

West Lothian Local Development Plan 2 Evidence Report

Schedule	23. Energy, heat and cooling
<p>Information required by the Act and NPF4 regarding the issue addressed in this section</p>	<p>Town and Country Planning (Scotland) (Act) 1997, as amended:</p> <ul style="list-style-type: none"> • section 15(5) the infrastructure of the district, and how that infrastructure is used. • Regulation 9 Have regard to the national marine plan any regional marine plan. <p>National Planning Policy 4 (adopted 13 February 2023)</p> <ul style="list-style-type: none"> • NPPF4 identifies 18 ‘national developments’ which are described as: "significant developments of national importance that will help to deliver the spatial strategy. Six National Developments support the delivery of sustainable places, number 3 being ‘Strategic Renewable Electricity Generation and Transmission Infrastructure’ which is identified as being required for the whole of Scotland. • NPF4 Policy 1 – Tackling the climate and nature crises – LDPs must address the global climate emergency and nature crisis by ensuring the spatial strategy will reduce emissions and adapt to current and future risks of climate change by promoting nature recovery and restoration in the area. • NPF4 Policy 2 – Climate mitigation and adaption – The LDP spatial strategy should be designed to reduce, minimise or avoid greenhouse gas emissions. The six spatial principles should form the basis of the spatial strategy, helping to guide development to, and create, sustainable locations. The strategy should be informed by an understanding of the impacts of the proposals on greenhouse gas emissions. LDPs should support adaptation to the current and future impacts of climate change by taking into account climate risks, guiding development away from vulnerable areas, and enabling places to adapt to those risks. • NPF4 Policy 11 – Energy – LDPs should seek to realise their area’s full potential for electricity and heat from renewable, low carbon and zero emission sources by identifying a range of opportunities for energy development. • NPF4 Policy 18 – Infrastructure First - LDPs and delivery programmes should be based on an integrated infrastructure first approach. Plans should: be informed by evidence on infrastructure capacity, condition, needs and deliverability within the plan area, including cross boundary infrastructure; set out the infrastructure requirements to deliver the spatial strategy, informed by the evidence base, identifying the infrastructure priorities, and where, how, when and by whom they will be delivered; and indicate the type, level (or

method of calculation) and location of the financial or in-kind contributions, and the types of development from which they will be required.

- **NPF4 Policy 19 – Heating and cooling** seeks to help Scotland achieve zero emissions from heating and cooling our buildings and adapt to changing temperatures. The policy takes account of changes to Building Standards regulations which will require new homes to be heated by a low carbon alternative to gas boilers by and statutory greenhouse gas emissions reductions targets, all of which have read across consequences for energy infrastructure.

Other relevant legislation:

- Section 36 of the Electricity Act 1989 applies to proposals for the construction, extension or operation of an onshore electricity generating station whose capacity exceeds (or, when extended, will exceed) 50 megawatts. Applications to construct or operate electricity generating stations below this threshold which do not require section 36 consent are made to the local planning authority under the Town and Country Planning (Scotland) Act 1997. Under Section 37 of the Electricity Act 1989 consent is required from the Scottish Ministers to install (and keep installed) an electric line exceeding 20 kilovolt (kV) above ground.
- The Pipelines Safety Regulations 1996 [PSR] were made under the Health & Safety at Work Act and are the principal health and safety legislation in the UK concerning the safety of pipelines. The overall aim is to ensure pipelines are designed and constructed properly and operated safely.

This schedule aims not to repeat the content of other topics covered by the LDP2 Evidence Report. Other schedules which should be read alongside this schedule on energy, heat and cooling:

- Climate Change
- The Water Environment and Flooding (which covers Marine Planning in respect of regulation 9)

Links to Evidence referred to in this schedule

- Scottish Government, [Climate Change Plan 2018-32 \(updated in 2021\)](#)
- Scottish Government, [draft Energy Strategy and Just Transition Plan](#)
- West Lothian Council, [Climate Change Strategy 2021-2028.](#)
- West Lothian Council, [Local Heat and Energy Efficiency Strategy \(2023-2028\)](#)
- [SGN data layers](#)
- Scottish Government, [The Scottish house condition survey \(2019\)](#)
- Scottish Government, [Hydrogen Action Plan \(2022\)](#)
- Energy Networks, [Britain’s Hydrogen Network Plan 2021](#)
- SPEN, [Network Development Plan \(NDP\) \(May 2024\)](#)
- SPEN, [Distribution Heat Map tool](#)
- National Grid, [UK Electricity Ten Year Statement \(ETYS\)](#)
- NESO, [Electricity System Operators “Beyond 2030” report \(2024\)](#)
- SPEN, [RIIO-T2 Business Plan \(2021-2026\) \(Transmission\).](#)

- SPEN, Distribution Future Energy Scenarios (DFES)
- SPEN, Long Term Development Statement for the Years 2023/24 to 2027/28 (2023) (LTDS)
- West Lothian Council, Public Electric Vehicle Infrastructure Plan
- West Lothian Council, Statutory guidance on Wind Energy Development
- West Lothian Council, Statutory guidance on Renewables and Low Carbon Energy'

Summary of Evidence

Purpose, scope and structure of this schedule

This schedule focuses on the capacity of infrastructure networks in West Lothian. This schedule and its evidence are set out in the following sections:

1. National strategies, priorities and evidence
2. Local strategies, priorities and evidence
3. Gas
4. Hydrogen
5. Electricity
6. Electric Vehicles and charging points
7. Renewable Energy
8. Heat and Cooling

Part 1 - National strategies, priorities and evidence

- 1.1 The **Scottish Climate Change Plan 2018-32 (updated in 2021)** sets out the Scottish Government's proposals and policies for meeting its climate change targets and identifies how Scotland could deliver its target of 75% by 2030 (compared with 1990) and to net zero by 2045. In April 2024 the Scottish Government accepted, following a report from the Climate Change Committee that this target was out of reach. A new Scottish Climate Change Plan is expected in 2025.
- 1.2 A draft **Energy Strategy and Just Transition Plan** was published in January 2023 and set out how the Scottish Government hopes to create a net zero energy system that delivers affordable, secure and clean energy while benefitting communities across Scotland by providing high quality jobs and economic opportunities.

Part 2 - Local strategies, priorities and evidence

- 2.1 West Lothian Council signed the Climate Change Declaration in 2007 and following on from its declaration of a Climate Emergency in September 2019, produced the **West Lothian Climate Change Strategy 2021-2028**.
- 2.2 The strategy provides a framework for the council's actions as a public sector organisation aimed at reducing greenhouse gas emissions and preparing for the unavoidable impacts of changing weather patterns through the period 2021-2028 while also considering the pathway to achieving a net-zero West Lothian by 2045 at the latest. The strategy contains six outcomes and 28 actions

for the council to reduce emissions across areas such as energy, transport, waste and biodiversity.

- 2.3 The **West Lothian Local Heat and Energy Efficiency Strategy (2023-2028)** focuses on energy efficiency and heat decarbonisation and LHEES aims to establish local authority area-wide plans.

Part 3 - Gas

- 3.1 Gas consumption in West Lothian is set out below.

		Total consumption in Gigawatt Hours (GWh)									
		2018		2019		2020		2021		2022	
		Domestic	Non-Domestic	Domestic	Non-Domestic	Domestic	Non-Domestic	Domestic	Non-Domestic	Domestic	Non-Domestic
Scotland		28,383.0	19,341.1	28,850.0	19,156.5	29,409.8	19,509	28,278.2	19,067.9	24,654.5	18,979.6
West Lothian		1,061.4	690.9	1,089.1	1,083.9	1,112.2	690.9	1,070.6	730.2	940.5	812.2

Source: *Subnational Gas Consumption, Great Britain, 2018 to 2022 - Department for Business, Energy and Industrial Strategy*

These estimates are weather-corrected. This means that the effect of differences in weather conditions between years has been removed to provide more like for like comparisons over time.

- 3.2 The gas distribution network operator in West Lothian is SGN, (previously known as Scotia Gas Networks). SGN has created [4 separate data layers](#) (by pressure tier) to identify the location of their gas network:

- LP - Low Pressure (19 mbar - 75 mbar)
- MP - Medium Pressure (75mbar - 2 bar)
- IP - Intermediate Pressure (2 bar - 7 bar) and
- HP - Regional High Pressure (>7 bar) (also referred to as Major Accident Hazard Pipelines - MAHP)

- 3.3 Not all of Scotland is on the gas grid. [The Scottish house condition survey \(2019\)](#) concluded that approximately 17% of homes in Scotland were outside the coverage of the gas grid, and SGN continues to extend its network into communities without gas through projects known as 'infills'. This is where it lays new gas mains and service pipes to connect homes and businesses to the existing gas network. Costs are shared by the properties within the project boundary.

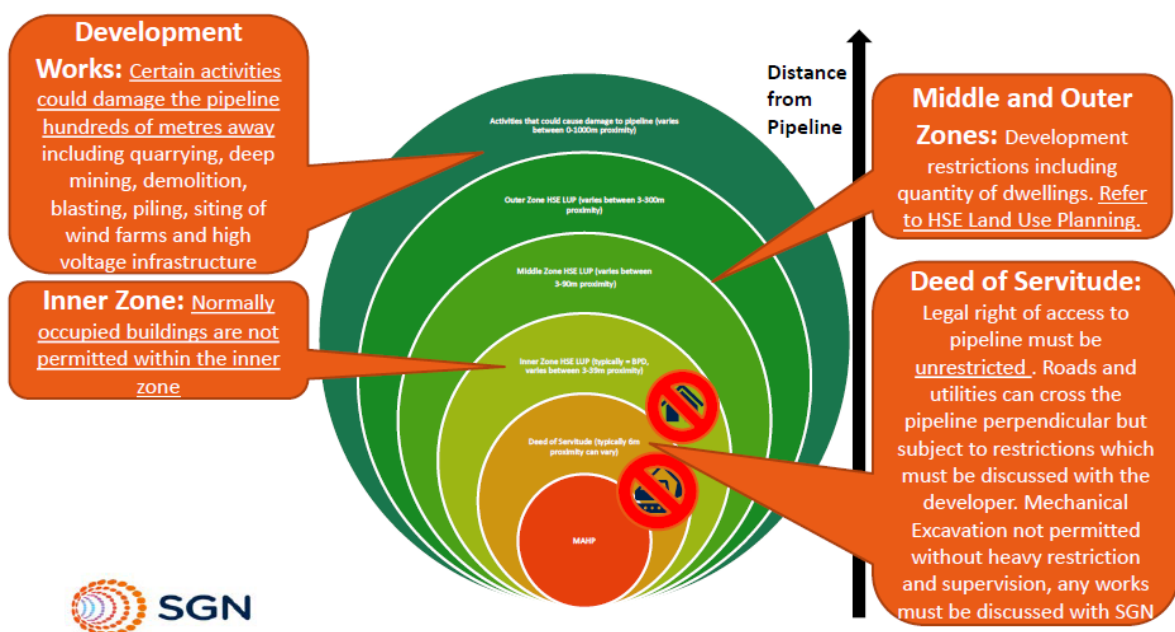
- 3.4 New gas transmission infrastructure developments (pipelines and associated installations) are also periodically required to meet increases in demand and changes in patterns of supply. SGN have a 30-year programme to upgrade the gas network which involves replacing old metal pipes with new plastic pipe to ensure homes and businesses continue to receive a safe and reliable gas supply for the foreseeable future.

- 3.5 There is no publicly available information regarding the capacity of the gas distribution network in Scotland but the 2023 Long-Term Development Statement (LTDS) provides and insight into how the business may develop over the next 10 year.

- 3.6 Provisional discussion with SGN about their physical assets in West Lothian have confirmed that there is likely to be capacity to meet future demands for growth. This will nevertheless require to be confirmed by developers in consultation with SGN at the time of any application for planning

permission. There may however still be constraints to gas supply in part of the north west of West Lothian due to previous mining and ground conditions.

- 3.7 In West Lothian, there are no significant projects (above £0.5million) anticipated to be carried out by SGN in the period up to 2030.
- 3.8 A series of Strategic Planning Grid Reviews covering the West Lothian area have been undertaken by SGN which identify the Intermediate Pressure (IP) and Medium Pressure (MP) gas infrastructure. These two pressure tiers usually connect the close-by towns and villages, supplying at times non-domestic customers with large gas demands and of course the Low Pressure (LP) networks. The LP is usually the direct supply to the vast majority of domestic customers, but they also can feed commercial and industrials. For technical reasons the LP isn't provided in these reports. Assessing the impact to the tier is difficult without knowing specific information, such as exact gas demands and locations of potential connections.
- 3.9 In terms of **High-Pressure Gas Pipelines in West Lothian**, for Natural Gas, Pipelines > 7barg (High Pressure) are known as Major Accident Hazard Pipelines (MAHP) under the Pipelines Safety Regulations 1996. High pressure gas pipelines are a potential constraint on development for reasons of their alignment and restrictions imposed by the pipeline operator, SGN, and the Health and Safety Executive (HSE). There are other high-pressure pipelines traversing West Lothian, for example the SABIC UK Wilton to Grangemouth Ethylene Pipeline.
- 3.10 Decisions made about the development of land in and around major accident hazard installations and pipelines must be made with due regard to these installations and planning and consultations zones must be considered. The provide a HSE Planning Advice Web App and methodology. The Council, as planning authority, has access to GIS data of SGN assets showing the location of pipelines for use in planning screening and will consult with the HSE and pipeline operators as appropriate) on the potential allocation of sites for development which are located within pipeline consultation zones.



Part 4 - Hydrogen

- 4.1 The Scottish Government's **Hydrogen Action Plan (2022)** sets out an ambition of 5 GW of renewable and low-carbon hydrogen production by 2030 and 25 GW by 2045. The UK's **Hydrogen Network Plan 2021** sets out how the gas networks can transition from delivering natural gas to hydrogen including a roadmap towards blending up to 20% hydrogen in the gas grid by 2023. It also identifies the projects that the gas networks will deliver to enable a net zero gas grid.
- 4.2 Scottish Gas Networks (SGN) has undertaken a pilot study based in Fife to explore the potential for 'power to hydrogen'. The aim is to create a link between the electricity network - fed by renewables from a variety of sources - and the gas network, which would be used to carry hydrogen to a variety of end-use applications including heating, transport and industry.
- 4.3 One of the direct implications for the planning system is that it will need to be able to accommodate a large volume of applications for hydrogen production, storage, pipeline and other ancillary facilities.

Part 5 - Electricity

- 5.1 SP Energy Networks (SPEN) operates the electricity distribution networks in the Central Belt and South of Scotland (SP Distribution) serving 2 million customers. It also owns and maintains the electricity transmission network in the Central Belt and South of Scotland (SP Transmission).
- 5.2 The **SPENs Network Development Plan (NDP) (May 2024)** provides details on available network capacity to accommodate future demand and generation growth, as well as the company's planned interventions to increase network capacity to facilitate decarbonisation.
- 5.3 The [SPEN Distribution Heat Map tool](#) provides a geographic view of where there is available network capacity to accommodate new generation. This provides an indication of the potential opportunities to connect Distributed Generation to the 11kV and 33kV network in the SP Distribution plc licence area. Each substation and circuit have been assigned one of the following categories:
 - **Category: Green** – All operational factors are within tolerable limits and so opportunities may exist to connect additional Distributed Generation without reinforcing the network (subject to detailed studies)
 - **Category: Amber** – At least one factor is nearing its operational limit and hence, depending on the nature of the application, network reinforcement may be required. This can only be confirmed by detailed network analysis.
 - **Category: Red** – At least one factor is close to its operational limit and so installation of most levels of Distributed Generation and a local connection is highly unlikely. It may also require extensive reinforcement works or given the lack of a local connection, require an extensive amount of sole user assets to facilitate such a connection.

5.4 Tables 3, 4 and 5 show capacity, constraints, demand, and category information regarding the electricity infrastructure (grid supply points and primary substations) serving West Lothian.

Grid Supply Point (GSP): Bathgate				
Voltage (kV)	Firm Capacity (MVA)	Maximum Load (MVA)	Minimum Load (MVA)	Overall Category
132/33	90.00	53.83	13.46	RED
Generation Connected (MW)	Generation Contracted (MW)	33kV Generation Capacity	33kV Fault Level	Wider Constraints
91.64	89.96	RED	RED	Known network constraints: LMS

Grid Supply Point (GSP): Broxburn				
Voltage (kV)	Firm Capacity (MVA)	Maximum Load (MVA)	Minimum Load (MVA)	Overall Category
132/3	90.00	61.54	15.38	RED
Generation Connected (MW)	Generation Contracted (MW)	33kV Generation Capacity	33kV Fault Level	Wider Constraints
33.25	112.87	RED	RED	Known network constraints: LMS

Grid Supply Point (GSP): Drumcross				
Voltage (kV)	Firm Capacity (MVA)	Maximum Load (MVA)	Minimum Load (MVA)	Overall Category
132/33	90.00	51.12	12.78	RED
Generation Connected (MW)	Generation Contracted (MW)	33kV Generation Capacity	33kV Fault Level	Wider Constraints
69.39	177.53	RED	AMBER	Known network constraints: LMS

Grid Supply Point (GSP): Grangemouth				
Voltage (kV)	Firm Capacity (MVA)	Maximum Load (MVA)	Minimum Load (MVA)	Overall Category
275/33	120.00	63.16	15.79	GREEN
Generation Connected (MW)	Generation Contracted (MW)	33kV Generation Capacity	33kV Fault Level	Wider Constraints
40.10	0.21	GREEN	GREEN	N/a

Grid Supply Point (GSP): Livingston East				
Voltage (kV)	Firm Capacity (MVA)	Maximum Load (MVA)	Minimum Load (MVA)	Overall Category

132/33	90.00	44.69	11.17	RED
Generation Connected (MW)	Generation Contracted (MW)	33kV Generation Capacity	33kV Fault Level	Wider Constraints
171.01	24.13	AMBER	GREEN	Known network constraints: LMS

For constrained areas of the grid, detailed network analysis is required to ascertain if a grid connection can be achieved.

Source: [SPEN Distribution Heat Maps](#)

Table 4: Primary Substations (converts to 11,000 volts) demand and capacity

Associated Grid Supply Point (GSP): Bathgate						
Primary Substation	Location	Overall Category	Existing Primary Demand (MVA)	Firm Capacity (MVA)	Total Demand (MVA)	Forecast Demand (MVA) 2030
Armadale	Armadale	RED		24.0		
Blackburn	Blackburn	RED		10.0		
Deans	Livingston	RED		24.0		
Muckraw	Westfield	RED		14.0		
Paulville	Bathgate	RED		20.0		
Polkemmet	Whitburn	RED		23.0		
Pyramid	Bathgate	RED		24.0		

Associated Grid Supply Point (GSP): Broxburn						
Primary Substation	Location	Overall Category	Existing Primary Demand (MVA)	Firm Capacity (MVA)	Total Demand (MVA)	Forecast Demand (MVA) 2030
Broxburn	Broxburn	RED		24.0		
Cameron	Livingston	RED		23.0		
East Mains	Livingston	RED		24.0		
Newbridge	Newbridge	RED		24.0		
S. Queensferry	S. Queensferry	RED		24.0		

Associated Grid Supply Point (GSP): Drumcross						
Primary Substation	Location	Overall Category	Existing Primary Demand (MVA)	Firm Capacity (MVA)	Total Demand (MVA)	Forecast Demand (MVA) 2030
Deans	Livingston	RED		24.0		
Bo'ness	Bo'ness	RED		10.0		
Gauze Road	Bo'ness	GREEN		24.0		

Linlithgow	Linlithgow	RED		24.0		
Manuel	Whitecross	RED		23.0		
Polmont	Polmont	RED		24.0		
Wholeflats	Grangemou th	RED		21.0		
Zetland Park	Grangemou th	RED		24.0		

Associated Grid Supply Point (GSP): Livingston East						
Primary Substation	Location	Overall Category	Existing Primary Demand (MVA)	Firm Capacity (MVA)	Total Demand (MVA)	Forecast Demand (MVA) 2030
Almondvale	Livingston	RED		24.0		
Cousland	Livingston	RED		24.0		
Dedridge	Livingston	RED		24.0		
Kirknewton	Kirknewto n	RED		10.0		
Kirkton	Livingston	RED		24.0		
West Calder	West Calder	RED		10.0		

For constrained areas of the grid, detailed network analysis is required to ascertain if a grid connection can be achieved.

Source: [SPEN Distribution Heat Maps](#)

Table 5: Primary Substations (converts to 11,000 volts) categories

Associated Grid Supply Point (GSP): Bathgate						
Primary Substation	Location	Overall Category	EHV Generating Capacity	HV Generation Capacity	Reverse Power Flow	33 kV Fault Level
Armadale	Armadale	RED	RED	RED	RED	RED
Blackburn	Blackburn	RED	RED	GREEN	RED	RED
Deans	Livingston	RED	RED	GREEN	RED	AMBER
Muckraw	Westfield	RED	RED	GREEN	RED	RED
Paulville	Bathgate	RED	RED	GREEN	GREEN	RED
Polkemmet	Whitburn	RED	RED	GREEN	RED	RED
Pyramid	Bathgate	RED	RED	GREEN	RED	RED

Associated Grid Supply Point (GSP): Broxburn						
Primary Substation	Location	Overall Category	EHV Generating Capacity	HV Generation Capacity	Reverse Power Flow	33 kV Fault Level
Broxburn	Broxburn	RED	RED	GREEN	RED	GREEN
Cameron	Livingston	RED	RED	GREEN	RED	GREEN

East Mains	Livingston	RED	RED	GREEN	RED	GREEN
Newbridge	Newbridge	RED	RED	GREEN	GREEN	GREEN
S. Queensferry	S. Queensferry	RED	RED	GREEN	RED	GREEN

Associated Grid Supply Point (GSP): Drumcross

Primary Substation	Location	Overall Category	EHV Generating Capacity	HV Generation Capacity	Reverse Power Flow	33 kV Fault Level
Deans	Livingston	RED				AMBER

Associated Grid Supply Point (GSP): Grangemouth

Primary Substation	Location	Overall Category	EHV Generating Capacity	HV Generation Capacity	Reverse Power Flow	33 Kv Fault Level
Bo'ness	Bo'ness	RED	GREEN	GREEN	RED	GREEN
Gauze Road	Bo'ness	GREEN	GREEN	GREEN	GREEN	GREEN
Linlithgow	Linlithgow	RED	GREEN	GREEN	RED	GREEN
Manuel	Whitecross	RED	GREEN	GREEN	RED	GREEN
Polmont	Polmont	RED	GREEN	GREEN	RED	GREEN
Wholeflats	Grangemouth	RED	GREEN	GREEN	RED	GREEN
Zetland Park	Grangemouth	RED	GREEN	GREEN	RED	GREEN

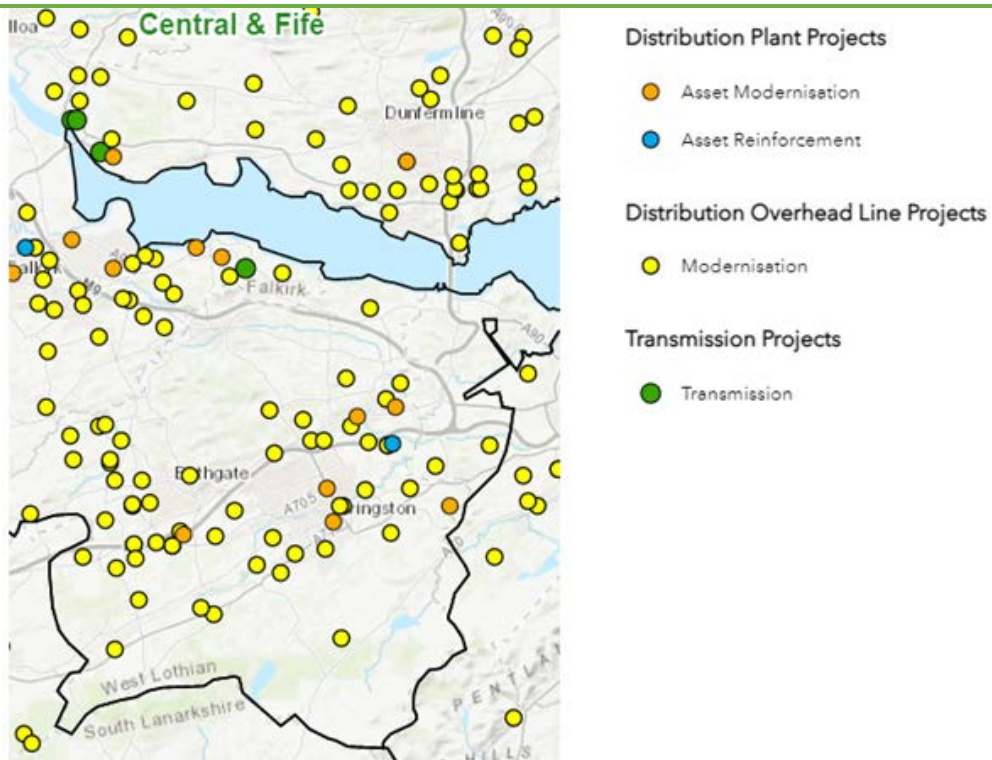
Associated Grid Supply Point (GSP): Livingston East

Primary Substation	Location	Overall Category	EHV Generating Capacity	HV Generation Capacity	Reverse Power Flow	33 kV Fault Level
Almondvale	Livingston	RED	RED	GREEN	GREEN	RED
Cousland	Livingston	RED	RED	GREEN	AMBER	RED
Dedridge	Livingston	RED	RED	GREEN	RED	RED
Kirknewton	Kirknewton	RED	RED	GREEN	RED	RED
Kirkton	Livingston	RED	RED	GREEN	RED	RED
West Calder	West Calder	RED	RED	GREEN	RED	RED

For constrained areas of the grid, detailed network analysis is required to ascertain if a grid connection can be achieved.

Source: [SPEN Distribution Heat Maps](#)

5.5 Figure 6 sets out SP Energy Networks map of investment projects in West Lothian.



5.6 In terms of the future of the electricity grid, the [Electricity Ten Year Statement \(ETYS\)](#) sets out future transmission requirements, and the capability of Britain’s National Electricity Transmission System (NETS) based on the latest Future Energy Scenarios (FES). Scotland is divided into 7 regions with associated numbered ‘boundaries’. West Lothian is located in region B4 which is operated by SPEN. Boundary B4 separates the transmission network at the SP Transmission and SSEN Transmission interface running from the Firth of Tay in the east to the north of the Isle of Arran in the west.

5.7 The B4 region capability is identified as being limited to 3.4GW due to a thermal constraint on the Westfield-Longannet 275kV circuit on the Fife side of the Forth. With increasing generation and potential interconnectors in the adjacent SSEN Transmission LTD area, the required transfer across Boundary B4 is expected to increase significantly over the ETYS period. There are however no specific recommendations for reinforcement projects in West Lothian at this time.

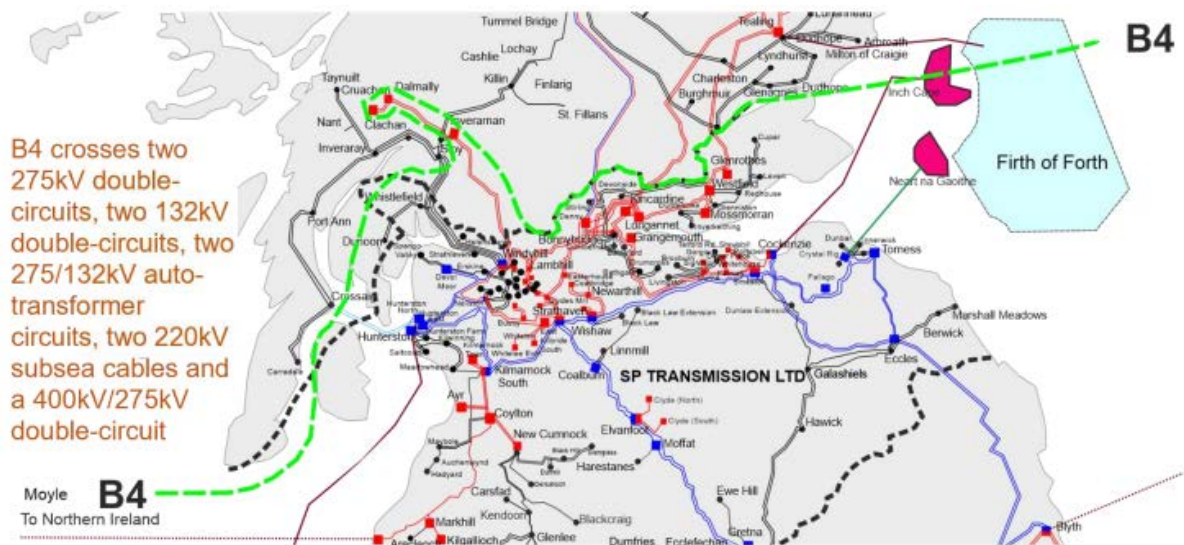


Figure 3: Boundary B4 – SSEN Transmission to SP Transmission

5.8 Electricity System Operators **“Beyond 2030” report (2024)** sets out recommendations for wider UK transmission system upgrades required throughout the 2030s to support, amongst other drivers, connecting ScotWind developments in the north of Scotland.

5.9 A number of these recommended schemes include the reinforcement and capacity upgrade of existing overhead lines and substations, but others being recommended include brand new routes and sites. These will therefore be subject to detailed routeing, siting, including pre-application consultation and engagement, ahead of EIA and energy/planning consents being submitted in the coming years. Of these, the two new build schemes which have potential to be of interest to West Lothian are HGNC (Harburn to Gala North) and NHNC (New Deer to Harburn).

5.10 Tables 6 and 7 highlight the future energy scenarios (demand and generation projections to 2040 in the SPEN central/southern Scotland area, as outlined in the **SPEN RIIO-T2 Business Plan (2021-2026) (Transmission)**.

Table 6: Demand Projections (MW) to 2040 – Central/Southern Scotland

Demand Projections (MW)			
	2018	2026	2040
Electric Vehicles	50	332 – 1,462	10,248 – 19,431
Heat Pump Installations	No known installations	78 – 420	244 – 3,282
Demand changes (peak demand)	31.5	29.9 – 35.6	27.2 – 36.6

Table 7: Generation Projections (MW) to 2040 – Central/Southern Scotland

Demand Projections (MW)			
	2018	2026	2040
Wind	20	20-23	21 - 52
Solar PV	0	1 - 32	2 - 37
Storage	0	0	0
Controllable	11	11	11
Combined Heat and Power	0	1 - 23	1 -23
TOTAL	31	33 - 89	35 - 123

Tables 8 and 9 provide more information regarding how SPEN expect electricity demand and supply to change.

Table 8: How electricity demand will evolve

Electricity Demand	Description
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Electric Vehicles	It is anticipated up to 20% of vehicles in Scotland will use electricity by 2030. This is approximately 610,000 vehicles which could require up to 406 MW of power at peak times, less than 10% of additional demand. To minimize the impact on the network, this demand will need to be managed, for example, by delaying charging electric vehicles until an off-peak time and overnight.
Heating	Using electrical heat pumps to heat buildings is currently quite rare, but it may become more commonplace in the future, particularly in new build and off-gas grid properties. It's not expected to impact demand by much in the RIIO-T2 period. However, it's a very difficult area to predict: electrical heating is just one of the many approaches the UK could take to meeting the Net Zero target.
Domestic demand	Less electricity is being used in our homes for appliances, lighting and other consumer goods, due largely to improving energy efficiency and also an awareness of cost. Domestic installations of roof top solar panels is also expected to help homes become more energy efficient and people are incentivised to shift to electricity use to off-peak periods.
Industrial and commercial demand	Demand from shops, offices and industry has also reduced due to improved efficiency. Economic factors will mean this trend is likely to continue, with the exception of a small number of energy intensive industries.
Population change	Population growth is expected be modest in SPEN area and will not have a significant impact. According to the ONS a 2% growth in population is forecast by 2026.

Table 9: How electricity supply will evolve

Electricity Supply	Description
Wind generation	The steady growth in wind capacity in the network is likely to continue, based on projects currently being developed. Growth in transmission-connected wind is expected to more than double in capacity across most scenarios, largely due to offshore wind.
Solar PV	Solar Photovoltaic (PV) generation is set to increase, including small scale rooftop schemes and larger solar farms. However, it is expected that this will have a minimal impact in winter in Scotland and a relatively low impact in summer when peak and minimum demands in the network are experienced.
Energy storage	Storing electricity can help with the management of peak demand and network constraints. At present, storage capacity is largely limited to pumped hydro. There is a greater interest in large scale batteries connecting to the distribution and transmission network. It is anticipated that this will have a low impact on the transmission system over the RIIO-T2 period (2021-2026).

5.11 The **SP Energy Networks RIIO-T2 Business Plan (2021-2026)** (Transmission) outlines strategies for managing the three types of lead assets that comprise the overhead lines (steel towers, conductors, and fittings). The overhead lines operate at 132, 275 and 400 kV. Investment plan proposals, which are indirectly relevant to West Lothian are shown in Tables 10 and 11.

Table 10: SPEN investment planning – West Lothian and cross-boundary infrastructure

Type	Route reference	Area	Circuit length (km)	Completion date
Major 400 kV system	Overhead line route XJ	Lanarkshire and Lothian	147.32	2026 (indicative)
Minor 400 kV system	Overhead line route ZT	Lothian and Borders	68.52	2025
Minor 400 kV system	Overhead line route ZS	Lothian	108.14	2025
Major 132 kV system	Overhead line route AC	Lothian	2.98	2025

5.12 The **SPEN Distribution Future Energy Scenarios (DFES)** documents forecasts electricity demand and distributed generation to 2050 in the southern and central Scotland distribution region. The DFES Data Workbook provides full forecast details of customer demand and generation (peak demand, electric vehicles, heat pumps, generation capacity, etc.). The fully detailed West Lothian information and scenarios can be accessed in the **DFES Data Workbook and Map**. These are reviewed and updated annually.

5.13 The **SPEN Long Term Development Statement for the Years 2023/24 to 2027/28 (2023) (LTDS)** provides detailed network information and overview of developments for 5 years. This includes information on the operation and development of the 33kV and 11kV distribution network in the SP Distribution licence area such as network asset technical data, network configuration, geographic plans, fault level information, demand and generation levels, and planned works.

5.14 **The LTDS Appendix 8 (Predicted Changes –Table 8)** outlines the development opportunities for the SP Distribution network, highlighting connection opportunities for generation and load. Key projects which are relevant to West Lothian are noted below in Table 12. **The LTDS Appendix 10 (Geographic Plans – Table 10)** provides geographic plans of the SP Distribution network area, including the West Lothian area.

Table 12: Key LTDS projects relevant to West Lothian

Project	Location	Description	Completion date
Reinforcement	Kirknewton primary substation	Replace the two 10 MVA transformer units. Provide a dedicated connection	2025

		to Kirkbank via two new 33 kV cable circuits.	
Modernisation	Kirknewton primary substation	Replacement of 11 kV Primary circuit	2024
Modernisation	Blackburn primary substation	Refurbishment of 33Kv transformer	2025
Modernisation	Blackburn primary substation	Refurbishment of 11 kV Primary circuit breaker	2025
Modernisation	Cousland primary substation	Replacement of 11 kV Primary circuit	2026
Modernisation	Cousland primary substation	Modernisation of 33 kV transformer	2025
Modernisation	Linlithgow	Modernisation of 33 kV transformer	2025

Proposed Energy Infrastructure – Energy Storage

Proposed energy storage, including Battery Energy Storage System (BESS) in West Lothian and City of Edinburgh are noted in Table 13

Table 13: Proposed energy storage

Project	Location	Capacity (MW)	Application ref
Learielaw Energy Storage (Screening)	Land to the east of A801 approximately 1.45 km to the northwest of Bathgate	Greater than 50MW	Energy Consents Unit ECU00004760 & ECU00004983
Pond Flexible Energy Park	Pond Industrial Estate, Bathgate	Up to 200 MW	Energy Consents Unit ECU00004765
South Couston BESS	Land located immediately to the east of A801 approximately 1.45 km to the northwest of the settlement of Bathgate		Energy Consents Unit ECU00005051

Grid capacity

5.15 Applications for storage projects are increasing faster than any other technology and West Lothian has already seen a growth in proposals for energy storage facilities. This is expected to continue with the attendant implications and conflicts for land use planning. Such proposals are typically land hungry and provide limited employment opportunities which can create policy tensions.

5.16 Across Scotland, the connected and contracted transmission pipeline is over 120 GW and it has been estimated that only 20% to 30% of projects currently contracted to connect will ultimately be realised. There are consequently growing pressures to raise entry requirements, remove

stalled projects, better utilise existing networks and better allocate network capacity. Battery storage proposals offer benefits in terms of grid management, but still require grid connection. Proposals are therefore increasingly required to demonstrate viability to secure a connection, to ensure that speculative proposals do not take up grid capacity.

Part 6 - Electric Vehicles & Charging Points

- 6.1 According to the DVLA and UK Department of Transport the number of battery electric vehicles registered in the West Lothian Council area has risen from just over 400 in Spring 2020 to 2140 in Spring 2023.
- 6.2 In 2023 the Council published a **Public Electric Vehicle Infrastructure Plan** to accelerate the deployment of Electric Vehicle Charge Points (EVCPs) across the Council area. To fulfil the demand generated by these additional vehicles, West Lothian will require an estimated 3,900 to 19,500 kW of additional charging capacity.
- 6.3 While some of this will be provided by the private sector independently of this Plan, there will be a continued need for West Lothian Council to be involved in order to ensure EV charging infrastructure is provided in areas where the commercial case for investment is more limited so that all communities in West Lothian can benefit from the switch to EVs.
- 6.4 Based on the current split between private and public sector CPOs in West Lothian and known committed expansion plans, it has been assumed that there will be an approximate 60 / 40% split between private and public CPOs over the lifetime of this strategy.
- 6.5 To meet the above 40% provision target, the plan identifies 148 sites across West Lothian at which it is proposed an additional 294 charging devices could be provided.
- 6.6 The sites are located in areas of land known to be in council ownership. This includes council owned car parks, leisure centres, community centres, partnership centres, education centres, and schools. Should all the identified sites be delivered, it is estimated that 67% of households in West Lothian who do not have access to off-street parking would be within a reasonable walk of a charge point location. This compares to a current figure of 23%. The location of the existing and proposed charge point sites and their associated walk catchments as well as the distribution of houses without access to off-street parking across West Lothian is shown in Figure 4.

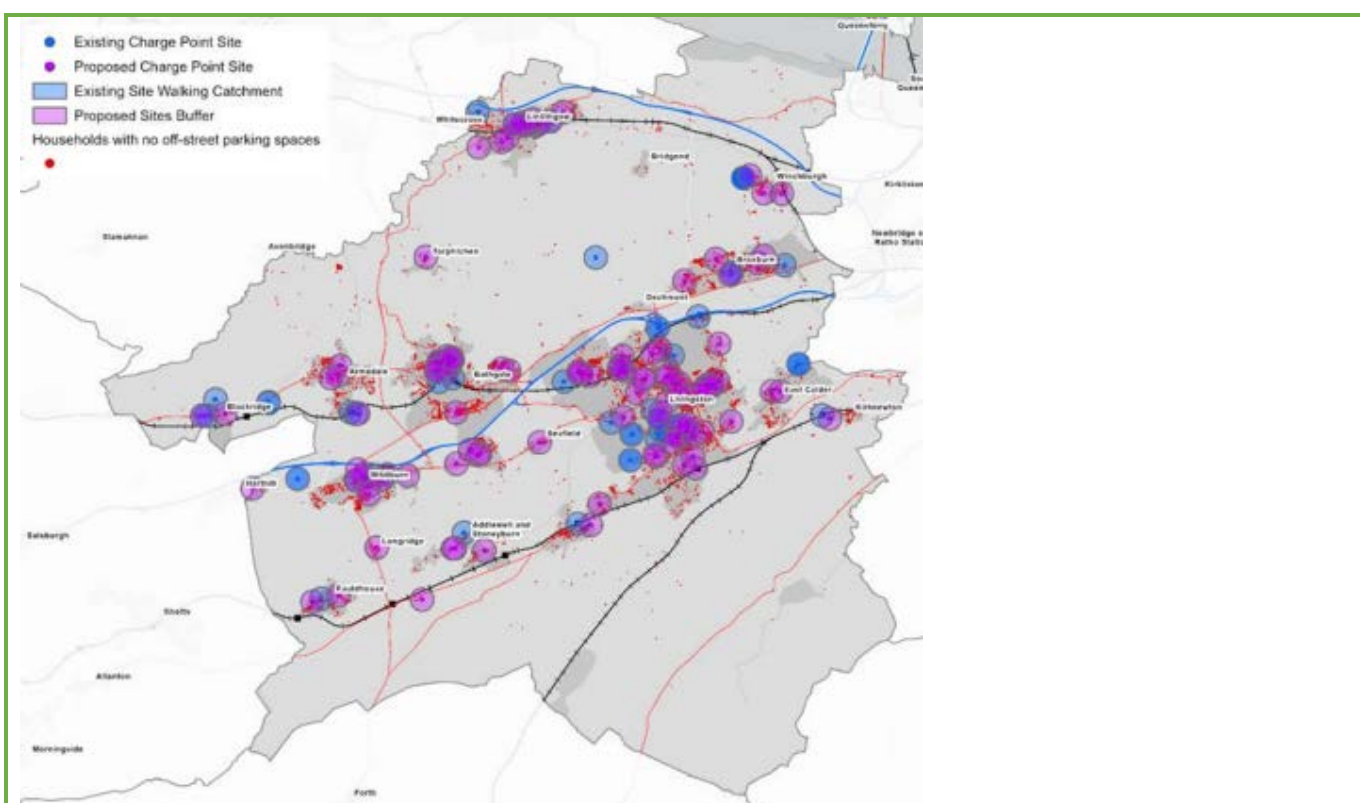


Figure 4: Location of existing and proposed charge points and associated walk catchments

Part 7 - Renewable Energy

7.1 The [Scottish Government's Energy Strategy](#) (2017) expected targets to be met from a range of renewable energy sources, including on and off shore wind, but also hydro-electric, solar, biomass and geothermal.

Table 17: Renewable Energy Generation in the West Lothian Area

Type of installation	Number of sites	Installed capacity (MW)	MWh generated
Photovoltaics	5,196	14.9	10,936
Onshore wind	34	105.1	251.823
Hydro	0	0	0
Landfill gas	1	1.0	0
TOTAL	5,231	121.0	262,759

Source: UK Government – Department for Energy Security and Net Zero 2022

Onshore wind

7.2 NPF4 is broadly supportive of wind energy developments, subject to assessment against specific criteria relating to project design and mitigation. The requirement for planning authorities to produce a Spatial Framework for wind energy was not carried over to NPF4 following the revocation of Scottish Planning Policy and as such it is not intended that this will not form part of LDP 2.

7.3 Currently, local guidance on wind energy developments, including landscape capacity guidance, is provided in the council's statutory **Supplementary Guidance 'Spatial framework and assessment criteria for on-shore wind energy development in West Lothian'** Adopted June 2021.

7.4 Based solely on landscape and visual assessment, there are eight potentially acceptable locations for wind energy identified in the Landscape Capacity Study for Wind Energy Development in West Lothian (2011). These potential sites are set out below. Of these the most likely potentially deliverable locations, allowing for changes due to build out are those highlighted in bold text:

- East Mains Industrial Estate, Broxburn
- Houstoun Industrial Estate, Livingston
- Livingston/ M8 Corridor
- Junction 4/M8 Corridor
- **Almond Valley, West Calder**
- **Pates Hill Extension, Breich**
- **Tormywheel (or Woodmuir Plantation if Tormywheel not constructed), Breich**
- **Fauldhouse Hills, Fauldhouse**

7.5 There remains some landscape capacity for wind energy development, although viability will largely depend on emerging technology, grid connection and storage, and future subsidy and funding regimes. There has also been some interest in relation to extension to existing wind energy developments, as well as repowering existing schemes with larger turbines.

Solar/Photovoltaics (PV)

7.6 There is significant scope for small scale solar/PV development across the West Lothian Council area within both urban and rural settings and particularly since many free standing and roof mounted installations can be installed without the express need for planning permission (although it excludes installations in conservation areas and associated with listed buildings).

Field-scale solar PV installations (Solar Farms)

7.7 Solar farms generate electricity at scale, usually to feed into the grid. To produce a viable amount of energy from solar schemes it is estimated that approximately 2.5 to 3ha of land is required on average to produce 1MW of energy.

7.8 Installations are more appropriately located on previously-developed land rather than greenfield sites. Where sites are proposed in rural areas they should avoid prime agricultural land, highly prominent locations and areas designated as 'Special Landscape Areas (SLAs)'. In such situations they can however have dual purpose usage with animals grazing between rows and help to support biodiversity. Solar farms represent time-limited, reversible land use and can provide an increased, diversified and reliable source of income for landowners and farmers.

7.9 Developments which produce in excess of 50kW require planning permission and can have a substantially greater impact, firstly in terms of physical land take but also visually due to the requirement for transformers, inverters and perimeter fencing. Proposals for larger solar farms (over 0.5ha or in a sensitive landscape area) are also likely to require to be the subject of an

Environmental Impact Assessment (EIA) and Landscape and Visual Impact Assessments (LVIA) may also be required.

Hydro-electric

- 7.10 The potential for larger hydro-electric schemes is limited in West Lothian, due to geography and spatial land use, there are held to be more opportunities for the smaller schemes with an output of less than 100kW to serve domestic, agricultural and perhaps some commercial operations.
- 7.11 Generally, the council is supportive of hydro-electric developments provided that they are in the right location and where there would be appropriate mitigation of any negative impact on access, visual amenity and landscape (including transmission lines) and natural landscape and built heritage designations.
- 7.12 The criteria used to identify possible sites must however be consistent with the criteria required by SEPA as set out in its [guidance for developers of run-of-river hydropower schemes](#). Where water is taken from a stream or river for hydro purposes an abstraction licence is required. Installations of this nature are subject to a Controlled Activity Regulations (CAR) licence from SEPA. SEPA explicitly requires developers of hydro schemes to include mitigation to protect the water environment and this applies equally to micro or pico-hydro as well as larger scale hydro power energy schemes.

Energy Grid Connections

- 7.13 All renewable energy schemes will need to check the potential for connection to the National Grid, where electricity is to be produced, and all renewable energy projects connecting to the National Grid are subject to a separate consent process. The grid connection, should it require overhead elements, requires consent under 37 of the Electricity Act 1989, and deemed planning consent under section 57(2) of the Town and Country Planning (Scotland) Act 1997. Many projects will be directly connected to their local distribution network, operated by the Distribution Network Operator (DNO).

Energy from Waste

- 7.14 There is a [moratorium on new Energy from Waste \(EFW\)](#) in Scotland since 2022 which in practice put limits on planning approval of new Energy from Waste Plans.

Part 7 – Heat and Cooling

- 8.1 The **West Lothian Local Heat and Energy Efficiency Strategy (2023-2028)** focuses on energy efficiency and heat decarbonisation and LHEES aims to establish local authority area-wide plans. LHEES are core to the principle of a place based, locally-led and tailored approach to the heat transition. LHEES will underpin an area-based approach to heat and energy efficiency planning and delivery, setting out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area to help reach the net-zero goal.
- 8.2 The LHEES has identified 14 potential Heat Network Zones across West Lothian.

Summary of Stakeholder Engagement

This will summarise the steps taken by the planning authority to seek the views of all relevant stakeholders. This will also summarise the views expressed, and explain how they have been taken account of in the Evidence Report. (hyperlinks to records of engagement may be added where appropriate)

Statements of Agreement / Dispute

This should include statements from stakeholders highlighting their agreement or the areas they dispute

Summary of Implications for the Proposed Plan

This will cover what the evidence means for the plan, e.g. the spatial strategy, the Delivery Programme or plan preparation.

1. Gas - provisional discussion with SGN about their physical assets in West Lothian have confirmed that there is likely to be capacity to meet future demands for growth. This will nevertheless require to be confirmed by developers in consultation with SGN at the time of any application for planning permission. There may however still be constraints to gas supply in part of the north west of West Lothian due to previous mining and ground conditions.
2. Electricity - Evidence identifies that there are potential constraints on the electrical network. SPEN's heat map tool will be used to analyse the potential requirements for electrical infrastructure of the spatial strategy in the proposed plan.

Based on the evidence, the proposed plan will be required to:

3. Consider the development of land in and around major accident hazard installations and pipelines must be made with due regard to these installations and planning and consultations zones.
4. Provide policy on the accommodation of hydrogen production, storage, pipeline and other ancillary facilities.
5. Provide policy on the accommodation of battery storage and other ancillary facilities.
6. Support EV infrastructures and ensure EV charging infrastructure is provided in areas where the commercial case for investment is more limited so that all communities in West Lothian can benefit from the switch to EVs.
7. Set out the eight potentially acceptable locations for wind energy identified in the Landscape Capacity Study for Wind Energy Development in West Lothian (2011).
8. Provide policy on the location of Field-scale solar PV installations (Solar Farms) to be located on previously-developed land rather than greenfield sites. Where sites are proposed in rural areas they should avoid prime agricultural land, highly prominent locations and areas designated as 'Special Landscape Areas (SLAs). In such situations they can however have dual purpose usage with animals grazing between rows and help to support biodiversity. Solar farms represent time-limited, reversible land use and can provide an increased, diversified and reliable source of income for landowners and farmers.
9. Provide policy on the location of hydro developments in West Lothian.
10. Heat networks - West Lothian Council's LHEES has identified 14 potential Heat Network Zones across West Lothian which require to be implemented within the Proposed Plan.