Annex 11 – Infrastructure First

Topic:	**Infrastructure First** This Annex excludes transport, healthcare, and education. Transport is addressed in Annex 10, and healthcare and education are within the Fife-wide section of the Evidence Report.
Information required by the Act regarding the issue addressed in this section.	Town and Country Planning (Scotland) (Act) 1997, as amended: Section 15(5): (d) the infrastructure of the district (including communications, transport, and drainage systems for the supply of water and energy, and health care and education facilities) (e) how that infrastructure is used
Links to Evidence	• National Mission Local Impact – Infrastructure Investment Plan for Scotland 2021/22 to 2025/26 • Infrastructure Commission for Scotland • Fife Economic Strategy (2023-2030) • Draft Regional Energy Strategic Plan (RESP) • The Scottish Government Onshore Wind Policy Statement 2022 • Annual Compendium of Scottish Energy Statistics 2020 • Fife local Heat and Energy Efficiency Strategy (LHEES) and delivery plan) • Heat Network (Scotland) Act 2021 • Dunfermline and Rosyth Energy Prospectus 2024 • Fife Council Renewable Energy Monitor 2023 • A Holistic Network Design for Offshore Wind | National Energy System Operator • Beyond 2030 | National Energy System Operator • DFES SPEN Distribution 2025 • SPEN Investment in Fife – ED1 & ED2 (incl. emails from SPEN) • Hydrogen Action Plan (Scotland) • Scotland Gas Networks CONFIDENTIAL Investment and Capacity Reports • Department of Energy and Climate Change

	• Fife Council Electric Vehicle Charging Strategy (Jacobs 2023) • Scottish Water Horizons - Growth & Sustainable Development - Scottish Water Horizons • Scottish Water's Development Services Connecting to our Network information - Developing housing and commercial properties - Scottish Water • Water supply capacity in Fife GIS Data (Scottish Water GIS data) • Wastewater supply capacity in Fife GIS Data (Scottish Water GIS data) • Scottish Water - Reasonable Cost Contribution (RCC) • Scottish Government Digital Strategy • Digital Scotland Superfast Broadband • Ofcom Research, statistics, and data • Think Broadband • Reaching 100% - Superfast Broadband for All - R100 Programme • Scottish Government Building Standards technical handbook April 2024: domestic buildings • Scottish Government Building Standards technical handbook April 2024: non-domestic buildings • FIFEPlan Planning Obligations Framework Guidance (2017)
Abbreviations	
BID – Business Improvement District DFES – Distribution Future Energy Scenarios DSSB – Digital Scotland Superfast Broadband EGL4 – Eastern Green Link 4 HVDC - High-Voltage Direct Current electrical link IIB – Infrastructure Investment Board LDP – Local Development Plan LHEES – Local Heat and Energy Efficiency Strategy RIIO – Revenue Incentives Innovation Outputs SFT – Scottish Futures Trust SGN – Scotland Gas Networks SPEN – Scottish Power Energy Networks SSEN-T – Scottish and Southern Electricity Networks Transmission	

Introduction

A11.1 This Annex includes infrastructure evidence drawn from Fife Council, utility providers, and other infrastructure stakeholders. The evidence is intended to

demonstrate the infrastructure of the district, including communications, and drainage systems for the supply of water and energy, how that infrastructure is used, and any changes the Council considers may occur with a view to understanding the implications for land use and development in the new LDP. Transport is addressed in Annex 10 and health care and education are within the main body of the Evidence Report.

A11.1 The Annex provides information on energy generation, infrastructure for the major utility networks: electricity, gas, water, and digital. It does not include transport, healthcare, and education. Transport is addressed in Annex 10, and healthcare and education are within the Fife-wide and localities section of the Evidence Report (Parts 2 and 3, respectively).

Summary of evidence

A11.2 The evidence brought together in this Annex shows:

- Renewable generation capacity will accelerate as fossil fuel power is phased out. This new demand and generation will push the distribution network beyond what it is designed for, meaning that the electricity supply network will need to evolve to enable the Net Zero transition.
- Large scale electricity supply into Fife will be critical alongside substantially increased local generation and potentially local supply There is significant demand for energy in the Dunfermline and Rosyth areas of Fife due to the Green Freeport and existing operations at Rosyth Waterfront as well as other developments in the area.
- New and updated development allocations in the new LDP will need to show the development programming so that demands on infrastructure are managed within their limits. The LDP's Delivery Programme has an important role in explaining how phased development and related infrastructure provision will be provided.
- Some of Fife's prime agricultural land has been used renewable energy development such as solar farms and for battery storage. Some uses may be reversible, but the LDP will need to consider at the impacts of this and how it can safeguard these important aspects of land use.
- Onshore wind will generally be considered to be acceptable where impacts are localised and/or appropriate design mitigation has been applied. This is consistent with NPF4 Policy 11: Energy.
- Several battery storage planning application proposals are in the process of being determined in Fife with more anticipated in the future. The local development plan will have a role in setting a development planning context for these proposals and implementing NPF4 Policy 11.
- Currently and taking account of planned interventions, the current gas infrastructure capacity in Fife, is sufficient to meet the needs of projected development sites as allocated in FIFEplan. Scotland Gas Networks (SGN) will respond to future allocations.
- New LDP guidance must clearly promote blue-green nature-based solutions as the future to manage flood risk new builds should have the next fastest

broadband connection within the cost cap. The LDP will reflect this in the requirements for allocated sites.

Gaps in evidence

A11.3 There are some matters such as the impact of new development on infrastructure capacity for which evidence will not be available until the LDP's spatial strategy is prepared and development proposals are selected for the Proposed Plan. Infrastructure providers advise that they will respond to any infrastructure capacity issues once they know the type and location of development sites to be considered for the Proposed Plan; infrastructure capacity is included in the LDP's site assessment methodology.

A11.4 Some of the electricity, gas, graphic information, and water supply and wastewater data, are in formats that cannot be accommodated fully in this Annex, but they are available in links to the utility providers.

A11.5 In the meantime, the Council considers the information provided in this Evidence Report to be sufficient to prepare the LDP and prepare the spatial strategy by showing how existing infrastructure can be used to best effect and the implications of new land use proposals on transport infrastructure.

Policy context and infrastructure first

National tier policy

The Infrastructure Investment Plan for Scotland 2021-22 to 2025-26

A11.6 The National Infrastructure Investment Plan was published in February 2021 and sets out a long-term vision of infrastructure in Scotland, which supports an inclusive, net zero carbon economy. The plan focuses on adopting and building on the recommendations of the Infrastructure Commission for Scotland's Phase 1 report and its vision is that the country's infrastructure supports Scotland's resilience and enables inclusive, net zero and sustainable growth.

A11.7 An important feature of the National Infrastructure Plan is the investment hierarchy which comprises four steps:

- Determine future need.
- Maximise the useful life of existing assets.
- Repurpose and co-locate.
- Replace, create, and build new assets.

A11.8 The efficient use and adaptation of existing infrastructure therefore needs to be considered before moving to investment in new facilities which will be part of the methodologies used in developing the new LDP spatial strategy and allocating land use proposals.

National Planning Framework 4 (NPF4)

A11.9 NPF4 policies most relevant to infrastructure first and this Annex are listed in Table 1.

Table 1 - Assessment of NPF4 policies relevant to infrastructure in Fife

NPF4 policy	LDP2 …	Assessment
Policy 11: Energy	LDPs should seek to realise	Potential heat network zones

NPF4 policy	LDP2 …	Assessment
	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.	have been identified as part of the requirements of the Council's Local Heat & Energy Efficiency Strategy. 153 draft zones have been now being identified and will form part of the site assessment.
Policy 13: Sustainable Transport	Should prioritise locations for future development that can be accessed by sustainable modes. The spatial strategy should reflect the sustainable travel hierarchy and sustainable investment hierarchy by making best use of existing infrastructure and services Should promote a place-based approach to consider how to reduce car-dominance Should be informed by an appropriate and effective transport appraisal undertaken in line with relevant transport appraisal guidance.	This policy is aligned with Local Transport Strategy for Fife 2023-33 but the Council notes tension between developing in locations which support sustainable travel and other priorities, for example economic development, has led to developments which are not well served by sustainable travel. There are historic difficulties in delivering sustainable transport infrastructure as part of new developments, for example: travel links outside site boundaries, and private bus company decisions on the commercial viability of bus services. NPF4 Policy 13 will be a consideration in the methodologies used in developing the new LDP spatial strategy and allocating land use proposals. Evidence Report Annex 10 deals with transport.
Policy 18: Infrastructure First	LDPs and delivery programmes, based on an integrated infrastructure first approach, 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,	Fife has a mature transport infrastructure network, including established corridors such as the A92 road, M90 motorway, Fife Circle rail line, and rail lines connecting Edinburgh to Dundee (part of the East Coast mainline railway), and Edinburgh to Perth. Several of the SEStran 2035 Regional Transport Strategy regional corridors are in Fife (and described in Figure 3, below): Fife West; Fife Central: Fife East; West

NPF4 policy	LDP2 …	Assessment
	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. Plans should align with relevant national, regional and local infrastructure plans and policies and take account of the Scottish Government infrastructure investment hierarchy and sustainable travel and investment hierarchies in developing the spatial strategy.	Lothian South; Tay Bridges; Queensferry; Kincardine. NPF4 Policy 18 will be a consideration in the methodologies used in developing the new LDP spatial strategy and allocating land use proposals. The Council is also conscious that infrastructure providers may not know the full context of how their infrastructure, policies, or ambitions relate to other developments or infrastructure, or potential spatial strategy options still to be developed.
Policy 19: Heat and cooling	LDPs should take into account the area's Local Heat & Energy Efficiency Strategy (LHEES). The spatial strategy should take into account areas of heat network potential and any designated Heat Network Zones (HNZ).	Potential heat network zones have been identified as part of the requirements of the Council's Local Heat & Energy Efficiency Strategy. 153 draft zones have been now being identified and will form part of the site assessment.
Policy 24: Digital infrastructure	LDPs should support the delivery of digital infrastructure, including fixed line and mobile connectivity, particularly in areas with gaps in connectivity and barriers to digital access.	NPF4 Policy 24 will be a consideration in the methodologies used in developing the new LDP spatial strategy, allocating land use proposals, and policies.

A11.10 Annex 13 summarises what LDP2 needs to do to implement NPF4 and the actions Fife Council is taking to discharge those requirements.

Regional Energy Strategic Plan (RESP)

A11.11 Regional Energy Strategic Plans will be developed for multiple regions across the United Kingdom, with one or two being developed for Scotland. These plans will enable the coordinated development of the whole energy system for a region across multiple vectors, provide confidence in system requirements and enable network infrastructure investment ahead of need. The plans will be defined by Ofgem and delivered by the National Energy System Operator (NESO). Regional insight will be provided by strategic boards and working groups, including representatives from local authorities, networks, and other key local actors. These plans will ultimately support the energy transition to net zero.

Heat Network (Scotland) Act 2021

A11.12 The Heat Network (Scotland) Act 2021 introduced powers for the regulation of the heat networks market in Scotland, and targets for the combined supply of thermal energy from heat networks. Sections 47 and 48 of the Act place statutory duties on Councils to review and formally designate heat network zones. A zone being defined as whether an area is likely to be particularly suitable for the construction and operation of a heat network. More information on Fife's Local Heat Energy Efficiency Strategy can be found later in this Annex.

Heat Network Zones

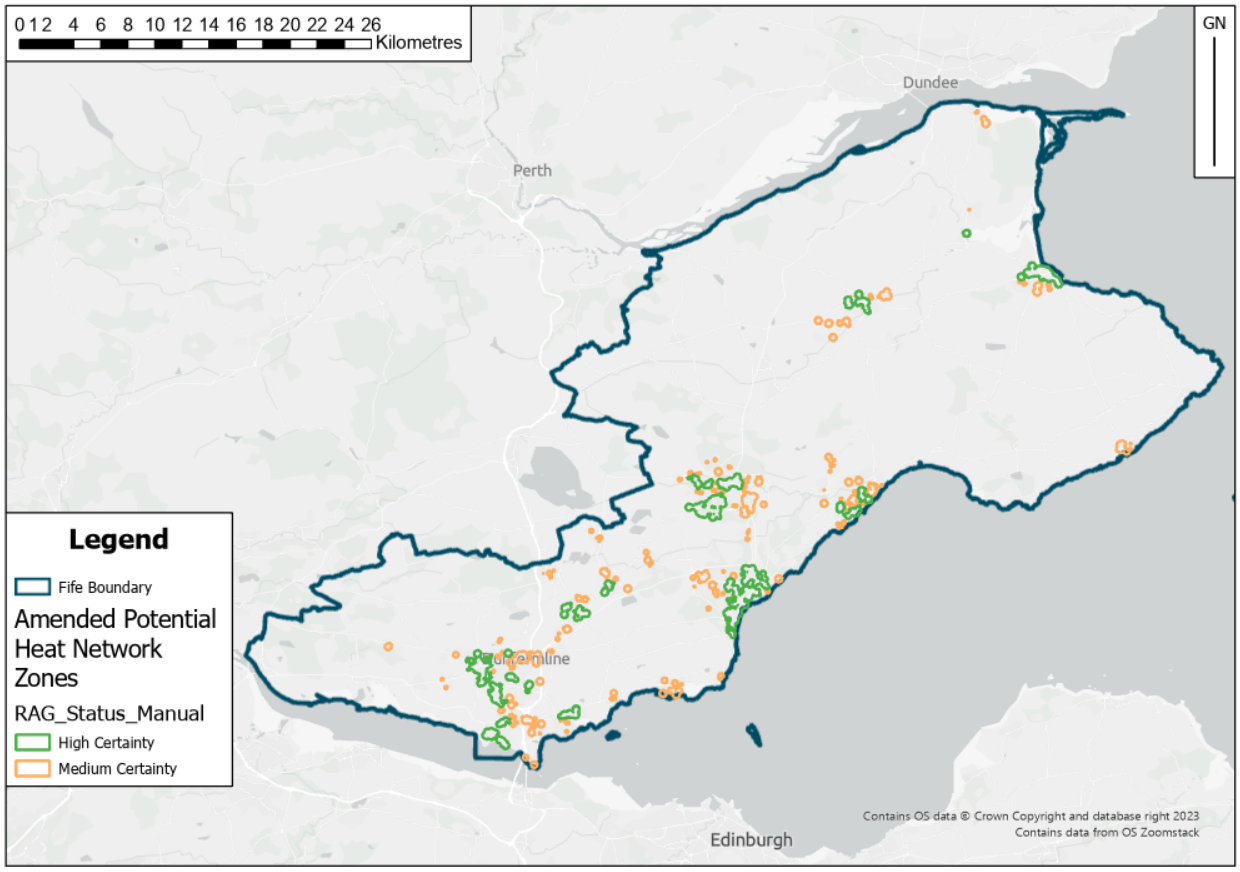
A11.13 Potential heat network zones have been identified as part of the requirements of the Local Heat & Energy Efficiency Strategy (LHEES). These are areas where a heat network provides a potential heat decarbonisation opportunity. These zones are the initial step to meeting the statutory requirements under sections 47 and 48 of the Heat Network (Scotland) Act 2021.

A11.14 Initially 35 zones were identified across Fife. Following publication of the strategy this analysis was expanded upon with 153 draft zones now being identified. The approach was informed by engagement with heat network operators and technical experts. Each zone has been categorised based on an several factors, to grade their certainty of delivery (high or medium). Social housing clusters which overlap or are nearby heat network zones have also been identified as locations where a heat network could be delivered to help decarbonise heat and tackle fuel poverty.

A11.15 Heat networks will require significant pipe work to both existing buildings and new developments. Each network will also require energy centres near key heat sources. Heat networks are not a utility at the present time and therefore are likely to require planning permission.

A11.16 A map of Fife's amended draft heat network zones is available on the following link: Fife Local Heat & Energy Efficiency Strategy (LHEES) Web Map. Figure 1 shows the Fife-wide opportunities for heat networks.

Figure 1 - Heat network opportunities



Source: Fife LHEES

Electricity Infrastructure Summary of Evidence

A11.17 The condition and capacity of existing electricity infrastructure varies in Fife and is a result of years of ad hoc interventions and improvements. This patchwork approach along with the way people generate, use, and interact with electricity is changing quickly meaning a different approach to infrastructure is needed. To tackle the climate emergency and deliver Net Zero carbon targets, a significant proportion of transport and building heating will need to be electrified.

A11.18 Renewable generation capacity will accelerate as fossil fuel power is phased out. This new demand and generation will push the distribution network beyond what it is designed for, meaning that the network will need to evolve to enable the Net Zero transition. The electricity distribution networks will be critical to Scotland's ambition in supporting the connection of zero carbon heating, charging of electric vehicles, and potential electrification of industrial processes.

A11.19 A Holistic Network Design (HND) has been prepared by the National Energy System Operator (NESO) and is an integrated approach for connecting 23GW of offshore wind to Great Britain. The HND enables investment and delivery of infrastructure, including locations in the east coast of Scotland. NESO's Beyond 2030 report builds on HND and covers much of Fife's next LDP period. Scottish Power Energy Networks (SPEN) and Scottish and Southern Electricity Networks

Transmission (SSEN-T) will continue to be key consultees in the development of the LDP to advise on the implications of proposed development on their infrastructure.

A11.20 Scottish Power Energy Networks (SPEN) has several major initiatives planned for Fife, which support Scotland's transition to clean energy. One prominent project is the multi-million pounds investment in a new substation near Guardbridge, aimed at improving the reliability and resilience of Fife's electricity network. This upgrade will enhance the capacity to support renewable energy integration, reflecting SPEN's commitment to expanding green energy infrastructure across the region. It should be noted, however, that these upgrades are thought to be small in the scale of change required over the next decade and then to 2040.

A11.21 Another transformative plan is the Eastern Green Link 4 (EGL4) project. EGL4 is a High-Voltage Direct Current electrical link (HVDC) that will connect Fife to Norfolk in England, enabling the transmission of up to 2GW of renewable energy—enough to power approximately two million homes. This "electricity superhighway" will facilitate the rapid growth of renewable energy sources, boosting energy independence and economic growth in both regions. Large scale electricity supply into Fife will be critical alongside substantially increased local generation and potentially local supply. SPEN is conducting public consultations for this project to involve Fife's communities in the planning and gather input on the preferred cable routes and construction sites.

Table 2 - Electrical network capacity and SPEN investment

Fife Network (SPEN)	Current Capacity	Investment Information
Dunfermline	Constraints	Replacing grid supply point board and building a new substation at Halbeath.
Guardbridge	New substation	Multi-million pounds investment by SPEN.
Kirkcaldy	Available	No investment planned
Levenmouth	Available	Anticipate significant investment in the area with two new substations and circa £4.5m invested.
Inverkeithing	Constraints	TBC
Glenrothes	Available	Replacing substation (ED2).
Cupar	Available	Cupar benefited from investment in ED1 in the form of a new transformer and associated infrastructure. Significant infrastructure refresh carried out. It is future proofed with space to extend capacity.

Fife Network (SPEN)	Current Capacity	Investment Information
St Andrews/Guardbridge	Significant Constraints	Work ongoing to make the network there as flexible as possible. A new substation is being developed in partnership with St Andrews University (Eden Campus) at Guardbridge. The largest investment in a generation both generation and capacity.
Westfield to Kinghorn	Planning stage	14km underground power cables are to be built between the converter station at Westfield and the landfall point at Kinghorn.

Source: SPEN

A11.22 Table 2 provides an overview of electricity grid capacity and investment in Fife. There is significant demand for energy in the Dunfermline and Rosyth areas of Fife due to the Green Freeport and existing operations at Rosyth Waterfront as well as other developments in the area. There are competing needs for what is a limited energy supply, however solutions are currently being investigated in partnership with SPEN, landowners and other stakeholders.

A11.23 The investment shown in Table 2 is part of SPEN's broader £3.3 billion plan under the Revenue Incentives Innovation Outputs (RIIO) framework, supporting UK-wide goals for achieving Net Zero emissions. This includes upgrades across the distribution network to accommodate an expected increase in electric vehicles, heat pumps, and renewable power sources, with anticipated benefits for residents and green job creation across Scotland.

Fife's Annual Electricity Consumption and Generation

A11.24 Figures published by the Department of Energy and Climate Change (DECC) provide information on electricity consumption at a local authority level. The latest published data is for 2023. Annual electricity consumption figures for Fife and Scotland are presented in Table 3.

Table 3 - Fife's Annual Electricity Consumption. 2011-23

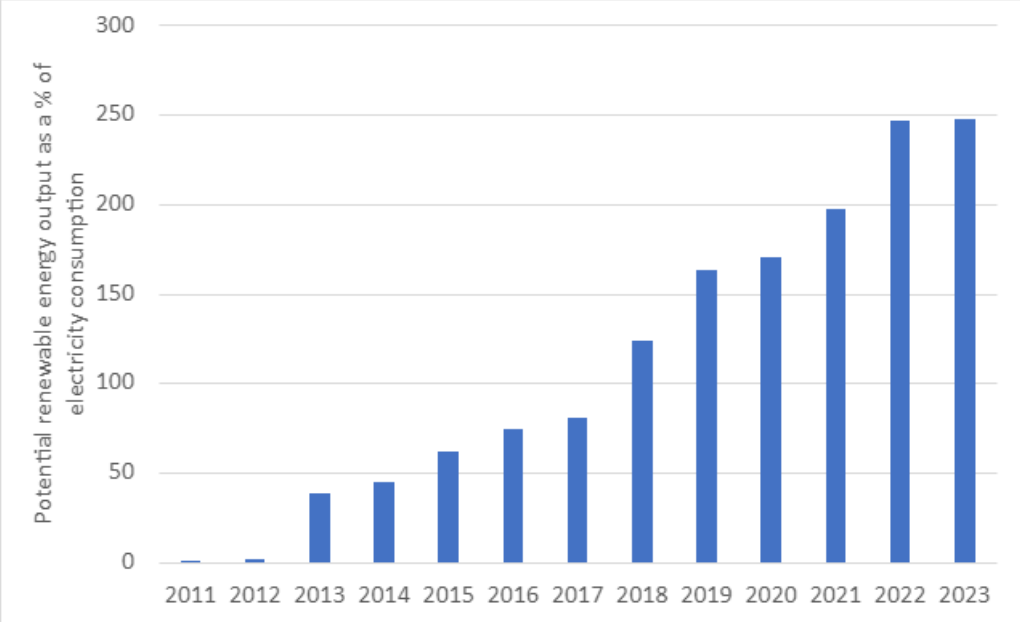
GWh	Fife	Scotland
2011	1,628	26,658
2012	1,650	26,177
2013	1,645	25,873
2014	1,555	25,322
2015	1,630	25,863
2016	1,571	24,665
2017	1,562	24,783
2018	1,510	24,216
2019	1,475	23,680
2020	1,443	22,708
2021	1,442	22,927
2022	1,441	23,155
2023	1,440	23,382

Source 1: Department for Energy Security and Net Zero (DESNZ)

A11.25 Figure 2 shows Fife's estimated renewable energy output as a percentage of the electricity consumed. Fife's renewable energy output rose significantly between 2011 and 2012 from 2% followed by a steady year-on-year increase thereafter. By 2017 over 60% of Fife's electricity-demand equivalent was sourced by renewable energy generated in Fife.

A11.26 Based on the assumption that all renewable energy projects with granted planning permission between 2018 and 2020 proceed to the generation stage then the 2020 estimate could be as high as 95%. However, Scotland energy demand annually is roughly made up of electricity 21%, transport 25%, and heat over 50%. Winter peaks mean electricity demand will likely be many times that of existing. In reality this means renewable electricity is likely less than 1% of actual demand, meaning that more will be required.

Figure 2 - Electricity Demand Equivalent Generated from Renewable Energy

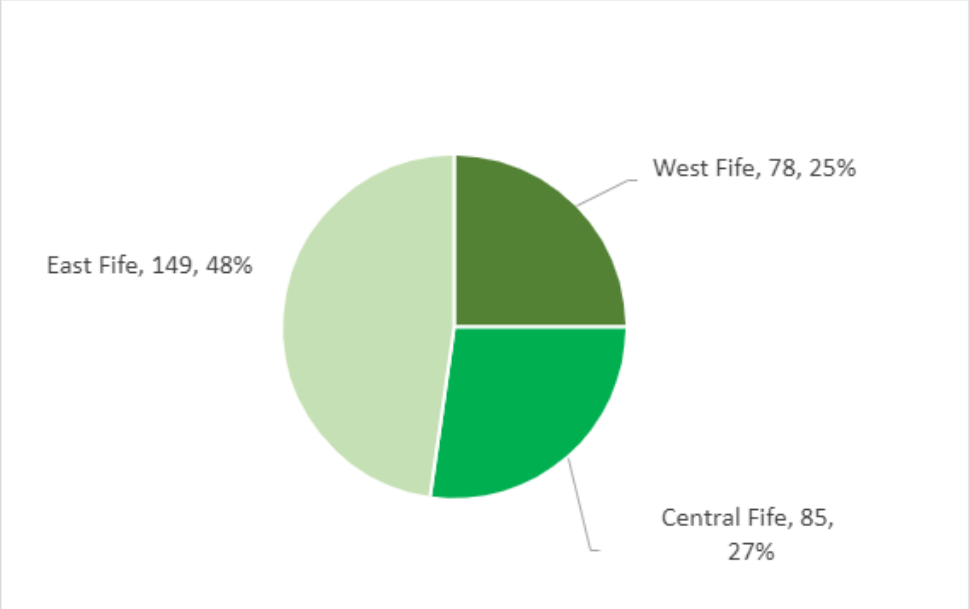


Source: Planning applications and DESNZ Electricity Consumption dataset

Fife's renewable energy projects by location

A11.27 The total number and percentage share of renewable energy installation projects across East, Central, and West Fife, is shown in Figure 3. Since 2011, 52% of renewable energy projects were in West Fife (25%) and Central Fife (27%), and almost half of all renewable energy installations in East Fife, accounting for 48% of all renewable energy projects in Fife.

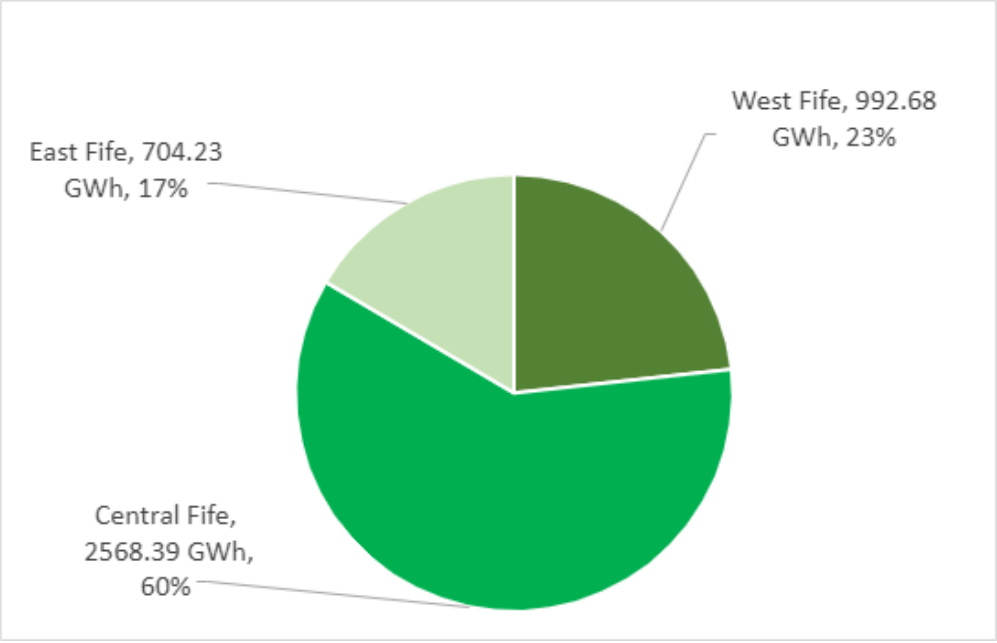
Figure 3 - Renewable energy projects by Location 2011-23



Source: Fife Council Planning Applications

A11.28 Figure 4 shows that Central Fife, by far, recorded the largest share of renewable energy currently or anticipated to be generated at 2,568.39 GWh, which accounted for 60% of the total estimated renewable energy output with East and West Fife at 17% and 23% respectively.

Figure 4 - Percentage share of renewable energy generated - West, Central, and East Fife (2023)



Source: Derived using data from Fife Council Planning Applications

A11.29 The generating capacity of renewable energy sources can vary greatly and is determined by factors such as location, and any planning conditions on the operating times. Table 4 illustrates the number of renewable energy projects and

annual output by technology type. Solar and biomass produce the most renewable energy with an annual output of 506.54GWh and 468.78GWh. The average output (per installation) was 84.42GWh and 78.13GWh, respectively.

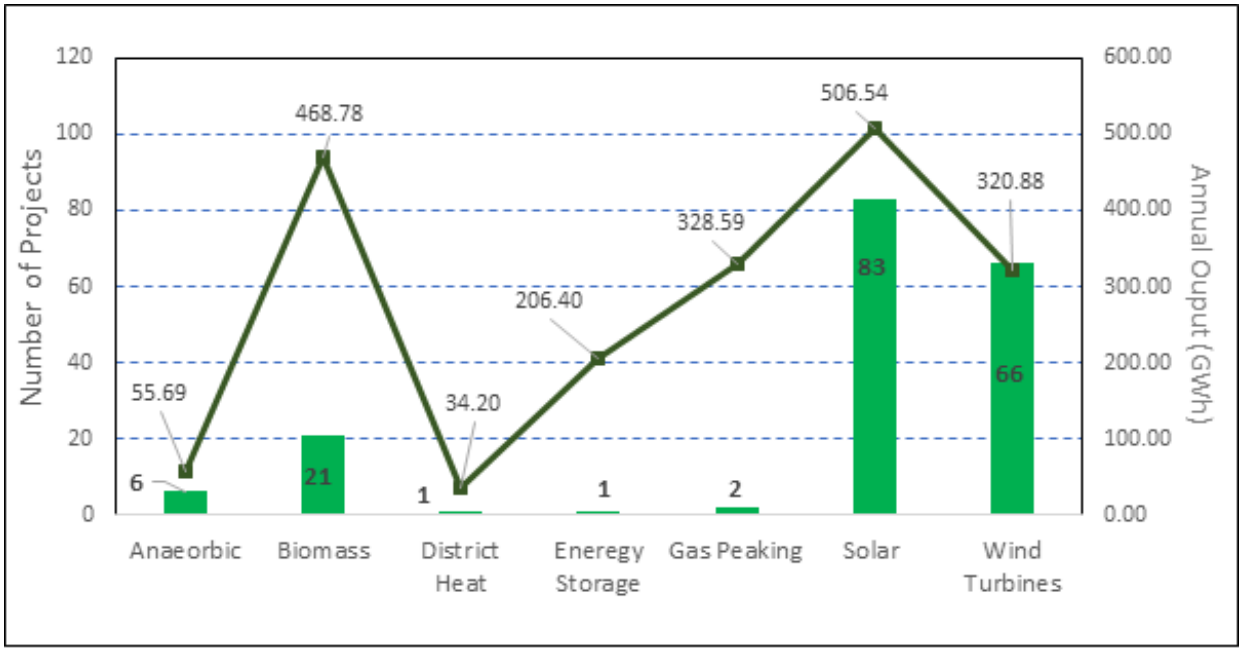
Table 4 - Fife's largest 10 non-domestic renewable energy projects (2023)

Technology	Location	Output (Annual GWh)	Year Started/or Forecast to Start Generating
Energy storage	Glenrothes	494.5	2023/24
Solar and energy storage	Near Lochhead Landfill	411.97	2025/26
Energy storage	Gleniston/ Auchtertool	411.97	2024/25
Biomass	Glenrothes	350	2016/17
Solar PV and energy storage	Crossgates	321.98	2024/25
Gas peaking	Belleknowes IE, Inverkeithing	164.29	2025/26
Solar farm	Westfield	131.4	2025/26
Gas peaking	Land north of Duniface Farm, Leven,	164.29	2025/26
Solar	Land north of Balgeddie, Thornton	105.1	2021/22
Wind farm	Earlseat Farm, Kirkcaldy	98.11	2024/25

Source: Fife Council derived using data from planning applications

A11.30 The Local Development Plan will encourage renewable energy development at all suitable scales but not to the detriment of the wider network users. A balanced and potentially phased approach to development and infrastructure provision will likely be required.

Figure 5 - Fife's renewable energy projects by technology type and generating capacity (Annual GWh)



Source: Derived using data from Fife Council Planning Applications (Crystal Report)

Land Use Issues

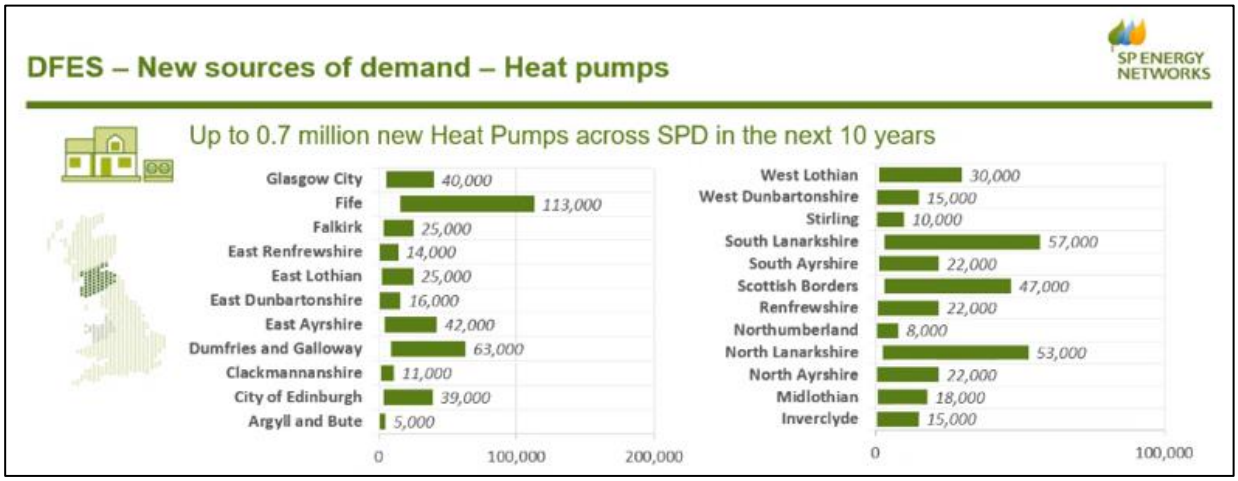
A11.31 Some of Fife's prime agricultural land has been used renewable energy development such as solar farms and for battery storage. Some uses may be reversible, but the LDP will need to consider at the impacts of this and how it can safeguard these important aspects of land use. Prime agricultural land is specifically mentioned in NPF4 as priority for protection as such the LDP will restrict use of prime agricultural land. The LDP must consider both these issues when formulating policy for the LDP.

Heat Pumps

A11.32 Heat pumps could have three times the impact on electricity network as a transition to electric vehicles. Heat pumps use electricity to heat buildings and provide hot water. Heat pumps – both air source and ground source – represent another change to the future electricity demand. Deployment is currently very low, representing well under 1,000 households within a total stock of circa 2 million households in the SPEN Power Distribution area. Figure 6 indicates that Fife has great potential with regard to heat pumps and as such the local development plan will seek to maximise this potential, where applicable.

A11.33 Compared to electric vehicles, where the roll-out rate between Distribution Future Energy Scenarios (DFES) is different but by 2050 the overall volumes are broadly similar, there is significant variance across the four scenarios for heat pumps. This means that there will be very different impacts on the electricity network depending on which heat decarbonisation route is followed.

Figure 6 - Future heat pump demand



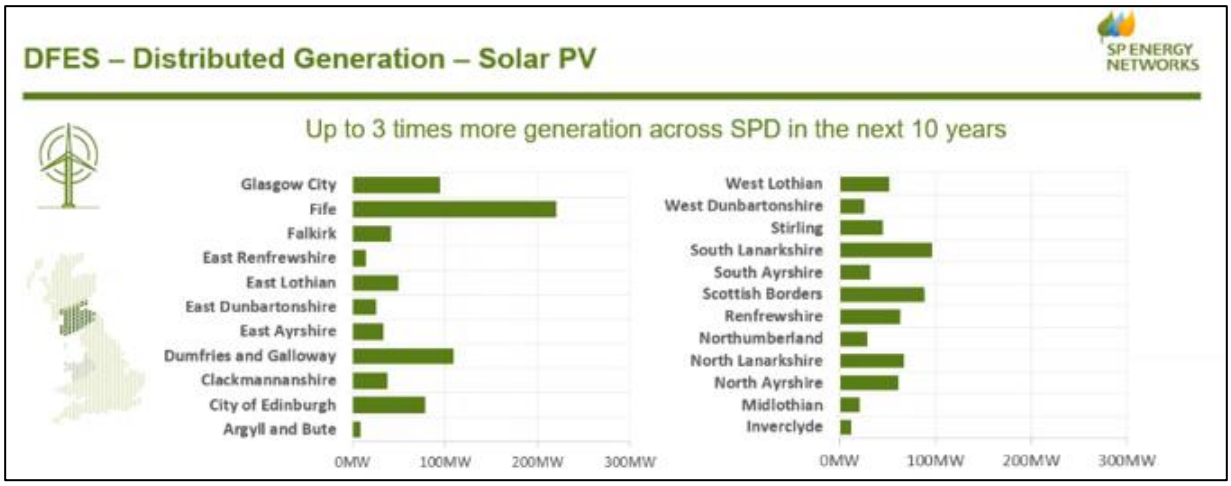
Source: SPEN

Solar Power

A11.34 Fife is well positioned to realise opportunities in solar energy generation (Figure 7). There are several solar farms in operation with more currently being considered through the planning application process. Fife has made significant progress since 2015 with the volume and scale of solar developments. These include solar farms at Crail, Tayport, Wormit, Thornton, Kirkcaldy, Cameron, and Blairhall.

A11.35 These solar farms typically have an annual generating capacity of around 43.8GWh per year – a single solar farm could produce enough electricity to meet 3% of Fife's 2020 annual electricity consumption. The local development plan will support solar PV and other renewable technologies where appropriate.

Figure 7 - Future solar PV distributed generation



Source: SPEN

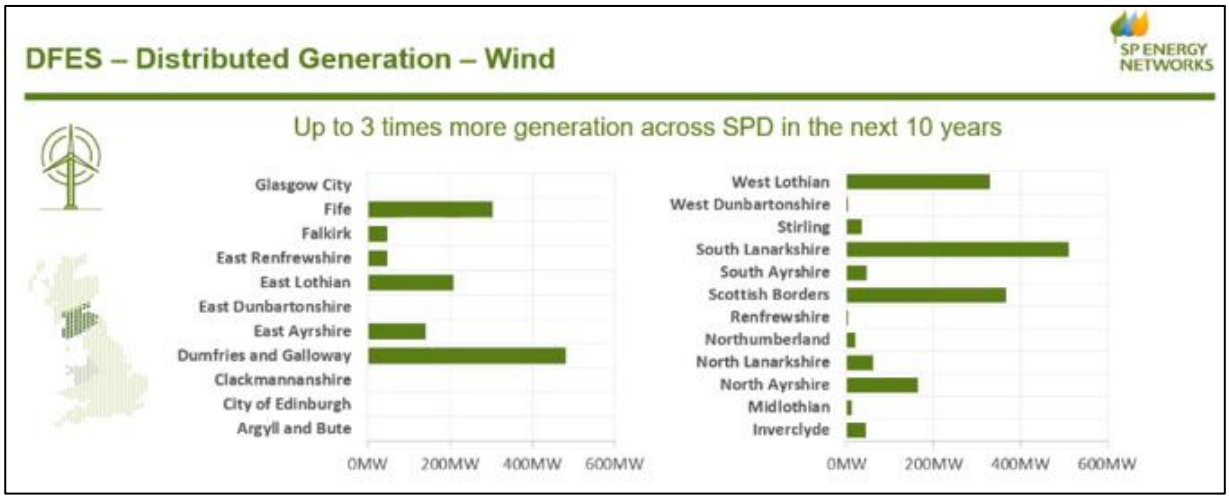
Wind Energy Generation

A11.36 Over the last ten years, there has been steady growth in wind capacity on the SP

Distribution network leading to circa 1.7 GW of installed capacity in Scotland. Currently in Fife, demand for new windfarm development appears to have shifted from onshore to offshore locations.

A11.37 Low Carbon Supplementary Guidance linked to the current Local Development Plan includes a spatial framework and identifies landscape capacity for new onshore wind turbines across Fife. It identifies areas where cumulative impact of existing development had already reached capacity at the time it was produced. The Scottish Government's Onshore Wind Policy Statement 2022[1] requires consideration of enabling additional wind generation as part of meeting the increased electricity demand; as such the local development plan should investigate existing and future wind energy production capacity in implementing NPF4 Policy 11; Energy.

Figure 8 - Future wind generation demand



Source: SPEN

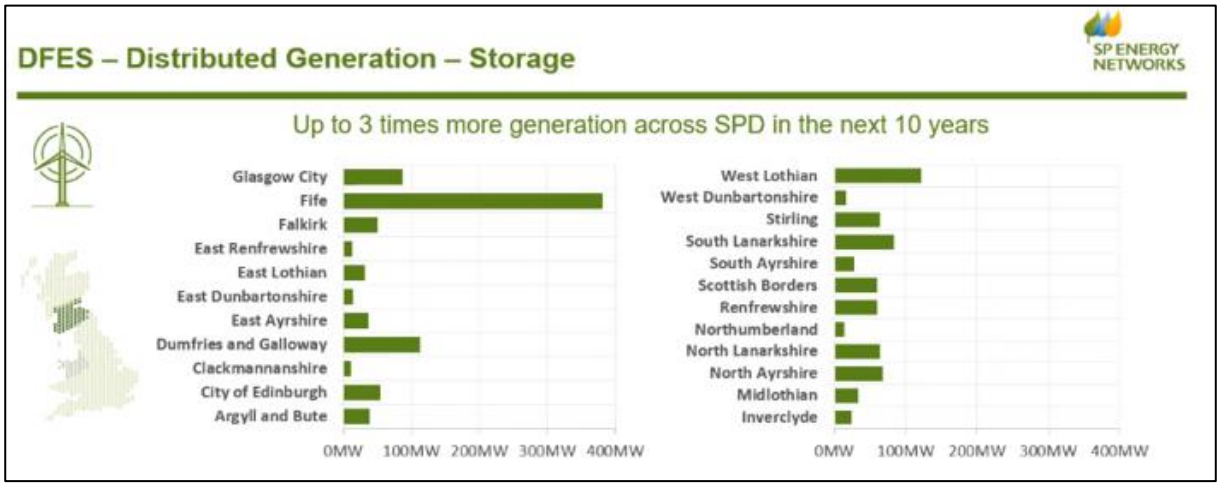
Energy Storage

A11.38 The mid-2020s is likely to experience more growth in energy storage than in any other generation technology. As the move to a decarbonised system with renewable generation gathers pace, storage is likely to play a valuable role in balancing that generation and ensuring system stability.

A11.39 Significant growth in distribution connected storage capacity is expected through the 2020s and early 2030s with Fife at the forefront (Figure 9). Beyond 2035, growth could be substantial in scenarios where there is more decentralised generation, in particular solar PV, that storage would help to manage.

[1] Onshore Wind Policy Statement 2022 Section 3.6

Figure 9 - Future energy storage demand



Source: SPEN

A11.40 SPEN confirmed that a number of significant proposed developments such as battery storage proposals does mean that capacity is reserved for such proposals from the approval of a point of connection application. SPEN would expect progress to be made in delivering proposals otherwise such reserved capacity can be removed; it is understood, however, that planning authorities do have power to refuse permissions where such proposals would impact on wider development within an area.

A11.41 SPEN has outlined proposal to roll out 140,000 monitors at sub stations across Scotland over a 5-year period to enable energy demand profile to be monitored, including peak demand, which will allow better planning and investment decision making. New grid supply points can take 5-10 years to come to become operational.

A11.42 Several battery storage planning application proposals are in the process of being determined in Fife with more anticipated in the future. The local development plan will have a role in setting a development planning context for these proposals and implementing NPF4 Policy 11.

Electric Vehicle Charging

A11.43 As investment in electric vehicles and the decarbonisation of Scotland's rail services increase so does the demand on the electricity grid. Widespread adoption of electric vehicles is expected to provide a significant challenge to the electricity sector due to the resultant large increases in peak demand.

A11.44 Fife Council has recently published their Electric Vehicle Charging Strategy. This area is expanded upon in Annex 10 (Transport). The strategy states that a site assessment has been undertaken to estimate the most efficient use of the council owned car parks throughout Fife to meet future EV charging demand.

A11.45 Sixty sites in Fife have been earmarked for EV charging stations cover many towns and villages. A further 20 other sites in Fife have been earmarked for

additional EV charging stations, including.[2] The strategy states that Fife's approach is to work with a charge point operation to develop a commercial operating model aimed at attracting investment interest. The LDP will incorporate the electric vehicle charging strategy where appropriate and inform policy development.

Gas Infrastructure Summary of Evidence

A11.46 Gas networks will remain a vital and flexible component of Scotland's national infrastructure, delivering affordable energy for heating homes and businesses. To meet the ambitious net zero carbon emissions targets set by the UK and Scottish Governments, sectors like heating and transport must decarbonise: transitioning away from using fossil fuels like natural gas and diesel to zero-carbon alternatives like hydrogen.

Heating

A11.47 The just transition towards decarbonising heat will require the changing use of existing energy infrastructure. This will be influenced by where grid improvements and additional generation are required, and in the long-term moving away from natural gas. The shift towards the electrification of heat is significant, placing large demand pressures on the grid, likely dwarfing other similar pressures. This will be carefully managed in discussion with the Distribution Network Operator to ensure electricity grid constraints are managed.

A11.48 District heat networks and heat storage provide opportunities to help balance the demand on the grid, by offering a large-scale heat supply with a lower relative demand compared to individual heat pump counterfactuals. Use of local renewables and constrained energy could also be used to heat up heat stores, further helping balance the grid.

A11.49 Scotland Gas Networks (SGN) own and operate the gas distribution networks in Scotland and the South-East of England, suppling energy to 5.9 million homes and businesses through over 74,000km of pipeline infrastructure. The UK Government has legally committed to reducing greenhouse gas emissions to net zero by 2050, with the Scottish Government committing to the same reduction by 2045. As part of this transition to net zero, demand for unabated natural gas must be phased out and replaced by low carbon and ultimately renewable energy sources. This will require the transition of natural gas connections to low carbon alternatives such as hydrogen or biomethane.

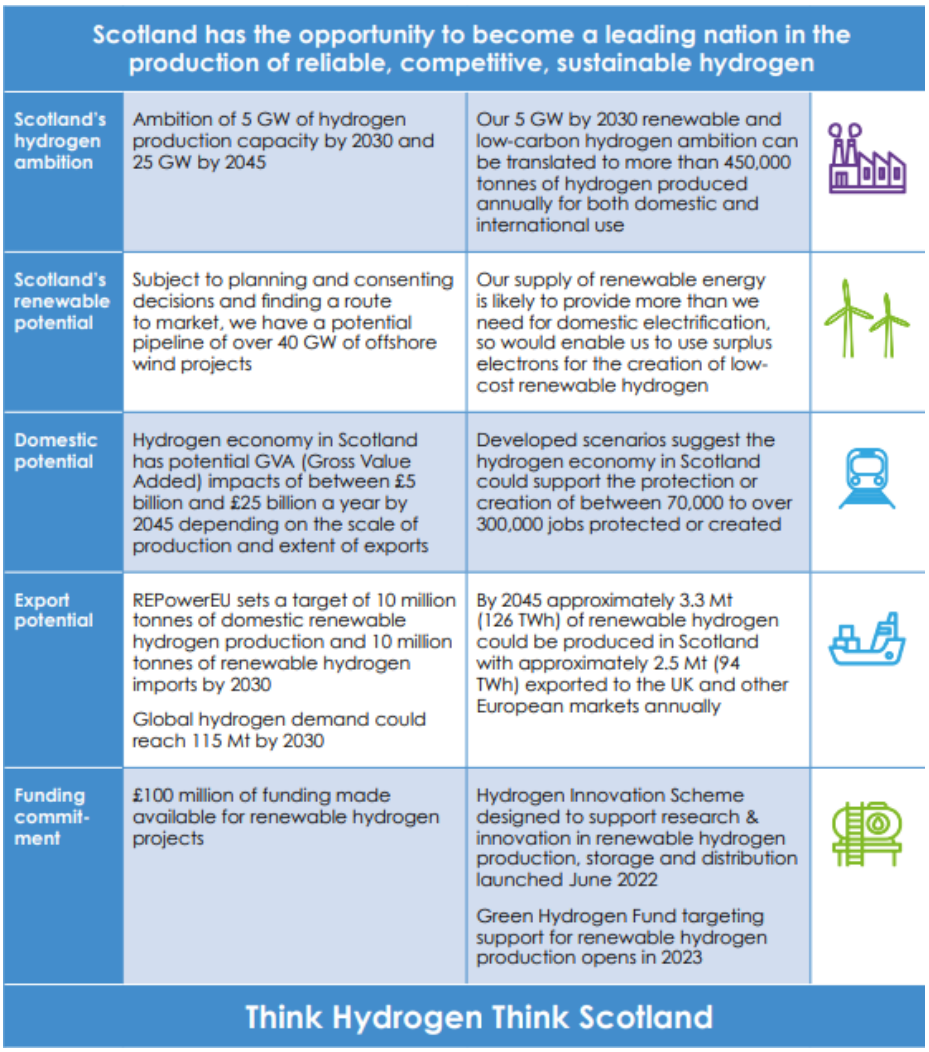
Hydrogen

A11.50 Hydrogen has an important critical role to play in the net zero future and the Hydrogen Action Plan indicates the potential for the country to becoming a leading nation in creating a sustainable hydrogen economy (Figure 10). Fife can contribute to that and help the country to use hydrogen as one of the emerging technologies that can help the UK move away from fossil fuels to a greener

[2] Details are included in a report to the Cabinet Committee meeting of 10 October 2024.

economy.

Figure 10 - Hydrogen economy in Scotland



Source: Hydrogen Action Plan (Scotland)

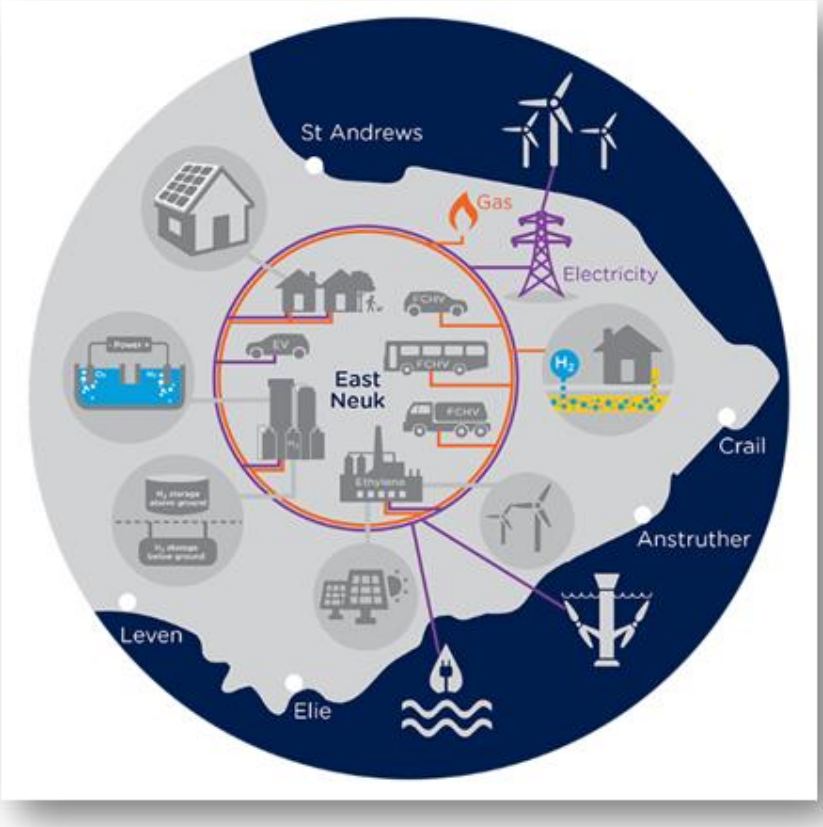
A11.51 Switching carbon-emitting natural gas for hydrogen, which doesn't produce carbon when it burns, is one of the ways homes and businesses can be kept warm and safe while making ground in the fight against the climate emergency. It has the potential to provide green energy to millions of homes and businesses, power heavy industry and transport sectors, and create up to 100,000 skilled jobs.

A11.52 Scotland Gas Network (SGN) is developing H100 Fife, a world-first hydrogen network in Buckhaven and Methil that will bring renewable hydrogen into homes, providing zero-carbon fuel for heating and cooking. In the project's first phase, the network has provided hydrogen to around 300 local homes using clean gas produced by a dedicated electrolysis plant, powered by a nearby offshore wind turbine.

A11.53 SGN has used the East Neuk of Fife, with its abundant onshore and offshore renewables resource and well-developed electricity and gas networks, as a test bed to investigate the use of surplus electricity generated by renewables to

produce green hydrogen, which could then be used to heat homes and businesses carbon-free.

Figure 11 - Fife hydrogen projects



Source: SGN

A11.54 The SGN investigation found that cheap, low-carbon power could underpin cost-effective hydrogen production in Fife. The area's energy attributes could make it a centre for hydrogen production, with high levels of grid connectivity. It also opens the door for hydrogen production in other renewable energy centres.

Local Heat and Energy Efficiency Strategy (LHEES)

A11.55 Increasing energy efficiency and decarbonised heat for all buildings in Scotland is a core part of the energy transition to net zero and tackling the climate emergency. The Scottish Government is keen to support sectors improve their building stock and have introduced several national targets.

A11.56 The Government asked Councils to strategically plan opportunities and actions to help building owners transition buildings to meet these targets and have net zero emissions. To support this, all Scottish Councils were required to publish a Local Heat and Energy Efficiency Strategy (LHEES) and 5-year Delivery Plan by 31 December 2023. Fife Council's strategy and high-level delivery plan were published in November 2023. A detailed delivery plan is in development and is expected to be approved and published in 2025.

A11.57 The Strategy is at the heart of a place based, locally led, and tailored approach to the heat transition. It underpins an area-based approach to heat and energy efficiency planning and delivery. For Fife, the Strategy was developed in partnership with key stakeholders, and:

- Provides a long-term, flexible strategy, and iterative delivery plan to decarbonise heat and improve energy efficiency, considering wider priorities and targets.
- Details how segments of building stock must change to meet national and local targets.
- Identifies opportunities for heat decarbonisation and energy efficiency.
- Uses an optioneering process to prioritise actions.

A11.58 The vision for Fife's first Local Heat and Energy Efficiency Strategy is to: Provide a focus for Fife to improve the energy efficiency and decarbonise heat sources of buildings in a climate friendly, ready, and just manner to meet targets.
Eight prioritise form the basis of the strategy. These were informed by engagement with key local stakeholders. They help ensure the strategy improves energy efficiency and decarbonises heat of buildings, and other important considerations such as fuel poverty, skills & jobs, and community wealth building.

A11.59 The strategy will play a crucial role in helping the Council meet its 2045 Net Zero target, and help Fife be climate friendly, climate ready, and climate just by 2045. Close alignment with the Local Development Plan will be crucial in delivering the required energy efficiency and decarbonisation actions.

Fife's Gas Infrastructure Capacity, Condition and Development

A11.60 The National Planning Framework 4 (NPF4) sets the housing land requirement for Fife. This in conjunction with other considerations including the spatial strategy will determine where development sites will be allocated in Local Development Plan. Fife Council will continue to work in partnership with Scotland Gas Networks and will reassess the impacts of that planned development on the gas infrastructure to identify required improvements and investment.

A11.61 The figures used to show the gas grid in this section are illustrative and not clear at the scale shown in this Evidence Report but they can be provided by SGN.

Current Coverage and Impact of Planned Development (FIFEPlan 2017)

Cupar gas grid

Figure 12 - Cupar gas grid overview

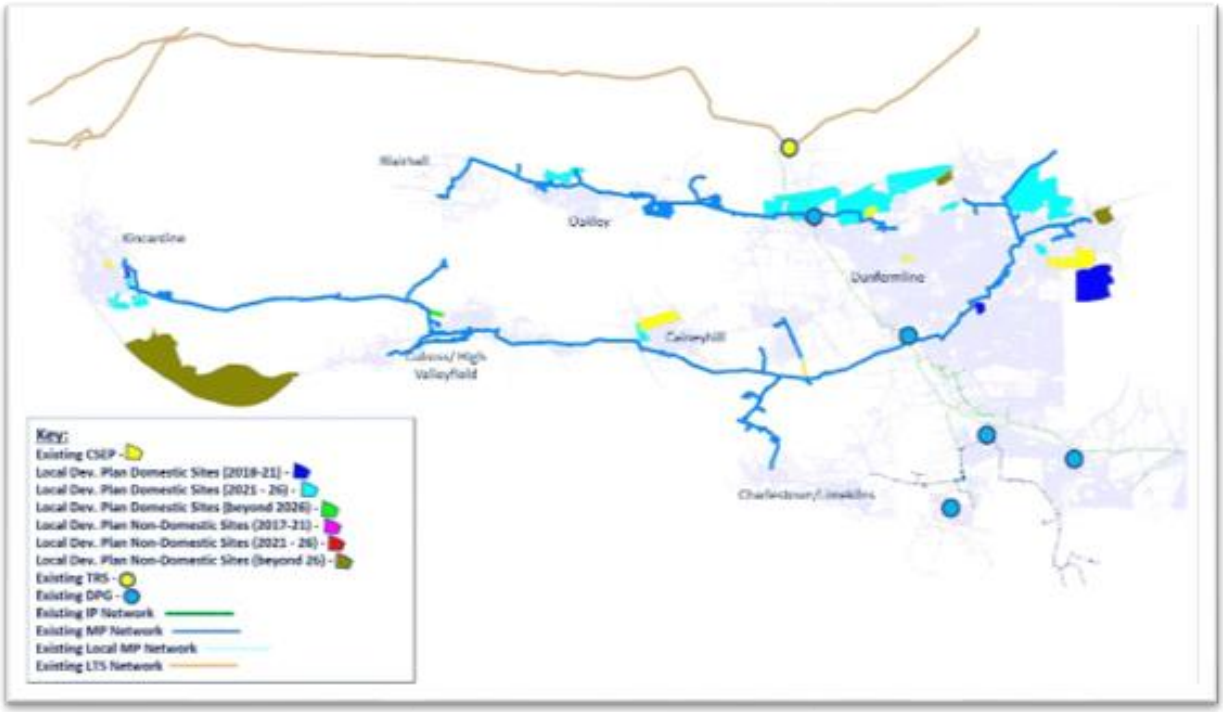
Source: SGN

A11.62 The grid feeds the town of Cupar and the villages of Springfield, Ceres, Dairsie and Strathkinness. The grid also supplies Quaker Oats and two Fisher Service Laundry sites. Of the sites allocated in Fife Local Development Plan (FIFEplan 2017), the mixed development site; Cupar North Development Area, accounts for over half of development.

A11.63 SGN's assessments based on FIFEplan (2017) sites have highlighted no requirement to reinforce the network serving Cupar and the surrounding area.

Dunfermline-Kincardine gas grid

Figure 13 - Dunfermline-Kincardine gas grid overview



Source: SGN

A11.64 This section of the grid supplies the settlements of Dunfermline, Oakley, Blairhall, Cairneyhill, Crossford, Charlestown, Limekilns, Low/High Valleyfield, Comrie, and Kincardine. In recent years there has been a large investment to key infrastructure between Edinburgh and Fife.

A11.65 The 2018 Dunfermline Validation Report draws attention to the two weak sections of the network at Kincardine and Blairhall, both situated at the extremities of the network. The load build-up at these points of the network is being monitored. The load build-up is also being monitored for two sites within FIFEplan (2017) Swallowdrum North (900 homes) and North of Oakley (260 homes).

A11.66 Reinforcement is located on the Kincardine leg and will be the first of two reinforcements required on this leg. The main trigger for the reinforcement is the load build-up of the Kincardine Eastern Expansion site, which at the moment has its planning application pending.

A11.67 SGN's assessment is that reinforcements are required in the short term; however, in the medium term two have been initially proposed (2023 and 2025). In the long term there is one reinforcement categorised as speculative and is scheduled for 2027.

A11.68 The former Longannet Power Station has been decommissioned. Fife Council has identified the site to be used for energy related uses, however this is subject to change and will be addressed in the preparation of LDP2. If connected to the

Dunfermline Kincardine network, the potential large demand of the site could pose a major issue for the grid.

Dunfermline to Kirkcaldy gas grid

Figure 14 - Dunfermline-Kirkcaldy gas grid overview

Source: SGN

A11.69 This part of the grid supplies the settlements of Dunfermline, Rosyth, Inverkeithing, Dalgety Bay, Aberdour, Burntisland, Kinghorn and Kirkcaldy. 2003 saw the closure of British Aluminium at Burntisland which has meant the loss of one of the largest customers supplied by the system. Until that time, this was the low point of the system. That area has now been developed for residential use.

A11.70 The Dunfermline – Kirkcaldy gas grid is connected to and supplies the adjacent Dunfermline-Kincardine grid. Most of all potential sites within the network are found on the Dunfermline-Kincardine MP. The few sites that connect to Dunfermline- Kirkcaldy are situated almost in the middle of the grid and none would cause the network to drop below minimum network pressures. SGN therefore conclude that no reinforcement is required.

Kirkcaldy-East Neuk gas grid

A11.71 This part of the grid supplies Kirkcaldy, Thornton, Glenrothes, Levenmouth area, and the East Neuk villages.

Figure 15 - Kirkcaldy-East Neuk gas grid overview

Source: SGN

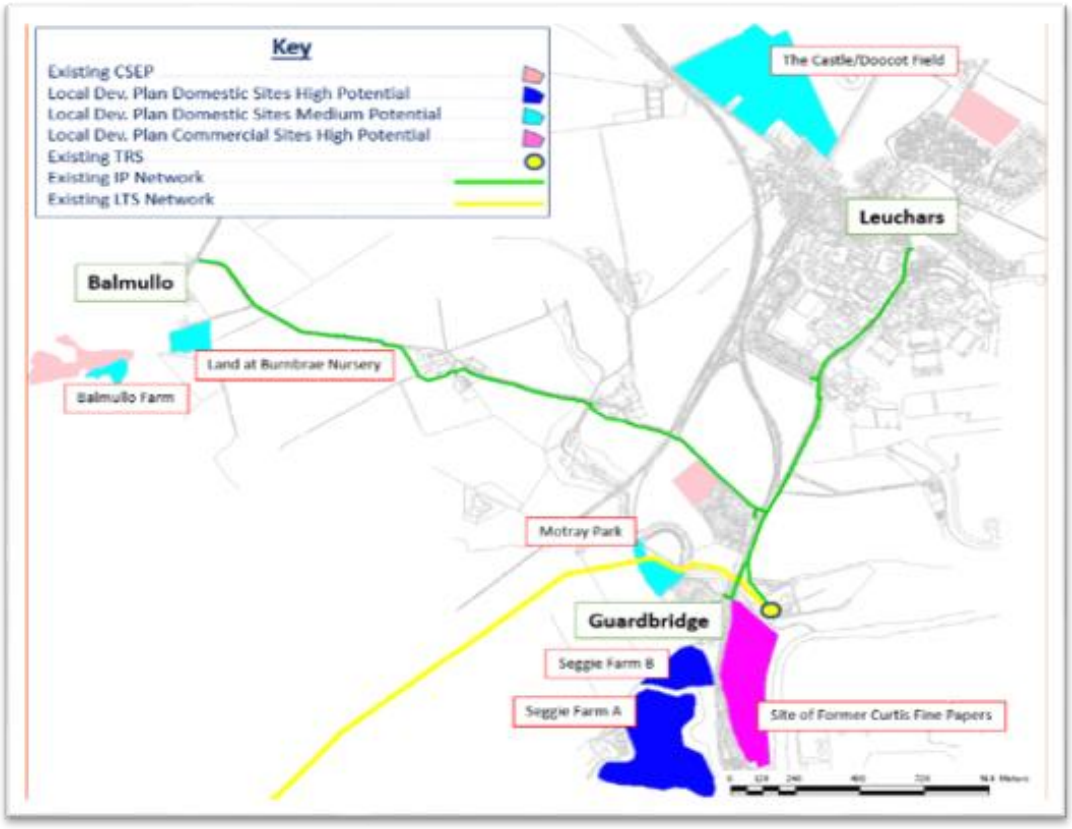
A11.72 Notable sites on the grid are Kirkcaldy South-West (1,200 homes), Kingdom Park (1,760 homes), Land North-West of Thornton (900 homes) and Levenmouth SDA (1650 homes). The driving force behind reinforcement on the Leven – Buckhaven leg, is Levenmouth SDA (1,650 homes). Development at the medium potential of Crail North (320 homes) will be the driving force behind reinforcement heading East.

A11.73 SGN advise that six reinforcements are required. There is no immediate security of supply concern. Reinforcement at Elie has been split over 2 phases predominately to cover the Crail North Development. This allows for a closer monitor of load build up along the Crail leg of the network and reduces the potential to over reinforce. The former Tullis Russell site had previously been a cause for concern due to its large load. However, the new occupants are using the site as a CHP site and have a significantly lower demand.

A11.74 If gas is to play a key role in meeting the energy requirements as a result of sites identified within FIFEplan (2017), then reinforcement will be required. The proposed reinforcements enable the network to supply the build-up of demand through to 2030+ and have been scheduled accordingly.

Guardbridge-Leuchars gas grid

Figure 16 - Guardbridge-Leuchars gas grid overview



Source: SGN

A11.75 This part of the grid supplies the settlements of Guardbridge, Leuchars and Balmullo. Approximately 40 new homes are anticipated in Balmullo, scheduled for construction between across two development sites. Approximately 400 new homes are planned in Guardbridge between 2018 and 2025. In Leuchars 150 new homes are expected to be built.

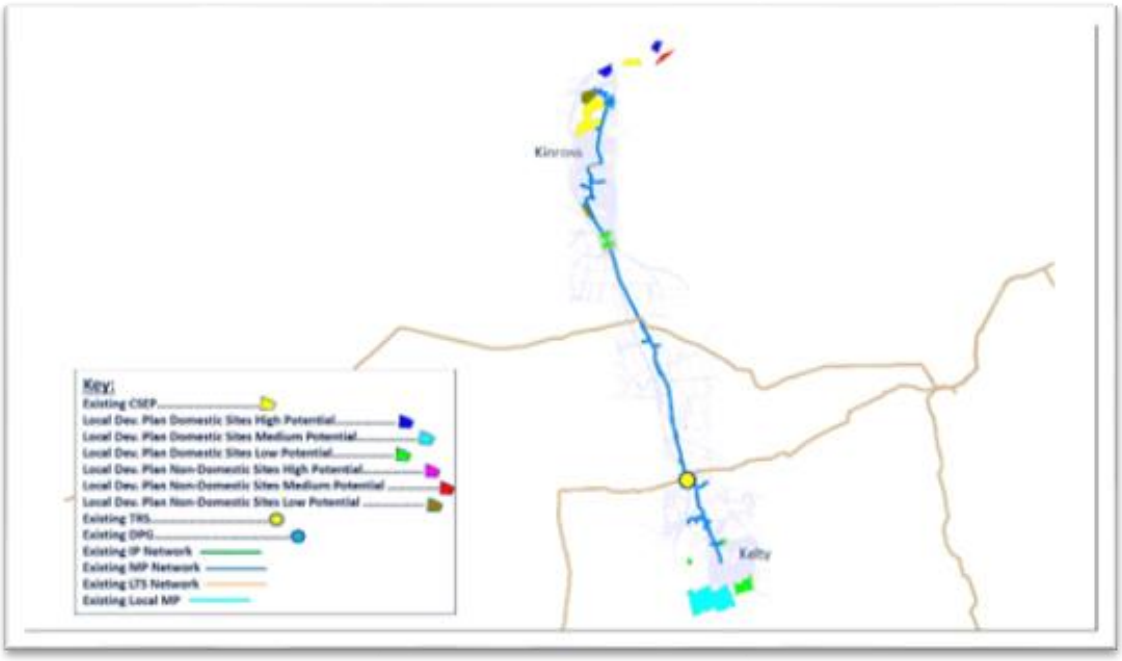
A11.76 The feed from Guardbridge to the Bridge – Innerbridge crosses a body of water and contains a significant length of pipe that causes in a large drop in pressure. This leg is very sensitive to new demand. Reinforcement is required to support the development allocated in FIFEplan (2017). Replacement of infrastructure with a higher capacity is required in order to supply future anticipated demand.

A11.77 The Guardbridge – Leuchars IP network has sufficient capacity in its existing configuration to support the development of most sites as outlined in FIFEPlan (2017). Reinforcement is required to maintain minimum required pressure. Replacement infrastructure is also required since potential future demand exceeds the stated capacity.

Kelty-Kinross gas grid

Figure 19 Kelty - Kinross (Grid 023) Overview of Major Development

Figure 17 - Kelty-Kinross gas grid overview



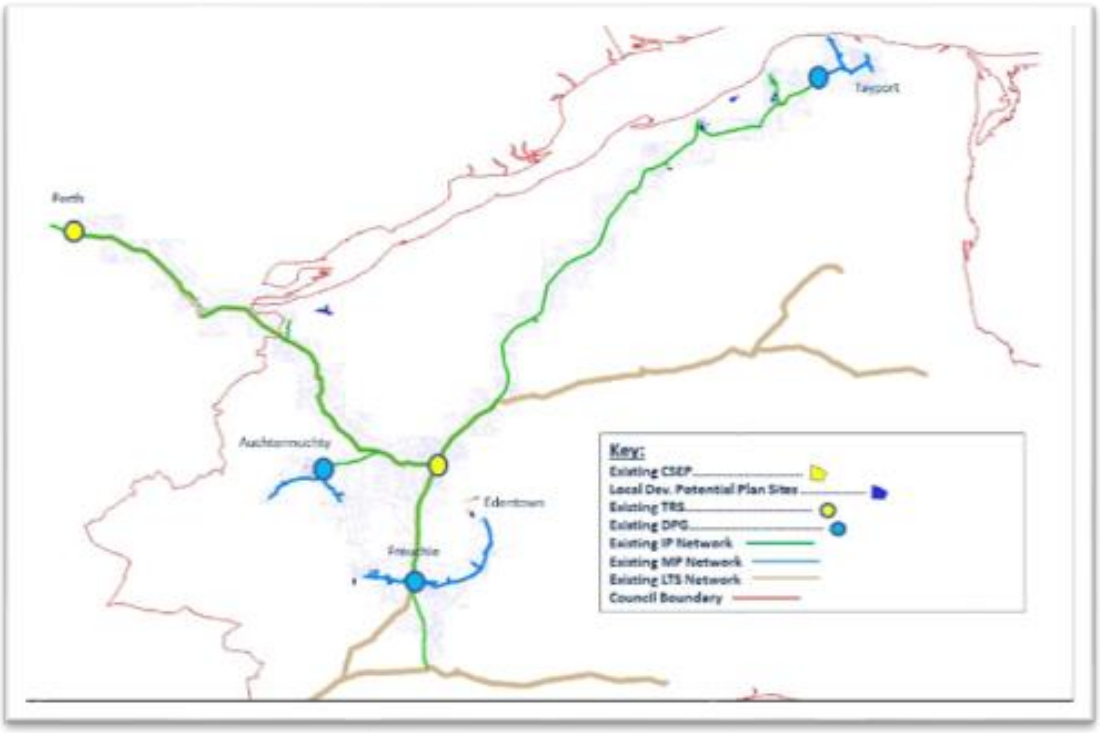
Source: SGN

A11.78 This part of the grid supplies the Kelty. It also supplies Kinross and Milnathort within Perth and Kinross Local Authority area. Three of the four residential sites in Fife do not have planning consent. One site, Kelty South-West, is awaiting planning consent. The site proposes up to 900 dwellings, as well as 3.5 acres in employment land. Various reinforcement might be required depending on the build-out rate of sites in the Perth part of the grid. Those reinforcements dictate what, if any, reinforcements are required to accommodate the Kelty South-West development.

A11.79 Reinforcement within the grid is required due to developments at the tail of the network, located in Perth and Kinross Local Authority area.

Perth-Freuchie-Tayport gas grid

Figure 18 - Perth-Freuchie-Tayport gas grid overview



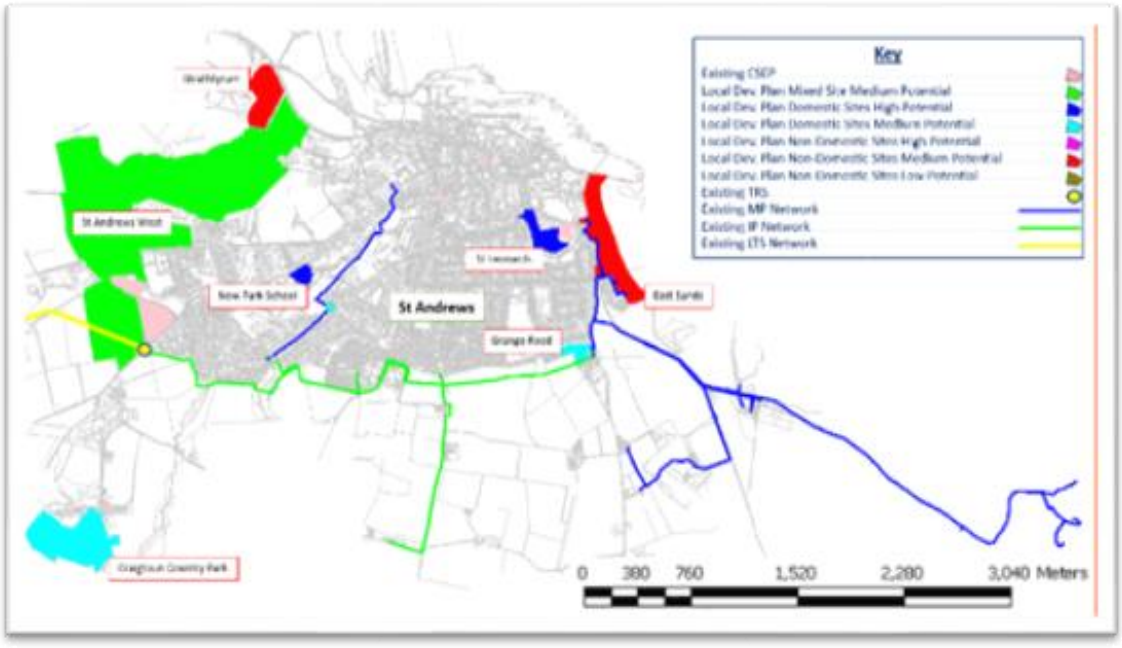
Source: SGN

A11.80 This part of the grid supplies the settlements of Freuchie, Tayport, Auchtermuchty, Dunshelt, Collesie, Wormit, Gauldry, and Newport-on-Tay. Within the Perth-Freuchie-Tayport gas grid, Fife is the only council that has significant future growth. One reinforcement has been designed and scheduled for 2027. The reinforcement is located parallel to the existing main supplying the village of Newburgh. The trigger sites for the reinforcement, at present, have no planning consent.

St Andrews gas grid

A11.81 This part of the grid supplies the settlement of St Andrews and outskirts. The most significant site for housing development is St Andrews West SDA with the construction of approximately 1,000 homes planned and making up approximately 80% of all planned domestic development. Three sites are currently under construction, St Andrews West SDA, St Leonards, and New Park School. St Andrews West SDA is also the most significant Industrial/commercial development site and makes up approximately 50% of potential industrial/commercial demand in St Andrews.

Figure 19 - St Andrews gas grid overview



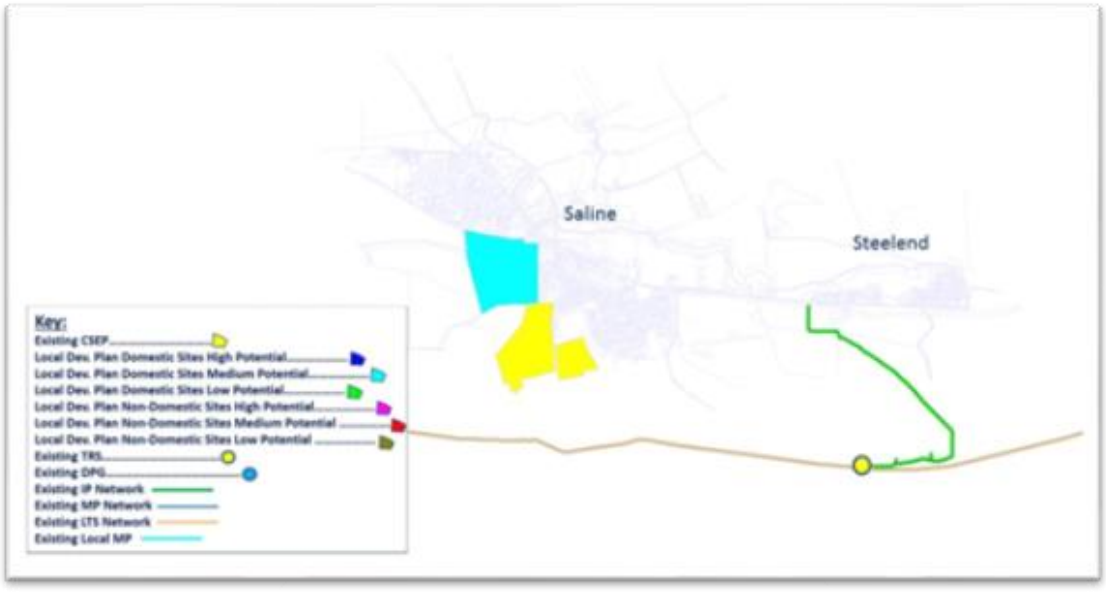
Source: SGN

A11.82 No reinforcement required based on the FIFEplan (2017) development build-out rates. The St Andrews grid has sufficient capacity in its existing configuration to support development FIFEplan's without requirement for any reinforcement.

Saline Grid

A11.83 This part of the grid was commissioned in the early 1990s as part of the then Region's 'Going for Growth' policy and supplies the settlements of Saline and Steelend.

Figure 20 - Saline gas grid overview



Source: SGN

A11.84 Taking account of planned development, SGN conclude no grid reinforcement is required. All future growth is expected to be supplied directly through Saline. Three domestic sites are the only developments expected in the near future. No reinforcement is required.

Gas Infrastructure Capacity Summary

A11.85 Currently and taking account of planned interventions, the current gas infrastructure capacity in Fife, is sufficient to meet the needs of projected development sites as allocated in FIFEplan. All development has been factored into Scotland Gas Network's investment and coverage plans and continue to be monitored to ensure infrastructure is in place to meet the needs of Fife.

A11.86 There is a need to transition to energy supply that does not exacerbate climate change and recognition that continuing to expand the gas grid is counter to climate ambitions. Fife Council will continue to work closely with Scotland Gas Networks and other infrastructure providers in producing the Proposed Local Development Plan. Collaborative working, engagement, and early delivery of infrastructure, where applicable, is key to delivering sustainable growth and an infrastructure first approach to realise the aims and objectives of the Local Development Plan.

Water supply and wastewater treatment infrastructure summary of evidence

A11.87 New and updated development allocations in the new LDP will need to show the development programming so that water supply issues and the treatment of wastewater are managed within infrastructure limits. Scottish Water provides water to domestic and commercial properties in many parts of Fife (some rural areas have private water sources). Scottish Water also provides waste-water treatment services in most settlements in Fife. In rural areas, wastewater is treated on site via septic tanks or other means.

A11.88 Scottish Water provides local authorities with water supply and wastewater capacity GIS data that shows which areas of Scotland may require further investment in waste-water treatment and water supply infrastructure. The information is in a format that cannot be accommodated fully in the Evidence Report. Maps showing the position in Fife are shown in Figures 21 and 22.

A11.89 These maps only show high-level constraints and there may be localised issues in areas where no supply issues are identified. The maps identify areas of Fife where normal water supply and/or wastewater treatment may not be possible or will require intervention.

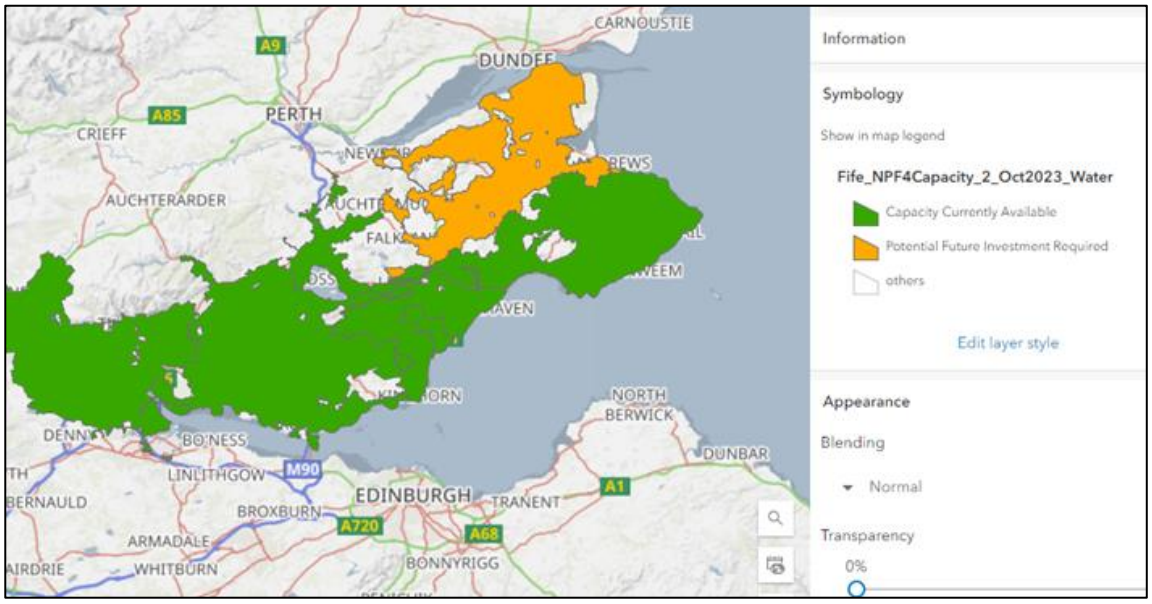
A11.90 Figures 21 and 22 indicate that North East Fife, City of Dunfermline, Cupar, and parts of South and West Fife are potential areas where wastewater treatment capacity might need intervention to accommodate further development. It is a relatively large area of North East Fife that has potential issues with water supply with small countryside pockets in Mid and West Fife. Through the LDP site

selection process all sites will be assessed with regards to water supply and wastewater treatment capacity and connectivity.

Figure 21 - Fife's wastewater treatment capacity

Source: Scottish Water

Figure 22 - Fife's water supply capacity



Source: Scottish Water

A11.91 Early and regular engagement with Scottish Water when developing the spatial strategy and proposed local development plan will determine phasing of developments to make best use of capacity and an infrastructure first approach. Scottish Water and Fife Council are committed to working closely with developers in Fife so that Local Development Plan ambitions can be achieved fully and to the benefit all who live and work in Fife.

A11.92 When assessing proposals to connect to the water and/or wastewater network, Scottish Water operate on the ethos of not accepting new detriment to their existing network from the connection of new properties to the public network. Scottish Water conduct Strategic Network Impact Assessments of the public foul drainage and water networks to understand any risk and identify infrastructure upgrade requirements.

A11.93 Domestic sites from Housing Land Audits and Strategic Housing Investment Programmes feed into these studies and where impacts are highlighted, Scottish Water has a delivery vehicle to design and install these network infrastructure mitigations just ahead of need and this is funded by Scottish Water's Infrastructure Fund. Where development needs do not justify a strategic assessment, a developer may be asked to conduct a standalone network impact assessment and deliver any infrastructure upgrades which may be eligible for Reasonable Cost Contribution (RCC) reimbursement from Scottish Water.

A11.94 Scottish Water is funded to provide additional capacity at strategic treatment assets for water and waste. This capital investment is planned to align with Scottish Water's regulatory investment periods which run in six-year cycles (currently SR21-27). Close partnership working with Fife Council has allowed them to understand realistic development need. Scottish Water assess current and future treatment capacity for drinking water provision and wastewater treatment and trigger growth projects to provide additional capacity if required. Scottish Water has provided GIS mapping data which highlights all strategic wastewater and water treatment assets in Fife that currently have capacity and others where further investigation may be required.

A11.95 Scottish Water's Surface Water Management Policy requires all new development applying for connection to public networks to design sites in a manner that promotes sustainable above ground green-blue based surface water solutions. Scottish Water does not allow new connections of surface water to combined drainage networks, unless under very exceptional circumstances, and new LDP guidance must clearly promote blue-green nature-based solutions as the future to manage flood risk.

Planned Scottish Water investment in Fife

A11.96 Dunfermline and Iron Mill Bay Strategic wastewater solution to meet the needs of existing LDP growth ambitions and provide enhanced environment benefits through reducing flood risk. This complex project was initiated within current investment period (SR21-27) and is scheduled to deliver into the next investment cycle (SR27-33).

Digital connectivity summary of evidence

A11.97 Digital infrastructure is the foundation of connected business, social, and educational connectivity. It enables success, powers transformation and connects people around the world. The infrastructure should be modern and capable of adapting to future technological advancements. Robust digital

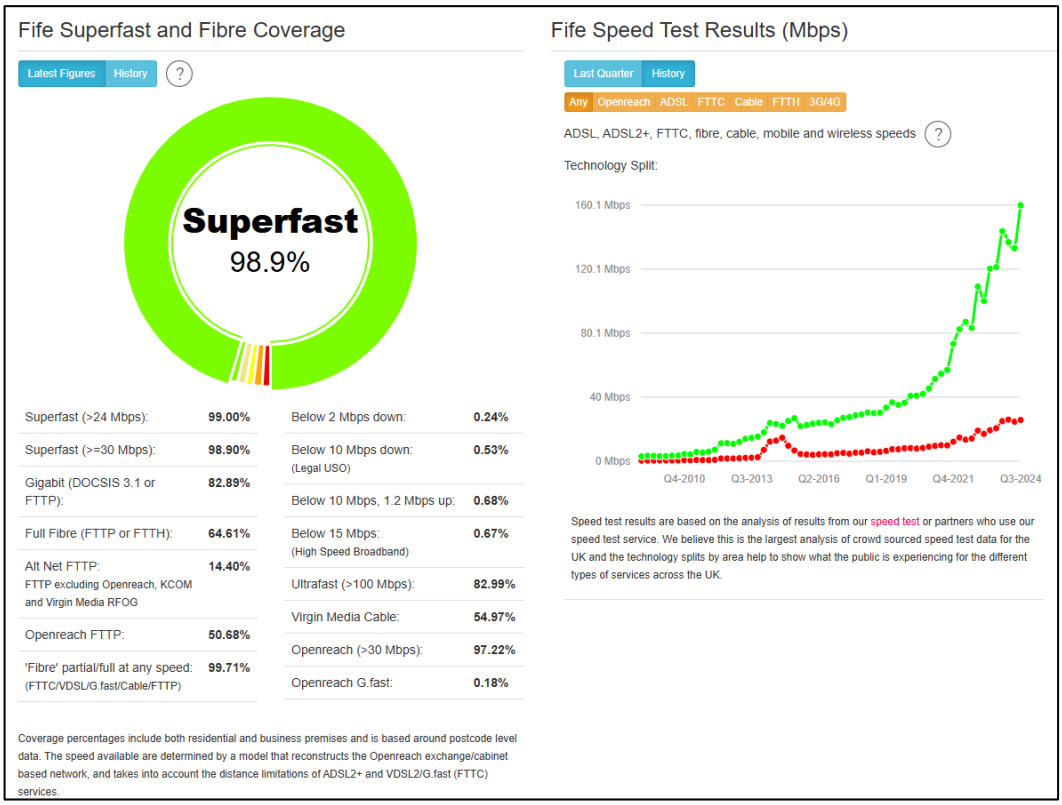
infrastructure should support rapid innovation of new digital products and business models, enabling data-driven decisions and superior customer experiences.

A11.98 Fife's Economic Strategy 2023-30 states that one of the challenges faced by the Fife economy is that business investment in innovation/digitisation is below the Scottish average. Many industrial estates need significant digital investment and there are gaps in digital connectivity in less populated areas. The manufacturing, tourism and retail sectors have been particularly impacted by digitisation. The Strategy aims to improve coverage and reach of digital networks to homes and businesses, eliminating areas of low connectivity and tackling areas of exclusion, increasing take-up, and giving individuals and businesses improved choices. The LDP can assist the implementation of the Economic Strategy through policy support for digital infrastructure.

Superfast Broadband

A11.99 Private and public investment in fibre broadband has enabled just under 99% of homes and businesses in Fife to have access to fibre-enabled broadband (Figure 23), superfast access (greater than or equal to 24 megabits per second (Mbps) for 97.0% of which 96.7% is at speeds greater than or equal to 30Mbps. The fibre network in Fife has received significant private and public sector investment and the fibre footprint in Fife has considerable coverage. All of Fife's exchanges and all Openreach Cabinets are now fibre-enabled.

Figure 23 - Fife's superfast and fibre coverage



Source: Think Broadband Statistics

A11.100 Digital connectivity coverage in Fife is advancing significantly due to various projects aimed at providing high-speed, reliable internet to homes and businesses. GoFibre, is developing additional infrastructure, already covering over 12,000 homes and businesses in places such as Cupar, Cardenden, Burntisland, and Newport and Tayport. This work is expected to eventually serve 16,000 premises with future-proof connectivity, bypassing the limitations of older copper networks. Together, these initiatives represent a substantial investment in Fife's digital landscape, ensuring that rural and urban areas alike can access high-speed internet that supports economic growth, education, and community engagement across the region.

A11.101 UK and Scottish Government strategy is that priority should be given to investment in gigabit capable full fibre connectivity. However, fixed fibre networks and mobile 5G are complementary technologies, so mobile technologies are also a priority. 5G will require dense fibre networks if coverage ambitions are to be achieved. In some places, 5G may provide a more cost-effective way of providing ultra-fast connectivity to homes and businesses. 5G technology is still at an early stage of its development. The convergence between fixed and mobile technologies, and the transition from copper to full fibre (gigabit-capable) networks will also drive investment in digital technologies.

A11.102 The Scottish Government introduced legislation, Scottish Government Building Standards technical handbooks April 2024 for domestic and non-domestic properties to ensure that faster broadband will feature in all new build properties in Scotland. The new legislation will require developers to ensure all new build homes have the physical infrastructure as well as a gigabit-capable connection, subject to a £2,000 cost cap per dwelling. Where this is not possible, new builds should have the next fastest broadband connection within the cost cap. The LDP will reflect this in the requirements for allocated sites.

Mobile Telecommunications Equipment

A11.103 Fife Council wants Fife to have high quality mobile connectivity where people live, work and travel. Mobile coverage has significantly improved over recent years. Proposals for the installation of telecommunications equipment such as masts, cabinet boxes and satellite dishes, erecting antennae or other such structures will be determined in accordance with the National Planning Framework (NPF4). In line with the NPF4, the Council will support the expansion of electronic communications networks, including mobile telecommunications and high-speed broadband. The LDP may need to provide additional information in specific cases where circumstances, such as site sensitivities, require it.

A11.104 The Council will aim to keep the numbers of radio and telecommunications masts and the sites for such installations to a minimum consistent with the efficient operation of the network. Existing masts, buildings and other structures should be used unless the need for a new site has been demonstrated to the satisfaction of the Council. Where new sites are required, equipment should be sympathetically designed and appropriately camouflaged where possible.

A11.105 Although not a matter directly for the LDP, the Council notes that a significant challenge faced by telecommunications operators is the requirement for wayleaves. For example, the R100 contract requires a wayleave for an average of eight premises slowing down delivery and increasing costs. There may be a need to consider this in development requirements and site layouts. In the longer-term, the Government expects to see a more converged telecoms sector. Fixed fibre networks and 5G are complementary technologies, and 5G will require dense fibre networks. In some places, 5G may provide a more cost-effective way of providing ultra-fast connectivity to homes and businesses.

Data driven innovation

A11.106 Smart Dunfermline is a pilot underway in the City of Dunfermline looking at delivering real change using data and a joined-up approach to delivering services. This approach is supported by the National Planning Framework 4 (NPF4) in several areas including sustainable places, infrastructure first, and digital connectivity. This model can be used for: mobility data, town centre footfall data, information on green space and wellbeing, LHEES and wider energy planning, and community safety. LDP2 will identify opportunities to deliver, and not inhibit, the land use and development change required for smart places.

Employment Site digital connectivity

A11.107 Virgin operates a fibre network and offers business fibre products but has extremely limited coverage in industrial estates. Significant areas of business parks are ducted by Virgin but believed to be empty of fibre. BT Openreach covers all of Fife at varying levels of service. Current upgrades of Fibre to the Premises (FTTC) are tending to avoid industrial and business parks, only reaching these where there is a cabinet shared between residential and business areas. Leased lines are available in most areas subject to costs and there is a wide variety of market choice available.

A11.108 As digital infrastructure improves, further development opportunities may arise and result in demand for land and property to accommodate the development of data hubs, dark stores, and digital innovation centres. The Local Development Plan will support the development of such facilities on sites allocated for economic development where they are an employment generator and/ or where the development may serve to attract further business investment.

Rural Broadband

A11.109 Fife, whilst having some rural areas is mainly urban in nature and has over just under 99% coverage with a significant part of that carried out through the Digital Scotland Superfast Broadband programme. However, there are some rural areas where access is difficult, and other interventions will be required to meet superfast speed targets.

A11.110 The Reaching 100% (R100) programme, led by the Scottish Government in partnership with Openreach, has brought full fibre broadband to around 4,100

premises in Fife, with future expansions planned in areas like Aberdour, Glenrothes, and Newburgh. This network upgrade is part of a broader effort to reach Scotland's more challenging areas, offering speeds up to 30 times faster than the initial government targets, which improves reliability for remote work, business operations, and personal use.

Planning Obligations/Developer Contributions Summary of Evidence

A11.111 Planning Obligations will be reviewed as part of the LDP process. Significant upfront investment in infrastructure will be required in most incidences. Local Authorities, including Fife, may need to explore public-private partnerships, developer contributions or community Infrastructure levies. This could raise costs for developers and potentially influence housing affordability and the viability of development proposals. The Planning Obligations Framework Guidance (2017) will be reviewed as part of the LDP process at the Proposed Plan stage.

Summary of implications for the Local Development Plan

A11.112 At this stage of preparing the new LDP, without having an agreed local housing land requirement figure or employment land allocations, it is not possible to be clear on how much development Fife's infrastructure can accommodate. The utility providers have advised on their assessment of capacity issues for their respective networks, as described in this Annex.

A11.113 The implications of this evidence for the Proposed LDP are summarised as follows:

- The transition to zero-emission electricity and the use of battery storage means that the electricity grid is at capacity in parts of Fife. This, along with other infrastructure requirements, is likely to require a phasing of development in the new LDP.
- Development site allocations in the new LDP will be required to show the development programming so that development does not lead to electricity supply issues and or lead to capacity issues on the energy transmission grids. This will be achieved through collaborative working with infrastructure providers.
- Opportunities to allocate land for local energy generation and storage of energy may be specified in the LDP's development requirements.
- The new LDP will need to consider how to realise the full potential of opportunities for renewable, low carbon, and zero emission energy in Fife. These are among several new demands for land in Fife. There may be the need to provide additional guidance on siting low carbon energy infrastructure across Fife.
- Consider the impact of renewable development on prime agricultural land and employment sites as part of LDP site selection, allocation and policy formulation.

- Consider including sites identified for electric vehicle charging infrastructure as well as the requirements in this respect for new development.
- Support an area wide energy transition through LHEES and other strategies. This will be critical to support new development, and facilitate the infrastructure required to support existing development, including any designated Heat Network Zones.
- Take account of the land use needs for potential connections from offshore generators direct to Fife in support of energy supply and transition.
- The Scottish Government Onshore wind: policy statement 2022 requires consideration of enabling additional wind generation as part of meeting the increased electricity demand. This will be considered as part of the Proposed Plan stage.
- Consider the implications for Fife as a potential location for a Regional Hydrogen Hub, as well as current and proposed hydrogen projects in Fife in relation to land-use planning, with consideration to distribution and storage.
- Apply energy considerations as part of the LDP strategy and in the site assessment methodology by taking account of considering the proximity of and potential for heat network zone designation in designating proposed development sites.
- Fife's just transition towards decarbonising heat will require the changing use of existing energy infrastructure. This will be influenced by where grid improvements and additional generation are required, and in the long-term moving away from natural gas. SP Energy Networks, Scotland Gas Networks, and Scottish Government must take the lead role in this (for upgrading the electricity grid, looking at alternative fuels, and providing national coordination, respectively). The LDP has a role by providing local context based on the outputs of the Local Heat and Energy Efficiency Strategy.
- The phasing and delivery of infrastructure will be reflected in development requirements, if required, and monitored through the Delivery Programme.
- Investigate funding mechanisms;
- Phasing of development in collaboration with utility companies and developers, monitored through the Delivery Programme; and
- The LDP site selection process will take account of Scottish Water advice on water supply and wastewater treatment capacity and connectivity.
- Where development needs do not justify a strategic assessment, a developer may be asked to conduct a standalone network impact assessment and deliver any infrastructure upgrades which may be eligible for Reasonable Cost Contribution (RCC) reimbursement from Scottish Water.
- Scottish Water is responsible for the main carrier systems that take surface water in built up areas. The drainage capacity is being stretched by climate change so the new Local Development Plan should give guidance on the role of blue-green infrastructure and possible disconnection of surface water from existing development.

- Scottish Water's Surface Water Management Policy requires all new development applying for connection to public networks to design sites in a manner that promotes sustainable above ground green-blue based surface water solutions. Scottish Water does not allow new connections of surface water to combined drainage networks, unless under very exceptional circumstances. LDP guidance may be needed to identify, require, or promote blue-green nature-based solutions as the future to manage flood risk.
- The LDP will support the delivery of digital infrastructure in all new-built development in urban and rural areas and to support smart cities and towns. That may involve specifying development requirements.
- The LDP will continue to require consideration of the visual and/or cumulative impact of digital connectivity infrastructure in implementing NPF4 Policy 24: Digital infrastructure.
- Review the policy needs for planning obligations and developer contributions as part of the local development planning process.
- The Delivery Programme needs to reflect the phasing and programming of development to demonstrate they can be delivered taking account of infrastructure needs and costs, and the lead agencies for infrastructure.
- Development proposals will only be supported where it can be demonstrated that provision is made to address the impacts on infrastructure.

Statement of Agreement/Disagreement

A11.114 Fife Council has regularly and closely engaged with Scotland Gas Networks (SGN), Scottish Power Energy Networks (SPEN), Scottish Water (SW), Scottish and Southern Energy Networks Transmission (SSEN-T) and relevant Fife Council services with regards to infrastructure to inform the Evidence Report. Business & Employability Services are the Council representative for the Digital Scotland Superfast Broadband (DSSB) roll-out project and has provided the evidence included in this Annex. Table 5 records support or disagreement with this draft Annex and identifies disputed matters with reasons.

Table 5 - Statements of agreement or dispute

Paragraph/section	Nature of agreement/disagreement	FC Comments
Scottish Water 10/06/2026	Scottish Water has confirmed Fife Council has engaged appropriately with Scottish Water throughout the evidence gathering process and have taken their data and information into consideration when preparing Fife Local Development Plan 2 Evidence Report. Two typos were identified.	These matters have been addressed in the resubmission version.
Scottish Power Energy Networks (SPEN)	In June 2025 SPEN was sent a final copy of the resubmission document. They agree broadly with the content and focus on Annex 11, specifically. Some updates were suggested for Figures 6-9 in the Annex relating to future energy scenarios.	Annex 11's distribution future energy scenarios (DFES) in these Figures were based on the 2024 DFES report. The 2025 version has been included in the links in this Annex but the Figures reman unchanged as the information will continue to change and dialogue will continue with SPEN as the LDP is prepared to access the latest available information at that time. Evidence Report has not been re-written to incorporate all updates change as some updates will not be material changes in the evidence base.
Scotland Gas Networks (SGN)	In June 2025 SGN was sent a final copy of the resubmission document. SGN stated that they disagreed with the Evidence Report, highlighting that paragraph A11.51 of Annex 11	These matters have been addressed in the resubmission version.

Paragraph/section	Nature of agreement/disagreement	FC Comments
	(Infrastructure First) should refer to 'H100 Fife' rather than Levenmouth H100. A url for H100 Fife was also supplied.	
Scottish and Southern Electricity Networks Transmission (SSEN-T)	In June 2025 SSE-T was sent a final copy of the resubmission document. SSEN-T agrees broadly with the finalised Evidence Report. Some additional reference sources published by National Energy System Operator (NESO) were suggested because they provide the justification for why the electricity transmission grid needs to be upgraded and expanded by 2030 and beyond across SSEN Transmission and SPEN licenced operating areas in Fife.	The additional reference sources have been incorporated.