Breckland District Council

Energy Infrastructure Study: Phase 1

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Table of figures

Glossary of terms and abbreviations

BESS	Battery Energy Storage System. Technology for storing electricity to balance supply and demand.
Biomass	Organic material used as fuel to produce heat or electricity.
Curtailment	A grid management action where renewable energy output is reduced due to lack of network capacity.
DESNZ	Department for Energy Security and Net Zero
DNO	Distribution Network Operator
DSO	Distribution System Operator
EV	A vehicle powered entirely by electricity, usually requiring home or public charging infrastructure.
FHS	Future Homes Standard
Flexibility	The ability to adjust electricity consumption or generation to support grid stability.
GWh	Gigawatt-hour
GW	Gigawatt
Headroom (electricity grid)	The available capacity in the grid to accommodate more demand or generation without overload.
LSOA	Lower Layer Super Output Area
Microgrid	A localised energy system that can operate independently or in coordination with the main grid.
MVA	Megavolt-ampere. A measure of apparent power in an electrical system.
Net zero	The balance between the greenhouse gases emitted and those removed from the atmosphere.

Non-firm connection	A type of electricity grid connection that allows export only when capacity is available, subject to curtailment.
OHL	Overhead line.
Passivhaus	A building standard for ultra-low energy use, with high thermal comfort and airtightness.
Peak demand	The highest energy use level over a certain period; a key constraint for infrastructure planning.
PV	Photovoltaics – solar panel technology that converts sunlight directly into electricity.
Smart grid	An electricity network using digital technologies to detect and respond to local changes in usage and supply.
Storage technology	Systems that store energy, usually batteries, to be used later to improve grid flexibility and reliability.
Substation (primary/secondary)	Facilities that transform electricity voltage levels: primary (33kV to 11kV), secondary (11kV to 230V).
Time-of-use tariff	Electricity pricing that changes depending on the time of day to encourage demand during off-peak hours.
UKPN	*UK Power Networks.* The DNO responsible for electricity distribution in Breckland and surrounding regions.
Vehicle-to-grid	Technology that allows electric vehicles to export electricity back to the grid when needed.

Introduction

Bioregional and the Centre for Sustainable Energy (CSE) have been commissioned to undertake an Energy Infrastructure Study for Breckland Council.

The findings from this study will help to inform Breckland Council in addressing local electricity grid constraints and how these can be mitigated through strategy and policy improvements. Recommendations from this report will contribute to policy considerations in the upcoming Regulation 18 consultation for the emerging Breckland Local Plan (2024-2042).

Phase 1 aims to address the current situation in Breckland through assessing and exploring the following components:

1. National Energy Landscape
2. Stakeholder Engagement and Initial Data Collection
3. Electricity Network Constraints
4. Current and Projected Future Energy Demands
5. Appraisal of Local Network Projects
6. Recommendations and Futureproofing

Phase 2 builds upon the findings from Phase 1 to then undertake specific supply and demand energy modelling for site allocations selected for the emerging Breckland Local Plan. Phase 2 consists of the following tasks and outputs:

1. Initial Agreement of Assumption and Approach
2. Growth Archetyping
3. Energy Demand Estimations
4. Energy Supply Estimation
5. Constraint Analysis
6. Alternatives to Grid Reinforcement

National energy landscape

National policy and strategy

The UK's national energy strategy is determined by its overarching legally binding commitment to reach net zero by 2050, but more immediate targets are also redefining the pace of change. A key recent development is the government's Clean Power by 2030 ambition, which sets out a goal for the UK to decarbonise its electricity system entirely by the end of this decade, 5 years earlier than set by the previous government. This target supersedes earlier commitments outlined in the Net Zero Strategy (2021) and the British Energy Security Strategy (2022) and has been the foundation for more recent outputs and updates from the Department for Energy Security and Net Zero.

Under these strategies, the UK aims to quadruple offshore wind capacity to 50 GW by 2030, scale up solar deployment to 70 GW by 2035, and maintain a strong commitment to nuclear as a foundational power source. Energy efficiency improvements and demand-side flexibility are also core focuses, alongside continued investment in emerging technologies such as hydrogen and carbon capture, which remain uncertain in their ability to significantly contribute to net zero goals given a lack of commercial viability to date.

Local authorities are recognised as critical enablers in this transition, which have a key role to play to integrate zero priorities into planning frameworks, facilitate the deployment of low-carbon technologies, and work collaboratively with Distribution Network Operators (DNOs) and regional stakeholders to unlock energy infrastructure constraints. The trajectory of national policy not only sets the pace for energy transition but also should empower councils like Breckland to play a more strategic role in the UK's future energy landscape.

Technological trends

The UK's energy sector is experiencing a significant transformation, driven by advancements in renewable technologies and energy storage solutions. In 2024, renewable energy sources accounted for a record 51% of the UK's electricity generation, marking the first time renewables accounted for the majority of generation in the national energy mix. Wind energy was the predominant contributor, generating 84.1 TWh, with onshore wind increasing by 7.6% to 35.1 TWh and offshore wind slightly decreasing by 1.5% to 48.9 TWh due to infrastructure issues.

Solar power also saw growth, with a 6.5% increase leading to a total generation of 14.8 TWh in 2024. Biomass energy contributed 5% to the renewable mix, while hydropower accounted for 1.8%.

Battery energy storage systems (BESS) are becoming increasingly vital for grid stability. As of early 2025, the UK has over 8 GWh of operational BESS capacity, with nearly 20 GWh under construction. In 2024 alone, approximately 1.5 GW of BESS capacity was completed, although this was a 28% decrease from the previous year.

Electrification of transport is also progressing, with over 1.3 million fully electric vehicles on UK roads by the end of 2024. This shift necessitates further advancements in charging infrastructure and grid capacity to accommodate increased demand.

State of the electricity grid

In 2024, the UK's electricity generation landscape continued its transition towards cleaner energy sources. According to National Grid, the generation mix was as follows:

- Natural gas: 26%
- Wind: 30%
- Nuclear: 14%
- Solar: 5%
- Hydro: 2%
- Biomass: 7%
- Coal: 0.6% (last coal plant now closed)
- Storage: 1.2%
- Imports: 16.0%

Notably, wind energy surpassed gas as the largest single source of electricity for the first time, accounting for 30% of the UK's electricity generation in 2024

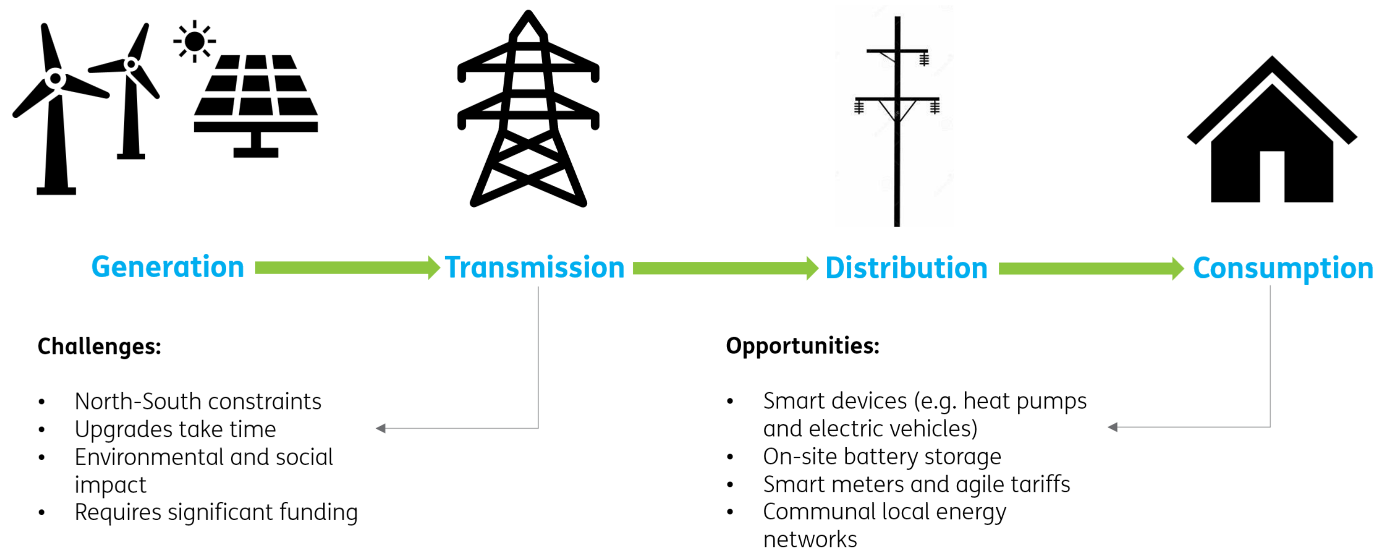


Figure 1: Diagram showing flow of UK electricity from generation to consumption.

The UK's electricity grid is under increasing pressure as it adapts to accommodate higher volumes of renewable generation, and the rising demand associated with electrification. While the high-voltage transmission system is being upgraded to support countrywide energy flows, including new undersea interconnectors and offshore wind transmission, the lower-voltage distribution network, which sources energy to homes and businesses, is a key constraint.

Fig. 1 above shows the typical flow of electricity from generation to consumption, based on our primarily centralised electricity system, and outlines key challenges and opportunities. While transmission upgrades are crucial to reaching a fully decarbonised electricity system, many opportunities are available on the consumption side to reduce grid constraints, which are explored in later in this report.

In many rural areas like Breckland, the distribution grid was not originally designed to support two-way power flows or high-density energy loads from EV charging, solar panels, and electric heating. As a result, developers frequently face constraints when seeking to connect new low-carbon projects to the grid, with long wait times and costly reinforcement works often required.

DNOs, such as UK Power Networks (UKPN) for Breckland, are now transitioning into Distribution System Operators (DSOs) with broader responsibilities for managing flexibility and facilitating local energy markets. These operators are introducing flexibility services and alternatives to traditional upgrades, including local storage and demand response schemes. However, significant investment is still needed to upgrade

Implications for Breckland

infrastructure and enhance digital monitoring and control systems. Close coordination between councils, DNOs, and developers will be essential to ensure that local energy aspirations can be realised without overloading the network.

Predicted trajectories

Looking ahead, the UK's energy system is set for continued transformation, whereby electricity demand is expected to double by 2050, driven by the electrification of transport and heating. The government aims for a fully decarbonised power system by 2030, with renewables playing a central role.

In 2024, wind power generated 30% of the UK's electricity, exceeding gas for the first time by 4%. This trend indicates that wind energy will continue to be the largest single source of electricity generation.

Battery storage capacity is projected to expand significantly, with the pipeline of battery projects increasing by two-thirds over the past year. This growth supports the integration of intermittent renewable sources and enhances grid flexibility.

Community energy initiatives and local energy markets are also expected to gain prominence, empowering regions like Breckland to actively participate in the energy transition. These developments underscore the importance of strategic planning and investment to ensure a resilient and sustainable energy future.

Breckland Council finds itself at the intersection of national energy ambitions and local implementation challenges. As a largely rural area with significant land availability, Breckland is well-placed to support the rollout of renewable energy projects, including solar farms, onshore wind, and BESS. Agricultural buildings and brownfield sites also present opportunities for rooftop solar and small-scale storage.

However, constraints on the electricity distribution network pose a barrier to many developments. A lack of grid capacity can delay or prevent viable projects from being connected, impacting both the pace of local decarbonisation and economic development. Engaging proactively with UKPN and developing local partnerships will be essential to overcoming these barriers.

Breckland also faces the challenge of transitioning its housing stock, much of which is older and off the gas grid, toward low-carbon heating. To capitalise on these opportunities, Breckland will need to embed an energy strategy into its planning framework, support capacity-building among staff and local organisations, and promote community engagement. By doing so, the district can not only contribute to national net zero goals and the Council's own 2035 net-zero goal as an organisation, but also build a more resilient, affordable, and locally controlled energy future for new growth throughout the local plan period.

Breckland and wider Norfolk strategies

Greater Norwich Energy Infrastructure Study (2019)

This study was commissioned by the Greater Norwich Development Partnership to assess whether energy infrastructure could accommodate the significant housing and employment growth planned to 2036. It identifies current and future constraints, particularly within the electricity network, and proposes policy responses to address them.

The study evaluates infrastructure needs associated with the delivery of 42,900 homes and approximately 45,000 jobs, highlighting that existing network capacity is not uniformly sufficient across the area. It identifies specific zones where electricity supply may become a limiting factor for growth and stresses the importance of infrastructure-led spatial planning. The study also highlights the potential of decentralised energy solutions and smart grid technologies where traditional reinforcement is not immediately viable.

However, a key limitation of the study is that it only considers growth within the administrative boundaries of Norwich, Broadland, and South Norfolk. It does not account for the significant and related growth occurring in neighbouring Breckland, particularly along the A11 growth corridor. This includes major urban extensions at Attleborough and Thetford and substantial employment growth at Snetterton, which will place additional demand on the shared energy infrastructure serving the wider area.

It is therefore important to recognise the need for cross-boundary energy planning and to assess the cumulative impact of growth along the A11 corridor more holistically. For Breckland, this underscores the importance of integrating energy infrastructure planning early in the local plan process, collaborating proactively with UKPN, and steering growth towards areas where capacity exists or where strategic reinforcement is planned.

North Norfolk Power Study (2019)

The North Norfolk Power Study provides a practical example of how a rural district can assess and respond to electricity network constraints. The approach taken, mapping substation capacity against future housing and employment allocations, offers a clear methodology that could be replicated in Breckland. The study examined capacity issues across a range of substations and projected the impact of development through to 2036, including around 11,000 new homes and associated employment land.

The study identifies a number of substations with limited spare capacity, raising concerns about the viability of delivering planned development without network reinforcement. Importantly, the study highlights the likely increase in peak demand arising from the electrification of heating. To address these concerns, it recommends a combination of conventional network reinforcement and alternative approaches such as demand-side management, smart grid solutions, and localised energy storage.

These findings relate to Breckland and the approaches that could be taken to similarly mitigate grid constraints for the Breckland Local Plan. The likely increase in electricity demand from electric heating and vehicle charging also underscores the need for forward-looking infrastructure planning, which Phase 2 of this study will assess in detail.

Breckland Sustainability Strategy 2021–2035

Breckland Council's Sustainability Strategy sets out a clear commitment to achieving net-zero carbon emissions by 2035. The strategy outlines the council's approach across three thematic areas: reducing its own environmental footprint, influencing sustainability through its regulatory and policy functions, and supporting community-led environmental action. While the strategy is broad in scope, it includes several objectives and actions with direct implications for electricity infrastructure.

The council aims to decarbonise its own operations, including through reduced water and energy consumption and lower emissions from buildings and transport. It also commits to embedding environmental sustainability in procurement, decision-making and development control processes. From an infrastructure perspective, the strategy indicates a clear intent to encourage electrification of heating and transport, alongside enabling low-carbon technologies such as solar PV and electric vehicle infrastructure through local planning policies. Moreover, the strategy supports empowering local residents and groups to take action, including through community energy initiatives, which could contribute to local grid resilience if effectively integrated.

These ambitions will place increasing pressure on the local electricity distribution network, particularly without a strategic approach to mitigating additional loads from new generation and consumption. As more homes and businesses adopt electric heating and transport, demand on the grid will rise significantly. Breckland's ability to deliver on its net zero targets will therefore depend on the resilience and flexibility of its electricity infrastructure. The strategy highlights the need for electricity networks to be recognised as a critical enabler of climate action and supports the case for stronger coordination between planning, sustainability, and infrastructure teams within the council and with external partners, such as UKPN.

Breckland electricity network constraints

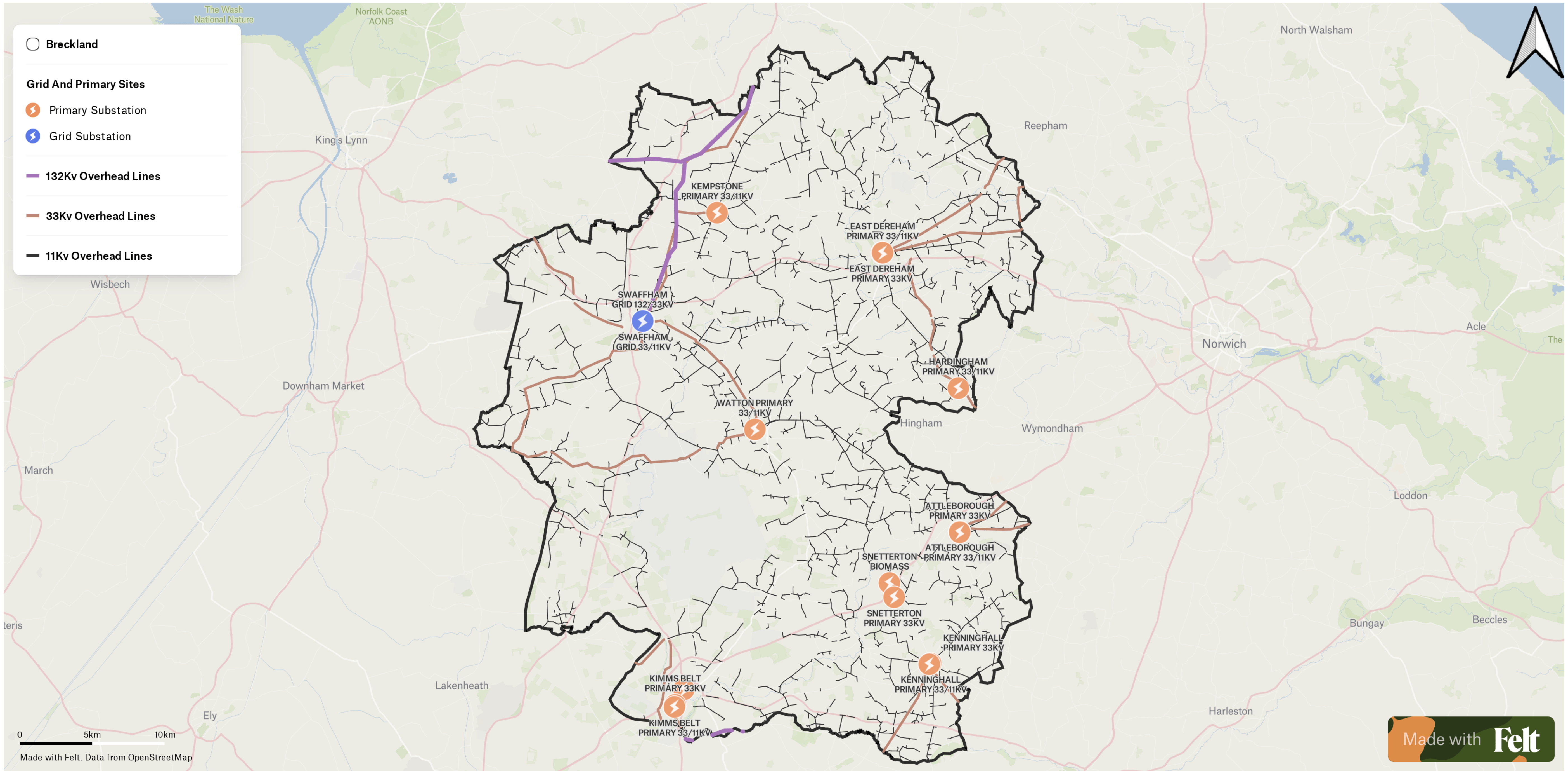


Figure 2: Grid and primary sites, and overhead lines in Breckland.

Network overview

UK Power Networks takes electricity at high voltages from the National Grid and transforms it down to lower voltages, which are suitable for commercial and domestic use:

- **Grid Supply Points** in the wider area relevant to Breckland at Walpole, Norwich, and Bramford convert electricity from 400kV to 132kV.
- **Grid substations** convert 132kV to 33kV for downstream distribution. These are located at Swaffham, Thetford, Bury, Diss, Trowse, Earlham, and Salle in the wider area relvant to Breckland.
- **Primary substations** transform electricity from 33kV down to 11kV for distribution to secondary substations (11kV/230V) and local consumption.
- 8 generation sites are connected directly to the 33kV network.

Fig. 2 shows the distribution of grid and primary substations, and overhead lines in Breckland.

Breckland's power supply is divided into three zones

- **North-Western Area** that is primarily supplied from Swaffham grid
- **Eastern Area** that is supplied from Salle, Earlham & Trowse grids
- **Southern Area** that is supplied from Thetford and Diss grids

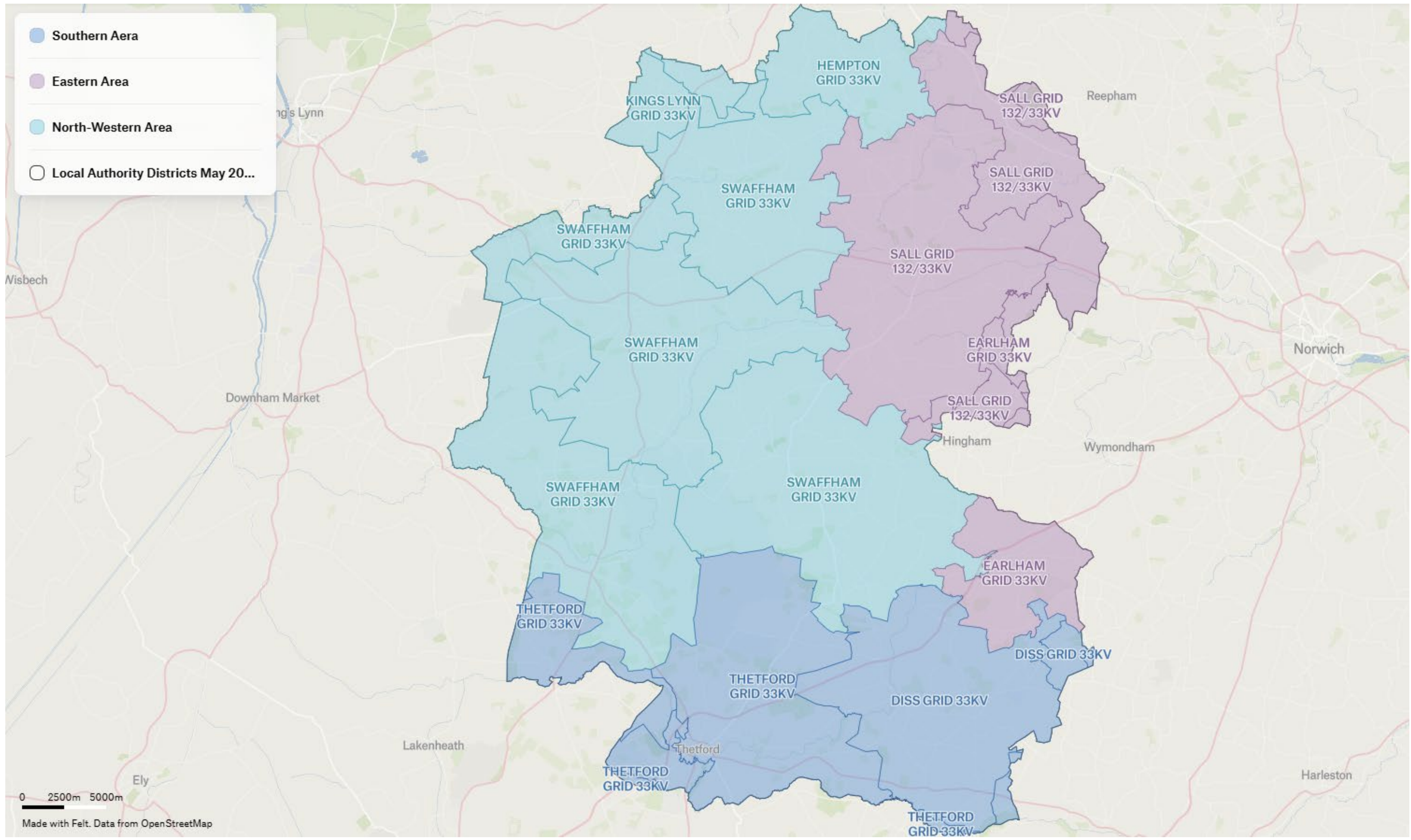


Figure 3: Power supply areas.

Identification of constrained areas

Fig. 3 shows primary substation supply areas throughout Breckland.

As shown on the map, primary substation supply areas are largely unconstrained, with over 5% headroom in the majority of supply areas.

The B22 Kenninghall primary substation supply area is currently constrained, showing that the area is more than 5% overloaded.

The B36 Feltwell primary substation supply area primarily falls into Breckland and could be at risk of constraints due to being between 5% overloaded and 5% headroom. This potential constraint is unlikely to have a significant impact on Breckland due to the low area coverage by this supply area. But it is an important consideration if large sites are allocated and/or come forward in this constrained area.

However, in summary, primary substation supply areas have a strong level of headroom.

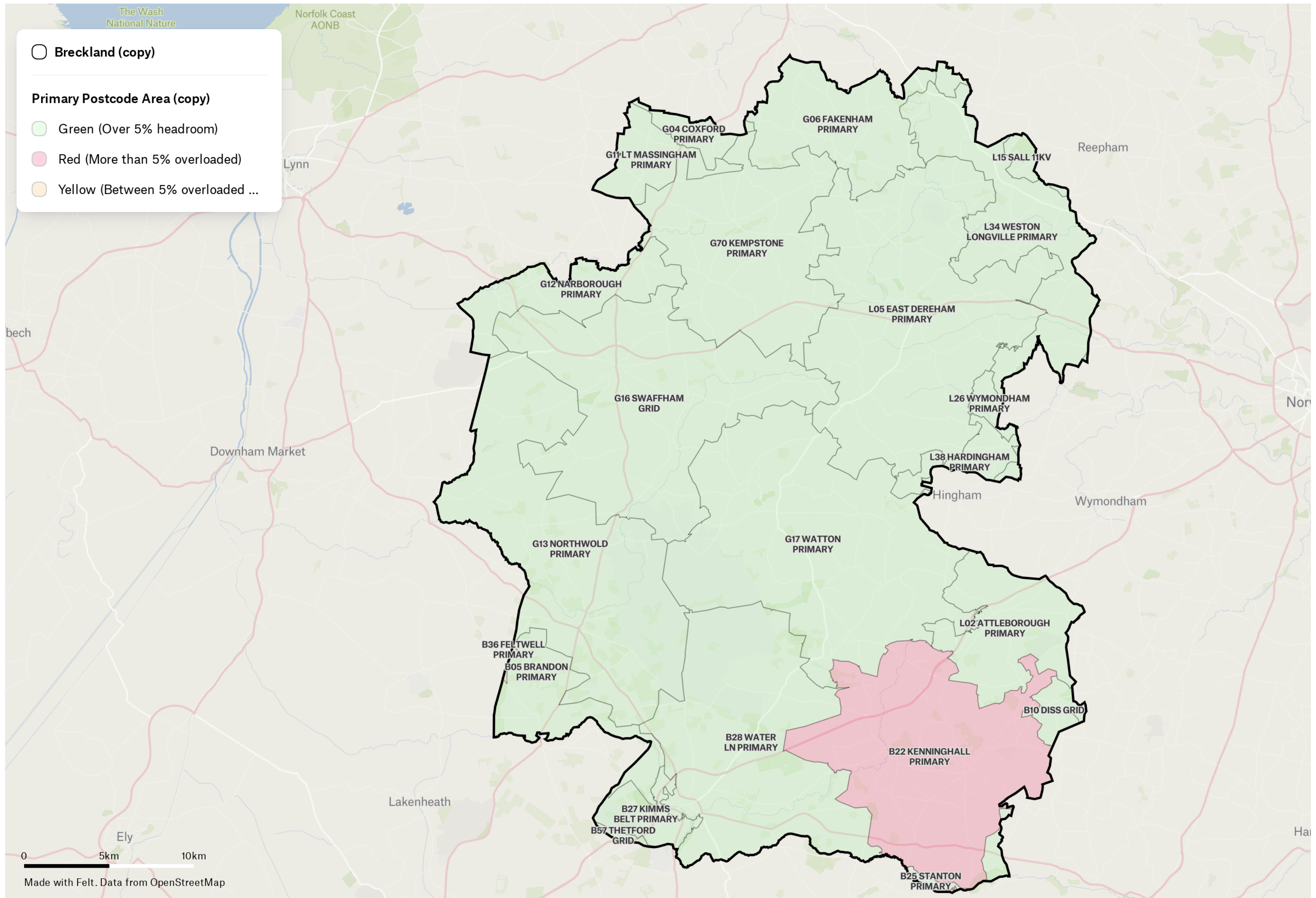


Figure 4: Primary substation supply areas in Breckland.

Identification of areas suitable for development

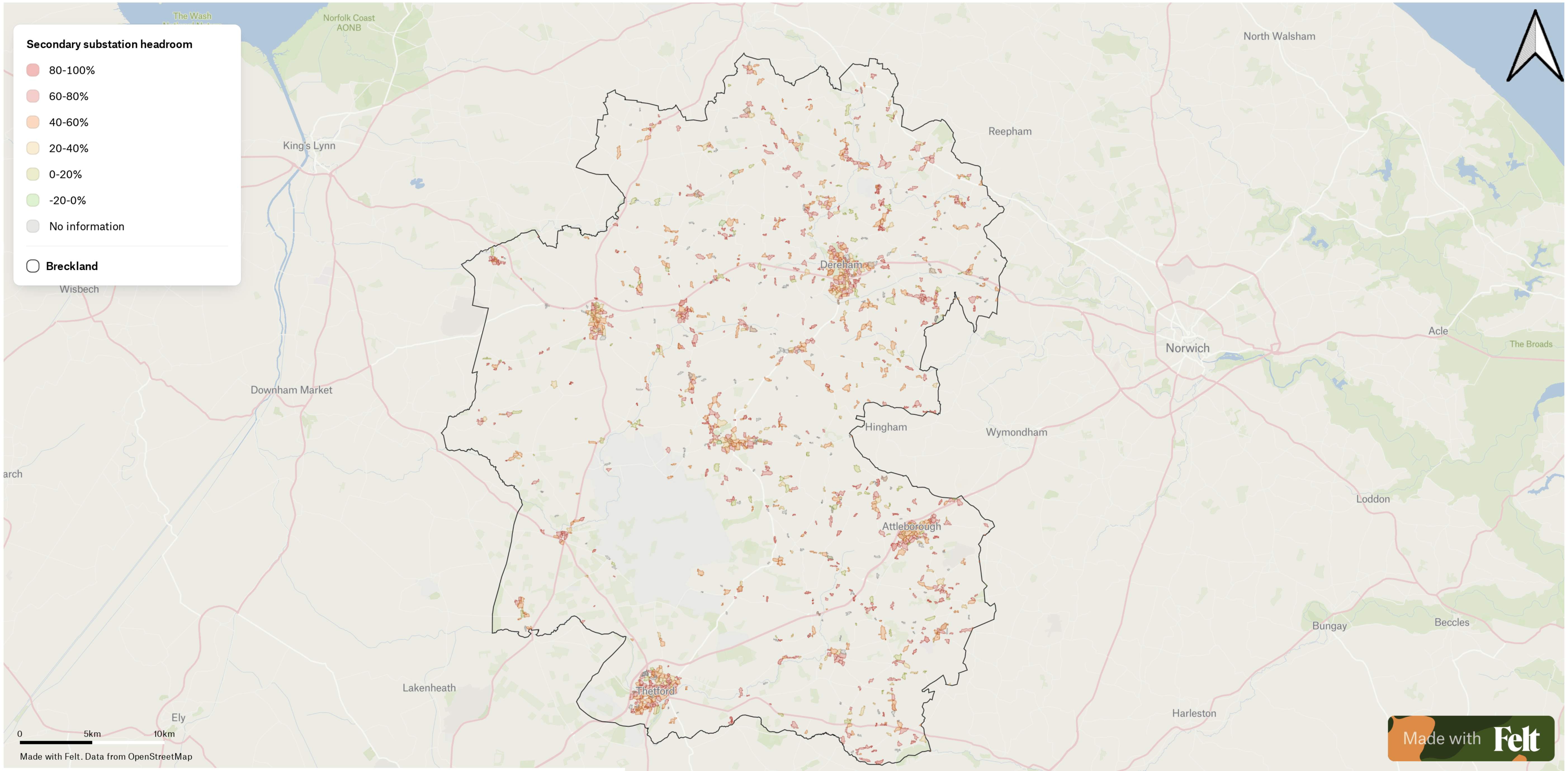


Figure 5: Postcode areas supplied by secondary substation distribution areas in Breckland.

Fig. 5 shows the demand headroom of postcode areas supplied by secondary substations in Breckland.

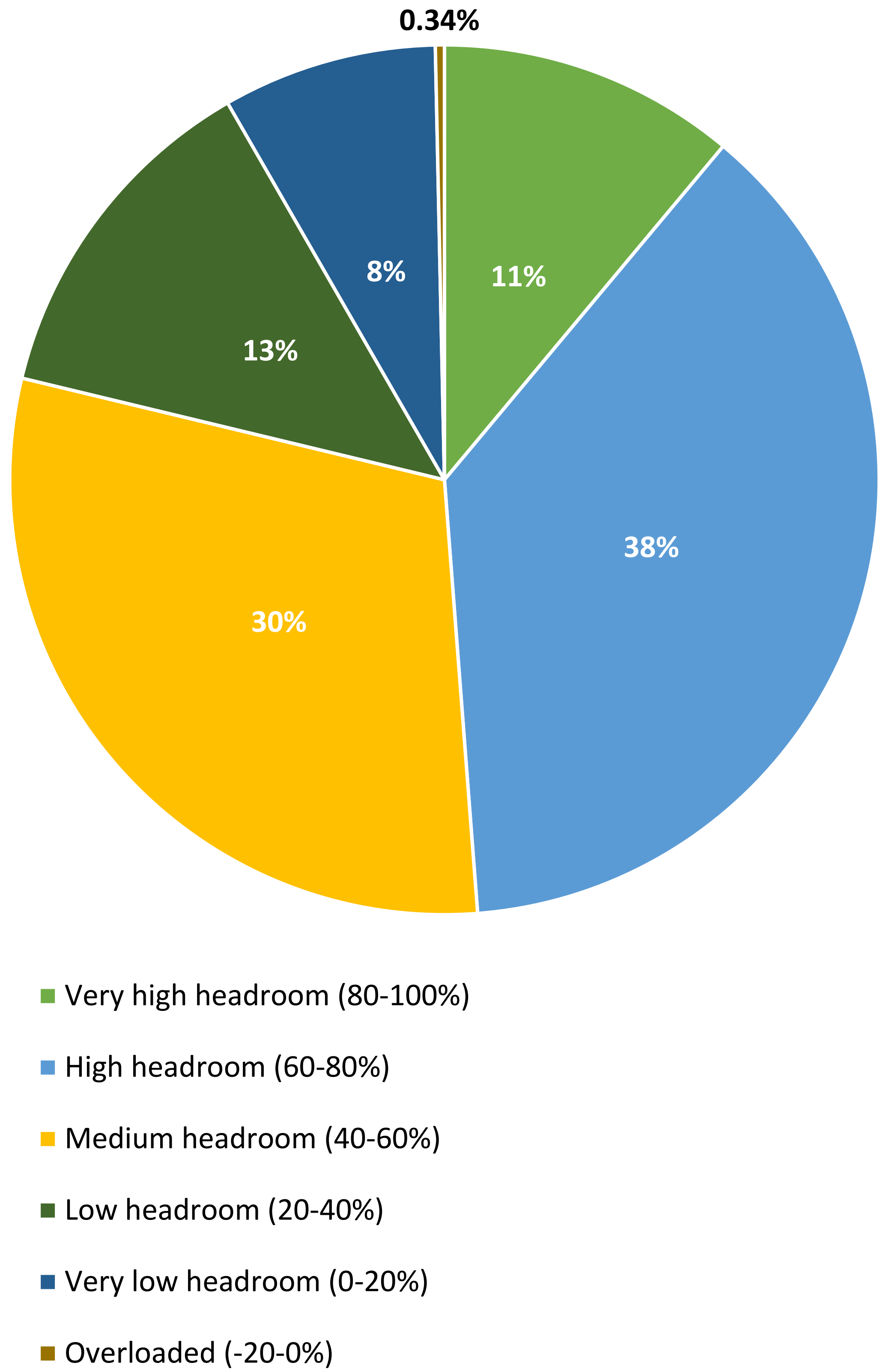
As expected, there is a range of headroom across postcode areas in Breckland. As shown in the chart to the right, the most prominent groups are the medium and high headroom groups. In addition, given that 11% of postcode areas have very high headroom, this indicates that there is a significant opportunity for development across the majority of Breckland. These areas can broadly be considered suitable for development. However, without detailed site-level assessments, the scale of development cannot be precisely determined.

A low proportion of postcode areas are constrained, with 13% having low headroom, and 8% having very low headroom, whilst only 0.34% of postcode areas are currently overloaded.

Of the 1191 postcode areas assessed in the dataset, 511 have predicted reinforcement dates to accommodate for additional demand, with dates ranging from 2025 to 2049.

Tabe 1 below provides a rough indication of key postcodes associated with each headroom designation.

Table 1: Approximate postcodes by headroom	
Very high headroom	Thetford - IP24 1ND
	Narborough - PE32 1SS
	Thompson Close - NR20 4PE
High headroom	Dereham - NR19 1AE
	Surlingham Drive - PE37 7SF
	Thetford - IP24 3LH
Medium headroom	Swaffham - PE37 7QT
	Attleborough - NR17 2DH
	Watton - IP25 6DX
Low headroom	Dereham - NR20 4AQ
	Thetford - IP24 1BN
	Old Buckenham - NR17 1RE
Very low headroom	Attleborough - NR17 2DY
	Attleborough - NR17 1JN
	Dereham – NR20 3td
Overloaded	Mileham - PE32 2QU
	Watton - IP25 6RJ



Current and future projected energy demands

Sources and drivers of demand

Existing residential energy demand in Breckland arises from several core end uses, each contributing differently to total energy consumption, which is shaped by the district's rural housing profile.

Source of demand	Description	Typical energy type	Comments/relevance	Drivers of future demand
Space heating	Heating rooms to maintain indoor comfort	Oil, gas, electricity, biomass	Largest energy use in Breckland; off-gas homes rely heavily on oil; low insulation levels in the UK housing stock	Electrification via heat pumps, fabric retrofit programmes, colder winters or extreme weather
Water heating	Heating water for showers, baths, washing	Same as above and electric immersion	Often integrated with space heating, demand influenced by household size	Growth in population; higher comfort expectations; switch to electric or smart water systems
Lighting	Indoor and outdoor lighting	Electricity	LED uptake improving efficiency; larger homes may have higher lighting requirements	Smart lighting controls; increased indoor occupancy; lifestyle shifts
Cooking	Food preparation using ovens, hobs, microwaves	Gas, electricity	Shift toward electric cooking in off-gas homes and with full electrification	Full electrification of homes; appliance upgrades
Appliances/plug loads	Fridges, freezers, laundry, entertainment, computing	Electricity	Growing with digital lifestyles and homeworking	Smart appliances; lifestyle tech (e.g. gaming); demographic shifts
Electric vehicles	Charging battery-electric vehicles at home	Electricity	Growing demand source; off-street parking supports private charging uptake	Wider EV adoption; smart/time-of-use charging; second car electrification
Smart heating, ventilation, and cooling controls	Programmable thermostats, timers, and ventilation systems	Electricity (control systems)	Enable more efficient energy use, especially with heat pumps or hybrid systems	Rise in smart home tech; consumer demand for control; integration with solar/storage

Current demand

To determine the current baseline level of demand for residential buildings in Breckland, gas and electricity data was used from the Department of Energy Security & Net Zero

	Gas	Electricity
Highest consumption per LSOA (kWh)	14,389	6,111
Lowest consumption per LSOA (kWh)	7,110	2,657
Average consumption per LSOA (kWh)	11,318	3,863
Total consumption in Breckland (GWh)	369	246

In the majority UK homes, residential gas consumption is significantly higher than electricity consumption. This is primarily because gas is the primary energy source for space and water heating, which are by far the largest components of household energy demand, especially in colder climates and older housing stock, such as that found across much of Breckland.

Heating a home to a comfortable temperature during winter requires a substantial amount of energy. Gas central heating systems, which remain the most common form of heating in the UK, typically consume upwards of 10,000 kWh per year for space and water heating alone. In comparison, electricity used for lighting, appliances, and other services typically ranges between 2,000 and 4,000 kWh per household per year, unless electric heating or EV charging is involved.

Gas is relatively cheap per unit of energy compared to electricity (roughly a 1:4 ratio), which further explains its widespread use for residential energy end uses like heating and hot water. While electricity is often used for less energy intensive, more controllable demands (e.g. lighting, appliances, electronics), it is less commonly used for whole-home heating in areas with gas grid access, due to the higher costs and historical absence of incentives for electrification.

In off-gas areas, which are common in Breckland (21 out of 78 LSOAs are not connected to the gas grid), there is likely to be higher electricity use due to more reliance on electric heating, particularly if oil systems for heating are not utilised in replacement of being connected to the gas grid.

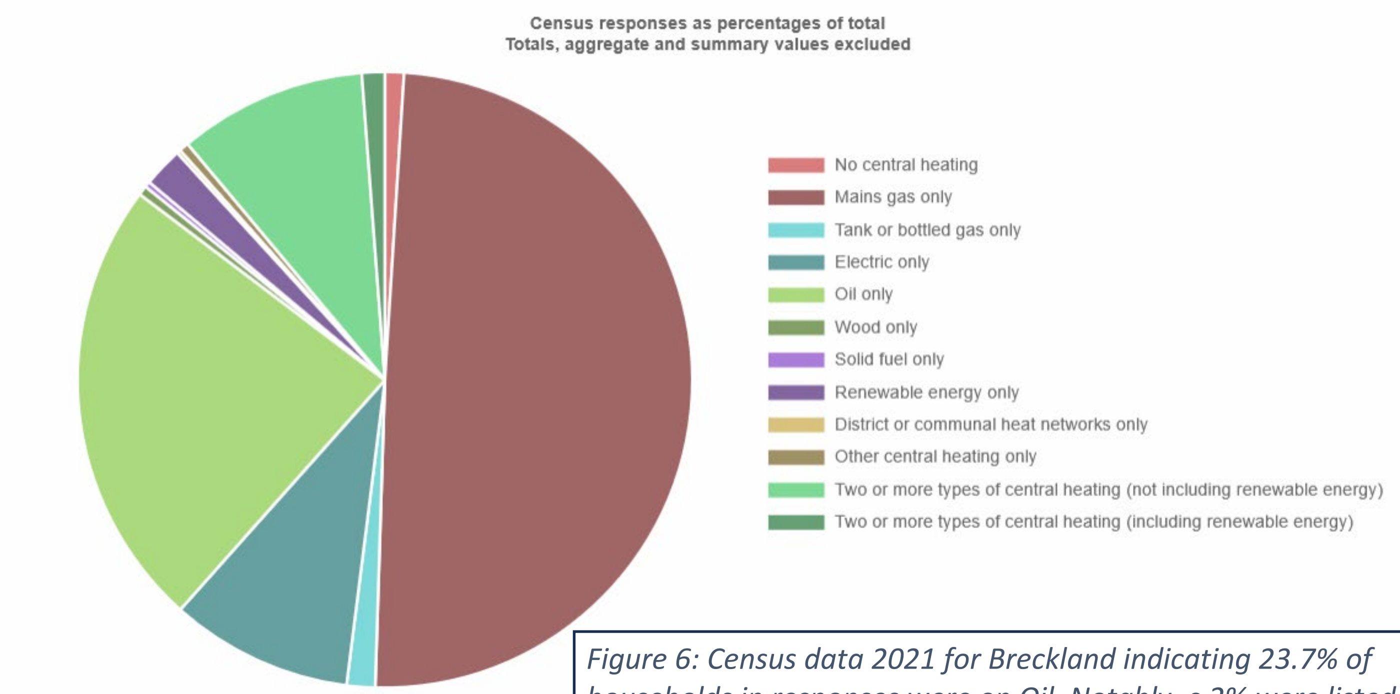


Figure 6: Census data 2021 for Breckland indicating 23.7% of households in responses were on Oil. Notably, c.2% were listed as renewable energy that we could take as heat pump usage. Note this data is 4 years old and heat pump technology has advanced, and new schemes are in place to incentivise.

As heating systems transition from gas to electricity (e.g. via heat pumps), overall electricity demand is expected to rise substantially. However, an electrified system with a heat pump draws in multiple benefits over gas-led systems:

- Superior efficiencies (300-400% compared to ~90% from gas boilers)
- Time-of-use electricity tariffs to reduce household bills
- Potential for use as air conditioning units in summer (by reversing the heat exchange valve)
- Ability to support demand-side electricity reduction through smart electricity tariffs

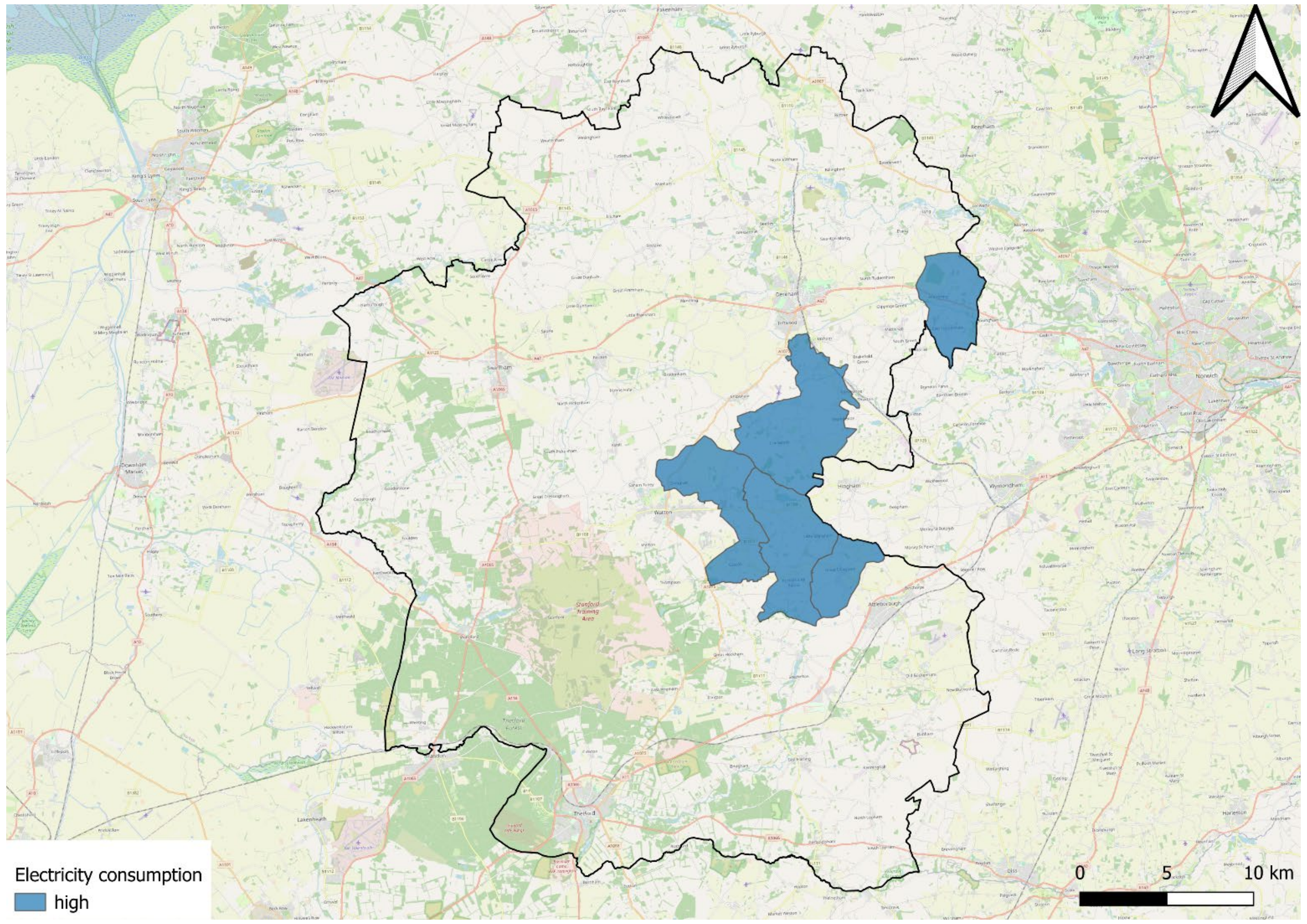


Figure 7: Top 5 highest residential electricity demand LSOAs in Breckland.

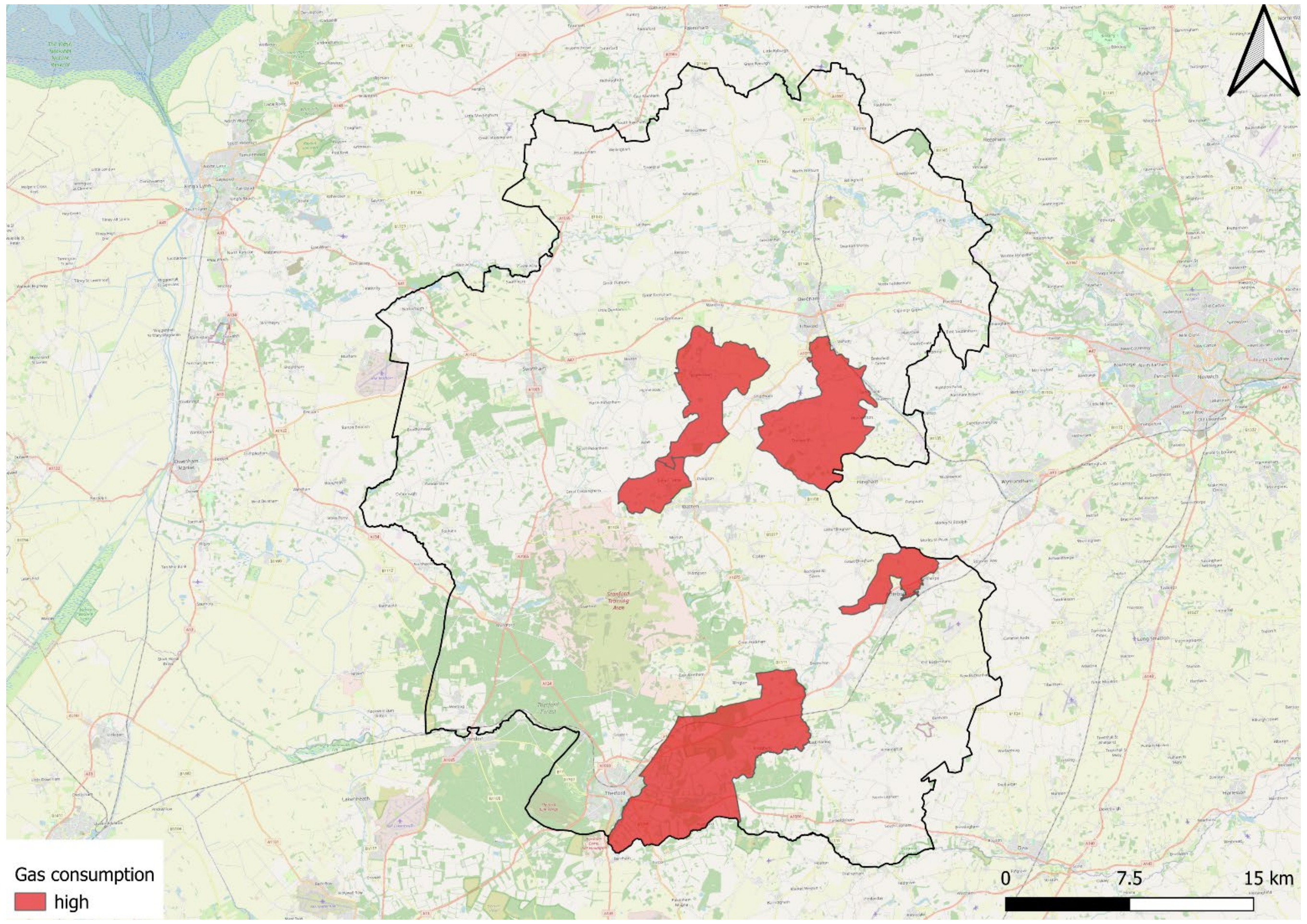


Figure 8: Top 5 highest gas demand LSOAs.

As shown in the table above, the range of consumption for both electricity and gas varies somewhat significantly. Residential gas and electricity consumption can differ significantly between LSOAs due to a combination of housing characteristics, socioeconomic factors, infrastructure access, and behavioural patterns.

As can be seen in *Fig. 7* above, the most electricity-consuming LSOAs are in a clustered area east of Watton/south of Dereham/north-west of Attleborough. *Fig. 8* shows the highest gas consumption LSOAs, which are similarly located around Attleborough, Cranworth and Bradlingham. Interestingly, there is an overlap around Attleborough.

One of the most influential factors is housing type and age. LSOAs with a high proportion of older, detached, or poorly insulated homes typically show higher energy consumption, especially for gas used in space and water heating. In contrast, areas with newer, well-insulated housing or more compact dwellings (such as flats) tend to have lower energy use per household.

Demographic and lifestyle factors further influence local energy profiles. Areas with older or retired populations may exhibit higher electricity use due to longer periods spent at home, while larger households generally use more gas and electricity overall. Conversely, areas with higher rates of fuel poverty may show suppressed energy use, where households underheat their homes due to affordability constraints.

In addition, adoption of low-carbon technologies such as electric vehicles, rooftop solar, and heat pumps is uneven across LSOAs and can shift local consumption patterns. Affluent areas with higher uptake of these technologies may experience rising electricity demand.

Future demand of new residential buildings

To determine future demand from housing growth in Breckland throughout the next local plan period (2024-2042), we assume that all new homes will be built to the Future Homes Standard (FHS) Option 1, as set out in the 2023 consultation. As Breckland does not currently set policy, that exceeds Building Regulations for operational energy/carbon standards of new residential buildings, the FHS is representative of the standards that will be set for new residential buildings over the emerging Breckland Local Plan period. It should be noted that Breckland Council is exploring changes to the emerging building standards policy based on feasibility and viability evidence.

	Apartment (1 unit)	Semi-detached
Electricity consumption (kWh/m²/yr)	46.13	68.15
Regulated electricity consumption (kWh/m²/yr)	30.34	51.77
Unregulated electricity consumption (kWh/m²/yr)	15.79	16.38
Total electricity consumption (kWh/yr)	**3,857**	**5,547**
Annual solar PV supply (kWh/yr)	3,446	3,645
Total electricity consumption minus solar PV supply (kWh/yr)	*411*	*1,901*

The table above sets out modelled operational electricity consumption, representative of additional expected electricity consumption from semi-detached and apartment archetypes under the indicative FHS specification. Annual solar PV supply is also presented, yet this data is not assessed for Phase 1 and will instead be assessed in detail for Phase 2 where site-specific demand and supply balances are to be modelled.

According to the Breckland Housing and Economic Development Needs Assessment, the current housing split is set out in the table below.

House type	Number
Bungalow	16,020
Flat	4,210
Terraced	11,960
Semi-detached	11,970
Detached	15,940
Total	60,100

To estimate the additional demand from housing growth during the local plan period, we assume that the housing mix of new residential buildings will broadly reflect the current splits. While we have modelled electricity consumption for one non-flatted dwelling type—a semi-detached home built to Future Homes Standard specification—we use this as a proxy for all non-flat housing types, including bungalows, terraced, semi-detached, and detached homes. This approach acknowledges that actual consumption may vary, with terraced homes typically using less energy and detached homes potentially using more, but in the absence of more detailed data, the semi-detached archetype provides a reasonable average estimate. This assumption can be updated as site allocations are finalised, and more specific housing data becomes available.

Under these assumptions, 7% of all new residential development in Breckland is expected to be flats/apartments, whilst the remaining 93% will be houses (bungalows, terraced, semi-detached, and detached).

Current housing growth numbers in Breckland, 625 homes a year, are required to increase to 903 a year under the new housing growth requirements set out by the new Labour Government. During the upcoming Breckland local plan period (2024-2042), we can therefore assume that by 2042, Breckland will build 16,254 new homes, and will be subject to an additional annual electricity demand from new residential buildings of:

- **Flats/apartments** (1,134 over plan period): 4,373,838 kWh; 4.37 GWh
- **Houses** (15,120 over plan period): 88,870,640 kWh; 88.87 GWh

There is no additional gas demand as the assumed specification is entirely electrified.

Future demand from existing residential buildings

To account for changes in electricity and gas demand in existing residential buildings in Breckland from 2024-2042, projections from National Grid Future Energy Scenarios 2023 (latest available version) data is used. This data is used to project demand shifts to all existing buildings at the time of writing. The 'System Transformation' scenario is used as this represents the most reasonable scenario in the report.

For new residential buildings, as explored above, an assumption is made that there is no change in electricity demand from new buildings because these buildings are already fully electrified and should not require any retrofitting in future.

The table below shows national projections for gas and electricity demand changes for residential buildings. Changes to gas and electricity demand in the projections occur because of:

- Lighting and appliance efficiency improvements
- Fabric improvements
- Heat pump uptake
- Gas boiler removals/replacements
- Electric vehicle uptake

The % change of gas and electricity demand at a national level is applied to Breckland demand in 2024, through to 2042. For gas, national demand falls by 73% from 2024-2042, whilst electricity demand increases by 85%.

The final demand values of existing residential buildings in Breckland specifically are:

- **Gas**: 97.95 GWh
- **Electricity**: 455.82 GWh

Combining these values with additional demand from new residential buildings during the Breckland local plan period, 2042 demand values from housing in Breckland will be:

- **Gas**: 97.95 GWh
- **Electricity**: 549.06 GWh

From current levels of demand in Breckland, gas demand to 2042 is projected to reduce by 73%, whilst electricity demand is expected for increase by 123%. These significant changes represent the importance of addressing electricity grid constraints ahead of time to ensure the system is readily prepared to support projected housing growth and the additional demand that arises with it.

In summary, from current levels of demand in Breckland, gas demand to 2042 is projected to reduce by 73%, whilst electricity demand is expected to increase by 123%. This figure includes both the projected 85% rise in electricity demand from existing residential buildings and the additional demand from new, fully electrified homes delivered during the Local Plan period. These significant changes represent the importance of addressing electricity grid constraints ahead of time to ensure the system is readily prepared to support projected housing growth and the additional demand that arises with it.

Years	National gas demand (TWh)	Cumulative % change	Breckland gas demand (GWh)	National electricity demand (TWh)	Cumulative % change	Breckland electricity demand (GWh)
2024	302	0.00%	369.00	102	0.00%	246.00
2025	299	-0.99%	365.35	102	0.00%	246.00
2026	294	-2.65%	359.21	103	+0.98%	248.41
2027	290	-3.97%	354.34	105	+2.94%	253.24
2028	285	-5.63%	348.21	108	+5.88%	260.47
2029	280	-7.28%	342.13	111	+8.82%	267.70
2030	274	-9.27%	334.80	115	+12.75%	277.37
2031	262	-13.25%	320.06	119	+16.67%	286.00
2032	248	-17.88%	303.03	124	+21.57%	298.07
2033	235	-22.19%	287.17	130	+27.45%	313.53
2034	221	-26.82%	270.12	136	+33.33%	328.59
2035	203	-32.78%	248.00	143	+40.20%	344.89
2036	184	-39.07%	224.99	151	+48.04%	364.17
2037	166	-45.03%	202.86	158	+54.90%	380.05
2038	148	-50.99%	181.00	166	+62.75%	400.37
2039	131	-56.62%	160.05	173	+69.61%	417.22
2040	113	-62.58%	138.13	179	+75.49%	431.70
2041	97	-67.88%	118.57	184	+80.39%	443.76
2042	**80**	**-73.51%**	**97.95**	**189**	**+85.29%**	**455.82**

Appraisal of local network projects

Current renewable energy generation and storage in Breckland

Site Name	Technology Type	Installed Capacity (MW)	Development Status
Jafa, Great Dunham - Solar Photovoltaic Farm & Battery Storage	Solar Photovoltaics	49.9	Planning Permission Granted
Snetterton Biomass Plant	Biomass (dedicated)	44.2	Operational
Thetford Biomass Power Station	Biomass (dedicated)	38.5	Operational
Attleborough Road Solar Farm	Solar Photovoltaics	30	Under Construction
Three Bridges Solar Farm	Solar Photovoltaics	15	Planning Permission Granted
Three Bridges Solar Farm	Battery	15	Planning Permission Granted
Hardingham Solar Farm	Solar Photovoltaics	14.8	Operational
North Pickenham	Wind Onshore	14.4	Operational
Burntstalk Solar Park	Solar Photovoltaics	11.5	Operational
Kenninghall Solar / Hazeldick Solar	Solar Photovoltaics	8	Operational
Claypit Moor Solar Farm (Lexham)	Solar Photovoltaics	7.9	Operational
Hardingham Solar Farm - extension	Solar Photovoltaics	5.2	Operational
Airfield Farm PV	Solar Photovoltaics	5	Operational
Huntingfield Solar Farm	Solar Photovoltaics	4.4	Operational
North Pickenham Airfield	Wind Onshore	4	Operational
Little Cressingham, Cranswick Country Foods - Solar Array	Solar Photovoltaics	1.82	Planning Permission Granted
Swaffham Plashes II	Wind Onshore	1.8	Operational
Swaffham 1 - Ecotech Wind Park	Wind Onshore	1.5	Operational
Attleborough Ad Plant Limited - Anaerobic Digestion Facility Expansion	Anaerobic Digestion	1	Operational

Land North of the A11 - Solar Park	Solar Photovoltaics	1	Planning Permission Granted
Cranswick Country Foods, Brandon Road - Solar Panels	Solar Photovoltaics	0.66	Planning Permission Granted
HMP Wayland - Solar Panels	Solar Photovoltaics	0.34	Operational
Station Road - Solar Panels	Solar Photovoltaics	0.32	Planning Permission Granted
Hamonds High School, Brandon Road - Solar Panels	Solar Photovoltaics	0.26	Planning Application Submitted
IFD Group, Harling Road - Solar Panels	Solar Photovoltaics	0.25	Planning Permission Granted
Hargham Road - Solar Panels	Solar Photovoltaics	0.25	Planning Application Submitted
Lays Farm, Wood Lane - Solar Panels	Solar Photovoltaics	0.23	Planning Permission Granted
Nicholas Hamond Academy - Solar Panel Canopies	Solar Photovoltaics	0.22	Planning Permission Granted
The Bishops CE Primary Academy - Solar Panels	Solar Photovoltaics	0.21	Planning Permission Granted
Tesco Superstore Thetford Road	Solar Photovoltaics	0.2	Operational
Dereham Leisure Centre, Station Road - Solar Panels	Solar Photovoltaics	0.17	Planning Permission Granted

Based on the data shown above from the Renewable Energy Planning Database (REPD), produced by DESNZ, there is a large number of operational renewable energy projects in Breckland, currently with an installed capacity of 162.74 MW. Projects with planning permission granted total 84.83 MW, which represents a significant additional amount of generation and storage capacity, whilst 30 MW is currently also under construction. 0.51 MW of capacity has been submitted for planning, which represents a minimal additional amount of capacity.

Development status	Installed capacity
Operational	162.74
Planning permission granted	84.83
Under construction	30.00
Planning application submitted	0.51

Planned electricity grid reinforcements

To accommodate the additional renewable energy generation and storage projects, and additional electricity demand to 2042, a significant amount of electricity infrastructure upgrades will be required. The latest Breckland-specific report from UKPN sets out the current planned grid reinforcements.

These grid infrastructure upgrades across Breckland reflect work carried out by UKPN to strengthen the local electricity network and ensure it can support current and future demands, particularly in areas of growth. Each intervention contributes to improving network reliability, increasing capacity, and enabling the integration of low-carbon technologies and new development to support Breckland’s 2035 net zero target.

When UK Power Networks (UKPN) refers to “customer-funded” infrastructure, it means that the costs of the grid connection and associated upgrades are paid by the developer or organisation requesting the connection, not by UKPN or through general electricity bills.

This typically applies for customers with UKPN such as:

- A housing developer building a large new development
- A business or industrial park expanding or setting up operations
- A renewable energy project (e.g. solar farm) looking to export electricity to the grid

1. North-Western Area (primarily supplied from Swaffham Grid)

- New 132/33kV transformers have been installed at Swaffham Grid (UK Power Networks contribution to provision of additional capacity to RAF Marham).
- New 33kV/11kV transformers have been installed at Watton Primary.
- Swaffham - Fairstead 33kV overhead line reinforcement.
- New 33kV switchgear and cabling at Northwold Primary Substation.

The installation of new 132/33kV transformers at Swaffham Grid significantly increases the area's high-voltage capacity and improves resilience, particularly benefiting strategic users such as RAF Marham. This upgrade ensures stable supply for large, critical loads and unlocks additional headroom for future connections. Similarly, the installation of new 33/11kV transformers at Watton Primary enhances the capacity and flexibility of the medium-voltage network, allowing it to serve growing local demand more effectively. Reinforcement of the Swaffham–Fairstead 33kV overhead line strengthens a key distribution corridor, improving load transfer capabilities and reducing the risk of power outages. At Northwold Primary Substation, the addition of new 33kV switchgear and cabling modernises the infrastructure, improving operational control.

2. Breckland South (the main supply points are at Thetford and Diss Grid substations)

- New 33.11kV substation to supply Snetterton Business Park is currently under construction providing 6MVA capacity (customer funded)
- New 33/11kV substation to supply developments in North Thetford is under construction providing 19MVA of capacity (customer funded).

Two new 33/11kV substations are being developed in this area, both funded by customers, highlighting strong development-led demand. The substation under construction at Snetterton Business Park will provide 6MVA of capacity, directly supporting the area’s economic development ambitions by enabling business expansion and new commercial connections. Meanwhile, the larger 19MVA substation in North Thetford is being built to support substantial new residential development, reinforcing the importance of aligning infrastructure delivery with housing growth. These investments will reduce pressure on existing substations and support the electrification of heat and transport in new communities.

3. Eastern Area (the main supply points are East Dereham (Sall & Earlham Grids) and Attleborough (Earlham & Trowse Grids))

- East Dereham 33kV OHL replacement

The replacement of the 33kV overhead line in East Dereham ensures continued reliability of supply in this area of the district. Overhead line replacement typically improves safety, reduces the likelihood of faults from weather or ageing infrastructure, and in some cases enables a modest capacity increase.

Future investment requirements

To support the growth of renewable energy generation, increased storage capacity, new development, and the electrification of heating and transport, significant investment in Breckland’s electricity infrastructure is required. The district’s current grid will need major upgrades to meet projected demand and enable a low-carbon transition to align with Breckland Council’s 2035 net zero aspirations.

A key area for investment is continuous grid capacity upgrades, which is the role of the UKPN, which the previous section has explored. The transmission and distribution network around Breckland must be reinforced to accommodate additional load and the export of renewable electricity. This includes the expansion of existing infrastructure, the construction of new substations, and the reinforcement of 132kV and 33kV lines. Large renewable developments, typically require substantial upgrades to local substations and transmission assets, with associated costs ranging from £5 million to £10 million per site, depending on proximity to the grid.

The integration of energy storage, such as using utility- and household-scale batteries, is also essential. As the district brings forward more intermittent renewable generation, co-located and distributed battery energy storage systems (BESS) will be critical to manage grid stability and reduce curtailment, whereby renewable energy generation sites are turned down or off to keep grid frequencies at healthy levels. Investment in inverters and smart control systems will also be necessary to replace traditional grid-balancing functions typically provided by fossil-fuelled power stations.

Reinforcement of the local distribution network is another priority, which will be impacted significantly by consumer-driven electricity demand changes throughout the local plan period. The uptake of electric vehicles, heat pumps, and the construction of new residential developments will place significant pressure on the local grid. Existing infrastructure will need to be upgraded to avoid voltage drops, thermal constraints, and reliability issues. For example, a new residential development of 1,000 homes that are 100% electrified could require £1 million to £2 million in distribution network upgrades alone. These upgrades will also need to include the deployment of smart transformers and real-time monitoring systems.

To complement physical infrastructure, investment is needed in smart grid technologies and flexibility services. By deploying demand-side response systems, time-of-use tariffs, and digital metering, grid operators can reduce peak loads and mitigate against costly network upgrades. Local flexibility markets would also allow consumers and businesses to adjust their energy use in real time, further enhancing the resilience of the system.

These infrastructure improvements must be coordinated through strategic planning between Breckland District Council, UKPN, National Grid ESO, and developers. Phase 2 of this study and the upcoming Greater Norfolk Energy Plan will help to identify spatial zones of high demand or generation potential, which should enable and inform more efficient, targeted investment.

Overall, the future investment required to modernise, and future proof Breckland's electricity infrastructure is considerable but necessary to align with aspirations to meet national net zero targets and support upcoming housing growth throughout the local plan period. Cumulative costs could reach tens of millions of pounds across substation expansions, distribution reinforcements, energy storage deployment, and smart grid integration. These investments will ensure the district can meet future energy demands, support low-carbon technologies, and align with the Council's net zero aspirations for the district.

Flexibility approaches

UKPN offers flexible connection options to help new generators connect to the grid in areas with limited capacity. This can help reduce grid investment requirements for new housing in Breckland and speed up the connection process to enable faster housing growth. For projects with export capacity exceeding on-site use, such as significant on-site solar PV and battery storage, UKPN can provide non-firm connections that allow generation to be curtailed during times of network constraint. This is managed via Active Network Management (ANM) systems, which signal when to increase or reduce output.

In some cases, timed connections are also available. These limit exports to specific periods of the day, typically 2 or 3 windows daily, when spare capacity exists. These are generally offered for connections over 1MVA and can help avoid or defer the need for costly grid upgrades. UKPN is also improving how it plans for future demand by incorporating local housing growth forecasts, policy standards, and development data into its network modelling, which helps to identify where reinforcements will be needed and enables more proactive investment planning.

Other operators offer similar approaches, such as Scottish and Southern Electricity Networks (SSEN) Distribution, who have launched the Community Smart Access initiative to expedite grid connections for new net zero housing developments. This scheme employs Dynamic Load Averaging (DLA) to manage local electricity demand, facilitating the integration of low-carbon technologies such as electric vehicles, heat pumps, solar panels, and battery storage systems. By procuring and compensating for necessary flexibility services in advance, SSEN enables construction to proceed even in areas with existing grid constraints.

The initiative aligns with the UK's broader goals of decarbonising the housing sector and expanding the adoption of 100% electrified homes. By addressing grid constraints proactively, SSEN's approach supports the development of sustainable communities and contributes to national and local net zero targets.

Both UKPN and SSEN approaches clearly demonstrate that innovative and modern approaches to new development can improve the quality of life for residents and simultaneously mitigate burdens on expanding electricity grids.

Recommendations and futureproofing

Current draft policies

In summer 2024, the Council put forward the draft Breckland Reg18 local plan with a number of policy proposals for renewable energy and energy efficient development. It is intended that these will go forward for another Reg18 consultation later this year. The table below assesses draft policies and what their impact on electricity infrastructure is.

Policy/guidance	Policy/guidance wording	Impact on electricity infrastructure
HOU20	New homes will be required to adopt the Fabric Energy Efficiency Standard to measure energy efficiency and the requirements of Building Regulations including Parts F and L.	HOU20 does address fabric efficiency, which reduces energy demand through the building having lower heating demand. However, Building Regulations sets fabric efficiency rates based on the notional building, rather than setting absolute values that limit energy consumption to robust levels that do not overburden local electricity networks. As HOU20 does not require an actual limit to energy consumption or a strict absolute target on fabric efficiency (or space heating demand), the policy is unlikely to have a significant impact on reducing energy demand in new residential buildings.
ENV01	Energy efficiency should be embedded in design both to minimise costs to users and to reduce their environmental impact. All developments should follow the energy hierarchy and design in energy efficiency features from onset.	ENV01 is positive in addressing lower energy demand through energy efficiency improvements. However, the policy is qualitative in nature and therefore is unable to hold developers to account in what level of energy efficiency is achieved. Without absolute numerical values for energy use in place, the policy is subjective and not robust in placing limits on the amount of energy consumption that new developments have. The energy hierarchy is a strong framework for a policy to operate in, yet it requires additional metrics to support each stage of the hierarchy to align with best practice. Without such metrics, ENV01 is unlikely to have a strong impact on reducing grid constraints linked to new buildings.
INF04	The Council supports proposals for new renewable energy and low carbon development, subject to consideration of the impact of the development and whether this can be made acceptable. Proposals will be considered having regard to the extent to which there are: a. adverse impacts on the local landscape, townscape or designated and non-designated heritage assets assessed in line with the policies of this Plan. b. adverse effects on residential amenity by virtue of outlook / overbearing impact, traffic generation, noise, vibration, overshadowing, glare, or any other associated detrimental emissions, during construction, operation, and decommissioning. c. an irreversible loss of the highest quality agricultural land. d. cumulative impacts of renewable energy development on an area; and	INF04 provides a framework for renewable energy and low carbon development to be assessed on. The policy focuses entirely on impact of the development and considerations in mitigation of impact. A key missing element of this policy is to address mitigation of constraints to electricity infrastructure, through support of innovative schemes that integrate electricity flexibility, smart grids, energy sharing, and other modern methods of electricity integration. Additionally, utility-scale battery storage acts as a key component is smoothing out peak loads from export of renewable electricity to

	e. adverse impacts upon designated wildlife sites; nature conservation interests and biodiversity, assessed in line with the policies of this Plan. Proposals will be permitted where the impact is, or can be made, acceptable. Applications will be expected to demonstrate that any adverse impacts can be mitigated. Proposals for renewable energy development including the landward infrastructure for offshore renewable schemes requiring planning permission will be assessed to determine whether the benefits they bring in terms of the amount and usability of energy generated outweigh any adverse impacts. When attributing weight to any harm, in addition to other relevant policies in the Local Plan, regard will be given to national policy and guidance, statutory duty and legislation which seeks protection and enhancement of the landscape, designated and non-statutory heritage assets. Where appropriate the authority will consider the need for planning conditions requiring the decommissioning and removal of all plant and ancillary equipment, and if necessary, the restoration of land, on the cessation of use. **Solar Energy Development** The effective use of land by focusing large scale solar farms on previously developed and non-agricultural land, will be encouraged provided that it is not of high environmental value. Particular factors that the Council will need to consider where a proposal involves greenfield land include: f. the proposed use of any agricultural land has been shown to be necessary and poorer quality land has been used in preference to higher quality land, where possible; and, g. that the proposal allows for continued agricultural use where applicable and/or encourages biodiversity improvements around arrays.	the grid. Stating explicit support for storage technologies would be a proactive step to mitigating grid constraints in Breckland. Smart location of renewable energy generation and storage sites would also be a beneficial component to INF04 to ensure new development is best supported in having energy demands met. Rather than focusing on impacts of renewable energy development, INF04 could take a more holistic approach to supporting innovative schemes that mitigate negative impacts to landscape and communities, whilst also improving local electricity infrastructure conditions.
Breckland Design Guide paragraph 6.3	Proposals for development should demonstrate that they follow the energy hierarchy. Energy considerations should underpin every stage of the design process from initial site assessment, through design concept to detailed application and implementation.	Same as ENV01.

Strategic policy recommendations

To support sustainable growth and address electricity grid constraints in Breckland, several strategic interventions should be prioritised within the Breckland Local Plan and through coordination with UKPN. These recommendations focus on enabling low-carbon development, supporting network resilience, and aligning infrastructure investment with local housing growth.

1. Introduce an energy infrastructure policy in the Breckland Local Plan

A dedicated policy on energy infrastructure in the local plan would ensure that new development is better aligned with available grid capacity and future upgrade plans. This policy should require developers, particularly for major development, to submit an Energy Strategy that includes evidence of early engagement with UKPN and demonstrates a viable electricity connection.

Where local grid capacity is limited, the policy should encourage or require the integration of on-site smart solutions, such as solar PV, battery energy storage systems, and load-reducing approaches to the whole development. This approach helps reduce risk to both developers and planners, ensures growth is deliverable, and supports coordinated infrastructure delivery across Breckland that is not delayed due to grid constraints. It also provides a framework for encouraging innovation in low-carbon energy systems at the local level.

2. Require high energy efficiency standards in new development

Reducing electricity demand at the point of use is one of the most effective policy approaches to address grid constraints while supporting climate objectives, which the local plan is able to set strict requirements on. The Breckland Local Plan should set ambitious but achievable limits on total energy use for new housing, such as using the Energy Use Intensity metric, which several councils now have adopted into local plan policy (e.g. Cornwall, Bath & North East Somerset, and Central Lincolnshire). Meet recognised net zero carbon building standards (e.g. Passivhaus or the UK Net Zero Carbon Buildings Standard) would also achieve low levels of energy use.

Limiting energy use itself is a powerful approach to mitigating grid constraints, to minimise the amount of renewable energy generation and supporting electricity infrastructure to match energy demand from new housing. Highly efficient buildings require less electricity for heating, lighting, and cooling, meaning they impose less stress on the local network and are better suited to electric heating solutions, such as air source heat pumps. These improvements also reduce long-term energy bills, support residents in adapting to future energy price fluctuations, and enhance climate resilience. Combined with smart design and low-carbon technologies, energy-efficient buildings form a key part of a distributed energy system that reduces reliance on traditional grid upgrades.

3. Support smart energy zones and local flexibility

Smart energy zones, or micro-grids, offer an integrated, scalable way to manage local energy supply and demand within the limitations of existing grid infrastructure. These zones can combine rooftop or ground-mounted solar PV, battery storage (at household or utility-scale), smart energy management systems, and digital infrastructure that enables dynamic control of demand. For example, homes could charge electric vehicles or heat water when grid demand is low, and export stored energy during peak periods. Similarly, residents could effectively share electricity with each other to smooth out varying peaks in demand between households, such as if one household works from home whilst the other is at the office.

This flexibility helps reduce the strain on substations and electricity lines, potentially mitigating the need for reinforcement. Collaboration between Breckland Council and UKPN would be beneficial to address potential zones of pressure in places such as Thetford and Snetterton. It is important to note that the significant growth in Thetford was planned under the previous Local Plan, while proposals for further expansion in Thetford and at Snetterton remain unconfirmed at this stage. Proactive engagement could unlock additional capacity for thousands of new homes without requiring major grid upgrades. Breckland Council could support these zones through integration into local plan policies, design codes, funding bids, or Local Development Orders that fast-track smart infrastructure.

4. Use local plan data to inform UKPN plans

A key cause of delay to new developments is uncertainty around electricity connection timescales. To mitigate this, Breckland Council should formalise data-sharing with UKPN to ensure that spatial planning data, such as site allocations, policy standards, planning consents, and housing delivery projections, is regularly incorporated into network investment planning.

UKPN has indicated it can incorporate site allocation data and policy standards into its models, but this needs to happen systematically and formally to have maximum impact. Doing so enables the DNO to prioritise reinforcements in areas with the highest certainty of growth and to seek regulatory approval for investment ahead of development occurring. This collaboration would improve long-term certainty for both developers and network planners, reduce connection delays, and better align infrastructure upgrades with Breckland's broader economic and environmental goals.

Key components of energy-flexible new developments

To address electricity grid constraints linked to new housing growth in Breckland, a range of smart energy solutions should be actively supported through the Local Plan. These technologies not only ease pressure on existing infrastructure but also support the district's ambitions for net zero by 2035. Incorporating these into planning policy can ensure that new developments are more resilient, low- or zero-carbon, and future-ready. Whilst not all of these components can be *required* in policy, they should certainly be promoted and encouraged by Breckland Council.

Battery energy storage systems

- Allow excess renewable electricity (e.g. from solar panels) to be stored and used later, reducing reliance on peak-time grid imports.
- Utility-scale systems can relieve local substations during high demand, while home-scale batteries improve self-consumption of rooftop solar, increasing energy independence for residents.

Smart grid technologies and digital infrastructure

- Enables local energy sharing among homes within a development.
- When combined with microgrids and local generation, such as solar PV or small-scale wind, communities can reduce peak demand on the main grid and make better use of locally produced clean energy.
- Increases resilience during wider network disruptions.

Demand-side response measures

- Examples such as vehicle-to-grid charging, smart appliances, and agile tariffs empower residents and landlords to shift electricity use to off-peak times.
- Reduces local strain on the grid and creates opportunities for residents to benefit financially from their flexible energy behaviour.

Community energy approaches and peer-to-peer trading models

- Supports local ownership and distribution of energy.
- Especially effective in rural settings like Breckland, where network upgrades are slower to deliver.
- Allows residents to buy and sell electricity locally, which can help optimise use of local renewable generation and keep energy revenues within the community.

District heating and heat networks

- Can decouple heating demand from the electricity network, especially in dense housing or mixed-use developments.
- By using low-carbon or waste heat sources, these systems reduce reliance on individual electric heat pumps and contribute to decarbonised, shared infrastructure.

Collectively, these solutions offer a toolkit for enabling sustainable growth while managing grid constraints. Embedding them into the Breckland Local Plan would support more balanced, flexible, and self-sufficient energy systems across new and existing communities.