

FALKIRK

Local Development Plan



Technical Report 8: Renewable Energy

November 2011



Falkirk Council

Falkirk Council Local Development Plan

Technical Report 8

Renewable Energy

1. Purpose of study

- 1.1. The purpose of the technical report is to provide an overview of current national policy and legislation relating to renewable energy. This report will set out the current policy position of Falkirk Council on renewable energy and reassess the constraints and potential as a basis for reviewing the current policies and whether they comply with national policy and guidance. Local Development Plans are required provide a suitable promotional framework whilst at the same time providing protection of our landscape and ecological and cultural heritage. This background study will in the first instance, inform the options set out in the Main Issues Report.
- 1.2. This study will set out the potential policy approaches as part of the LDP in relation to wind energy and other renewable technologies. This will involve the reassessment of constraints and potential identified in the 2003 BMT Cordah study and this will form the basis for reviewing the existing policies and moving forward with the LDP policy approach.

2. Background

- 2.1. The total existing installed renewable electricity capacity in Scotland is standing at 3825 MW. Most of the capacity comes from onshore wind, which amounts to 2126 MW (46% of total), followed by hydro power at 1473 MW. Schemes which have been granted consent but which are not operation account for a further 2819MW. (SNH, Renewable Electricity Trends in Scotland, 2010) Taking schemes which are installed and consented, these make about half of the 2020 target and with the number of schemes in scoping/pre application stage, it is anticipated that the 2020 target of 80% of electricity being derived from renewable sources would be achievable.
- 2.2. In 2003, Falkirk Council Commissioned a Renewable Energy Feasibility study. This was undertaken by BMT Cordah, and covered wind energy, hydro, geothermal, and solar energy. The study approach comprised a desk-based study of renewable energy technologies and information was compiled using existing environmental data. Modelling work took place to assess the potential for wind and hydro resources and this was set out within the report. The report identified a number of areas of potential for wind energy, and also identified the areas which were subject to constraints. It also identified a small number of very limited areas with potential for hydro. Technology surrounding all types of renewable energy, and in particular wind energy has evolved considerably since then, and many aspects of the study are out of date. The availability of larger turbines combined with an increase in

efficiency of turbines has meant that areas which were previously precluded from wind energy development are now seen as more attractive by the industry. There has also been a significant change in the subsidy regime for renewable energy, particularly with the uptake of Feed-in Tariffs for individual wind energy projects.

3. National Legislation and targets

- 3.1. The Scottish Government has set the ambitious target of 100% of Scotland's electricity generation to come from renewable sources by 2020. This is pursued through the Renewables Obligation (Scotland) which came into force in 2002. As a result, a duty has been placed on local authorities to provide a supportive policy framework for renewable energy development, and nationally, to provide the strategic infrastructure to support the renewable energy industry.
- 3.2. The Climate Change (Scotland) Act came into force in 2009 and underpins the government's strategy on renewable energy. The Scottish Government commitment to increase the amount of electricity and heat generated from renewable sources is a vital part of the response to climate change. The current targets are that 100% of gross electricity consumption and 11% of heat demand is to come from renewable sources by 2020. The requirements of the Climate Change Act have considerable spatial planning implications which need to be addressed through appropriate development plan policies.
- 3.3. Following on from the Climate Change (Scotland) Act, the Scottish Government produced a range of actions plans relating to renewable energy;
- 3.4. The Renewables Action Plan sets out what needs to happen and by when to meet the Scottish Government's Renewable Energy targets, with a focus on the next 24-36 months including the role of Local Authorities, infrastructure providers and communities.
- 3.5. The Renewable Heat Action Plan addresses the target for 11% of Scotland's heat consumed to come from renewable sources by 2020. Its initial focus is on the Public, commercial and industrial sectors with a view to building the skills base and putting in place appropriate infrastructure.
- 3.6. The Renewables Infrastructure Plan was produced to support Scotland's renewables industry and ensure global competitiveness by improving existing port and harbour and the skills base within Scotland.
- 3.7. The General Permitted Development Order (Scotland) was amended to permit certain types of microgeneration equipment such as domestic turbines to be installed without the need for planning permission in certain circumstances.

- 3.8. The Scottish Government is consulting on further potential amendments to the Permitted Development Rights for the installation of charging points for electric vehicles other structures, operations or technologies which could contribute toward the objectives of the Climate Change Act.

4. Overview of financial incentives

- 4.1. One of the main financial drivers behind the current level of interest in renewables is the introduction of the Feed in Tariff in April 2010. A set rate is paid for each unit (KWh) of energy generated and offers significant savings on energy bills and also direct financial return.
- 4.2. There are a wide range of medium-term funding programmes in place such as the Green Energy Fund and a fund set up by commercial energy companies. These mainly focus on small-scale charity and community renewable energy projects.
- 4.3. The UK Government has now announced the introduction of the Renewable Heat Incentive (RHI) from 2011. The scheme was launched in June 2011. Tariffs available are yet to be confirmed. The Renewable Heat Incentive (RHI) is designed to provide financial support that encourages individuals, communities and businesses to switch from using fossil fuel for heating, to renewables such as wood fuel. Eligible technologies include solar, biomass and CHP.
- 4.4. The Scottish Biomass Heating Scheme is a £2 million programme provides grants for installation of biomass heating systems in small and medium sized enterprises. Funding is available until March 2011 and the focus is intended to be on community district heating schemes.

5. National Planning Policy

NPF2

- 5.1. The National Planning Framework 2 is an overarching document that specifically identifies the strategic spatial planning priorities and identified major national developments. It reinforces the Scottish Government's intentions to place Scotland at the forefront of renewable energy technologies and highlights the important role which the renewable energy sector plays in Scotland's economy.

Scottish Planning Policy

- 5.2. Scottish Planning Policy supersedes the previous suite of SPPs and requires all local authorities to produce spatial frameworks for wind energy developments over 20MW. The SPP states that;

“Planning authorities should support the development of a diverse range of renewable energy technologies, guide development to appropriate locations and provide clarity on the issues that will be taken into account when specific proposals are assessed.”

The SPP also states that;

“Development plans should support the wider application of medium and smaller scale renewable technologies such as decentralised energy supply systems, community and household projects. Development plans should also encourage microgeneration projects including those associated with or fitted to existing buildings.”

The SPP requires Development Plans to;

“provide a clear indication of the potential for development of wind farms of all scales, and should set out the criteria that will be considered in deciding applications for all wind farm developments including extensions.” This includes:

- *landscape and visual impact,*
- *effects on the natural heritage and historic environment,*
- *contribution of the development to renewable energy generation targets,*
- *effect on the local and national economy and tourism and recreation interests,*
- *benefits and disbenefits for communities,*
- *aviation and telecommunications,*
- *noise and shadow flicker, and*
- *cumulative impact.*

5.3. The SPP requires Planning authorities to set out in the development plan a spatial framework for onshore wind farms of over 20 megawatts generating capacity. Authorities may incorporate wind farms of less than 20 megawatts generating capacity in their spatial framework if considered appropriate. The spatial framework should identify:

- Areas requiring significant protection because they are designated for their national or international landscape or natural heritage value, are designated as green belt or are areas where there are significant cumulative issues from existing wind farms.
- Areas where constraint existing but where proposals will be assessed on their individual merits against identified criteria
- Areas of search where proposals are likely to be supported subject to assessments against identified criteria

5.4. PAN 45 and Annex 2 has now been superseded by a raft of online guidance relating to renewable energy. To date these are as follows:

- Onshore Wind Turbines

- Process for preparing spatial frameworks for windfarms
 - Hydro Schemes
 - Woody Biomass
 - Landfill Gas
 - Energy from waste
 - Anaerobic digestion
 - Deep geothermal
 - Large photovoltaic arrays
 - Energy storage
- 5.5. These documents set out suggested areas of focus for planning authorities in terms of the suggested policy approach for each technology, and give specific guidance on preparing the required spatial framework.
- 5.6. Annex 1 has been retained and gives broad technical guidance on micro-renewables including micro-wind, solar, heat pumps and biomass. It also includes a number of case studies relating to each technology.
- 5.7. PAN 58 provides advice on good practice and guidance for planners dealing with EIA screening and scoping. It describes EIA as the process of identifying positive and negative environmental effects of development and identifying potential mitigation. The appendices set out the applicable thresholds for Schedule 1 and 2 developments. Windfarm proposals general fall within Schedule 2, which is based upon whether a proposal exceeds defined thresholds. Proposals fall within Schedule 2 if they comprise of more than 2 turbines or if the height exceeds 15 metres. The proposal is then assessed according to the criteria set out in the EIA checklist as to whether or not the proposal is considered likely to have a significant effect on the environment.

6. Existing Falkirk Council Development Plan Policy

- 6.1. Policy ENV.13 of the Falkirk Council Structure Plan is broadly supportive of renewable energy in appropriate locations and is as follows:

Proposals for the generation of energy from renewable sources will generally be supported subject to an assessment of individual proposals in relation to Structure Plan Policies ENV.1-ENV.7.

The council will work in partnership with other agencies to set out, in the local plan, the criteria for the location and design of renewable energy developments.

- 6.2. The supporting text makes reference to the BMT Cordah study, which identified some scope for small/medium-scale renewable energy

projects, and the fact the progress in renewable energy technology will lead to an increase in the viability of proposals.

- 6.3. In terms of current local plan policy, ST20 is broadly supportive of renewable energy development, having regard to other Local Plan policies.

Policy ST20 is as follows:

The Council will support development required for the generation of energy from renewable sources, and the utilisation of renewable energy sources as part of new development, subject to assessment of proposals against other Local Plan policies. Renewable energy development will be viewed as an appropriate use in the countryside where there is an operational requirement for a countryside location.

- 6.4. ST20 links back to the Structure Plan Policy and provides an overview of the approach taken to renewable energy policy as a result of the 2003 study.

- 6.5. Policy ST21 places reliance on the proposal being in accordance with other policies relating to landscape, ecology, and heritage. ST21 is as follows:

Wind energy developments will be assessed in relation to the following factors:

- *The visual impact of the development, having regard to the scale and number of turbines, existing landscape character, and views from settlements, main transport corridors and other key vantage points. Development will not necessarily be excluded from Green Belts or Areas of Great Landscape Value, but must demonstrate particular sensitivity in terms of scale and design where these designated areas are affected;*
- *The ecological impact of the development, having regard to Policies EQ24 and EQ25, including impacts on both designated sites and protected species. In particular, developers will be required to demonstrate that there will be no adverse impact on migratory birds;*
- *The impact on the cultural heritage and the landscape setting of cultural features, having regard to Policies EQ12, EQ14, EQ16, EQ17 and EQ 18;*
- *The impact on aviation and telecommunications, with particular regard to the safeguarding zones and operational needs associated with Edinburgh, Glasgow and Cumbernauld airports;*
- *The impact on settlements and residential properties by virtue of noise and ‘shadow flicker’; and*
- *Cumulative impacts in relation to the above factors, where there are existing developments in the area, or the development is one of a number of proposals for an area.*

- 6.6. The supporting text makes reference to the 2003 Study and justifies the current policy position.

7. Other Sources of Guidance

- 7.1. SNH are one of the primary statutory consultees in terms of renewable energy projects. They have produced a range of guidance on landscape and ecology issues.

Landscape

- Strategic Locational Guidance for Onshore Windfarms
- Siting and Designing Windfarms in the Landscape (2009)
- Visual representation of Windfarms – Good practice Guidance (2007)
- Visual Assessment of Windfarms – Best Practise – (2002)

Ecology

- Good practice during Windfarm Construction (2010)
- Survey methods for assessing the impact of onshore windfarms (2005 – revised 2010)
- TIN051 – Bats and onshore windfarms – Interim Guidance (2009)
- Natural heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA)

Renewable Technologies and their Policy Implications

8. Wind Energy

Local Context and Recent Developments

- 8.1. The BMT Cordah Report undertook a desk-based sieve mapping exercise in terms of constraints and identified 7 specific locations which would potentially be suitable for Renewable Energy (Figure 2.5 of report) which can be divided into 3 broad localities;
- Area around Letham Moss in the Carse of Forth
 - East of Denny Muir, avoiding the SSSIs at Denny Muir and Carron Valley
 - Slamannan Plateau, north of the Bean Geese fields
- 8.2. To date the main level of interest within the Falkirk Council Area has been focussed on relatively small wind energy developments comprising of single turbines, or small clusters of turbines, ranging from 60m 'Proven Energy Type' Turbines to large commercial scale turbines of up to 130m to tip. The first turbine in the Falkirk Council area was approved in 2008 and comprised a single 125m Turbine at the ASDA Depot in Bainsford. The second approved proposal is at Muirhouse Farm for a six-turbine scheme of small-scale 25m turbines. Rullie and Auchengean were broadly in line with the suggested localities in the

BMT Cordah report. At the time of writing this report the only wind farm to be constructed is a 6-turbine small-scale proposal at Muirhouse Farm, Linlithgow. No other turbines have been constructed to date.

Current wind turbine proposals in Falkirk Council Area (July 2011)

Name	Nr.	Height to Blade Tip (m)	Capacity (MW)	Planning Status
ASDA, Langlees, Falkirk	1	125	2	Planning approved Application
Muirhouse Farm, Linlithgow	6	25	0.09	Operational
Stoneridge, Avonbridge	13	127	26	(Planning Application under consideration)
Todhills, Torwood	4	130	12	(Planning Application under consideration)
Auchengean, Callendar Estate	10	125	20 approx	Scoping
Rullie, Dunipace	10	126.25	25	Scoping submitted) (PAN
Grangemouth Docks	6	Up to 150	up to 18	Scoping
Craigmad	1	66.62	0.5 approx	Non-EIA scoping
Kersebrock Farm	1	66.7	0.5 approx	Non Screening/scoping EIA
Woodwaste Plant, Bo'ness	1	103	1.5 approx	Non-EIA screening/scoping
Glenhead Farm, California	1	86.5	1 approx	Non-EIA screening/scoping

8.3. Falkirk has experienced significant pressures from cross-border wind energy developments over the last number of years. The main area of cumulative landscape impact is around the Denny Hills/Carron Valley where there is a cluster of wind energy developments within the Stirling Council Area. There are also an increasing number of proposals for single turbines within the North Lanarkshire and West Lothian local authority areas.

Current cross-border wind turbine proposals (July 2011)

Name	Nr.	Height to blade tip (m)	Capacity (MW)	Planning Status
Stirling				
Craigengelt	8	125	20 approx	Operational
Earlsburn	14	115	28 approx	Operational
Earlsburn North	9	115	21 approx	Planning Application Approved
Muirpark	11	126	24 approx	Planning Application under

				consideration
Clackmannanshire				
Forthbank	4	125	10	Planning Application under consideration
North Lanarkshire				
Bracco	3	125	9	Planning Application under consideration
Greendykeside	2	125	4	Operational
West Lothian				

Locational Requirements and Technology

- 8.4. Wind energy requires a suitable wind speed as well as a connection to the grid and suitable roads infrastructure to enable construction and maintenance.
- 8.5. The most common type of wind turbines operate with rotor blades on a vertical plane, extending from the hub attached to the nacelle which houses a generator and is located at the top of a tower. These can be free-standing units, as a single turbine, cluster or multiple turbines in the form of a wind farm, or attached to a building in the case of domestic-scale turbines.

Landscape Issues

Background

- 8.6. Wind developments have significant potential to impact upon landscape quality and visual amenity. The visual impacts of wind developments are a result of a combination of factors, primarily:
- The layout, scale and design of turbines
 - Location of support buildings
 - The construction and layout of access roads/tracks
- 8.7. The 2003 Renewable Energy Study did not include landscape capacity analysis. The study did undertake a desk based analysis which took into consideration the Landscape Character Assessments. No assessment of cumulative issues was undertaken because at that time wind energy developments in the wider area were limited. The Falkirk Council Area falls within two Landscape Character Assessments which were produced by David Tyldesley Associates in partnership with SNH. These assessments categorise the landscape into a series of Landscape Character Units and the capacity for windfarm development was considered for each landscape character unit. There are a total of nine Landscape Character Units in the Falkirk Council Area. There

were 4 landscape character units covering the area which fell within the zones considered as having potential for wind energy identified in the BMT COrdah study;

Grangemouth to Bo'ness Flats

- Low coastal flats dominated by large-scale petrochemical industry
- Area north-west of Grangemouth lies within Green Belt
- Visual amenity is of low-value and windfarm development would not have an effect on the value

Carse of Forth

- Typified by flat expansive, horizontal form of Carselands with dramatic sharp edge to Ochil Hills
- Extensive woodland NW of Airth will reduce impact of change brought about by wind development

Denny Muir

- Is for most part an AGLV but has a scale which may accommodate wind farm development
- The area edged the wider landscape of Gargunnock and Touch hills which may form greater potential

Slamannan Plateau

- Large expanse of elevated, open and undulating plateau
- Much of landscape is AGLV and forms feeding ground for Bean Geese
- Area is extensive and is of a scale which may accommodate wind development.
- Many views internalised which would also reduce visual effects

- 8.8. These landscape character areas represent distinct character units and could form the basis of a policy approach whereby criteria are set out, with cognisance given to certain key constraints within different areas. The current suite of Landscape Character Assessments do not consider the impact of wind farms so there is a requirement for more detailed landscape capacity work. Falkirk Council is currently in the process of commissioning a study which will assess the changes within the Landscape Character Areas.

Role of SNH

- 8.9. 'Strategic Locational Guidance for Onshore Windfarms in respect of Natural Heritage' produced by SNH was published in 2009 and identified zones of sensitivity in relation to natural heritage and landscape impacts. Falkirk Council is mostly within zones 1 and 2 which are identified as areas of low-medium sensitivity. The small areas identified in zone 3 are close to the boundary with Stirling and North Lanarkshire Councils where there are significant cumulative issues. Also identified were the areas around the Firth of Forth where

there have been a number of developments (eg. Longannet) over the last number of years which have resulted in significant changes to the landscape.

Cumulative Issues

- 8.10. The cumulative landscape impact of wind energy development is at the forefront of consideration when assessing wind energy proposals. Other Local Authorities have excluded land from areas of search where there are cumulative landscape issues within supplementary planning guidance. SNH published 'Siting and Designing Windfarms in the Landscape' in 2009 which makes reference to cumulative issues and recognises that such areas to be kept free of wind farms may have to be substantial to be effective, considering intervisibility and sequential impacts.
- 8.11. As part of the landscape capacity work undertaken, some assessment should take place regarding which areas are considered to have significant cumulative landscape issues. This work will take on board areas of concern which have been raised by SNH as part of their strategic work on proposals within the area. It is likely that all or part the AGLV to the west of Denny close to the border with Stirling would be identified. Concerns have been raised by SNH in response to wind energy proposals in the area previously, and the area may well have exceeded its landscape capacity anyway.

Green Belt

- 8.12. The SPP includes Green Belts in the general heading of areas requiring significant protection; however it advises that individual authorities should consider the appropriateness of wind farm development in their Green Belts. In terms of the Green Belt within the Falkirk Council Area, the primary function is to prevent coalescence of settlements, although preserving the landscape setting of settlements and providing access for recreation are also functions of the green belt. Scottish Planning Policy states that there should be a 2km buffer between settlements and areas of search. This would mean that most of the Green Belt would be excluded automatically. In terms of individual proposals, proposals should be considered on their own merits as to whether they compromise the role of the Green Belt as set out in the SPP and in the relevant Adopted Falkirk Local Plan policies.

Historic Environment

- 8.13. The Falkirk Council Area contains a number of international, national and local historic designations, including the Antonine Wall World Heritage Site, 9 conservation areas, over 300 listed buildings and around 100 scheduled ancient monuments. Unless careful consideration is given to the location, scale and layout of proposals at the design stage, wind energy developments have the potential have a

significant impact on the historic environment. The setting of Listed Buildings, Conservation Areas, Schedules Ancient Monuments and Designed Landscapes should be a particular consideration. Falkirk Council Local Plan policies EQ12-EQ18 provide protection for these sites and are designed to ensure that development does not adversely affect designated sites or in particular, impact upon their setting.

- 8.14. Historic Scotland are a key consultee as part of the EIA (or non-EIA) scoping process and they assess the nature, extent, design, location of the development proposed and the nature, extent and significance of the asset in question, its current relationship with its surroundings and the degree to which that would be altered by wind energy development. The Scottish Historic Environment Policy also provides further clarification on the definition of impacts on setting/context.
- 8.15. Historic Scotland has also produced specific guidance on micro-renewables as part of their 'Managing change in the Historic Environment' series which is designed to ensure that micro-renewables can be integrated into the fabric of historic buildings and conservation areas.

Ecology

- 8.16. Turbine and associated infrastructure can result in habitat disturbance and loss. Wind farm operation and maintenance may disturb sensitive species, and there is a risk of bird collision with moving blades and any additional overhead wires. Collision risk is greatest where wind farms straddle regular flight lines, such as between roosting and feeding grounds or where birds such as raptors make use of a wind farm site for hunting. 'Strategic Guidance for on-shore wind energy development' published by SNH identifies Raptors, geese, divers, some seabirds and seaduck are some of the species most likely to be subject to significant risks. Rare species, and those protected under EU and national legislation, require careful risk assessment on a site-specific, and species-specific basis. This is assessed under the statutory EIA process for developments which exceed the EIA threshold and as part of a general environmental assessment as part of the planning process for applications which fall below the EIA threshold.

Ecological Designations

- 8.17. There are two Special Protection Areas (SPAs) within the Falkirk Council area. The Firth of Forth SPA and the Slammanan Plateau SPA. SPAs are intended to safeguard the habitats of the species for which they are selected and to protect the birds from significant disturbance. SPAs, together with Special Areas of Conservation (which are designated under the Habitats Directive for habitats and non-bird species), form the Natura 2000 network of sites, which is a pan-EU network of sites for nature conservation.

- 8.18. The qualifying interests of the Slammanan SPA are that the areas identified immediately south of the Slammanan Plateau form overwintering areas for Bean Geese, which are protected under the Wildlife and Countryside Act. The flock overwintering on the Slamannan Plateau normally starts to arrive in late September with numbers increasing during October. It is thought that the Scottish flock fly direct across the North Sea using the Forth Estuary as their landmark and fly up the river Forth to the Slamannan Plateau. The birds normally depart in mid to late February returning to their breeding grounds in Sweden. In terms of impact on renewable energy proposals, the issues are mainly around disruption of flight paths and bird collision risk rather than construction impacts which can be limited to certain times of year to avoid disturbance.
- 8.19. The Firth Of Forth is designated as an SPA and as a RAMSAR site and is an coastal habitat with invertebrate-rich tidal flats and areas of lagoon, saltmarsh and dune. It supports wintering populations of a number of species of European importance including pink-footed geese and red-throated divers. SNH have advised that a number of proposals which would be deemed to have an impact on the qualifying interests of the Forth SPA would be required to undergo Appropriate Assessment.
- 8.20. There is a Special Area of Conservation at Black Loch Moss.
- 8.21. For international sites, wind farms must not have any adverse effects on the integrity of the sites, and this would be assessed through EIA and appropriate assessment.
- 8.22. In terms of National Sites, there are currently 10 Sites of Special Scientific Interest (SSSIs) Wind energy must not compromise the conservation objectives of the site, and the reasons for designation.
- 8.23. There is a network of locally designated sites, which are designed to support the objectives of the Local Biodiversity Action Plan. These local sites comprise over 60 Wildlife sites and around 25 Sites of Importance for Nature Conservation (SINCs). Proposals should only be permitted where the integrity of the site of not compromised or where there is scope for appropriate mitigation.
- 8.24. In spatial planning terms, internationally designated sites should be included in areas of constraint, which were adequately mapped as part of the 2003 BMT Cordah Study. Parts of the Slamannan Plateau are excluded on the basis of Bean Geese Lotting Fields, which are also clearly mapped. In terms of other designated sites, dialogue will be required with SNH and applicants to avoid compromising the integrity of the designated sites.

Birds

- 8.25. Wind turbines have the potential to have a negative impact on bird populations. All wild birds in the UK are protected under the Wildlife and Countryside Acts 1981 (as amended) with some species receiving additional protection. There are three potential impacts to birds which can arise from onshore wind farms:
- Displacement – whereby the birds avoid the windfarm and its surrounding habitat due to turbine movement and visitor disturbance. This can prevent birds from using their normal routes to or from feeding and/or roosting grounds.
 - Death – via collision or interaction with turbine blades. This is particularly problematic when proposals are located close to known flight paths.
 - Direct habitat loss as a consequence of construction of wind farm infrastructure (roads, buildings, turbine bases etc.)
- 8.26. As part of the scoping/application process, SNH require wind farm developers to quantify these risks through surveys which determine the usage of the site by different bird species, at different times of the year. This involves collision modelling work to be undertaken to determine the level of risk to known lines of flight and habitats.
- 8.27. In terms of sensitive ornithological receptors in the Falkirk area, the main areas are the Firth of Forth SPA and the Slamannan Plateau SPA.
- 8.28. The Firth of Forth SPA/SSSI designated for its important population of overwintering pink-footed goose. Pink-footed goose is assessed as very high value because flight activity may be attributable to birds using the SPA.
- 8.29. Slamannan Plateau SPA/SSSI designated for its important population of overwintering 'Taiga' bean goose.

Carbon Rich Soils

- 8.30. Wind farms tend to be sited on peat lands which hold large stocks of poorly protected carbon and so have the potential to greatly increase overall carbon losses. Scotland contains the majority of peat soils in the UK (defined here as soils with a surface organic horizon greater than 50 cm in depth) and the estimated stock of carbon held in Scottish soils is approximately 2800 MtC or 11000 MtC02 equivalent. During wind farm construction, carbon is lost from the excavated peat and from the area affected by drainage.
- 8.31. One of the main causes of peat disturbance is the construction of borrow pits. Access roads, hard-standing, foundations and other

structures require large quantities of stone. Unless an alternative source is available, it is normal practice to open borrow pits to obtain materials for track construction on wind farm sites. Construction of borrow pits can result in peat disturbance from ground excavation and drainage. Restoration is usually undertaken by the developer and where the turbines are sited on identified peaty soil, the mitigation would be set out in detail as part of the environmental statement. Developers are expected to explore alternative construction methods on peat soils which minimise the disturbance of peat.

- 8.32. The Environmental Statement for any proposal should include detailed calculations showing the Carbon Savings, losses, and estimated payback time in consultation with SNH. The Scottish Government published 'Calculating carbon savings from wind farms on Scottish peat lands - A New Approach' in 2008, which provides more detailed guidance on these issues. The SNH publication 'Good Practice during Windfarm Construction' also provides a brief summary of the recommendations of the report and how developers should seek to address them.
- 8.33. The Falkirk Council area contains a significant areas of peat soils. Concentrations can be found across parts of the Slamannan Plateau, and areas to the west of Denny. These are areas where there has been increasing pressure for wind energy development. The National Peatland Resource Inventory (Lindsay & Immerzi1996) identifies 1491ha of Deep Peat within the Falkirk Council Area.
- 8.34. In terms of spatial planning implications, this would be a matter that could be addressed through supplementary planning guidance, and could potentially be included within renewable energy policy criteria.

Residential Amenity

- 8.35. Paragraph 190 of the SPP refers to a guideline separation distance of up to 2km between areas of search for groups of wind turbines and the edge of towns, cities and villages, to reduce visual impact. However, this 2km separation distance is a guide not a rule and decisions on individual developments should take into account specific local circumstances and geography. There is no guide distance between established and proposed groups of wind turbines.
- 8.36. There is no set guidance on separation distances between individual groups of turbines, however, industry best practice is currently 500m, although this is dependant on the topography and scale of turbines.

Noise

- 8.37. ETSU R-97 provides the benchmark against which noise is assessed. Noise should be limited to 5dB(A) above background noise levels. Noise is addressed as part of the Environmental Statement. In spatial planning terms, residential amenity should be addressed as part of the policy criteria and potentially reference within SPG. The process is managed through Environmental Health Legislation.

Aviation

- 8.38. The 2003 Study provided an overview of aviation constraints including Glasgow, Edinburgh and Cumbernauld Airports. The Civil Aviation Authority advise Air Traffic Control operators to seek consultation on all wind farm proposals within a 30km radius of radar. Wind turbines within this range which are deemed to be within the line of sight will generate an objection. Areas outwith the 30km radius may also generate an objection if they are seen to interfere with radar or other aviation interests. NATs En Route Ltd (NERL) operate under license from the Civil Aviation Authority and to regulate and control UK airspace.
- 8.39. NATs are in process of preparing mapping identifying pinch points and areas of constraint with the aim of producing guidance aimed at informing policy development. At the present however, developers are encouraged to undertake NATs pre-planning service and consult with the Civil Aviation authority and the MOD as part of the scoping exercise. When considering an application for wind turbines, the number, location, height and configuration of turbines are taken into account and wind energy proposals often evolve through ongoing dialogue with NAT/NERL.
- 8.40. In terms of safeguarding of local airports, the two main airports are Glasgow and Edinburgh. The Edinburgh and Glasgow Airport safeguarding zones covers a radius of 30km each and includes large parts of the Falkirk area. (See Map)
- 8.41. As part of the statutory planning application process, many aviation objections can be dealt with by the use of suspensive conditions, as negotiation between NATs and the developers can sometimes be resolved within the timeframe for consent.
- 8.42. In spatial planning terms, other local authorities have not mapped aviation constraints as part of spatial frameworks as it is a constantly evolving field with a wide range of mitigation options emerging. As technology in relation to aviation constraints is moving on swiftly, it is suggested that it is kept under review, whilst including a requirement for aviation to be addressed within SPG/Policy criteria.

Telecommunications

- 8.43. Wind turbines produce electro-magnetic radiation which can interfere with broadcast communications and signals. The Radiocommunications Agency (RA) register of all civil radio communications installations in the UK can identify any radio installations in the neighbourhood of a wind farm site, but will not identify their owners.
- 8.44. Developers would normally liaise with any authorities or bodies likely to have an interest as part of the planning process, in particular, the local emergency services. This would be covered within the Environmental Statement.
- 8.45. The 2003 Renewable Energy study cited the list of fixed telecommunications link transmitters in the area which include:
- Doups
 - Myot Hill
 - Banknock
 - Falkirk
 - Grangemouth (multiple points)
 - Bo'ness
- 8.46. Outside the Falkirk area are transmitters which could be affected;
- Black Hill
 - Kirk 'O Shotts
 - Cairnpapple
 - Earls Hill
 - Knock Hill
- 8.47. In spatial planning terms, there is little scope to map this constraint, rather proposals are assessed on a case-by-case basis. It would merit inclusion within policy criteria, and background information and mitigation within Supplementary Planning Guidance.

Economic Opportunities and Constraints

Background

- 8.48. The BMT Cordah Study included an exercise where three development scenarios were identified and economic modelling carried out on each taking into account development factors such as site cost, Renewables Obligation Certificate (ROC) payback, turbine capitol costs, grid connection etc. The costs within the modelling which took place are likely to be outdated. For example, turbine costs will have changed, grid connection is becoming more affordable etc.

Land Ownership

- 8.49. Developers are reluctant to engage more than one or two landowners for a single development. The related legal issues in terms of payment and contract negotiation are often a high cost for multi-land owner developments. This could form part of the attraction for single turbine, or smaller developments.

Grid Connection

- 8.50. The BMT Cordah report highlighted the costs associated with grid connection. This can often be a significant outlay and small schemes which would ordinarily be considered viable can be set back by the costs involved. In terms of spatial planning implications, this can often mean that the proposed scale of developments is increased to ensure viability of a scheme. This issue is usually highlighted at scoping stage.

Community Benefit

- 8.51. Community benefits are voluntary contributions which are given by the developer to communities usually within the vicinity of windfarm developments. There is no legal or planning requirement for developers to provide community benefits associated with windfarm development. Community benefit packages are not a material planning consideration and applications must be determined in accordance with local and national planning policy.
- 8.52. Discussions on contributions should begin as early as possible in the development process to provide a degree of certainty to all parties. At the same time, however, these discussions should not be construed as the Council, as Planning Authority, pre-determining the application. Community benefit packages should not be a material consideration unless they meet the tests set out in Circular 1/2010. It is likely that the only elements which will meet the tests are required infrastructure, mitigation of direct impacts etc.
- 8.53. The approach that other Councils have taken is that a minimum sum per megawatt of energy produced is paid. There is a requirement for some flexibility in this calculation to allow for unforeseen viability issues. It is important for Planning Authorities to remain detached from the negotiation and administration of the funds, so there is the issue of whether other Council services would be willing to play a part in this. As a minimum, the possibility of other services within the Council providing a supporting role in the establishment of Community Trusts should be explored.
- 8.54. In terms of making reference to Community Benefits in the LDP policy and SPG, this is probably appropriate to make reference to this in the spatial planning policy and state that there is a requirement. Case

studies and further guidance could be provided in an information package separate from the planning guidance. The planning policy must make it clear that Developers are expected to negotiate terms of payment with the community and where funding is given to the Council, this is dealt with outside the planning process. There is industry best-practice in terms of community benefit and communities are becoming increasingly aware of this.

Employment Opportunities

- 8.55. This ties in with community benefit and is often linked in with benefit packages as part of industry best practice. The Council's advice note provides information on local employment agreements and this could be applicable to renewable energy developments. Whilst schemes coming forward are unlikely to generate a significant amount of long-term employment opportunities it is still an issue to be scoped out as part of any proposal which comes forward.

Overall Wind Energy Potential in Falkirk Council Area

- 8.56. The BMT Cordah report identified exploitable areas of wind resources across some of the Council area. The report encourages small-scale development in virtually any locality subject to minor constraints and medium-scale development of no more than 15 turbines per site. In terms of the assessment of constraints, many of the key issues are unchanged, but the cumulative landscape and ecological issues add an additional dimension to the policy requirements.
- 8.57. One of the main issues which has changed since the BMT Cordah study is the height of the turbines being proposed. BMT Cordah were working to a max tip height of 100m as part of their study, however, many commercial scale turbines are >120m in height. Turbines can now range from 15m microgeneration systems to 150m single or groups of turbines. This means that there is a need for further landscape work to underpin LDP policy and a Spatial Framework. This will focus in particular on the scope for further 'small-scale' wind energy projects, as there has been a surge in interest over the last couple of years.
- 8.58. The Antonine Wall World Heritage Site is another constraint which was not present around the time of the publication of the BMT Cordah study. The Antonine Wall WHS was designated in July 2008 and Development Plan Policy reflects the need to protect the Wall and its setting. There is currently draft Supplementary Planning Guidance in place which provides further guidance on development which may affect the Wall and its setting. The further landscape work required will need to take cognisance of this relatively recently emerging constraint and this will need to translate into renewable energy policy/SPG.

Future Policy Options

- 8.59. National Planning Policy requires planning authorities to set out in the development plan a spatial framework for onshore wind farms of over 20 megawatts generating capacity. Authorities may incorporate wind farms of less than 20 megawatts generating capacity in their spatial framework if considered appropriate.
- 8.60. To date, Falkirk Council has no formally adopted Wind Energy SPG and has not identified any areas of search for windfarms of any size. Parts of the 2003 Renewable Energy Study are now out of date, although is useful for background reference and as a baseline in part. The Adopted Falkirk Council Local Plan Policy is based on an area-wide criteria-based approach which is no longer fit-for-purpose. There is now a need for a more sophisticated approach in light of the emerging pressures, particularly in terms of landscape.
- 8.61. The suggested approach is that Falkirk Council brings forward a spatial framework for wind energy developments in advance of the LDP. In terms of the FCLP, the existing policies could form an appropriate 'hook' for an SPG to be prepared in advance of the proposed plan. It would then take the form of a specific policy and Supplementary Planning Guidance, which has enhanced status as part of the LDP. Landscape capacity work would be undertaken to form the baseline for an appropriate policy approach.
- 8.62. The SPP requires the Council to identify broad areas of search for wind energy developments or 20MW or more. The 2003 study did not identify any potential for large-scale wind energy projects and despite the fact that technology has progressed, the Council area does not have the locational characteristics or topography to accommodate large scale wind energy developments. It is therefore suggested that a tailored policy approach is required which looks at capacity for smaller developments is required.
- 8.63. The landscape capacity study will be required to undertake an assessment of areas which are at landscape capacity or approaching landscape capacity due to cumulative impacts from wind turbines and other types of development. The study will then need to identify areas where turbines could be located causing least visual intrusion and impact on landscape character and where such development would be unacceptable in terms of potential landscape and visual impact.
- 8.64. The study should identify a range of development scenarios from single/clusters of smaller turbines through to larger commercial-scale turbines and assess the capacity for different scales/types of turbines within the landscape character areas.

9. Hydro

Locational Requirements and Characteristics

9.1. Hydro schemes use the kinetic energy of moving water to produce electricity. This water is put through a turbine, which in turn drives a generator that creates electricity. Although there are different forms of hydroelectric schemes, they all are based on the following components:

- A Dam
- Penstocks
- Forebay
- Turbine(s)
- Generator(s)

9.2. The dam raises the level of the water to create a hydrostatic head - this is the difference between the level of the water in the dam and the level where it flows out from the scheme. This acts to trap the water and can be released when necessary, enabling the water held to become stored energy.

9.3. The locational requirements of a hydro scheme are that there is sufficient net head and mean flow, which dictates that generating capacity of the scheme.

9.4. There are several main categories of Hydro development:

Large-scale/commercial

9.5. Large-scale impoundment normally involves substantial flooding of an area of land and a substantial dam with associated infrastructure to control water flow, including pipework, a power station, a tailrace to slow and control water flow for release into land or a water course below, electricity generation transmission lines/pylons and vehicular access tracks/roads.

9.6. Large-scale development can also include pumped storage. Pumped storage involves the same arrangements as large scale impoundment, but would normally use a natural loch or additional reservoir at the lower level. Water is pumped back to the upper reservoir using cheaper off peak energy, for later release.

Small-medium scale commercial

9.7. Small-medium scale impoundment involves a scaled down version of large scale impoundment, but often use naturally forming water bodies or contained areas within the landscape such as river valleys.

Micro-hydro Schemes

- 9.8. The majority of small hydro schemes will be 'run of river', where water is taken from a river from behind a low weir, with no facility for water storage, and returned to the same watercourse after passing through the turbine. Micro-hydro schemes would primarily be for domestic/individual landowner use with an output of <100KW to serve the individuals needs or sold back to the grid under Feed in Tariff arrangements. Associated infrastructure includes the power house which would house a turbine, generator and transformer and involves a pipe or channel where water is returned to the watercourse. The scheme may or may not require permanent vehicular access but will require a service strip of some description.

National Legislation and Policy

- 9.9. In January 2010 the Scottish Ministers issued a policy statement which recognised the valuable contribution that hydropower generation makes to Scotland's renewables targets. At the same time Ministers wish to take appropriate measures to protect Scotland's water environment from significant adverse impacts. The statement recognised the contribution which larger schemes over 100kw made to the economy as well as the local benefits of smaller schemes and stated that Planning Authorities should be supportive of hydro developments.
- 9.10. Hydro Schemes are regulated as part of Water Environment (Controlled Activities) (Scotland) Regulations 2005 (as amended) and SEPA administer the licensing arrangements for this.
- 9.11. Under Section 36 of the Electricity Act, all hydro scheme proposals over 1MW previously had to be determined by the Scottish Government.. The The Scottish Government now propose to raise the Section 36 threshold from the 1MW to a 50MW level will ensure that more hydro proposals can be considered by local planning, to bring it into line with procedures for determining wind farms as well as procedures for determining Hydro schemes in England and Wales.
- 9.12. Scottish Planning Policy states that the scope for major new hydro-electric schemes is likely to be limited but there may be an increasing number of proposals for small run-of-river projects. Development plans should identify the issues which will be taken into account in decision making on hydro-electric schemes such as impacts on the natural and cultural heritage, water environment, fisheries, aquatic habitats and amenity, and relevant environmental and transport issues.
- 9.13. The Scottish Government online planning policy guidance identifies the suggested areas of focus for development plans. The guidance recommend a mapping of existing water resources including any

operational or consented schemes as well as areas of constraint/sensitivity. It asks local authorities to consider the appropriateness of any spatial guidance to be produced.

9.14. SEPA have produced specific guidance for Hydro schemes including tidal power which relates to advice on issues to be assessed for individual schemes, as well as what they expect Local Authorities to include within their Development Plan policies. These issues include;

- Carbon balance
- Air Quality
- Water Environment
- Marine Environment
- Soil and Peatlands
- Flood risk

Local context and recent developments

9.15. To date, the only proposal for a potential hydro scheme is at the former Carrongrove paper mill. The brief included a requirement for the developer to undertake a feasibility study for a hydro scheme in conjunction with the fish ladder. The planning application is pending a decision.

9.16. The BMT Cordah Study undertook a modelling exercise using the Institute of Hydrology HydrA programme and it was concluded that the potential for hydro was extremely limited. The study concluded that a total of only 0.2 – 0.3 MW of output could realistically be achieved, and in the short-medium term, only about a third could be achieved. A greater number of small schemes would also give rise to cumulative effects on ecology and water quality. 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
 - Row Burn, including Tor Burn.
- Only 2 areas were identified as having potential for a hydro scheme;
- 13km stretch of River Carron
 - 5km stretch of River Avon (excluding Muiravonside Country Park)

9.17. 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.

Ecology

- 9.18. Hydro developments could potentially have an impact on river ecosystems and habitats. Indeed most of the watercourses within the Falkirk Council Area have local and national ecological designations. Hydro schemes can have significant effects on:
- Peat
 - Watercourses
 - Lochs
 - Wetland
 - Water Supply (public and private)
 - Groundwater
 - Coastal Waters
- 9.19. The EIA for any proposal would be expected to establish whether or not there are any significant impacts on the biodiversity of an area, including aquatic and terrestrial ecosystems, habitats and species, e.g., breeding birds and/or freshwater fish. Areas of particular concern may relate to water quality, water quantity and flow, the transport of sediment, water temperature. The ecological status of the water environment would require to be considered, as well as aquatic species and habitats, particularly those protected under the EC Habitats Directive.
- 9.20. It is considered that there is scope for mitigation as hydro schemes in turn offer ecological benefits to off-set the disbenefits. This can be followed up as part of the planning process.

Existing Local Plan Policy

- 9.21. In terms of current local plan policy, ST20 is broadly supportive of renewable energy development, having regard to other Local Plan policies.
- 9.22. Policy ST20 is as follows:
- The Council will support development required for the generation of energy from renewable sources, and the utilisation of renewable energy sources as part of new development, subject to assessment of proposals against other Local Plan policies. Renewable energy development will be viewed as an appropriate use in the countryside where there is an operational requirement for a countryside location.*
- 9.23. ST20 links back to the Structure Plan Policy and provides an overview of the approach taken to renewable energy policy as a result of the 2003 study.

Future Policy Options

- 9.24. A broadly promotional policy framework is probably most appropriate. Potentially some guidance could be given if included in supplementary planning guidance but the most up-to-date source of guidance is probably industry-based or the online renewables guidance produced by the Scottish Government. There was limited potential identified in the 2003 study so assessment on site by site basis against a range of environmental policies is probably most appropriate.
- 9.25. It is considered that the 2003 Renewable Energy Study provides sufficient baseline information to formulate any specific policy relating to Hydro and that the a criteria-based approach is likely to be appropriate, incorporated into a general criteria-based renewable energy technologies policy (excl wind) as part of the LDP.

10. Biomass

- 10.1. Biomass plants installed at locations throughout Scotland currently make up around 86% of total renewable heat capacity, with three sites providing over 50% between them. This is currently 1.4% of total heat demand. Supply chains are now operational across Scotland at a range of scales. Woody biomass is identified in the Renewable Heat Action Plan as a key technology in delivering a significant proportion of the 11% heat target by 2020. The Renewable Heat Incentive is expected to drive further woody biomass schemes, and the development of local heat markets using local resources.
- 10.2. The Scottish Government has set out its policy on biomass in National Planning Framework 2, in its Section 36 Thermal Guidance and Section 36 Biomass Scoping Opinion guidance. In summary the Scottish Government would prefer to see biomass deployed in heat-only or combined heat and power schemes, off gas-grid, at a scale appropriate to make best use of both the available heat, and of local supply.

Locational requirements and characteristics

- 10.3. Biomass technologies use renewable organic resources to produce many energy related products including electricity, liquid, solid and gaseous fuels, heat, chemicals and other materials.
- 10.4. There are five basic categories of material:
- Wood from forestry or from wood processing
 - Energy crops - high yield crops grown specifically for energy applications
 - Agricultural residues

- Food waste
- Industrial waste from manufacturing and industrial processes.

Biomass requires a grid connection and a source of fuel. Most biomass proposals are likely to only be supported in industrial locations given their scale and nature.

Local context and recent developments

- 10.5. The only proposal to date has been the Grangemouth Renewable Energy Plant. Forth Energy is seeking consent from the Scottish Ministers under Section 36 of the Electricity Act 1989 to construct and operate the proposed Grangemouth Renewable Energy Plant with a net electrical output of 100 Megawatts (MWe), on a site at the Port of Grangemouth. The fuel will be sustainably sourced biomass, the main part of which will be wood waste, and will be used as a fuel to generate renewable electricity and heat. The biomass is burnt in a boiler which produces high pressure steam. This steam is passed through a steam turbine to produce electricity.
- 10.6. The BMT COrdah report identified considerable scope in the Falkirk Council Area for the development of biomass. The report considered the most feasible feed stock to be wood, with supplies coming from sources such as Central Scotland Forest Trust and the Forestry Commission. The report recommended that Falkirk Council provide a promotional framework and investigate the scope for smaller community-based schemes in the short term.

Future Policy Options

- 10.7. Areas of search for are not considered appropriate for Biomass technology. Biomass proposals require careful siting and location and proposal should be considered on a site-by-site basis. The Scottish Government Online guidance requires Development Plans to provide clarity on where different types of biomass could be located. In the long term, Falkirk Council may develop a strategy which could incorporate heat mapping (to link woodfuel supply with areas of heat demand) and promotional/supportive policies.

11. Micro-renewables

Local context and recent developments

- 11.1. Micro – renewables are widely accepted to be the production of heat and/or electricity from zero/low carbon technologies. This can include solar energy, micro-wind, and micro-hydro. Micro-renewables including solar, heat pumps and micro-wind have a fairly good take-up within the area and flagship projects such as Maddiston Primary School have

continued to raise awareness. PAN45 Annex 1 provides guidance on Micro-renewables.

Locational requirements for each technology

Solar

- 11.2. Solar power can be harnessed in three ways. Firstly by the installation of solar panels on to or within the proximity of buildings to harness solar energy for conversion to heat for the use in buildings. Secondly, photovoltaics, which are panels (similar to solar) which convert solar energy into electricity; and lastly, passive solar gain by siting and design of new development. The only locational requirement is that there is a reasonable availability of sunlight and a suitable connection into electricity infrastructure.

Micro-Wind

- 11.3. Micro-wind turbines have been used for many years in domestic, light industrial and farming applications for both water pumping and electricity generation. Micro-wind turbines have the potential to provide electricity in both domestic and commercial locations. Micro-turbines can be mounted on to a building or free-standing within the curtilage of a building.

Ground source heat pumps

- 11.4. Ground source heat pumps are usually installed within domestic and small-scale commercial units. They work by circulating water or other fluids through copper pipes buried underground, either in trenches or boreholes where the temperature is at a higher level. This is then fed back through to a heat pump and used to heat the property.

National Policy/Legislation

- 11.5. Recent changes to the General Permitted Development Order been brought forward to reduce the burden on householders who wish to install micro-generation equipment. Some scales/types of micro-generation equipment can be installed without the need for Planning Permission. The GPDO currently excludes micro-wind and ground source heat pumps at present however this is under review.
- 11.6. In terms of guidance, PAN45 Annex 1 still provides appropriate guidance for micro-generation technologies and provides an overview of the technologies and their constraints.

Current Local Plan Policy

- 11.7. Policy ST20 is very general and requires assessment against other policies relating to landscape, amenity, ecology etc. A broadly

supportive policy framework is provided to encourage micro-generation in suitable locations.

Future Policy Options

- 11.8. Microgeneration should be promoted through the specific and separate policies relating to the requirements of S72 of the Climate Change (Scotland) Act. Under section 72 of the Climate Change (Scotland) Act 2009 local development plans must require all new buildings to be designed to avoid a specified and rising proportion of the projected greenhouse gas emissions from their use through the installation and operation of low and zero carbon generating technologies. Some guidance is probably required regarding specific issues such as siting of micro-generation on listed buildings.

12. Other Technologies

Tidal

- 12.1. Tidal energy exploits the natural ebb and flow of coastal tidal waters via mechanical devices to produce electricity. The most common form of tidal energy capture is a dam or 'barrage' across a tidal bay or estuary. Gates and turbines are installed along the dam. When there is an adequate difference in the height of water on either side of the dam the gates are opened. This 'hydrostatic head' that is created causes water to flow through the turbines, turning a generator to produce electricity.

Local Context

- 12.2. There was some interest in Kinneil Lagoon for harnessing of tidal energy, however the SPA is likely to preclude tidal energy developments. The BMT CORDAH report did not undertake an assessment for tidal energy, as the technology was still undergoing development in 2003, and there was little scope for the technology in the Council area.

Future Policy Options

- 12.3 Tidal energy is at the forefront of new Marine Spatial Planning regime but the ecological constraints are may preclude tidal energy development in the Council area. It is not considered appropriate to develop specific policies as part of the LDP.

Deep Geothermal Energy

- 12.4 In geologically suitable areas, heat from deep within the Earth's interior can rise up to the surface. Such heat is referred to as geothermal energy. If water is forced to enter fissures in this hot rock, it can become heated and will emerge on the surface as hot springs, or

steam. Geothermal energy can be used directly for providing heating or geothermal power plants can use the steam, heat or hot water from geothermal reservoirs to provide a force to turn generators and produce electricity

- 12.5. Deep geothermal includes any geothermal energy source below 100m in depth. This will include minewaters, aquifer sources (HSA) and HDR enhanced (or engineered) geothermal systems (EGS). This is distinct from ground source heat which provides low temperature heat found at relatively shallow depths within the earth's crust, derived from solar warming.
- 12.6. The main types of deep geothermal are open loop systems and closed loop systems. Open loop systems require a source of groundwater which is circulated. Closed-loop systems involve circulation of liquid/water which is heated by geothermal energy.
- 12.7. For a site to have deep geothermal potential, there must be the correct lithology (rock type), thickness, regional distribution, depth of burial, hydro-geological properties and temperature.

Local Context

- 12.8. There have been a number of schemes utilising mine water and boreholes in Scotland. Examples of schemes can be found in Lumphinnans, Fife and Shettleston, Glasgow. There have been no commercial-scale schemes in the Falkirk Council Area to date, however ground source heat pumps continue to grow in popularity and this is discussed within the Microgeneration section.
- 12.9. The 2003 Renewable Energy Study concluded that there was not significant scope for deep geothermal within the Council area. However, it suggested that former mining areas may have potential for open-loop systems and this should be explored further.

National Policy

- 12.10. Scottish Government online guidance states that policies for deep geothermal cover should identify:
 - the potential different scales and types of deep geothermal operations;
 - design of plant and supporting infrastructure, drilling, reservoir stimulation, pollution control, amenity issues, decommissioning.
- 12.11. Scottish Government guidance also suggested Planning Authorities were proactive in terms of collating information on redundant mines and geological data.

Future Policy Options

- 12.12. The criteria for geothermal energy proposals can be easily accommodated within a general renewable energy policy. It is not appropriate to identify specific opportunities given the limited scope identified, but proposals should be assessed on a case-by-case basis, and potential could be explored as part of individual projects.

Falkirk Council
Development Services
Abbotsford House
David's Loan
Falkirk FK2 7YZ

Tel: 01324 504739 or 01324 504720
ldp@falkirk.gov.uk
www.falkirk.gov.uk



Falkirk Council
Development Services