

Renewable Energy

Supplementary Guidance SG17

November 2016



Falkirk Council
Development Services

Supplementary Guidance

A suite of supplementary guidance (SGs) is currently being produced by the Council. Most of these SGs are updated versions of previous Supplementary Planning Guidance (SPG) whilst others cover new topic areas (*denotes new SGs). There are 17 SGs in the series, all of which seek to provide more detailed guidance on how particular local development plan policies should be applied in practice.

These SGs form a statutory supplement to the Local Development Plan, and are intended to expand upon planning policies and proposals contained in the proposed plan.

A full list of the supplementary guidance available in this series is found below.

- SG01** **Development in the Countryside ***
- SG02** **Neighbourhood Design**
- SG03** **House Extensions and Alterations**
- SG04** **Shopfronts**
- SG05** **Biodiversity and Development**
- SG06** **Trees and Development**
- SG07** **Frontiers of the Roman Empire (Antonine Wall) World Heritage Site**
- SG08** **Local Nature Conservation and Geodiversity Sites ***
- SG09** **Landscape Character Assessment and Landscape Designations ***
- SG10** **Education and New Housing Development**
- SG11** **Healthcare and New Housing Development ***
- SG12** **Affordable Housing**
- SG13** **Open Space and New Development**
- SG14** **Spatial Framework and Guidance for Wind Energy Development**
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Renewable Energy

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1. Introduction

1.1 This supplementary guidance will set out the general principles and guidance for a range of renewable technologies including Biomass, CHP, Solar/PV, ground, air and water source heating and hydro, as well as the potential for district heating within the Falkirk Council area. It is not intended to set out specific micro-generation guidance as this is a constantly evolving field in terms of range of technologies available and their technical capabilities. There are links to other sources of up-to-date guidance in the Appendix which may be of use to smaller-scale proposals. Wind Energy is also addressed separately in SG14: Spatial Framework and Guidance for Wind Energy Development. This guidance is intended to expand on the requirements of Policy D04 and RW01(1) of the Falkirk Local Development Plan (LDP) which seeks to support renewable energy development where potential impacts can be addressed satisfactorily. The guidance does not direct development to specific locations, but sets out the broad nature of each technology, the policy background, and the relevant criteria for assessing each technology including ecology, the historic environment, landscape and other environmental considerations.

Purpose of Guidance Note

- 1.2** The guidance is aimed at:
- Developers exploring the feasibility of renewable energy as part of proposed or existing development in line with LDP policy;
 - Developers exploring the feasibility of commercial, freestanding projects;
 - Community organisations considering the potential for renewable energy schemes.
- 1.3** In addition to guidance on renewable energy technologies, the Supplementary Guidance includes information on district heating and heat networks to expand on the requirements of Policy D04 (3) of the LDP. This policy requires developers to explore the potential for district heat networks within major development sites. The guidance includes a strategic heat map which will identify areas of greatest potential, based on existing strategic areas of growth identified in the LDP, plus the boundary of the Grangemouth Energy Project, where a range of options are currently being pursued. There are, of course, other sites where district heating, on a smaller scale, will be possible. Developers should also aim to 'futureproof' sites where possible by including pipework and infrastructure which could link in to district heat networks in the future should they be brought forward. The SG will not identify any specific locations where heat networks are expected to be located, but it is intended to form a starting point for investigating the potential for proposals.

2. National Context and Drivers

- 2.1 The Scottish Government's aspiration includes the following:
- To achieve 1.5TWh of Scotland's heat demand from district or communal heating and to have 40,000 homes connected by 2020 according to its Heat Policy Statement in June 2015;
 - To have the equivalent of 100% of electricity consumption from renewables by 2020;
 - To meet at least 30% of overall energy demand from renewables by 2020;
 - For 11% of heat demand to come from renewable sources.

National Planning Framework 3 (NPF3)

- 2.2 NPF3 seeks a transition to a low carbon economy and recognises the importance of the planning system in delivering targets. NPF3 seeks to encourage greater use of all renewable technologies and recognised the progress to date with offshore and onshore wind. NPF3 seeks to encourage the recovery of waste heat and supports the development of heat networks, particularly in national developments such as Grangemouth Investment Zone. NPF3 also seeks to secure greater community ownership of renewable energy developments.

Scottish Planning Policy (SPP)

- 2.3 SPP requires Development Plans to:
- Ensure an area's full potential for electricity and heat from renewable sources is achieved in line with national climate change targets, giving due regard to relevant environmental, community and cumulative impact considerations;
 - Support new build developments, infrastructure or retrofit projects which deliver energy efficiency and the recovery of energy that would otherwise be wasted both in the specific development and surrounding area;
 - Set out the factors to be taken into account in considering proposals for energy developments. These will depend on the scale of the proposal and its relationship to the surrounding area and are likely to include the considerations set out at paragraph 169 (these include a range of Development Management criteria which are reflected in Falkirk LDP policy).

In relation to heat, SPP requires Local Development Plans to:

- Use heat mapping to identify the potential for co-locating developments with a high heat demand, with sources of supply;
- Support the development of heat networks in as many locations as possible. Even where they are initially reliant on carbon-based fuels if there is the potential to convert them to run on renewable or low-carbon sources of heat in future; and
- Identify where heat networks, heat storage and energy centres exist or would be appropriate and include policies to support their implementation.

The Renewable Heat Action Plan

- 2.4 The Renewable Heat Action Plan indicates that in order to achieve the target of 11% of heat being derived from renewable sources, retrofitting of micro-renewables and the development of district heating networks will be required. The action plan highlights the role that the planning system will play in terms of strategic policy and its regulatory role.

3. Relevant Local Strategies and Policy

District Heating Strategy

- 3.1 Falkirk District Heating Strategy is being developed with support from the Heat Network Partnership for Scotland (HNP). Section 7.10 highlights the aims of the Strategy and sets out how the Strategy relates to other plans.

Sustainable Development and Climate Change Strategy

- 3.2 Falkirk Council's Sustainable Development and Climate Change Strategy sets out how Falkirk Council intends to address sustainable development and Climate Change from a five-year period from 2012-2017. The accompanying Action Plan identifies a number of priorities including:

- Developing a strategic approach to renewable energy;
- Producing planning policy on reducing carbon emissions as part of new development;
- An increase in the use of sustainable biomass; and
- Installing a photovoltaic array on at least one secondary school.

Home Energy Policy 2011-2016

- 3.3 The Council's Home Energy Policy 2011-2016 sets out a number of aims including:

- Responding to the requirements of the Climate Change (Scotland) Act 2009;
- Improvement in energy efficiency across socially rented and private housing stock;
- Addressing fuel poverty across the Council area;
- To act as a basis for researching innovative technical solutions to improve home energy efficiency.

Carbon Management Plan (CMP)

- 3.4 Falkirk Council's Carbon Management Plan (CMP) lays out how carbon emissions can be cut across all of the Council's estate and activities and identifies a commitment to investigate the potential for renewable energy projects linked to Council functions. The CMP also sets out various potential funding sources, including potential income from renewables projects, and the Central Energy Efficiency Fund (CEEF) which can provide low cost loans and finance for energy efficiency and renewable energy projects.

Local Housing Strategy 2011-2016

- 3.5 The Local Housing Strategy 2011-2016 seeks to ensure that there is an adequate supply of good quality housing and increase the range of affordable housing options on the Council area. The LHS also makes a commitment to explore potential for renewable energy including decentralised energy provision within areas of fuel poverty and communities which are not served by the gas network.

4. Falkirk Local Development Plan

- 4.1 Falkirk Local Development Plan is broadly supportive of renewable energy proposals subject to relevant policy criteria. The LDP also seeks to ensure that major developments assess potential for decentralised energy generation and district heating systems. The relevant Local Development Plan policies are:

Policy RW01 Renewable Energy

1. Renewable energy developments will be supported subject to:
 - Satisfactory assessment of their impacts on the environment and communities; and
 - Compliance with other relevant LDP policies and statutory supplementary guidance, which will embody all the principles in Scottish Planning Policy 2014 and will set detailed policy considerations against which all proposals for renewable energy infrastructure developments will be assessed.
2. Wind energy developments will be assessed in relation to the following factors, as well as against the detailed spatial framework, policies and guidance contained in Supplementary Guidance SG14 'Spatial Framework and Guidance for Wind Energy Developments' prepared in full accord with Scottish Planning Policy 2014:
 - Landscape and visual impacts;
 - Ecological impacts;
 - Impact on green belt objectives;
 - Impact on carbon rich and rare soils;
 - Impact on the water environment;
 - Impacts on the historic environment;
 - Impacts on aviation and telecommunications interests;
 - Impacts on communities, whether settlements or individual residential properties, including issues of noise, shadow flicker and air quality;
 - Cumulative impacts in relation to the above factors, arising from the combined effect of the proposal with other existing or approved wind energy developments;
 - Net economic impacts, including local and community socio - economic benefits;
 - The scale of contribution to renewable energy generation targets and the effect on greenhouse gas emissions; and
 - Tourism and recreation impacts, including for public access and for long distance walking, cycling and scenic routes.

Policy D04 Low and Zero Carbon Development

1. All new buildings should incorporate on-site low and zero carbon-generating technologies (LZCGT) to meet a proportion of the overall energy requirements. Applicants must demonstrate that 10% of the overall reduction in CO2 emissions as required by Building Standards has been achieved via on-site LZCGT. This proportion will be increased as part of subsequent reviews of the LDP. All proposals must be accompanied by an Energy Statement which demonstrates compliance with this policy. Should proposals not include LZCGT, the Energy Statement must set out the technical or practical constraints which limit the application of LZCGT. Further guidance will be contained in Supplementary Guidance SG15 'Low and Zero Carbon Development'. Exclusions from the requirements of this policy are:
 - Proposals for change of use or conversion of buildings;
 - Alterations and extensions to buildings;
 - Stand-alone buildings that are ancillary and have an area less than 50 square metres;
 - Buildings which will not be heated or cooled other than by heating provided solely for the purpose of frost protection;
 - Temporary buildings with consent for 2 years or less; and
 - Where implementation of the requirement would have an adverse impact on the historic environment as detailed in the Energy Statement or accompanying Design Statement.
2. The design and layout of development should, as far as possible, seek to minimise energy requirements through harnessing solar gain and shelter;
3. Decentralised energy generation with heat recycling schemes (combined heat and power and district heating) will be encouraged in major new developments, subject to the satisfactory location and design of associated plant. Energy Statements for major developments should include an assessment of the potential for such schemes.

- 4.2 Supporting text for Policy RW01 (Paragraph 5.120 of the LDP) confirms that wind and biomass have some potential at a commercial scale, whilst other decentralised renewable energy technologies including but not limited to hydro, geothermal and solar will be exploitable at a community or domestic scale. The supporting text also sets out the commitment to produce Supplementary Guidance which accords with the requirements of SPP.

5. Guidance on Renewable Energy Technologies

Background

- 5.1 This section will set out the following:
- Provide a brief overview of each technology, and its technical feasibility and scope;
 - Locational guidance: this will identify any areas where known capacity has been identified through previous studies or through planning history;
 - Case studies where available and relevant; and
 - Relevant regulatory and planning considerations which will be required to be addressed for individual proposals including ecology, landscape and visual impact, water quality and the historic environment.

Hydro

5.2 Technical Feasibility and Scope

5.2.1 There are two main types of hydro power generation:

- Diversion (run-of-river) : where a proportion of water is diverted via a weir or lades into a penstock (pipe) to a turbine (which generates electricity) before returning the water to the river downstream; These schemes can often operate on a low head basis (run-of-river scheme that operates with a head of 20 meters or less).
- Impoundment: where a dam or series of dams hold water back in flooded valley systems, creating a hydraulic head from which electricity is generated. These would often operate on a 'medium or high head' basis which would have a head height of greater than 25m, and can exceed 300m. Pumped storage uses similar principles to large scale impoundment but involves a second reservoir used to pump water back into the first reservoir during off-peak hours. This provides a larger volume of water that can be used to generate electricity during periods of peak electricity usage.

Locational Guidance

5.2.2 There is one currently consented and operational hydro scheme at Carrongrove Mill which is included as a case study in Section 5.2.6.

5.2.3 A 2003 study undertaken by BMT Cordah included an assessment of potential for hydro across the Council area and undertook a modelling exercise which concluded that the potential for hydro was limited. The study identified three river catchments and a number of lochs which could potentially provide for hydro schemes and which were assessed. These are:

- The River Carron, including Bonny Water, Westquarter Burn, and the Walton Burn;
- River Avon including the Drumtassie Burn; and
- Pow Burn, including Tor Burn.

Only two areas were identified as having potential for a hydro scheme;

- 13km stretch of River Carron;
- 5km stretch of River Avon (excluding Muiravonside Country Park);

The conclusions of the study were that Falkirk Council should remain broadly supportive of hydro developments and should encourage small-scale projects for schemes that may come forward, particularly integrated with development sites, such as at Carrongrove.

5. Guidance on Renewable Energy Technologies

5.2.4 There is clearly scope for run-of-river schemes across the Council area, and these will be assessed on a case-by-case basis, subject to relevant policies in the LDP, the guidance set out in this SG, and other relevant assessments.

Planning and Procedural Considerations

5.2.5

Determining Authority	< 50 MW output	>50MW output
	Falkirk Council	Scottish Government under s.36 Electricity Act

Consideration	Types of Impact	Guidance and Information Required
Landscape and Visual Impacts	Hydro schemes can result in localised landscape, and particularly visual impact depending on the scale of proposal. This can be as a result of weirs/impoundment infrastructure, or ancillary infrastructure such as pipework, access tracks or buildings.	Landscape and Visual Impact Assessment required for larger commercial schemes. Requirement for LVIA or smaller schemes assessed on case-by case-basis. Cumulative landscape and visual impact with other proposed and consented developments should be assessed if appropriate.
	Some proposals may result in the loss of trees and woodland. Some areas of trees/woodland may subject to a Tree Preservation Order (TPO) or may be identified as Ancient and Semi-natural woodland (which may also be a key habitat).	A felling license may be required by the Forestry Commission. There is a presumption against loss of ancient and semi-natural woodland unless there are exceptional circumstances. Loss of trees and woodland should be quantified at the early stages of a proposal, and compensatory planting should be included in any scheme. Additional landscaping may also be required as part of habitat enhancement or mitigation of visual impact.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Ecological Impacts</p>	<p>Proposals can result in direct impacts on ecology, as well as a loss of habitat, or habitat connectivity. This is dependent on the scale and location of the proposal. This could result of obstruction of riparian corridors, or through ancillary development required for the operation of the hydro scheme. Particular areas which should be addressed are:</p> <ul style="list-style-type: none"> • Water Quality; • Changes to quantity and flow of water; • Sediment transport; • Impacts on migratory fish. <p>Hydro schemes can also result in impacts on legally protected species including bats, badgers and Great Crested Newts. This could be as a result of changes to the watercourse, or disturbance or displacement of supporting habitat as a result of construction or ancillary infrastructure.</p>	<p>Initial Phase 1 habitat assessment required, plus further detailed studies required for most hydro schemes to ascertain what may/may not be on-site.</p> <p>SNH are the statutory authority for protected species licenses.</p> <p>Applications subject to EIA should include sufficient detail within the Environmental Statement.</p> <p>Hydro power can also provide natural heritage benefits through habitat creation and enhancement of the green network. This should be identified prior to submission of application.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Impact on the Water Environment</p>	<p>Hydro schemes could potentially have a significant impact on water quality and the ecological status of the water environment, including during the construction phase. Impacts include:</p> <ul style="list-style-type: none"> • Changes in ecological status as a result of impoundment and changes in water flow; • Pollution from construction; • Flooding and surface water drainage issues. <p>Hydro proposals have the potential to impact on Groundwater-Dependent Terrestrial Ecosystems.</p>	<p>Proposals involving abstraction or river engineering works are likely to require a CAR license in line with the Water Framework Directive and The Water Environment (Controlled Activities) (Scotland) Regulations 2011, administered by SEPA. The following information is likely to be required:</p> <ul style="list-style-type: none"> • The location of the intakes and outfalls; • Compensation flow; • Fish passages; • Other relevant CAR or planning applications or consents for abstractions/hydro schemes. <p>The timing of a CAR license should be carefully considered in relation to the planning process.</p> <p>Proposals should meet the terms of the Water Framework Directive and the relevant River Basin Management Plans. The current ecological status of waterbodies will be a key consideration when identifying potential locations for hydro development.</p> <p>Applicants should refer to SEPA Pollution Prevention Guidelines and engage with SEPA at an early stage in the process.</p> <p>A Flood Risk Assessment may be required for hydro developments.</p> <p>Specific requirements relating to the provision of SUDS, and wastewater drainage should be discussed with SEPA, Scottish Water, and the Council as part of pre-application discussions.</p> <p>Impacts on Groundwater-Dependent Terrestrial Ecosystems are a key consideration.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Impact on Peat and Carbon-rich Soils	<p>Parts of the Falkirk area contain areas of deep peat, and areas of intermediate peat bog, as well as areas of carbon rich soil. Ancillary development associated with hydro developments such as access tracks and pump buildings could potentially impact in terms of:</p> <ul style="list-style-type: none"> • Habitat loss due to changes in hydrology; • Loss of sensitive species and habitats, some of which are protected species or form qualifying interests to nationally or internationally designated sites; • Release of carbon through disturbance of carbon rich soils. 	<p>Developers should refer to the joint SEPA/Scottish Renewables document 'Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste.'</p> <p>Impacts on peat would form a chapter within any EIA Environmental Statement, or non-EIA Environmental Statement.</p>
Trees, Woodland and Forestry	<p>Hydro schemes may result in the felling of trees and woodland in order to accommodate access tracks or ancillary infrastructure.</p>	<p>Where relevant, a tree survey should be undertaken as part of the planning application. Loss of trees and woodland should be quantified at the early stages of a proposal, and compensatory planting should be included in any scheme. Additional landscaping may also be required as part of habitat enhancement or mitigation of visual impact.</p> <p>Compensatory planting should consider the impact in terms of flood risk. Waste resulting from clearance of trees should be addressed in line with SEPA guidance document 'Management of Forestry Waste' and associated guidance.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Impact on the Historic Environment</p>	<p>The Falkirk Council Area contains a number of international, national and local historic environment designations including:</p> <ul style="list-style-type: none"> • The Frontiers of the Roman Empire (Antonine Wall) World Heritage Site and associated Buffer Zone; • Over 350 Listed Buildings and 9 Conservation Areas; • Around 100 Scheduled Monuments and archaeological sites on the Sites and Monuments Record (of regional and local importance); • 3 sites within the Inventory of Historic Gardens and Designed Landscapes; • A number of non-inventory garden and designed landscapes of local importance; • Sites identified in the Inventory of Historic Battlefields. <p>The impacts arising from hydro development on the historic environment are likely to either be direct impacts such as archaeological disturbance, or visual impacts, such as the impact on the setting of a sensitive receptor. Setting can also be affected by sensory factors such as noise, dust or vibration.</p>	<p>For proposals which may have direct impacts upon, or which may affect the setting of sensitive receptors, a specific Historic Environment study should be submitted with the application. The scope of this should be agreed with Historic Environment Scotland and the Council. It may be appropriate to draw on viewpoints and receptors identified in a Landscape and Visual Impact Assessment.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Access and Transportation</p>	<p>Depending on the size of scheme, hydro schemes may result in an increase in traffic and required access, particularly during the construction stage.</p> <p>Hydro schemes can also result in temporary closure or diversion of public access including Rights of Way and Core Paths.</p>	<p>The location of the proposal should be carefully considered in terms of it's relationship to existing public access, and whether there will be a need to divert access paths either temporarily or on a permanent basis.</p> <p>Application/Environmental Statement should include a detailed plan of public access across the site, showing:</p> <ul style="list-style-type: none"> • Existing public access; • Paths/areas available for public access during construction; • Paths/areas of public access upon completion; and • Any diversions of paths - temporary or permanent - proposed for the purposes of the development.
<p>Impact on Communities</p>	<p>There are a number of potential impacts on communities which can arise from a hydro scheme.</p> <ul style="list-style-type: none"> • Visual Impact: likely to be relatively localised, but sites may be visible from paths and roads. • Noise: This could either be from the scheme itself or during the construction stage. This would depend on distance from residential properties and communities. • Safety Issues: the site including individual components of the hydro scheme should be considered in terms of public safety, particularly during the construction stage. 	<ul style="list-style-type: none"> • Visual Impact: where appropriate, visualisations should be submitted showing impacts from any sensitive receptors including settlement edges, individual dwellings and paths. • Noise: applications should adhere to best practice construction guidance in relation to noise and hours of operation. Where relevant, noise impacts on residential receptors should be assessed as part of the planning application in consultation with Falkirk Council Environmental Health. • Safety Issues: Details should be provided as part of the application in relation to security on site, both temporary and permanent, as well as the location of signage and scale and type of fencing.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Net Economic Benefits and Contribution to Renewable Energy and Greenhouse Gas Emission Targets.	<p>Hydro can contribute to net economic benefits in terms of direct and indirect employment and investment in the local economy. This would be derived from procurement/construction, operation and decommissioning.</p> <p>Hydro, depending on the scale and type, can make a significant contribution to meeting the Scottish Government's ambitious targets for electricity and heat demand, as well as meeting targets on the reduction on greenhouse gas emissions.</p>	<p>Applications (non-domestic) should be accompanied by a statement detailing:</p> <ul style="list-style-type: none"> • Potential power output from the development; • Contribution to national renewable energy targets; • Contribution to targets relating to the reduction in greenhouse gas emissions.
Cumulative Impacts	<p>Hydro schemes have the potential to have cumulative impacts when considered in addition to other consented or implemented development. A key issue is ecological impact. These impacts could relate to movement of migratory fish, as well as changes to the quality of the water environment.</p>	<p>Proposals should address the impacts on riparian ecosystems through an EIA, or non-EIA Environmental Statement. This will also be addressed as part of the Water Environment (Controlled Activities) (Scotland) Regulations 2011.</p>

Case Study: Carrongrove Hydro, Denny

5.2.6 This hydro scheme was built on the site of a former paper mill which has historically utilised water from the River Carron. The paper mill closed in 2005 and the site was subsequently acquired by Mactaggart and Mickel. This hydro scheme was completed by TLS Hydro in November 2015 and operated by Locogen. Electricity is to be exported to the National Grid. The output is around 500KWh (enough to serve around 400 homes) of electricity per annum. The project is a 'run of river' scheme which means that no dam or other form of water storage will be used. A 600m stretch of pipe was laid and a new turbine house was constructed. The scheme also includes a Denil-type fish pass and counter, to allow migratory fish to travel upstream for the first time in 200 years within this section of river.

5. Guidance on Renewable Energy Technologies

Biomass and CHP (Combined Heat and Power)

5.3 Technical Feasibility and Scope

- 5.3.1** Biomass involves the production of heat and/or electricity from organic matter including wood and wood-waste, biogas, bioethanol and straw. Biomass can provide heat or electricity. CHP systems deliver a combination of both. Anaerobic digestion is another potential source, with methane-rich biogas from biodegradable waste being used to fuel biomass plants. Biogas can be sourced from operations such as livestock and food processing plants.
- 5.3.2** The choice of fuel will be down to a range of site specific factors and project goals, such as:
- Fuel availability and cost;
 - Fuel carbon content;
 - Plant size and type;
 - Fuel delivery and storage facilities required; and
 - Plant maintenance requirements and cost.
- 5.3.3** CHP systems are designed so that much of the heat produced as a consequence of generating electricity can be recycled for local space and water heating or for residential use or industrial processes. CHP is not necessarily a renewable technology as CHP can utilise a number of fuels. Natural gas is the most commonly used fuel for CHP.
- 5.3.4** Biomass and CHP can be applied to larger-scale industrial settings, as well as individual small-scale or domestic application.

Locational Guidance

- 5.3.5** Biomass proposals can potentially be located within or outside of urban areas and the location should be closely matched with key areas of heat demand shown on Scotland's Heat Map or specifically identified users of heat. Biomass schemes are generally located close to a source of biomass. At a smaller-scale, biomass and CHP can be an efficient way to heat a single unit, or a number of units as part of a district heating scheme.
- 5.3.6** Planning consent was granted in June 2013 under Section 36 of the Electricity Act 1989 for a Biomass Plant at Forth Ports in Grangemouth. This would provide 100MW of electricity and around 200MW of heat. Forth Ports remain involved with the project, which has not progressed to date. It is anticipated that the project or similar proposal will be taken forward in the future.
- 5.3.7** Biomass continues to be exploited at an individual domestic/business level and there is significant scope for biomass to be explored for district heating purposes.
- 5.3.8** The Scottish Government are also keen to encourage heat only and woody biomass CHP in locations which are off-grid. There may be locations in rural localities within the Council area which would be suitable. There are a number of rural areas where fuel poverty is an issue and the Council would be keen to support new development which could potentially reduce fuel poverty.

5. Guidance on Renewable Energy Technologies

Planning and Procedural Considerations

5.3.9

Determining Authority	< 50 MW output	>50MW output
	Falkirk Council	Scottish Government under s.36 Electricity Act

Consideration	Types of Impact	Guidance and Information Required
General	There are a range of specific impacts which may arise from biomass development. Domestic and small-scale schemes may not fall within the scope of the Environmental Impact Assessment (Scotland) Regulations 2011 unless located within or close to a sensitive area. Larger schemes, or schemes which are close to a sensitive location may be subject to Environmental Impact Assessment (EIA) and therefore subject to more detailed assessment.	For all proposals, the following information will be required: <ul style="list-style-type: none"> • Description of unit including output and combustion mechanism; • Description/drawings of flue stake; • Source of fuel; • Drawings/elevations and description of buildings; • Maintenance and delivery arrangements.
Landscape and Visual Impacts	Landscape and visual impacts may arise from developments which require a substantial built development footprint and flue/tower.	Landscape and Visual Impact Assessment required for larger commercial schemes. The requirement for LVIA for smaller schemes will be assessed on a case-by-case basis. The scope should be agreed with the Council as part of the pre-application discussions.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Trees, Woodland and Forestry</p>	<p>Applications should consider whether proposal will directly affect trees subject to Tree Preservation Order (TPO) or whether they are Ancient and Semi-natural woodland (which may also be a key habitat). There is a presumption against loss of ancient and semi-natural woodland unless there are exceptional circumstances. Loss of trees and woodland should be quantified at the early stages of a proposal, and compensatory planting should be included in any scheme. Additional landscaping may also be required as part of habitat enhancement or mitigation of visual impact.</p> <p>The Scottish Government and the Forestry Commission are also keen to ensure that a sustainable supply of biomass fuel is available and that the co-location of supply to users is considered as part of biomass schemes. The Forestry Commission have a significant data resource showing supply chain data, and information on funding and incentives.</p>	<p>A felling license may be required by the Forestry Commission where development involves loss of trees/forestry. SNH would also require information on any loss of ancient and semi-natural woodland.</p> <p>Where relevant, a tree survey should be undertaken as part of the planning application. Loss of trees and woodland should be quantified at the early stages of a proposal, and compensatory planting should be included in any scheme. Additional landscaping may also be required as part of habitat enhancement or mitigation of visual impact.</p> <p>Applicants should be clear in the application about where the biomass will be sourced from and ensure that, where possible, this is from renewable sources. The Forestry Commission manage the National Forest Inventory (NFI) which is a GIS data layer which confirms the type and geographic extent of all woodland in Scotland. The Forestry Commission can provide further advice on potential sustainable sources of fuel.</p> <p>All wild plant species receive protection under the Wildlife and Countryside Act 1981 (as amended). Some more rare or vulnerable species are given added protection under that Act by being listed on Schedule 8. SNH are the statutory authority for species licensing. Further information can be found on their website.</p>
<p>Ecological Impacts</p>	<p>Proposals can result in direct impacts on ecology, as well as a loss of habitat, or habitat connectivity. This is dependent on the scale and location of the proposal. Larger commercial schemes or schemes close to ecologically sensitive areas or receptors may result in potentially significant ecological impacts.</p>	<p>An initial Phase 1 habitat assessment may be required, depending on the scale and location of the proposal. This will identify any key species/habitats initially. SNH are the statutory authority for protected species licenses.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Impact on Carbon-rich and Rare Soils	Direct impacts on carbon-rich and rare soil relating to biomass energy centres and associated development are likely to be limited, depending on location.	<p>Where relevant, developers should refer to the joint SEPA/ Scottish Renewables document '<i>Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste.</i>'</p> <p>Impacts on peat would form a chapter within any EIA Environmental Statement, or non-EIA Environmental Statement.</p>
Impact on the Water Environment	Depending on the scale of proposal, there may be impacts on the water environment including species reliant on groundwater and watercourses. Hydro proposals have the potential to impact on Groundwater-Dependent Terrestrial Ecosystems. This will depend partly on any required abstraction for cooling or other purposes, or discharge of water or chemicals.	<p>Where appropriate, applicants should refer to SEPA Pollution Prevention Guidelines and engage with SEPA at an early stage in the process. SEPA have a range of advice notes relating to impacts on air quality and species/habitats which depend upon the water environment. Impacts on Groundwater-Dependent Terrestrial Ecosystems are a key consideration. This Impacts on the water environment would be a likely heading as part of any EIA/non-EIA environmental statement.</p> <p>Specific requirements relating to the provision of SUDS, and wastewater drainage should be discussed with SEPA, Scottish Water, and the Council as part of pre-application discussions.</p>
Air Quality and Pollution	<p>There is the potential for biomass development to have impacts on air quality including Nitrogen Dioxide, particulates, and Sulphur Dioxide within the Council area and further afield. In terms of areas currently subject to monitoring, there are 4 Air Quality Management Areas (AQMAs) in the Council area at:</p> <ul style="list-style-type: none"> • Falkirk Town Centre; • Grangemouth; • Haggs; • Banknock. <p>Parts of the urban area are identified as a smoke control area which means that biomass boilers must have the appropriate specification.</p>	<p>Depending on the size of scheme, the regulatory processes are likely to fall within the scope of either Part A or Part B of the Pollution Prevention and Control (Scotland) Regulations 2000.</p> <p>Applications proposing the installation of a biomass boiler should be accompanied with an air quality assessment. This will be based on baseline environmental information and would include:</p> <ul style="list-style-type: none"> • Choice of location in relation to settlements; • Net reduction (or potential increase) in carbon emissions as a result of the choice of fuel; • Emissions standard of boiler.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Impact on the Historic Environment</p>	<p>The Falkirk Council Area contains a number of international, national and local historic environment designations including:</p> <ul style="list-style-type: none"> • The Frontiers of the Roman Empire (Antonine Wall) World Heritage Site and associated Buffer Zone; • Over 350 Listed Buildings and 9 Conservation Areas; • Around 100 Scheduled Monuments and archaeological sites on the Sites and Monuments Record (of regional and local importance); • 3 sites within the Inventory of Historic Gardens and Designed Landscapes; • A number of non-inventory garden and designed landscapes of local importance; • Sites identified in the Inventory of Historic Battlefields. <p>The impacts arising from biomass development on the historic environment are likely to either be direct impacts such as archaeological disturbance, or visual impacts from built development, including impact on the setting of a sensitive receptor. Setting can also be affected by sensory factors such as noise, dust or vibration.</p>	<p>For proposals which may have direct impacts upon, or which may affect the setting of sensitive receptors, a specific Historic Environment study should be submitted with the application. The scope of this should be agreed with Historic Environment Scotland and the Council. It may be appropriate to draw on viewpoints and receptors identified in a Landscape and Visual Impact Assessment.</p>
<p>Impact on Communities</p>	<p>Impacts on communities are likely to relate to:</p> <ul style="list-style-type: none"> • Air quality and pollution • Potential noise • Transport and impacts relating to delivery of biomass stock. <p>Biomass developments tend to be located within the urban area so it is important that impacts on communities are carefully considered.</p>	<p>Potential impacts on communities should be communicated as part of pre-application discussions, and consultation required by EIA and major applications.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Net Economic Benefits and Contribution to Renewable Energy and Greenhouse Gas Emission Targets.	<p>Biomass can contribute to net economic benefits in terms of direct and indirect employment and investment in the local economy. This would be derived from procurement/construction, operation and decommissioning.</p> <p>Biomass, depending on the scale and type, can make a significant contribution to meeting the Scottish Government's ambitious targets for electricity and heat demand, as well as meeting targets on the reduction on greenhouse gas emissions.</p>	<p>Applications (non-domestic) should be accompanied by statement detailing:</p> <ul style="list-style-type: none"> • Potential output from the development; • Contribution to national renewable energy targets; • Contribution to targets relating to the reduction in greenhouse gas emissions.
Access and Transportation	<p>Biomass development, depending on the scale, can result in potentially significant impacts on the road and freight network in terms of delivery of biomass stock.</p>	<p>For larger applications, a Transport Assessment may be required. All applications should include a description of site access and parking, anticipated vehicle movements, frequency and volume of deliveries and any anticipated heavy loads.</p>
Cumulative Impacts	<p>Cumulative impact with other proposed and consented developments should be assessed. Impacts are likely to include:</p> <ul style="list-style-type: none"> • Air quality; • Pollution; • Ecological impacts (including impacts on national/internationally designated sites); • Transport. 	<p>Cumulative impacts should be addressed within the relevant chapter of an EIA or non-EIA environmental Statement.</p>

5. Guidance on Renewable Energy Technologies

Heat Pumps and Deep Geothermal Energy

5.4 Technical Feasibility and Scope

5.4.1 The Scottish Government online renewables guidance advises that deep geothermal relates to geothermal sources below 100m in depth. There is a considerable deep geothermal heat resource which can be derived from a number of sources:

- Abandoned mine workings (low temperature);
- Hot sedimentary aquifers (low and possibly relatively high temperature);
- Hot dry rocks/petrothermal sources (relatively high temperature).

5.4.2 Works can involve recovering hot waters from mines (circa 50-1000m depth, <40 ° C), or from water enclosed within permeable rocks known as hot sedimentary aquifers (HSAs). Water or steam can be retrieved and then used to either power turbines to generate electricity or heat property.

5.4.3 Hot Dry Rock Geothermal is where water (from elsewhere) is injected into fractured hot dry rocks, allowed to heat-up, and then taken out of another borehole. The steam or hot water produced can run turbines to generate electricity or heat properties.

5.4.4 Ground source heat pumps utilise heat from the ground which is absorbed at low temperatures into a fluid inside a loop of pipe (a ground loop) buried underground within trenches. The fluid then passes through a compressor that raises it to a higher temperature, which can then heat water for the heating and hot water circuits of the building. The cooled ground-loop fluid passes back into the ground where it absorbs further energy from the ground in a continuous process as long as heating is required.

5.4.5 Water source heat pumps (WSHPs) operate by taking the latent heat from water courses and boosting the temperature using electrically driven pumps. The resultant hot water can be fed into local heat networks or single buildings, providing a low-carbon source of renewable heat to local areas. WSHPs can also be used for cooling.

5.4.6 The water used can be from a range of sources, including rivers, canals, lakes, mines, the sea and groundwater aquifers (although the latter tends to be referred to as a ground source heat pump, the technology is basically the same). Heat pumps can be “closed loop” or “open loop”. In an open loop system, water is abstracted from the water source and passed through a heat pump before being discharged back into the water source. In a closed loop system pipes or heat exchange panels are placed in the water and a water/antifreeze mixture is passed through the pipes/panels absorbing energy from the water

5.4.7 Air source heat pumps extract heat from the outside air in the same way that a fridge extracts heat from its inside. It can get heat from the air even when the temperature is as low as -15° C. Air source pumps can also be used for cooling.

Locational Guidance

5.4.8 There is a potential geothermal resource across the Council area, particularly in areas where there are abandoned coal mine workings. There have been no commercial/large-scale geothermal proposals to date but the Grangemouth Energy Project acknowledges that there may be some scope for deep geothermal at Kinneil Kerse as part of options for further assessment. On a domestic/small-scale level, ground/water/air source heat pumps are continuing to be utilised.

5.4.9 The Scottish Government is also keen to encourage geothermal energy generation, particularly in locations which are off-grid. There may be locations in rural settlements in the Council area which would be suitable such as areas close to former mine workings. There are a number of rural areas which are subject to fuel poverty and the Council would be keen to support new development which could reduce fuel poverty.

5. Guidance on Renewable Energy Technologies

Planning and Procedural Considerations

5.4.10

Determining Authority	< 50 MW output	>50MW output
	Falkirk Council	Scottish Government under s.36 Electricity Act

Consideration	Types of Impact	Guidance and Information Required
Landscape and Visual Impacts	There is the potential for landscape and visual impact depending on the scale or scheme. There is a greater likelihood of impact where there is a significant size of built development and apparatus such as a drill rig and energy centre, or where there are multiple schemes in close proximity to each other, or to settlements.	Requirement for Landscape and Visual Impact Assessment considered on a case-by case-basis Cumulative impact with other proposed and consented developments should be assessed where appropriate.
Ecological Impacts	Proposals can result in direct impacts on ecology, as well as a loss of habitat, or habitat connectivity. There is the potential for impacts on local, national and internationally designated sites. There may also be ecological impacts relating to the water environment. Smaller-scale development, particularly closed loop heat pump systems have less potential for significant impacts, although this is dependent on type and scale of development, and location.	Initial Phase 1 habitat assessment may be depending on the size of scheme, and whether the site is close to any sensitive receptors. Deep Geothermal development may be subject to either Environmental Impact Assessment and as such detailed assessment of ecological impacts will be required. This is likely to include international, national and local designations, protected species, Local Biodiversity Action Plan (LBAP) species, and in particular, groundwater dependent terrestrial ecosystems.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Impacts on Peat and Carbon-rich Soils</p>	<p>Parts of the Falkirk area contain areas of deep peat, and areas intermediate peat bog, as well as areas of carbon rich soil. Depending on the scale and type of scheme and the location, there is the potential for:</p> <ul style="list-style-type: none"> • Habitat Loss due to changes in hydrology (for open loop heat pumps and deep geothermal); • Loss of sensitive species and habitats, some of which are protected species or form qualifying interests to nationally or internationally designated sites; • Release of carbon through disturbance of carbon rich soils. <p>Ground source heat pumps and deep geothermal in rural localities where there are known carbon-rich soils may have an impact.</p>	<p>Developers should refer to the joint SEPA/Scottish Renewables document '<i>Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste.</i>'</p> <p>Impacts on peat would form a chapter within any EIA Environmental Statement, or non-EIA Environmental Statement.</p>
<p>Impact on the Water Environment</p>	<p>Heat pumps and deep geothermal technologies have the potential to impact upon the water environment. Impacts may arise from abstraction, pollution from discharges and surface water drainage. There may also be an increase in flood risk.</p>	<p>Applicants should refer to SEPA Pollution Prevention Guidelines and engage with SEPA at an early stage in the process.</p> <p>Proposals are likely to require a CAR license in line with the Water Framework directive and The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Permits may also be required for any discharged to ground or surface water.</p> <p>Information submitted as part of a planning application is likely to include:</p> <ul style="list-style-type: none"> • Water abstraction and circulation within the energy recovery system; • Information on the current water quality and any proposed abstraction or discharge; • Hydrology and drainage including abstractions, impoundments and watercourse engineering including crossings including details of surface water drainage. • A flood risk assessment (where appropriate). • A pollution prevention plan as part of the Construction Environmental Management Plan addressing SEPA Pollution Prevention Guidelines. <p>Specific requirements relating to the provision of SUDS, and wastewater drainage should be discussed with SEPA, Scottish Water, and the Council as part of pre-application discussions.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Impact on the Historic Environment</p>	<p>The Falkirk Council Area contains a number of international, national and local historic environment designations including:</p> <ul style="list-style-type: none"> • The Frontiers of the Roman Empire (Antonine Wall) World Heritage Site and associated Buffer Zone; • Over 350 Listed Buildings and 9 Conservation Areas; • Around 100 Scheduled Monuments and archaeological sites on the Sites and Monuments Record (of regional and local importance); • 3 sites within the Inventory of Historic Gardens and Designed Landscapes; • A number of non-inventory garden and designed landscapes of local importance; • Sites identified in the Inventory of Historic Battlefields. <p>The impacts arising from heat pumps and deep geothermal on the historic environment are likely to either be direct impacts such as archaeological disturbance, or visual impacts from development associated with the technology which could impact on the setting of a sensitive receptor. Setting can also be affected by sensory factors such as noise, dust or vibration. This will be dependant on the scale, nature and location of the proposal.</p>	<p>For proposals which may have direct impacts upon, or which may affect the setting of sensitive receptors, a specific Historic Environment study should be submitted with the application. The scope of this should be agreed with Historic Environment Scotland and the Council. It may be appropriate to draw on viewpoints and receptors identified in a Landscape and Visual Impact Assessment.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Access and Transportation</p>	<p>Heat pumps and deep geothermal schemes may result in an increase in traffic and access, though this is likely to be limited to the construction stage.</p> <p>There may also be temporary closure or diversion of public access including Rights of Way and Core Paths.</p> <p>Deep geothermal which may involve construction of energy generating centre(s) and other substantial ancillary development requiring ongoing maintenance will be required to provide more detail than smaller schemes.</p>	<p>The location of the proposal should be carefully considered in terms of its relationship to existing public access, and whether there will be a need to divert access paths either temporarily or on a permanent basis.</p> <p>Application/Environmental Statement should include a detailed plan of public access across the site, showing:</p> <ul style="list-style-type: none"> • Existing public access; • Paths/areas available for public access during construction; • Paths/areas of public access upon completion; and • Any diversions of paths - temporary or permanent - proposed for the purposes of the development.
<p>Community Impacts</p>	<p>There are a number of potential impacts on communities which can arise from heat pumps or deep geothermal technologies.</p> <ul style="list-style-type: none"> • Visual Impact: Depending on the scale and type of proposal, there may be visual impact arising from an energy centre and other infrastructure, or from drilling rigs. • Noise, vibration and land stability: Deep geothermal abstractions could cause subsidence or have other impacts on property. Noise and vibration arising from construction, boreholes or operation is another potential concern. • Pollution: There may be impacts in the event of pollution or contamination of land or watercourses. 	<p>Information required should address:</p> <ul style="list-style-type: none"> • Visual Impact: where appropriate, visualisations should be submitted showing impacts from any sensitive receptors including settlement edges, individual dwellings and paths. • Noise: applications should adhere to best practice construction guidance in relation to noise and hours of operation. Where relevant, noise impacts on residential receptors should be assessed as part of the planning application in consultation with Falkirk Council Environmental Health. • Pollution: Permits and licensing relating to groundwater investigation, abstraction or discharge are administered by SEPA and the timing of these permits should be carefully considered in relation to the timing of a planning application.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
<p>Net Economic Benefits and Contribution to Renewable Energy and Greenhouse Gas Emission Targets.</p>	<p>Heat pumps and deep geothermal can contribute to net economic benefits in terms of direct and indirect employment and investment in the local economy. This would be derived from procurement/construction, operation and decommissioning.</p> <p>Depending on the scale and type, proposals could make a significant contribution to meeting the Scottish Government's ambitious targets for electricity and heat demand, as well as meeting targets on the reduction on greenhouse gas emissions.</p>	<p>Applications should be accompanied by statement detailing:</p> <ul style="list-style-type: none"> Potential output from the development; Contribution to national renewable energy targets; Contribution to targets relating to the reduction in greenhouse gas emissions.

5. Guidance on Renewable Energy Technologies

Solar/Photovoltaics

5.5 Technical Feasibility and Scope

5.5.1 Photovoltaic/solar panels convert sunlight to electricity via a solar inverter. Solar thermal energy generation uses the light from the sun to create heat, which can be used directly or to power a generator to make electricity. Solar and PV developments take a number of forms including:

- Mounted on a roof or structure (often in a domestic setting) or integrated within a roof fabric;
- Large-scale free standing solar arrays, either on previously developed land or on agricultural, undeveloped land. These are installed in rows, with a metal frame mounting anchored to the ground. They may have the ability to rotate according to the position of the sun.

Locational Guidance

5.5.2 There is significant scope for solar/PV development across the Council area, within a number of settings. There has been significant uptake of domestic/small scale technology, and a several schemes installed within public facilities including Falkirk Sheriff Court Solar and within Scottish Water land holdings. Solar/PV is an eligible LZCGT which can be used to meet the requirements of LDP policy D04 as part of new development.

5.5.3 There has been some interest in large-scale solar arrays within the Council area, although some schemes may now be unviable as a result of changes to the subsidy regime.

5.5.4 Larger solar arrays should preferably be located on previously-developed land rather than greenfield sites. Where sites are located within rural areas, they should avoid prime agricultural land, where possible. Many ground mounted solar panels are able to maintain livestock grazing alongside solar array operations. Large-scale solar arrays should also avoid proximity to settlements, highly-visible locations and areas of Special Landscape Value.

5. Guidance on Renewable Energy Technologies

Planning and Procedural Considerations

5.5.5

Determining Authority	< 50 MW output	>50MW output
	Falkirk Council	Scottish Government under s.36 Electricity Act
Consideration	Types of Impact	Guidance and Information Required
Landscape and Visual Impacts	In terms of large-scale solar/PV arrays, there is significant potential for landscape and visual impact (including cumulative impacts) depending on the scale and location of scheme. Schemes on the fabric of existing buildings or structures may also have landscape and visual impact, depending on scale and location. Solar arrays can result in potentially significant impacts through glint and glare, and changing the character of a rural-semi-rural landscape. Ancillary development including access tracks, security fencing and cameras may also have a significant impact.	<p>There is likely to be a requirement for Landscape and Visual Impact Assessment for a solar array. Cumulative impact with other proposed and consented developments should be assessed. Clear visualisations showing the panels and ancillary development should be submitted with an application. SNH Guidance document 'Large scale solar photovoltaic installations: considering landscape, visual and ecological impacts' highlights the critical information to be included in application as:</p> <ul style="list-style-type: none"> • Description of landscape character and setting, including the qualities of the landscape; • Equipment to be installed (eg number, colour and size of panels, foundations); • Layout and design (including landscaping and earthworks); • Ancillary infrastructure required.
Impacts on Aviation	There is the potential for large-scale solar arrays to cause glint and glare which could have implications for aircraft navigation.	Applicants should engage with National Air Traffic Services, the Civil Aviation Authority and airport operators to identify any potential impacts. Edinburgh Airport Safeguarding Zone lies within the eastern part of the Council area and development may be therefore constrained.

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Ecological Impacts	Solar proposals can result in direct impacts on ecology, as well as a loss of habitat, or habitat connectivity and displacement. There is the potential for impacts on local, national and internationally designated sites, depending on the location of the proposal, as well as impact on birds in terms of collision risk. There could be impacts in soil quality and drainage. Solar arrays generally result in little can result in some ground disturbance as a result of the panel installation, and there may be ancillary infrastructure including roads and grid connection which may have adverse impacts. Returning the land to its previous state following decommission will also require consideration.	<p>An initial Phase 1 habitat assessment may be depending on the size of scheme, and whether the site is close to any sensitive receptors. The proximity to any international, national and local designations, protected species, Local Biodiversity Action Plan (LBAP) species should be considered in an ecological assessment.</p> <p>Developers should include an ecological assessment highlighting the potential impacts as identified in this SG and how they will be mitigated. Solar/PV schemes also represent an opportunity for habitat restoration and enhancement, and developers should highlight where these opportunities could co-exist with the scheme. SNH Guidance document 'Large scale solar photovoltaic installations: considering landscape, visual and ecological impacts' provides further detail on ecological considerations.</p>
Impacts on Peat and Carbon-rich Soils	Parts of the Falkirk area contain areas of deep peat, and areas intermediate peat bog, as well as areas of carbon rich soil. There is usually minimal ground disturbance associated with solar arrays, although ancillary infrastructure in and around carbon-rich or rare soils may result in impacts.	<p>Developers should refer to the joint SEPA/Scottish <i>Renewables document 'Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste.'</i></p> <p>Any identified impacts on peat would form a chapter within any EIA Environmental Statement, or non-EIA Environmental Statement.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Impact on the Water Environment	Solar arrays may result in potential run off, which could potentially exacerbate flood risk elsewhere should surface water drainage be inadequate.	<p>There may be a requirement for a Flood Risk Assessment (FRA) and this would be considered on a case-by-case basis.</p> <p>Specific requirements relating to the provision of SUDS, and wastewater drainage should be discussed with SEPA, Scottish Water, and the Council as part of pre-application discussions.</p>
Impact on the Historic Environment	<p>The Falkirk Council Area contains a number of international, national and local historic environment designations including:</p> <ul style="list-style-type: none"> • The Frontiers of the Roman Empire (Antonine Wall) World Heritage Site and associated Buffer Zone; • Over 350 Listed Buildings and 9 Conservation Areas; • Around 100 Scheduled Monuments and archaeological sites on the Sites and Monuments Record (of regional and local importance); • 3 sites within the Inventory of Historic Gardens and Designed Landscapes; • A number of non-inventory garden and designed landscapes of local importance; • Sites identified in the Inventory of Historic Battlefields. <p>The impacts arising from solar development on the historic environment are likely to either be direct impacts such as archaeological disturbance, or visual impacts, such as the impact on the setting of a sensitive receptor such as a battlefield or a listed building. Setting can also be affected by sensory factors such as noise, dust or vibration. Consent will normally be required where there is potential direct impact on a listed building or Scheduled Monument.</p>	<p>For proposals which may have direct impacts upon, or which may affect the setting of sensitive receptors, a specific Historic Environment study should be submitted with the application. The scope of this should be agreed with Historic Environment Scotland and the Council. It may be appropriate to draw on viewpoints and receptors identified in a Landscape and Visual Impact Assessment.</p>

5. Guidance on Renewable Energy Technologies

Consideration	Types of Impact	Guidance and Information Required
Access and Transportation	<p>There may also be temporary closure or diversion of public access including Rights of Way and Core Paths. This may be a result of security provisions on-site.</p>	<p>The location of the proposal should be carefully considered in terms of its relationship to existing public access, and whether there will be a need to divert access paths either temporarily or on a permanent basis.</p> <p>The Application/Environmental Statement should include a detailed plan of public access across the site, showing:</p> <ul style="list-style-type: none"> • Existing public access; • Paths/areas available for public access during construction; • Paths/areas of public access upon completion; and • Any diversions of paths - temporary or permanent - proposed for the purposes of the development.
Community Impacts	<p>Depending on the scale and type of proposal, there may be visual impact, glint and glare arising from solar panels.</p>	<p>Where appropriate, visualisations should be submitted showing impacts from any sensitive receptors including settlement edges, individual dwellings and paths.</p>
Net Economic Benefits and Contribution to Renewable Energy and Greenhouse Gas Emission Targets.	<p>Solar development can contribute to net economic benefits in terms of direct and indirect employment and investment in the local economy. This would be derived from procurement/construction, operation and decommissioning.</p> <p>Depending on the scale and nature, proposals could make a significant contribution to meeting the Scottish Government's ambitious targets for electricity and heat demand, as well as meeting targets on the reduction on greenhouse gas emissions.</p>	<p>Applications should be accompanied by statement detailing:</p> <ul style="list-style-type: none"> • Potential output from the development; • Contribution to national renewable energy targets; • Contribution to targets relating to the reduction in greenhouse gas emissions.

5. Guidance on Renewable Energy Technologies

Case Study:

Solar Panels at Loretto Housing Association Development,
Glenburn Road, Falkirk

- 5.5.5** Loretto Housing Association in conjunction with Page/Park Architects completed a development at Glenburn Road on the site of a former steading in Hallglen, Falkirk. The development comprises 26 units (flatted, maisonettes, and townhouses) and was completed in Summer 2015. The properties have incorporated roof-mounted solar/PV panels in order to meet the requirements of Bronze Active sustainability labelling under current building regulations.

5. Guidance on Renewable Energy Technologies

6. Pre-Application Consultation and Engagement

- 6.1** Many renewable energy proposals will fall within Schedule 1 or 2 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 and should be subject to screening at the earliest opportunity. Pre-application engagement with statutory authorities and the community should take place to ensure that potentially sensitive receptors are identified, and that any impacts can be successfully mitigated.
- 6.2** For proposals which fall within the 'national' or 'major' applications category in The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009, these will be subject to statutory community consultation. The construction of an energy generating station of over 20MW will be classified as a major development. National Developments are identified in the National Planning Framework 3 (NPF3). All applications for planning permission or for planning permission in principle under regulations 9 to 11 for national and for major developments require PAC between developers and communities. Applications for such developments will need to demonstrate compliance with the legislative requirements for PAC. The NPF and the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009 (SSI 2009/51) provide clarity about the range of development to be treated as national or major respectively.
- 6.3** The Scottish Government has published Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments. (Link located in Appendix) Whilst this is intended primarily for onshore wind, the principles of good practice could be applied to other technologies. Community benefits associated with renewable energy are delivered entirely outwith the planning system. Developers are however, expected to engage with local communities to explore options in which community benefit can be delivered as part of wind energy developments. The Scottish Government has published '*Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments*'. This document was drawn from engagement with the industry and sets out how developers are expected to deliver community benefit. Scottish Government recommends a community benefit package for onshore wind developments with a value to the equivalent of at least £5,000 per installed megawatt per annum, index-linked for the operational lifetime of the project. Other onshore technologies should aspire to this level. Additionally, Scottish Government would like to see opportunities for increased levels of community investment explored.

7. Renewable Heat and Decentralised Energy Networks

Description of Technology

- 7.1 The term 'district heating' refers to a network system for distributing heat from a central location to meet requirements for heating and hot water in residential and commercial developments. Heat is normally generated in an energy centre and distributed through a pipe network to which heat customers are connected. An energy centre can be run either from renewable or non-renewable sources of energy such as natural gas or LPG. For new district heating schemes, a switch to renewable sources of fuel can take place in the future, as long as the specifications of the energy centre are appropriate.
- 7.2 The main component of a district heating system consists of the primary pipe network below ground level. The primary pipe network transports heat in the form of hot water or steam to the door of each consumer, the hot water or steam passes through a heat exchanger, which is then passed onto heating systems within buildings and consumed as space heating and/or hot water. The lifetime of the pipe network should be around 40 to 50 years.
- 7.3 There are various development models for delivering and operating district heating. Examples include:
- Systems to serve new housing or mixed use development - initially owned by developer and may be transferred to 3rd party;
 - Systems to serve public buildings such as a hospital - can be client owned or transferred to 3rd party;
 - Social housing development schemes - owned and managed by local authority or housing association; and
 - Energy from waste schemes - initially owned by local authority but can be transferred to a 3rd party.

Scotland's Heat Map

- 7.4 Scotland's Heat Map was developed by the Scottish Government as a tool to visualise opportunities for district heating. Data shown within the heat map includes:

- **High Heat Demand:** This tends to be associated with urban areas where denser building layouts are more commonplace and where there are buildings with constant high heat demand (anchor heat loads), such as swimming pools, hospitals and industrial buildings. However, high heat demand is not exclusive to these areas and there might also be areas within rural communities with high heat demand by virtue of existing business uses, or heat demand within a rural settlement. Heat maps can also identify areas of high need such as fuel-poor areas or off gas grid communities, where there may be a policy objective to deliver more efficient, secure and sustainable heat.
- **Heat Supply Opportunities:** These can also be identified by locating sources of waste streams, surplus heat (e.g. from distilleries/industrial uses), deep geothermal operations, sites suitable for biomass (e.g. through proximity to existing and planned woodlands, sawmills etc.).

Heat maps can assist in spatial planning and co-locating areas of high heat demand and need with heat supply opportunities. Heat maps can show links between development plan proposals, and can assist with regeneration strategies and masterplanning for major sites. The data held within Scotland's Heat Map will be subject to ongoing updates and can form a useful baseline for developing heat networks in the future.

7. Renewable Heat and Decentralised Energy Networks

Key Drivers

- 7.5 As required by the Climate Change (Scotland) Act 2009, the Scottish Government through its Renewable Heat Action Plan for Scotland has set a national target of 11% of Scotland's heat demand to be met from renewable sources by 2020. The Scottish Government published its Heat Policy Statement in June 2015. This document sets out the Scottish Government's future policy direction on heat and bring together a number of policy positions on heat demand, transmission and generation.
- 7.6 **Scottish Planning Policy (SPP):** SPP paragraph 158 - 160 requires Local Development Plans to support the development of heat networks to ensure that an area's full potential for electricity and heat from renewable sources is achieved subject to relevant environmental, community and cumulative impact considerations. Local Development Plans can play a role by co-locating developments with a high heat demand with sources of heat supply. They should also support the development of heat networks in as many locations as possible, even where they are initially reliant on carbon-based fuels if there is potential to convert them to run on renewable or low carbon sources of heat in the future.
- 7.7 The Falkirk Council Home Energy Policy 2011-16 relates to the Council's housing stock and is an integral part of the Local Housing Strategy. There is a wide ranging policy context within which the Council's strategies in relation to Home Energy and Fuel Poverty have been prepared. These include:
- Meeting the Energy Efficiency Standard for Social Housing (ESSH);
 - Scottish Government target to eradicate Fuel Poverty by 2016;
 - Climate Change Act (Scotland) 2009.

Local Development Plan Policy

- 7.8 Criteria 3 of LDP policy D04 states:
Decentralised energy generation with heat recycling schemes (combined heat and power and district heating) will be encouraged in major new developments, subject to the satisfactory location and design of associated plant. Energy Statements for major developments should include an assessment of the potential for such schemes.
- 7.9 The utilisation of heat mapping data and the mapping of potential opportunities within the Falkirk Council area is at a very early stage. Further identification of areas with potential for creating district heating networks may be possible through the preparation of LDP2. Until this time, the Council will encourage proposals for the development of local heat networks based on low carbon and renewable sources, or which facilitate the use of waste heat from existing developments or other sources, where such proposals accord with other relevant policies in the LDP and associated Supplementary Guidance.

Falkirk District Heating Strategy

- 7.10 The Scottish Government's Heat Network Partnership was established to assist local authorities with developing a District Heating Strategy. The HNP provides a programme of support that will guide participating local authorities through the process of developing a district heating strategy, provide a framework for the identification and strategic appraisal of opportunities for district heating schemes, and encourage and support delivery of projects. The Strategy forms a starting point for the identification of potential opportunities in the Council area. The Sustainable Energy Action Plan (SEAP) is the likely mechanism for individual opportunities to be taken forward. This will supersede current Council Sustainability Action Plans by not only considering the Council but incorporating community partners and industry across the Falkirk Council area.

7. Renewable Heat and Decentralised Energy Networks

Existing District Heating Projects

- 7.11** The Council currently operates a 1.12MW gas powered Combined Heat and Power system along with a 2MW gas fired boiler in Callendar Park, Falkirk to provide thermal energy to 6 blocks of 84 flats each within the Callendar Park Estate and Callendar House (a non-domestic building). A feasibility study has been commissioned to:
- Identify opportunities to expand the current energy centre to serve 3 additional blocks of 84 flats each within close proximity of the existing system;
 - Provide electrical power through private wire to various non-domestic premises;
 - Identify a stand-alone communal heating project for Glenfuir Court (a tower block with 84 flats) in Camelon.
- 7.12** Additional district heating schemes within the Falkirk Area include: Calachem Multi User site, where heat, power and additional utilities is provided by Calachem to several chemicals sector users across a single site; and INEOS who operate a site wide heat and power network across the Grangemouth refinery and petrochemicals complex.
- 7.13** In addition, the Council is taking forward the Grangemouth Energy Project in conjunction with Scottish Enterprise to assess the overall energy requirements of the Grangemouth industries. The backdrop to this is NPF3, and the inclusion of Grangemouth Investment Zone and associated infrastructural requirements as a national priority. In addition to the refining and petrochemical industries, activities within Grangemouth and the Grangemouth Investment Zone include engineering; infrastructure; recycling & waste management; energy support services; agricultural research; systems controls; fine chemicals; industrial services, cabling; plant hire; healthcare products; construction, storage tanks; sealing products; and pallets & packaging.

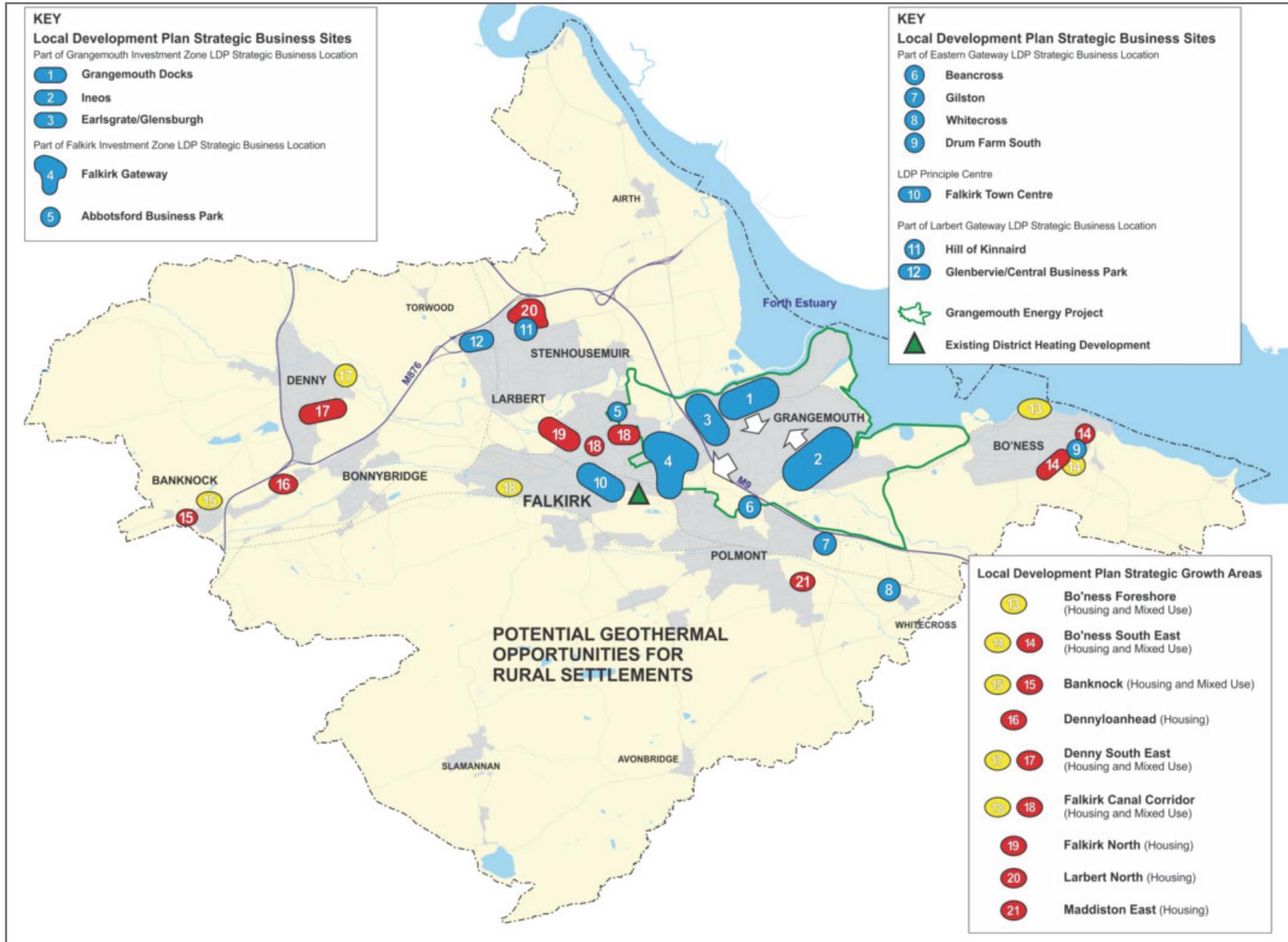
- 7.14** Due to the industrialised nature of the area there is a high concentration of energy consumption as shown on Scotland's Heat Map. This concentration provides an opportunity to determine if a more resource-efficient, low-carbon, cost-effective energy solution can be implemented. The solution could involve the utilisation of existing local generation assets, newly developed generation assets as well as existing and/or new transmission infrastructure such as cabling and heat networks. The overall aim of the project is to lower the cost of energy to businesses and eventually homes in the Grangemouth area.
- 7.15** The options appraisal and development of the business case is ongoing and it is expected that progress will be reflected in future revisions of Supplementary Guidance and within LDP2. The boundary of the project area is identified on Map 1.

Guidance for Developers

- 7.16** Policy D04 (3) requires developers to investigate the potential for decentralised heating systems for major new development. The Strategic Heat Map 1 shows the broad areas where there is likely to be most potential, but there will be other areas and developments where district heating may be feasible by virtue of their location in relation to potential sources or heat or other users, or where there is a source of funding for district heating and other technologies.

7. Renewable Heat and Decentralised Energy Networks

Strategic Heat Map 1: Strategic Sites and Existing Projects



7. Renewable Heat and Decentralised Energy Networks

7.17 The process of identifying whether there is potential for district heating starts with a high-level, desk-based assessment. A starting point would be to identify the following:

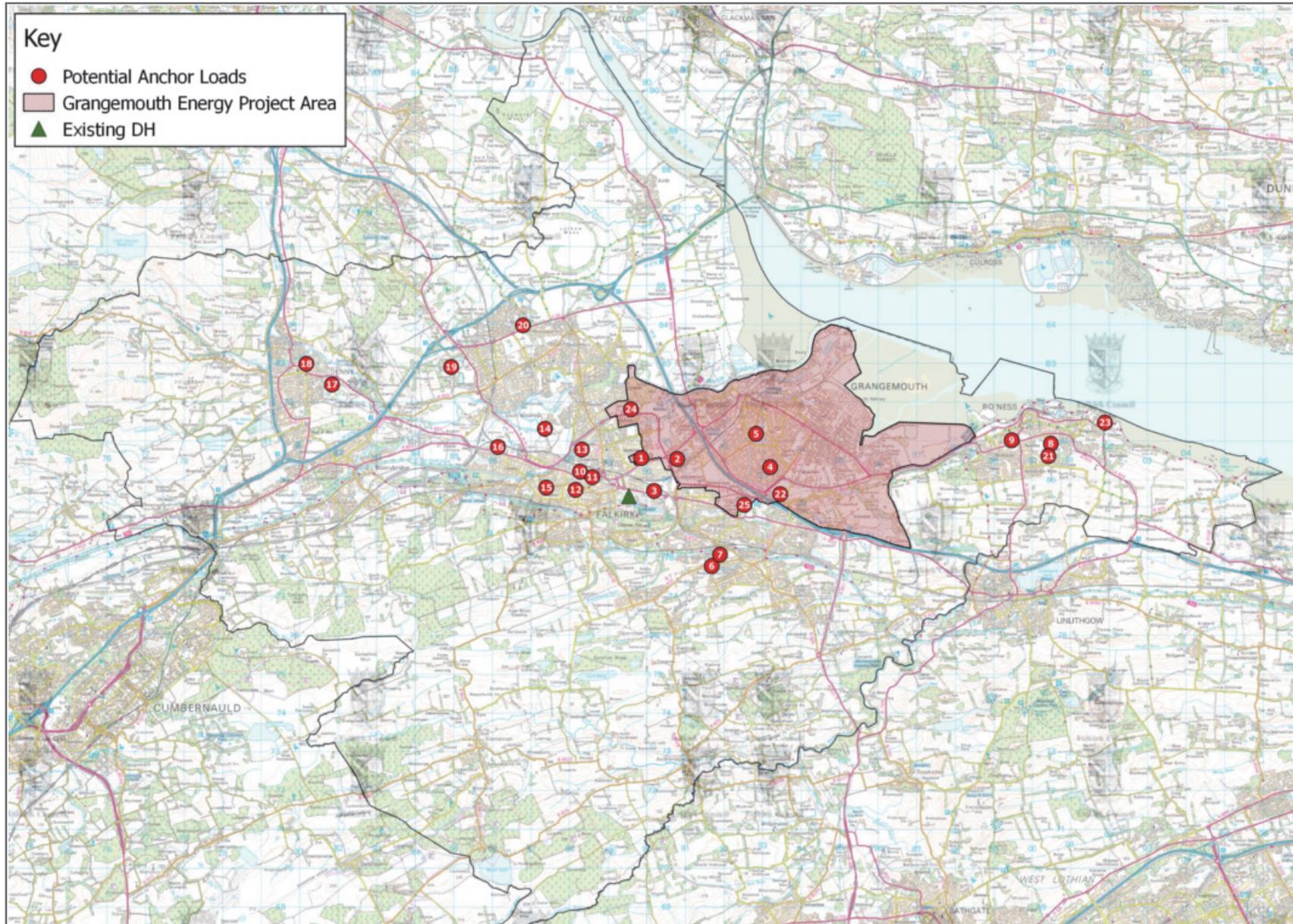
- **High Heat Demand:** these are displayed on the heat map in the 'hotter' colours and the Scottish Government heat map allows users to zoom in to view more detail down to individual buildings or groups of buildings. The confidence level is also a broad indicator of reliability of data. The confidence levels are calculated by assigning a confidence score to each property. For example, a property where the heat demand value was taken from actual energy consumption data would be assigned a score of 4 to signify a high level of confidence. In contrast, a property where little information was known other than the average for that type of building, a score of 1 would be assigned to signify low confidence;
- **Proximity to any Existing Heat Networks:** Identification of any current operational schemes within close proximity which may form a future link, or gain critical mass from proposed development;
- **Potential Anchor Loads (Strategic Heat Map 2):** These are land uses and buildings which are likely to have heat loads which vary little across a 24 hour day, a month or a year. Examples would include public swimming pools or hospitals. These are the most reliable uses in terms of securing a stable demand. Another potential anchor load would include large areas of social housing. This may need to be combined with other less variable loads as domestic loads are variable. Examples of potential anchor loads are shown on Table 1 and Map 2.

Table 1: Potential Anchor Loads

ID	Name	Public/Private Sector
1	Forth Valley College	Public
2	Falkirk Stadium	Public
3	Graeme High School	Public
4	Grangemouth High School	Public
5	Grangemouth Leisure Centre	Public
6	Braes High School	Public
7	Polmont YO & Scottish Prison Service	Public
8	Bo'ness Academy	Public
9	Bo'ness Community Hospital	Public
10	FC Municipal Buildings and Town Hall	Public
11	Falkirk Police Station	Public
12	Falkirk Community Hospital	Public
13	St. Mungos High School	Public
14	Camelon Crematorium	Public
15	Falkirk HS & Bantaskine PS	Public
16	Mariner Leisure Centre	Public
17	Denny High School	Public
18	Carronbank House	Public
19	Forth Valley Royal Hospital	Public
20	Bellsdyke Hospital	Public
21	Bo'ness Recreation Centre	Public
22	Inchyra Hotel	Private
23	Carriden processing & related businesses	Private
24	ASDA Bankside Distribution Centre	Private
25	Falkirk Distillery	Private

7. Renewable Heat and Decentralised Energy Networks

Strategic Heat Map 2: Potential Anchor Loads



7. Renewable Heat and Decentralised Energy Networks

7.18 An energy statement for major new development will already address LDP Policy D04 in terms of the requirement for Low and Zero Carbon Generating Technologies. Supplementary Guidance SG15 addresses how this should be achieved. The Energy Statement should then provide a high-level assessment of district heating feasibility within the proposed development. This could be undertaken by consultants or by the developer/agent, where there is in-house knowledge or expertise.

7.19 Technical barriers may include:

- Presence of existing below ground infrastructure or the presence of wayleaves or pipelines;
- Challenging topography and ground conditions, or restricted developable area of site;
- Lack of proximity to potential anchor loads.

7.20 Financial barriers may include:

- High levels of abnormal costs associated with the site due to other constraints or requirements. Examples of this would be significant infrastructure investment to deliver the site, or significant remediation of the site as a result of previous uses;
- Restriction on the availability of funding or finance due to the development model or type of development.

7.21 It is acknowledged that not all new development will be able install district heating infrastructure. In order to maximise the potential opportunities, district heating should be considered as part of the early stages of a proposal, and within the initial information scoping of a masterplan for larger sites. In particular, it may be harder for solely private schemes to gain the critical mass to ensure overall viability. Where sites are unable to accommodate an energy centre or connect in to other potential sources of heat, developers should wherever possible 'future-proof' the site in terms of installing district heating infrastructure that could link into future networks. The Scottish Government highlights that the cost per metre of the heat pipe ranges from £400/metre for the smallest diameter pipe (20 mm) to almost £3,000/metre for the largest (1,100 mm). A typical cost is around £1,000/metre (Source: Potential and Costs of District Heating Networks, Poyry, 2009). These costs are indicative and may differ from those costs set out in 2009.

7.22 For larger sites, district heating also represents an opportunity to co-locate with green infrastructure. This could include green corridors and infrastructure wayleaves, This requires careful consideration at the initial stages of the proposal.

8. Sources of Guidance and Funding

8.1 Scottish Enterprise (Delivered through Scottish Investment Bank) Renewable Energy Investment Fund (REIF): Provides financial assistance for projects that will deliver energy from a renewable source, reduce the cost of renewable energy or provide key solutions for renewable energy generation. Projects must also provide benefit to the economy of Scotland. Scottish Government support for renewables has made a transition from grants to loans and revenue support. Financial assistance is available to support electricity generation projects through a **Feed-In Tariff (FIT) or Renewables Obligation Certificates (ROCs)**, and a similar **Renewable Heat Incentive** (RHI and FIT- administered through the UK government and DECC).

The Community And Renewable Energy Scheme (CARES) are offering loans for the pre-planning costs of renewables projects in Scotland in the financial year 2011/12, with a budget of £5.35 million for supporting community owned projects and £2.4 million for supporting projects owned by land managers, farmers and SMEs. All projects are required to demonstrate a minimum level of community benefit to the local area. For further information visit www.localenergyscotland.org

The Scottish Government's District Heating Loan Fund is designed to help address the financial and technical barriers to district heating projects as commercial borrowing can be extremely expensive and difficult to obtain. The fund provides loans for both low carbon and renewable energy technologies to help organisations implement district heating projects that benefit local communities. The scheme is open to local authorities, registered social landlords, small and medium sized enterprises and energy services companies [ESCOs] with less than 250 employees.

The Energy Saving Trust is also a source of advice for homes and businesses in terms of accessing financial assistance for projects.

Appendix 1 : Useful Weblinks

Scottish Planning Policy

<http://www.gov.scot/Publications/2014/06/5823>

Scottish Government: Online Renewables Advice

<http://www.gov.scot/Topics/Built-Environment/planning/Policy/Subject-Policies/Utilities/Delivering-heat-electricity/renewables-advice>

Scottish Government: 2020 Routemap for Renewable Energy

<http://www.gov.scot/Publications/2011/08/04110353/0>

Scottish Government: Heat Policy Statement 2015

<http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/Heat>

Scottish Government Electricity Generation policy Statement

<http://www.gov.scot/Resource/0042/00427293.pdf>

Scottish Government Good Practice Principles for Community Benefits from onshore renewable energy developments (2013)

<http://www.gov.scot/resource/0043/00438782.pdf>

Scotland's Heat Map

<http://heatmap.scotland.gov.uk>

Heat Network Partnership for Scotland

<http://www.districtheatingscotland.com/content/district-heating-scotland>

Forestry Commission: Felling licences

<http://scotland.forestry.gov.uk/supporting/grants-and-regulations/felling-licences>

Forestry Commission: Woodfuel and Bio-energy advice

<http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/climate-change-renewable-energy/woodfuel-and-bio-energy>

Scottish Natural Heritage: Large scale solar photovoltaic installations: Considering landscape, visual and ecological impacts

<http://www.snh.gov.uk/docs/A1859348.pdf>

Scottish Natural Heritage: guidance on Hydro Development

<http://www.snh.gov.uk/planning-and-development/renewable-energy/hydro/>

Scottish Natural Heritage: Position statement on Bioenergy and Natural Heritage

<http://www.snh.gov.uk/docs/A1208854.pdf>

Scottish Natural Heritage: Guidance page on protected species and species licensing

<http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/protected-animals/>

SEPA and Scottish Renewables: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste (2012)

<http://www.gov.scot/Resource/0045/00455955.pdf>

SEPA: Guidance on renewable energy

<http://www.sepa.org.uk/environment/energy/renewable/>

Appendix 1 : Useful Weblinks

SEPA: Guidance on the Water Environment (Including CAR licensing, pollution, abstraction and groundwater)

<http://www.sepa.org.uk/regulations/water/>

Local Energy Scotland: Guidance and advice for communities, businesses and developers.

<http://www.localenergyscotland.org>

Scottish Enterprise: Renewable Energy Investment Fund

<http://www.scottish-enterprise.com/services/attract-investment/renewable-energy-investment-fund/overview>

Historic Environment Scotland: Technical advice and case studies for low carbon and renewable energy

<http://conservation.historic-scotland.gov.uk/renewables>

Historic Scotland: Managing Change in the Historic Environment

<https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/legislation-and-guidance/managing-change-in-the-historic-environment-guidance-notes/>

Historic Scotland: Environmental Assessment

<https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/environmental-assessment/>

Supplementary Guidance SG17

November 2016



Falkirk Council
Development Services