

Newhaven Energy Framework

How do we make a future
energy system clean and affordable



1. What we did and why?

Lewes District Council declared a climate emergency and has since supported projects that cut carbon and deliver cleaner energy; these are set out in the Council's Climate and Nature Action Plan¹. But turning aspiration into real-world action at a price people can afford, and in a way that is fair and reduces costs for residents and businesses, is not straightforward. Different local factors, from the type of homes we have to the capacity of the electricity network, can change what works. If we over-simplify, we risk investing in solutions that don't deliver and cost more in the long run.

In light of this, Lewes District Council initiated a study with its joint venture Clear Futures² and the Sustainable Markets Initiative³ to understand what the net-zero transition could look like in practice, taking on board the above principles of fairness and locally driven solutions. Working with partners, we looked at the whole energy system so we could be clear about what is likely to work locally, and what wouldn't; this included how we heat buildings, power homes and businesses, and travel. Reaching net zero needs a joined-up step-change, not small increments in isolation.

We used Newhaven in East Sussex as our case study so we could test future energy options in a real place and with real constraints. Our learning could help the challenges many other towns in the UK will face as national policy work has mainly focussed on cities. The scope was wide ranging and looked at homes and businesses, transport, and how energy is supplied and used. Newhaven was chosen because it:

- Has mixed housing, mixed industry and a wide range of incomes
- Has real-world factors that affect delivery, for example, planning sensitivities, a coastal/estuary setting, port activity, and heavy road and rail transport
- Is large enough to show what the transition could look like, while still being realistic to deliver.
- Has an air quality management area due to traffic pollution⁴
- Parts of the town are in transition, with areas of deprivation undergoing regeneration
- There are already strong local partnerships, and an enterprise zone that make it easier to coordinate action across sectors.

The result was a Newhaven Energy Framework effectively an enhanced Local Authority Energy Plan, focused on what can and cannot work, and actions that are realistic to deliver.

¹ <https://www.lewes-eastbourne.gov.uk/article/2739/Climate-and-Nature-Strategy-and-Action-Plan>

² <https://www.clearfutures.co.uk/>

³ <https://www.sustainable-markets.org/>

⁴ https://uk-air.defra.gov.uk/aqma/details?aqma_ref=1576



2. How we approached it

We knew from the start that no single organisation had all the answers and before we engaged with the local community, we needed to have more certainty on what might work and importantly what might not, (both technically and financially). Also, as energy affects how we live, work and travel, and the choices we make in one area (like transport) can create knock-on impacts in another (like the electricity grid), we took a whole-system approach.

To do this, the Council brought together an expert working group to test different options and combinations. We involved engineers, energy specialists and commercial experts so the outputs were both technically sound and grounded in what can realistically be delivered. The working group included the following organisations and could not have happened without our joint venture Clear Futures and involvement with the SMI.



The work was deliberately engineer-led and used industry-standard tools to model different scenarios, including EnergyPRO, Poweriver, and UKPN’s Net Zero Hub; the UKPN portal enabled access to local grid data, grid constraint points and future scenario testing. Commercial input also helped us identify the options that can cut carbon but would be too expensive or difficult to deliver in practice.

The summary diagram below shows the main technologies and actions we tested, the assets that might need to change, and the areas of the town that could be affected.

Technologies	Assets	Geography
Fabric upgrades, Solar PV HT ASHP, LT ASHP Heat battery, Infrared Electric battery Heat networks, Biofuels Hydrogen, Wind EfW, BESS, Private wire	Houses (all types) Flats Commercial units Road & marine transport LV & HV grid connections	Individual home Neighbourhoods Community-wide

3. The emerging evidence

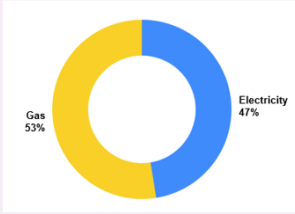
The analysis to date suggests that:

- Electricity demand could rise significantly (potentially up to three times today's levels) as we switch buildings and transport to electricity. Heavy road transport electrification is a major factor.
- Rooftop solar PV has strong potential, but it won't fully offset the increase in demand. It could also mean upgrades are needed at over half of local secondary substations.
- Wind is likely to play a limited role locally. Biomethane and hydrogen are not yet proven to be affordable and available at the scale needed.
- Town-scale battery storage could help manage peaks in electricity use, but whether it stacks up financially depends on future demand, market revenues and grid constraints.
- Private wire networks are challenging unless a core network and sufficient local generation are already in place – this is due to the high cost of laying additional cables if existing grid cables can not be utilised.
- Heat networks are not viable due to low heat-demand density i.e. there is not enough heat demand in our homes to justify the cost to laying new heat pipes down a street; a decentralised approach is the most appropriate way to deliver heat i.e. heat supplied in individual homes
- Heat batteries could be more suitable than heat pumps for smaller homes.
- Residential heat solutions (especially heat pumps) often do not have a simple payback and therefore require subsidy, particularly for lower-income households.
- Demand reduction in transport will be a key foundation for Newhaven's decarbonisation.
- Active travel and public transport are critical to reducing domestic transport demand. Rail hubs could shift some HGV movements off roads and help reduce future electricity demand.
- Some form of 'smart grid' will be needed to manage higher electricity use and make better use of flexibility (for example, charging and heating at off-peak times).
- Energy companies have flexibility to support innovative approaches to balancing supply and demand.

The diagram below shows how electricity demand could increase if the commercial sector electrifies its buildings and heavy transport fleet. The chart on the left shows the current split between gas and electricity usage for the buildings in the commercial zone. The chart on the right shows the future electricity consumption if all energy needs were met by electricity. From these two charts electricity usage jumps from 27GWh to 73GWh. If all buildings and transport in the commercial zone were to electrify then we need to be sure there would be enough supply for this to happen, and this importantly this supply would not take away the needs of the domestic sector.

Current Consumption

30GWh pa Gas
27GWh pa Elec



Demand peaks in winter at approximately double the summer baseline

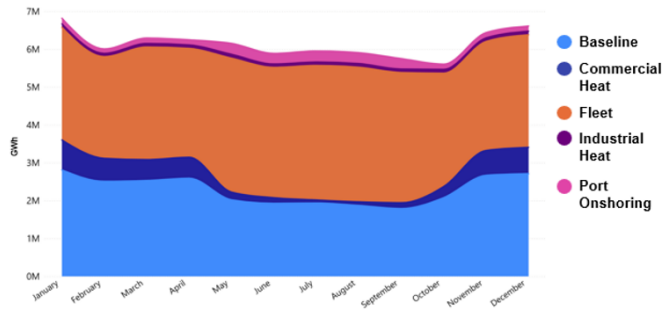
CLEAR FUTURES

Forecast Consumption

73GWh pa Elec

Significant increase in load to achieve a low carbon community, driving factors:

- Vehicle electrification
- Port shore power
- Electrification of heat (space and industrial)



4. What next

The next phase is about moving from feasibility to delivery—turning the findings into practical projects by working with partners and the local community, aligning with national programmes, and putting together investable plans that can attract funding.

- Work with NESO and the local network operator (DNO) so Newhaven’s plans align with electricity-grid upgrades and flexibility opportunities.
- Prioritise ‘no-regrets’ actions such as rooftop solar PV that can be scaled up over time. The first phase of focus will be on commercial roofs.
- Create a phased delivery roadmap that is clear about who does what, when key decisions are needed, and how projects can be funded.
- Package up investable projects (for example, industrial EV charging and targeted heat solutions) and test interest with the market.
- Put the right partnership and governance in place to manage a fair transition and meaningful community engagement.

Glossary

LT ASHP	Low-temperature air source heat pump
HT ASHP	High-temperature air source heat pump
BAU	Business as Usual – baseline
EfW	Energy from Waste plant
BESS	Battery Energy Storage system