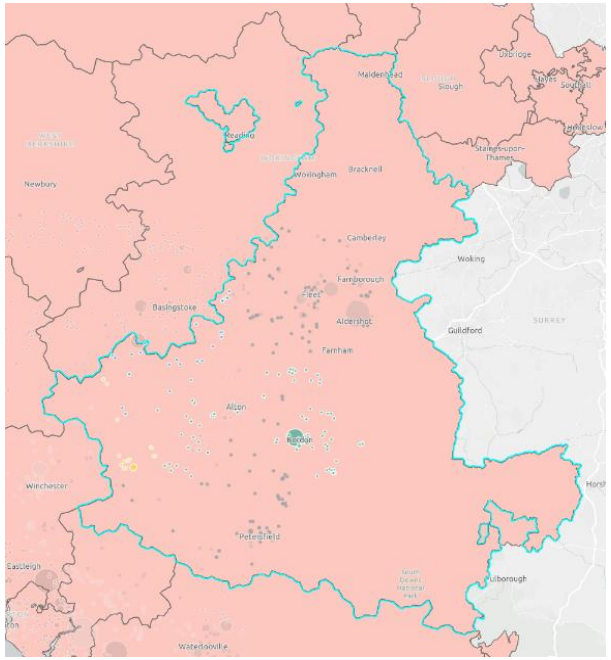
EV Demand Findings

1. The data shows forecast EV charging peak demand, which is independent of the SPD forecast. These findings focus on the number of potential EVs in the supply region. We have assumed that all households with an EV would all have a7kW EV charger and that the peak demand would be equal to 70% being in use at the same time.
2. If all local authorities had their peak demands at the same time, the sum would be 15.6 MW in 2030 and 49.3 MW in 2050. The SDP report indicates that the Fleet GSP supply network can accommodate the required number of public EV charge points to meet demand if the recommendations are implemented.
3. **East Hampshire** is the area most requiring network reinforcement in the Fleet GSP supply area to meet the EV charging demands.
4. SSEN note plans to upgrade existing 11 kV and 33 kV networks in East Hampshire in the SDP.

Spatial Analysis

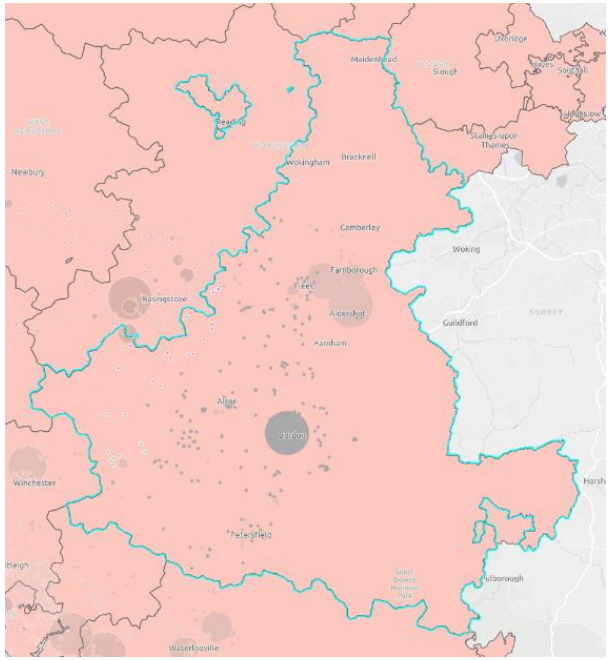
- Residential demand was calculated using provided dwelling information from the Hampshire Spatial Analysis team
  - See appendix for table and assumptions

2030 dwelling data



20 MW After Diversity Maximum Demand

2050 dwelling data



33 MW After Diversity Maximum Demand

Local Authority	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Basingstoke and Deane	0.4	0.3
Hart	3.7	5.7
Rushmoor	7.4	13.1
East Hampshire	5.8	10.3
South Downs National Park	1.9	2.3
Winchester	0.9	1.2
TOTAL	20.2	32.9

Spatial Analysis Findings

1. The data shows forecasted residential demand in 2030 and 2050 – the growth is shown by the size of the location.
2. This dwelling calculation does not include heat pumps but includes domestic EVs and minimal heating as it is required for new builds.
3. Largest areas of growth are **East Hampshire** and **Rushmoor:**
    a. Camberley Reserve and Bracknell BSP to multiple PSS's circuits will be overloaded 2035. Reinforcements to address these constraints are planned.

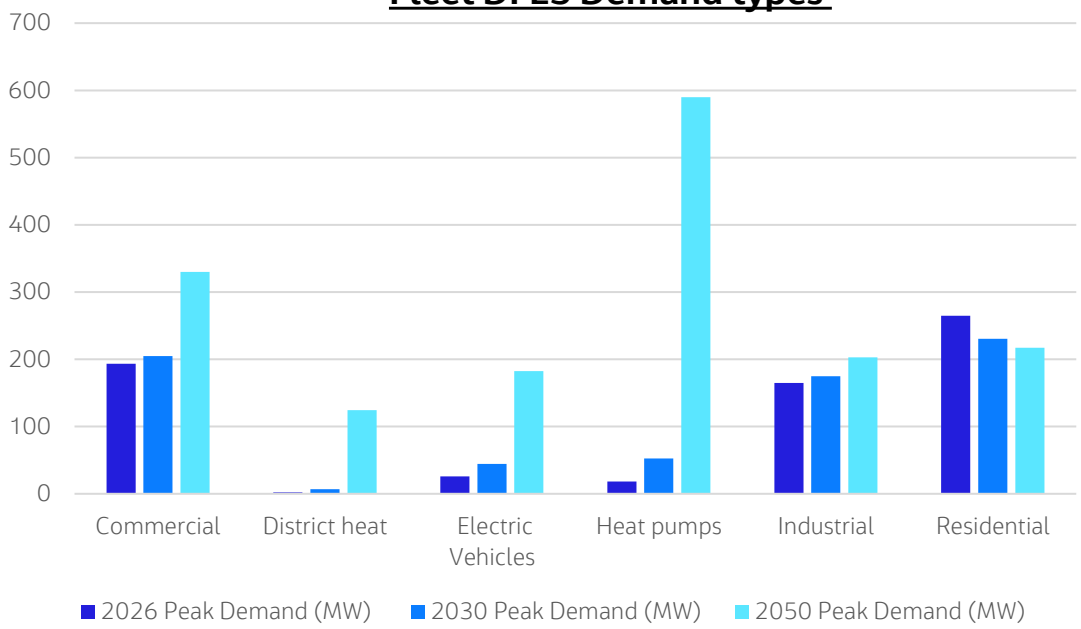
Conclusion to Demand Analysis

- There is some variance between the Jacobs, LTDS and DFES forecast demand estimates.
- Jacobs forecasts are more closely aligned to the DFES forecasts, with the LTDS figures being substantially higher.
- The Jacobs estimate does not consider all demand types that are included in the DFES forecasts. Current dwellings are not added to our value so we would assume the value to be a 200-300 MW higher than calculated
- DFES EV is higher than our estimate, DFES HP is lower than our estimate

DFES Demands

Demand type	2026 Peak Demand (MW)	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Commercial	193.6	204.9	329.9
District heat	2.0	7.0	124.3
Electric Vehicles	25.6	44.6	182.4
Heat pumps	18.3	52.3	590.0
Industrial	164.8	174.9	203.1
Residential	264.7	230.4	217.2
Total	**669.0**	**714.1**	**1646.9**
LTDS data	**1147.8**	**1304.6**	
Initial estimate		**210.2**	**1,061.0**

Fleet DFES Demand types



SSEN information – tRESP

- With a consistent baselining approach across GB, the tRESP Pathways use inputs from the DNOs, the DFES and other datasets, and an alignment review framework, to ensure the final tRESP Pathways balance consistency and reflect differences between nations and regions
- Uses common planning assumptions (CPAs) across all GB regions, avoiding DNO-to-DNO inconsistency and creates one value forecast
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	Contributions to peak demand MW		Contributions to energy consumption MWh	
Category	Additional at 2035 - % of underlying (peak demand MW)	Additional at 2050 - % of underlying (peak demand MW)	Additional at 2035 - % of underlying (energy consumption MWh)	Additional at 2050 - % of underlying (energy consumption MWh)
Heat pumps - domestic	6.6%	53.6%	5.1%	41.5%
Heat pumps - I & C	2.2%	17.9%	1.5%	11.7%
EV - cars & vans	16.3%	21.2%	22.2%	28.8%
Electric HGVs	4.2%	6.8%	10.1%	16.5%
Electric Buses	0.2%	0.4%	1.4%	2.1%
Electrolysers	8.5%	21.4%	14.2%	36.0%
Large industry Fuel Switching	4.7%	10.0%	7.9%	16.9%

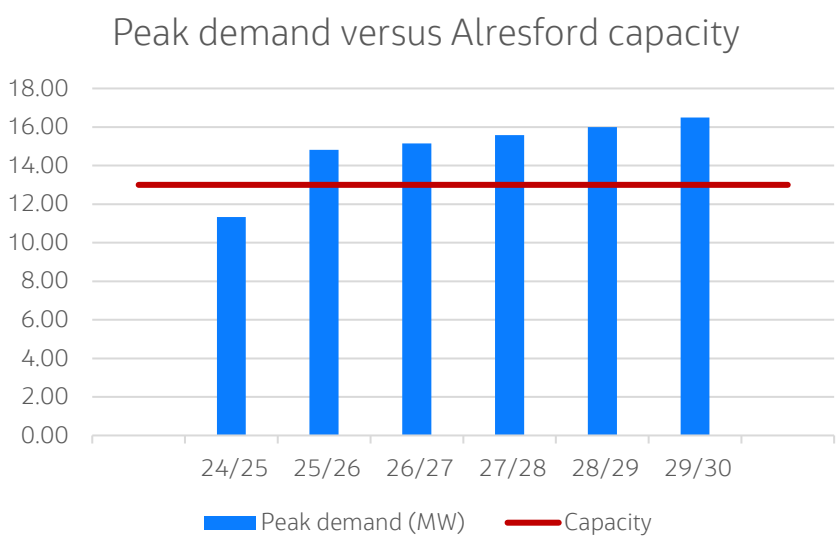
tRESP unit	2026 Forecast	2030 Forecast	2050 Forecast
Demand (GWh)	16.0	47.1	254.5
LCT connections (GWh)	264.7	275.2	334.4

Case study impact

Below is the impact to nearby substations from the two of the three AI Growth Zones:

Winchester

Alresford substation

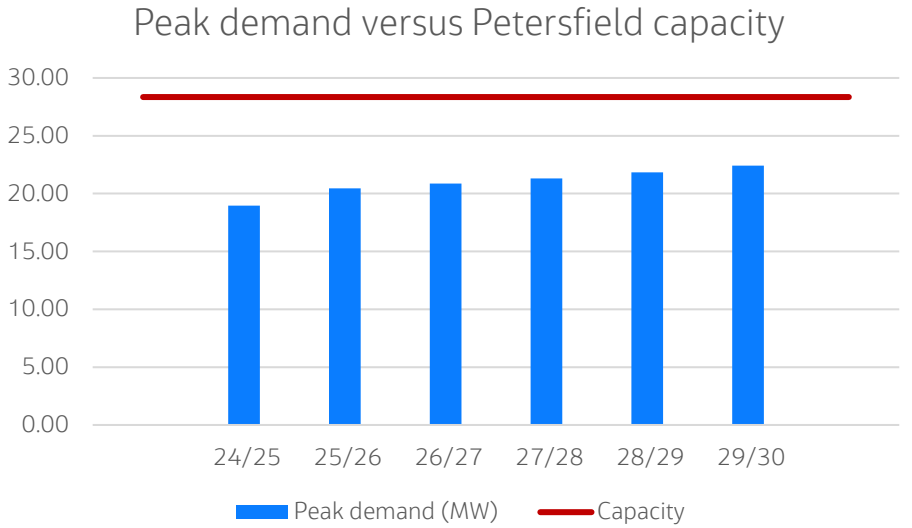


SSEN is currently upgrading existing 33/11 kV transformers from 13MVA to 15/30MVA at Alresford substation. This may free up space for small data centres, however these **will be insufficient for larger AI centre demands.**

Source of loads: Network Maps

Petersfield

Petersfield substation



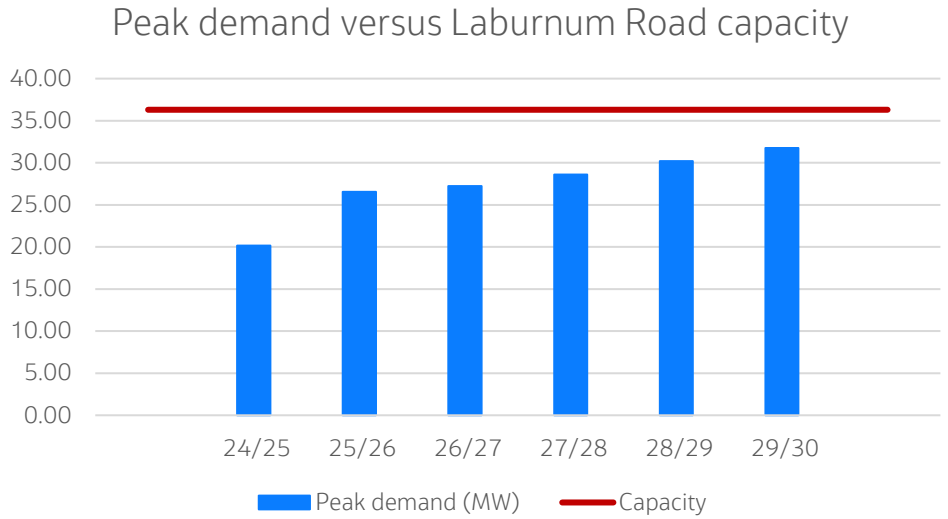
SSEN is not currently upgrading Petersfield PSS but plans to replace secondary transformers. Depending on their capacity, this PSS **may be available for AI centre demands.**

Case study impact

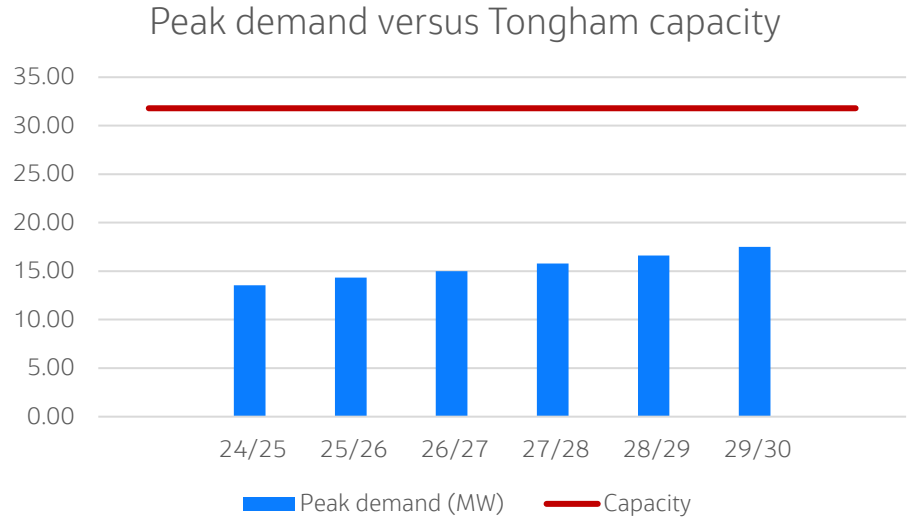
Below is the impact to nearby substations in the final AI Growth Zone:

Aldershot

There are 14 substations in Aldershot that are supplied by Fleet. The two largest firm capacities were chosen.



SSEN is planning to upgrade existing a 15 MVA transformer to 15/30MVA at Laburnum Road PSS. They will also transfer load from Aldershot PSS to Laburnum Road PSS This means that this substation **will be insufficient for larger AI centre demands.**



SSEN is planning to add or upgrade existing transformers at Tongham PSS. This substation **could be sufficient for small to mid-AI centre demands.**

Source of loads: Network Maps

Jacobs

Challenging today.
Reinventing tomorrow.

Case study 3: Lovedean

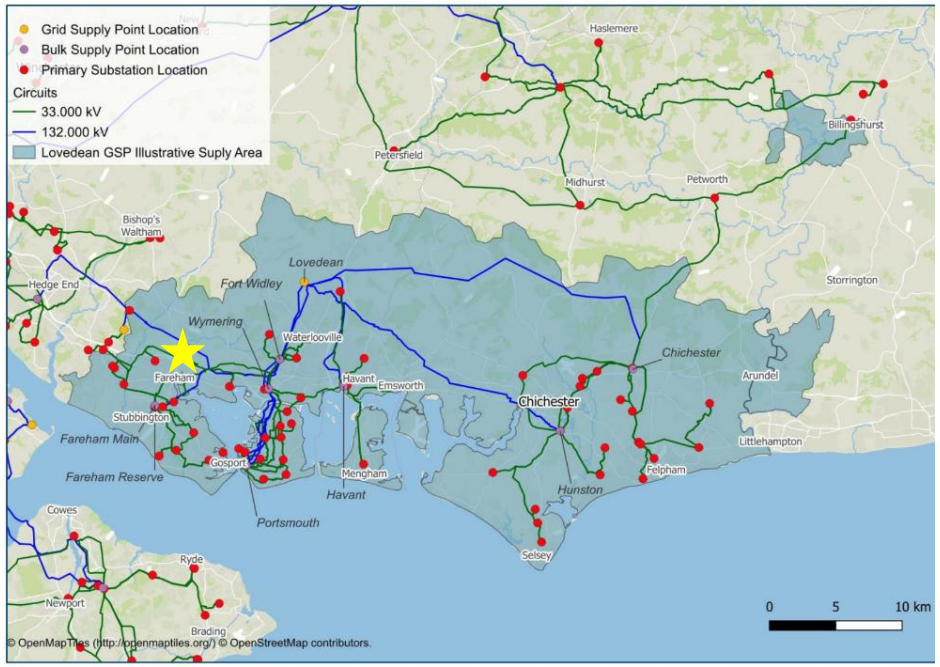
Scenario used: Solar development

Lovedean SDP Summary

- Located in Horndean, East Hampshire
- Impacting Havant, Gosport, Fareham, Winchester and East Hampshire local authorities

- Potential increase of Solar PV and BESS, investigate Clean Power targets to ensure grid development is on track
- Investigation of system needs
- Discussions with SeaChange as maritime industry demands may increase

50 MW large solar development has been identified in this region



Lovedean GSP supply area
Source: lovedean---strategic-development-plan---july-2025.pdf

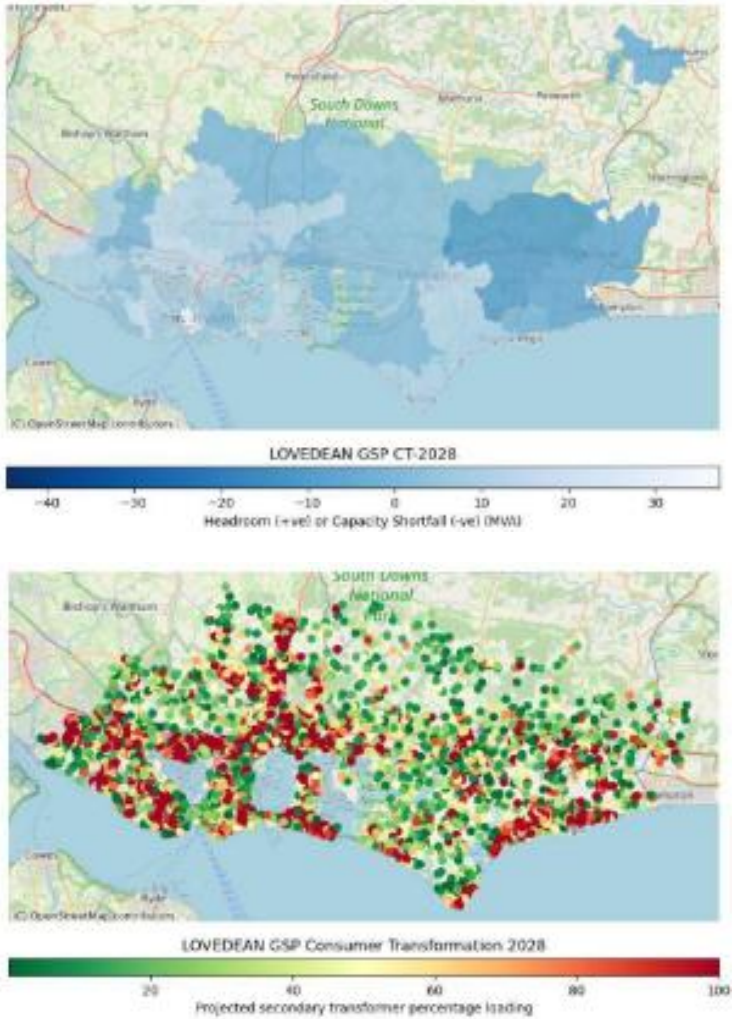
Near Future Constraint Points

Lovedean SDP includes a two spatial maps:

1. Capacity shortfall spatial map: darker blue indicates that the PSS does not have the required operating capacity
2. Transformer loading map: Green indicates that the transformer is underloaded whilst red indicates that the transformer is overloaded. Standard transformer loading would be between 50-80%.

From this comparison:

There is no overlap where HV and LV are overloaded. For LV systems, west region is more constrained and for HV systems, east region is more constrained.



Lovedean GSP spatial plan 2028
Source: lovedean---strategic-development-plan---july-2025.pdf

Current Constraint Points

- N-1 analysis was done by SSEN (loss of one major unit), below is a list of near-term needs by 2035 regardless of DFES scenario

Transformers replacement required

- Brandon Road PSS
- Chichester PSS
- Selsey PSS

Circuits overloading

- Chichester BSP to Shripney switching station

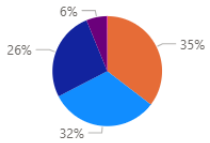
Generation Analysis: Renewable Energy Planning Database – Lovedean

- Using the Renewable Energy Planning Database, operational renewable plants were mapped in the Lovedean supply area

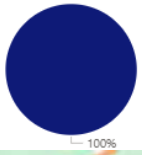
Capacity (MW) by Development Status

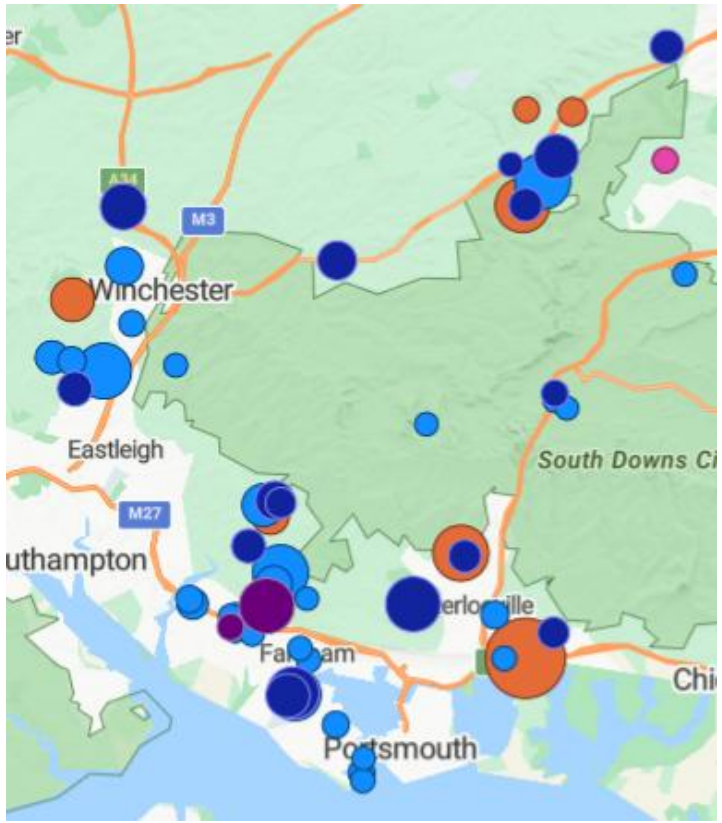
Development Status
- Planning Permission Granted
- Planning Application Submitted
- Operational
- Appeal Granted
- Under Construction

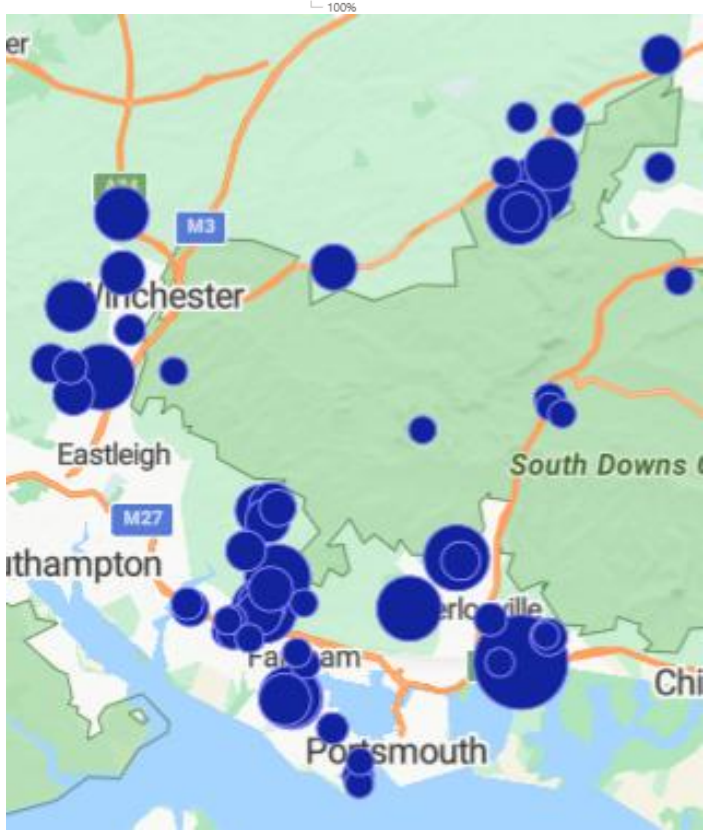
2025



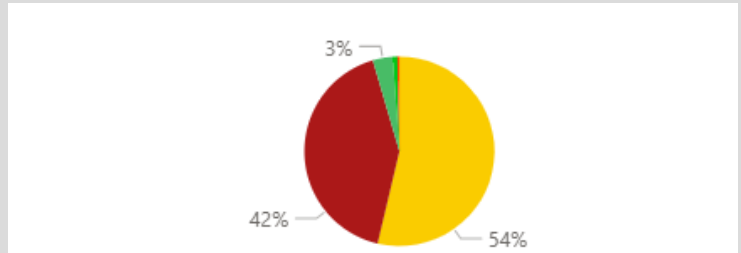
2030/2050



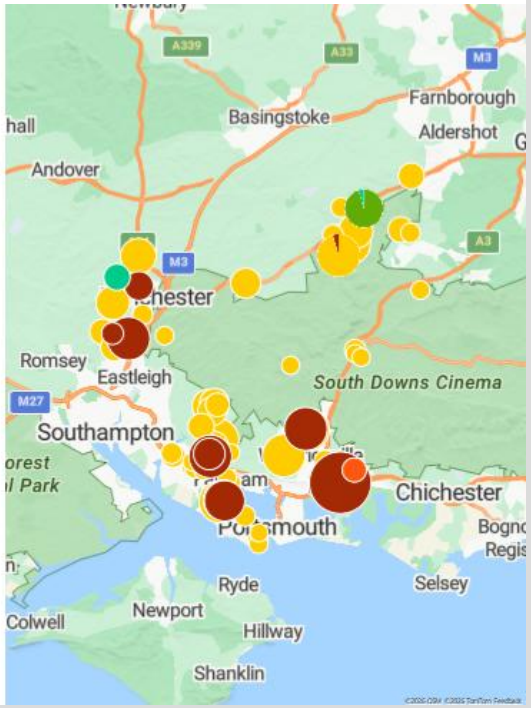




Capacity (MW) by Technology



Technology Type
- Solar Photovoltaics
- Battery
- EfW Incineration
- Anaerobic Digestion
- Landfill Gas

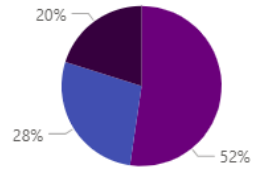


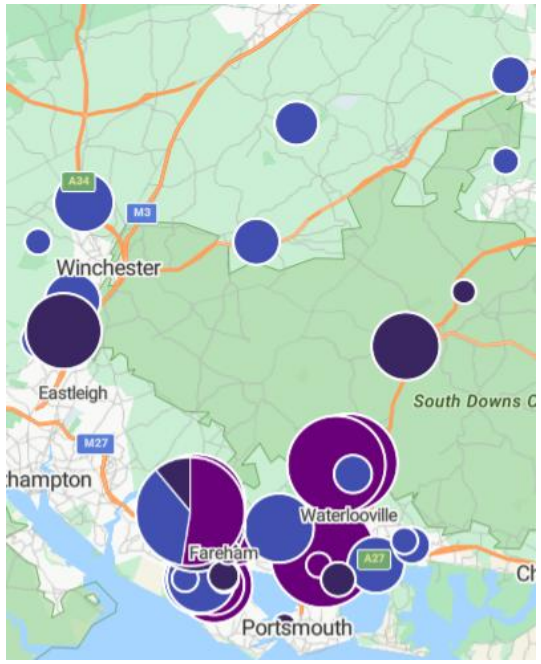
Generation Analysis: Embedded Capacity Register – Lovedean

- Using the Embedded Capacity Register, both renewable and non-renewable plants were mapped in the Lovedean supply area

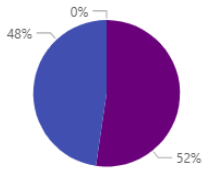
Capacity (MW) by Development Status

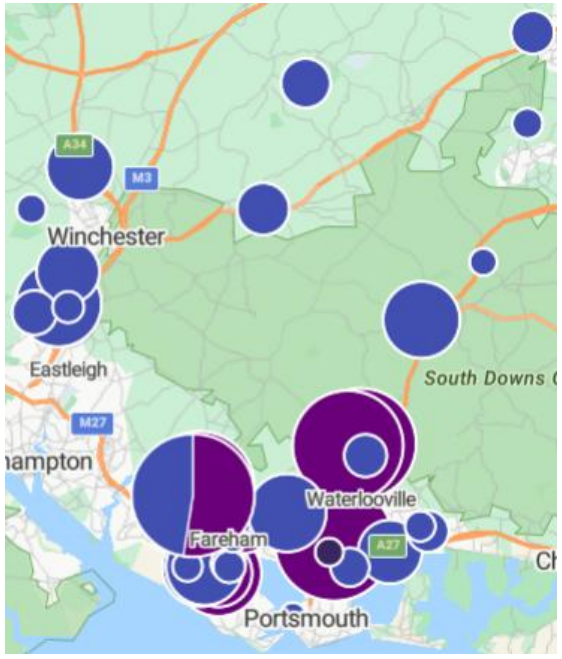
2026



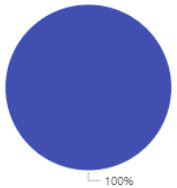


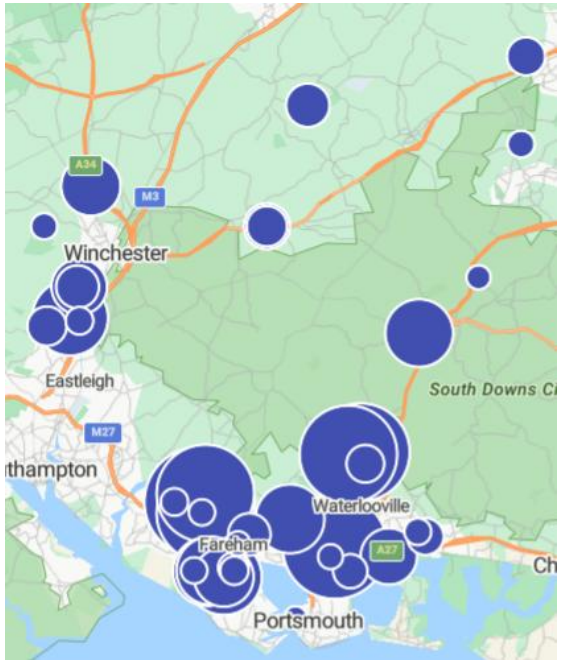
2030



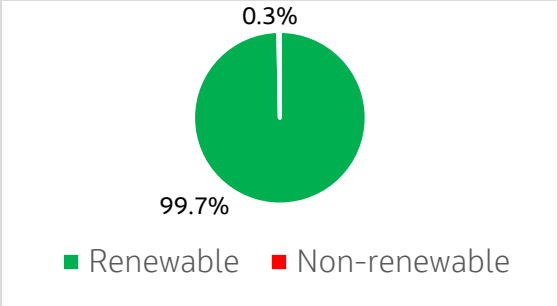


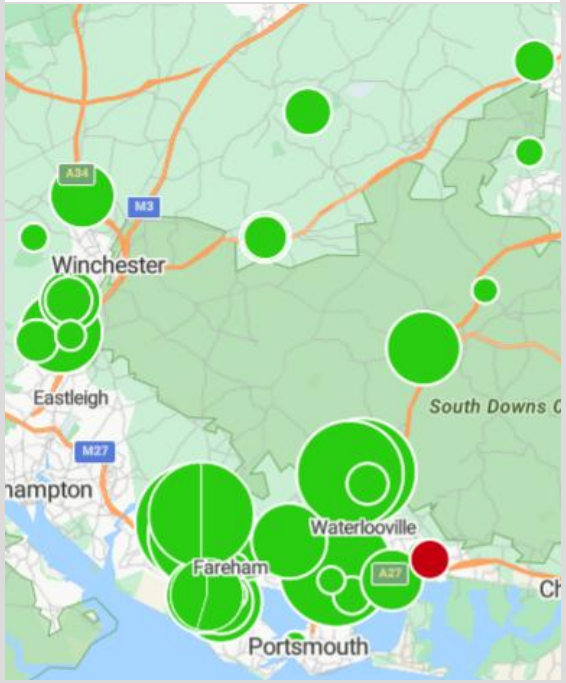
2050





Capacity (MW) by Technology



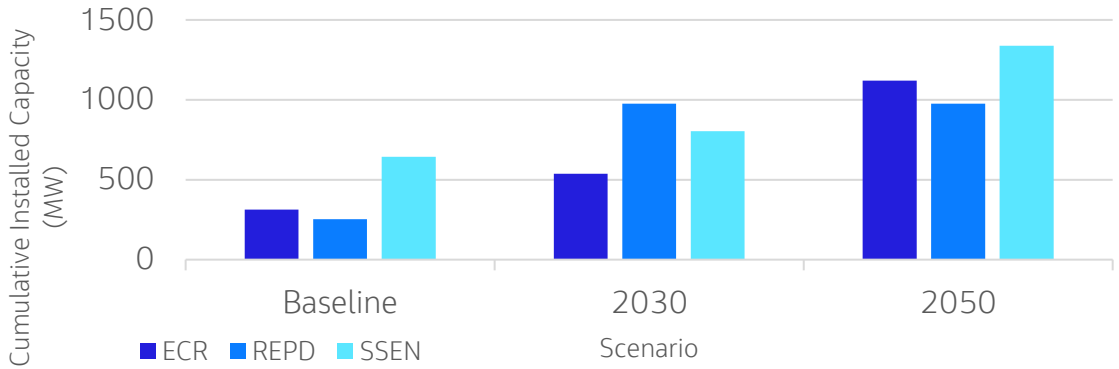


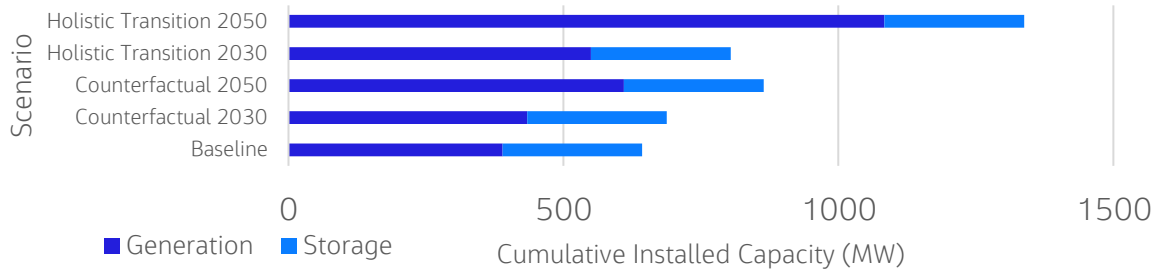
Generation Analysis: SSEN DFES Projections – Lovedean

CASE STUDY 3

- The DER table outlines SSEN's projected generation capacity across 2030 and 2050, listed under the counterfactual and holistic transition scenarios
- The data is subject to uncertainty because the grid connections reform mandate may change how DERs are connected
- Addressing discrepancies between planning data and SSEN:
  - The accuracy of the planning data is subject to modelling assumptions, which may differ to DFES projections
  - The SSEN Data is based on Grid Supply Points, which may only include a portion of a Local Authority
  - SSEN Data is subject to Net Zero policy mandates
- The ECR is less than SSEN's holistic transition pathway, suggesting a potential supply shortfall in 2030 and 2050

Distributed Energy Resource (SSEN DFES 2025)					
Units - MW	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Generation					
Biomass CHP	0	0	0	0	0
Energy from Waste	20	20	0	20	0
Hydropower	0.4	0.4	0.4	0.4	0.5
Solar PV	282	320	554	495	1050
Diesel	38	38	0	0.5	0
Gas	31	38	38	16	15
Onshore Wind	0.0	0.0	0.0	0.0	0.0
Renewable Engines	2.8	2.8	2.8	3.2	3.2
Hydrogen Electrolysis	0	0	0	0	0
Other Generation	14.9	14.9	14.9	14.9	14.9
TOTAL	389.1	434.1	610.1	550.0	1083.6
Storage					
Domestic Storage	7.6	18	56	34	154
Generation co-Location	0	0	1.9	0	11
High energy user	4.9	8.2	15	10	28
Standalone	108	173	173	173	173
TOTAL	120.5	199.2	245.9	217.0	366.0

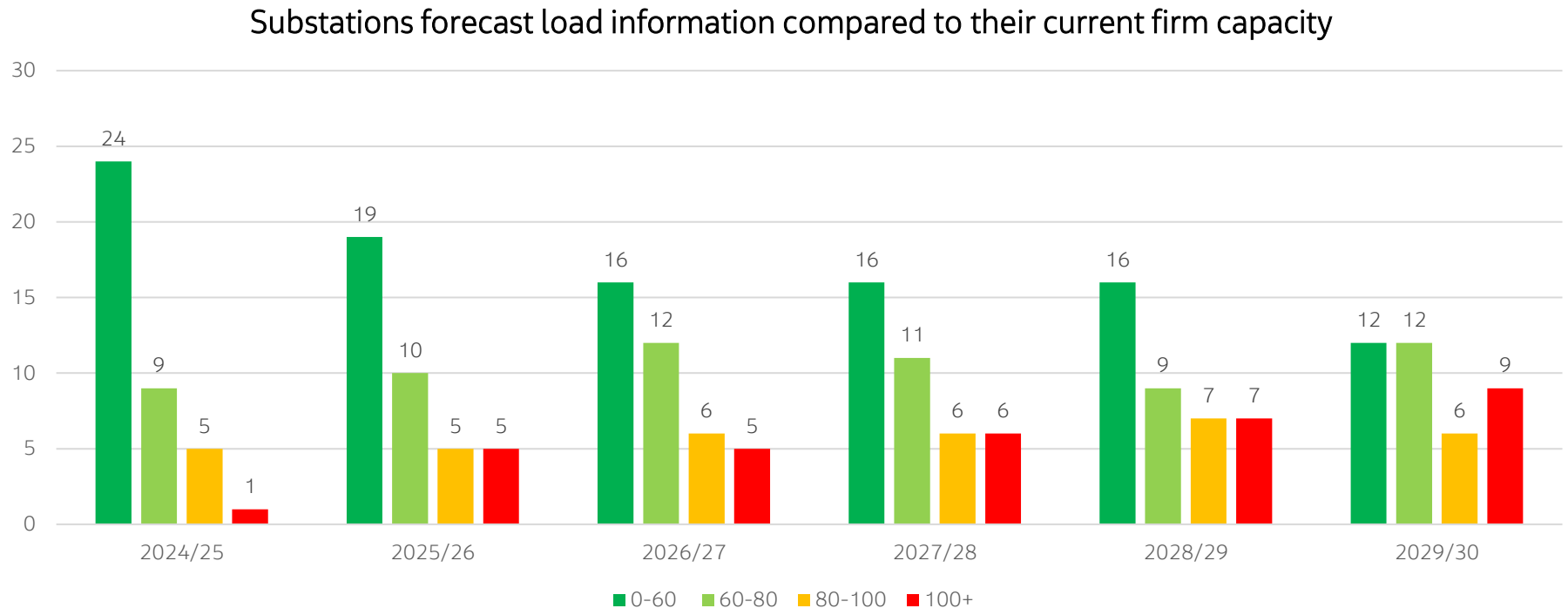




Current Energy Demand Analysis

Lovedean GSP has a peak recorded demand of 520 MW and has 39 substations

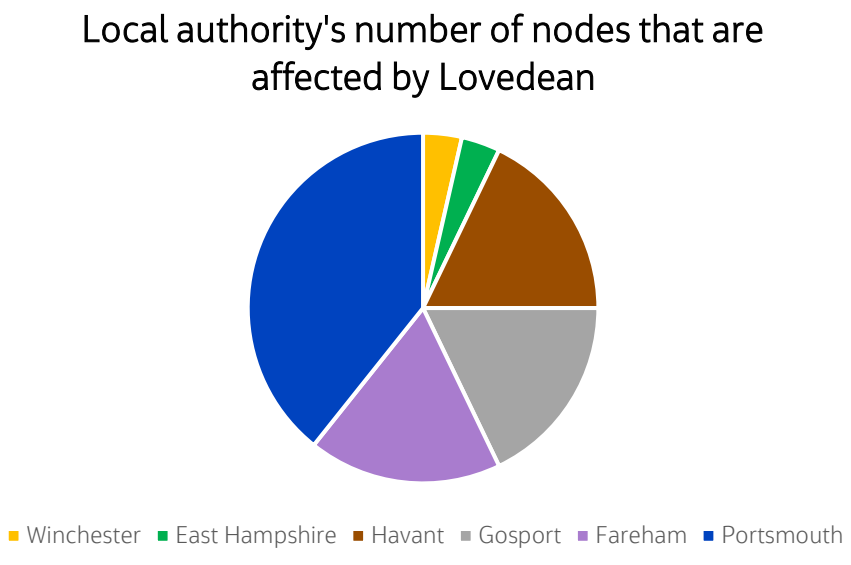
Summation of all substation's 2024 capacity is 999 MW

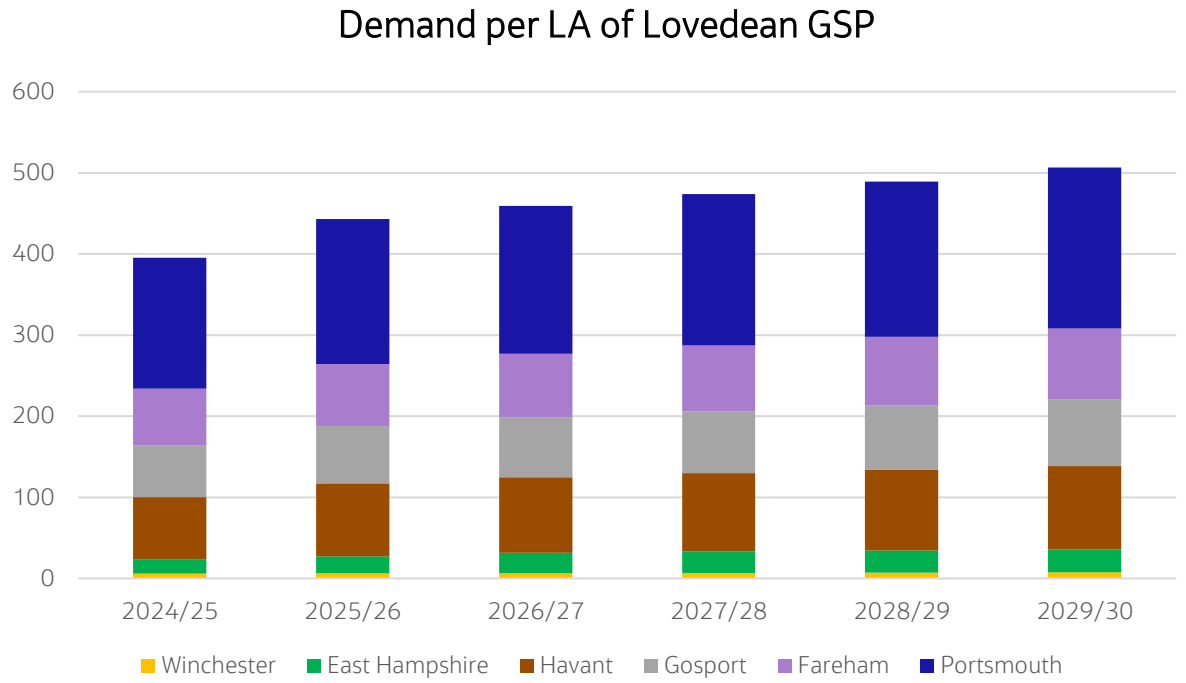


Southern Electric Power Distribution Long Term Development Statement Tables – November 2025

Current Energy Demand Analysis

- Majority of Lovedean's connected substations are in Portsmouth
- Overall demand for Lovedean GSP will increase by 30% by 2030 (596 MW → 773 MW)

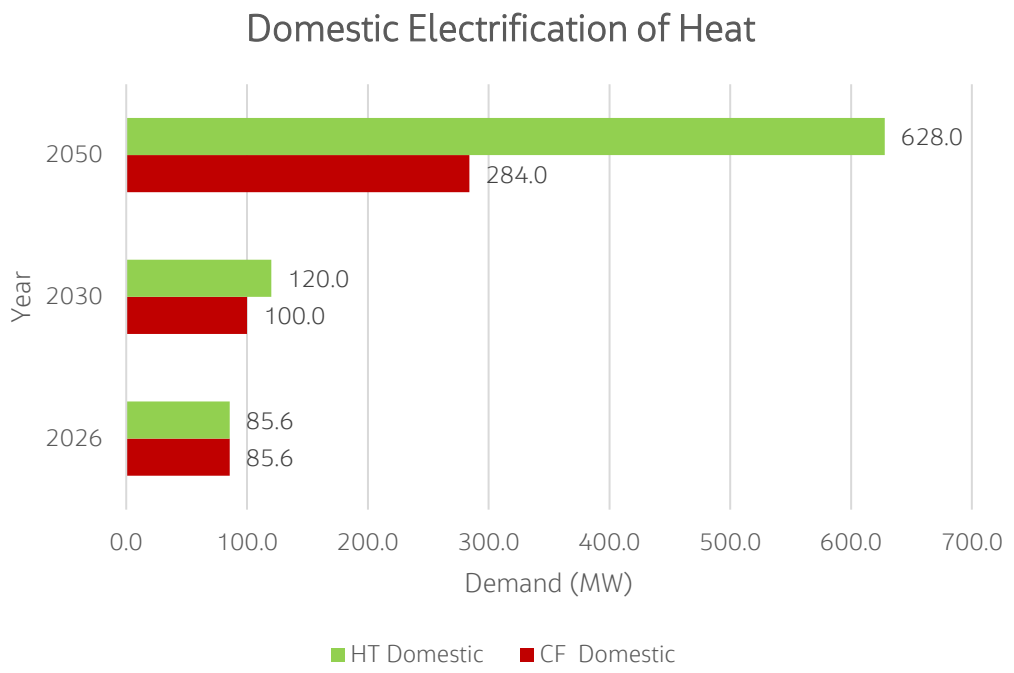


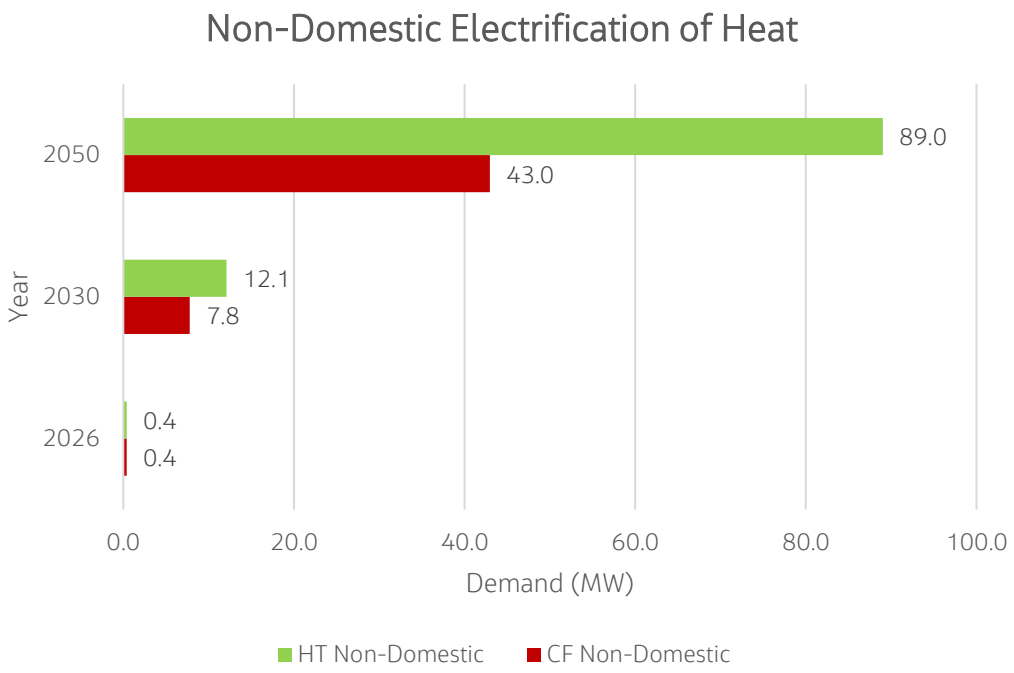


Southern Electric Power Distribution Long Term Development Statement Tables – November 2025

Peak Demand Analysis for Heat Pumps

- We have converted the Heat Pump SDP data to the impact on peak demand (MW)
  - See appendix for SDP table and assumptions



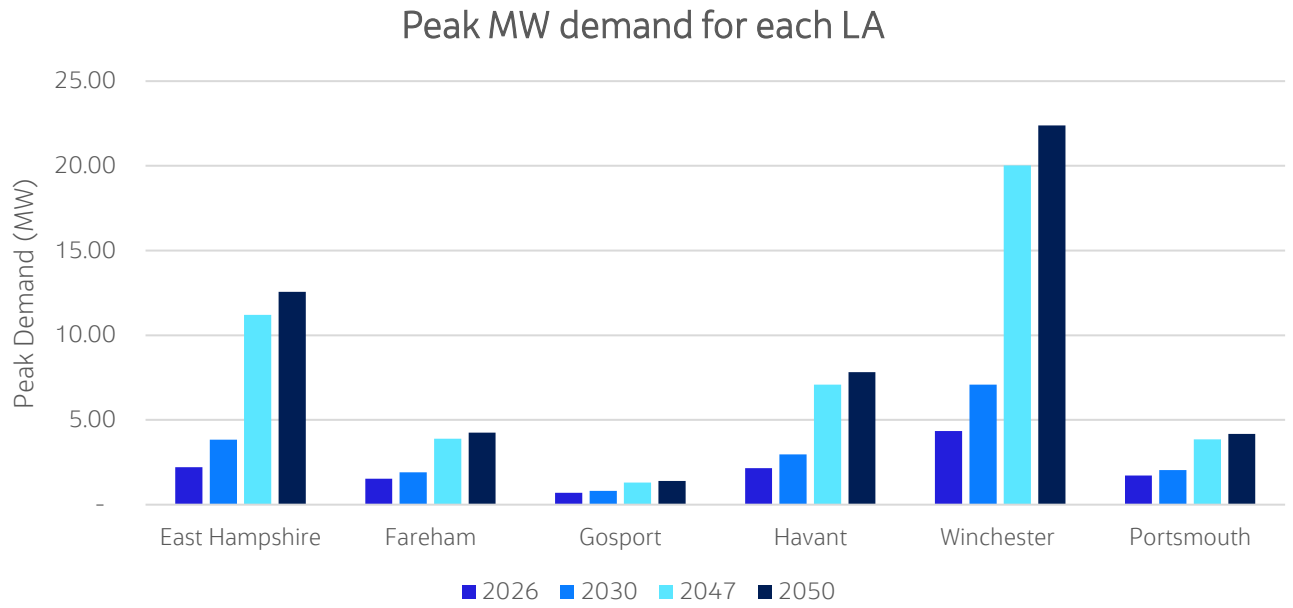


Heat Pumps Demand Findings

1. The data shows forecasted electric heating technology
2. Domestic heat pump forecasted demand is significantly greater than non-domestic
   a. Non-domestic heat pumps had higher efficiencies assumed due to the figures being presented in m^2
3. To achieve Holistic Transition scenario:
   a. *There must be an increased uptake of domestic heat pumps by 2050*
   b. *There must be an increased uptake of non-domestic heat pumps by 2050*
4. Assuming that all new dwellings contain Heat Pumps would only account for **11%** of the forecasted domestic HPs in 2030
5. All areas will be impacted but HP trend will follow spatial demand trend (shown in spatial analysis slides)

Peak Demand Analysis for EV

- EV data was calculated using methodology, data displayed below. The percentage of EVs compared to total cars on road was by using Zapmap's current statistics and UK goals for EVs [1] [2]



Sources:

[1] UK ev market share 2026: latest electric car registration stats | zapmap

[2] Pathway for zero emission vehicle transition by 2035 becomes law - GOV.UK

EV Demand Findings

1. The data shows forecast EV charging peak demand, which is independent of the SPD forecast. These findings focus on the number of potential EVs in the supply region. We have assumed that all households with an EV would all have a7kW EV charger and that the peak demand would be equal to 70% being in use at the same time.
2. If all local authorities had their peak demands at the same time, the sum would be 18.7 MW in 2030 and 52.6 MW in 2050. The SDP report indicates that the Lovedean GSP supply network can accommodate the required number of public EV charge points to meet demand if the recommendations are implemented.
3. **Winchester** would be the major area for reinforcements in terms of the Lovedean GSP.
4. LV systems are heavily constrained in Winchester and there are multiple 33 kV reinforcements planned.

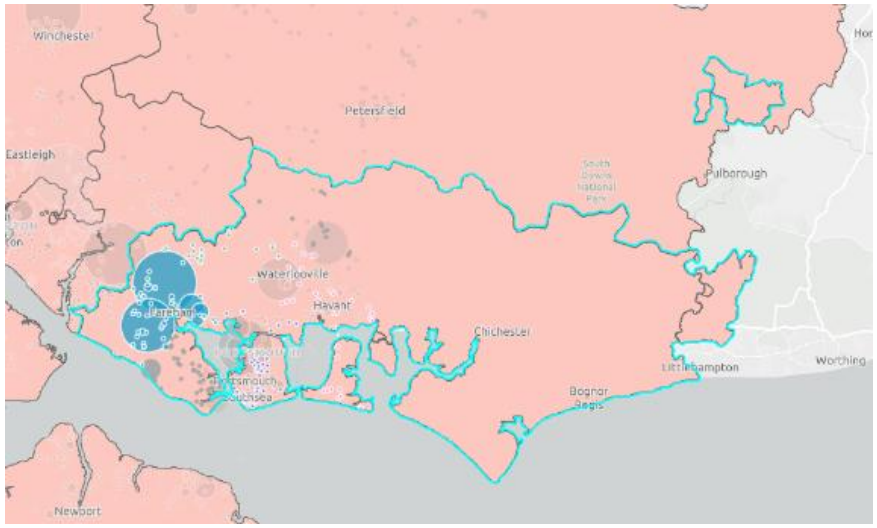
Spatial Analysis

- Residential demand was calculated using provided dwelling information from the Hampshire Spatial Analysis team:
  - See appendix for table and assumptions

2030 dwelling data

21 MW After Diversity Maximum Demand

2050 dwelling data



59 MW After Diversity Maximum Demand

Local Authority	2030 Peak Demand (MW)	2050 Peak Demand (MW)
East Hampshire	2.0	3.5
Fareham	7.9	29.4
Gosport	3.1	5.1
Havant	3.7	6.3
Portsmouth	3.8	10.8
South Downs National Park	0.0	0.0
Winchester	2.5	3.7
TOTAL	20.9	55.3

Spatial Analysis Findings

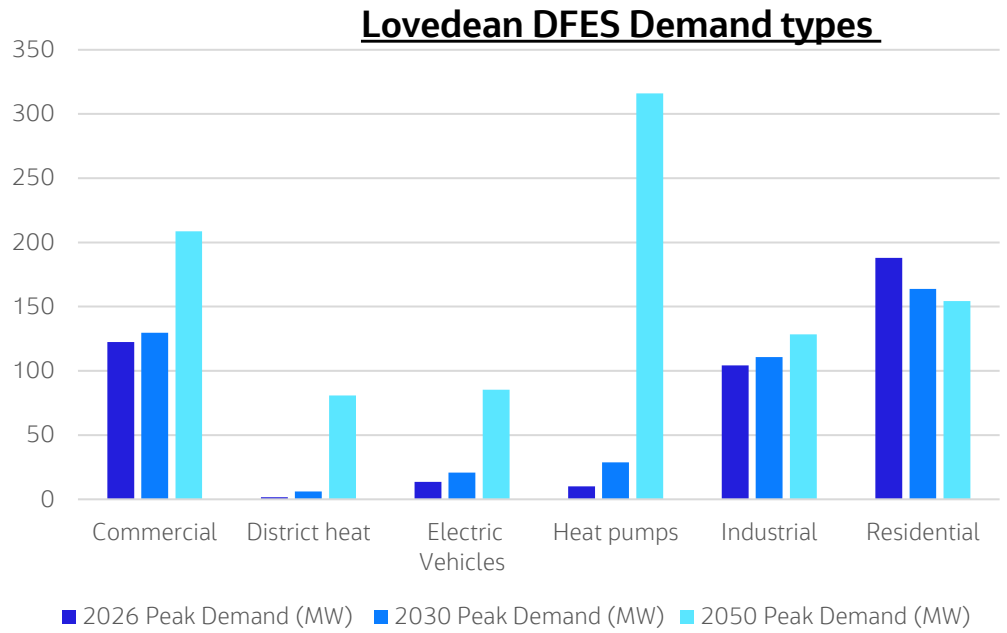
1. The data shows forecasted residential demand in 2030 and 2050 – the growth is shown by the size of the location.
2. This dwelling calculation does not include heat pumps but includes domestic EVs and minimal heating as it is required for new builds.
3. Largest areas of growth are **Fareham** and **Portsmouth**.
4. There are current reinforcement of 33kV circuit sections between Hoeford PSS and North Fareham PSS and other reinforcements at Fareham BSP are planned to address these constraints.

Conclusion to Demand Analysis

- There is some variance between the Jacobs, LTDS and DFES forecast demand estimates.
- Jacobs forecasts are more closely aligned to the DFES forecasts, with the LTDS figures being substantially higher.
- The Jacobs estimate does not consider all demand types that are included in the DFES forecasts. Current dwellings are not added to our value so we would assume the value to be a 100-200 MW higher than calculated.
- EV is similar to our estimate; HP is lower than our estimate.

DFES Demands

Demand type	2026 Peak Demand (MW)	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Commercial	122.5	129.6	208.6
District heat	1.7	6.1	80.8
Electric Vehicles	13.7	20.9	85.4
Heat pumps	10.0	28.8	316.0
Industrial	104.3	110.6	128.4
Residential	188.0	163.7	154.3
Total	**440.2**	**459.7**	**973.5**
LTDS data	**690.6**	**788.5**	
Initial estimate		**173.7**	**828.6**



SSEN information – tRESP

- With a consistent baselining approach across GB, the tRESP Pathways use inputs from the DNOs, the DFES and other datasets, and an alignment review framework, to ensure the final tRESP Pathways balance consistency and reflect differences between nations and regions
- Uses common planning assumptions (CPAs) across all GB regions, avoiding DNO-to-DNO inconsistency and creates one value forecast
- This is recent (Jan 2026), however can be used once technology has matured
- Demand mainly consists of HP and EV tech

Table 1: Increase to peak demand and energy consumption in 2035 and 2050 of future demand components (heat pumps, electrified transport, electrolysers, industry) as a percentage of underlying residential and commercial demand (Northern Powergrid 2023 DFES – Best View scenario). Source: Energy Networks Association[4].

	Contributions to peak demand MW		Contributions to energy consumption MWh	
Category	Additional at 2035 - % of underlying (peak demand MW)	Additional at 2050 - % of underlying (peak demand MW)	Additional at 2035 - % of underlying (energy consumption MWh)	Additional at 2050 - % of underlying (energy consumption MWh)
Heat pumps - domestic	6.6%	53.6%	5.1%	41.5%
Heat pumps - I & C	2.2%	17.9%	1.5%	11.7%
EV - cars & vans	16.3%	21.2%	22.2%	28.8%
Electric HGVs	4.2%	6.8%	10.1%	16.5%
Electric Buses	0.2%	0.4%	1.4%	2.1%
Electrolysers	8.5%	21.4%	14.2%	36.0%
Large industry Fuel Switching	4.7%	10.0%	7.9%	16.9%

tRESP unit	2026 Peak Demand (MW)	2030 Peak Demand (MW)	2050 Peak Demand (MW)
Demand (GWh)	15.9	37.4	208.1
LCT connections (GWh)	122.5	127.3	154.7

Case Study Impact

Below are potential connections points and the impact to their capacity for this 50MW solar park.

Connection to Plessey Titchfield or West End 33/11 kV PSS

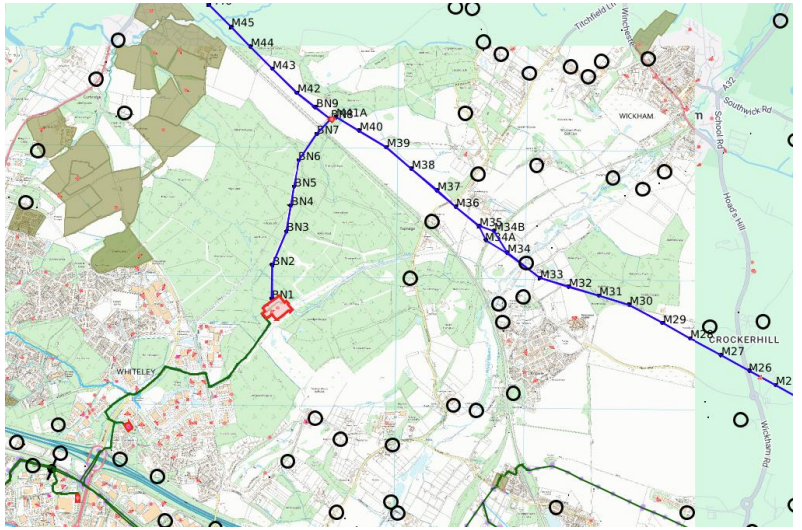
These two have the largest PSS capacity at 30 MW thus will major extensions however they have available capacity of approximately 55%. Plessey Titchfield has a peak demand of 16 MW whilst West End has a peak demand of 13 MW.

Connection to Fareham Main 132/33 kV BSP

Fareham Main would provide more capacity compared to a PSS connection. However, further discussions with SSEN would be required as these are not reviewed in the relevant SDP as it excludes Fareham Main.

Connection to Botley Wood GSP

Although Botley Wood is not the selected case study area, it is the closest connection to the 50 MW solar park. This is a viable solution however the GSP is constrained so reinforcements are needed.



Wickham area and current circuit

Source of loads: Network Maps

Concluding Remarks

Summary of Findings

Nursling

- Solent Gateway operates the 83-hectare Marchwood Port on the River Test opposite the Port of Southampton
- Current network infrastructure has capacity, but secondary transformers in the region are heavily overloaded
- Depending on the demand to be provided, Solent Gateway 2 can be connected via a BSP but network reinforcements may be needed

Fleet

- Winchester, Aldershot and Petersfield are marked as AI Growth Zones
- Current network infrastructure has areas where there is a capacity shortfall, and secondary transformers are marginally overloaded, overlapping slightly
- Few substations in Fleet are currently suitable to connect the demand of a mid-size AI data centre – a new connection substation would almost certainly be required

Lovedean

- A 50 MW large solar development has been identified in this region
- Current network infrastructure has areas where there is a capacity shortfall, and secondary transformers are marginally overloaded, - these do not overlap
- Major connection works are needed to accommodate the proposed 50 MW solar farm

Potential Gaps in Generation Capacity

- Comparing the ECR and the REPD with the capacity available under SSEN's planned infrastructure, highlights where network or supplier shortfalls may exist

Difference between planned capacity and projected network capacity (MW)

Nursling	ECR	REPD	Fleet	ECR	REPD	Lovedean	ECR	REPD
Baseline	-8.8	124.6	Baseline	-215.7	-276.2	Baseline	-329.5	-389.6
2030	4.9	984.7	2030	-520.3	246.8	2030	-266.5	170.9
2050	458.7	-238.3	2050	-278.9	-1168.9	2050	-217.6	-362.6

Note: -ve means supplier shortfall (infrastructure > supplier), and +ve means more planned capacity than what the network can handle (infrastructure < supplier)

- In conclusion:
  - Nursling: Excess generation in 2030 and 2050 to achieve Holistic Transition decarbonisation scenario
  - Fleet, Lovedean: Generation shortfall in 2030 and 2050 to achieve Holistic Transition decarbonisation scenario

Demand vs Generation

- Summary:
  - There is a current network constraint in Fleet
  - Network capacity is greater than consumer demand in 2030 and 2050
  - To meet SSENs Holistic Transition decarbonisation targets, additional renewable generation may be required

Breakdown of Demand vs Generation (MW)

Nursling	Generation supply (Embedded Capacity Register)	Network (SSEN Generation Capacity)	Consumer (Demand)
Baseline	299	307	266
2030	620	615	284
2050	2297	1838	599
Fleet	**Generation supply (ECR)**	**Network (SSEN Generation Capacity)**	**Consumer (Demand)**
Baseline	295	511	669
2030	613	1133	714
2050	2270	2549	1647
Lovedean	**Generation supply (ECR)**	**Network (SSEN Generation Capacity)**	**Consumer (Demand)**
Baseline	314	643	440
2030	538	804	460
2050	1120	1338	974

Future steps

- **Phase 4:** *Enabling strategic energy planning. High-level analysis to understand how current grid constrains intersect with projected energy demand and development:*
  - Pinpoint key areas of impact and identify practical solutions to support the region's growing electricity needs and renewable energy ambitions
  - Identify key solutions and recommendations to enable better planning for development, transport, and renewable energy deployment
  - Alignment of national reforms and opportunities will be identified to make sure Hampshire is positioned to benefit from national energy reforms

This will shape our Strategic Report. Upon completion of that report, we will deliver a knowledge transfer session in the final workshop designed to equip local authorities with the knowledge and tools to advocate for and implement energy solutions effectively.

Jacobs

Challenging today.
Reinventing tomorrow.

Appendix

Summary of projects in each LA

Local Authorities	Notes
Eastleigh	They plan to develop a green energy scheme at One Horton Heath which will include a solar farm and a ground source heat pump network
New Forest	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.
Southampton	1. New developments will be required to generate a certain fraction of their energy demand from on-site renewable generation. 2. The Council has also initiated several projects to expand electric vehicle infrastructure in support of this target, including: a) an electric vehicle trial for private hire cars and taxis; b) ongoing rollout of electric vehicle charge points across the city; electrification of the council's vehicle fleet; c) and a commitment to zero emissions from public transit by 2030 as detailed in their Green City Plan 2030. 3. They have also installed solar panels on the Sea City Museum as part of the Council's Corporate Assets Decarbonisation Scheme
Test Valley	1.The Council was awarded funds through the UK Shared Prosperity Fund to support decarbonisation projects in partnership with Community Energy South and part of this is set to be used for a Net Zero Business Service to support rural businesses to decarbonise. 2.Additionally, the Council has secured funding through the Public Sector Decarbonisation Scheme to decarbonise heating in council-owned buildings 3. The Council are developing their new local plan with development for the most part split between the Andover area in the North and the Romsey area in the South. They anticipate the largest site allocation to be approximately 1,100 dwellings. 4. They have also received funding to progress feasibility studies for a heat network in Andover town centre and are looking at the possibility of a wider heat network zone.
Winchester	1. Working with local businesses and procurement teams to decarbonise freight fleets and investing in EV charge points to decarbonise private cars. The EV strategy proposes locations for 46 charge points in council car parks, and so far, 35 have been installed. 2. The Council has also recently launched its first electric waste vehicle. Instavolt also launched the UK's largest rapid-only EV charging Super Hub off the A34 in Winchester in March 2025. It will be powered by on-site PV and energy storage. 3. The Council has also committed to developing a local area energy plan (LAEP) as a priority action and is in the process of creating the first digital LAEP in collaboration with Scottish and Southern Electricity Networks Distribution and Advanced Infrastructure Technology Limited, using the Local Net Zero Accelerator (LENZA) tool. Part of this will include the development of a renewable energy generation plan. The Carbon Neutrality Action Plan sets an objective to develop an additional 203MW of renewable energy across the Winchester district.
Fareham	They are investigating opportunities to improve the energy efficiency of their buildings, running a bio-fuel trial for their garden waste collection vehicles, exploring opportunities to convert their vehicle fleet to ultra-low emission, including electrification. More broadly, the council plans to install EV charge points in car parks, funding carbon reduction measures in their community centres, signposting residents to retrofit funding and exploring the feasibility of potential options for a solar farm.

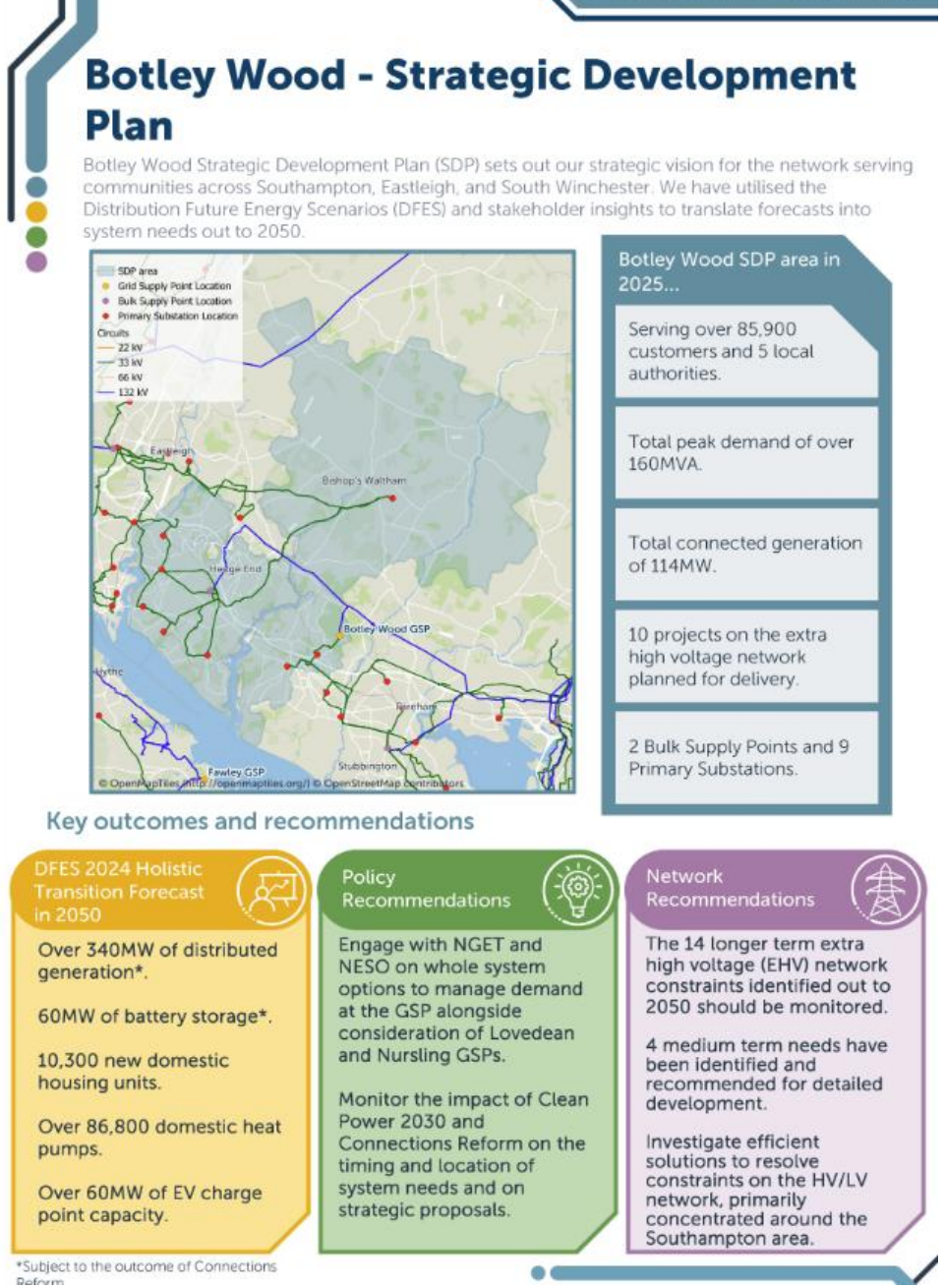
Summary of projects in each LA

Local Authorities	Notes
Portsmouth	The Council has a clean air zone and is rolling out on street electric vehicle charging, including 320 new charge points across 2025. The local plan encourages the use of heat networks in schemes of over 250 dwellings. The Council supports the roll out of the Green Homes Grant Local Authority Delivery (GHG-LAD) and Home Upgrade Grant (HUG) schemes to retrofit domestic properties.
Basingstoke & Deane	1. The Council has recently adopted its EV Charging Strategy and has been rolling out chargers in car parks, with a proposal for a facility to be operated by Gridserve on Council land. The Council is also working with the County Council for delivery of on-street chargers and are doing a phased electrification of their vehicle fleet and working with public transport operators to look at the longer-term electrification of their fleets. 2. The Council has undertaken sustainability audits of their building assets and are rolling out decarbonisation plans. This included commissioning a Solar Panel Study of PV potential for all non domestic rooftops larger than 30 m2. They are also carrying out domestic energy surveys and signposting support for retrofit. There are three community energy companies in the borough who have received grant funding to help get projects off the ground, and the council has been rolling out Solar Together schemes.
Hart	The council is working with Hampshire County Council on expanding the electric vehicle charge point network. The Council has started to deliver public electric vehicle charge points in its town/village centre car parks across the district. The Cycle and Car Parking in New Development supplementary planning document, provides guidance on electric vehicle charge points for developers which requests compliance with Part S of building regulations. The Council is taking a fabric-first approach to upgrading their buildings and feasibility studies are underway to determine whether heat pumps can be used. Whilst there are no plans to build new district heat networks, the Council is undertaking research to understand whether this would be an option in the future.
East Hampshire	The Council has already rolled out five electric vehicle charge points in the borough and has committed to developing an EV strategy as part of the net climate and environment strategy delivery plan. This is likely to look at centralised locations like car parks for deployment.
Rushmoor	The Council details 12 priority actions, including electrifying their vehicle fleet and collaborating with Hampshire County Council on electric vehicle infrastructure rollout.
Havant	The council works in partnership with the Solar Together scheme and has undertaken a Heat Network Feasibility Study.
Gosport	The council has already installed 30 charging points in 7 Council-owned car parks and the local plan has a policy requirement for an EV charge point for each new dwelling and a charge point for every five non-residential parking spaces. The Council has a rolling programme of work to keep Council houses up to date and aspires that in the future this will include the installation of low carbon technologies.
Isle of Wight	Cannot access the Fawley SDP

Botley Wood SDP Summary

- Located in Whiteley, Winchester District
- Impacting Eastleigh, Fareham, and Winchester local authorities:

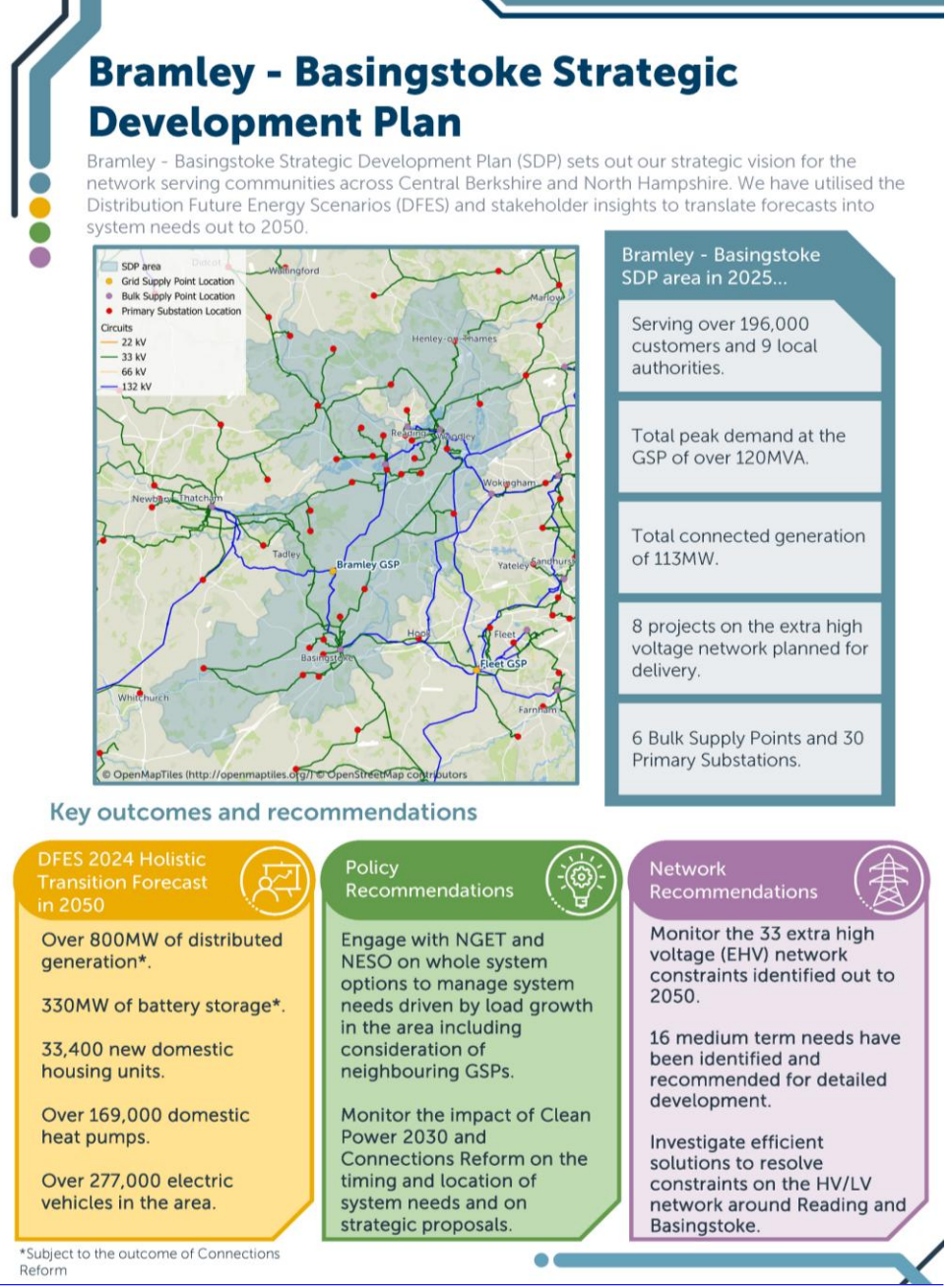
- Areas of concern for 2035 are Bitterne and Netley Common (due to primary transformers overloading)
- Many secondary transformers are overloaded by 2030 & 2050
- Assist Lovedean and Nursling GSPs as supply grows in the Southampton region



Bramley-Basingstoke SDP Summary

- Located in Pamber, Basingstoke and Deane, Deane
- Impacting Basingstoke and Deane, and Hart local authorities:

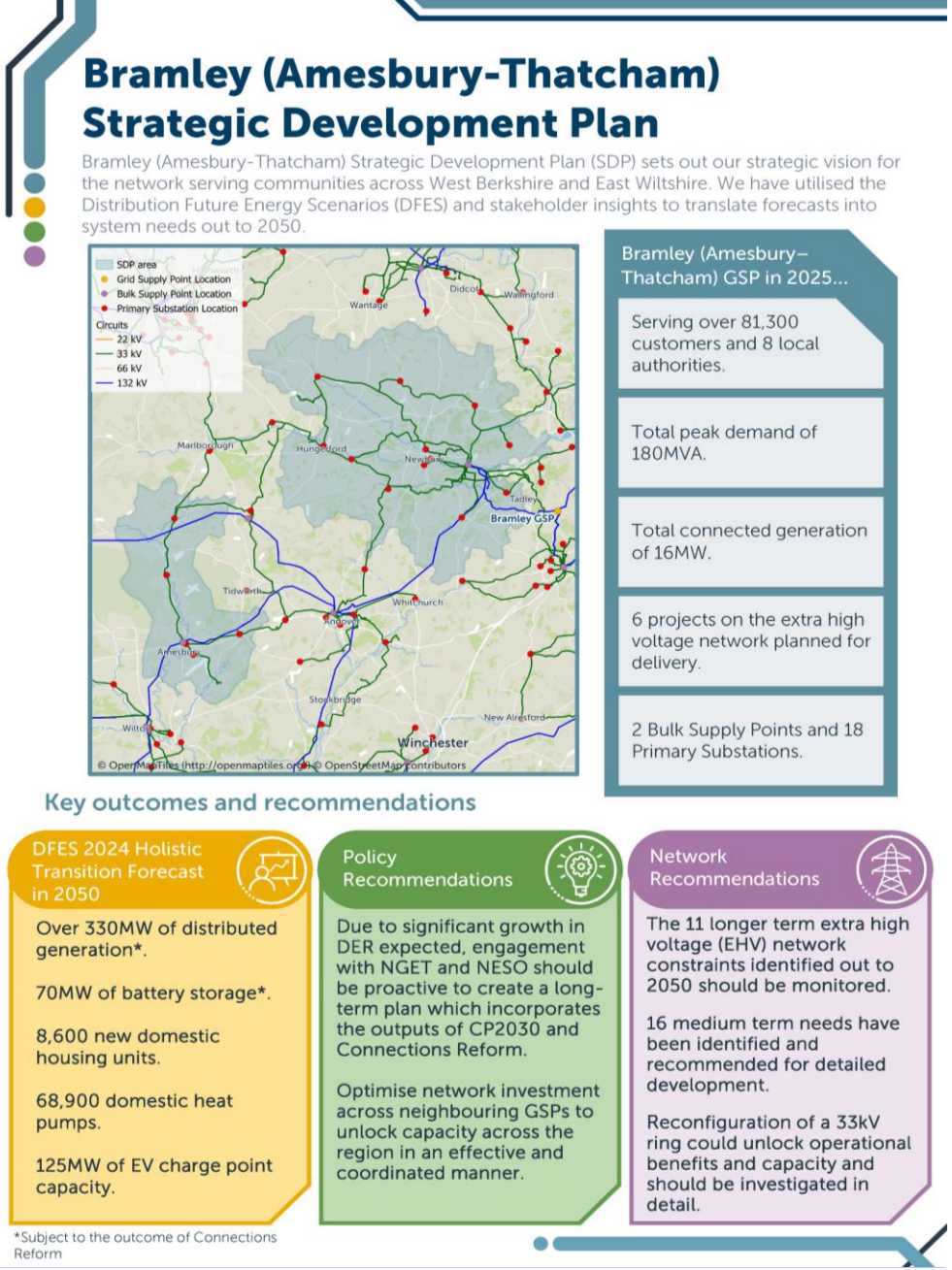
- Areas of concern for 2030 around Reading and Basingstoke mainly from circuits overloading
- Engagement with NGET and Fleet GSP team
- Motorway Service Areas may increase demand



Bramley (Amesbury- Thatcham) SDP Summary

- Located in Pamber, Basingstoke and Deane, Deane
- Impacting Basingstoke and Deane, and Test Valley local authorities:

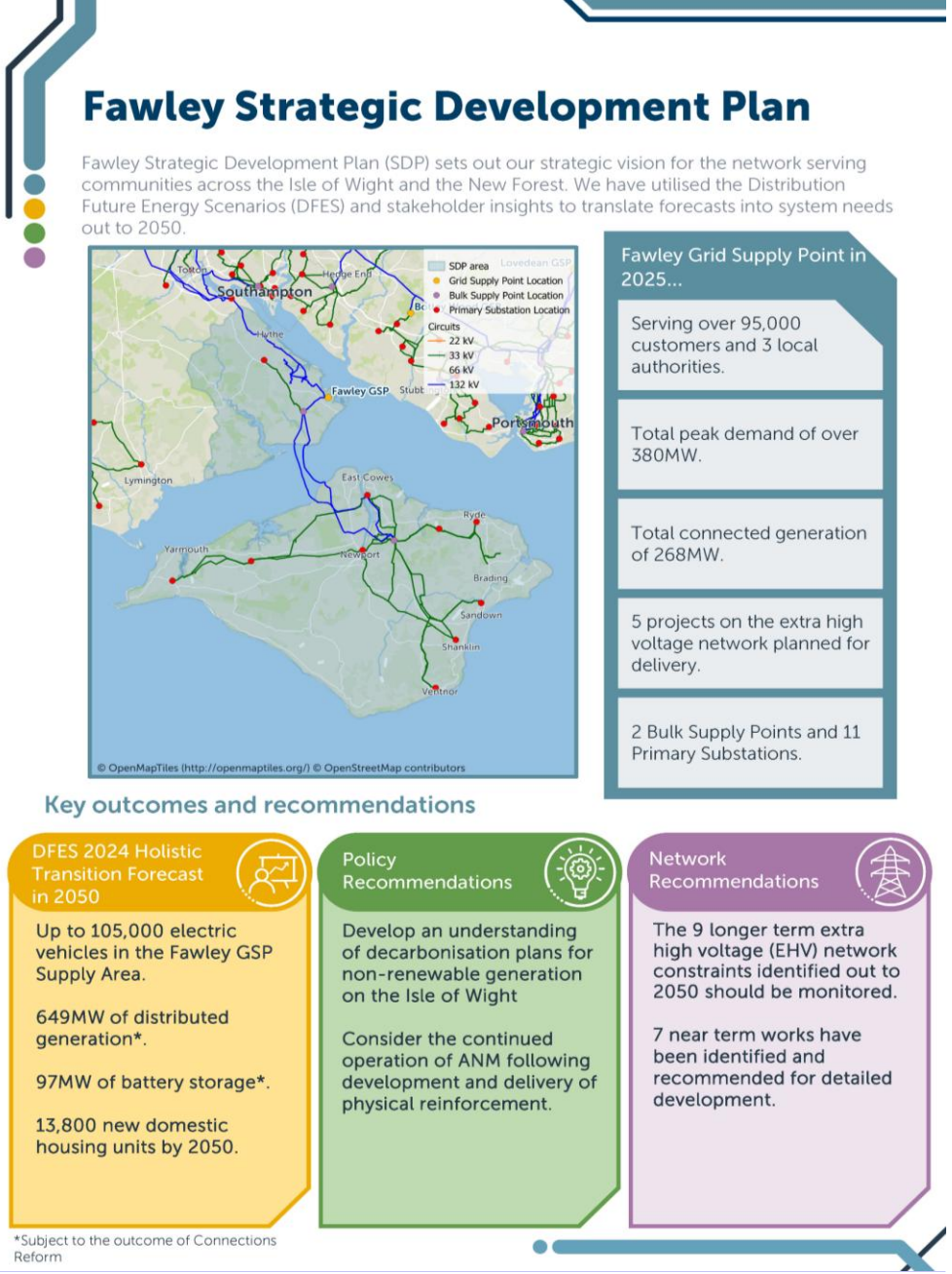
- Areas of concern; Love Lane, Riverside, Thatcham, Ratfyn (due to transformer overloading)
- Reconfiguration of 33kV ringed circuit connected to multiple PSS
- DER expansion requires stakeholder engagement with NGET



Fawley SDP Summary

- Located in New Forest, Hampshire
- Impacting New Forest local authority and Isle of Wight:

- Potential to add additional cable between Isle of Wight and mainland
- Areas of concern include Sandown, Cowes, Ryde (due to transformers overloading)
- Low Carbon Technology stakeholder engagement

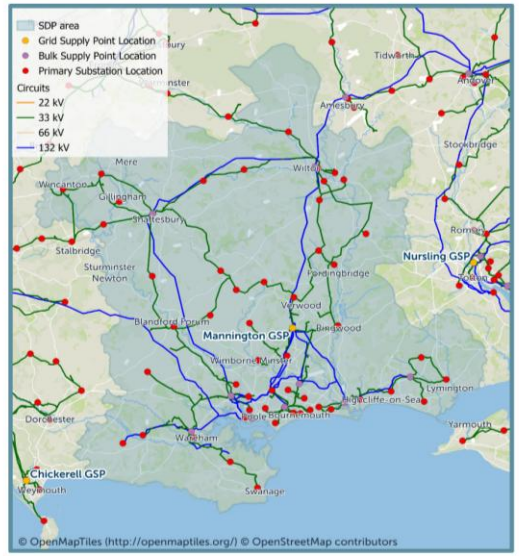


Mannington SDP Summary

- Located in Wimborne Minster
- Impacting New Forest and Test Valley local authorities:
  - Stakeholder expectations i.e. engaging with maritime and industrial industries due to their decarbonisation
  - DER expansion and economic growth should be monitored closely
  - Investigation of system needs

Mannington Strategic Development Plan

Mannington Strategic Development Plan (SDP) sets out our strategic vision for the network serving communities across the Southcoast. We have utilised the Distribution Future Energy Scenarios (DFES) and stakeholder insights to translate forecasts into system needs out to 2050.



Mannington Grid Supply Point in 2025...

- Serving over 410,000 customers and 5 local authorities.
- Total peak demand of over 590MW.
- Total connected distributed energy resources of 489MW.
- 31 projects on the extra high voltage network planned for delivery.
- 10 Bulk Supply Points and over 57 Primary Substations.

Key outcomes and recommendations

DFES 2024 Holistic Transition Forecast in 2050

Projected installed solar PV generation capacity of 1840MW at Mannington GSP*.

682MW of battery storage*.

331,991 domestic heat pumps.

48,088 new domestic housing units by 2050.

Policy Recommendations

Understand maritime decarbonisation impacts on electricity demand.

Identify future substation sites early through proactive engagement with local authorities and landowners.

Coordinate with NGET and NESO to develop a long-term plan for DER growth.

Network Recommendations

The 28 longer term extra high voltage (EHV) network constraints identified out to 2050 should be monitored.

27 near term works have been identified and recommended for detailed development.

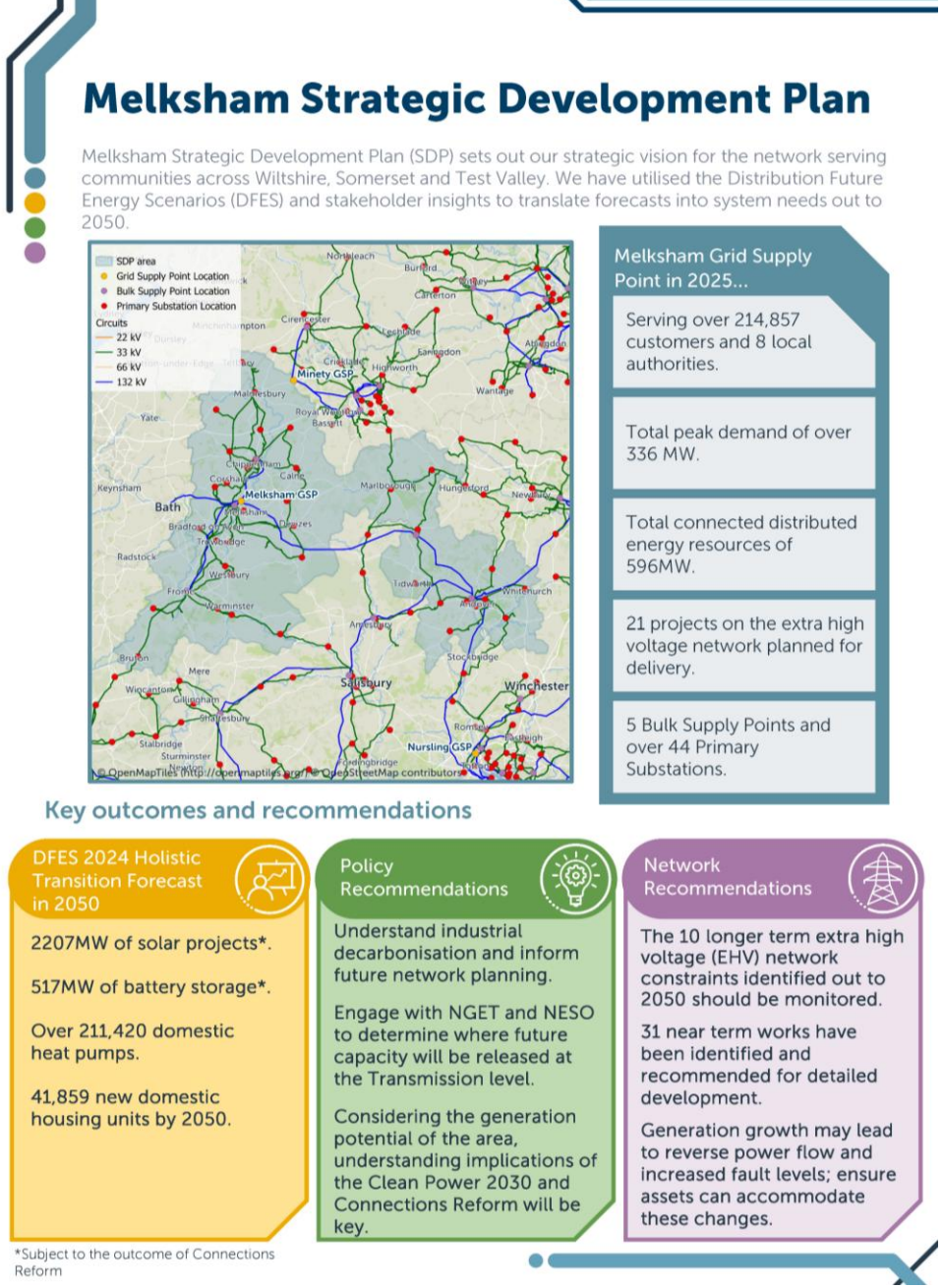
Monitor distributed generation growth to ensure that network assets can accommodate higher reverse flows and increased fault levels

*Subject to the outcome of Connections Reform

Melksham SDP Summary

- Located in Melksham Without, Wiltshire
- The Majority of the area supplied by Melksham is outside of Hampshire, but it does supply the Test Valley local authority:

- DER expansion requires stakeholder engagement with NGET
- Investigation of system needs
- Electrification of road travel needs to be investigated (previously mentioned in DFES building blocks)



Heat Pumps Demand Analysis Assumptions

- The power coefficient for heat pumps per sqm for a commercial building with average insulation is 70 W/sqm [1].
- The thermal capacity for an average domestic heat pump is 10 kW [2] [3].
- Heat pump coefficient of performance (COP) is assumed to be 3.5 [4]. This is between the range for air and ground heat pumps.
- Diversity factor chosen is 0.7 (70% of heat pumps running at the same time is assumed to be peak)

$$MW_{electrical} = \frac{Number\ of\ heat\ pumps \times (Thermal\ capacity \div COP)}{1000}$$

$$MW_{electrical} = \frac{Area \times Heat\ coefficient}{1000 \times COP}$$

Sources:

[1] How to Size a Heat Pump: Step-by-Step Guide with Calculations

[2] What Size Heat Pump Do I Need in the UK? | Sizing Guide

[3] What size air source heat pump does my home need? – OVO

[4] What Is COP in Heat Pumps and Why Does It Matter? – ScienceInsights

Nursling - SDP Heat Pumps Demand Information

- The SDP data presents the heat pump demand from the number of units (for domestic properties) or the m^2 heated (for non-domestic)
  - The table shows the min and max scenarios

Electrification of heat					
	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Domestic (Number of units)					
Domestic direct electric heating	29000	29000	36000	28000	25000
Domestic heat pumps	2700	7600	45000	12000	139000
TOTAL	31700	36600	81000	40000	164000
Non-Domestic (m^2 heated)					
Non-domestic heat pumps	28000	177000	1940000	683000	2270000
TOTAL	28000	177000	1940000	683000	2270000

Fleet - SDP Heat Pump Demand Information

- The SDP data presents the heat pump demand from the number of units (for domestic properties) or the m^2 heated (for non-domestic)
  - The table shows the min and max scenarios

Electrification of heat					
	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Domestic (Number of units)					
Domestic direct electric heating	45000	44000	65000	43000	52000
Domestic heat pumps	7700	21000	114000	35000	396000
TOTAL	52700	65000	179000	78000	448000

Non-Domestic (m^2 heated)					
Non-domestic heat pumps	63000	862000	4380000	1260000	8270000
TOTAL	63000	862000	4380000	1260000	8270000

Lovedean - SDP Heat Pump Demand Information

- The SDP data presents the heat pump demand from the number of units (for domestic properties) or the m^2 heated (for non-domestic)
  - The table shows the min and max scenarios

Electrification of heat					
	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Domestic (Number of units)					
Domestic direct electric heating	40000	39000	60000	39000	43000
Domestic heat pumps	2800	11000	82000	21000	271000
TOTAL	42800	50000	142000	60000	314000
Non-Domestic (m^2 heated)					
Non-domestic heat pumps	28295	557000	3070000	863000	6360000
TOTAL	28295	557000	3070000	863000	6360000

EV Peak Demand Analysis Assumptions

- For EV analysis, we used ONS data for households in districts [1] and multiplied by Hampshire's estimate of vehicle per household of 1.39 [2]. After, the vehicles per district used the same area percentage to get the cars within a GSP supply area. Then average charger capacity of 7 kW was used [3] to obtain a total demand of all EVs and multiplied by a diversity factor to get a more accurate peak demand.
- Diversity factor chosen is 0.7 (70% of EVs charging at the same time is assumed to be peak)

[1] Population projections - Office for National Statistics

[2] Number of cars or vans - Census Maps, ONS

[3] LCT Connections - Primary Substation - SSEN Distribution Data Portal

Nursling - SDP EV Demand Information

- The SDP data presents the EV capacity from the number of units (for domestic properties) or the MW provided (for non-domestic). SDPs do not display demand data, instead they show potential capacity increases by MW or number of units
  - The table shows the min and max scenarios:

Transport Electrification19973.					
Units – no. of units	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Domestic EV Chargers	19,974	26,621	114,762	48,125	160,969

Transport Electrification					
Units - MW	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Car parks	1.8	4.5	25	4.2	8.5
Destination	3.1	3.9	9.4	5	8.2
Domestic on-street	1.7	8.9	58	20	79
En-route / local charging stations	0.85	6.9	60	9.3	38
En-route national network	7.5	11	44	17	47
Fleet/Depot	0.25	3.7	36	7	41
Workplace	1.1	8	64	15	51
TOTAL	16.3	46.9	296.4	77.5	272.7

Fleet - SDP EV Demand Information

- The SDP data presents the EV capacity from the number of units (for domestic properties) or the MW provided (for non-domestic). SDPs do not display demand data, instead they show potential capacity increases by MW or number of units
  - The table shows the min and max scenarios:

Transport Electrification					
Units – no. of units	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Domestic EV Chargers	57,801	77,248	316,782	135,309	431,782

Transport Electrification					
Units - MW	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Car parks	3.8	9	51	8.5	17
Destination	8.4	10	24	13	21
Domestic on-street	2.8	16	110	37	153
En-route / local charging stations	2.8	14	112	18	71
En-route national network	22	27	69	34	72
Fleet/Depot	0.46	4.9	65	11	74
Workplace	4.5	19	135	33	109
TOTAL	44.76	99.9	566	154.5	517

Lovedean - SDP EV Demand Information

- The SDP data presents the EV capacity from the number of units (for domestic properties) or the MW provided (for non-domestic). SDPs do not display demand data, instead they show potential capacity increases by MW or number of units
  - The table shows the min and max scenarios:

Transport Electrification					
Units – no. of units	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Domestic EV Chargers	33,507	45,672	209,616	85,294	296,019

Transport Electrification					
Units - MW	Baseline	Counterfactual		Holistic Transition	
	2026	2030	2050	2030	2050
Car parks	1.3	4	25	3.7	8.1
Destination	4.3	6.8	23	9.7	19
Domestic on-street	3	16	106	36	146
En-route / local charging stations	0.92	6.8	63	9.1	39
En-route national network	1.7	1.8	2.4	1.8	2.2
Fleet/Depot	0.27	2.9	38	6.5	44
Workplace	1.5	11	89	21	72
TOTAL	12.99	49.3	346.4	87.8	330.3

Spatial Analysis Assumptions

- Using dwelling data and SSEN calculator, the After Diversity Maximum Demand (ADMD) can be calculated for each district. Please note that SSEN uses number of properties, not number of dwellings. Two calculators are given from SSEN; one for less than 20 properties per district [1], and one for 20 to 100 properties per district [2]
- There is a dwelling calculator online that estimates via dwellings up to 500 dwellings – this will be used as it relates to the provided information [3]. In few cases of more the 500 dwellings, the remaining value will be added (i.e. 600 dwellings = 500 dwellings value + 100 dwellings value)
- Single phase was use for peak demand analysis as this is for residential areas

Sources:

[1] Demand calculator – SSEN

[2] ADMD calculator - LCT Ready Housing Developments - SP Energy Networks

[3] Maximum Demand Calculator UK | Free Tool | Electrical Tools & Calculators

Nursling - Spatial Analysis Information

- Using the spatial analysis data provided, we have displayed 2030 and 2050 development expansion within the GSP area
- All small sites (less than 10 dwellings) are assumed to be completed by 2030

Summation of new Dwellings per District

District	2030 Dwelling	2050 Dwelling
Eastleigh	2302	3482
New Forest	389	2521
New Forest National Park	155	155
South Downs National Park	22	31
Southampton	3024	4530
Test Valley	821	1874
Winchester	783	2045
TOTAL	7496	14638

Fleet - Spatial Analysis

- Using the spatial analysis data provided, we have displayed 2030 and 2050 development expansion within the GSP area.
- All small sites (less than 10 dwellings) are assumed to be completed by 2030

Summation of new Dwellings per District

District	2030 Dwelling	2050 Dwelling
Basingstoke and Deane	72	72
East Hampshire	1666	3599
Hart	1315	1974
Rushmoor	2321	4187
South Downs National Park	493	601
Winchester	266	358
TOTAL	6133	10791

Lovedean - Spatial Analysis Information

- Using the spatial analysis data provided, we have displayed 2030 and 2050 development expansion within the GSP area
- All small sites (less than 10 dwellings) are assumed to be completed by 2030

Summation of new Dwellings per District

District	2030 Dwelling	2050 Dwelling
East Hampshire	604	1106
Fareham	2336	9435
Gosport	847	1485
Havant	961	1770
Portsmouth	928	3220
South Downs National Park	6	6
Winchester	717	1124
TOTAL	6399	18146

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Reinventing tomorrow.