University of Southampton

Business South

Clean Energy South

An evidence-based exploration of decarbonising energy in Hampshire and the Solent

Acknowledgements

This report has been produced by academics at the University of Southampton as a Civic Impact Project in partnership with Business South.

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Executive *Summary*

Overview

Clean Energy South is an alliance of individuals and organisations from across the private, public and voluntary sectors with a shared interest in supporting a positive transformation to sustainable sources of affordable energy for the benefit of business, industry, public services and residents across the region of Hampshire and the Solent.

This report summarises the region's current energy demand and capacity and identifies the opportunities and challenges for Hampshire and the Solent presented by the decarbonisation agenda.

Challenges and Opportunities

Hampshire and the Solent faces an energy deficit. The renewable energy generated in the region only meets 8%[1] of demand, leaving it heavily dependent on imported energy and vulnerable to volatile global markets. For every £1 spent on electricity, 92p leaves the region (Ridett & Anderson, 2023a), in an area already affected by high energy prices; 10-15% of households in Portsmouth experience fuel poverty[2]. Without significant intervention, the region will fail to meet its 2050 net-zero target, and energy costs will remain subject to market fluctuations. At the same time, future demand is projected to increase dramatically due to the electrification of heat and transport, with scenarios suggesting rises between 93% and 144% by 2050[3]. Meeting this demand while achieving decarbonisation requires infrastructure investment and policy reform.

However, the region possesses untapped renewable potential which could transform it into a net exporter of green energy, generate new jobs, reduce energy bills, and contribute to the region's £81bn annual economic output (The Solent Cluster, 2025). Offshore wind, solar farms, and rooftop solar offer the potential to more than meet current demand.

Working at the regional level brings economic, social and environmental benefits. Research indicates that regional approaches to net zero deliver four times more economic and social value than centralised strategies, with green energy investments yielding an economic multiplier of 1.19 compared to 0.65 for fossil fuels[4].

Barriers to Transition

Realising the region's potential, will require overcoming a number of technical, economic and social barriers. The primary constraint is grid capacity. Up to half of the region's primary substations would overload in high-renewables scenarios without immediate upgrades. The investment needed to address this is between £5bn to £12bn (Ridett & Anderson, 2023a). There is also the issue of social acceptance of the infrastructure developments needed. A "trust gap" exists between communities and industrial developers, exacerbated by feelings of exclusion from decision-making. Developing the necessary renewable energy projects requires community trust and engagement. To fully benefit from the clean energy transition, the region needs to tackle its skills shortage. The region faces a significant deficit in "green collar" workers, particularly retrofit installers and high-voltage engineers, threatening to slow the transition.

Key Findings

This report includes a number of key findings on the economic, environmental and social benefits for the region from the clean energy transition:

- Economic: The cost of inaction exceeds the price of the transition. The Climate Change Committee estimates a return of £2.20-£4.10 for every £1 invested in net zero; unchecked climate change could reduce UK GDP by 8% by the early 2070s. For Hampshire and the Solent, for every £1 spent on electricity, approximately 92p leaves the regional economy to pay for power generated elsewhere.
- Environmental: A successful transition could reduce emissions by more than 5 MtCO2e/year (The Solent Cluster, 2025) and deliver public health benefits through improved air quality.
- Social: The transition offers skilled jobs and potential energy bill reductions, but needs to be managed fairly to avoid increasing energy inequality.

[1] Ridett, E and Anderson, B (2023a)
[2] https://www.portsmouth.gov.uk/services/health-and-wellbeing/joint-strategic-needs-assessment/poverty-and-cost-of-living/
[3] Ridett, E and Anderson, B (2023a)
[4] Batini, Nicoletta et al Building back better: How big are green spending multipliers? - ScienceDirect

Recommended Actions

The report sets out 12 policy options, which can be grouped into four categories:

Practices: Regulation

- Adopt "Net Zero Ready" building standards for Freeport developments
- Mandate rooftop solar on new builds
- Enable SME energy cooperatives through Power Purchase Agreements

Infrastructure:

- Prioritise upgrading the 20 substations with the most potential for growth
- Designate Wind Priority Areas
- Accelerate offshore wind development
- Transition from Blue to Green Hydrogen

Community Engagement:

- Implement Community Municipal Investments
- Embed communities in governance and decision-making
- Introduce Local Electricity Discount Schemes and Social Tariffs to protect vulnerable households

Skills Development:

- Establish a Hampshire and Solent Energy Academy
- Provide green training for current energy sector employees

Summary

The overall message of this report is that while the region faces significant energy challenges, it possesses untapped potential which could go a long way to meeting its needs. Through policy reform, community engagement and infrastructure investment there is an opportunity for a clean energy transition which brings economic, social and environmental benefits to the region.

The Solent Cluster. (2025). Solent Local Industrial Decarbonisation Plan (Solent LIDP) Transitioning Pathways Version 1.

Background

The Hampshire and Solent region currently relies heavily on carbon energy.

Only 706 MW of renewable energy, accounting for just 8% of demand, is produced locally (Ridett & Anderson, 2023a). This leaves the region highly dependent on energy imports and increases its vulnerability to volatile global markets (Ridett & Anderson, 2023a). Some business-as-usual scenarios suggest that without significant changes to energy policies, the region will fail to meet the net zero emissions target by 2050, and costs for both residents and businesses will remain subject to market fluctuations.

In this analysis, we look at possible approaches for increasing the region's energy generation through renewables, in particular through the development of offshore wind and local solar power. If successful, this could help meet the region's net-zero target and make it a net exporter of green energy. In the long-term such a shift could reduce energy bills for residents and local businesses and bring income and green-skilled jobs to the region. This potential for renewables growth in the region – which has been quoted as much as nearly three times above current levels - is primarily limited by grid infrastructure; up to half of primary substations would overload in a high-renewables scenario without immediate upgrades (Ridett & Anderson, 2023b).

However, the transition to a low-carbon economy requires not only technical solutions, but also social acceptance. The lack of a workforce with the right skills, fuel poverty, and local opposition to energy installations, and a lack of trust between local communities and industrial companies can all restrict the transition to green energy. The importance of community support for infrastructure has been demonstrated by the impact of opposition to projects such as the Aquind Interconnector (a proposed route of cables tunnelled under community facilities and protected habitats which were opposed by locals), and Fawley Carbon Capture CO2 Pipeline Plan (where residents on the Isle of Wight and in the New Forest campaigned against the plans to build a pipeline to store carbon under the English channel) (Stop Aquind, 2025; BBC News, 2024).

Transitioning to more renewable energies can support economic resilience, better health, and energy autonomy for the region's communities. The collaborative approach recommended in this report, coupled with the region's strength in scientific excellence and innovative industrial sectors, can help support the clean energy transition. The report suggests a number of policy, infrastructure, energy efficiency, and community-based proposals which, in conjunction with wider reforms, could help create an enabling business environment to unlock the region's potential, reduce emissions, accelerate decarbonisation, and create sustainable economic growth, bringing benefits for local communities and energy producers and consumers.

Only 706 MW of renewable energy, accounting for just 8% of demand, is produced locally

(Ridett & Anderson, 2023a).

1

The National and Regional *Energy Perspective*

The potential for energy transition at the regional level is heavily influenced by a national policy landscape that has historically been prone to frequent changes and a climate of uncertainty.

The UK's Modern Industrial Strategy, published in the summer of 2025, sets out a ten-year plan for the shift to a decarbonised economy and, in principle, provides the necessary longer-term certainty for business and policy makers. It marks a clear move towards a proactive, place-based economic model that enables local authorities and Mayoral Strategic Authorities to create regional clusters of excellence. The government has identified eight high-growth sectors as priorities, including Clean Energy Industries, Advanced Manufacturing, and Digital and Technologies. The sector plan for clean energy industries includes the aim of "unleashing the full potential of our city regions, nations and clusters" and recognises the "growth potential of clean energy innovation, supply chain scale-up, and deployment".

For the Hampshire and Solent region, the strategy offers crucial support for deploying renewable infrastructure. By presenting decarbonisation as not only a climate necessity but also a key driver for economic growth and regional improvement, the Modern Industrial Strategy aims to create a funded national framework for the energy transition. It commits to doubling investment in Clean Energy Industries by 2035, backed by Great British Energy and the growth of Investment Zones. Additionally, the strategy confronts the grid bottlenecks, which are one of the barriers to green energy in the Hampshire and Solent region.

> **"Decarbonisation [is] not only a climate necessity but also a key driver for economic growth and regional improvement."**

It proposes significant planning reforms, such as expanded permitted development rights, a 13-week target for planning decisions by ministers, and the ability to reserve future grid capacity for strategic investments.

At the national level, revisions to the National Planning Policy Framework (NPPF) in December 2024 have improved prospects for renewable generation. The changes lifted the ban on the development of onshore wind and allowed solar and wind projects under 100MW to bypass the lengthy Nationally Significant Infrastructure Project (NSIP) process in favour of quicker local planning routes (Ministry of Housing, Communities and Local Government, 2024). The Planning and Infrastructure Act 2025, and supporting measures such as the Spatial Development Strategies, are aimed at making the delivery of critical infrastructure, including electricity networks and clean energy generation, faster and more predictable.

Despite these developments at the national level, regional decarbonisation policy remains closely tied to the government's Industrial Cluster strategy which currently backs the ongoing extraction and use of fossil fuels by promoting Blue Hydrogen (hydrogen produced from natural gas) and Carbon Capture and Storage (CCS) at major sites like the Fawley refinery (The Solent Cluster, 2025). While industry stakeholders argue that this is necessary to secure energy supply and protect jobs in heavy industries, local climate authorities caution that funding fossil-fuel-derived hydrogen could distract from the urgent need for zero-carbon technologies (Southampton Climate Commission, 2024). The green-energy transition also faces a lack of workforce readiness. Recent regional plans, such as the New Forest Skills Action Plan 2025-2030 and the Solent Local Skills Improvement Plan (LSIP), have pointed out significant shortages in green collar roles such as retrofitting and high-voltage engineering. These shortages have led to calls for government-supported, employer-led "Green Skills Bootcamps" (New Forest District Council, 2025; Hampshire Chamber of Commerce, 2026).

2 Current and Future *Energy Demand*

2.1 The Current Deficit

The Hampshire and Solent region currently faces high energy demand and low local supply. In 2020, electricity use in the Hampshire and Solent area was approximately 7,520 GWh. Local renewable energy generation accounted for only 625 GWh - a self-sufficiency rate of just 8.3% (Ridett & Anderson, 2023a). For every £1 spent on electricity, approximately 92p leaves the regional economy to pay for power generated elsewhere. This often comes from gas-fired stations in other parts of the UK or from gas transported by boat from elsewhere, significantly raising costs and emissions.

The region's consumption pattern is largely industrial and urban. The cities of Southampton and Portsmouth are energy usage hubs with dense housing and port operations. In contrast, rural Hampshire has lower demand, but it is this part of the region that holds significant potential for renewable energy generation. This discrepancy between where energy is needed and where it can be generated requires a more effective distribution network and grid.

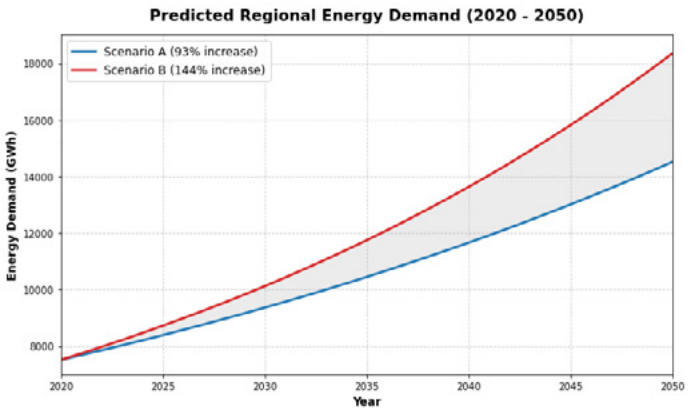
The region's current renewable capacity is currently heavily weighted towards solar energy, which makes up 88% of all local renewable energy generation (Ridett & Anderson, 2023a). While the "Sunny South" is well-suited to solar energy, a heavy reliance on solar can create problems due to its seasonal variability. In the summer, the region can generate extra energy during daylight hours but during winter months, when heating demand is at its highest, solar generation drops substantially. Without a varied mix that includes solar and off- and on-shore wind, the region will need to rely on fossil fuels as a backup in winter, causing a challenge for the green-energy transition and the delivery of net zero goals.

2.2 Potential Future Demand

Demand for electricity in the region is expected to increase significantly. The electrification of heat (the installation of heat pumps to replace gas boilers) and transport (electric vehicles replacing petrol cars) will fundamentally increase usage (Figure 1) (Ridett & Anderson, 2023a).

- Scenario A: Steady Progression. Even with moderate uptake of efficiency measures, demand is projected to rise by 93% by 2050 (Ridett & Anderson, 2023a).
- Scenario B: High Electrification. If the region aggressively pursues net-zero targets through electrification, demand could rise by 144%, reaching over 18.000 GWh/year (Ridett & Anderson, 2023a).

To meet this increased demand, and address the existing ~92% import deficit, the region will need to build and upgrade new infrastructure or face continued reliance on high-carbon imports (Ridett & Anderson, 2023a).



3 Current and Future *Renewable Capacity*

3.1 Current Capacity

The region currently generates 706MW of renewable energy, accounting for just 8.3% of the demand (Ridett & Anderson, 2023a). The relative contributions from renewable sources are as follows:

- Solar PV: 622 MW (88%)
- Landfill Gas/Biomass: 63 MW (10%)
- Onshore Wind: 17 MW (2%)

Area specific renewable capacities include Test Valley (185 MW), Winchester (97 MW), Isle of Wight (93 MW), and East Hampshire (50 MW). This mix is currently heavily weighted towards Solar and perhaps suggests barriers for others forms of renewable energy, such as restrictive planning restrictions.

3.2 Future Capacity

University of Southampton modelling highlights the technical potential of the region for energy generation (not taking account of restrictions from the grid and connectivity), i.e., what could be implemented if current constraints were removed. These include:

- Offshore Wind: The potential capacity is 2,479 MW, capable of generating 10,040 GWh/year. This single technology could meet 134% of the region's current demand.
- Solar Farms: Significant potential (51,361 GWh) but in practice this is limited by the competition for agricultural land.
- Rooftop Solar: 460 GWh of potential exists on roofs that are already built. This avoids land-use conflict.
- Onshore Wind: the potential for onshore wind plants is included in the local plans of Test Valley Borough Council and Basingstoke and Deane Borough Council. ABP is considering plans to erect wind turbines along the port area in Southampton .

With an initial investment of approximately £12bn, full-scale renewable potential includes:

- A single large offshore wind development = 134% of current demand.
- Utility solar full potential = 709% of current demand.
- Onshore wind = 57% of current demand.
- Full technical potential implementation = >940% of demand.

A cheaper initial approach is for Distribution Network Operators (DNOs) to address capacity issues through reinforcement, energy storage, or altering demand distribution by prioritizing areas identified with high available capacity and generation potential. The total available capacity for 149 substations in the region, if upgraded now, is approximately 2280 MW which would meet current demand.

Geothermal

In the late 1970s and early 1980s, the UK's Department of Energy launched a programme to explore the commercial potential of the country's geothermal aquifers. Two key exploratory wells were drilled in the region: one in Marchwood in 1981 and another in Southampton's city centre near the Western Esplanade. Drilling into the Triassic Sherwood Sandstone at a depth of about 1,700 to 1,800 meters, they successfully located a geothermal reservoir with brine temperatures ranging from 70°C to 76°C. However, the government decided that the flow rates, around 20 to 30 litres per second, were too low for large-scale electricity and heat generation, and the initiative was not pursued. Instead of sealing the well, Southampton City Council took over the project and established the UK's first geothermal district heating scheme. Pumping began in 1986, initially serving just the Southampton Civic Centre.

Today, the Southampton District Energy Scheme stands as the largest and most successful commercially developed district energy system in the UK (Bring Energy, n.d.; UK Parliament Committees, 2023). Operated by Bring Energy in partnership with the City Council, the scheme has grown far beyond its initial goal. It uses the 1,800-meter-deep geothermal well, providing about 2 MW of thermal energy. To meet the city's increasing demands, it evolved into a "trigeneration" system, supplying heating, cooling, and electricity. This was achieved by adding a 7 MW Combined Heat and Power (CHP) plant, a 1 MW biomass facility, and conventional backup boilers. The energy is distributed through a 14km network of well-insulated underground pipes. It serves over 1,000 residential properties and notable commercial sites, including the West Quay shopping centre, the BBC South TV studios, Solent University, the Royal South Hants Hospital, and the Leonardo Hotel. The scheme generates over 70 GWh of energy each year and helps the city save an estimated 10,000 to 12,000 tonnes of CO_2 annually, providing a reliable energy source.

While Southampton remains the only operational deep geothermal network in the area, the broader Hampshire and Solent region, especially around Havant and the New Forest, has some of the most accessible, proven geothermal resources in England (DESNZ, 2025; Geothermal Communities, n.d). The future of geothermal energy in the region points toward three potential developments: The original Southampton well was meant for exploration and not for maximising commercial electricity production. A major proposed upgrade, though with significant technical challenges, is to deepen the Western Esplanade well beyond its current depth of 1,800 meters to reach water closer to 100°C. Higher temperatures and increased flow rates would allow the plant to significantly enhance its electrical generation capacity along with its heat distribution. There is potential to drill new wells in areas like Havant to create localised district heating for new housing, offices, and large-scale agricultural greenhouses. In Southampton, discussions are ongoing about connecting separate geothermal plants, such as those at the hospital, university, and city centre, into a mutually supportive city-wide "heat loop." Future projects could link deep geothermal extraction with waste heat from heavy industries. For instance, a highly ambitious proposal involves capturing waste heat from the Marchwood Energy Recovery Facility (incinerator) and connecting it via an under-Solent pipeline to the Southampton heat network. Combining geothermal energy with industrial waste heat has potential, if financial and technical challenges can be overcome, to provide a strong, fossil-fuel-independent grid for the Solent region.

"the Southampton District Energy Scheme stands as the largest and most successful commercially developed district energy system in the UK."

Geothermal

4

Development Opportunities and *Transport Links*

4.1 The Grid

SSEN's constraint maps (SSEN, 2026) show that while the grid is full, "Flexible Connections" (Active Network Management) can provide a temporary solution. This allows constrained substations and generators to connect to the grid, increasing flexibility in energy distribution during peak times, and thereby avoid wasting energy. This simple change in grid usage and energy distribution improves efficiency and reduces costs significantly. This is a low-cost solution to a physical limitation in the current grid setup.

4.2 The Freeport

The **Solent Freeport** is a key tool for regional development. It has tax sites at Southampton Docks, Navigator Quarter, and Dunsbury Park, securing £638m in private investment (Solent Freeport, 2026) and contributes to the £81bn strong economy in Hampshire and the Solent. (https://democracy.hants.gov.uk/documents/s138341/Appendix%20Hampshire%20LGR%20Strategic%20Business%20Case.pdf). These sites provide an opportunity for the development of smart microgrids. By requiring all new infrastructure to have rooftop solar and battery storage, the Freeport could avoid over-reliance on the national grid, significantly reducing demand across the region, and lowering energy costs for both residents and businesses (Solent Freeport Consortium 2026). The development of the Freeport also has the potential to reduce emissions in the transport sector, particularly road and maritime. The Freeport's success will depend on the efficiency of Solent Gateway rail links; moving freight from road to rail, particularly electrified rail, can reduce diesel emissions in the region. Cruise ships running their diesel engines while in port significantly raises local NO2 levels, but a local grid connection could help to address this as well as providing health benefits.

4.3 The Urban Landscape and Local Power Plan

Corroborating the problem of grid constraints across the wider region, Whitehead (n.d.) explores issues relating to infrastructure in Southampton's city centre. Whitehead highlights findings from an August 2024 University of Southampton report by Professor Bakr Bahaj, which projected that in the future Southampton would effectively run out of power, as demand from users exceeds local primary substation capacity. This report suggests a number of potential solutions, with varying degrees of complexity, including: establishing a city-wide aggregated rooftop solar programme; deploying onshore wind at the eastern docks; re-boring the city's existing 1984 geothermal plant deeper than 1800m to achieve water temperatures near 100°C for electricity generation; and capturing waste heat from the Marchwood incinerator via an under-Solent pipeline. Whitehead notes that these local generation projects are highly viable under current national policy, pointing to the newly established Great British Energy (GBE), which has allocated £1.3 billion of its £8 billion budget for community-owned projects under its Local Power Plan.

4.4 Regional Development Programmes

Regional Development Programmes (RDPs) are collaborative efforts led by the National Energy System Operator (NESO) in collaboration with regional Distribution Network Operators (DNOs), including Scottish and Southern Electricity Networks (SSEN). These programmes aim to address urgent network issues caused by the fast growth of Distributed Energy Resources (DER), like local solar panels, wind farms, and battery storage, that want to connect to the grid. The South of England, particularly the Hampshire and Solent area, was among the first places in the United Kingdom to face these infrastructure challenges, making it a key target for early RDP actions.

To tackle these regional challenges, NESO and local DNOs launched a dedicated South Coast RDP. This programme created a modern operational system connecting local distribution control rooms with the national control room and offering better visibility and real-time control of local energy flows. Previously, under traditional "intertrip" systems, local renewable energy generators in the Solent could face complete restrictions or disconnections during tough network conditions to avoid system overloads. The RDP improves this binary on/off approach with smarter coordination, allowing local green energy to stay connected and managed safely, even when there are network issues, subject to constraints at high-load points.

The insights gained from these RDPs contribute to NESO's new transitional Regional Energy Strategic Plan (tRESP). For the Hampshire and Solent region, this means that future grid investments by SSEN from 2028 to 2033 will be strategically directed to better support local decarbonisation goals. This approach could enable quicker and more efficient connections for renewable energy.

4.5 Hydrogen

The Solent Cluster outlined plans to create a hydrogen pipeline network linking Fawley to the port of Southampton, with the potential to expand northward towards Heathrow (The Solent Cluster, 2025). The existing pipeline to Heathrow positions the Solent as a potential hub for Sustainable Aviation Fuel (SAF) in the UK (The Solent Cluster, 2025). If Fawley shifts to producing SAF and hydrogen, it can secure the region's industrial significance for the next 50 years (The Solent Cluster, 2025). Policy makers and businesses could invest and support this pipeline.

5 Literature Review: *Challenges and Solutions*

5.1 Delivering Multiple Benefits

The Clean Air South report (University of Southampton, 2025) used the idea of "split-screen thinking". It highlights the need to tackle urgent health issues, like air pollution, while also planning for long-term changes, such as decarbonisation. It shows that air quality and energy policy are connected (e.g. the same particulate matter that leads to respiratory problems in Portsmouth is a product of burning fossil fuels in transport and industry). Therefore, reducing carbon emissions from the energy grid is both a climate action and a public health measure. Clean Energy South can use this split-screen thinking approach, by recognising that both short-term action (eg upgrades to existing infrastructure) and long-term planning can work in tandem to benefit both public health and energy security.

5.2 Industrial Decarbonisation

The Solent Cluster LIDP Roadmap (2025) and the Policy Brief for LIDP (2025) outline the UK government's plan to cut emissions through "Industrial Clusters." The Solent Cluster, centred on ExxonMobil's Fawley refinery, aims to reduce regional emissions by 99% through Carbon Capture and Storage (CCS) and hydrogen switching. Eadson et al. (2025) argue that this "state-orchestrated" model often overlooks local areas that feel left behind. While schemes may bring benefits to industry, through jobs and investment, the local communities bear the risks and environmental impacts, such as pipelines and pollution. The LIDP Workshop Report (2025) supports this by demonstrating how local stakeholders feel disconnected from large projects, despite the jobs and income they can create. A review of local media and campaign groups shows a challenging environment for new infrastructure:

- ***Aquind Interconnector:*** The Stop Aquind campaign (2025) successfully opposed a £1.2 billion subsea cable. They cited concerns about national security and environmental harm to Milton Common. This case study demonstrates that national objectives can be frustrated by local opposition.
- ***Fawley Hydrogen and Carbon Capture:*** The Solent Protection Society (2025) points out that although hydrogen is labelled as a "green energy," the concept of "Blue Hydrogen," which relies on gas, raises concerns among locals who worry that it could prolong the use of fossil fuel infrastructure (Southampton Climate Commission, 2024).

The Solent Freeport Interim Evaluation (2026) looks at the region's preparedness. Although the Freeport expects to create 4,700 jobs, the area faces a "technical skills deficit." It falls behind the Southeast average for Level 3 qualifications, with 61.8% compared to the Southeast average of 68%. The Solent Local Skills Improvement Plan (LSIP) (2025) highlights a significant shortage of "green collar" workers, particularly retrofit installers, and high-voltage engineers. This shortage could limit the speed and effectiveness of the transition to clean energy.

Solent Local Industrial Decarbonisation Plan (LIDP)

In January 2025, the Solent Cluster (one of 13 projects funded by the UK government to look at decarbonisation across the UK's regions) published a report looking at the region's potential for decarbonisation, the barriers that needed to be overcome, and public perceptions.

In the 'Transitioning Pathways' report, a project team from industry and academia engaged with over 100 local partners to understand how key players and decision-makers could build public support for the changes needed to avoid a business-as-usual scenario which will see a reduction in emissions of just 2% by 2050.

The report suggested that a deep decarbonisation of industry could be achieved in the Solent region, with the potential to reduce emissions by 99% in this same timescale, at the same time bringing significant benefits to the region in the form of investment, economic growth and high-quality employment opportunities. It suggested a number of pathways to decarbonisation through infrastructure and emission reduction projects.

The approach of the Solent LIDP was underpinned by an environment of collaboration, building alliances between local industry, academia, the public sector and regional infrastructure operators, as well as through engagement with local stakeholders and the wider public.

6

Community *Engagement*

This section draws on the LIDP Workshop Report and external campaign data gathered during consultations with the Business South Energy and Utilities and Sustainability Action Groups.

6.1 The Trust Gap

Some people have an instinctive mistrust of large industrial enterprises, with one LIDP Workshop participant remarking that "we are asked to trust the same companies that caused the problem to solve it." Communities do not always regard carbon capture as a solution but as a means for industry to continue burning fossil fuels and avoid the shift to renewables.

6.2 Technological Scepticism

Both academics and NGOs are understandably cautious about relying on largely untested technologies. The LIDP workshop suggested that such scepticism is exacerbated when residents feel excluded from the decision-making process. They may be more supportive of rooftop solar projects where they have more direct control than the installation of pylons and pipelines in their locality.

6.3 Embedding Communities in Decision Making

Some stakeholders also regard decision-making as too centralised. There is some support for a model which would provide local authorities with the power of veto in partnerships between the public and private sectors. Embedding communities in decision-making would involve moving away from a more, passive "consultation" model and encourages active co-design and shared governance. In practice, this can take several forms, including shared ownership, where communities become financial partners in the project ensuring they have a stake in its success (RenewableUK, 2025). Another form is through Co-Design of Community Benefit Funds (CBFs), which give local representatives a voting power on project boards. For example, the West Solent Solar Co-operative , near Lymington, operates a 2.4MW solar farm which supplies power into the public grid, generating enough electricity to power approximately 650 homes." The Co-op has more than 400 members who each invested capital to help raise the £2.6 million to build a community energy project. The annual operating surplus is distributed to members and to a community benefit fund which makes grants to local sustainability projects. Participatory Planning describes a way for communities to engage in the initial stages of a project to help identify suitable sites. This allows developers to incorporate local geographic and social knowledge before investing. In all community engagement processes care must be taken to avoid risk of domination by more vocal, well-resourced minority opposition groups who drown out a majority view in support of a project.

The case for including communities in decision making includes securing the "Social License to Operate", which involves the informal acceptance of a company by its stakeholders and the public. Early and meaningful community engagement, especially when combined with real financial benefits, for example in the form of shared ownership, can change public perception. This can reduce costly planning objections and legal challenges (ClimateXChange, 2025). Including communities in the financial structures of local energy, can also mean that the economic benefits of the transition stay within the regional economy. Another benefit is improved spatial design, as locals have better detailed knowledge of their immediate environment. Engaging them early can help developers avoid sensitive ecological or cultural sites that could later derail a project.

Genuine community embedding faces significant systemic and practical barriers (DESNZ, 2025; Triodos Bank UK, 2024), such as financial capital and subsidies, where community groups lack the finance needed for upfront development and grid-connection costs. Also, the removal of government safety nets like the Feed-in Tariff (FiT) and the Enterprise Investment Scheme (EIS) tax relief has increased the risks around using local community finance. Community energy groups are usually volunteer led and need to have access to the technical, legal, and financial knowledge needed to navigate the UK's complex energy grid and planning system. Even if a community successfully designs and funds a local solar or wind project, the current grid queue can mean they may have to wait more than a decade to connect to the network and begin recouping some of their financial outlay.

Energy Alton

A community solar power project

Energy Alton is a community energy charity in Hampshire that helps local households, businesses, and public spaces reduce energy use, lower costs, and create healthier living environments. It was set up in 2010 as an outcome of the Greening Alton and Holybourne campaign, registered in 2011 as a not-for-profit company limited by guarantee, and became a Community Interest Company in 2014.

In January 2012 the group won an £84,000 government grant and ran a High Street Advice Centre on energy efficiency which is now an advice desk in Alton Library. They offer free home energy surveys to local residents and businesses in Alton and the surrounding villages as well as running insulation, energy-saving and renewable energy workshops and demonstrations.

In 2014 Energy Alton won a Community Renewable Energy Award from the National Energy Foundation for the installation of a 10kW solar photovoltaic system on Alton Library. Since 2016 they have sought to develop other potential renewable energy schemes, for example in local schools. Powering Up is the name of their community renewable energy project working with **Community Energy South** and **Energise South Downs** to identify and kick-start community renewable projects in and around Alton, enabling the community to purchase, manage, and generate low carbon heat and power. The first was LEEF – installing PVA units on the library roof which now generates around 10MW per year.

The Caker Stream Solar Farm is being developed by Quintas Cleantech and will cover approximately 65 hectares of farmland east of Upper Farringdon. A planning application is being considered by East Hampshire District Council. If it gets the go ahead the Solar Farm will generate enough electricity to power 15,150 homes annually for over 35 years and prevent over 10,400 tonnes of CO2 emissions. The developers are enabling community investment in the project of up to 10% which will be managed by Energy Alton and Energise South Downs.

Shared ownership of renewable energy projects in the UK allows communities and commercial businesses to jointly benefit from renewable energy developments, such as wind and solar farms. The Caker Stream Solar Project would be one of the first large-scale solar farms in the UK to offer shared community ownership.

6.4 Local v national priorities

There may also be differences in local and national priorities: the UK national government has a legally binding, mandate to decarbonise, but local communities may prioritise more short-term, localised concerns,
like landscape aesthetics, property values, and construction noise.

Economic alignment and community involvement do not guarantee the acceptance of infrastructure. The case of Vestas on the Isle of Wight provides an example of this. In 2009, Vestas, the world's largest wind turbine manufacturer, closed its blade manufacturing plant in Newport, resulting in the loss of about 600 local jobs. This sparked a highly-publicised worker occupation of the factory (Weaver & Morris, 2009). Vestas cited a lack of UK market demand due to restrictive planning rules and strong local opposition. Despite the island benefiting from the green manufacturing supply chain, local politicians and community groups fought against onshore wind farm proposals like the Wellow project. Vestas warned that local opposition to siting the turbines built in its factories sent a negative message to the market. This situation was repeated in 2015 with the proposed Navitus Bay offshore wind farm. Despite the potential to provide up to 1,700 jobs and an £8.6m community fund, strong local opposition around the visual impact of the turbines on the Jurassic Coast and the impact on local tourism led the government to deny planning permission (The Ecologist, 2015).The project is not included in the next round for Offshore wind, which is focused exclusively in the North Sea, and it remains listed as a Medium Term Priority Area[2].

6.5 Balancing concerns

A balanced policy approach must acknowledge that while embedding communities is crucial for fair wealth distribution and building consensus, it does not always offer a perfect solution. Local engagement cannot, by itself, easily overcome deeply rooted objections. Therefore, while policymakers can seek to provide financial benefits to the local community, central and local government needs to be prepared to make unpopular planning decisions to ensure critical regional energy infrastructure is built.

[2]Offshore Wind Leasing Round 6 | The Crown Estate

7

Responses from Action Groups

This section summarises responses taken directly from meetings with stakeholders in Business South's Energy and Utilities and Sustainable South Action Group in Spring 2026. Questions and summarised responses include:

7.1 How can stakeholders collaborate to accelerate infrastructure upgrades?

- Speed up planning applications for smaller scale projects that will benefit communities, as well as for micro energy grid schemes to help the local grid balance.
- Establish joint committees between utility groups and local communities to discuss needs from both sides.

7.2 What example case studies could be used to show what could be beneficial to secure public support for an energy transition?

- Generate energy for local use only and develop programmes to educate local stakeholders on the different renewable energy solutions.
- Being transparent about plans and making the benefits more visible/well known is helpful, as local authorities can clearly demonstrate how developers contribute to the community.
- Co-ownership models of renewable energy, or reduced energy bills for nearby residents can help build trust. More consultation with communities and landowners is essential.

7.3 How could we plan for a more independent and diverse energy mix?

- Build upon what we already have; install rooftop solar upon existing car parks; use farm waste for biofuels; use geothermal where possible; use excess waste heat from sites such as data centres and incinerators.

7.4 How could some stakeholders deliver the necessary education and retraining for our local workforce for the green transition?

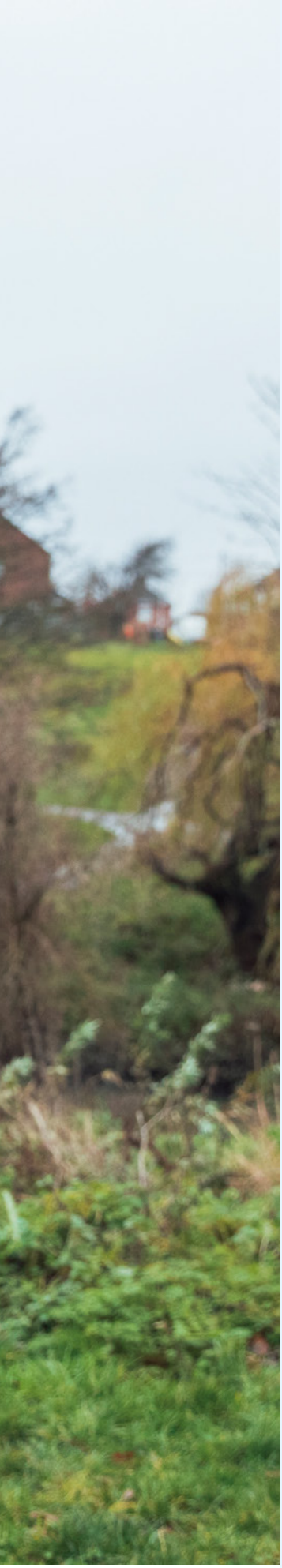
- Lobby NESO and the government/local councils to fund businesses and universities to create renewable energy apprentices and courses, which could be funded through a levy in utility bills, and would ultimately be offset by the savings from the renewable transition.

7.5 If you could implement one immediate action to accelerate our transition from an energy importer to a cleaner and cheaper energy producer, what would it be?

- Reform the planning system/ simplify and speed up planning regulations to reduce bureaucratic friction and accelerate the transition.
- Ensure legal considerations are in place to support local people and businesses.
- Set a target for every home and business to be offered retrofitting and an energy generation package.

8

Impacts



Decarbonisation will inherently disrupt business as usual. Business owners, residents, and policy makers will have to adjust their thinking and practices.
In the short-term it will inevitably create some winners and losers. This report suggests that it can mostly create winners, though all impacts need to be accounted for. Anticipated positive and negative impacts are listed below:

8.1 Economic Impacts

Positive:

- Job Creation: The transition could create approximately 3,200 net new jobs in the Solent (Solent Cluster, 2025). These jobs (e.g., wind turbine technicians) pay above the regional average.

- Resilience: Reducing import dependence protects local businesses from global gas price shocks, stabilising and potentially reducing costs.

Negative

- Cost of Transition: The grid upgrades required to unlock this future will cost between £5bn and £12bn (Ridett & Anderson, 2023a). Without government subsidy, these costs will be passed on to consumers, potentially exacerbating fuel poverty in the short term.

8.2 Environmental Impacts

Positive:

- Carbon: A reduction of greater than 5 MtCO2e/year. Air Quality: A direct correlation exists between decarbonising the grid/transport and reducing hospital admissions for respiratory complications in Southampton (Clean Air South, 2025).

Negative:

- Habitat Loss: The construction of CO2 pipelines and offshore wind cabling poses a risk to the seabed and coastal marshes (Solent maritime sites).

- Visual Impact: Solar and wind farms alter the character of the rural landscape, prompting concerns about the “industrialisation of the countryside”.

8.3 Political Impacts

Positive:

- Energy Sovereignty: A region that is energy self sufficient will be more prosperous and more able to invest in a better quality of life for its residents ; be more attractive to private investors and deliver outstanding public services.

Negative

- Politicians may have to make unpopular decisions for example on planning, behaviour change, or tax rises/levies to achieve longer term dividends.

8.4 Social Impacts

Positive:

- Increases in income and employment. Increased financial stability due to a decrease in reliance on global gas markets. Cleaner air, improved public health and benefits for reducing costs for local health suppliers and pressure on NHS.

Negative

- Fuel Poverty: 10-15% of households in Portsmouth are fuel poor. If the transition is funded by regressive levies on bills, this will worsen. However, if “Social Tariffs” are introduced for those living near renewable infrastructure, it could alleviate poverty.

9 Costs and Benefits of Action

9.1 National Significance

While the initial investments needed for regional grid upgrades and renewable infrastructure are high, economic evidence suggests that the long-term benefits of moving to a clean energy system can exceed these transitional costs. A 2026 analysis by the Climate Change Committee (CCC) states that for every £1 spent on the Net Zero transition, the UK economy can expect a return of between £2.20 and £4.10 in benefits. The CCC also found that the net cost of achieving Net Zero by 2050 is lower than the economic damage from a single fossil fuel price spike like that seen during the 2022 energy crisis. By reducing reliance on volatile global gas markets, a decarbonised and electrified system can be more efficient. The CCC estimates that energy losses will be halved, saving the UK economy about £30 billion each year in wasted energy (Lempriere, 2026). The Office for Budget Responsibility (OBR) also warns that failing to act will be much more costly than making the transition. The OBR's 2025 Fiscal Risks Report projects that unchecked climate change could reduce UK GDP by 8% by the early 2070s, which would double the negative effect on government borrowing compared to investing in the net-zero transition (Office for Budget Responsibility, 2025). Therefore, while the £5bn to £12bn for regional grid upgrades is a significant short-term challenge, it could act as an important economic safeguard, protecting the region's businesses and residents from future energy shocks.

9.2 Regional Significance

For many stakeholders in the Hampshire and Solent region, this economic resilience translates directly into localised wealth building, job security, and community empowerment. A recent analysis by PWC and UKRI showed that a regional and local-driven approach to delivering Net Zero generates four times greater economic and social value than a top-down strategy from central government (Innovate UK, 2026). Within the Hampshire and the Solent region, the transition to self-generated renewables is projected to protect up to 500,000 existing jobs in traditional sectors like maritime and manufacturing and create approximately 3,200 new jobs through the Solent Cluster and 4,700 via the Solent Freeport (The Solent Cluster, 2024; Solent Freeport, 2026). These "green collar" roles carry a wage premium, currently averaging 40% higher than the regional baseline. Furthermore, capital expenditure on renewables is more likely to stay within the local economy than fossil fuel spending. The International Monetary Fund (IMF) calculates that green energy investments yield an economic multiplier of 1.19, meaning every £100 invested generates £119 in local GDP, compared to just £65 for fossil fuel equivalents (Sustainable Energy Association, 2025). For local businesses and residents, this means that the 92% of energy expenditure that currently leaves the region to pay external gas conglomerates would instead circulate locally. The £5bn–£12bn required for infrastructure upgrades will directly accelerate and promote long-term economic growth and stability.

10 Policy Options

This report identifies a number of opportunities and challenges for Hampshire and the Solent in the clean energy transition. This section sets out some actions policy makers, businesses, and other regional stakeholders may wish to consider.

Improving Infrastructure

1. Policy makers might explore investment to upgrade the 20 most constrained substations, such as Alresford and Alton. Upgrading substations would remove the biggest barriers to change. This immediate investment will unlock 1 GW of currently trapped renewable energy potential. To action this, the mayor might use their statutory power to convene, which places a legal duty on local partners to respond.
2. Regional and local authorities could proactively begin designating Wind Priority Areas on land where grid connection is viable, the locations of which helped decided by local communities, and pursue investments in offshore wind, where visual impact is low, signalling "Open for Business" to the wind sector.
3. Blue-to-Green Hydrogen: Utilise Fawley's gas infrastructure to kickstart the hydrogen economy (Blue) with a timetable for transitioning to electrolysis (Green).
4. Unlocking Onshore Wind potential: Recent changes to the NPPF (National Planning Policy Framework) in 2024 make this possible. This would require the identification of "Wind Priority Zones" in the windy, less densely populated rural corridors.

Developing practices and policies

5. Adopters of the Freeport status can voluntarily adopt a "Net Zero Ready" building standard (maximized rooftop solar, EV charging, heat pumps) before it becomes regulation to improve energy resilience undeterred by global gas market price shocks.
6. Supply Chain Localisation: Major developers (Exxon, SSEN) could publish "Local Content" targets, committing to sourcing a % of labour and materials from within the Hampshire region to ensure economic trickle-down to reduce local push back on planned projects.
7. PPA Aggregation: SMEs can form "Energy Co-operatives" to buy renewable power directly from local solar farms via Corporate Power Purchase Agreements (CPPAs), bypassing volatile grid prices.
8. Maximising Rooftop Solar: make this mandatory for all new builds, especially within the Freeport

Engaging Communities

9. Developers and investors could implement and actively enforce Community Municipal Investments to guarantee local people have a meaningful stake in the energy transition.
10. Policy makers should include local communities in governance and decision-making frameworks regarding local energy (see section 4.3 for further detail). The Mayoral Strategic Authority can formally support this by embedding these community frameworks directly into their statutory Local Growth Plan and Spatial Development Strategy.

Creating 'green' jobs

11. Establish a Hampshire and the Solent Energy Academy in association with local academic institutions, funded by Freeport retained rates, to retrain the fossil fuel workforce for the green economy.
12. Businesses within the energy sector could provide green training for current and future employees, transferring carbon-based skills and knowledge into skills and knowledge more suited towards the renewable transition.

Improving energy efficiency

13. Build an open access online Hampshire and the Solent Energy Dashboard. Real-time visualisation of regional energy performance will engage the public, businesses and employers and help drive behavioural change. This will encourage monitoring and improve management, as stakeholders will be able to see and use data in real time.

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Glossary

Active Network Management (ANM) A smart grid technology used by Distribution Network Operators to manage constraints. It allows renewable generators to connect to a full grid by agreeing to have their output automatically curbed (turned down) during rare periods of peak grid stress.

Aquind Interconnector A proposed High Voltage Direct Current (HVDC) subsea cable intended to link the British and French electric grids, making landfall in Portsmouth. It has faced significant local opposition due to environmental and political concerns.

Blue Hydrogen Hydrogen produced from natural gas (methane) where the carbon emissions generated during the process are captured and stored (CCS). It is often seen as a "bridge" technology between fossil fuels and Green Hydrogen.

Bulk Supply Point (BSP) A major substation on the electrical grid where power from the high-voltage transmission network (National Grid) is transformed to a lower voltage for the regional Distribution Network Operator (SSEN) to distribute locally.

Carbon Capture and Storage (CCS) The process of trapping carbon dioxide emissions at their source (e.g., a factory or power plant) and storing them deep underground to prevent them from entering the atmosphere.

Combined Heat and Power (CHP) A highly efficient process that captures and utilises the heat that is a by-product of the electricity generation process, often used to supply local district heating networks.

Community Benefit Funds (CBF) A voluntary commitment by a renewable energy developer to pay a fixed annual sum into a locally managed trust, which is then used to fund local community projects or infrastructure.

Community Municipal Investments (CMI) A financial model that allows residents to invest lesser amounts of money (e.g., via a bond) into local green infrastructure projects, earning a return on their investment while funding community benefits.

Contracts for Difference (CfD) The UK government's main mechanism for supporting low-carbon electricity generation, providing developers with high upfront capital costs a guaranteed flat rate for the electricity they produce.

Corporate Power Purchase Agreement (CPPA) A long-term contract between an electricity generator (e.g., a solar farm) and a corporate buyer (e.g., a factory), where the buyer agrees to purchase electricity directly at a fixed price, bypassing the volatility of the wholesale energy market.

Distribution Network Operator (DNO) The company licensed to distribute electricity from the national grid to homes and businesses in a specific region. In the Solent and Hampshire region, the DNO is SSEN (Scottish and Southern Electricity Networks).

Fuel Poverty A condition where a household cannot afford to keep their home adequately warm at a reasonable cost, often defined as spending more than 10% of income on energy.

Gigawatt Hour (GWh) A unit of energy measuring the amount of electricity consumed or generated over time. One GWh is enough to power ~350 UK homes for a year.

Great British Energy (GBE) A publicly owned energy company established by the UK Government to drive clean energy deployment, boost energy independence, and support local/community energy projects through its funding mechanisms.

Green Hydrogen Hydrogen produced by splitting water into hydrogen and oxygen using renewable electricity (electrolysis). It produces zero carbon emissions and is considered the "gold standard" for deep decarbonisation.

Gross Value Added (GVA) An economic metric measuring the value of goods and services produced in an area, industry, or sector. It is the primary measure of the Solent region's economic contribution to the UK (£31bn).

Heat Network Zones Designated urban areas where heating for buildings is provided by a shared, low-carbon district heating network rather than individual gas boilers. Mayoral Strategic Authorities possess statutory powers to coordinate these zones.

Independent Distributed Network Operator (IDNO) A company licensed by OFGEM to develop, own, and operate local electricity networks, often acting as an alternative to the regional DNO for connecting new developments or laying "last mile" cables.

Level 3 Qualifications A level of education equivalent to A-Levels or an advanced technical certificate/diploma. A shortage of workers with these technical qualifications is a key barrier to the energy transition in the Solent.

Local Electricity Discount Scheme (LEDS) A scheme where renewable energy developers provide an index-linked, direct annual discount applied directly to the electricity bills of properties located close to a new wind or solar farm.

Local Growth Plan A statutory document that Mayoral Strategic Authorities must produce to outline the economic development strategy for their region.

Local Industrial Decarbonisation Plan (LIDP) A strategic roadmap funded by the government to help industrial clusters (like the Solent) identify the technologies and infrastructure needed to reduce their emissions to net zero.

Local Power Plan A specific function of Great British Energy aimed at partnering with local authorities and community groups to roll out small and medium-scale renewable energy projects.

Mayoral Development Order (MDO) A statutory power allowing a mayor to grant pre-emptive planning permission for specific types of development in a defined area, bypassing the standard, lengthy planning application process.

Mayoral Strategic Authority (MSA) A combined regional authority headed by an elected Mayor, granted specific devolved statutory powers from Central Government regarding transport, planning, housing, and economic development.

Megawatt (MW) A unit of power measuring the capacity of a generator at a specific moment. 1 MW = 1,000 Kilowatts.

Net Zero The state where the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere.

OFGEM The Office of Gas and Electricity Markets. The government regulator for the electricity and downstream natural gas markets in Great Britain.

Photovoltaic (PV) A technology that converts sunlight directly into electricity (Solar PV).

Power to Convene A statutory power enabling a mayor to formally call together local partners (such as utility companies or public bodies) to address regional challenges, placing a legal "duty to respond" on those partners.

Primary Substation A key node in the electrical grid where voltage is stepped down for local distribution. These are the main "bottlenecks" identified in the Solent grid.

Retrofitting The process of adding modern technology or features to older systems. In this report, it primarily refers to upgrading existing buildings with energy efficiency measures (insulation) and low-carbon heating (heat pumps).

Scope 1 Emissions Direct greenhouse gas emissions that occur from sources that are controlled or owned by an organization (e.g., emissions from burning fuel in a boiler or fleet of vehicles).

Shore Power (Cold Ironing) The provision of shoreside electrical power to a ship at berth. This eliminates the need for ships to burn diesel engines while in port, significantly improving local air quality.

Solent Cluster A cross-sector collaboration of industry (led by ExxonMobil), universities, and local government working to decarbonise the region's heavy industry and transport.

Solent Freeport A designated zone in the Solent region benefiting from tax and customs incentives to encourage economic activity.

Spatial Development Strategy A statutory planning document produced by a Mayoral Strategic Authority that sets out the spatial vision and strategic land-use policies for the entire region.

SSEN (Scottish and Southern Electricity Networks) The specific Distribution Network Operator (DNO) responsible for managing the local electricity grid in the Hampshire and Solent region.

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