EAST AYRSHIRE COUNCIL

Local Development Plan 2

Energy and EV Charging

Supplementary Guidance

2024

Contents

1. Context and Purpose of Supplementary Guidance

1.1 Purpose of this Supplementary Guidance

As the drive for renewable energy intensifies, a clear and robust policy approach for the development of renewable energy capacity in East Ayrshire is essential. In order to achieve the Scottish Government's targets, the East Ayrshire Local Development Plan 2 (LDP2) supports a wide range of renewable energy development and aims to ensure that East Ayrshire plays its part in tackling the climate emergency and reducing greenhouse gas emissions.

This Supplementary Guidance is a statutory document, which forms part of the Council's Local Development Plan 2. The Guidance sets out in detail the Council's approach to renewable energy developments and electric vehicle charging infrastructure, and provides further information on the criteria against which associated developments will be assessed, underpinning **Policy RE1, Policy RE2, Policy RE3 and Policy T5** of the LDP2.

1.2 Scotland's Climate Targets

The use and development of renewable energy technologies plays an important part in the national and international drive to respond to climate change and move towards a low carbon future, as is strongly emphasised in National Planning Framework 4 (NPF4). By increasing the use of renewable energy sources and reducing reliance on traditional fossil fuels, Scotland can not only secure a safe long term energy supply, but also tackle the rise in global temperature associated with the burning of fossil fuels.

The Scottish Government is firmly committed to increasing Scotland's renewable energy output, as is reflected in its ambitious targets for renewable energy generation. In direct response to the international Paris Agreement, the Climate Change (Scotland) Act 2009 was amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, increasing the ambition of Scotland's emissions reduction targets to net zero by 2045.

The Scottish Government has had a long-standing target to generate the equivalent of 100% of gross Scottish electricity consumption (total generation minus net exports) from renewable sources, with figures showing that Scotland reached 98.8% in 2020. The 2022 Onshore Wind Policy Statement (ONWPS) reasserts the need to accelerate Scotland's transition towards a net zero society and includes an expectation for a substantial increase in demand for electricity to support this transition in the next decade.

More detail on the wider policy context for renewable energy development in Scotland is provided in Chapter 2.

1.3 Renewable Energy in East Ayrshire

Similar to much of rural Scotland, the demand for renewable energy production in East Ayrshire is most evident in relation to onshore wind energy development. This is discussed in greater detail in Section 3.1.

East Ayrshire Council is a signatory to the Scottish Declaration for Climate Change and this commits the Council to:

- Acknowledge that Climate Change is occurring
- Welcome the opportunity to take action
- Make a commitment to action

As part of this commitment, East Ayrshire Council submits an annual report that looks at the achievements to date of reducing carbon emissions and targets for the year ahead. Reducing the carbon intensity of heat is essential to achieving the Scottish Government's targets and alleviating fuel poverty.

In the time since the previous Local Development Plan (LDP1) was adopted in 2017, there has been a number of small and large scale renewable heat technology developments consented in East Ayrshire: in particular, there has been increasing applications for biomass boilers, heat pumps, and solar/PV installations. There is also growing interest in hydrogen developments. All applications consented since 2018 are listed in Appendix II.

East Ayrshire is also continuing to explore the potential for district heating across the council: in 2021 the Council commissioned Changeworks to undertake a **Local Heat and Energy Efficiency Strategy (LHEES)** Pilot Project, which focused on Kilmarnock.

LHEES provide a pathway to delivering heat decarbonisation and energy efficiency, allowing local authorities to prioritise and target a range of work, such as deploying energy efficiency measures or encouraging the development of district heating or other low carbon heat sources.

Following the successful pilot, the Council is now committed to fulfilling the requirements of:

1. the Local Heat and Energy Efficiency Strategies (Scotland) Order 2022, which places a duty on local authorities to prepare, publish and update a Local Heat and Energy Efficiency Strategy and Delivery Plan, and;
2. the Heat Networks (Scotland) Act 2021, which places a duty on local authorities to carry out a review to consider whether one or more areas in its area is likely to be particularly suitable for the construction and operation of a heat network.

Additionally, the three councils making up the Ayrshire region are committed to the joint development of an **Ayrshire Energy Masterplan (AEM),** which will complement and add value to the LHEES that each local authority will complete. The overall objective of the AEM is to present an internationally-leading pathway to net zero that maximises socio-economic benefits for Ayrshire.

1.4 Electric Vehicles and Charging Infrastructure

Scotland's National Transport Strategy 2 identifies that transport is currently Scotland's largest sectoral emitter of greenhouse gas emissions, and the largest source of transport emissions is cars. In addition, 25% of emissions were generated by a combination of Lights Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs). These figures have risen year on year since 2013 despite technological advances in engines, due to an increase in traffic levels and associated vehicle kilometres driven. Reducing these impacts will be a key challenge in delivering on net-zero targets. In addition, the term 'Transport Poverty' refers both to a lack of adequate transport services to access general services and work, or the inability to pay for these transport services. Making it easier for people to get around using efficient, green transport services will be key to reducing transport poverty and ensuring a just transition to net zero.

The Scottish Government has committed to reduce car kilometres by 20% and it is also planned to end sales of new petrol and diesel vehicles by 2035.. A preferred future transport system will support advances in technology to ensure improvements in engine efficiencies, whilst also recognising that ultra-low emitting cars continue to generate congestion and that any future transition should also improve space efficiency and promote public or shared transport. However as part of this, the expansion of electric vehicle infrastructure will be necessary to ensure a just transition to net zero. (See Figure 1).

In order to ensure that East Ayrshire is ready for the future of car travel, LDP2 (Policy T5) requires new developments to include provision for electric vehicle charging spaces, and states that consideration should also be given to the need for hydrogen charging spaces, where the nature of the development is likely to be accessed by hydrogen vehicles.

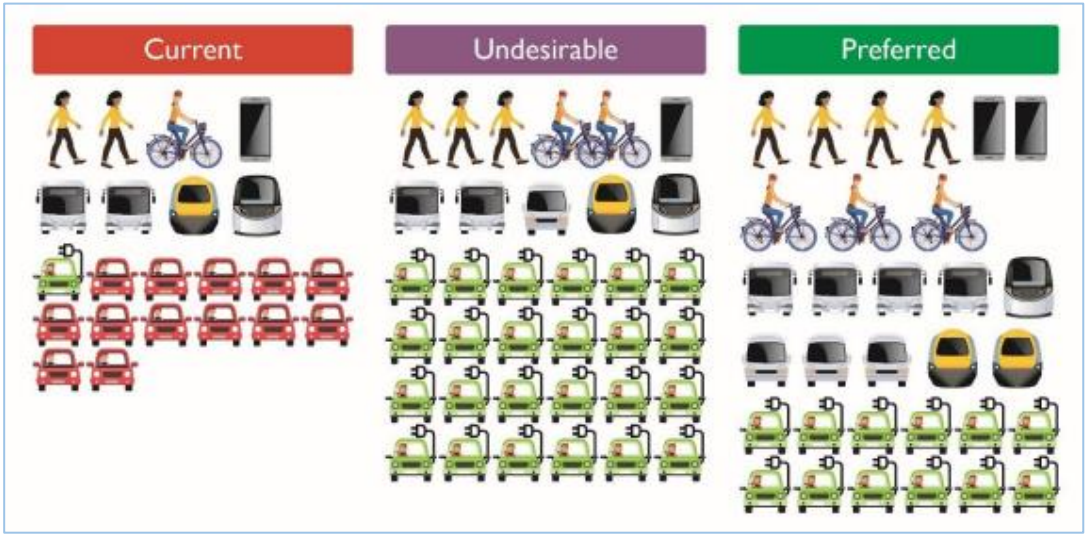


Figure 1: Preferred future transport system, National Transport Strategy 2

2. National and Local Policy Context

2.1 Climate Change

The Climate Change (Scotland) Act 2009 was amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. The Act commits Scotland to achieving net zero greenhouse gas emissions by 2045 at the latest, with two interim targets of 75% by 2030 and 90% by 2040. Meeting these targets will require decisive and meaningful action across all sectors, including the built environment and planning.

Scotland's updated Climate Change Plan 2018-2032 sets out the Scottish Government's strategy for meeting the targets set in the Climate Change Act 2019. The Scottish Government state its commitment to delivering a place-based approach to green recovery, and to the ongoing planning system reforms which will aim to reduce process and procedures so that planning can focus more on places and people as well as net zero ambitions. Other goals of relevance include:

- The zero emissions heat transition will involve changing the type of heating used in over 2 million homes and 100,000 non-domestic buildings by 2045, moving from high emissions heating systems, reliant on fossil fuels, to low and zero emissions systems such as heat pumps, heat networks and potentially hydrogen;
- Reducing the demand for less sustainable modes of transport and following the sustainable travel hierarchy to promote active travel and shift to more sustainable modes, while deprioritising single-occupancy care use; and
- Making large scale and rapid changes in the way we use and manage our land, requiring the movement of appropriate land out of farming, expanding Scotland's forestry and woodlands, and protecting its peatland areas.

2.2 National Planning Framework 4

National Planning Framework 4 (NPF4) was formally adopted by the Scottish Parliament in February 2023 and is Scotland's most ambitious NPF to date with regard to tackling the climate emergency. Policy 1 of the NPF4, which in turn shapes the document as a whole, is worded as follows:

"When considering all development proposals significant weight will be given to the global climate and nature crises"

The intent behind this policy is to encourage, promote and facilitate development that addresses the global climate emergency and nature crises.

NPF4 Policies that are of specific relevance to the LDP2 Policies covered by this Supplementary Guidance are listed in the table below. This is not an exhaustive list of policies that will be applied in the assessment of renewable energy developments.

Policy Name	Policy Intent
Policy 2 – Climate mitigation and adaptation	To encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change.
Policy 11 – Energy	To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage (CCUS).
Policy 13 – Sustainable Transport	To encourage, promote and facilitate developments that prioritise walking, wheeling, cycling and public transport for everyday travel and reduce the need to travel unsustainably. (This includes proposals for electric vehicle charging infrastructure and electric vehicle forecourts, especially where fuelled by renewable energy).
Policy 19 – Heat and cooling	To encourage, promote and facilitate development that supports decarbonised solutions to heat and cooling demand and ensure adaptation to more extreme temperatures.
National Development 2 – Pumped Hydro Storage *Location: All Scotland*	This national development will play a significant role in balancing and optimising electricity generation and maintaining the operability of the electricity system as part of our transition to net zero. This is necessary as we continue to move towards a decarbonised system with much more renewable generation, the output from which is defined by weather conditions.
National Development 3 – Strategic Renewable Electricity Generation and Transmission Infrastructure *Location: All Scotland*	This national development supports renewable electricity generation, repowering, and expansion of the electricity grid. The following classes of development are designated as national development: • Onshore electricity generation, including electricity storage, from renewables exceeding 50 megawatts capacity. • New and/or replacement upgraded onshore high voltage electricity transmission lines, cables and interconnectors of 132kv or more. • New and/or upgraded infrastructure directly supporting onshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations. This designation means that the principle of the development does not need to be agreed in the planning application process, providing more certainty for communities, business and investors.

2.3 Draft Energy Strategy and Just Transition Plan (2023)

The Draft Energy Strategy and Just Transition Plan (ESJTP) was published by Scottish Government in January 2023. It sets out a plan to transform the way that Scotland generates, transports and uses energy in order to seize the opportunity this presents and deliver maximum benefits to Scotland's people, workers, communities and economy from the country's vast renewable energy resource.

With regards to energy, some of the key ambitions to be achieved by 2030 include significantly increasing domestic production of renewable energy and ensuring that Scotland's main energy-using sectors – heat in buildings, transport, industry and agriculture – will be using energy more efficiently, and that the energy they do use will be largely decarbonised.

This is also Scotland's first draft Just Transition Plan, and its purpose is to:

- maximise the economic benefits of Scotland's transition to net zero, including ensuring a pipeline of skills for net zero jobs;
- ensure fair distribution of opportunities, benefits and risks, including consideration of community benefits, and how to adapt to the impacts of climate change; and
- ensure an inclusive and fair process via co-design with stakeholders, trade unions and the public.

Annex G of the Draft ESJTP includes a draft Solar Vision for Scotland. It is expected that this will progress further, and any available information is likely to be relevant to energy developments.

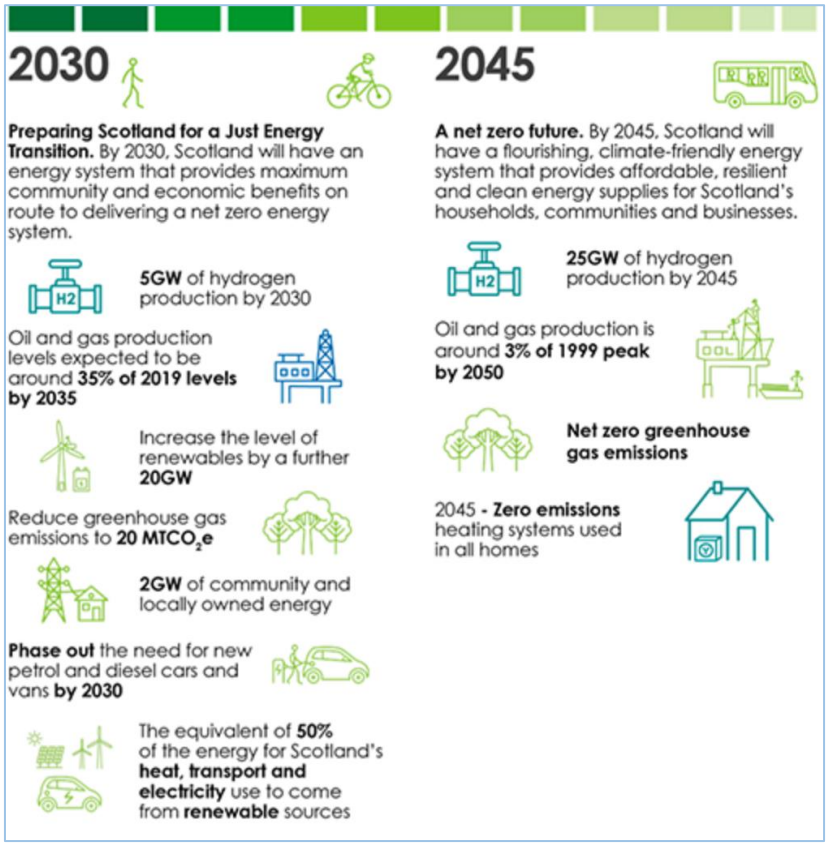


Figure 2: Delivering the net zero vision, Draft Energy Strategy and Just Transition Plan

2.4 Onshore Wind Policy Statement (2022) and Onshore Wind Sector Deal (2023)

The Scottish Government's 2022 Onshore Wind Policy Statement (ONWPS) sets a headline ambition for a minimum installed capacity of 20 gigawatts of onshore wind in Scotland by 2030. The associated Onshore Wind Sector Deal sets the ambition for how the aims of the ONWPS will be delivered in Scotland.

The ONWPS highlights the environmental considerations around onshore wind developments and the need to achieve balance and maximise benefits. The Scottish Government recognises that whilst onshore wind will remain an essential part of Scotland's energy mix, there is also a concurrent nature crisis: onshore wind farms must strike the right balance in how land is cared for and used.

Therefore, the Scottish Government expects the onshore wind industry in Scotland to take up the following challenges:

- Showcase considered schemes that will not just mitigate impact but also improve and enhance our natural environment - identifying opportunities to secure positive outcomes for peatlands, forestry and biodiversity.
- Embrace bespoke management plans which incorporate industry-wide advances in thinking as well as site-specific knowledge to ensure the optimum outcome.
- Actively engage with relevant authorities, agencies and government to ensure effective collaboration as we work together to support our net zero and nature ambitions[1].

There is also an expectation that communities across Scotland will feel the benefits of a just transition to net zero and that all onshore wind developments in Scotland will support national and local supply chains. Ambitions for delivering on this are set out in the Sector Deal.

2.5 Heat in Buildings Strategy (2021)

The 2021 Heat in Buildings Strategy outlines how the Scottish Government intends to reduce greenhouse gas emissions from Scotland's homes, workplaces and community buildings and to remove poor energy performance as a driver of fuel poverty. To meet these objectives, the Scottish Government is supporting a place-based, locally-led and tailored approach to heat decarbonisation and energy efficiency. The vision is that by 2045, Scotland's homes and buildings will be cleaner, greener and easy to heat.

[1] Scottish Government: Onshore Wind Policy Statement 2022, page 49

The key element of the approach is targeted, area-based schemes led by local authorities: **Local Heat and Energy Efficiency Strategies (LHEES)**. The aim of an LHEES is to set a framework and delivery programme for how each local authority will reduce the energy demand and decarbonise the heat supply of buildings in their area. As per Policy **PROP6** of the Local Development Plan 2, once the LHEES has been published, consideration will be given to taking relevant parts of it into Supplementary Guidance. It will also be used to inform the next Local Development Plan (LDP3).

2.6 Community Benefits

The Scottish Government have made a commitment to maximising the benefits to communities and regions, with an ambition of 2 gigawatts of community and locally owned renewable energy by 2030. Developers are being encouraged to offer community benefits and shared ownership opportunities as standard on all new renewable energy projects - including repowering and extensions to existing projects. The Onshore Wind Sector Deal sets out the ambition to foster collaboration between the Scottish Government, industry and local communities, to ensure that onshore wind projects nurture sustainable growth and economic prosperity. The Deal aims to secure benefits for Scotland's supply chain, skills sector and the circular economy[2], as well as offering community benefits and practical routes to shared ownership[3]. More information on the opportunities available to communities in the ownership and management of renewable energy projects can be found in Appendix I. The Council's preferred approach to community benefits is set out in separate non-statutory planning guidance.

2.7 East Ayrshire Council Climate Change Strategy

The Council's Climate Change Strategy has the following objective regarding energy:

"Reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies".

The **Community Renewable Energy (CoRE) project**, part of the Ayrshire Growth Deal, is East Ayrshire's flagship response to climate change. CoRE's vision is that Ayrshire will become an exemplar for transitioning to a low-carbon society, through repurposing assets and natural resources to produce energy self-reliant communities, such as extracting heat from underground mine waters and harnessing excess wind energy. The CoRE project will deliver two key packages of work:

[2] Scottish Government: Onshore Wind Sector Deal for Scotland 2023, page 6
[3] Ibid, page 9

1. Construction of a Centre of Excellence in Cumnock, which will be used by academic Partners to develop renewable and sustainable technologies. The Centre will also be used to deliver training, skills and STEM education programmes, to up-skill the local community so they are positioned to contribute to the net-zero transition.
2. Deliver a series of Demonstrator Projects to help and encourage our communities to make changes to their lives in order to transition to low carbon and meet national targets for climate change. The Demonstrator Projects will showcase examples of successful transitions to net zero in critical areas such as housing, transport, and energy generation. These projects will provide practical examples of how communities can effectively embrace low carbon and renewable technologies.

2.8 East Ayrshire Local Development Plan 2

In line with National Planning Framework 4, Local Development Plan 2 places strong overall emphasis on tackling the dual climate and nature crises.

2.8.1 Spatial Strategy

Policy SS1 states that when considering all development proposals, significant weight will be given to the Global Climate Emergency. All development should support these aspirations, where possible, by:

(i) Minimising carbon emissions;
(ii) Maximising carbon storage and sequestration;
(iii) Mitigating the impacts of climate change; and
(iv) Being designed to be adaptable to the future impacts of climate change.

Section 3.5 of the Spatial Strategy sets out the Council's key priorities for land use and development relating to energy and climate resilience. The Plan will:

A. Enable the transition to a low carbon energy system;
B. Protect and enhance our peatland, recognising their importance for carbon retention and nature;
C. Protect our communities from the risk of flooding and seek creative ways to alleviate flood risk to unlock potential development sites; and
D. Support woodland creation, increasing tree planting in the right places.

In addition, **Policy PROP5** and **Policy PROP6** reiterate the Council's commitment to developing both the regional Ayrshire Energy Masterplan and an East Ayrshire-wide LHEES; relevant parts of the LHEES will (i) be taken forward into supplementary guidance to support implementation and (ii) be used to inform work on LDP3.

Policy SS12 states that the Council will support proposals for renewable energy or renewable heat developments on underutilised land within settlements, in particular:

- The use of green and blue spaces as low carbon heat sources, heat storage sites and heat transmission corridors (provided there are no unacceptable negative impacts on overall use or environmental quality);
- The use of sites on the vacant and derelict land register, or other brownfield sites, for renewable energy/heat generation or storage.

2.8.2 Policy RE3: Low and Zero Carbon Buildings

The **CoRE project**, being undertaken as part of the Ayrshire Growth Deal, will place East Ayrshire at the forefront of creating low carbon communities. The LDP2 therefore encourages all developers to be ambitious in their approach to minimising the carbon emissions that their development will create.

As per policy RE3, proposals for all new buildings will have to demonstrate that at least 15% of the overall reduction in carbon emissions as required by Building Standards will be achieved by the installation and operation of LZCGTs (low and zero carbon generating technologies).

The minimum 15% reduction target will be reviewed two years after adoption of the local development plan to identify a rising target. The revised target will then be published in an updated version of this supplementary guidance.

Policy RE3: Low and Zero Carbon Buildings
Development proposals for all new buildings will be required to incorporate low and zero carbon generating technologies (LZCGTs) to reduce greenhouse gas emissions and contribute to national climate change targets.
Proposals for all new buildings will have to demonstrate that at least 15% of the overall reduction in carbon emissions as required by Building Standards will be achieved by the installation and operation of LZCGTs. The minimum 15% reduction target will be reviewed two years after adoption of the local development plan to identify a rising target. The revised target will be published in the Energy and Electric Vehicle Charging Supplementary Guidance.
This requirement will not apply to:
(i) Alterations and extensions to buildings;
(ii) Change of use or conversion of existing buildings;
(iii) Ancillary buildings that are stand-alone and have an area of less than 50 sqm;
(iv) Buildings which will not be heated or cooled, other than heating to protect from frost; or
(v) Temporary buildings that have an intended life of less than two years.
Compliance with this policy will require the submission of an Energy Statement, showing clearly which low and zero carbon technologies will be used and how their use will reduce the carbon emissions by at least the 15% required. The Energy Statement should have input from a suitably qualified energy assessor. The Council's building standards section will have a role in assessing the energy statement to ensure compliance with this policy.
Developers are encouraged to contribute further to carbon reduction targets by achieving higher sustainability standards, such as Passivhaus standard or a high BREEAM score.

2.9 Summary

The overarching East Ayrshire Spatial Strategy, coupled with all of the national and local plans and strategies summarised in this chapter, together make up the context in which the Council is operating when considering development proposals covered by the following four policies and thus included in this Supplementary Guidance:

Policy RE1: Renewable Energy

Policy RE2: Heating and Cooling

Policy RE3: Low and zero-carbon buildings

Policy T5: Charging Infrastructure for electric vehicles

3. Wind Energy Development (assessed under policy RE1)

Policy RE1: Renewable Energy
Proposals for the generation, storage and utilisation of renewable energy, including proposals for the co-location of these technologies, in the form of new build development, infrastructure or retrofit projects are encouraged and will be supported in standalone locations and as integral parts of new and existing developments, where they are acceptable when assessed against all relevant criteria set out in the Renewable Energy Assessment Criteria table below.
The criteria will be considered in terms of the impacts of the development itself and the cumulative impacts arising when the proposed development is considered alongside other developments.
Areas identified for windfarms are expected to be suitable for use in perpetuity.
To maximise renewable energy generation, proposals to re-power or extend existing renewable energy developments will be supported, where they are acceptable when assessed against the Renewable Energy Assessment Criteria table below.
All applications for renewable energy proposals should be accompanied by detailed supporting information to allow a detailed assessment to be made against the criteria, both in terms of the impacts of the development itself and the cumulative impacts when considered alongside other developments.
Energy and Electric Vehicle Charging Supplementary Guidance supports the policy, explaining in greater detail the criteria that will be used to assess renewable energy proposals.
Note: *This policy applies to all types of renewable energy development proposals, with the exception of heat and energy from waste.*

3.1 Wind Energy in East Ayrshire

Wind energy has become a major land use in East Ayrshire and wind turbines have become a notable feature within the landscape. The growth of the sector is clear from the statistics below (as at 22/02/2024):

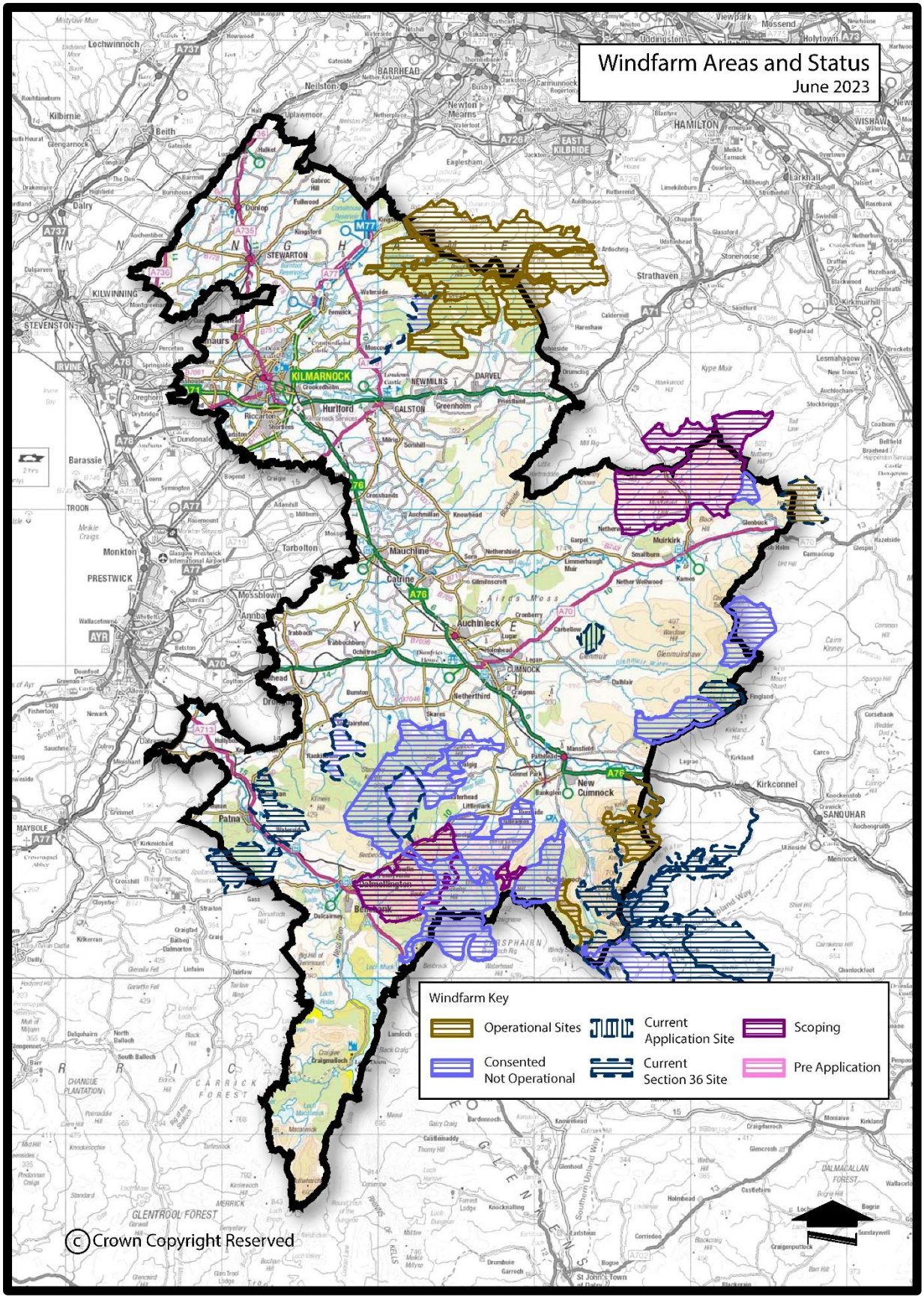
- 100 of the 215 turbines that make up Whitelee wind farm fall within East Ayrshire
- The Hare Hill wind farm and extension has 52 turbines within East Ayrshire, that form part of the backdrop to New Cumnock
- Afton Wind Farm is a 25-turbine development on the southern boundary of East Ayrshire, 5.7km south of New Cumnock
- A further 4741 hectares of land is consented for future onshore wind development on sites between New Cumnock and Dalmellington (South Kyle; Enoch Hill; Pencloe)
- 3679 hectares are consented for development on sites between Dalmellington and Cumnock (Over Hill; North Kyle; Polquhairn)
- 1782 hectares are consented for development on sites to the south eastern edge of the council boundary (Penbreck; Lethans)

Stage of development	No. of developments	No. of turbines	Generating capacity (MW)
Approved or operational	19	422	Up to 17,000
Applications under consideration (planning and S36 applications, incl. where appeals lodged)	14	66	137
Proposals at pre-application or Scoping stage	3		119

Table 1: Developments and proposals in excess of two turbines, as at 22/02/2024

Spatially, there is a clear pattern of development across East Ayrshire linked to the landscape form, its height and the associated wind speeds. The East Ayrshire landscape is characterised by a broad upland arc running around its eastern and south-eastern edges, which extends into neighbouring South Ayrshire, South Lanarkshire, Dumfries and Galloway and East Renfrewshire. Whilst the upland areas display distinct variations in terms of landform and scenic qualities, in general terms they form large-scale, sparsely-settled landscapes, typifying the kind of landscapes that are most commonly associated with wind energy. In contrast, much of the north and western sections of East Ayrshire form a traditional lowland landscape interspersed with river valleys, which provides a smaller scale, intimate landscape that for the most part does not lend itself to large-scale wind energy development. As a result, pressure for wind energy is clearly centred on the upland areas around the southern and eastern rim of East Ayrshire. **Figure 3** is a visual register of wind energy developments and proposals within East Ayrshire. The visual register is available on the Council's website and is updated monthly.

Figure 3: Windfarm areas and status in East Ayrshire (June 2023). ©Crown Copyright Reserved.)



3.2 Renewable Energy Assessment Criteria: wind energy developments

All wind energy developments larger than domestic scale will be assessed under Policy RE1 of the Local Development Plan. This means that they will be assessed against the Renewable Energy Assessment Criteria, which are listed on page 143 of the Plan and discussed in detail in this chapter.

Development proposals over 50 MW are assessed by the Scottish Government Energy Consents Unit, and the Council will be a statutory consultee. In this case, accordance with the Criteria will inform the Council's consultation response.

PLEASE NOTE: All applications will need to meet the statutory requirements for planning applications, including **location plan, site plan and scaled plans and elevations** of any equipment, buildings, and all associated infrastructure to be installed. Many renewable energy developments will also require submission of a **Design Statement.**

3.2.1 Climate Change Impacts:

- **Scale of contribution to renewable energy targets;**
- **Effect on greenhouse gas and carbon emissions**

The Scottish Government has set ambitious targets for the generation of renewable energy. **All proposals should provide details of the extent to which the turbines will help to meet government targets for renewable energy generation**. Subject to meeting environmental criteria and all relevant LDP2 policies, the Council will be in favour of renewable energy proposals which contribute to the reduction of greenhouse gas emissions and meet the Scottish Government's targets in this regard.

NPF4 policy 5 and LDP2 policy NE11 allow for renewable energy developments on peatland, carbon-rich soils and priority peatland habitats. At the same time, this must be balanced against the role that Scotland's peatland soils play in driving towards a low carbon future: the carbon stored in Scotland's soils is equivalent to over 180 years of greenhouse gas emissions from Scotland at current emission rates. As per NPF4 and LDP2 policy NE11 where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site-specific assessment will be required to identify, among other criteria, the likely net effects of the development on climate emissions and loss of carbon.

In order to demonstrate fully how a proposed development will effect overall carbon emissions, and comply with policy RE1, applications should be accompanied by an estimate of the total annual and lifetime CO_2 savings that would be derived from the proposal. This should be weighed against the carbon

footprint associated with all elements of the wind energy developments construction, in order to indicate the 'CO_2 payback period' i.e. the time required for the development to generate enough electricity to offset its own carbon footprint. In order to make this assessment, applications should be accompanied by evidence that the proposal has been assessed for carbon losses and savings – the Council would encourage use of the Scottish Government's Carbon Calculator tool[4].

Scotland's soils contain more than 3,000 megatonnes of carbon, making soils the main terrestrial store of carbon. Peatlands hold most (53%) of our carbon store. A further 50 megatonnes of carbon is locked in Scotland's vegetation – most of it is held in natural woodland and forest, which covers more than 1.3 million hectares in Scotland (16% of the total land area)[5]. Where the proposal will affect established peatlands or woodland/forestry, the Council will expect the CO_2 payback period to take into account the carbon losses resulting from the loss of peat or woodland/forestry. Carbon losses arising from the disturbance of the peat must be balanced against the carbon gains that would come from the renewable energy output of the proposed wind energy development.

Subject to the above comments, the Council will be supportive of proposals which contribute to the Scottish Government's renewable energy targets where the proposals comply with relevant National policy and regulations (which will be a significant consideration in the assessment of any proposal).

The following resources may be of use to potential developers:

- 2016 Carbon and Peatland Map
- Calculating Carbon Savings from Wind Farms on Scottish Peatlands

[4] The Carbon Calculator tool is currently being reviewed by Scottish Government, as at July 2024. It is recommended that potential applicants remain up to date with the progress and outcome of ths review.

[5] Managing nature for carbon capture | NatureScot

3.2.2 Environmental Impacts:

*Depending on the outcome of a screening request, an **Environmental Impact Assessment** may be required for major development under the Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017. Many of the issues covered in this Environmental Impacts section will be explored as part of the wider EIA process.*

Significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/or appropriate design mitigation has been applied, they will generally be considered to be acceptable.

As part of the application process, a detailed **Landscape and Visual Impact Assessment (LVIA)** should be prepared to clearly demonstrate the landscape and visual effects of any proposal. Landscape impacts comprise the potential change that will take place to the physical landscape, including impact on landscape character and impact on prominent landscape features and their setting. Visual Impact Assessments consider the potential changes to available views in a landscape that will arise as a result of a development proposal and the resultant effect on visual amenity and peoples responses to such changes.

The impact of **turbine lighting** should be considered within the LVIA process. Turbines in excess of 150 metres, and in some cases smaller than this, are required to have lighting for aviation safety purposes. When such lighting is required, the potential effects should be fully examined and steps taken to minimise the landscape and visual impacts. This should include an assessment of Cumulative Night-time Lighting in order to accurately demonstrate the effects of lighting during the hours of darkness. Photomontages should be submitted, along with accurate explanations of the lighting levels that are modelled in the photomontages. Comprehensive information should be provided. Developers should also undertake analysis of the cumulative impact of lighting from other wind farms in the area.

The effects of turbine lighting are likely to be more significant in areas with less existing artificial lighting, such as the Dark Sky Park and Wild Land area. In these areas, it should be demonstrated that the proposal will not have an unacceptable significant adverse impact on the qualities of Wild land, the quality of the Dark Sky or the operation of the Dark Sky Observatory should it be re-built. Should any impact be identified, possible mitigation measures should be explored. Any proposal within the Dark Sky Park and surrounding transition zone should take account of the Council's Dark Sky Park Lighting Supplementary Guidance.

A **Zone of Theoretical Visibility (ZTV) map** should be used as a starting point to identify appropriate locations for viewpoints, selecting points where the development is likely to be most visible and where there are appropriate receptors. The list of viewpoints must be agreed with the Council and, in respect of large scale schemes, should be subject to consultation with NatureScot and, if appropriate, neighbouring planning authorities. Therefore, early discussions with NatureScot and the Council's specialist Development Management Energy Team are encouraged. Viewpoints should comprise a variety of local and long range views and should include, but not be restricted to, the following receptors:

- Settlements from where the development will be visible;
- Important heritage designations, including listed buildings, scheduled monuments and designed gardens and landscapes where their setting may be affected;
- Strategic walking routes (including the Southern Upland Way and the River Ayr Way), core paths and rights of way;
- Landmark Hills comprising Auchenroy Hill, Benquhat Hill, Blackcraig Hill, Craigbraneoch Rig, Hare Hill, Corsencon Hill, Wardlaw Hill, Cairn Table, Blackside, Loudoun Hill and Carrick Forest Hills;
- Wild Land (Merrick) and Local Landscape Areas;
- Tourist Routes, A Roads and other relevant local roads; and
- Gateways into East Ayrshire

All proposals will be required to consider fully the **landscape impacts**. The applicant should be able to demonstrate an understanding of the key sensitivities of the landscape area in which their development is proposed and show how they have responded to these sensitivities in their site selection and design process. The relevant LDP2 policies are: **NE1**; **NE2** and **NE3**. As per Policy NE2, any proposals for renewable energy development which may impact on the Merrick Wild Land Area must be accompanied by a **wild land impact assessment** which sets out how design, siting or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements, where appropriate.

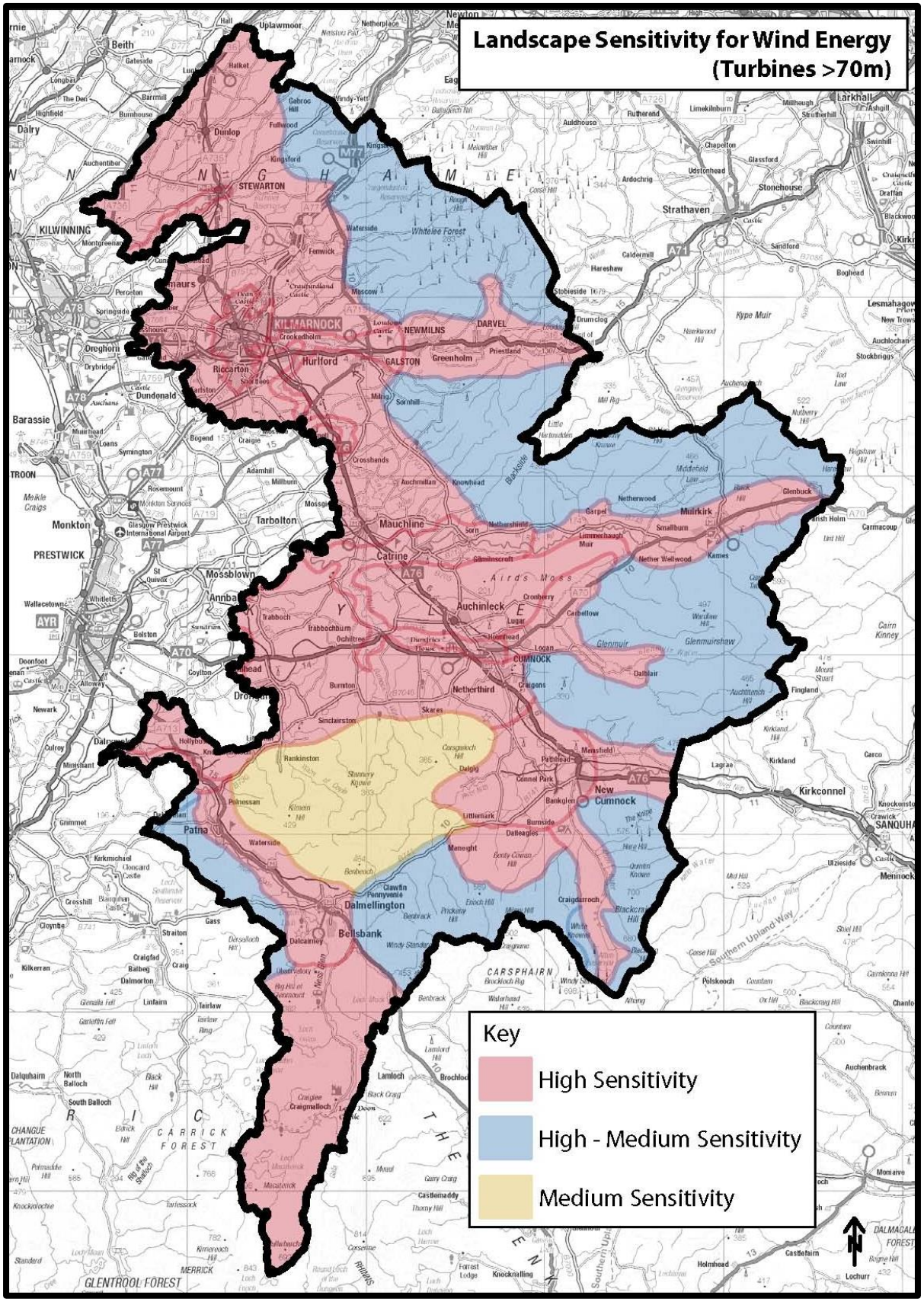
East Ayrshire Council has approved as non-statutory planning guidance a landscape capacity study for wind energy development. The guidance is a material consideration in the determination of planning applications and the Council will use the landscape sensitivity maps and detailed sensitivity assessments within the landscape capacity study to help assess all applications for wind energy development. Although the Study was last reviewed in 2018, many of the findings and advice set out within it are still applicable to current developments and thus it remains a relevant document. The landscape capacity study must however be supplemented, through the LVIA, by more detailed site specific information submitted by the applicant, which will fully demonstrate how the specific development fits into the landscape of East Ayrshire (see Figure 4). When viewed together, Figure 3 and Figure 4 show that much of the area with the lowest landscape sensitivity already has consented schemes within it, whilst there is also considerable existing and proposed development in the blue area of high-medium sensitivity. This means that finding suitable capacity for new wind energy developments which are compatible with East Ayrshire's landscape is becoming more challenging – future proposals will need to be carefully planned and assessed in terms of layout, size and relationship with other schemes.

NatureScot has prepared the following guidance in relation to expressing and assessing the landscape impacts of wind energy developments:

- Siting and Designing Wind Farms in the Landscape
- Visual representation guidance for onshore and offshore wind farm applications.

Please also refer to the later section on Cumulative Impacts

Figure 4: Landscape Sensitivity for turbines >70 metres. ©Crown Copyright Reserved



Effects on biodiversity, including birds, with particular reference to European sites and other national and local designations

East Ayrshire benefits from significant areas of recognised biodiversity value, which include a Special Protection Area and Special Areas of Conservation (commonly known as European sites). Policy NE5 confirms a presumption against development that could adversely impact European sites. Under the provisions of the relevant Habitat Regulations, where a proposal may impact on a European site, the competent authority (either East Ayrshire Council, or Scottish Ministers if the application is determined by the ECU) will be required to carry out a **site based Appropriate Assessment**. The applicant will be required to provide sufficient information to enable the competent authority to conduct such an assessment. Development will only be approved if the assessment shows there will be no adverse effect on the integrity of the site.

In the event that an assessment is negative with regards to impacts on European sites, development would only be supported under the Regulations if the competent authority are satisfied that:

- There are no alternative solutions; and
- The plan or project must be carried out for imperative reasons of overriding public interest.

Should these tests be satisfied, the competent authority are required to ensure that any necessary compensatory measures are taken to ensure that the overall coherence of the UK's European Site Network is protected.

East Ayrshire hosts approximately 20 Sites of Special Scientific Interest (SSSIs), hosting a variety of habitats and species. The SSSI's, as well as other designations can be viewed at East Ayrshire Mapping. As per policy NE5, development affecting a SSSI will only be supported where it will not adversely affect the integrity of the area or the qualities for which it has been designated or where any significant adverse effects on the qualities for which it is designated are clearly outweighed by social, environmental or economic benefits of national importance.

Outwith the above recognised areas, developers will be expected to fully assess the natural attributes of the sites in terms of biodiversity and to assess the impact of the proposal on existing habitats and species. This should include consideration of the impact on locally designated sites, including local nature conservation sites (LNCS), local geodiversity sites and local nature reserves. As far as possible, mitigation measures should be identified for any predicted adverse impacts.

As per development plan Policy NE4, development proposals for national or major development or development that requires an environmental impact assessment (EIA) will only be supported by the council where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks, so that they are in a demonstrably better state than without intervention, including through future management. This is particularly pertinent to wind energy proposals in the context of the aspirations of the Onshore wind policy statement, as set out in section 2.4 of this guidance. The Scottish Government has produced **draft planning guidance on biodiversity**, which should be taken into consideration in all proposals.

Wind energy developments can present particular risks to birds and bats, through displacement, collision with turbine blades or direct habitat loss through the construction of wind energy infrastructure. The RSPB has prepared a map indicating onshore wind opportunity, showing sensitivities and constraints. Developers are encouraged to consider this map during initial site assessment for any wind energy proposals. It is however important to note that this tool is not exhaustive, and its use does not negate the need for more detailed, site-specific assessment in order to understand the likely impacts for specific species and habitats, particularly where pressures may be high. An assessment of the potential impacts that a wind energy development may have on birds should be included as part of the application submission, in line with guidance published by NatureScot.

NatureScot have developed a suite of advice on the ecological impacts of potential renewable energy developments, available here: Planning and development | NatureScot

Impacts on the historic environment

All wind energy proposals will be required to assess the impact of development on the following historic features, including their setting:

- Listed buildings (see LDP2 policy HE1)
- Conservation areas (see LDP2 policy HE2)
- Scheduled monuments, Historic Battlefields and other Archaeological and Historic Environment Assets (see LDP2 policy HE3)
- Gardens and Designed Landscapes (see LDP2 policy HE4)

A number of factors may be relevant to the assessment of setting, dependent on the site-specific circumstances. Consideration should be given to whether the asset was located specifically to be seen from distance or viewpoints; whether it was intended for the asset to benefit from long ranging views; what its contribution is to the landscape and the effect the surroundings have on the landscape.

Regarding sites of national importance, as per Policy HE3 of LDP2, development that would have an adverse effect on Scheduled Monuments or on their settings shall not be supported unless there are exceptional overriding circumstances. The Council will also seek to protect and conserve the key landscape characteristics and special qualities of sites in the Inventory of Historic Battlefields. There is currently one site within East Ayrshire included on the Inventory; Loudoun Hill to the east of Darvel.

Furthermore, gardens and designed landscapes – grounds consciously laid out for artistic effect – are an important element of Scotland's historic environment and landscape and are often rural or semi-rural in nature. As per Policy HE4 of LDP2, development will not be supported where it will have significant adverse impacts upon the special historical, architectural and landscape interest of both Inventory and Non-Inventory Gardens and Designed Landscapes.

There are a range of non-designated heritage assets and areas of historical interest, which do not have statutory protection, but are nevertheless an important part of the area's heritage. Policy HE3 of the Local Development Plan states that the Council will seek to preserve and protect these sites as far as possible, and that any impacts should be avoided, and where this is not possible, minimised and mitigated. The Council will require wind energy developers to demonstrate that they have considered the impact of their proposal on any non-designated historic assets and their settings.

Developers may consult the West of Scotland Archaeological Service (WOSAS) for further advice. The developer may be required to supply an archaeological evaluation report prior to the determination of a planning application. The Council, in consultation with WOSAS, may apply conditions to protect non-statutory assets as well as statutory ones.

For Historic Environment Scotland (HES) pre-application engagement, please contact: HMEnquiries@hes.scot.
For early consultation with the West of Scotland Archaeology Service (WOSAS), please contact: enquiries@wosas.glasgow.gov.uk

Effects on hydrology, the water environment, flood risk and groundwater dependent terrestrial ecosystems

Wind energy developments require to be carefully considered and monitored especially at construction stage, to avoid any pollution or disruption of watercourses, groundwater and private water supplies and to ensure that the ecological status of waterbodies is not adversely affected. An assessment of both the risks to water quality and any increased risk of flooding as well as any mitigation measures proposed, should be carried out through the EIA process, or if there is no EIA then through a hydrology study, and will be subject to detailed consultation with SEPA and NatureScot.

The water environment includes rivers, lochs, burns, groundwater resources (including acquifers) and reservoirs. During the assessment process, the applicant will be required to demonstrate that the design process (inclusive of ancillary works) of the wind energy development has made a concerted effort to leave the water environment (including the natural flow of the water throughout the site) in its natural state. As a general rule, all turbine bases and associated infrastructure should be set back a minimum 50 metres from watercourses.

Furthermore, surface water within the site should be controlled at source and the inclusion of construction SUDS should be used where necessary.

It should also be ensured that any engineering works, e.g. culverts, bridges, water course diversions, bank modifications, dams and so on, are avoided unless there is no practical alternative. In situations where a watercourse crossing cannot be avoided, the developer should ensure that bridging solutions or bottomless or arched culverts, which do not affect the bed and banks of the watercourse, are used. The developer should refer to SEPA's engineering guidance pages for more information.

The Water Framework Directive specifically protects Groundwater Dependent Terrestrial Ecosystems (GWDTE), which are types of wetland, and groundwater abstractions. In terms of GWDTE, a **habitat survey** should be carried out for the whole site. The guidance document A Functional Wetland Typology for Scotland should be used to identify all wetland areas. National Vegetation Classification (NVC) should be completed for any wetlands identified. If GWDTEs are located within 100 metres of excavations shallower than one metre, such as tracks, roads and cable trenches, or 250 metres from features with excavations deeper than this, then further assessment will be required. The results of this further assessment and proposed mitigation measures should be included in the EIA or appropriate study.

With regard to ground water or acquifer abstractions, these can be disrupted and impacted upon by roads, foundations and other works associated with wind energy developments. To address this risk, all groundwater or acquifer abstractions both within and outwith the site boundary should be identified, risk assessed and any appropriate mitigation measures and contingencies set out.

Further guidance is available from SEPA:

- SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems
- SEPA Guidance Note 4: Onshore Wind Energy Developments

Major development proposals will require a **Flood Risk Assessment** – this will be assessed on a case-by-case basis.

Applicants should also refer to the Guidance for Pollution Prevention. Early consultation is often recommended with the Council's Flood Prevention Officer: enquiries@ayrshireroadsalliance.org and SEPA: planning.sw@sepa.org.uk

Wind energy developments should ensure that there are no unacceptable adverse impacts on Scottish Water telemetry systems and below ground assets, as well as drinking water quality and quantity. Where impacts are anticipated, mitigation measures should be outlined. Scottish Water will be consulted on all applications for wind energy developments. If a Drinking Water Area is present, it may require protection through mitigation actions. Similarly, below ground assets such as water and sewer mains can be affected by heavy construction traffic and may require protection. Scottish Water will be required to be consulted: DevelopmentOperations@ScottishWater.co.uk.

Depending on the size of the site, it may be necessary for developers to apply to SEPA for a construction site licence under the Water Environment (Controlled Activities)(Scotland) Regulations 2011 (as amended) for water management across the whole construction site. Applicants should seek the advice of SEPA directly on relation to this.

Impacts on trees, forests and woodlands

In line with policy NE8 of LDP2, there will be a presumption against the loss of ancient semi-natural woodland; native woodland; ancient and veteran trees; individual trees of high biodiversity value; trees protected by Tree Preservation Orders and hedgerows. The removal of these natural assets will only be allowed where this will achieve significant and clearly defined economic, social and environmental benefits. Where relevant, **tree surveys** should be undertaken and the Council's Senior Arboricultural Officer should be consulted.

Where removal can be fully justified, **compensatory planting and mitigation proposals** will be required, in line with the provisions of the Scottish Government's Policy on the Control of Woodland Removal and the associated implementation guidance. Proposals of this kind should also take account of information contained within theAyrshire and Arran Forestry & Woodland Strategy. The strategy sets out the priorities for woodland expansion within spatially defined landscape zones. These provide a starting point for identifying appropriate sites for compensatory planting. Where woodland is to be removed in Ayrshire and Arran to facilitate development, the first preference should be to replace with onsite planting. Where this is not appropriate, the associated compensatory planting should also be provided within East Ayrshire and if this is not possible within the boundary of Ayrshire and Arran. The Scottish Government Policy on 'The Control of Woodland Removal' recognises the value of woodlands and seeks to reduce the impact of development on woodland resources by requiring compensatory planting for woods lost to development.

Any loss of trees or woodland should be fully quantified in the early stages of a proposal. A **felling permission** may be required from Scottish Forestry, where development involves loss of trees or forestry. Scottish Forestry should also be consulted on the potential loss of any Ancient Semi-Natural Woodland (ASNW).

Wind energy developments that involve the removal of woodland cover will be required to provide a **phased deforestation plan**. This information should be provided, where possible, as part of any application or, where necessary, as part of the environmental impact assessment (EIA). Proposals should pay due regard to the Forestry and Woodland Strategy and should be prepared in consultation with Scottish Forestry.

For guidance on how to manage forest waste removal, please see:

- Joint SEPA, NatureScot and FCS guidance on Use of Trees Cleared to Facilitate Development on Afforested Land;
- SEPA guidance on Management of Forestry Waste

3.2.3 Community and Economic impacts:

Impacts on public access, including long distance walking and cycling routes and scenic routes

An important role of the Local Development Plan is to support the continued use and expansion of East Ayrshire's recreational routes, which are enjoyed by both locals and visitors alike. Wind energy applications should provide an assessment of any potential impacts of the development on any relevant resources associated with outdoor leisure activities, including, but not exclusively:

- The Dark Sky Park;
  - The Galloway Dark Sky Park forms a unique attraction for South West Scotland. Any wind energy proposal within the Dark Sky Park will be expected to demonstrate that the turbines will not have a significant adverse impact on the quality of the Dark Sky at construction, operational and decommissioning stages of the development. Any potential impacts on the Dark Sky area from aviation lighting should also be assessed, to ensure that this does not significantly affect the quality of the night sky in this area.
- Heritage and cultural attractions, and their settings;
- The high scenic and landscape quality of the Irvine and Doon Valleys, Loch Doon and Glen Afton and associated hill tops and viewpoints;
- The nature conservation interests of the Muirkirk Uplands and River Nith areas;
- Important strategic routes, into, out of and through East Ayrshire including the River Ayr Way, the Galloway Tourist Route and the National Long Distance Cycling and Walking Network; and
- The core paths network and rights of way, including end destinations

(See Figure 5; page 30)

Many of these valuable resources are also described in paragraphs 208 – 223 of LDP2

The Galloway and Southern Ayrshire Biosphere is an important UNESCO designation that aims to support the understanding and enjoyment of the area as a world class environment. The boundary of the biosphere is shown on Figure 6 on page 31. Each of the three zones contribute to the overall aims and functions of the biosphere. Where developments are expected to impact on the biosphere designation, the Council expects applicants to consider how their proposals can make a positive contribution to the biosphere, with particular reference to opportunities to increase enjoyment of the area as a world class environment. **(See Figure 5; page 30).**

East Ayrshire's upland areas are an important recreational resource for locals and visitors. A range of formal and informal access routes are supported as well as natural assets found in the landscape such as crags and water bodies, which support a range of pursuits, including walking, mountain biking, climbing and canoeing. The impact of any proposal on the recreational use of the landscape should be considered by the applicant. The applicant should maintain formal

and informal recreational assets and access routes and, where possible, explore whether their development could enhance the recreational use of the site, in recognition that wind energy developments provide good opportunities to enhance outdoor access, such as has been achieved at Whitelee wind farm. Developers are encouraged to incorporate within their proposals, measures to promote their site as part of East Ayrshire's network of recreational routes, including core paths and rights of way. Such proposals will form part of the assessment of the proposal's economic impact.

Impacts on communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker

Wind energy developments, if not carefully sited and designed, have the potential to have a significant impact, both on their own and cumulatively, on the amenity of communities and residents living close by. The Council would recommend that wind energy developers notify as many residents as possible at each stage of the application process. As good practice, the Council encourages developers to notify all residential properties located within 2km of the proposal or within an alternative range appropriate to the geography and location of the specific development. Where properties within 2km are not notified, the Council would expect the applicant to provide reasoned justification for this.

A key role of the planning authority in determining and responding to applications for wind energy developments will be to examine the likely impact on residential amenity, including the cumulative impact on residential amenity. The anticipated impact of the development on the quality of life of local residents will be a significant consideration in the determination of wind energy applications. The Council expects applicants to take a robust and comprehensive approach to assessing how their proposals will impact or otherwise on local communities and residents. Residential amenity will be assessed in terms of four key respects:

Noise:

The noise associated with wind turbines is a common concern raised in relation to wind energy developments. Two distinct types of noise are generated by turbines; mechanical noise, associated with the gearbox and generator and aerodynamic noise, produced by the blades moving through the air.

Any adverse noise impacts, including cumulative noise impacts, are most effectively eliminated through ensuring wind energy proposals are sufficiently remote from communities and residential properties. All proposals for turbines of over 50 metres to blade tip should be accompanied by a full detailed assessment of the noise impacts of the proposal, in line with ETSU-R-97 standards. Applicants should refer to the most up-to-date available guidance on the application of ETSU-R-97[6].. The Council will only support proposals where it can be clearly evidenced that the noise levels will not significantly impact

[6] As at July 2024 this is available here, but is currently undergoing revision.

on residential amenity. As part of any planning consent granted, there may be a requirement, based on the site specific circumstances, for regular noise monitoring to be undertaken for a limited period to demonstrate that the wind energy development is complying with its conditions in terms of noise.

Shadow flicker:

Shadow flicker is caused by low sun passing behind the rotating blades of a turbine. The movement of the turbine blades can cause light and dark shadows to be to be cast over properties, creating a strobe light effect. Where there are window openings in a property, this flickering between light and dark can cause considerable disturbance and annoyance.

Shadow flicker can generally be avoided by ensuring there is an adequate separation distance between turbines and properties. Depending on topography and particular site specific circumstances, careful siting of turbines may be required to reduce or eliminate the potential for shadow flicker. Where shadow flicker is likely to occur, a shadow flicker assessment should be submitted, including mitigation measures that can be implemented to ensure shadow flicker impacts are avoided.

Visual dominance:

Any wind energy development proposed within 2km of a settlement will be required to demonstrate special consideration in respect of the visual impact on the local community. Developers should refer to the relevant maps in LDP2: Volume 2 for the exact settlement boundaries.

As stated in relation to Landscape and Visual Impact Assessment, all proposals for turbines over 50 metres to blade tip should be accompanied by a clear and robust assessment of how the development will be viewed from nearby settlements and other relevant locations. Such locations should be agreed in conjunction with the Planning Authority.

The LVIA should consider fully the visual impact of the proposed development on individual properties within the vicinity of the development, through a Residential Visual Impact Assessment. Whilst no standard separation guidelines are suggested in specific reference to visual impacts, applicants are expected to make a comprehensive assessment of the visual effects of the proposed development on all residential properties within 2km of the proposed turbines. If there is a settlement or cluster of properties within 2km, it will be appropriate to agree representative viewpoints within the settlement or cluster from which to assess visual impact, as opposed to every residential property. The scope of the Residential Visual Impact Assessment should be agreed with the Council prior to it being undertaken.

The Council will only support applications where the applicant can demonstrate that the proposal will not result in a visual impact that is of such a magnitude that the affected properties change from being satisfactory places in which to live, to unsatisfactory places in which to live. This will be an important consideration in coming to a balanced determination on all applications.

Private Water Supplies:

Some individual dwellings have private water supplies (PWS) and these water supplies may be impacted by wind energy development. Proposals should consider any impacts of a development on the quantity and quality of any private water supply assessed to be at risk from the development. Where it can be established that private water supplies will be affected by a development, proposals should be accompanied by a private water supply risk assessment which should clearly show the route of the private water supply from the source to the property/properties and how this relates to the proposed location of the development. It should also include appropriate mitigation and contingency measures commensurate with the assessment of risk for each property. The full and detailed PWS risk assessment should be submitted with the planning application or where requested by the planning authority.

Applicants should also consider the impact of their proposal on common interest communities, such as business, sports or heritage groups. In particular, the impact on any communities that may use sites for outdoor recreation should be examined and proposals should, where possible, minimise any impact on such communities.

Moreover, developments should consider how they contribute positively to social factors which can improve the health and wellbeing of local residents such as:

- Opportunities for good work (this is linked to the criterion below on 'Net Economic Benefit')
- Sustainable transport connections
- Access to natural spaces for leisure and recreation
- Building connected and resilient communities

Developments should also consider how they can mitigate any potential negative impacts on health and wellbeing that may occur due to e.g. increased vehicle traffic during construction and operation and impacts on groundwater supplies and distribution.

Net economic impact, including employment, training and business and supply chain opportunities

National Planning Framework 4, Policy 11 (Energy), section c) states that "development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities".

Wind energy developments have the potential to contribute positively to the local economy, as highlighted by the Onshore Wind Sector Deal. As part of the Sector Deal, work is ongoing to create a framework for maximising socio-economic impact as part of onshore wind projects, and in time this is likely to define many of the relevant considerations within a project which would be subsequently assessed by planning authorities.

As per **Policy SS11** of the Local Development Plan 2, developers applying for planning permission for a major development are required to submit a **skills and employment plan** demonstrating how they will look to provide training / skills and employment opportunities for residents in East Ayrshire.

As a minimum, this should detail:

- Direct job creation associated with construction, operation and maintenance;
- Indirect job creation and supply-chain opportunities for local businesses;
- Wider benefits to the local economy pertaining to any particular recreational / public access features that the proposal may include.

Developers will be asked to provide a post-construction economic monitoring report, demonstrating the actual economic impact of the development. Where justification for a wind energy proposal is in part or in full to financially support a local business, the Council will require full financial details of the proposal and a business plan which shows exactly how the proposal will cross fund and/or be invested into the business, to enable these matters to be assessed and balanced with other benefits and adverse impacts. The Scottish Government remains committed to supporting community and locally owned energy in Scotland, as outlined in their Good Practice Principles for Shared Ownership of Onshore Renewable Energy Developments. The Community and Renewable Energy Scheme (CARES) delivered by Local Energy Scotland offers support to communities and developers interested in shared ownership of a renewable project.

The Council supports the principle of community and shared ownership as a way of helping local communities to tap into and benefit from the wind resource in their local area. In considering a proposal, the socio-economic benefits of a community ownership or shared ownership scheme will be fully taken into account and balanced against all other matters. More information on support available to communities is provided in Appendix I.

Figure 5: Strategic Outdoor Leisure Resources in East Ayrshire

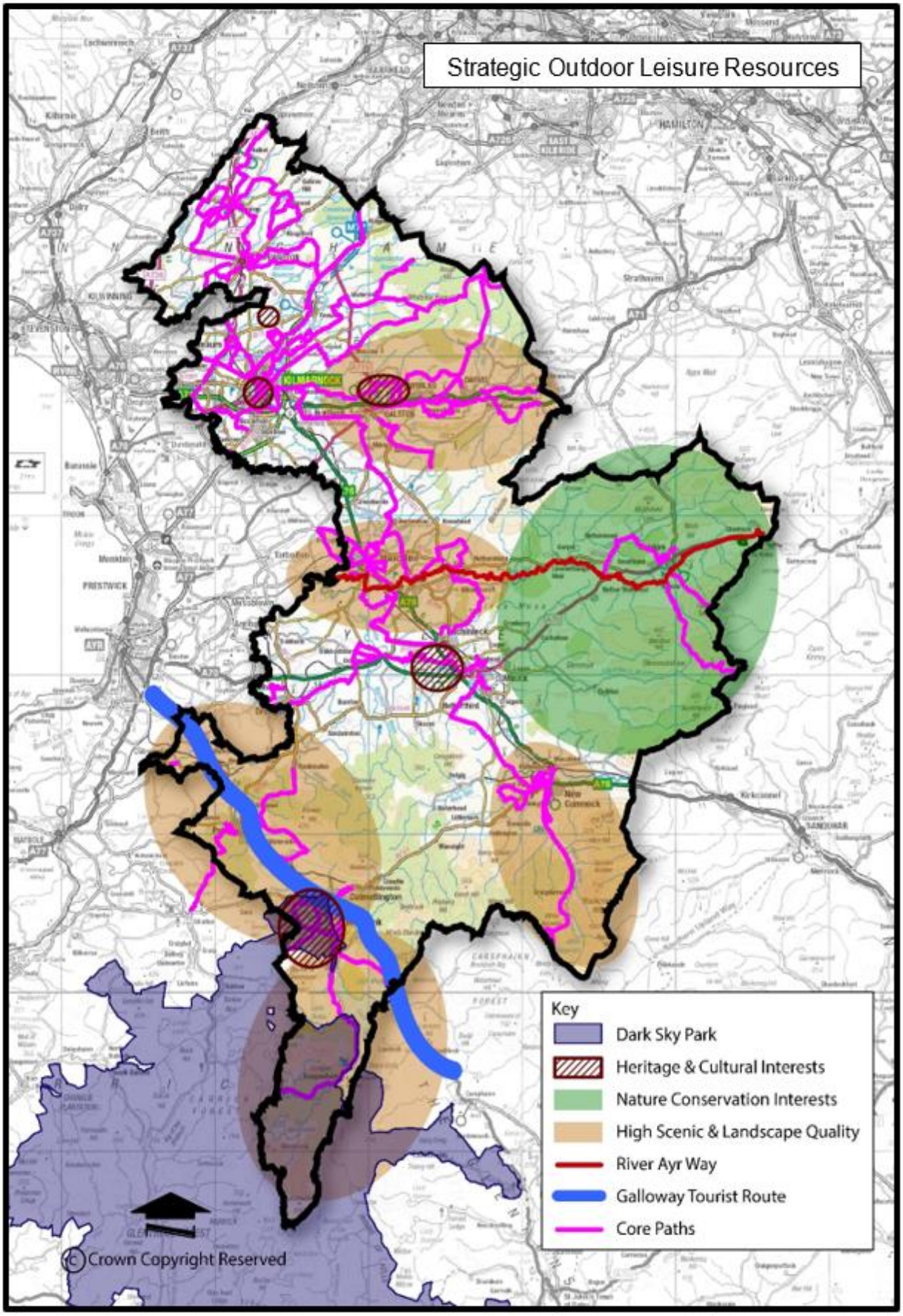
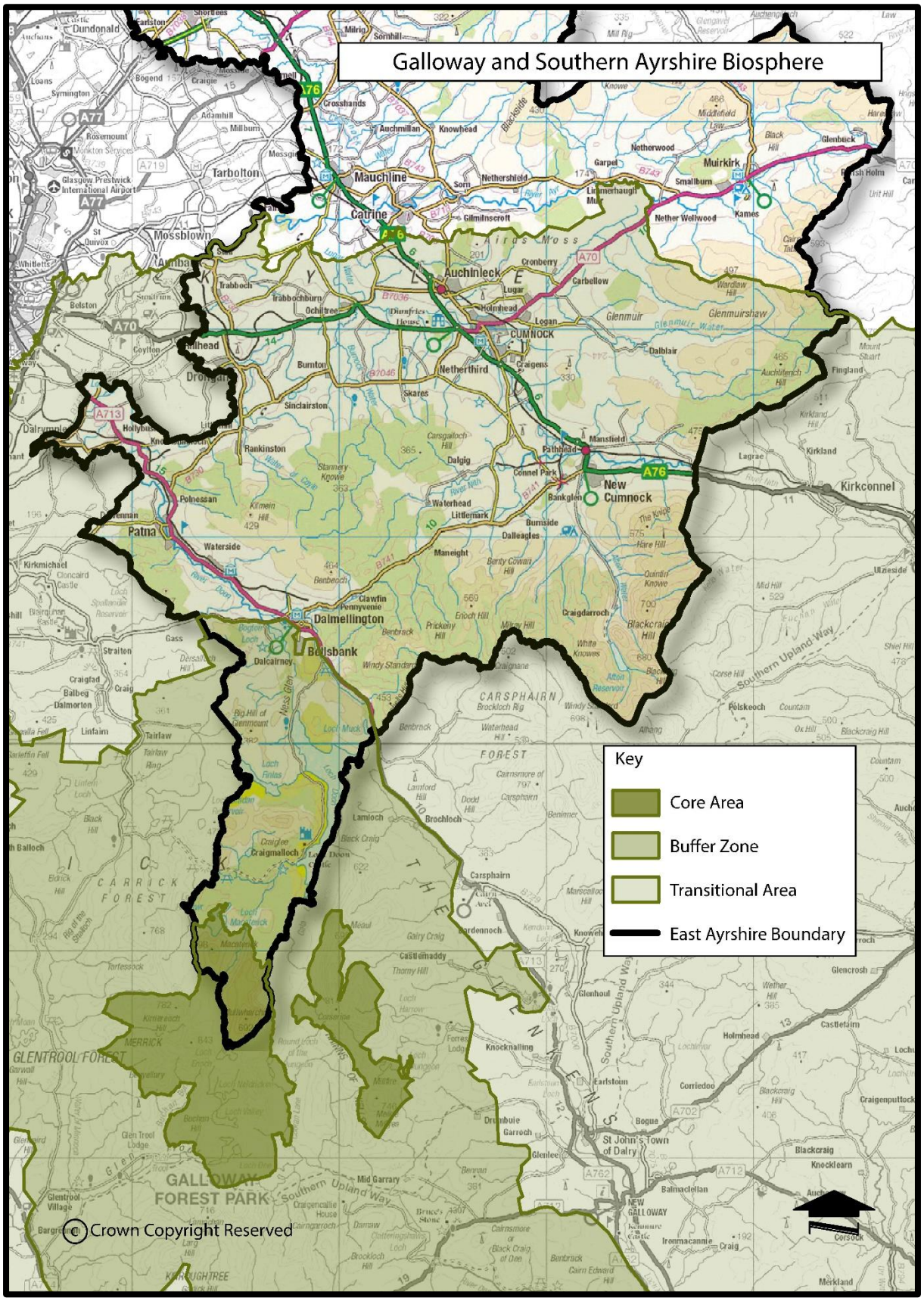


Figure 6: Galloway and Southern Ayrshire Biosphere



3.2.4 Infrastructure impacts:

Impacts on aviation and defence interests and seismological recording

Aviation issues represent major considerations in terms of wind energy development within East Ayrshire. The consultation zone for Prestwick Airport takes in the vast majority of East Ayrshire, with the exception of the southern part of the Doon Valley, whilst the consultation zone for Glasgow Airport takes in the northern part of East Ayrshire.

The presence of Prestwick Airport raises two key constraints in relation to wind energy development in East Ayrshire:

(i) the impact of wind energy on radar equipment – wind turbines can interfere with radar equipment. Significant work and research has been undertaken to develop new technologies to resolve radar issues at Prestwick, which has now allowed several aviation objections to be lifted. All new applications in the consultation zone will need to be considered by Prestwick Airport on a case-by-case basis.

(ii) the controlled airspace - An area around Prestwick Airport, known as the 'Controlled Airspace' is the most critical part of airspace for the airport and is established for the protection of aircraft during the most crucial phases of flights. The Controlled Airspace takes in a large section of East Ayrshire, from the western boundary across to Cumnock to the east, Mauchline to the north and Dalmellington to the south. (Please consult with the Civil Aviation Authority regarding the extent of Prestwick airspace). Prestwick Airport has advised that wind turbines under the controlled air space could compromise the safety of the Air Traffic Service and therefore development in this area may attract an objection from the airport on safeguarding grounds. The airport authority will be consulted on all applications, to assess the impact of turbines on communications, navigation and surveillance systems, on a site specific basis. Whilst the controlled airspace forms a significant constraint to development, the Council will take the advice of Prestwick Airport as to any instances where development can be safely accommodated within the area, including instances where mitigation should be utilised. Any request from the Airport Authority for additional information to ascertain if an objection should be maintained or removed, should be fulfilled by the applicant.

The safety of air travel is considered to be of paramount importance in the assessment of applications for wind energy developments. Developers are expected to engage directly with Prestwick Airport, as well as the other relevant aviation authorities (NERL, CAA, Glasgow Airport, Maritime and Coast Guard Agency and the Emergency Service Helicopter Support Unit) at the early stages of assessing the feasibility of proposals.

<u>Consultations with the Ministry of Defence</u>

The Ministry of Defence will be consulted on relevant applications and should be satisfied that no material impact will occur, or that a technical solution will be put in place to mitigate any issue raised. It is recognised that there are circumstances in which the MOD, or the Civil Aviation Authority will require lighting to be installed on turbines. This should be established prior to submission of an application, so this can be considered as part of the application as a whole. The impact of turbine lighting should be assessed through the LVIA process.

Consultations with Air Traffic Services

Under the Transport Act 2000, the UK Government issued a licence to NATS (En Route) plc (**NERL**) to provide en route air traffic services in the UK. The En-route environment is where aircraft are flying in the cruise mode and are not approaching or departing from airfields. Under the Safeguarding Direction 2002 and the Town and Country Planning Act, NERL is a statutory consultee and as such is required to assess the impact of wind turbines on its technical sites, infrastructure and operations.

NATS (Services) Ltd (**NSL**) are a business that provide air traffic control services at many airports in the UK, alongside a consultation service for prospective windfarm developments. NSL also owns the communication, navigation and surveillance (CNS) equipment which NERL use to provide their services.

NERL provide the en-route air traffic service from their facility, the NATS Prestwick Centre, which is unrelated to the airport operation. The en-route service utilises the following equipment which is of relevance to applications in East Ayrshire: NATS's Lowther Hill radar, the primary radar located at Glasgow airport and potentially the radar at Cumbernauld.

NATS's infrastructure comprises Primary and Secondary Surveillance Radars (PSR and SSR), navigation aids (DVORs) and Air-Ground-Air communication sites (AGA); as such its formal opinion on any impact is solely restricted to these aspects. NATS's position will be unrelated to that of other stakeholders such as Prestwick or Glasgow airport. It should be noted however, that NATS may also utilise third party infrastructure to provide an Air Traffic Control service, and as such may also object on these grounds.

NATS provides a range of wind farm services, including a chargeable pre-planning assessment as well as free self-assessment maps. The Council encourages early investigation into any aviation impact through the use of the self-assessment maps. NATS advice is for developers to familiarise themselves with the aviation aspects of wind farms and to include any evidence of assessments in their documentation.

The Council would advise developers to engage with NERL and NSL should they anticipate any issues, at the earliest opportunity.

Consultations with the Civil Aviation Authority (CAA)

The CAA are the acting authority for aviation in the UK, and are also the economic regulator of NERL (see above). Guidance from the CAA should be sought where developments are at (or near) aerodromes. Prospective developers are encouraged to consult CAP 764: Policy and Guidelines on Wind Turbines. Other than this, there is a suite of guidance on windfarm development available on the CAA website. Where further information is required, the CAA can be contacted at aerodromes@caa.co.uk.

Contact for Prestwick Airport: safeguarding@glasgowprestwick.com

Impacts on trunk roads and road traffic, during construction, operation and decommissioning

During construction, wind energy developments have the potential to generate significant levels of traffic, including abnormal loads associated with transporting the turbine components. The Council expects all proposals to fully consider the impact of the development on East Ayrshire Council's road network and trunk roads in terms of the structural and physical ability of both roads and bridges to accommodate the additional traffic generated and the need to minimise any disturbance to local communities. Cumulative impacts should be fully assessed, in terms of the suitability of roads to accommodate traffic from other development and the need for any subsequent phasing of construction traffic. Should turbine transportation routes require to cross third party land, the applicant should ensure that appropriate agreements are in place to allow access to be achieved.

Early contact should be made with the Ayrshire Roads Alliance in terms of the scope and extent of a **Transport Assessment** and **Construction Traffic Management Plan**, which would be required to address issues such as:

- Site access and parking;
- Anticipated vehicle movements and routes;
- Frequency and volume of deliveries and anticipated heavy loads;
- Transportation of turbines to the site;
- Any phasing of construction traffic;
- Existing public access and details of any diversion of public access (temporary or permanent);
- Possible need for legal agreements.

A separate statutory procedure requires to be followed to allow the temporary or permanent diversion of footpaths. An **Access Management Plan** may be required where rights of way or core paths will be affected.

Ayrshire Roads Alliance (ARA) can be contacted at: enquiries@ayrshireroadsalliance.org

Impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised

Wind energy developments have the potential to impact upon existing broadcasting installations. Applicants should consult with appropriate network operators to confirm the existence of any infrastructure and to assess whether the proposal would be likely to result in any interference to broadcasting. Where any such interference is likely, the applicant should put forward a technical solution to resolve the issue.

The Council may consider the addition of a planning condition to resolve any issues of interference that may occur after construction. Where considered necessary, the impact on the reception of satellite or other TV broadcasts in individual homes should also be assessed.

3.2.5 Other impacts:

Cumulative Impacts

Cumulative impacts are the additional changes caused by a proposed development in conjunction with other developments i.e. the combined impact of more than one development. Cumulative impact assessments most frequently involve landscape and visual impacts as well as natural and cultural assets and aviation interests. They may also be required for noise, shadow flicker and transport. Given the scale of wind energy development proposed in East Ayrshire as well as in neighbouring authorities, the cumulative impact of a proposal is likely to be relevant to all wind energy proposals and increasingly so, as the extent of wind energy developments continues to expand. Specific to landscape and visual impacts, the assessment of cumulative impacts should form a key part of LVIA's submitted alongside any application. Key issues to be addressed in the assessment of cumulative impacts include:

- Accuracy: Given the number of different wind energy proposals moving through the consents procedures, the cumulative impact of developments is continually evolving. In preparing cumulative assessments, therefore, all operational and consented wind energy developments as well as those at the planning and Section 36 application stage should be taken into account. The Council also considers it good practice for applicants to consider other developments in close proximity, where the scoping stage has been undertaken, as these may get to the application stage quicker than the applicants own submission. Whilst it is accepted that these schemes may evolve as they move through the planning system, they are nevertheless relevant when considering cumulative impact.
- Comprehensiveness: Assessment should take account of wind energy developments and proposals in East Ayrshire and surrounding authorities. The cumulative Zone of Theoretical Visibility (ZTV) should consider all such developments/proposals within a 35km buffer of the proposed site.
- Views: Cumulative impact assessment should consider sequential views i.e. an assessment of how views in all directions are affected when travelling through the landscape from both within and outwith East Ayrshire rather than just at one fixed point.
- Other land uses: Cumulative impact should not be limited to other wind energy developments, but should also consider other land use and features, including surface coal mining and overhead transmission lines where relevant

The assessment of cumulative impacts should take on board the guidance and methodologies included within:

- The East Ayrshire Landscape Wind Capacity study, and any update to it, which highlights particular cumulative issues in relation to each landscape character area within East Ayrshire.
- NatureScot's guidance on Assessing the cumulative impact of onshore wind energy developments.

Grid capacity

Grid capacity should not constrain renewable energy development. It is for developers to agree connections to the grid with the relevant network operator. The connection of the wind energy development to the national grid will normally require additional infrastructure to be put in place, by way of underground cabling or overhead power lines. National Planning Framework 4 Policy 11 states that consideration should be given to underground connections where possible.

Grid infrastructure is governed by a separate regulatory process, to the consideration of the windfarm development itself. The relevant District Network Operator (DNO) for Central and Southern Scotland is SP Energy Networks. Early engagement with the DNO regarding grid capacity and the means of connection is strongly encouraged, to inform the progression of a Section 37 application to the Scottish Government via the Energy Consents Unit.

Borrow Pits

There has been a rise in the use of borrow pits within wind energy developments for the extraction of materials to be used in the construction of crane pads, access routes and so on. Borrow pits within a wind energy development site can take up extensive areas and require to be properly assessed as part of the wind energy proposal.

NPF4 policy 33 on Minerals, and Policy MIN7 of the Local Development Plan 2, state that borrow pits will only be supported where: the proposal is tied to a specific project and is time limited; the proposal complies with the above mineral extraction criteria taking into account the temporary nature of the development; and appropriate restoration proposals are enforceable.

The Council is of the view that environmental benefits may ensue due to a reduction in HGV movements transporting to site via local roads. However, the developer will have to fully justify the use of borrow pits within the application in order to satisfy the requirements of NPF4. The EIA report, or otherwise supporting information, should include specific details of borrow pits including location, size, design, volumes, depth, drainage, indicative working method

statement, restoration measures and any proposed habitat or biodiversity enhancements associated with the borrow pits. Restoration measures should also include proposals for temporary access tracks, required for construction, but no longer necessary when the development moves into the operational phase.

The location of borrow pits should take account of any environmental constraints. Borrow pits should be sited well away from watercourses, groundwater abstractions and GWTEs Furthermore, the impact of borrow pits (including dust, blasting and impact on water) must be assessed in accordance with Planning Advice Note PAN50 Controlling the Environmental Effects of Surface Mineral Workings (Paragraph 53).

Siting and design of turbines and ancillary works

In addition to the turbines themselves, wind energy developments routinely comprise additional works, the impact of which will be assessed alongside the impact of the turbines. Such works will commonly include access tracks, borrow pits, temporary construction compounds and sub-stations.

The overall impact of the proposal can be largely influenced by its design; the detailed siting of turbines and ancillary works, the colour, style and size of turbines and any proposed lighting should all be considered. The design of the site should take full account of the land conditions, topography, landscape features and historic environment designations, as well as surrounding uses including existing and proposed wind energy developments. Ground stability, especially in areas where coal or minerals are present or have been previously worked, should be fully considered at an early stage, in order that any implications can then be taken on board in the design process.

In developing proposals, developers should consider the principles and guidance outlined in the NatureScot document Siting and Designing Wind Farms in the Landscape as well as the East Ayrshire Landscape Wind Capacity Study.

The connection of the wind energy development to the national grid will normally require additional infrastructure to be put in place, by way of underground cabling or overhead power lines. Whilst it is recognised that such works fall within a separate regulatory process, applicants should, where possible, demonstrate within their supporting information the likely method of connecting to the grid and the proposed route that this will take, allowing a more comprehensive assessment to be made of the overall impacts of the wind energy development. There is a potential for archaeology to be found when undertaking these works. Advice should be sought from **WOSAS** or, if directly affecting a scheduled monument, **Historic Environment Scotland (HES**).

It is also important for wind energy developers to have waste management measures to deal with any surplus peat. SEPA has advised that landscaping with surplus peat (or soil) may not be of ecological benefit and consequently a waste management exemption may not apply. In addition, the disposal of a significant depth of peat is considered landfilled waste and this may not be consented under SEPA's regulatory regimes.

Consultation with NatureScot may be required. More guidance can be found in their checklist, "How and when to consult NatureScot".

Decommissioning, Restoration and Aftercare (DRA)

Areas identified for wind farms should be suitable for use in perpetuity. Nevertheless, proposals for renewable energy must consider decommissioning and restoration proposals as part of their applications. All applications should be accompanied by a restoration programme outlining, to the satisfaction of the Council, the extent of works that will be undertaken. The DRA programme should include sufficient detail and relate to the turbines, foundations, borrow pits, access tracks and all other associated infrastructure. The DRA will often be secured through an appropriate planning condition and/or Section 75 Obligation. In addition, all decommissioning proposals should consider waste management implications in line with SEPA's requirements:

- Research and guidance on restoration and decommissioning of onshore wind farms: NatureScot Commissioned Report No. 591
- Decommissioning and Restoration Plans for wind farms

In order to ensure restoration and aftercare requirements are met in full, the Council will require financial guarantees to be put in place for wind energy developments of a significant scale and complexity, as per policy **FIN1** of the LDP2. Separate supplementary guidance has been prepared, detailing the Council's requirements for financial guarantees with the overarching purpose of ensuring that guarantees are maintained at a sufficient value over the lifetime of the development. The Council will usually also require proportionate financial guarantees for small and single turbine developments.

Consented wind farms will require to be monitored in compliance with the planning conditions attached to any consent. Paragraphs 291 – 292 of the Local Development Plan 2 set the context for compliance monitoring and should be referred to. The Council will appoint an independent compliance monitoring officer, the Planning Monitoring Officer (PMO), who will be involved in assessing the information submitted for the discharge of the environmental planning conditions and will monitor compliance of planning conditions during the construction of the wind farm and also at the decommissioning and restoration phase of the wind farm. Through the development management process, it will be normal practice for the Council to seek the costs involved in the duties undertaken by the PMO to be met in full by the wind farm developer and the preferred mechanism to achieve this is by way of an obligation secured by legal agreement. Unless otherwise agreed with the Council, the PMO shall visit the wind farm site at least once a month, during construction, and also prepare a monthly compliance monitoring audit 35 report and a quarterly report which shall be circulated to the developer and the Council for approval and will then be published on the Council website.

Should any turbine cease operating and supplying electricity without there being a clear commitment to repair or replace the turbine, the Council will require the turbine to be removed. Unless otherwise agreed with the planning authority, six months is considered a reasonable timeframe in which to either repair or commence removal. Appropriate planning conditions or legal obligations will be put in place to secure this.

Any application for repowering will be assessed against the relevant development plan policies and on the basis of detailed site specific information. The current use of the site as a wind farm will be a material consideration, however, it will be necessary for a full assessment of impacts, including cumulative impacts, to be made, taking particular account of any proposed increase in turbine height and numbers.

3.3 Design principles for small scale wind energy developments

3.3.1 Background

Smaller scale turbines are those below 50 metres in height. This scale of turbine is generally proposed as a single structure, or sometimes in small groupings of two or three turbines. These turbines are generally associated with quite different geographical and topographical areas than the large or medium scale developments, and therefore require a different assessment process.

The East Ayrshire Landscape Wind Capacity Study contains guidance on the opportunities for these types of development in East Ayrshire's respective landscape character areas. All applicants for this scale of development should refer to the capacity study, which is intended to help applicants have regard for local landscape characteristics and features, helping to ensure submitted proposals fit sensitively into the landscape. Although the Study was last reviewed in 2018, many of the findings and advice set out within it are still applicable to current developments and thus it remains a relevant document. Further information can also be found in NatureScot's guidance documents Siting and Designing Windfarms in the Landscape and Siting and Design of Small Scale Wind Turbines between 15 and 20 metres in height.

3.3.2 Categories of smaller turbine

The height of turbines relative to other structures in the landscape is a key consideration in terms of landscape 'fit'. With this in mind, three types of 'smaller' turbines are considered as follows:

- Micro-small — 15 metres and under to blade tip* — *For more information please see Section 4.8
- Small or small medium — 15 – 30 metres to blade tip
- Small-medium or large — 30 – 50 metres to blade tip

The landscape study identifies the character types in which these scales of turbine are likely to be appropriate and outlines the key considerations, relative to the different scales of turbine, which should be taken on board to achieve the best design and landscape fit.

3.3.3 Design considerations

The key design considerations, detailed fully in Annexe F of the landscape capacity study, include:

- Turbine height in relation to the scale of the landscape (e.g. topography; farmland features)
- Existing development pattern
- Landform shape
- Settlement and land use pattern and features
- The visibility of turbines
- Potential cumulative issues (e.g. landscape clutter; relationships with other turbines)

3.4 Wind Energy Developments – Required Information Checklist

All statutory requirements for planning applications, including location plan, site plan and scaled plans and elevations of turbines and all associated infrastructure.
Design Statement
Analysis of how the proposed development will contribute to national renewable energy targets and effect greenhouse gas and carbon emissions
Environmental Statement as required by the Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017 – Dependent on outcome of a screening request.*
Landscape and Visual Impact Assessment, including cumulative assessment in compliance with current NatureScot guidance*
Wild Land Impact Assessment, where impacts on the Merrick Wild Land Area are expected*
Assessment of impact on biodiversity (flora and fauna). Any protected species information must be provided in a confidential annex, clearly marked as such.*
Deforestation phasing plan and details of compensatory planting proposals if the development will remove existing woodlands.
Assessment of the impact on existing peatlands, carbon-rich soils or priority peatland habitat*
Assessment of impact on the historic environment, cultural heritage and archaeology*
Assessment of impact on waterbodies and ground water (including flood risk, wetlands, GWDTE and private water supplies)*
Analysis of any implications for public access or scenic routes
Residential Visual Impact Assessment (this may form part of the LVIA)*
Shadow Flicker Assessment and proposed mitigation scheme*
Noise Assessment, including cumulative assessment*
Details of anticipated economic impact of the proposal and associated benefits for local communities
Evidence of dialogue with the relevant aviation bodies and confirmation of any agreements reached.
Transport Assessment, Construction Traffic Management Plan and Turbine Transportation Plan
Access Management Plan, where rights of way or core paths will be affected
Assessment of impacts on broadcasting installations
Borrow pit scheme and details of import of construction materials
Details of decommissioning (including details of how waste generated through decommission will be dealt with), restoration and aftercare arrangements and confirmation of proposed financial bond

*In many cases, these issues will be explored through the EIA process.

Should the applicant be of the view that any of the above requirements are not relevant to their particular proposals, this should be clearly justified within the submission.

4. Other Renewable Energy Technologies - Developments assessed under Policy RE1

Aside from wind energy developments, which are discussed in detail in Section 3, Policy RE1 of the Local Development Plan also applies to all other type of renewable energy development proposals, with the exception of heat and energy from waste.

Please note: The types of renewable energy technologies detailed in this section are most likely to be assessed under Policy RE1 – however, should they be utilised for heat generation, they will then instead be assessed under Policy RE2.

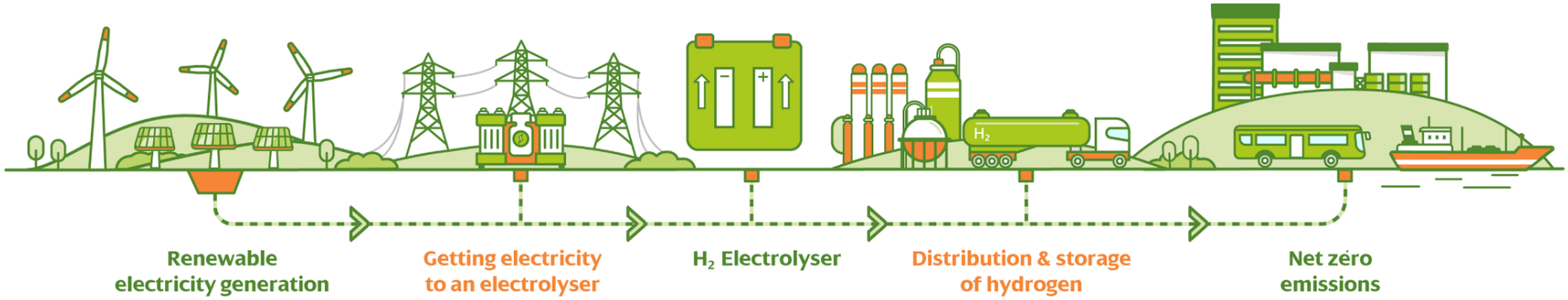
4.1 Hydrogen

The Scottish Government's Hydrogen Action Plan sets out steps to help the emerging hydrogen sector in Scotland achieve an ambition of 5 Gigawatts of renewable and low-carbon hydrogen – equivalent to a sixth of Scotland's energy needs – by 2030. Hydrogen provides a sustainable alternative to burning fossil fuels and can be used to decarbonise e.g. power and heat. Hydrogen is also anticipated to play a useful role in delivering large-scale and long-term energy storage. There are four types of hydrogen production defined in the action plan:

- **Renewable hydrogen (green hydrogen):** produced via electrolysis of water using renewable energy and is zero carbon.
- **Low-carbon hydrogen (blue hydrogen):** produced via reforming natural gas or biogas in conjunction with carbon capture and is very low-carbon.
- **Unabated hydrogen (grey hydrogen):** produced via reforming natural gas. The process produces hydrogen and CO_2 which is emitted to the atmosphere.
- **Biomass gasification with carbon capture and storage for the production of hydrogen:** less developed negative-emissions technology which could become part of the energy mix.

Currently the hydrogen produced in the UK is overwhelmingly grey hydrogen. Therefore there is scope to increase the production of green and blue hydrogen which is zero and low-carbon respectively. Scotland, and East Ayrshire, has abundant onshore wind power which has the potential to support the development of a range of small to large-scale renewable (green) hydrogen projects. The Ayrshire Region has been identified by Scottish Government as a potential location for a Regional Hydrogen Energy Hub that would be host to the entire hydrogen value chain, from production, storage and distribution to end-use. Hydrogen production is already up-and-running at Whitelee Wind Farm. (See also: Section 4.2 Energy Storage)

Green Hydrogen



PLEASE NOTE: The hydrogen sector in Scotland continues to grow, however at present there is no dedicated planning regime for hydrogen projects. Therefore, each application will be assessed against the Renewable Energy Assessment Criteria on a case-by-case basis.

Blue hydrogen facilities are most likely to be sited near existing gas terminals.

Green hydrogen production facilities are most likely to be sited alongside large-scale onshore wind developments. A very large volume of water is required in order to produce green hydrogen. Early engagement with Scottish Water, using their Pre-Development Enquiry (PDE) service, will be necessary in order to confirm water capacity for proposed sites: applications can be submitted online through their Customer Portal. If further support is needed, the Scottish Water Development Operations Team can be contacted on 0800 389 0379 or developmentoperations@scottishwater.co.uk

SEPA is currently working to examine the potential environmental impacts from the different production routes for hydrogen with a view to setting suitable regulatory thresholds above which an environmental licence would be required. For more information please see SEPA's information pages.

4.2 Energy Storage

Energy can be stored using technologies such as fuel cells and batteries, or hydrogen storage. The storage of energy has already begun to play an important role in increasing the availability of renewable energy, and this is likely to grow in future as new technologies continue to emerge. This helps to address the intermittency of certain forms of renewable energy generation, as well as demand and supply issues. ScottishPower Renewables have stated an aim to install 1.5 Gigawatts of energy storage technology by 2030 to keep Scotland's electricity grid secure and stable during the transition to Net Zero.

4.2.1 Battery Storage

Battery Energy Storage Systems (BESS) allow excess energy generation from e.g. solar or wind to be stored when demand is low, and used later, rather than that electricity being wasted. Intelligent battery software uses algorithms to coordinate energy production and computerised control systems are used to decide when to store energy or to release it to the grid. Batteries are considered to be a green technology which produce no emissions during normal operation. This type of energy storage is already in use in the region, with Whitelee BESS co-located with Whitelee Windfarm in Eaglesham, East Renfrewshire, and Dersalloch BESS co-located with Dersalloch windfarm near Straiton, South Ayrshire.

Lithium-ion batteries are currently the dominant storage technology for large-scale plants. However there are a number of other technologies for battery storage currently being developed, which include:

- Compressed air energy storage: With these systems, generally located in large chambers, surplus power is used to compress air and then store it. When energy is needed, the compressed air is released and passes through an air turbine to generate electricity
- Mechanical gravity energy storage: One example of this type of system is when energy is used to lift concrete blocks up a tower. When the energy is needed, the concrete blocks are lowered back down, generating electricity using the pull of gravity.
- Flow batteries: In these batteries, which are essentially rechargeable fuel cells, chemical energy is provided by two chemical components dissolved in liquids contained within the system and separated by a membrane[7].

HEALTH AND SAFETY

Lithium-ion batteries contain flammable electrolytes that can ignite and cause a fire that can quickly spread. As such, there are a number of actions that could be taken in order to reduce the risks of fire, and subsequent environmental damage, on BESS sites (particularly in the rural area e.g. at wind farm sites):

- Climactic control: BESS facilities should be designed and maintained so that the climactic conditions on site are dry and remain within a safe temperature range (factoring in anticipated global warming).
- Inventory limitation: There are likely to be restrictions on the number of lithium-ion batteries that can be held at a BESS, with a minimum distance between units.

[7] National Grid: https://www.nationalgrid.com/stories/energy-explained/what-is-battery-storage

- Fire Plan: The operator of the site may be asked to produce and implement a fire prevention, detection, management, environmental impact and mitigation plan for the facility, including management of firewater run-off. This would be expected to include information on bunds, impermeable surfaces, any contained SUDS on site, etc.)
- Security: The facility should have security provisions to avoid malicious or accidental damage by third parties that could lead to a fire.
- Appropriate decommissioning and disposal: Maintenance of disposal records from the BESS to a suitable licensed recycling or disposal facility.
- Buffer Zones: It may be the case that a suitable buffer zone will be required between BESS sites and any major infrastructure – in particular, sites should not be located immediately next to the rail network.

PLEASE NOTE: The Chief Planner Letter on Battery storage consents (August 2020) covers the current consenting regime for BESS and variations to planning permission for energy generating ancillary uses.

Potential applicants are encouraged to stay up to date with the emerging regulatory landscape. The National Fire Chiefs Council (NFCC) have published guidance for Fire & Rescue Services, which may aid understanding of the potential risks involved in BESS developments.It may also be helpful to refer to the relevant guidance produced by the UK Government Department for Energy Security and Net Zero – Grid Scale Electrical Storage Systems: health and safety (April 2024).

SEPA may also be able to provide further advice on how to mitigate the potential environmental impacts of BESS. It is also possible that any works will require other permits from SEPA such as CARS authorisation under the Water Environment (Controlled Activities) (Scotland) Regulation 2011 (as amended) or a Waste Management Licence.

Figure 7: A 22-megawatt BESS facility is co-located at the Pen y Cymoedd wind farm in Wales.

4.2.2 Hydrogen storage

A further potential for the hydrogen sector is that renewable energy can be stored in the form of hydrogen. Hydrogen allows vast quantities of clean energy to be stored for long durations, then converted back to electricity when required.

Hydrogen can be stored in three states:

- As a gas, hydrogen storage requires high-pressure tanks.
- Liquid hydrogen requires storage at cryogenic temperatures.
- As a solid, hydrogen can be stored by absorption either within a solid or on the surface of solids.

Stored hydrogen can then be used in stationary fuel cells for power generation. When renewable energy from e.g. wind or solar is not being produced, grid operators can turn on hydrogen generators as back up. This process has lower efficiency and is more expensive than other storage technologies, however it offers high storage capacity; hydrogen can be stored for months without losing power through discharge compared to other technologies such as lithium-ion batteries.

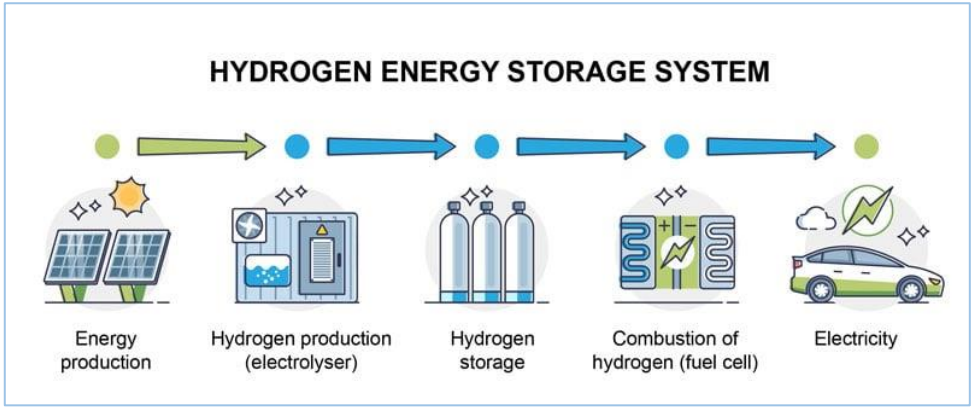


Figure 8: Diagram of a Hydrogen Energy Storage System. Source: Skeleton Technologies

4.3 Hydropower

Hydropower, or hydroelectric power, produces about 12% of Scotland's total electricity. 85% of the UK's hydroelectric energy resource is located in Scotland, and there is potential to introduce new hydropower schemes and expand or improve existing facilities. Hydropower technology uses running water to generate electricity, and thereafter heat. Scotland's wet climate and mountainous terrain means that it is well placed to make use of the technology on a large scale. Hydroelectric power is a cost-effective electricity and heat source. There are three main types of hydroelectric schemes in use in the UK:

Figure 10: Pitlochry Hydropower Plant

Reservoir schemes (impoundment): A dam or series of dams hold water back in flooded valleys, creating a hydraulic head from which electricity is generated. These often operate with a vertical fall of greater than 25 metres. The majority of Scotland's large hydropower stations are based around the use of a dam and impoundment reservoir.

Run-of-river schemes (diversion): These schemes involve a proportion of river water being diverted via a weir into a pipe that feeds a turbine, which generates electricity. The water then flows on and returns to the river downstream. These schemes can often operate on a vertical fall of 20 metres or less.

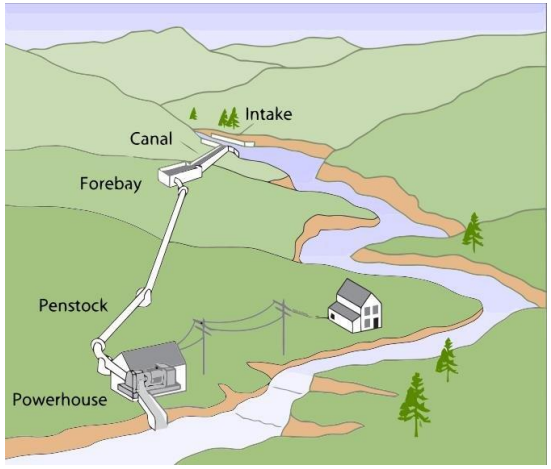


Figure 9: Run-of-river process diagram

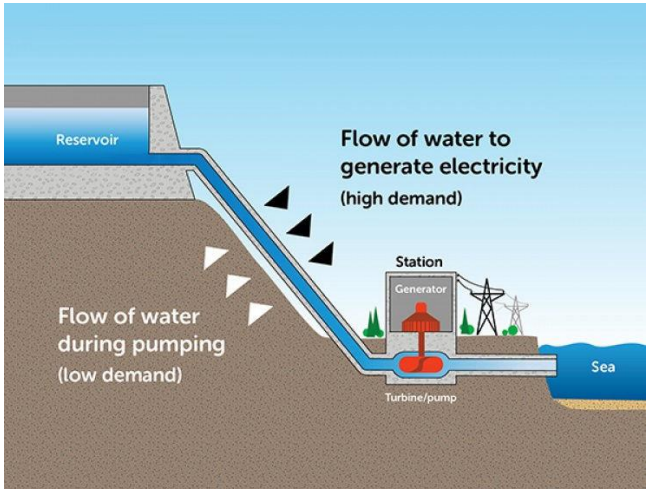


Figure 11: Pumped hydro storage process diagram. Source: Strathclyde University

Pumped hydro storage: These schemes allow-off peak electricity to be used to pump water from a river, the sea, or lower reservoir, up to a high reservoir, to allow its release during peak times. These schemes are not energy sources, but are storage devices.

Development contributing to 'pumped hydro storage' which meets the conditions of the NPF4 is designated as a national development for all Scotland. The policy will support additional capacity at existing sites as well as new sites.

PLEASE NOTE: The Scottish Environment Protection Agency (SEPA) is supportive of renewable energy development and has a team focussing on streamlining and assessing applications for hydropower developments. It is SEPA's duty to license hydropower schemes and to ensure that the benefits delivered from renewable energy generation balance against any environmental impact.

Hydropower developments in Scotland are regulated by the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), more commonly known as CARS regulations. Development of a hydropower scheme will therefore require CARS authorisation. All schemes will be required to demonstrate appropriate mitigation to ensure impacts on the environment are reduced to an acceptable level. For more information, visit the relevant pages on SEPA's website.

4.4 Bioenergy

Bioenergy is a flexible renewable energy resource that can be used to meet demand for heat, electricity or to support industrial decarbonisation. The feedstock comes from a wide range of diverse sources, and at its simplest is categorised as "dry or "wet"- as outlined in the diagram. This feedstock can be sourced from e.g. forestry, agricultural sources, or food waste, which is processed to form a solid or a liquid fuel.

The Scottish Government position on bioenergy was updated in 2024 following publication of a draft policy statement for consultation. This draft reaffirms that the bioenergy sector is considered a vital part of Scotland's circular economy.

The proposed priority use for bioenergy in Scotland is to facilitate carbon remove via Bioenergy with Carbon Capture and Storage (BECCS) technologies, as they are the cheapest method of delivering engineered negative emissions. However is also stated that there will be a number of other specific roles across heat, transport and industry where biomass can displace fossil fuels.

The Council would encourage potential developers of bioenergy systems to remain up to date with the progress and outcome of the consultation on the draft Bioenergy Policy Statement.

Please note: Depending on the detail, proposals for bioenergy developments may need to comply with Policy WM4 of the Development Plan.

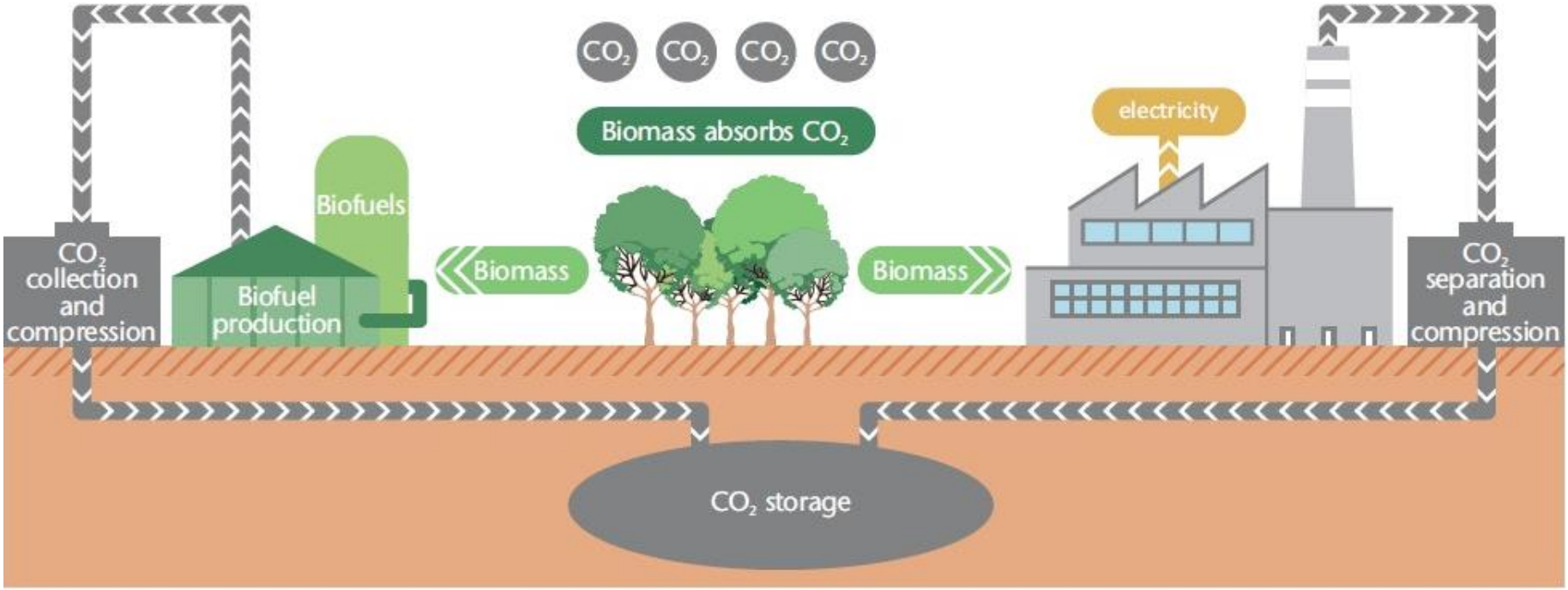
Bioenergy with Carbon Capture and Storage (BECCS)

Bioenergy is derived from biomass which serves as a carbon sink during its growth. During industrial processes, the biomass that is combusted or processed re-releases the CO_2 into the atmosphere. This means that, whilst biomass is a renewable energy source, it does release carbon that was previously trapped.

The National Planning Framework 4 remains supportive of "the production, storage and transportation [of bioenergy] with appropriate emissions abatement". **This means that commercial bioenergy production is likely to only be supported where accompanied by Carbon Capture and Storage.** Carbon capture and storage (CCS) technology serves to intercept the release of CO_2 and redirect it into geological storage locations or concrete. The addition of this technology means that biomass processes would then not result in 'net zero' emissions of CO_2 – however, this may be positively or negatively altered depending on the carbon emissions associated with biomass growth, transport and processing.

Bioenergy is therefore most effective when a local fuel source is used, as this reduces the transport impacts and therefore the carbon dioxide emissions. Any proposals should provide sufficient space to store and gain access to the fuel, to avoid frequent transport deliveries within the proposed site.

Figure 12: Biomass with Carbon Capture. Source: International Energy Agency



5. Heating and Cooling – Developments assessed under Policy RE2

Policy RE2: Heating and Cooling
To contribute to carbon emissions targets, the Council will support low and zero carbon approaches to heating and cooling homes and buildings.
A range of renewable heat technologies will be supported including, but not limited to, heat pumps (ground, air and water sourced), geothermal, hydrogen, hydro, combined heating and power (CHP), biomass and solar thermal. The Council will in principal support proposals that take heat from alternative sources, including the ground, rivers, waste and mine waters. Depending on the scale and nature of the development, proposals for renewable heat generation may be required to be assessed against the relevant renewable energy criteria in the table above.
Heat networks and energy centres will be encouraged in new developments at 'major' scale in the hierarchy of development. Major and national development with waste or surplus heat should be co-located in areas of heat demand, where the uses are compatible with regards to all other policies of the Plan. Such proposals should be accompanied by a Heat and Power Plan which clearly demonstrates how energy recovered from the development will be used to produce energy and heat. Where a heat network is not viable, developers should ensure that sites have the capability to be connected to any heat networks that may be developed in the future. The installation of pipework to the curtilage of development and safeguarding of piperuns within developments to allow future connection will be required unless the submitted energy statement demonstrates that there are significant financial or technical barriers to installation.
For smaller scale developments and where heat networks are not viable, developments should provide an alternative zero or low emissions heating system. The proposed heating system should form part of the Energy Statement required through Policy RE3.
Domestic biomass energy systems can be supported where (i) networked systems are not available and (ii) the impact on local air quality and of smoke on neighbouring properties has been considered and demonstrated to be acceptable.
Energy and Electric Vehicle Charging supplementary guidance supports this policy, setting out in greater detail the assessment criteria that will apply to each heat generating technology.

5.1 An Introduction to Heat Generation in Scotland

The Scottish Government's Heat in Buildings Strategy acknowledges a need to transform how Scotland's homes, workplaces and other public buildings are heated. This will involve using less energy by improving energy efficiency, and moving to zero emissions heating systems.

A significant consideration for heat is where and when it is needed. Heat demand can vary over the day, at weekends and holidays and, in relation to space heating, demand is significantly higher in the winter months. In Scotland, the majority of heat is generated from gas transmitted from the North Sea through pipelines (the mains gas network) directly into homes and businesses. The gas is combusted in local boilers or Combined Heat and Power plants (CHP). Heat can also be generated by electricity.

The Scottish Government has set an ambition to decarbonise one million homes by 2030, and to reduce emissions from non-domestic buildings. Furthermore, it is aiming for 2.6 TWh of thermal energy to be supplied by heat networks by 2027 and 6 TWh by 2030; a new target will be set for 2035. The Heat Networks (Scotland) Act was passed in 2021 and will be implemented by 2024 to establish a new regulatory regime for heat networks in Scotland.

There are opportunities to improve efficiency of heat distribution including district heating and thermal storage. In order to gain a greater understanding of the heat demand and supply needs across Scotland, the Scottish Government has developed an online Heat Map which can be used to identify heat demand areas and opportunities for heat networks. (See Section 6.1 for more information on Scotland's Heat Map).

The growth of a largely decarbonised heat sector within Scotland will become an important driver in tackling climate change. It can also alleviate fuel poverty by providing low-cost heat, generated from renewable sources. Heat generation sources can include developments producing unused excess heat, as well as geothermal systems, heat recoverable from mine waters, aquifers, other bodies of water and heat storage systems. Scotland generated 5,008 GWh of renewable heat in 2020; this is the equivalent of supplying 360,000 Scottish homes with gas for the year.

Some buildings also require energy for cooling. At present, this is more relevant for non-domestic properties, such as hospitals, larger open plan offices, hotels and retail units. As the climate changes, temperatures are likely to increase, with warmer winters and hotter summers becoming more common. As a result, there is likely to be an increased demand for cooling in the future. Some of this demand will be met through changes to building design and the deployment of natural solutions. However, the Scottish Government believe that it will be important to understand the need for, and role of, zero emission technologies that can also provide cooling, such as reversible heat pumps.[8]

[8] https://www.gov.scot/publications/draft-energy-strategy-transition-plan/pages/6/

5.2 Energy from Waste

As per NPF4 Policy 12 and LDP2 Policy WM4, development proposals which involve the recovery of Energy from Waste will only be supported in limited circumstances where a national or local need has been sufficiently demonstrated. These circumstances include where the proposal can demonstrate that a functional heat network can be created and provided within the site.

Energy from Waste (EfW) is the process of creating energy, in the form of electricity and/or heat, from incinerating municipal and commercial waste, thus resulting in less waste going to landfill and reducing reliance on fossil fuels. However, in order to be truly sustainable, EfW should only be used with resource streams which cannot offer greater environmental benefits through reuse or recycling.

EfW facilities can provide energy to District Heating Systems and Combined Heat and Power plants. For some District Heating Systems, hot water can be pumped underground through insulated pipes from the EfW facility and enter properties through a heat exchanger supplying heating and hot water needs.

All EfW facilities must support sustainable water management and not impede recycling and waste prevention. Preferred locations for EfW development will take account of the proximity of waste streams, end users (e.g. buildings with high heat demand such as hospitals), rail links or road infrastructure.

PLEASE NOTE: EfW plants are regulated under the Pollution Prevention and Control (Scotland) (PPC) Regulations 2012. To operate an EfW facility, the applicant must apply for a permit under the PPC regulations from SEPA. A number of assessments are required when submitting a PPC application for a permit including air modelling and a Human Health Impact Assessment. More information on the application process can be found on SEPA's website.

The Council would encourage potential developers of any systems included in this chapter to stay up to date with the progress of the Scottish Government's draft Bioenergy Policy Statement (2024).

5.2.1 Combined Heat and Power

Combined Heat and Power (CHP) plants are designed so that much of the heat produced, as a consequence of generating electricity, can be efficiently recycled for local space and water heating for residential or industrial use. Where a demand for both heat and electricity exists in the same location, CHP can reduce energy costs whilst reducing carbon emissions and air pollution.

A CHP system can run on a range of fuels, but would only be considered a renewable energy development if it were powered by biomass. As this tends to involve the conventional incineration of waste, most CHP plants would be considered Energy from Waste developments; policy WM4 would be applicable.

CHP plants are most commonly used in industrial processes where energy efficiency helps users to lower costs, improve their competitiveness and reduce their carbon emissions. CHP is also used in district heating systems and is being increasingly used in the public sector (such as in hospitals). Currently, most of the renewable heat generated in Scotland is from biomass heat and Combined Heat and Power (CHP) facilities.

Biomass and CHP developments in East Ayrshire to date have mainly involved small scale installation of boilers and associated buildings to provide a heating source for domestic residences in urban and rural locations.

The Scottish Government would prefer to see biomass be developed in heat only or good quality CHP schemes, to consume off-gas grid wherever possible, and at an appropriate scale so that any heat is supplied locally. There are several reasons for this approach:

- Biomass for heat-only or CHP will be essential to meet Scotland's target for renewable heat;
- Biomass or CHP for heat is 80-90% energy efficient compared to 30% in electricity only schemes;
- Biomass using off-grid gas delivers the highest carbon savings and makes the greatest impact on alleviating fuel poverty.

PLEASE NOTE: When submitting an application for CHP facilities, the applicant must consider the supply of the biomass source. The Scottish Government and Scottish Forestry are 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 any biomass scheme.

Applicants should be clear where the biomass will be sourced from and ensure that, where possible, this is from renewable sources. Scottish Forestry can provide further information on potential sources of fuel. Local fuel suppliers can be searched here: https://biomass-suppliers-list.service.gov.uk/find-a-fuel.

Developers will also be expected to provide a detailed assessment of impacts on air quality, and where necessary, implement appropriate mitigation measures.

5.2.2 Anaerobic Digestion

Anaerobic digestion is relevant in the context of Energy from Waste in relation to the processing of wet biomass waste (such as sewage sludge, animal manure and slurry and waste food). It uses bacteria in the absence of oxygen to break down organic matter in waste into "biogas" (predominately methane, CH_4), which can be used to generate electricity, supply heating (locally) or be directly injected into the gas grid. As anaerobic digestion recovers energy from the biodegradable component of waste, the resultant energy produced is renewable and therefore considered to be bioenergy.

AD provides an alternative to large quantities of biodegradable waste going to landfill and releasing a significant amount of harmful greenhouses gases into the atmosphere. The biogas produced from anaerobic digestion can be used to supply heating systems within a site or to the surrounding area or can be used for combined heat and power (CHP) schemes.

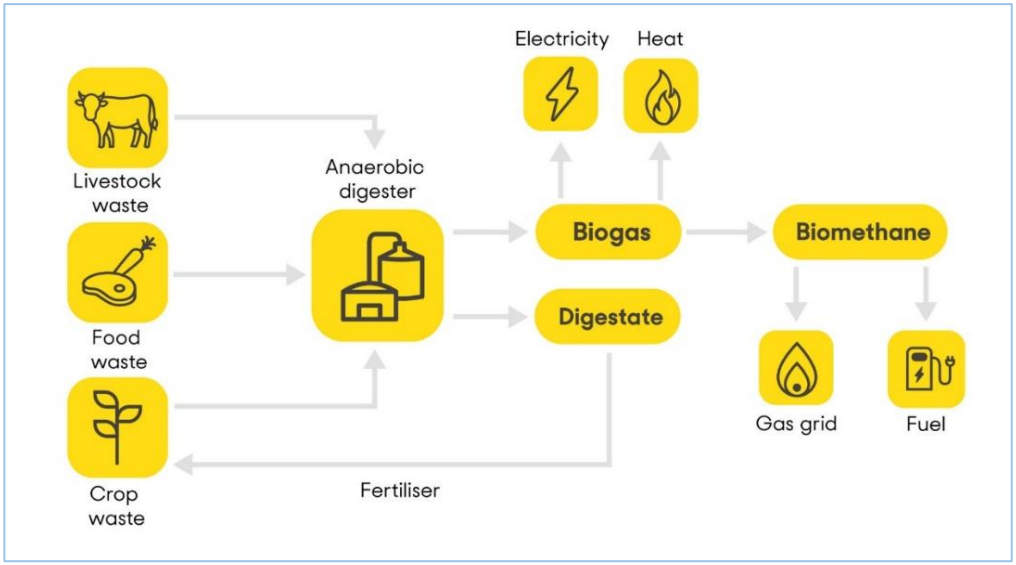


Figure 13: Anaerobic Digestion Process Diagram. Source: Good Energy

AD plants can be developed at two broad scales. Firstly, small-scale plants can be designed to treat e.g. the household biodegradable waste a village or group of villages, or the agricultural waste from a farm. Secondly, large-scale centralised facilities can be developed, which may co-digest municipal waste with other types such as e.g. agricultural waste, sewage sludge, or industrial organic waste. It is considered that these large-scale plants would be more suited to areas allocated for business and industrial use.

A typical AD plant will comprise of water pre-treatment equipment, a digester tank, a gas storage tank, a flare stack, associated pipework, and buildings to house ancillary equipment such as a generator. The most visible element of a plant is the flare stack, used for burning off surplus gas. The ground around anaerobic digestion tanks and in waste reception areas needs to be paved and bunded to prevent pollution from any accidental discharge or spillages. A collection system can be installed within and around the plant to enable spilled waters to be collected and pumped either directly into the digester or into a mixing tank to increase the water content of the solid waste.

Specific Scottish policies for Anaerobic Digestion have not been developed owing to the limited scale of deployment to date. AD plants are currently supported by the UK Government's Green Gas Support Scheme (GGSS) which provides financial incentives for new anaerobic digestion biomethane plants to increase the proportion of green gas in the grid. The scheme is open to applicants in England, Scotland and Wales for four years from 30 November 2021.

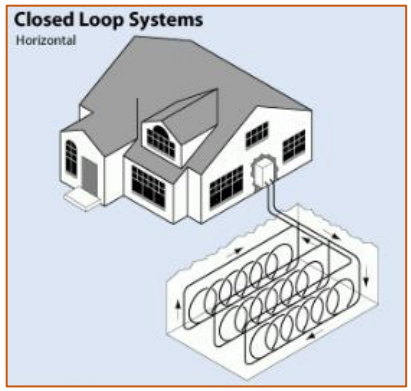
5.3 Heat Pumps

There are three main types of heat pump: ground source, air source and water source. In general terms, a heat pump takes energy from the air, water or soil/ground to provide heating and hot water to a building. The heat pump consists of four components; a compressor, a source of heat, a condenser and a pressure reducer. Heat pumps can form part of a District Heating System or energy centre, or can be used on a smaller scale for single dwellings – heat pumps are likely to be one of the most viable options for homeowners seeking to decarbonise their heating systems. This section provides an overview of the different types of heat pump technologies - **please see Section 5.6 for more information on the planning process for installing domestic heat pumps.**

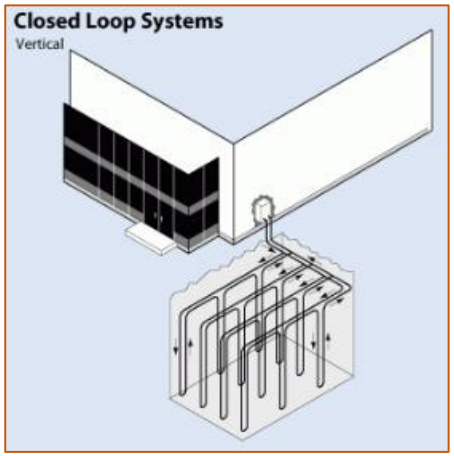
Ground and Water Source Heat Pumps (Geothermal):

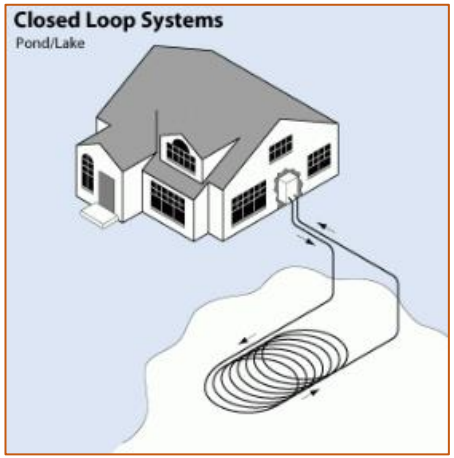
Geothermal heat pumps (GHPs), which include ground-source heat pumps (GSHPs) and water-source heat pumps (WSHPs), make use of the relatively constant temperature of the earth, which is warmer than the air above it during winter, and cooler in the summer. The GHP takes advantage of these more favourable temperatures to become high efficient by exchanging heat with the earth through a ground heat exchanger. As with any heat pump, geothermal and water-source heat pumps are able to heat, cool, and, if equipped, supply the house with hot water. There are three mains types of geothermal heat pump – closed loop and open loop.

Closed Loop – Horizontal: The majority of installed heat pumps are closed loop systems. These systems extract heat from the ground via heat exchangers installed in shallow trenches at least four feet deep within the ground. This type of installation is generally most cost-effective for residential installations, particularly for new construction where sufficient land is available. The most common layouts either use two pipes, one buried at six feet, and the other at four feet, or two pipes placed side-by-side at five feet in the ground in a two-foot wide trench. The Slinky™ method of looping pipe allows more pipe in a shorter trench, which cuts down on installation costs and makes horizontal installation possible in areas it would not be with conventional horizontal applications.



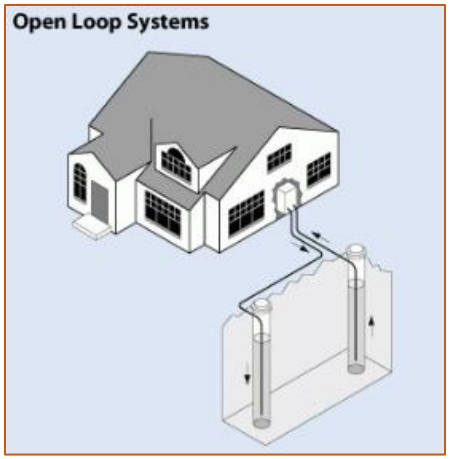
Closed Loop – Vertical: Large commercial buildings and schools often use vertical systems because of the challenges posed by the land area required for horizontal loops. Vertical loops are also used where the soil is too shallow for trenching, and they minimise the disturbance to existing landscaping. For a vertical system, holes (approx. four inches in diameter) are drilled about 20 feet apart, and 100-400 feet deep. Two pipes, connected at the bottom with a U-bend to form a loop, are inserted into the hole and grouted to improve performance. The vertical loops are connected with horizontal pipe, placed in trenches, and connected to the heat pump in the building.





Closed Loop – Water Source: If the site has an adequate body of water, such as a lake, loch, river or large pond, this type of system may be the lowest cost option. A supply line pipe is run underground from the building to the water and coiled into circles at least eight feet under the surface to prevent freezing. The coils should only be placed in a water source that meets minimum volume, depth and quality requirements.

Open Loop System: This is also a type of water source system. Instead of using a fluid to transfer the heat through submerged, sealed pipes, an open loop system takes water from a borehole, lifting it to the surface, extracting heat energy and then returning the cooled water to a separate borehole. Open loop systems move large volumes of water through the heat exchanger – higher than might be possible with a closed loop system. As a result, open loop WSHPs are often more efficient than equivalent ground or air source heat pumps. However, they also have higher operation and maintenance costs.



Geothermal heat pumps may not be suitable for every development. Most systems feature pipes laid in trenches as these are often cheaper to dig. A large amount of land is required for a trench system, however the land can be reverted back to its previous use or landscaped. A borehole system requires less land area but can be more expensive to install and therefore, may not be suitable for every site. In larger developments with open space or Sustainable Urban Drainage (SUDS) requirements, the ground source heat pumps can be placed beneath the surface of the water or open space in order to reduce the impact to the landscape.

PLEASE NOTE: Abstractions from and discharges of pollutants to the water environment, including those associated with geothermal energy, are regulated through the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), more commonly known as CARS. Development of a geothermal heat pump will therefore require CARS authorisation. For more information, visit the relevant pages on SEPA's website.

Air Source Heat Pumps (ASHP):

Air source heat pumps absorb heat from the air at a low temperature into a liquid. The fluid passes through a compressor where the temperature increases and then transfers the higher temperature heat into the building through radiators or underfloor heating. Air source heat pumps can also be used for cooling. ASHP do not generally require extensive underground pipework, however the compressor is required to be fitted to a wall or placed on the ground of a building. The performance of ASHP will vary throughout the year. ASHP are likely to be one of the most efficient options for domestic installation in the future.

For more information on different types of available heat pumps, guidance is available from the Energy Savings Trust.

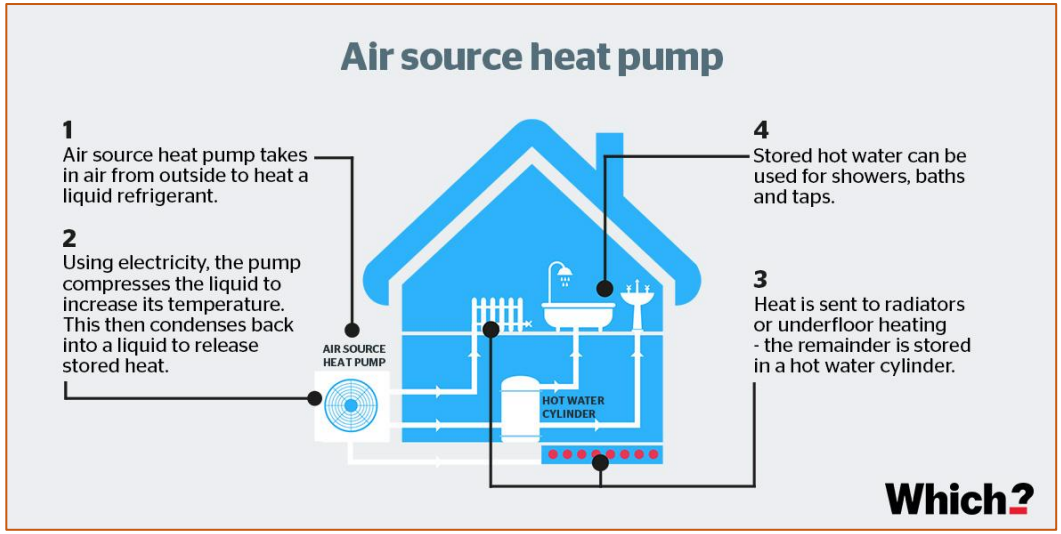


Figure 14: Air Source Heat Pump Process Diagram, Source: Which.

5.4 Solar Thermal / Photovoltaic cells (PV)

Solar panels can be used in large-scale solar installations or for residential properties. This section of the guidance deals with large-scale solar installations – **please see Section 5.6 for more information on the planning process for installing domestic solar panels.**

Solar panels are made up of photovoltaic (PV) cells which capture the sun's energy to produce electricity. These panels are typically seen on south facing roof slopes of buildings, but they can also be installed as free-standing structures.

Connecting several solar panels together creates what is known as a solar array. Large-scale solar arrays are often utilised for commercial or industrial premises. It is also possible to create 'solar farms', as seen in the image on the right of which there are currently 1,000 in the UK. These types of developments will require more supporting information in a planning application owing to the amount of land and equipment needed.

Figure 16: Commercial Solar Panel Installation. Source: Enerpower

Figure 15: A Solar Farm. Source: The EcoExperts

Solar water heating systems comprise of solar collectors (tubes or flat plates), a heat transfer system and a hot water store (hot water tank). Water is pumped through the solar panel and heated by solar energy. The heated water flows through a heat exchanger so that water, stored in the hot water tank, is heated. These systems can be used for domestic use, light industrial or agricultural use. They are less sensitive to shading than PV panels.

Figure 17: Industrial Solar Water Heating. Source: Orb Energy

5.5 Thermal storage

Thermal storage is a useful way of managing the peaks and troughs of heat demand over a period of time. Heated water is usually stored in a large, well-insulated cylinder (above or below ground) often called a buffer or accumulator tanks. Thermal stores work very well with solar water heating systems, and can also be linked to heat pumps. They can also increase the efficiency of biomass-burning heaters.

A thermal store can provide:

- Space heating and mains pressure hot water
- Space heating only (which may be the case with a heat pump system).
- Hot water only (common in the case of a solar water heating system).

A thermal store allows several different heating systems to be linked up on one site. It also allows for the management of the difference in time between when heat is available and when it is needed. A thermal store can be used in off-grid locations with multiple heat sources, and would only use mains electricity to top up the heating when other sources cannot provide enough energy. Using diverse energy sources in e.g. a Heat Network means customers are not dependent on a single source of supply, helping guarantee reliability and continuity of the service.

5.6 Domestic Renewables (Microgeneration Technologies)

Microgeneration (micro-renewables) refers to the generation, from low or zero carbon sources, of electricity of up to 50kW (kilowatts) capacity and heat of up to 45kW capacity as set out by the UK Government Energy Act 2004. Microgeneration technologies can contribute to the national targets for reducing greenhouse gas emissions, can help to alleviate fuel poverty and improve fuel security by increasing access to more affordable and locally available supplies of electricity and heat. NPF4 supports investment in renewable energy projects at all scales of development including microgeneration.

Permitted Development Rights for Domestic Renewables

Some small-scale/microgeneration heating systems/technologies may be classed as Permitted Development and as such may not require planning permission. As per the revised General Permitted Development (Scotland) Order and the Scottish Government guidance on householder permitted development rights (2021), subject to limitations, this would include:

- Flues for Biomass Heating System on a dwellinghouse or building containing a flat (Class 6C) (subject to Scottish Government review);
- Flues for Combined Heat and Power on a dwellinghouse or building containing a flat (Class 6F);
- The installation, alteration or replacement of a heat pump (ground, water or air source) within the curtilage of a dwellinghouse or building containing a flat (Classes 6D, 6E and 6H)
- The installation, alteration or replacement of a free-standing wind turbine within the curtilage of a dwelling (Class 6H).

In addition, subject to limitations:

- Installation of solar PV and solar thermal equipment that would be attached to a wall or roof of a dwelling house or a flat is now covered under classes 2B and 4A of the GPDO;
- Class 3B permits the installation of free-standing solar PV and solar thermal equipment for a dwellinghouse.

Most Permitted Development Rights do not apply to buildings that are listed or located in conservation areas, or sites of archaeological interest; proposals involving such assets will require planning permission. Particular attention will need to be paid to sensitive design.

However, since 2016 there have been **no such restrictions** for ground or water source heat pumps under classes 6D or 6E. As of 2023 EV Charging Points installed under Class 9E are also permitted in conservation areas.

Scottish Government Review of Permitted Development Rights

The Scottish Government is conducting an ongoing review of Permitted Development Rights and is currently consulting on plans to expand PD rights for domestic renewables. The scope of these changes could include, among other changes expanded permitted development rights for heat pumps and solar panels in conservation areas

The Council would advise that applicants keep up to date with the ongoing review of permitted development rights. Further advice relating to listed buildings and conservation areas is available in the Council's Listed Buildings and Buildings within Conservation Areas Design Guidance and Historic Environment Scotland's Short Guide to Micro-Renewables in the Historic Environment. Potential applicants can also contact the Council's Development Management team for more advice on what constitutes permitted development.

5.6.1 Domestic solar panels/PV cells

These panels are typically seen on south facing roof slopes of homes and buildings, but they can also be installed as free-standing structures in gardens or fields.

Recent innovations have resulted in new 'Solar Flower' technologies which are beginning to be installed at domestic properties in the UK. These are ground-mounted installations, with self-cleaning 'petals' which open up in the morning when the sun comes out, and close again at the end of the day. The height of these installations means that they are likely to require planning permission. Existing sensitivities in the historic or natural environment will need to be considered in the siting of this technology.

Figure 20: Rooftop Mounted Solar Panels

Figure 19: Ground Mounted Solar Panels

Figure 18: 'Solar Flower' technology

5.6.2 Solar hot water systems

Solar water heating systems can also be installed for domestic use. These are usually designed to provide the hot water needed for bathing, showering and using hot taps. These systems use panels or tubes, called solar collectors, to gather solar energy. There are two types of solar water heating collectors, as shown in the images.

Source: Energy Saving Trust

Figure 22: Evacuated Tubes - a bank of glass tubes mounted on roof tiles

Figure 21: Flat plate collectors - fixed on the roof tiles or integrated into the roof

5.6.3 Domestic heat pumps (ground, air and water)

Detailled information about heat pump technologies can be found in Section 5.3 of this document. In short, heat pumps transfer the heat contained in the ground, water or air to a building for the purposes of providing heating. Air-Source Heat Pumps (ASHP) in particular are one of the most efficient and sustainable heating solutions for homes. Homeowners in Scotland can apply for a standalone grant of £7,500 from the Home Energy Scotland Scheme to install heat pumps. This also includes a rural uplift of £1,500 for homeowners in rural areas. Please see Appendix I for more information on funding opportunities.

5.6.4 Domestic wind turbines

There are two types of domestic-sized wind turbine:

- Pole mounted – these are free standing and are erected in a suitable exposed position, with generation capacity around 6kW.
- Building mounted – these are smaller than mast mounted systems and can be installed on the wall or roof of a home where there is a suitable wind resource. Often these are around 2kW in size.

5.6.5 Micro CHP

A gas-fired boiler is used to produce electricity and heat from the mains gas. It can also produce heat as a by-product and most schemes that use fossil fuels are capable of being converted to utilise renewable sources of energy (such as biomass). Some domestic biomass and small-scale CHP schemes may not fall within the scope of Environmental Impact Assessment (Scotland) Regulations 2011 (EIA) unless located within sensitive landscape areas. Biomass energy proposals >50MW are subject to an EIA.

5.6.6 Biomass

At micro-generation scale, all biomass systems burn wood pellets or logs to provide heat. Biomass will deliver environmental benefits in the form of greenhouse gas savings provided the fuel supply originates from sustainable sources. Most biomass installations, at micro-scale, tend to involve minor building alterations limiting the scale of any potential impacts. As per Policy RE2 of the Local Development Plan, domestic biomass energy systems can be supported where (i) networked systems are not available and (ii) the impact on local air quality and of smoke on neighbouring properties has been considered and demonstrated to be acceptable. We would strongly encourage early engagement with the Council's Environmental Health Officers when considering this type of development.

5.6.7 Micro-hydro

In Scotland, there is an increasing number of micro-hydro schemes, generally taking the form of "run-of-river" schemes generating up to 10kW (kilo watts) of electricity. These types of schemes would generally be supported, where they accord with the provisions of Policy RE2 of the LDP2 and any other relevant environmental policies within the plan.

6. District Heating (including Heat Networks)

The term “district heating” refers to a network system for distributing heat from a central location (instead of individual boilers in homes) to meet requirements for heating and hot water in residential and commercial developments. There are already over 17,000 heat networks in place in the UK, and just over 2% of UK homes are currently connected to a district heating network. There is currently considerable national policy support for the expansion of heat networks.

Networks vary in size and length, from carrying heat a few hundred metres between a relatively small number of homes and flats, to several kilometres supplying whole communities and industrial areas. Heat is normally generated in an energy centre and distributed through a pipe network to which customers are connected. District Heat networks can be supplied by a diverse range of sources including:

- Power stations
- Energy from Waste (EfW) facilities
- Industrial processes
- Biomass boilers and Combined Heat and Power (CHP) plants
- Gas-fired CHP units
- Fuel cells
- Heat pumps (ground, air and water)
- Geothermal sources
- Electric boilers and solar thermal arrays.

The main component of a district heating system, other than the energy centre, consists of the primary pipe network below ground level. The primary pipe network transports heat to each consumer in the form of hot water or steam; the hot water or steam is then passed through a heat exchanger, before being diverted to heating systems within buildings and used for space heating and/or hot water. The anticipated lifetime of the pipework is around 40 to 50 years.

There are various development models for delivering and operating district heating such as:

- District heating networks to serve new housing or mixed use development
- Networks to serve public buildings such as hospitals and schools
- Social housing development schemes- owned/managed by local authorities or housing associations
- Energy from Waste facilities can serve District Heating networks

6.1 District Heating in East Ayrshire

There are currently no district heating systems operating in East Ayrshire. However, the Council is in the process of preparing both the regional **Ayrshire Energy Masterplan (AEM)** and our own **Local Heat and Energy Efficiency Strategy (LHEES)**. The aim of a Local Heat and Energy Efficiency Strategy (LHEES) is to set a framework and delivery programme for how each local authority will reduce the energy demand and decarbonise the heat supply of buildings in their area. This will include analysing data on building type, age and energy efficiency rating, as well as relevant socioeconomic data on e.g. fuel poverty, in order

to identify areas which may be most suitable for, or gain most benefit from, the establishment of a heat network. A pilot project was conducted in 2021 which focused on the areas of North West Kilmarnock and South Central Kilmarnock.

Development Plan Policy RE2 encourages heat networks and energy centres in new developments at 'major' scale in the hierarchy of development. Major and national development with waste or surplus heat should be co-located in areas of heat demand, where the uses are compatible with regards to all other policies of the Plan. Where a heat network is not viable, developers should ensure that sites have the capability to be connected to any heat networks that may be developed in the future. The installation of pipework to the curtilage of development and safeguarding of piperuns within developments to allow future connection will be required unless the submitted energy statement, demonstrates that there are financial or technical barriers to installation.

The upcoming East Ayrshire LDP3 will advance this area of work by taking on board results and recommendations from the LHEES Strategy and Delivery Plan. Heat Networks are an emerging energy solution which are set to grow substantially over the next 5-10 years.

6.2 Advantages to District Heating Systems

Compared to owning and operating a single boiler, a switch to district heating can benefit users in a number of ways:

- District Heating systems can generate heat at low costs which can contribute to reducing fuel poverty;
- Systems are built with stand-by heating capacity (more than one boiler) to ensure that heat is always available the user;
- Compared to older heating systems, district heating provides heat that can be easily controlled within a building for the user;
- Within a new building, the owner avoids the cost of purchasing a boiler (or boilers) and associated facilities such as a flue;
- The user only pays for the heat that is actually used, leading to substantial savings in energy costs; and
- Domestic hot water can be generated instantly through a dedicated heat exchanger, saving losses incurred in storage and eliminating the time delay in regeneration.

6.3 Cost of District Heating Systems

The largest element of capital cost is the heat network. The pipe required is expensive as is installation. Installation requires a trench to be made, preparation of the bed of the trench for the pipe, joining the steel and insulating cover and re- instatement of the trench. In urban areas, the pipe route will need to be navigated around existing services (water, sewage, gas and electricity pipes). Bulk schemes may be cheaper to install than non-bulk schemes, as the latter require extra components such as internal pipework and individual hydraulic interface units (HIUs) for dwellings, which are relatively expensive. Heat network costs are estimated to be around £150 per MWh of electricity generated, or approximately £1000 per metre of main network length on average, though this will range depending on the scale of the network and thus the pipe sizes required.

6.4 Heat Mapping

All new heat generating developments should, be located as close as possible to potential heat users so that the possibility of developing heat networks, including district heat networks, can be investigated. NPF4 Policy 19 and LDP2 Policy RE2 on Heat and Cooling aim to ensure that development is connected to expanding heat networks which use and store heat from low or zero emission sources.

6.4.1 Scotland's Heat Map

Scotland's Heat Map was developed by the Scottish Government as a tool to identify where there are opportunities for decentralised energy projects across Scotland. It can be used to identify where there are opportunities for district heat networks, to assess heat density and proximity to heat sources. Data within the Heat Map includes:

Heat Demand: Scotland's Heat Map includes a scale of heat demand ranging from blue areas which are classed as low heat demand areas, to red areas which are classed as high heat demand areas. High heat demand tends to be associated with urban areas (such as Kilmarnock) where there is more dense building layouts and where there are buildings with constant high heat demand such as swimming pools, hospitals and industrial buildings. As shown on the map on the next page, high heat demand is not exclusive to large urban areas. Towns such as Cumnock, Mauchline, Stewarton and Galston can be identified as areas with relatively high heat demand. In addition, there may be high heat demand at individual sites within rural communities or in the rural area such as school buildings, recreation facilities and industrial sites.

Energy Supply: These have been identified by locating sources of waste streams, surplus heat (e.g. from industrial buildings), sites suitable for biomass and heat pumps. As shown on **Figure 25**, Scotland's Heat Map has indicated the existing and potential renewable heat generation technologies that can be developed in East Ayrshire. The Heat Map identifies the opportunities for onshore wind, water source heat pumps, landfill gas, heat only boilers and energy from waste facilities[9].

Heat maps can assist in spatial planning and co-locating areas of high heat demand and need with heat supply opportunities. The data held within Scotland's Heat Map will be subject to ongoing updates and will be one of the baseline datasets used in the development of East Ayrshire Council's LHEES.

Potential Developers should use the heat map to identify areas or sites of high heat demands. The Heat Map allows users to zoom in to view more detail, down to individual buildings or groups of buildings. There is also a 'confidence' layer which can be used as a broad indicator of reliability of the data within the map.

Potential developers should also use the map to identify current operational renewable heat generation technologies within close proximity to high heat demand areas/sites. These areas could form future district heat networks.

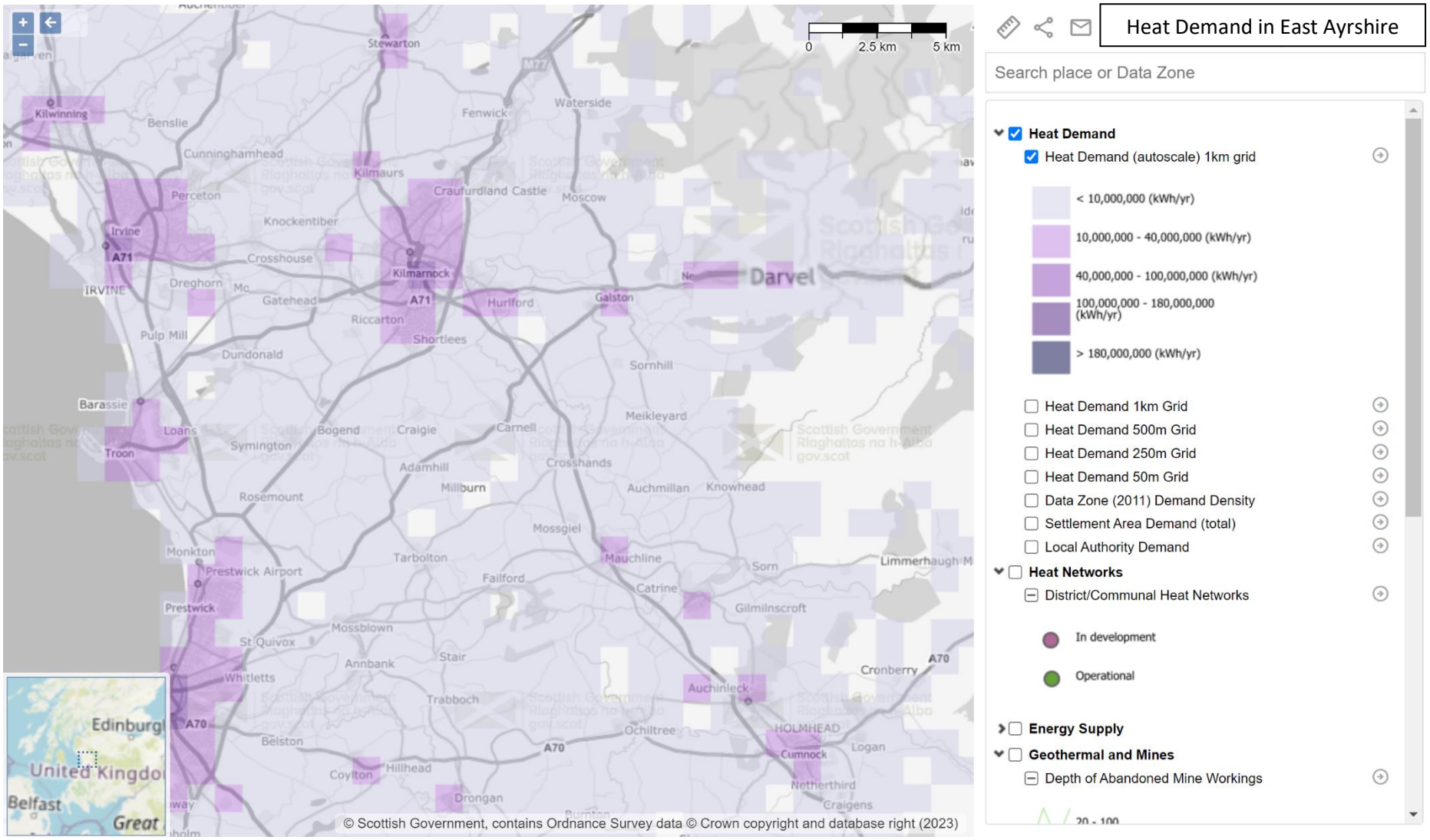
[9] Scotland's Heat Map may only show existing and the potential for large scale developments. It does not identify operational microgeneration developments.

Potential Anchor Heat Load Areas: Potential Anchor Loads are sites which are likely to have heat loads which vary little throughout a day, a month or a year such as schools, sports facilities, industrial estates/buildings and hospitals. These are the most reliable uses in terms of securing a stable demand for heat and may therefore be more suitable to accommodate proposals for district heating systems. Examples of potential anchor loads of the five service centre towns of East Ayrshire are shown in the table below.

Site	Location	Site	Location
Ayrshire College	Kilmarnock	**Dalmellington Community Centre and Recreation Area**	Dalmellington
Crosshouse University Hospital	Kilmarnock	**Damellington Care Centre**	Dalmellington
HALO Enterprise & Innovation Centre	Kilmarnock	**Dalmellington Area Centre**	Dalmellington
Galleon Leisure Centre	Kilmarnock	**Glebe House Care Centre**	Dalmellington
Grange Academy	Kilmarnock	**Stewarton Academy**	Stewarton
Rugby Park – Kilmarnock FC	Kilmarnock	**Nether Robertland Primary School**	Stewarton
Glencairn Retail Park	Kilmarnock	**Stewarton Sports Centre**	Stewarton
East Ayrshire Community Hospital	Cumnock	**Lainshaw Primary School**	Stewarton
Netherthird Primary School	Cumnock	**Loudoun Leisure Centre**	Galston
Barony Campus	Cumnock	**Loudoun Academy**	Galston
Thistle Business Park	Cumnock	**Galston Primary School**	Galston
Caponacre Industrial Estate	Cumnock	**St Sophia's Primary School**	Galston
Doon Academy	Dalmellington		

Table 2: Potential Heat Anchor Loads

Figure 23: Heat Demand in East Ayrshire



6.5 Mine Water Heat Schemes

The UK Government Coal Authority has been exploring the potential of unlocking heat within the UK's historic mine network to heat and cool homes and businesses. Water within mines is warmed by natural processes and can, if sustainably managed, provide a continuous supply of heat. It is estimated that 25% of homes and businesses in the UK are located above former coal mines. Many of East Ayrshire's settlements are located near to an abandoned mine, as demonstrated on the map below. Mine water can be abstracted from boreholes, shafts or adits (an entrance to an underground mine). Heat exchangers and pumps are used to recover the heat, which is distributed via district networks to homes and buildings.

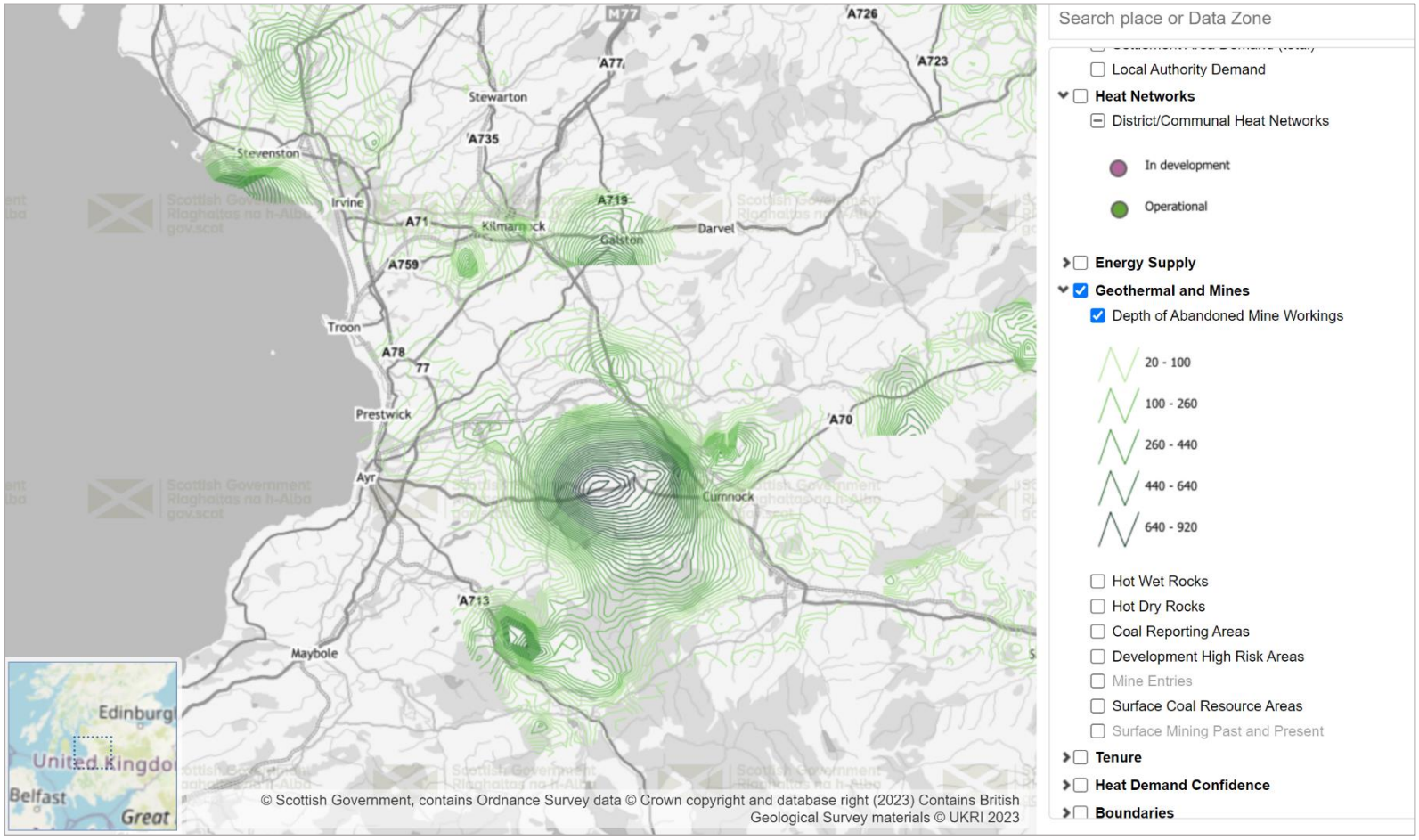


Figure 24: Depth of Abandoned Mine Workings in East Ayrshire

7. Assessment against Renewable Energy Assessment Criteria

Supporting information that may be required for renewable energy technologies listed in Sections 4, 5 and 6 of this guidance. (For wind energy developments please see Section 3.2)

PLEASE NOTE: All applications will need to meet the statutory requirements for planning applications, including location plan, site plan and scaled plans and elevations of any equipment, buildings, and all associated infrastructure to be installed. Many renewable energy developments will also require submission of a Design Statement.

Climate change impacts

- **Scale of contribution to renewable energy targets;**
- **Effect on greenhouse gas and carbon emissions**

Subject to meeting environmental criteria and all relevant LDP2 policies, the Council will be in favour of renewable energy proposals which contribute to the reduction of greenhouse gas emissions and meet the Scottish Government's targets in this regard.

Applications should contain a statement setting out how the proposal contributes to reducing greenhouse gas emissions. Subject to the above comments, the Council will be supportive of proposals which contribute to the Scottish Government's renewable energy targets where the proposals comply with relevant national policy and regulations (which will be a significant consideration in the assessment of any proposal). This should also include details of any 'future proofing' proposals, e.g. the inclusion of pipework or infrastructure which could link to district heat networks in the future.

NPF4 policy 5 and LDP2 policy NE11 allow for renewable energy developments on peatland, carbon-rich soils and priority peatland habitats. At the same time, this must be balanced against the role that Scotland's peatland soils play in driving towards a low carbon future. Where development on these assets is proposed, a detailed site specific assessment will be required to identify, among other criteria, the baseline depth, habitat condition, quality and stability of carbon rich soils, and the likely effects of the development on peatland, including soil disturbance. For further information, please see the following resources:

- 2016 Carbon and Peatland Map
- Guidance on Developments on Peatland – Site Surveys

Environmental impacts:

*Depending on the outcome of a screening request, an **Environmental Impact Assessment** may be required for major development under the Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017. Many of the issues covered in this Environmental Impacts section will be explored as part of the wider EIA process.*

Significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/or appropriate design mitigation has been applied, they will generally be considered to be acceptable.

The landscape and visual impacts of a development will be assessed on all occasions. The level and extent of any landscape and visual impact will depend on the scale of development and should be identified in any **Landscape and Visual Impact Assessment (LVIA).** Smaller schemes will be assessed on a case-by-case basis as to whether an LVIA is required.

The general information that should be detailled in an LVIA includes:

- Description of the existing landscape character and setting
- Equipment to be installed (e.g. number; colour; size; pitch/elevation; foundations)
- Layout and design (include any landscaping and earthworks)
- Details of any buildings required on site (e.g. materials; boundary treatment; height of stack)
- Details of ancillary infrastructure required
- Details of lighting planned for the site
- Details on the use of natural features to screen any security fencing required
- Maintenance regime of land around the site during operation of the development

For developments including Energy from Waste or Anaerobic Digestion, buffer distances may be considered by the planning authority. As a guide, appropriate buffer distances may be:

- 100m between sensitive receptors and recycling facilities, small-scale thermal treatment or leachate treatment plant
- 250m between sensitive receptors and operations such as outdoor composting, anaerobic digestion, mixed waste processing, thermal treatment or landfill gas plant
- Greater distances may be required between sensitive receptors and landfill sites

As per development plan Policy NE2, any proposals for renewable energy development which may impact on the Merrick Wild Land Area must be accompanied by a **wild land impact assessment** which sets out how design, siting or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements, where appropriate.

Effects on biodiversity, including impacts on birds, with particular reference to European sites and other national and local designations

As per development plan Policy NE4, development proposals for national or major development or development that requires an environmental impact assessment (EIA) will only be supported by the council where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks, so that they are in a demonstrably better state than without intervention, including through future management. The Scottish Government has produced **draft planning guidance on biodiversity**, which should be taken into consideration in all proposals.

For all developments, consideration of potential impacts on protected areas and protected species will be required. An initial **Phase 1 habitat assessment** may be required depending on the size of the scheme and if the site is close to any sensitive receptors. Any protected species information must be provided in a confidential annex, clearly marked as such.

Any development that may adversely impact on areas of local importance for nature conservation, including provisional wildlife sites, local geodiversity sites and local nature reserves, will be expected to demonstrate how that impact can be avoided or mitigated (refer to Policies NE4, NE5, NE6 and NE7 of LDP2). Any proposed trenching works, boreholes or borrow pit schemes that form part of the development proposal should have no adverse impacts on any ecological site, with or without adequate mitigation.

For developments such as hydropower which will have a direct impact on watercourses, the following information will be required:

- Impact on ground water quality of installation phase of development
- Potential drainage problems
- Disturbance of species during installation or operation
- Potential disturbance to peatland or wetlands.

In turn, renewable energy developments can present opportunities for biodiversity enhancement and the submission of a site-specific biodiversity action plan will aid in the assessment of this.

NatureScot have developed a suite of advice on the ecological impacts of potential renewable energy developments, available here:

- Planning for development: What to consider and include in Habitat Management Plans;
- General pre-application and scoping advice for solar farms;

- Micro renewables and the natural heritage;
- Hydroelectric schemes and the natural heritage

Impacts on the historic environment

Any impacts from renewable energy developments on the historic environment of East Ayrshire should be fully assessed and if appropriate, mitigation measures should be identified. This should include assessment of potential impacts on cultural heritage and archaeological assets.

Early consultation with Historic Environment Scotland (HES) may be required. For HES pre-application engagement contact: HMEnquiries@hes.scot.
Please also refer to this Short Guide to Micro-Renewables in the Historic Environment.

Early consultation with the West of Scotland Archaeology Service (WOSAS) may be required: enquiries@wosas.glasgow.gov.uk

Effects on hydrology, the water environment, flood risk and groundwater dependent terrestrial ecosystems

Water extraction proposals (heat pumps; hydropower) are likely to require **CARS authorisation** in line with the Water Framework Directive and The Water Environment (Controlled Activities) (Scotland) Regulations 2011. The timing of a CARS authorisation should be carefully considered in relation to the planning process. Any excavation works should have no impacts on any water course.

Many development proposals will require a **Flood Risk Assessment** – this will be assessed on a case-by-case basis.

Applicants should also refer to the Guidance for Pollution Prevention, Early consultation is often recommended with the Council's Flood Prevention Officer: enquiries@ayrshireroadsalliance.org and SEPA: planning.sw@sepa.org.uk

Where relevant, schemes 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 schemes.

Any impact on areas of wetland and in particular on **Groundwater Dependent Terrestrial Ecosystems (GWDTE)** will need to be identified and mitigated where necessary. Please refer to SEPA Guidance Note 31 for more advice.

Scottish Water abstractions are designated as **Drinking Water Protected Areas (DWPA)** under Article 7 of the Water Framework Directive. In the event of an incident occurring that could affect Scottish Water they should be notified without delay using the Customer Helpline number 0800 0778 778. Similarly, below ground assets, such as water and sewer mains, can be affected by heavy construction traffic and may require protection. In the event that asset conflicts are identified then early contact should be made with the Highway Authorities and Utilities Committee (HAUC) at Hauc.diversions@scottishwater.co.uk.

Impacts on trees, forests and woodlands

When submitting a renewable energy development proposal, applicants should consider whether the proposal can minimise any adverse impact on existing trees. Where relevant, **tree surveys** should be undertaken and the Council's Senior Arboricultural Officer should be consulted. A **Woodland Management Strategy** may also be required for some sites.

In line with policy NE8 of the LDP2, there will be a presumption against the loss of ancient semi-natural woodland; native woodland; ancient and veteran trees; individual trees; trees protected by Tree Preservation Orders and hedgerows. The removal of these natural assets will only be allowed where this will achieve significant and clearly defined economic, social and environmental benefits.

Where removal can be fully justified, a **deforestation phasing plan** and **compensatory planting and mitigation proposals** will be required in line with the provisions of the Scottish Government's Policy on the Control of Woodland Removal and the associated implementation guidance. Proposals of this kind should also take account of information contained within the Ayrshire and Arran Forestry & Woodland Strategy.

Any loss of trees or woodland should be fully quantified in the early stages of a proposal. A **felling licence** may be required from the Forestry Commission Scotland where development involves loss of trees or forestry. Scottish Forestry should also be consulted on the potential loss of any Ancient Semi-Natural Woodland (ASNW).

For guidance on how to manage forest waste removal, please see the Joint SEPA, NatureScot and FCS guidance on Use of Trees Cleared to Facilitate Development on Afforested Land.

Community and Economic impacts:

- **Impacts on public access, including long distance walking and cycling routes and scenic routes;**
- **Impacts on communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker**

Analysis should be undertaken to assess the potential impacts on public access and long distance walking and cycling routes, as these are a major part of the recreational offer of East Ayrshire for both locals and visitors alike.

Proportionate to the scale of proposals, visualisations should be submitted showing impacts on public access routes and other scenic routes from any sensitive receptors including settlement boundaries, individual dwellings or paths – these may form part of a **Residential Visual Impact Assessment** (which may in turn be included in the LVIA). Where proposals are to be located in an urban area, it is particularly important that impacts on communities are fully and carefully considered.

All applications should adhere to the best practice construction guidelines in relation to noise and hours of construction. Depending on the proposal, noise reduction features may be required to be incorporated into the design. Operations that will give rise to noise should be located as far as possible from sensitive receptors e.g. dwellings. A **Noise Impact Assessment** may be required, and this should include a cumulative assessment where there are other developments nearby.

Early consultation with the Council's Environmental Health Department will be required: environmentalhealth@east-ayrshire.gov.uk.

All development proposals relating to energy from waste, biomass, or anaerobic digestion will require an **Air Quality Assessment**, which should include the following information:

- Justification for choice of location in relation to proximity to settlements;
- Net reduction in carbon emissions as a result of the choice of fuel;
- Emissions standard of the boiler proposed.

Any pollution that may be caused by the proposal should be minimised. Permits and licensing relating to groundwater investigation, abstraction or discharge are administered by SEPA.

Early consultation may be required: planning.sw@sepa.org.uk

Where necessary, details should be provided in relation to planned security on site (temporary and permanent), as well as the location of signage, scale and type of fencing required, to ensure the safety of residents and communities.

Moreover, developments should consider how they contribute positively to social factors which can improve the health and wellbeing of local residents such as:

- Opportunities for good work including learning and employability opportunities (this is linked to the criterion below on 'Net Economic Benefit')
- Sustainable transport connections
- Access to natural spaces for leisure and recreation
- Building connected and resilient communities (e.g. community ownership of renewable energy assets and land and/or opportunities to provide low cost energy to households in the surrounding area and subsidise energy efficiency measures)

Developments should also consider how they can mitigate any potential negative impacts on health and wellbeing that may occur due to e.g. increased vehicle traffic during construction and operation and impacts on groundwater supplies and distribution.

Net economic impact, including employment, training and business and supply chain opportunities

Proposals for renewable energy developments should provide a **statement**, proportionate to the scale of the development, of the socio-economic benefits that will arise from the development e.g. employment, supply chain opportunities or associated business. This could include e.g. the overall number of jobs created by the development, the economic activity associated with procurement, construction and operation, and what is being done to ensure that local communities in particular see the benefit of this economic activity. On the latter,

As per **Policy SS10** of the Local Development Plan, developers applying for planning permission for a major development are required to submit a **skills and employment plan** demonstrating how they will look to provide training / skills and employment opportunities for residents in East Ayrshire.

As a minimum, this should detail:

- Direct job creation associated with construction, operation and maintenance;
- Indirect job creation and supply-chain opportunities for local businesses;
- Wider benefits to the local economy pertaining to any particular recreational / public access features that the proposal may include.

Developers will be asked to provide a post-construction economic monitoring report, demonstrating the actual economic impact of the development. Where justification for an energy proposal is in part or in full to financially support a local business, the Council will require full financial details of the proposal and a business plan which shows exactly how the proposal will cross fund and/or be invested into the business, to enable these matters to be assessed and balanced with other benefits and adverse impacts. The Scottish Government remains committed to supporting community and locally owned energy in Scotland. The Community and Renewable Energy Scheme (CARES) delivered by Local Energy Scotland offers support to communities and developers interested in shared ownership of a renewable project.

The Council supports the principle of community and shared ownership as a way of helping local communities to tap into and benefit from the wind resource in their local area. In considering a proposal, the socio-economic benefits of a community ownership or shared ownership scheme will be fully taken into account and balanced against all other matters.

Infrastructure impacts:

Impacts on aviation and defence interests and seismological recording

For large-scale solar thermal and PV developments, applicants should engage with the **Civil Aviation Authority** and **Prestwick Airport** to identify potential impacts of the proposal. Where agreements have been reached with the relevant authorities, these should be submitted in support of a planning application.

Contact for Civil Aviation Authority: aerodromes@caa.co.uk

Contact for Prestwick Airport: safeguarding@glasgowprestwick.com

Impacts on trunk roads and road traffic, during construction, operation and decommissioning

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. Applicants should detail which routes construction traffic will use during the construction phase.

A **Transport Assessment** may be required for large-scale developments. This should include (where relevant):

- A description of site access and parking;
- Anticipated vehicle movements and routes;
- Frequency and volume of deliveries and anticipated heavy loads;
- Existing public access;
- Detailled plan of public access across the site and immediate hinterland;
- Paths/areas of public access available during construction and after completion;
- Details of any diversion of paths (temporary or permanent).

Large-scale proposals should also be supported by a **Construction Traffic Management Plan**.

A separate statutory procedure requires to be followed to allow the temporary or permanent diversion of footpaths. An **Access Management Plan** may be required where rights of way or core paths will be affected.

Early consultation with Ayrshire Roads Alliance (ARA) will usually be required: enquiries@ayrshireroadsalliance.org

Impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised

Where necessary, analysis should be undertaken to assess any potential impacts on telecommunications and broadcasting installations.

Other:

Cumulative Impacts

Any cumulative impact with other proposed and consented developments should be assessed and should examine air quality, pollution, ecological, noise and transport impacts, as well as any other relevant impacts.

Grid Capacity

Grid capacity should not constrain renewable energy development. It is for developers to agree connections to the grid with the relevant network operator. The connection of the wind energy development to the national grid will normally require additional infrastructure to be put in place, by way of underground cabling or overhead power lines. National Planning Framework 4 Policy 11 states that consideration should be given to underground connections where possible.

The relevant District Network Operator (DNO) for Central and Southern Scotland is SP Energy Networks. Where necessary, early engagement with the DNO regarding grid capacity and the means of connection is strongly encouraged, to inform the progression of a Section 37 application to the Scottish Government via the Energy Consents Unit.

Decommissioning, Restoration and Aftercare (DRA)

For major energy developments, details should be included on decommissioning plans (including details of how waste generated through decommission will be dealt with), restoration and aftercare arrangements, and confirmation of proposed financial bond.

7.1 Quick-Start Guide: Required Information Checklist

	Statement on contribution to reducing emissions	Landscape & Visual Impact Assessment	Wild Land Impact Assessment	Phase 1 Habitat Assessment	Eary consultation with Nature.Scot	Tree survey and consultation with EAC Arbricultural Officer	Site-specific survey of peatland habitats	Assessment of any impact on the historic environment	Early consultation with Historic Environment Scotland and/or WOSAS	Flood Risk Assessment	Early consultation with SEPA/ EAC Flood Prevention Officer	Early consultation with Scottish Water	CARS licence	Air Quality Assessment	Noise Impact Assessment	Early consultation with Environmental Health	Statetment on socio-economic benefits	Engagement with Civil Aviation Authority / Prestwick Airport	Transport Assessment	Early consultation with Ayrshire Roads Alliance	Impacts on telecoms and broadcasting installations	Engagement with DNO r.e. grid connections
Wind Energy (major)*	X	X	(X)	X	X	X	(X)	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Heat Pumps	X	X		(X)	(X)		(X)	X	(X)		X	(X)	X		X	X	X			(X)		(X)
Bioenergy & CHP	X	X	(X)	(X)	(X)	X	(X)	X	X	(X)	X	(X)		X		X	X		(X)	X		(X)
Solar Thermal & PV	X	X	(X)	(X)	(X)		(X)	X	X								X	X		(X)		X
Energy from Waste	X	X	(X)	(X)	(X)			X	X					X	(X)	X	X		(X)	X		(X)
Anaerobic Digestion	X	X	(X)	(X)	(X)			X	X		X	(X)		X	(X)	X	X		(X)	X		(X)
Hydropower	X	X	(X)	(X)	(X)	X	(X)	X	X	(X)	X	(X)	X		(X)	X	X		(X)	X		X
Hydrogen	X	X	(X)	X	X	X	(X)	X	(X)	(X)	X	X			(X)	X	X		(X)	X		X
Microgeneration tech	X	(X)		(X)	(X)			X	(X)	(X)	X	(X)	(X)			(X)	(X)			(X)		(X)
District Heating	X		(X)	(X)	(X)			X	(X)								X					X
Energy Storage	X	X	(X)	(X)	(X)	X	(X)	X	X	(X)	X	(X)			X	X	X		(X)	(X)		(X)
	Climate Change impacts	Environmental impacts												Community & Economic impacts				Infrastructure impacts				

This table is intended as a quick-start guide: the information within it may not be an exhaustive representation of the information required for any individual development proposal.
Please refer to Section 4.9 for more detail on the information likely to be required.
Supporting information required will be proportionate to the size and scale of the proposed development.

KEY

X	Always required
(X)	Proportionate information required
*	Householder developments for e.g. single wind turbines will be assessed proportionately

8. Electric Vehicle Charging Infrastructure

The guidance in this chapter is intended to assist developers with the requirements for the provision of Electric Vehicle (EV) charging for developments being determined under the East Ayrshire Local Development Plan 2 (2024).

East Ayrshire Council recognises that the provision of electric vehicle charging infrastructure is one part of a wider vision to decarbonise transport systems. The proportion of income-deprived residents in East Ayrshire is slightly higher than the Scottish average, and the current costs associated with Electric Vehicle ownership (both upfront at point of purchase and the ongoing cost of charging) mean that these will not be a viable solution for many households. Therefore it is important that the expansion of electric vehicle infrastructure is achieved in conjunction with an expansion of decarbonised public transport services and an increase in safe routes for active travel.

Policy T5 of LDP2 requires EV charging spaces to be included within both residential and non-residential developments.

Policy T5: Charging Infrastructure for electric vehicles
All new development will be required to provide low or zero-emission vehicle and cycle charging points in safe and convenient locations, in alignment with building standards.
Developers should engage with electricity providers to ensure that the entire electricity supply infrastructure will have sufficient capacity to enable all charge points to operate simultaneously or the ability to deploy a Smart EV Charging solution at the development in conjunction with the Electricity Network Operator. The developer will be required to meet the cost of any upgrades needed.
Hydrogen charging spaces should be provided where there will be demand from end users of the development.
Further guidance on Electric Vehicle Charging requirements and how these should be implemented will be provided in Energy and Electric Vehicle Charging Supplementary Guidance.

As of June 2023, changes to Building Standards regulations in Scotland mean that, subject to limitations, every building must be designed and constructed in such a way that provision for the charging of electric vehicles is made where car parking spaces are located within the building or the curtilage of the building.

EV Charging spaces can be provided in two ways:

- **Active** parking spaces are those which are fully wired and ready to use.
- **Passive** parking spaces have infrastructure in place (power supply, ducting and fuses) but without the cabling and chargers. The charging equipment and cabling can be installed and activated within passive parking spaces when the demand arises.

8.1 New Developments: Location of Charge Points

Whist the EV charging requirements are embedded within Building Standards rather than Planning legislation, given its importance to overall site planning and design, it is considered worthwhile to set out the following requirements that apply to the location of charge points (as per the Building Standards Technical Handbook 2023, **Chapter 7.2: Electric Vehicle Charging**):

- Charge points should be located outwith any surfaces used as an access route and should not present an obstruction to pedestrians, cyclists or vehicles. Location of charge points should enable charging to take place without charging cables crossing or otherwise obstructing pedestrian, cycle or vehicle routes, including drop kerbs between road and pedestrian surfaces.
- Charge points should be positioned in relation to parking spaces to minimise the risk of accidental damage, for example, from vehicles projecting over kerbs. Where a protective barrier is provided, this should not impede the use of the charge point.
- Where a charge point serves more than one parking space it should be provided with one charge point socket per parking space (with each socket able to deliver a minimum of 7 kW simultaneously) and should enable safe and convenient use of all outlets at the same time.

To enable installation, maintenance and ease of use:

- Floor mounted charge points should be installed so that there is not less than 1500 mm between the sides, and 500 mm between the rear, of the charge point enclosure and any adjacent wall or similar obstruction.
- Wall mounted charge points should be installed so that there is not less than 800 mm between the charge point enclosure and any adjacent wall or similar obstruction. Charge points should be installed with the lower edge of the charge point enclosure between 700 mm and 1000 mm from floor level.

Additional guidance on delivering accessible charge points is provided within PAS 1899:2022 – 'Electric vehicles – Accessible charging – Specification'. Installations should meet the requirements of BS 7671 and the IET's 'Code of Practice: Electric Vehicle Charging Equipment Installation'.

8.2 Information needed in support of a planning application

For new EV Charging Points being installed on commercial premises (e.g. in large-scale car parks) or in new-build residential developments, the following supporting information will be required:-

- Location Plan (typically 1:1250 or 1:2500 for larger sites) showing the extent of proposed works in an enclosed **red** line boundary and the full extent of surrounding land ownership in an enclosed **blue** line boundary;
- Site Plan (typically 1:100, 1:200 or 1:500) showing:-
  - The extent of proposed works in an enclosed **red** line boundary and the full extent of surrounding land ownership in an enclosed **blue** line boundary.
  - Locations of EV Chargers (on specific parking spaces where applicable)
  - Location of any other infrastructure such as e.g. signage
  - Location of any overground cabling if applicable;
- Any supporting photographs of the site;
- Composite plans for the proposed EV Chargers showing:-
  - Dimensions (H x W x D)
  - Elevations (front; rear and side views)
  - Plan views
  - Materials and colours
  - Any fixing details and duct locations
  - The extent/depth of any foundations;
- Manufacturers documentation of the EV Charger make and model (e.g. installation guide and/or operating instructions);
- Details of planned connections to electricity supply including evidence that the district network operator (DNO) has been informed as the electricity supplier must be made aware and have approved the installation; and.
- Any supporting information on whether proposed charging facilities will be private or shared.

Please be aware that further supporting information may be requested by Development Management where necessary.

Please Note: In recent years a number of new commercial EV charging points have been installed in e.g. supermarkets or other similar public spaces in East Ayrshire. Whilst the ongoing provision of public charging infrastructure is important and the support of local businesses in this expansion is welcomed, there is also a need to ensure that EV Charging Infrastructure is spread proportionately throughout the Council area, including in more rural areas. This will help to alleviate 'induced demand', i.e. electric vehicle owners making standalone journeys to charge their cars, when they may otherwise have not travelled and/or made the journey using public transport.

8.3 Householder Installations

- In general, EV Chargers may be installed at most detached, semi-detached or terraced brick/rendered properties with their own off street parking. **Permitted Development Rights apply under Classes 9E and 9F of the GDPO**.
- Flatted/tenement style properties with their own off street parking may be granted permission; these cases will be reviewed on a case-by-case basis.
- Flatted/tenement style properties without their own off street parking at present will generally not be granted permission as charging cables cannot cross public land; these cases will be reviewed on a case-by-case basis.

Standard home charging points usually have a nominal output of 3.6 kW (slow charger) or 7kW (fast charger), and domestic electricity supplies tend to be sufficient to support these. Rapid charging units (ca. 22 kW) are permitted under the UK Government's minimal technical specification for residential chargepoints, but the increase in output will require a three-phase electrical supply, which is not usually found in residential buildings.

Where permitted development rights do not apply, the following information will be required in support of an application for planning permission:-

- Location Plan (typically 1:1250) showing the extent of proposed works in an enclosed **red** line boundary and the full extent of surrounding land ownership in an enclosed **blue** line boundary (if this is different);
- Site Plan (typically 1:100, 1:200 or 1:500) showing:-
  - The extent of proposed works in an enclosed **red** line boundary and the extent of surrounding land ownership in an enclosed **blue** line boundary.
  - Proposed locations of EV Chargers within the curtilage of the property;
- Details to confirm the provision and location of any associated cabling, ducting or infrastructure (this may be included on a site plan);
- Photographs (or otherwise) showing the materials and colours of the proposed EV Charging Infrastructure;
- Documentation of the EV charger make and model (e.g. installation guide and/or operating instructions). It must be a domestic charger between 1 and 7 kW and be British Standard approved. The charger should be fitted with an isolation switch, ideally away from the charging point;
- Evidence that the district network operator (DNO) has been informed, as the electricity supplier must be made aware and have approved the installation; and
- Any supporting information on whether proposed charging facilities will be private or shared.

Please be aware that further supporting information may be requested by Development Management where necessary.

PERMITTED DEVELOPMENT RIGHTS FOR EV CHARGING INFRASTRUCTURE:

As per the 2023 revisions to the General Permitted Development (Scotland) Order, permitted development rights apply to the installation of domestic EV charge points. Subject to limitations: -

- Class 9E permits the installation, alteration or replacement (within a qualifying parking area) of an EV charging point mounted on a wall
- Class 9F permits the installation, alteration of replacement (within a qualifying parking area) of an upstand to mount an EV charging point and associated equipment

As of 2023, Class 9E PDR also applies to listed buildings and properties in conservation areas. However restrictions of this kind remain for Class 9F.

Please contact the Council's Development Management team for further advice on what constitutes permitted development.

Appendix I: Funding Opportunities

Please note that the information included in this appendix is unlikely to be an exhaustive list of the funding opportunities available for renewable energy projects in Scotland.

Information for developers:

- The 2023 Draft Energy Strategy and Just Transition Plan sets out £5 billion of investment in the sector's net zero energy transformation over the current parliamentary period – please refer to Chapter 6 of the document for further information.
- The Emerging Energy Technologies Fund administered by Scottish Government has earmarked £180 million of funding to support the development of the hydrogen sector and carbon capture and storage (CCS), including Negative Emissions Technologies (NETs) in Scotland. More information can be found here: Emerging Energy Technologies Fund - Renewable and low carbon energy
- The Energy Saving Trust offers various funding streams to help support the uptake of electric vehicles across Scotland, including help with the cost of installing EV charging infrastructure. More information is available here: Grants and loans for energy and transport - Energy Saving Trust

Information for homeowners and communities:

- The Scottish Government offer various grants and loans for energy saving improvements to homes. More information can be found here: Grants and loans for energy saving improvements - mygov.scot
- The Community and Renewable Energy Scheme (CARES) is funded by the Scottish Government and managed and administered by a consortium of partners named Local Energy Scotland. The goal of CARES is that communities across Scotland are engaging, participating and benefiting in the energy transition to net zero. This is achieved through funding and support for community groups to install renewable energy generation. More information can be found here: We are Local Energy Scotland
- Business Energy Scotland offer support to small and medium-sized enterprises, providing specialist advice on implementing energy efficiency measures to reduce both emissions and costs. They can also provide unsecured loans for the installation of energy efficient measures. More information can be found here: Business Energy Scotland · Make Your Business Greener
- Scotland's Heat Network Fund (SHNF) is open to organisations seeking to develop and deploy heat networks in Scotland. This could include various community-based organisations. More information can be found here: Scotland's Heat Network Fund: application guidance
- The Energy Saving Trust offers various funding streams to assist both individuals and businesses with e.g. electric vehicle uptake, boiler upgrades, energy efficiency improvements, and general renewable energy projects. More information can be found here: Grants and loans for energy and transport - Energy Saving Trust

Appendix II: Consented renewable energy developments in East Ayrshire since 2018 (excluding large-scale wind energy developments)

Technology Type	Application Reference	Description	Nearest Settlement
Biomass Boiler	19/0299/PP	Retrospective planning permission for the biomass boilers and associated infrastructure.	Newmilns
	19/0369/PP	Installation of shipping container to house biomass boilers with flues and fuel store. (Retrospective)	Kilmarnock
	19/0424/PP	Installation of biomass boilers within existing building and associated infrastructure and flues. (Retrospective)	Darvel
	19/0654/LD	Biomass Boiler installed in December 2014 in an existing (old byre) building	Mauchline
	19/0814/PP	Retrospective application for siting of Biomass Boiler container	Auchinleck
	19/0948/PP	Installation of 199Kw woodchip biomass boiler in existing outbuilding (Retrospective)	Mauchline
	19/0969/PP	Installation of biomass boiler (Retrospective)	Cumnock
	19/1045/PP	Installation of biomass boiler within existing building and associated flue (Retrospective)	Kilmarnock
	19/1046/PP	Installation of biomass boilers within existing building and associated flues (Retrospective)	Waterside
	19/1047/PP	Application for installation of biomass boiler within existing building and associated flue (Retrospective)	Fenwick
	20/0045/PP	Erection of an Energy Building to house a Biomass Heating system to replace existing gas boilers.	Stewarton
	20/0161/PP	Installation of 3 no. biomass boilers and flues (Retrospective)	Darvel
	20/0203/LD	Installation of Biomass Boiler	Kilmarnock
	20/0366/PP	Installation of five biomass boilers and external flues (Retrospective)	Mauchline
	20/0694/PP	Installation of biomass boiler, flue and woodchip store	Mauchline
	21/0015/PP	Biomass boilers and associated components installed within an existing building	Newmilns
	21/0219/PP	Installation of two biomass boilers and associated components installed within existing agricultural buildings (Retrospective)	Muirkirk
	21/0281/PP	Installation of three biomass boilers and associated components within an existing agricultural building (Retrospective)	Muirkirk

Technology Type	Application Reference	Description	Nearest Settlement
	21/0313/PP	Installation of three biomass boilers and associated components installed within existing agricultural buildings. (Retrospective)	Newmilns
	21/0411/PP	Installation of biomass boiler and associated components within existing agricultural building (Retrospective)	Muirkirk
	21/0664/LD	Installation of one biomass boiler and associated flue	Ochiltree
	21/0776/PP	Removal of existing shed and erection of rear extension and flue to house existing biomass heating system	Newmilns
	21/0849/PP	Proposed biomass boiler, associated flue and woodchip container	Kilmarnock
	22/0025/LDEU	Installation of one biomass boiler and associated flue.	Cumnock
	22/0292/PP	Installation of biomass boilers, flue and associated infrastructure	Galston
	22/0380/PP	Installation of Biomass Boiler located in Shipping Container	Galston
	23/0236/LDEU	Erection of building to house biomass boiler, chip store and 8 stables	Dalmellington
Heat Pumps	18/0846/PP	Installation of a 600kw water source heat pump (Retrospective)	Dalrymple
	18/0954/PP	Erection of detached dwelling and installation of an Air Source Heat Pump	Mauchline
	19/0131/PP	Erection of a grass drying and storage shed and the installation of a Heat Pump	Galston
	19/0623/PP	Installation of new Ground Source Heat Pump and associated ground collector. (Retrospective)	Auchinleck
	19/0704/PP	Reconstruction and extension of derelict cottage and erection of artist studio. Installation of air sourced heat pump and upgrading of access	Auchinleck
	20/0128/PP	Installation of ground source heat pump	Darvel
	20/0162/PP	Installation of heat pump	Dalrymple
	20/0202/PP	Proposed Installation of a Ground Sourced Heat Pump within existing Store	Auchinleck
	20/0352/PP	Installation of a proposed heat pump at the site	Newmilns
	20/0603/PP	Installation of an addition of 5 pods, amenity block and containerised ground-source heat pump	Newmilns
	20/0607/PP	Installation of Ground-source heat pumps installed internally, with 4 boreholes	Newmilns
	20/0671/LD	Rear garden extension and proposed air source heat pump renewable heating upgrade to existing house	Stewarton

Technology Type	Application Reference	Description	Nearest Settlement
	21/0044/PP	Partial removal of existing service shed, erection of new single storey printmaking studio and installation of new air source heat pump.	Cumnock
	21/0850/PP	Installation of Air Source Heat Pump to existing dwelling	Muirkirk
	21/0851/PP	Erection of educational building and shed with air source heat pump and photo voltaic panels, parking, landscaping and other minor works.	Cumnock
	22/0031/NMV	Inclusion of Air Source Heat Pumps to Blocks, and amendments to photovoltaic panels to Blocks of (Planning Consent No. 21/0189/PP)	Kilmarnock
	23/0132/LB	Installation of air source heat pump and solar panels	Crosshouse
	23/0280/PP	Installation of 2No 7kw Heat Pumps	Ochiltree
	23/0286/PP	Installation of an air source heat pump	Crosshouse
Combined Heat and Power (CHP)	21/0616/PP	Erection of a building to house a combined heat and power plant using biomass	Auchinleck
Solar Panels (PV)	18/0032/NMV	Relocation of solar panels and increase from 18 to 24 panels of Planning Consent No. 17/0049/PP	Dalmellington
	18/0758/PP	Installation of 5no Electric Car Charging Units, an Electricity Substation and Solar Canopy.	Kilmarnock
	19/0026/NMV	Change windows and doors to Alu-Clad in lieu of PVC and add PV panels to rear elevation of Planning Consent No. 18/0954/PP	Mauchline
	20/0175/PP	Erection of 2 shelters, 1 double stable with fixed wind turbine and solar panel, 1 stable pod, 1 polytunnel, 1 dog kennel, fenced pen enclosure and perimeter fence (Retrospective)	Newmilns
	20/0300/PP	Erection of Extension, formation of three dormers and PV panels to existing dwelling	Kilmarnock
	21/0017/PP	Installation of 778 photovoltaic solar panels on roof including associated inverters and ancillary equipment.	Kilmarnock
	21/0054/PP	Installation of Solar PV system on the gym hall roof	Kilmarnock
	22/0361/PP	Upgrade of existing 32KW roof mounted Solar PV system to include an additional 75KW roof mounted Solar PV installation.	Ochiltree
	22/0364/PP	Installation of 10 no. photovoltaic panels on pitched roof	Kilmarnock
	22/0365/LB	Installation of 10 no. photovoltaic panels	Kilmarnock
	22/0615/PP	Install 44 KW of Solar PV panels on building rooftop	Kilmarnock

Technology Type	Application Reference	Description	Nearest Settlement
	22/0711/PP	Installation of Ground Mounted 200kW Solar Panels	Muirkirk
	23/0196/PP	Installation of solar panels	Dalmellington
	23/0522/PP	Installation of 40kWp ground mounted solar panesl	Darvel
	23/0533/PP	Installation of a solar PV system on the roof of building	Kilmarnock
Hydropower	18/0911/PP	Construction of hydro electric scheme including erection of powerhouse building	Dalmellington
Hydrogen	20/0001/S36SCR	Proposed solar pv, green hydrogen production facility and battery storage facility	Whitelee Wind Farm
	23/0312/PP	Construction and operation of a green hydrogen production facility including associated infrastructure and compound	Patna
Wind Turbines	21/0001/PP	Proposed new detached garage and installation of wind turbine	Cumnock
	21/0673/PP	Erection of 1KW wind turbine erected on an 8m pole	Dalmellington

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