

Renewable & Low Carbon Energy

SEA Non-Technical Summary

August 2019



in partnership with



The James
Hutton
Institute

Acknowledgements

© 2019 Perth & Kinross Council

© 2016 The James Hutton Institute

Limited extracts from the text may be reproduced provided the source is acknowledged.

© Crown copyright [and database rights] 2017 OS 100016971. Use of this data is subject to terms and conditions. <https://www.ordnancesurvey.co.uk/business-and-government/public-sector/mapping-agreements/viewing-terms.html>

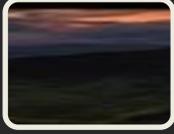
Some features of the maps are based on digital spatial data licensed from the Centre for Ecology and Hydrology. © NERC.

© Some features of the maps are based on digital spatial data licensed from The James Hutton Institute 2016. User License No. MI/2009/315.

Some features of the maps are based on data licensed from: © Forestry Commission, © Scottish Natural Heritage, © Royal Society for the Protection of Birds, © Historic Environment Scotland, © Defra, © Loch Lomond and the Trossachs National Park Authority, © Cairngorms National Park Authority, © Scottish Government. Use of this data is subject to terms and conditions.

Table of Contents

	Page
1. Introduction	4
• What is SEA and why has it been carried out?	4
2. Renewable and Low Carbon Energy SG	5
• Area Covered by the Draft Guidance	5
• Purpose and Objectives	5
3. State of the Environment of Perth and Kinross	7
• Air	7
• Water	8
• Soils	8
• Cultural Heritage	8
• Landscape and Land Use/Cover	9
• Biodiversity, Flora and Fauna	9
• Material Assets, Population and Health	10
• Climatic Factors	10
4. Main Environmental Issues of Relevant to Perth and Kinross	11
5. Expected Environmental Issues without the Guidance	15
6. Approach to SEA	16
• Why did we choose to look at these environmental topics?	16
• Have you assessed the possible effects of the draft Guidance?	17
7. Key Findings	18
• Spatial Assessment	18
• Wind	19
• Hydro	22
• Solar	24
8. Cumulative and Strategic Sensitivities	26
• Wind	26
• Hydro	27
• Solar	27
• Policy Assessment	29
9. Mitigation, Enhancement and Monitoring	35
10. Consultation and Next Steps	35
• How to comment on the Environmental Report	36
• Where can I view more information?	36
• Data Protection	36
11. Contacts and Team Credits	37



1. Introduction

What is SEA and why has it been carried out?

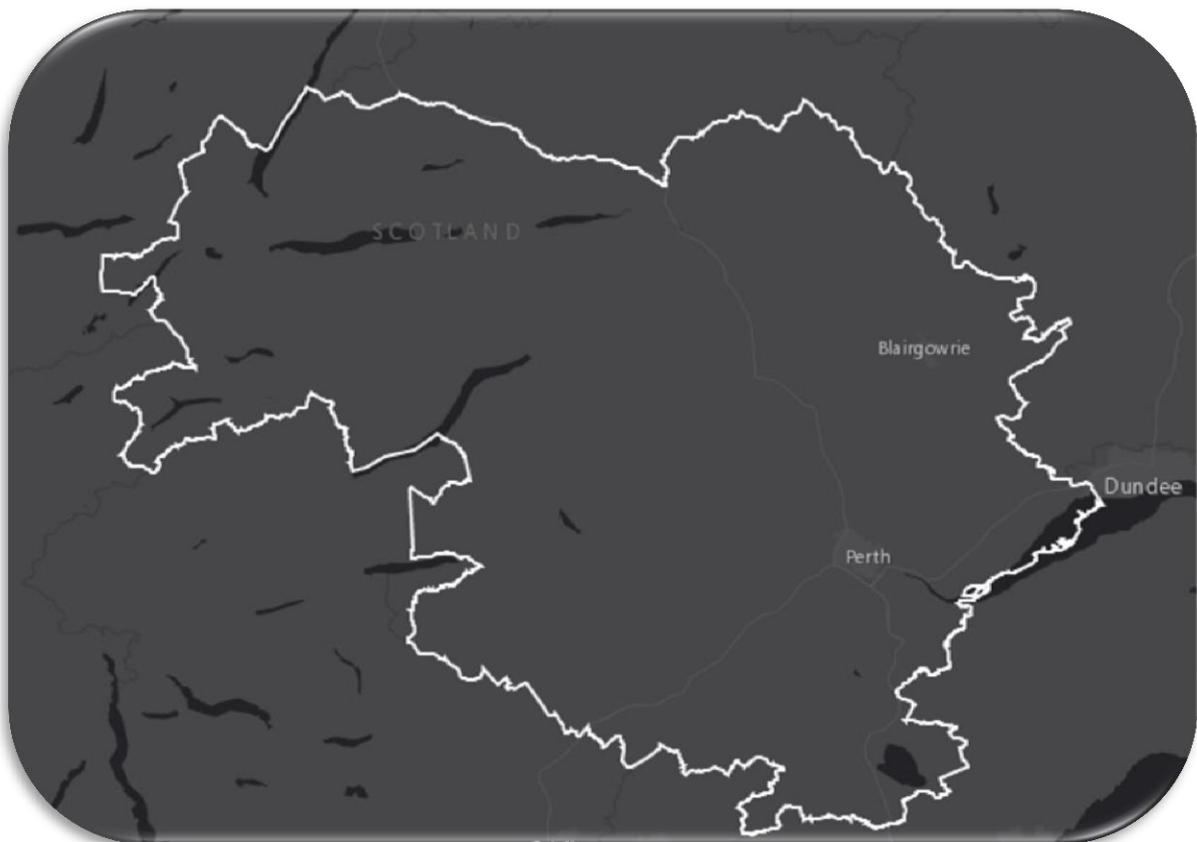
- 1.1. Strategic Environmental Assessment, or SEA, is a process used to assess, consult upon and monitor the likely significant effects, both positive and negative, of implementing a qualifying plan, programme or strategy (PPS) on the environment. Qualifying PPS are normally those produced by public bodies, like Perth & Kinross Council. A list of such PPS and the legislative requirements for SEA are described in the Environmental Assessment (Scotland) Act 2005.
- 1.2. A SEA has been carried out for the Council's draft Renewable and Low Carbon Energy Supplementary Guidance (SG). The purpose of the SEA is to identify any potential significant positive and negative environmental impacts associated with the draft guidance for each of the renewable and low carbon energy technologies dealt with in the draft SG (i.e. wind, hydro and solar).
- 1.3. The SEA's role is also to ensure that any significant negative environmental effects are avoided or mitigated through appropriate measures. The SEA framework will help identify strategic and cumulative environmental sensitivities, allowing the draft SG to pinpoint where capacity exists and also environmentally sustainable locations for new renewable and low carbon energy developments. The results of that environmental assessment are set out in the SEA Environmental Report, and this Non-Technical Summary accompanies that Report, providing an outline of the purpose, methods and findings of that assessment. This summary can be read on its own or as part of the full Environmental Report.



2. Renewable and Low Carbon Energy SG

Area Covered by the Draft Guidance

- 2.1. The following map shows the area covered by the draft Supplementary Guidance. It excludes the parts of the Cairngorms and Loch Lomond and The Trossachs National Parks where there are separate statutory Planning Authorities.



Purpose and Objectives

- 2.2. The draft Supplementary Guidance (SG) is intended to replace the current guidance for wind energy development issued in 2005, and will support the delivery of a diverse range of renewable and low carbon energy technologies, including wind, solar, hydro, renewable heat and other forms of renewable and low carbon energy generation. The draft SG will also include guidance on the expansion and repowering of existing renewable and low carbon energy developments.

- 2.3. In addition to supporting the delivery of a diverse range of renewable and low carbon energy technologies generally, the draft SG will – through strategic environmental sensitivity mapping – provide an indication of areas, at a strategic level, that may be suitable locations for development proposals. However, it is likely that more detailed assessment(s) will be required at the site specific proposal stage.
- 2.4. The document will include the following elements to address key requirements as outlined below:
- Scottish Planning Policy SPP - **Spatial Framework for Wind** steering wind farms to the least sensitive locations in accordance with SPP Table 1: Spatial Framework for Wind.
 - Landscape Capacity Study (LCS) for Wind - Guidance relating to the David Tyldesley Landscape Capacity Study (2010) which identifies the landscape sensitivity and capacity for wind energy development in the Perth & Kinross area.
 - Spatial Policy Guidance through Environmental Sensitivity maps and guidance for Wind (Group 3 areas only), Hydro and Solar technologies (developed as part of the Environmental Assessment process) to steer developments – at a strategic scale – to the least sensitive locations. The maps and guidance will inform the decision making process by identifying strategic scale environmental sensitivities and how any impacts can be considered as part of the planning/consenting process.
 - Policy Guidance on a range of environmental, social and economic considerations which should be addressed – where relevant - when preparing renewable and low carbon energy proposals.
- 2.5. The Guidance when adopted will support the implementation of a range of existing policies, and will set out a consistent approach to be applied across Perth and Kinross to help developers in the siting and design of renewable and low carbon energy development proposals, and also the Council in reaching a decision on these types of applications. Once formally approved, the SG will become statutory supplementary guidance supporting the Local Development Plan, and will be used to assess the acceptability of development proposals.
- 2.6. The draft SG has a **relationship with a number of other plans, policies and strategies**, but those which are most relevant include:

- The Climate Change (Scotland) Act 2009
- Climate Change (Emissions Reduction Targets)(Scotland) Bill
- Climate Change Plan (The Third Report on Proposals and Policies 2018-2032)
- Scottish Energy Strategy (2017)
- Onshore Wind Policy Statement
- National Planning Framework 3 and Scottish Planning Policy



3. State of the Environment of Perth and Kinross

- 3.1. Including data in an assessment helps to build a picture of the social, economic and environmental characteristics of an area, and the key environmental issues that it faces. A lot of consideration was given to the question of what information should be included within the assessment; this was to ensure that we collected a more relevant and focussed set of data for the range of topics likely to be specifically influenced by the Renewable and Low Carbon Energy SG.
- 3.2. As a result, the Council, in partnership with The James Hutton Institute (JHI), gathered spatial data from a variety of sources, including the Scottish Government's Land Use Data Directory, and information from SEPA and SNH, in order to create a baseline of relevant environmental considerations. The environmental assessment highlights any data gaps where there were no obvious datasets available for certain services or other considerations.
- 3.3. The section below summarises existing environmental issues and considerations for the area identified through consideration of the environmental baseline for Perth and Kinross.

AIR

- 3.4. There are currently two Air Quality Management Areas in Perth and Kinross, one in Perth and one in Crieff.
- 3.5. Carbon dioxide emission estimates per capita in Perth and Kinross have decreased slightly since 2007. In 2012, 8.1 tonnes of CO₂, a rise of 0.6 over the previous year,

were emitted compared with 6.7 tonnes as an average across Scotland. Of this, 27% was from the industry and commercial sectors, 31% from domestic, and 42% from road transport.

- 3.6. A relatively larger proportion of carbon emitted in Perth and Kinross is taken up by land use, land use change and forestry than at the Scottish level.

WATER

- 3.7. Currently approximately 36% of sub catchments within and/or intersect Perth and Kinross provide drinking water services. 97% of drinking water is supplied by Scottish Water with the remaining 3% coming from private supplies. In 2017, 45% of the total number of rivers and 82% of groundwater bodies were classified as being of good status or better, with areas in the east and south containing areas of bad or poor status. The whole of the area is a ground water drinking protected area (SEPA 2014).
- 3.8. SEPA has identified approximately 14,660 hectares (ha) of wetlands in Perth and Kinross (2009). Across Scotland most wetlands within protected sites are in favourable condition, with the exception of lowland raised bogs where 59% of sites are in unfavourable condition.

SOILS

- 3.9. Approximately 11% of Perth and Kinross contains prime agricultural land located in the south and eastern areas. These areas are also where a quarter of large abstractions of water for agriculture occur.
- 3.10. Soil major sub groups considered to be of national interest included: humus, peat – peatland habitats, alluvial soils, alpine and subalpine soils. Organic-mineral and organic soils are mainly located on the northwest fringe of the area and cover around 2000 km². Table 1 of Scottish Planning Policy (SPP) identifies carbon rich soils, deep peat and priority peatland habitat as nationally important mapped environmental interests. Within the Perth and Kinross Area this includes over 55,000ha of Class 1 and over 54,000ha of Class 2 soil types. In addition to this carbon rich soils (categories 1, 2, 3 and 5) should also be considered where present and mitigation may be required to minimise disturbance and release of greenhouse gas emissions from soil. There are 47,393 ha of Class 3 soils and 30,744 ha of class 5 soils in Perth and Kinross

CULTURAL HERITAGE

3.11. Perth and Kinross contains 734 Scheduled Ancient Monuments and 3069 listed buildings. 96 of those listed buildings are on the buildings at risk register - a decrease of 27% since 2014. Throughout Perth and Kinross there are 42 Gardens and Designed Landscapes covering 11,123 ha, 36 Conservation Areas, and 4 sites on the Inventory of Battlefields (Battle of Duplin Moor, Battle of Dunkeld, Battle of Killiecrankie, and Battle of Tippermuir). Approximately 18,425ha of undesignated archaeological sites/remains are also located within the area.

LANDSCAPE AND LAND USE/COVER

3.12. There is a clear distinction between scrub, heath and moorland in the upland area in the northwest and agriculture in the lowland areas of the south east and river valleys. The main land cover categories are montane and heath scrub (36%), grassland (28%), agriculture (10%) and woodland (17%). National Scenic Areas (NSAs) and Wild Land Areas (WLAs) are nationally important landscape designations. Special Landscape Areas (SLAs) are locally designated landscape areas. There are 4 National Scenic Areas wholly within Perth and Kinross (Loch Rannoch and Glen Lyon, Loch Tummel, River Tay, and River Earn, and also part of the Glen Coe and Rannoch Moor). 11 Special Landscape Areas have been designated; these consist of a range of highland and lowland areas covering 27% of the Council Area. There are also 5 Wildland Areas within or intersecting Perth and Kinross. The Historic Land Use Assessment identified 55 individual historic land-use types. The majority of the region has been identified as rough grazing and rectilinear fields.

BIODIVERSITY, FLORA AND FAUNA

3.13. There are approximately 57,142 ha of ancient and semi-natural woodland cover in Perth and Kinross. Protected areas – also known as designated sites – help to ensure that their natural features of special interest remain in good health for all to enjoy, now and in the future. Around 36% of Perth and Kinross is designated under national or international legislation to protect the landscape, habitats and species. In 2019 75.1% of designated sites were considered to be in favourable condition, with 5.7% in recovering status and 19.2% in unfavourable status. Further information is available on specific sites including details about latest assessed condition, site visits, etc. on the Scotland's Environment website.

3.14. Surveys of the number of breeding waders at several key breeding sites were carried out by the RSPB in 2012. This is of particular relevance to floodplain and other wetland habitats and enclosed farmland, where inappropriate development can have a

significant adverse impact on priority bird populations such as breeding waders. The area contains or adjoins 8 Important Bird Areas (covering nearly 44,000 ha; has 4 National Nature Reserves (NNRs) covering 1.4% of the area, and has the highest number of SSSIs per land mass in Scotland.

MATERIAL ASSETS, POPULATION AND HEALTH

- 3.15. In 2010, the Forestry Commission (FC) completed the National Forest Inventory (NFI) which shows the extent of all woodland of 0.5 ha or over. According to the NFI 17% of Perth and Kinross is forested, which is an increase of 1% (or over 6500 ha) since 2002 (FC, 2011). The Native Woodland Survey of Scotland (FC, 2013) identifies approximately 6% of this area as native or nearly native woodland. 'Strategic Green Networks, Cycleways, Paths and Recreation Areas' maps the distribution of these assets. Development should not only contribute towards new green infrastructure, a contribution should also be made to existing green infrastructure, either through enhancement, or by ensuring that there is no adverse impact or fragmentation of it.

CLIMATIC FACTORS

- 3.16. Perth and Kinross has 3.15% of the nation's installed microgeneration capacity, the second highest in Scotland and the UK. Installed capacity for windfarms in the area has increased by 70 Megawatts (MW) since 2011, and is currently 264 MW. Since 2003 the total domestic energy consumption per capita Kilowatt-hour (kWh) for the area has steadily decreased year on year. The latest data for the area, produced in 2014, recorded consumption, per head of the population, of 9630 kWh. Scotland had the highest mean domestic consumption of natural gas with 14,300 kWh per meter.
- 3.17. Scotland's 2014 State of the Environment Report predicts less overall summer rainfall, and higher autumn/winter rainfall, which will lead to higher annual river flows. This, along with an increased frequency of extreme precipitation events, a higher temperature in all seasons, and sea-level rise, is predicted to have an adverse impact on the environment through loss of habitat, increased pollution and increased flooding. The National Flood Risk Assessment has found that 1 in 22 of all residential properties and 1 in 13 of all non-residential properties are at risk of flooding.



4. Main Environmental Issues of Relevance to the Plan

- 4.1. The development of a variety of renewable and low carbon energy technologies is likely to result in a wide range of potential environmental impacts across all of the SEA Objectives which we have identified for the topics: soils, land use, the water environment, forests and woodlands, habitats and species, renewable energy resources and climate change, landscape, the historic and cultural environment, green networks, designated sites, and air quality.
- 4.2. Table 3.2 in the SEA Environmental Report (see below) specifically details the key environmental issues associated with the draft guidance and where the environmental assessment is primarily focused. **The environmental assessment has the important role of ensuring that when the contents of the guidance, once adopted, are put into practice they do not lead to any significant negative effects on the environment.** The Environmental Report sets out the process followed to carry out that assessment and its results, as well as recommending changes to the draft guidance to avoid or reduce any significant impacts that have been identified through the assessment.

Environmental Report Table 3.2: SEA Topic and Associated Environmental Issues and Considerations

SEA Topic	Potential Environmental Issues and Considerations
<p>Biodiversity, Flora & Fauna</p>	<ul style="list-style-type: none"> • Consideration of the role of peatland areas which support important habitats and avoid impacts on these areas. Any development or activities in these areas are likely to have an impact on the integrity of peatland dependent habitats. • Biomass production could have negative effects on biodiversity, landscape and also amenity implications as a result of planting, harvesting, transport and processing. However an important consideration is what sort of land-use forestry for biomass is replacing e.g. carbon-intensive agricultural practice. • Preservation and enhancement of the distinctive landscape of the Perth and Kinross area is important to maintain community wellbeing, biodiversity and to support the local economy. • Careful planning will be required in order to avoid potential adverse impacts at the local and potentially strategic scale on biodiversity, soil, water, landscape and cultural heritage through the development of renewable energy proposals and distribution networks. • The redevelopment of existing power stations and projects with carbon capture and storage may impact on biodiversity, air and water. • The safeguarding of nationally important landscapes (National Scenic Areas and National Parks) from large scale wind farms will be beneficial to these landscapes, biodiversity and wider ecosystems. • Potential for the loss of areas of green space and habitat connections, together with the loss and damage of geology and minerals as a result of development. • Potential for disturbance to species and/or damage, fragmentation or destruction to habitats as a result of development and increased access. In addition, habitat fragmentation can restrict the movement of species in response to the effects of climate change.
<p>Population, Human Health & Access</p>	<ul style="list-style-type: none"> • Potential for impacts on amenity through noise and localised effects such as shadow flicker. • Renewable energy developments can generate a high volume of public interest, mainly as a result of their perceived visual impacts and on amenity. • Potential for creating and enhancing walking and cycling routes linked to renewable energy proposals. • Preservation and enhancement of the distinctive landscape of the Perth and Kinross area is important to maintain community wellbeing, biodiversity and to support the local economy. • Potential negative human health and air quality impacts arising from particulate matter and other emissions associated with biomass, anaerobic digestion, energy from waste and landfill gas
<p>Soils</p>	<ul style="list-style-type: none"> • Healthy and diverse soils are important for crop growth, carbon storage and sustaining biodiversity across a range of habitat types. Human activity, land use and intensity, and global climate effects can be detrimental to soils, reducing their distribution, function and sustainability. • Careful planning will be required in order to avoid potential adverse impacts at the local scale on soils including associated impacts on biodiversity and water resources through the development of renewable energy proposals and distribution networks.

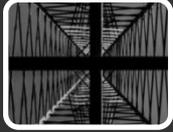
SEA Topic	Potential Environmental Issues and Considerations
	<ul style="list-style-type: none"> ● Threats to soil functions are erosion and compaction related to land management, contamination, sealing, loss of biodiversity, acidification from acid rain, climate change, and loss of organic matter. ● Renewable energy developments can also lead to a loss of, and impacts on, prime agricultural land, carbon rich soils, deep peat and priority peatland habitats, as well as the capacity of soils to act as a carbon store.
Water	<ul style="list-style-type: none"> ● Potential impacts from flood risk areas on development proposals and conversely impacts from development proposals which exacerbate existing flood risk areas. ● Any developments/proposals that could adversely impact upon the ecological status of the water environment have the potential to impact upon its ability to deliver supporting services. ● Careful planning will be required in order to avoid potential adverse impacts at the local scale on biodiversity, soil, water, landscape and cultural heritage through the development of renewable energy proposals and distribution networks. ● Potential impacts on Ground Water Dependent Terrestrial Ecosystems (GWDTES), which are particularly susceptible during construction phase of projects and impacts from abstractions and changes in flow.
Air	<ul style="list-style-type: none"> ● Air quality could be affected (as a localised effect) by increased biomass for heat, or proposals such as energy from waste (EfW), anaerobic digestion, and landfill gas.
Climatic Factors	<ul style="list-style-type: none"> ● Encouraging an increase in renewable and low carbon energy development (in appropriate locations) can result in positive environmental impacts by helping the area adapt to and mitigate against the effects of climate change. ● Increased risk from flooding – as a result of climate change - impacting on the development of renewable and low carbon energy technologies, including any associated adaptation measures required. ● Positive contributions are likely to be achieved as a result of encouraging renewable and low carbon energy developments in appropriate locations by making a contribution to meeting the national targets for reducing greenhouse gas emissions. ● Consideration should be given to areas of peatland as they perform an important carbon sink role. Any development or activities in these areas are likely to disturb peat resources with subsequent impacts on climatic factors. ● Potential transportation effects associated with biomass developments transporting fuels from source to the processing plant.
Material Assets	<ul style="list-style-type: none"> ● Potential for negative impacts on the area's green networks through development. ● Potential for damage and/or temporary obstruction of the core paths, long distance and cycle route network through development. ● Wind energy developments can often require the felling of large areas of forestry in order to accommodate turbines and access roads. ● Felling of trees as a result of wind turbine and hydro-scheme developments can generate a significant amount of waste.
Cultural Heritage	<ul style="list-style-type: none"> ● Development can directly and indirectly affect cultural heritage including archaeological and historic sites and their settings and may cause irreversible damage. Potential impacts on the historic environment should be considered as proposals are developed. This may involve

SEA Topic	Potential Environmental Issues and Considerations
	<p>systematic archaeological survey to identify the location, extent and significance of historic environment features before any works are undertaken.</p>
<p>Landscape, Land Use/ Cover</p>	<ul style="list-style-type: none"> ● Preservation and enhancement of the distinctive landscape of the Perth and Kinross area is important to maintain community wellbeing, biodiversity and to support the local economy. ● Biomass production could have negative effects on biodiversity, landscape and also amenity implications as a result of planting, harvesting, transport and processing. However an important consideration is what sort of land-use biomass planting is replacing e.g. carbon-intensive agricultural practice. ● New developments or planting of wood fuel crops may alter the land use, and this may affect cultural heritage e.g. historic landscapes or the wider setting of historic environment features. ● Careful planning will be required in order to avoid potential adverse impacts at the local scale on biodiversity, soil, water, landscape and cultural heritage through the development of renewable and low carbon energy proposals and distribution networks; e.g. negative impacts on the setting of settlements, visual amenity and landscape character, both as a result of effects from individual proposals and the cumulative effects of a number of proposals. ● Enhancements of electricity grid infrastructure (namely transmission network infrastructure) could result in a range of environmental effects, including landscape change, depending on the extent to which new infrastructure will be required. ● The safeguarding of nationally important landscapes (e.g. National Scenic Areas) from large scale wind farms will be beneficial to these landscapes, biodiversity and wider ecosystems. ● The location of, and qualifying features associated with, wild land areas (WLAs) will require to be considered for any renewable proposals in close proximity to, or within, WLAs.



5. Expected Environmental Issues without the Guidance

- 5.1. The SEA process requires responsible authorities producing plans, programmes and strategies (PPS) to consider the likely environmental impacts on an area in the absence of that PPS being produced. In the case of the draft SG, it is considered that **without the Guidance renewable and low carbon energy developments will continue to be assessed without detailed guidance**, including Strategic Environmental Sensitivity Mapping for various technologies, which will help inform – at a strategic level – locations where proposals may or may not be acceptable. In particular, the Guidance will include a spatial framework for wind energy developments which will spatially identify areas where proposals will not be acceptable, where there is significant protection, and where windfarms are likely to be acceptable subject to detailed consideration.
- 5.2. The Council's current guidance for Wind Energy Proposals, which was published in 2005, is now out of date in terms of what National Planning Policy says, and as a result it no longer accurately represents current policy for these types of proposals.
- 5.3. The draft SG has been produced to provide further detail on a wide range of considerations relevant to renewable and low carbon energy developments, and once adopted will be used as part of the decision-making process for proposals. Therefore, without this information, proposals would not be subject to the same level of scrutiny.



6. Approach to SEA

6.1. The identification of specific SEA Objectives is recognised as a good way in which the environmental effects of the draft Guidance can be described, analysed and compared.

Why did you choose to look at these environmental topics?

6.2. The choice of environmental topics included in the Environmental Report was based upon those specified in legislation, alongside the issues identified in the earlier SEA Scoping Report, and also in consultation with Historic Environment Scotland, Scottish Environment Protection Agency and Scottish Natural Heritage. It is also based on the range of matters that the draft SG is likely to deal with.

6.3. The following 12 SEA Objectives, relating to the key environmental topics, were identified as part of the assessment process:

- 1) Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils
- 2) Avoid adverse impacts on existing land use/cover
- 3) Promote the sustainable management of the water environment
- 4) Promote the important role and potential of forests and woodlands and avoid adverse impacts
- 5) Conserve and enhance the diversity of habitats and species
- 6) Increase the potential of Perth and Kinross in contributing to Scotland's renewable energy resources
- 7) Support adaptation to climate change and 'future proofing' of new development
- 8) Conserve and enhance the character, local distinctiveness, scenic and cultural value of the area's landscapes
- 9) Protect and enhance, where appropriate, the historic and cultural environment
- 10) Protect and enhance green infrastructure networks
- 11) Safeguard the integrity of designated sites
- 12) Protect and enhance air quality

Have you assessed the possible effects of the draft Guidance?

- 6.4. The Council, in partnership with The James Hutton Institute (JHI), designed an assessment approach to consider the key environmental impacts, and likely significant effects of the draft Guidance^{1&2}.
- 6.5. The assessment was applied to the development of the draft SG by using two key approaches:
- 1) A **spatial, map based** assessment of strategic environmental sensitivity for wind, hydro and solar technologies considering a range of environmental considerations.
 - 2) A **policy based** assessment to identify and assess key environmental effects of a range of renewable and low carbon energy technologies.

¹ Baggio-Campagnucci, A; Gimona, A; Poggio, L; Castellazzi, M: *Renewable Energy Supplementary Guidance Task A* (2016)

² Baggio-Campagnucci, A; Gimona, A; Poggio, L; Castellazzi, M: *Renewable Energy Supplementary Guidance Task B* (2016)



7. Key Findings

Spatial Assessment

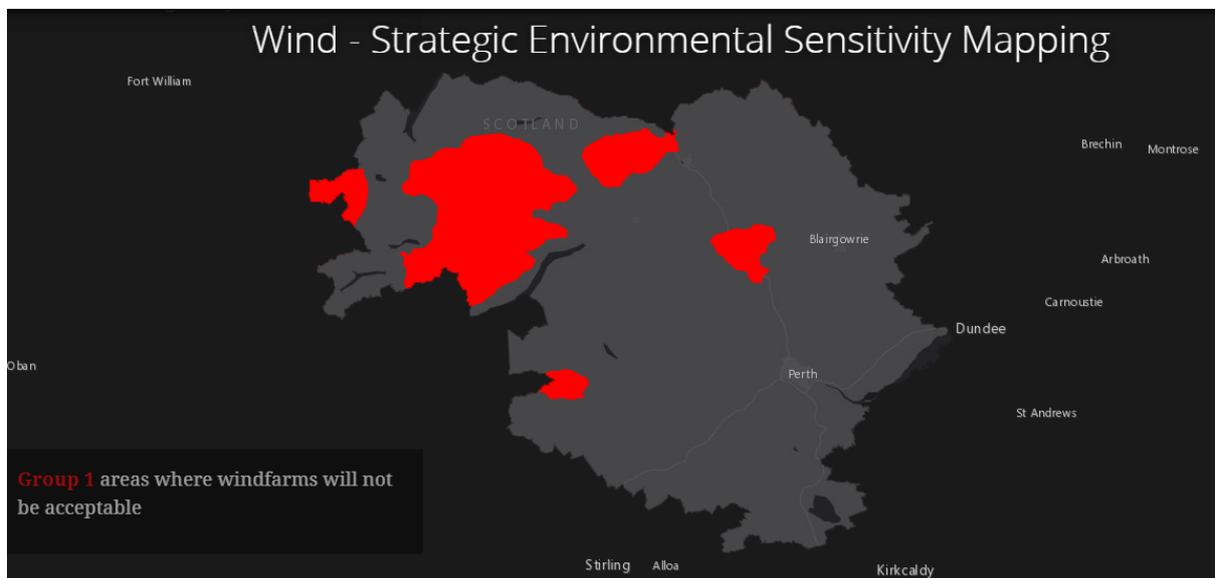
- 7.1. The Strategic Environmental Sensitivity maps to follow identify for each technology – wind, hydro and solar – where there is indicative capacity for potential future development based on the sensitivity of the environment to accommodate such proposals. As noted in the Environmental Report (ER), capacity has been determined by the level of sensitivity based on the considerations included within each technology assessment. The sensitivity maps have been prepared using the methodology identified in Section 5 of the ER and will inform the spatial strategies contained within the draft Guidance. The maps show the following categories of strategic environmental sensitivity.

Significant Sensitivity (Special Landscape Areas for Wind only)	Proposals will need to substantially overcome significant impacts on identified sensitivities
High Sensitivity	Proposals are likely to need to address impacts on a wide range of sensitivities
Medium Sensitivity	Proposals may need to address impacts on a number of sensitivities
Low Sensitivity	Proposals are likely to have fewer sensitivities to address

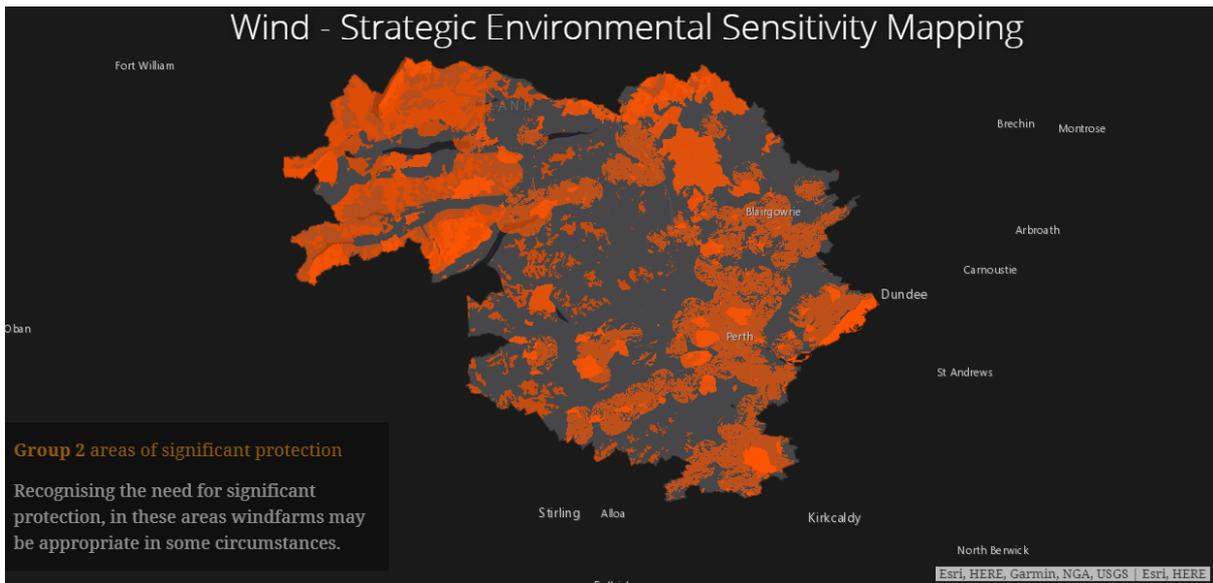
- 7.2. The key findings maps to follow have been identified as part of the environmental assessment process. This summary document has been divided into the three technologies (Wind, Hydro and Solar). Full details of the environmental assessment findings, and methodologies used can be found in Sections 5 and 6 of the Environmental Report. Please note that the colour theme used in the maps to follow for each of the technologies has also been carried through in the text that accompanies them. . The reader is asked to note that no site specific conclusions should be drawn from the study in relation to currently proposed or possible future developments. Proposals should demonstrate that they can be satisfactorily accommodated in the landscape, and they should properly address the issues raised in the report. All proposals will still have to be considered on a case-by-case basis, taking into account all features that may have a limiting effect on the proposal. Further more detailed environmental effects can only be known and discussion at planning application stage.

WIND

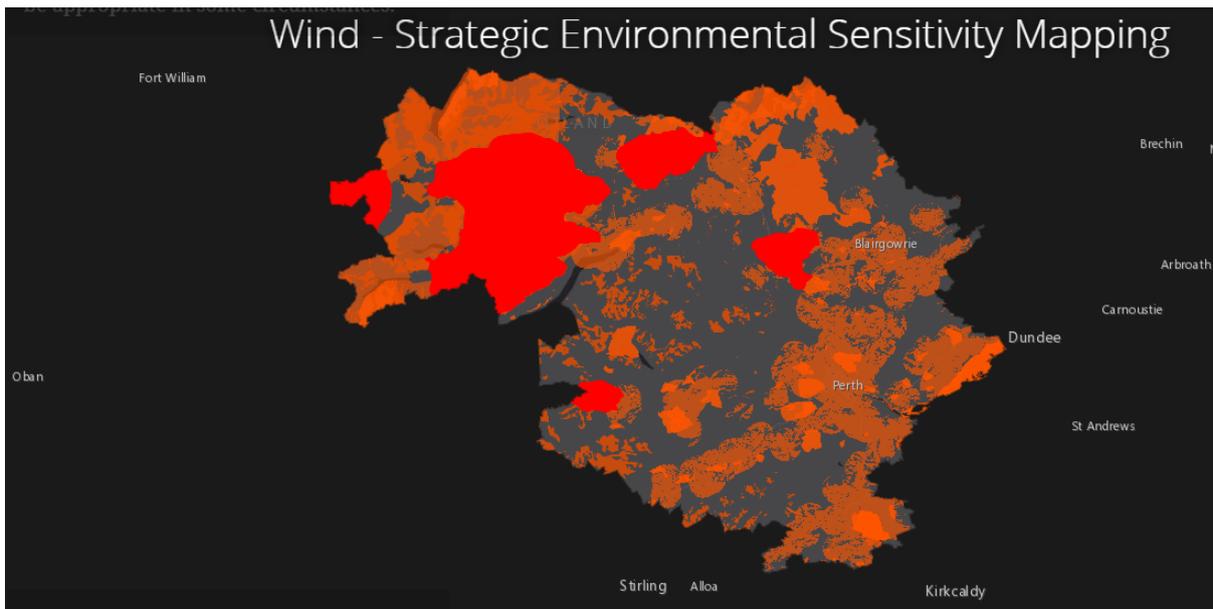
- 7.3. The below maps illustrate the Scottish Planning Policy (SPP) Spatial Framework for Wind, as well as the approach and outputs of the Strategic Environmental Sensitivity mapping for wind energy developments.
- 7.4. The Council's new policy targeting a 'Spatial Framework for wind energy proposals' will include a map identifying areas where windfarms will not be acceptable (Group 1), Areas of Significant Protection (Group 2) and remaining Group 3 areas where windfarms are likely to be considered acceptable subject to detailed site consideration as required by SPP.
- 7.5. **Group 1** areas where windfarms will not be acceptable:



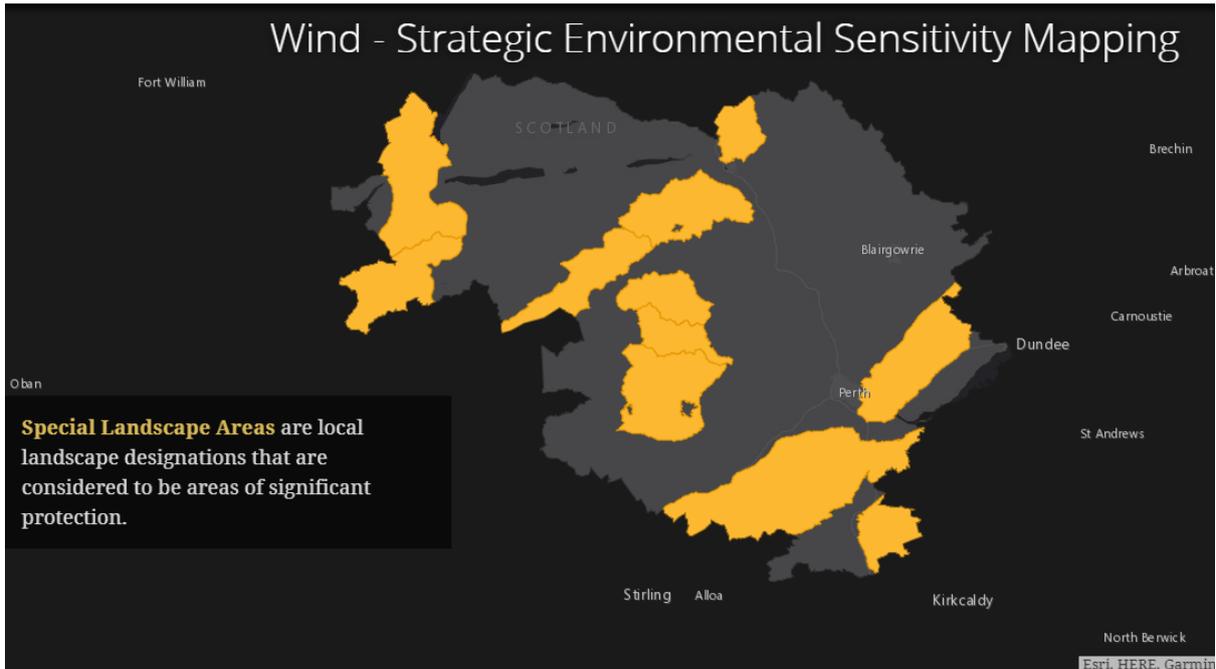
- 7.6. **Group 2 areas of significant protection** - recognising the need for significant protection, in these areas windfarms may be appropriate in some circumstances.



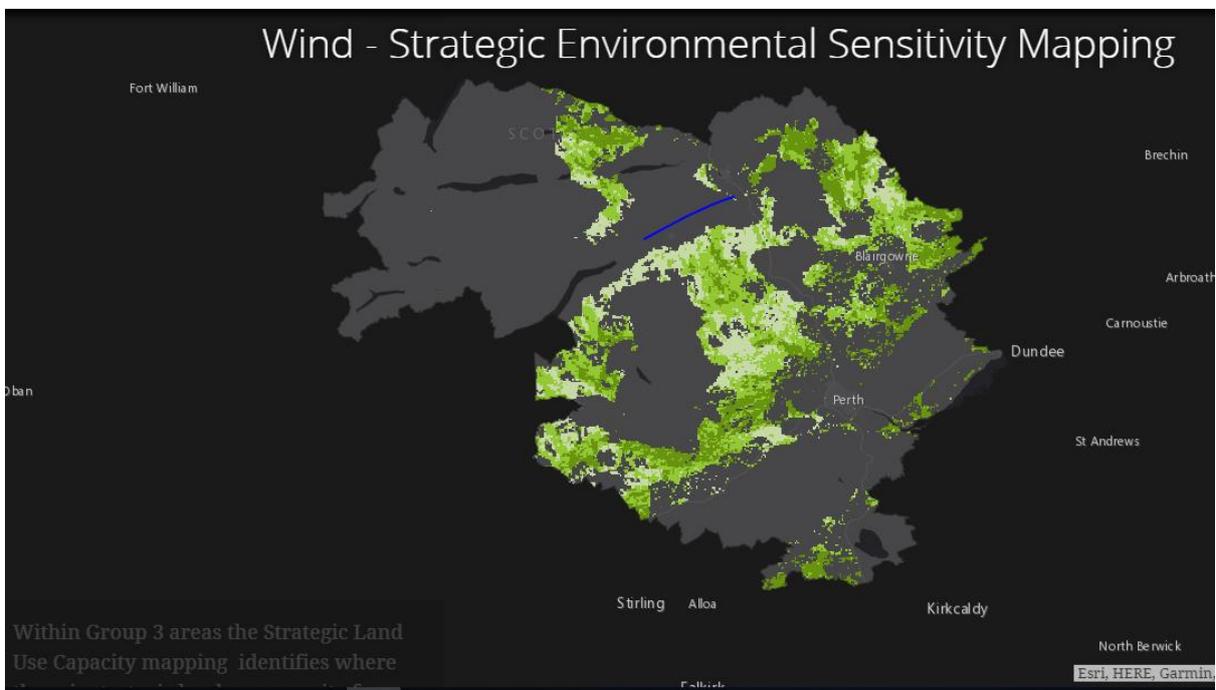
7.7. The remaining unshaded areas, beyond Groups 1 and 2 are Group 3 areas where windfarms are likely to be acceptable, subject to detailed consideration against identified policy criteria.



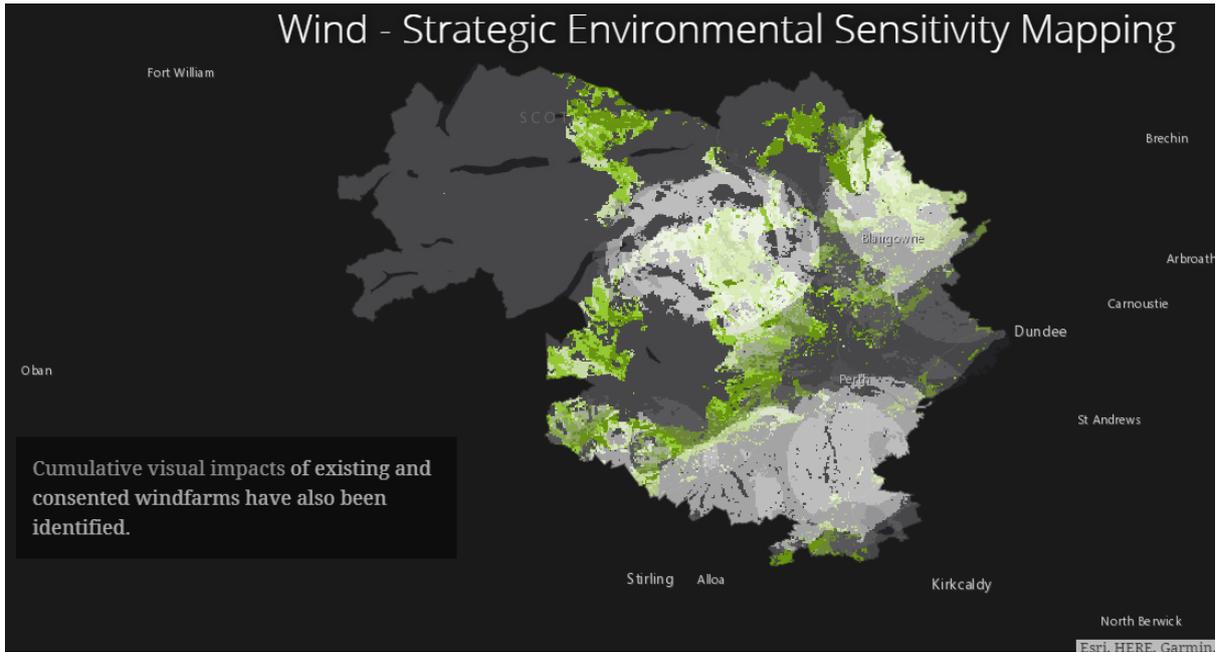
7.8. **Special Landscape Areas** are local landscape designations that are considered to be areas of significant protection.



7.9. Within Group 3 areas the Strategic Environmental Sensitivity mapping identifies where there is indicative, strategic capacity for windfarms and areas with the greatest potential for wind development. The map identifies outwith Group 1 and 2 areas, areas with lowest sensitivity and areas with medium sensitivity for wind development.

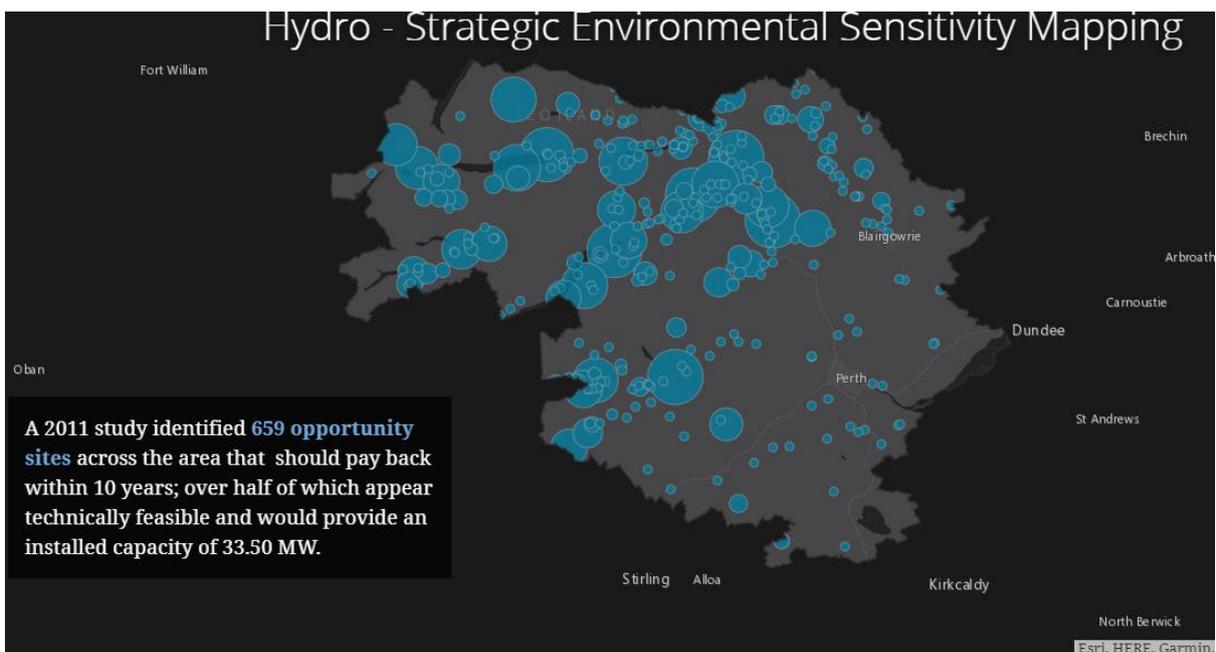


7.10. Cumulative visual sensitivity of existing and consented windfarms has also been identified.

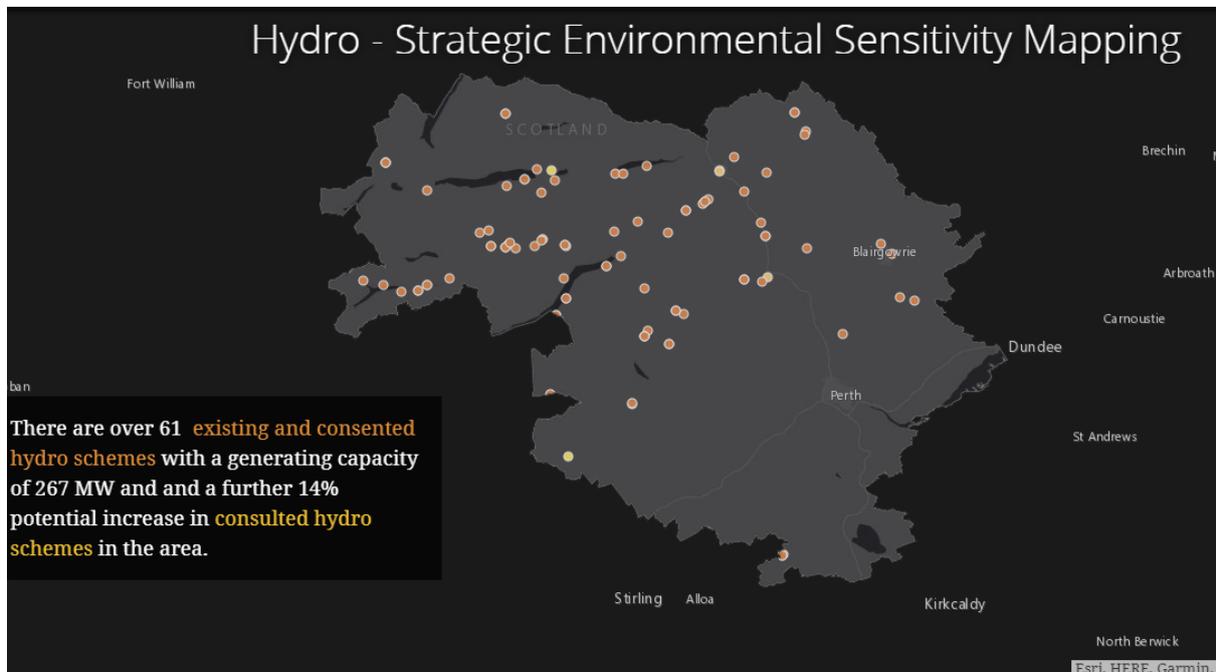


HYDRO

- 7.11. The following maps illustrate the approach and outputs of the Strategic Environmental Sensitivity mapping for hydro.
- 7.12. A 2011 study identified [659 opportunity sites](#) across the area that should pay back within 10 years; over half of which appear technically feasible and would provide an installed capacity of 33.50 Megawatts (MW).



7.13. Despite extensive historical hydro development in the region, the results indicate a healthy potential for further hydro schemes, particularly for further smaller scale developments (<100kw). While cumulative impacts mean that not all identified sites could be developed, hydro's contribution to renewable generation in the region could be between 5 and 20 MW over the next 10 years.



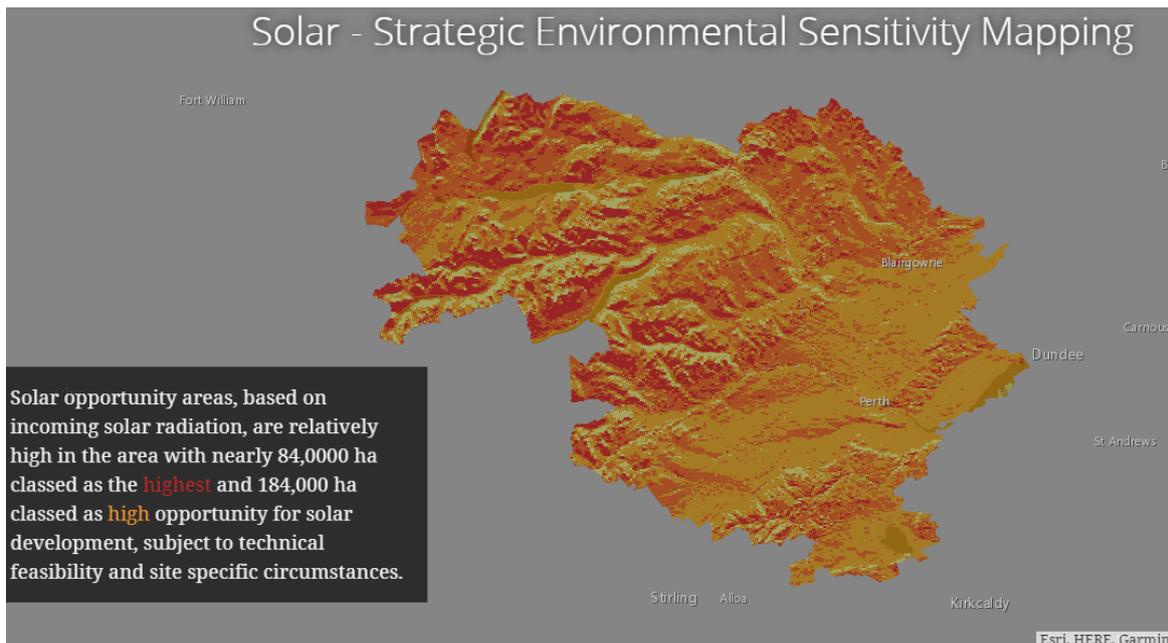
7.14. There are over 61 existing and consented hydro schemes with a generating capacity of 267 MW and a further 14% potential increase in consulted hydro schemes in the area.

7.15. The sensitivity assessment mapping identifies where there is indicative, strategic land use capacity for hydro schemes and areas with the greatest potential for hydro development. The map identifies areas with lowest sensitivity and also those areas with medium sensitivity and high sensitivity.

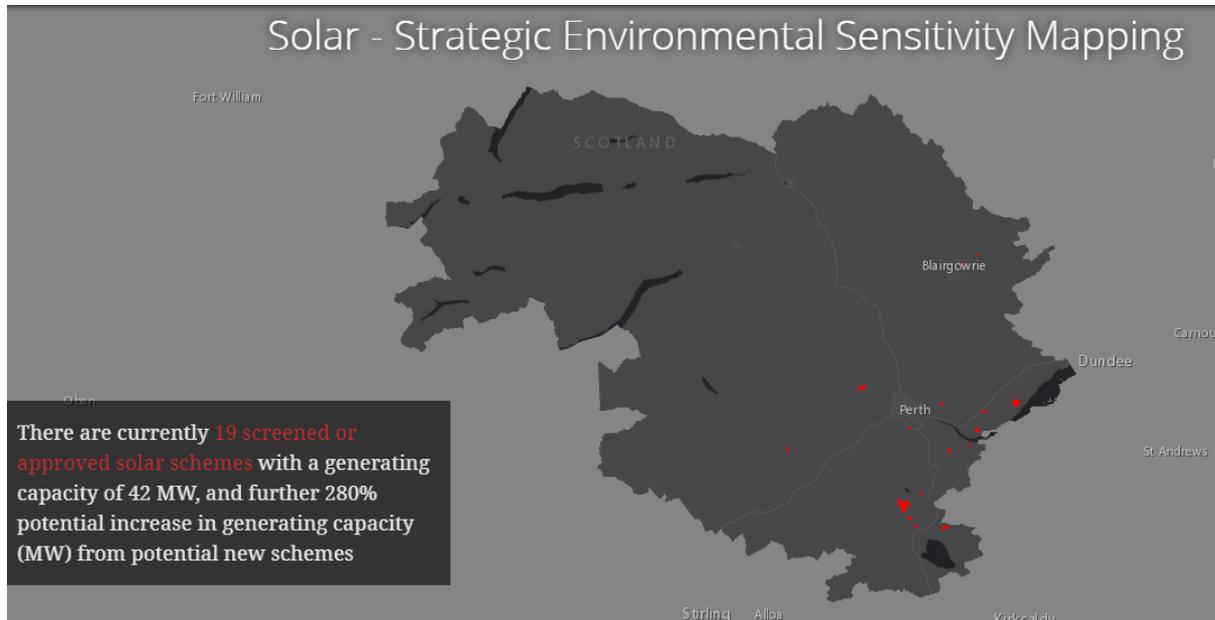


SOLAR

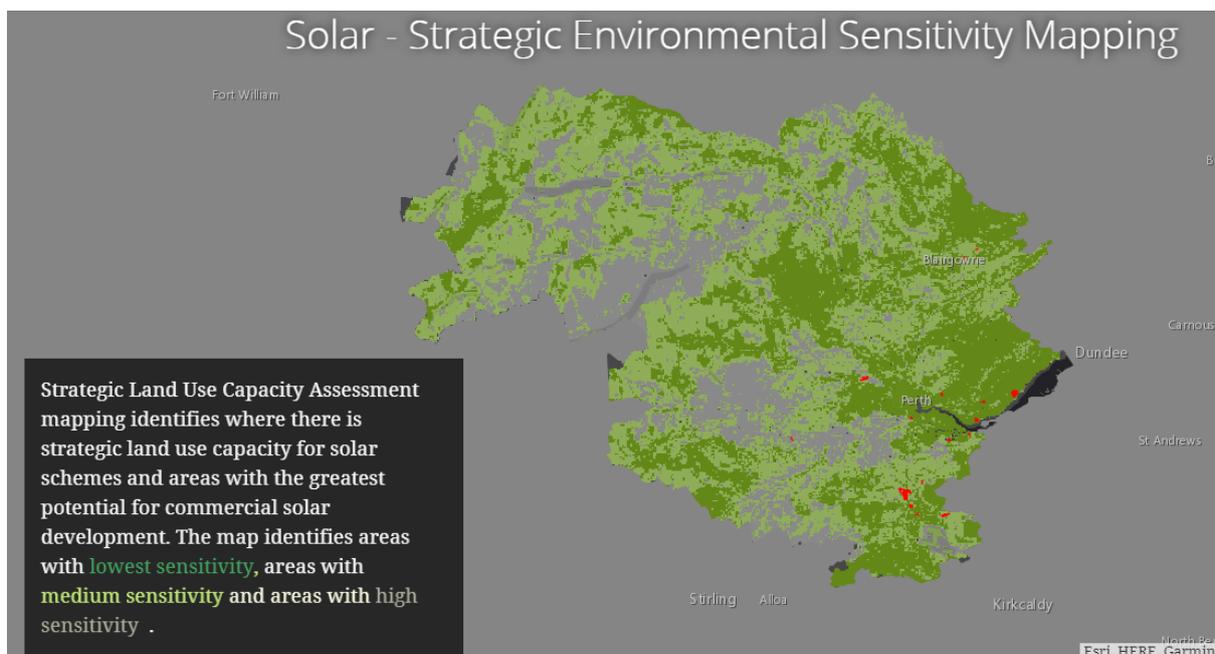
- 7.18. The following maps illustrate the approach and outputs of the Strategic Environmental Sensitivity mapping for solar.
- 7.19. Solar opportunity areas, based on incoming solar radiation, are relatively high in the Perth and Kinross Area, with nearly 84,000 ha classed as the **highest** and 184,000 ha classed as **high** opportunity for solar development, subject to technical feasibility and site specific circumstances.



- 7.20. There are currently 19 **screened or approved solar schemes** with a generating capacity of 42 MW, and further 280% potential increase in generating capacity (MW) from potential new schemes.



- 7.21. The sensitivity assessment mapping identifies where there is indicative, strategic land use capacity for solar schemes and areas with the greatest potential for commercial solar development. The map identifies areas with lowest sensitivity and areas with **medium sensitivity**.





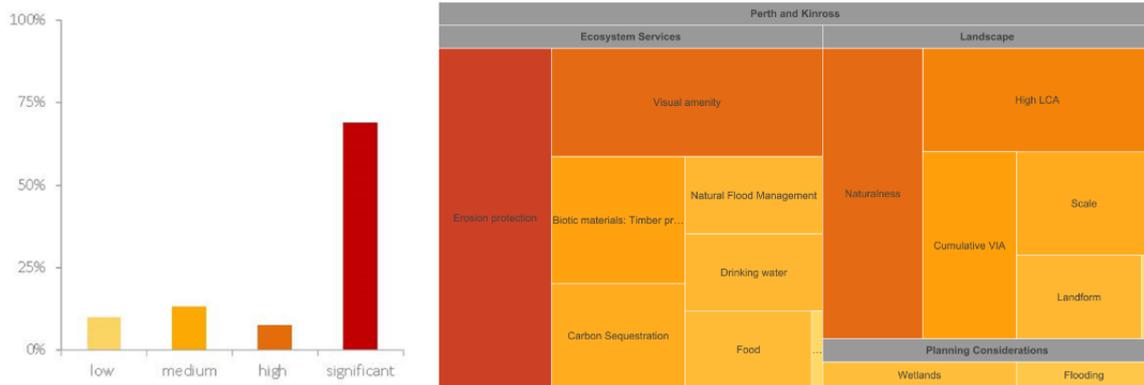
8. Cumulative and Strategic Sensitivities

- 8.1. SEA legislation requires the consideration of the possible secondary, cumulative and synergistic effects of implementing the draft Guidance. As part of the spatial assessment, the Council has identified the key cumulative and strategic environmental sensitivities for each of the three technologies. These key sensitivities have been summarised in the paragraphs that follow.
- 8.2. This part of the assessment **highlights which environmental considerations are most prevalent and the levels of environmental sensitivity across the Council Area** based on each technology. Further detail on potential secondary, cumulative and synergistic effects can also be found in Section 6.6 of the main Environmental Report.

WIND

- 8.3. Out-with SPP Group 1 areas, the **majority of the area is classed as having significant sensitivity**. These areas fall within the SPP Group 2 classification - 'areas of significant protection' where windfarms may be appropriate in some circumstances. The remaining areas (25%) are relatively evenly classed from high to low sensitivity levels.
- 8.4. Key strategic sensitivities to consider include **erosion protection, visual amenity, landscape naturalness, highest level of sensitivity for wind energy development and cumulative visual impact**. Relatively high scores for landscape criteria make it an essential requirement to consider.

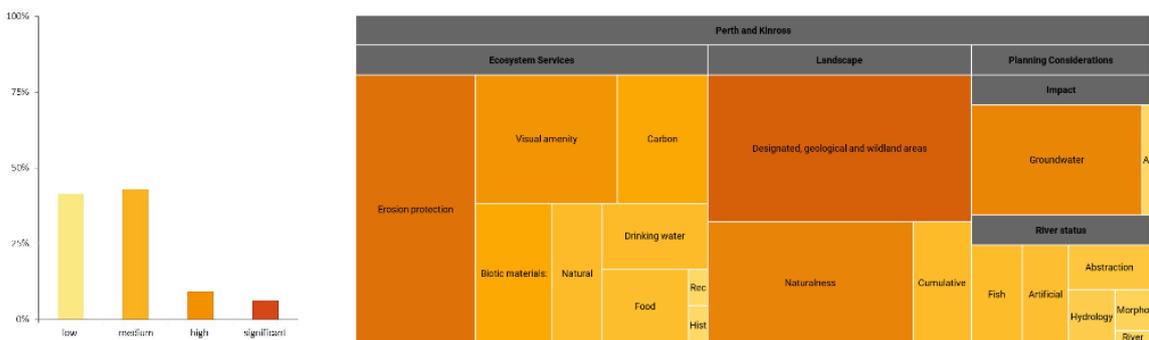
Key Strategic and Cumulative Sensitivities for Wind:



HYDRO

- 8.5. Levels of significant environmental sensitivity (6%) are considerably lower in comparison to wind energy.
- 8.6. Council-wide, the key sensitivities (focused around key surface water areas) for hydro energy proposals to consider include: **designated, geological and wildland areas, naturalness, erosion protection and visual amenity**. Relatively high scores for landscape criteria, particularly designated, geological and wildland areas, require the draft SG to include guidance on any respective impacts, including cumulative impacts.

Key Strategic and Cumulative Sensitivities for Hydro:



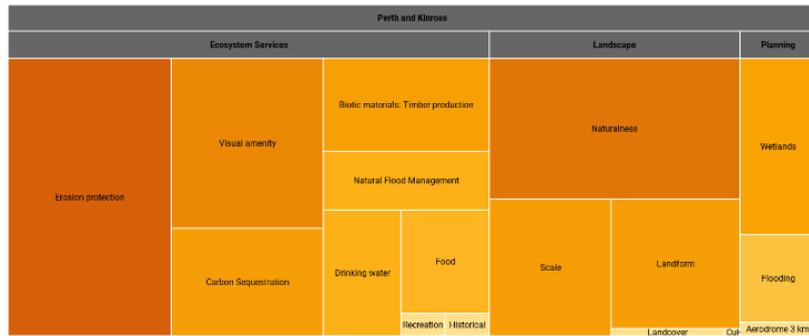
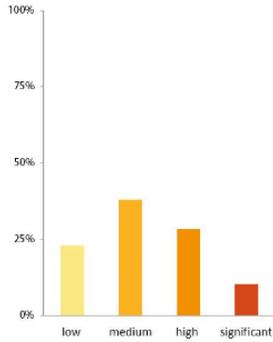
SOLAR

- 8.7. Areas classified as a 'significant' sensitivity in terms of solar are low in comparison to wind (10%). Well over 50% of the Council Area is classified as having 'medium' or 'low' levels of sensitivity. These are the areas where the Council would ordinarily

target for new developments based on anticipated environmental impact at a strategic level.

- 8.8. Council-wide, the key sensitivities to consider include **erosion protection, naturalness, visual amenity, carbon sequestration and naturalness.**

Key Strategic and Cumulative Sensitivities for Solar:



POLICY ASSESSMENT

- 8.9. We have also undertaken a conventional policy-based assessment of the potential environmental effects of all technologies included in the draft Guidance. Full details can be found in Section 6.5 of the Environmental Report as well as in Appendix 4.

Onshore Wind	
Population & Human Health	Onshore wind energy developments have the potential to contribute to Scotland’s renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality. Onshore wind energy developments also have the potential to negatively effect on green infrastructure and networks e.g. loss of woodland corridors, predominantly from the construction of associated infrastructure.
Biodiversity, Flora & Fauna	Onshore wind energy developments have the potential to negatively affect biodiversity, flora and fauna and associated habitats (including protected species and designated sites), where inappropriately sited through both the siting of turbines and associated infrastructure such as tracks, during the construction, operational and decommissioning phases. Key identified effects include impacts on biodiversity such as turbine strike, or impacts such as hydrological or habitat changes, or forest/woodland loss.
Soil	Onshore wind energy developments have the potential to result in the direct loss of prime agricultural land and/or carbon rich soils where these fall within areas considered to be technically feasible for wind, primarily during the construction phase.
Water	Onshore wind energy developments have the potential to significantly impact on the water environment, including direct impacts on natural hydrological processes from the siting and installation of turbines and the construction and operation of access tracks. Impacts can be during construction, operational and decommissioning phases.
Climatic Factors	Onshore wind energy developments have the potential to contribute to Scotland’s renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality. Onshore wind energy developments can also result in the direct loss of woodland/forest cover and/or carbon rich-soils which may have negative implications in terms of climate, particularly when considered cumulatively, although this would be mitigated against through requirements for replanting.
Material Assets	Onshore wind energy developments have the potential to significantly alter existing land uses/cover, which currently directly or indirectly benefit society. In addition, onshore wind energy developments have the potential to contribute to Scotland’s renewable energy resources.

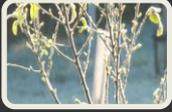
Cultural Heritage	Onshore wind energy developments have the potential to negatively affect cultural heritage, including designated and non-designated sites, features and buildings, during construction, operational and decommissioning phases.
Landscape	Onshore wind energy developments have the potential to significantly, negatively impact on landscape, including the inappropriate siting of turbines and associated infrastructure such as access tracks. Landscape impacts can be associated with both designated and non-designated sites.
Air	Onshore wind energy developments have the potential to significantly contribute to Scotland's renewable energy resources, with resultant improvements to air quality. Onshore wind energy developments also have the potential to result in localised negative air quality impacts particularly during the construction phase.
Hydro	
Population & Human Health	Hydro energy developments have the potential to contribute to Scotland's renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality. Hydro energy developments also have the potential to negatively effect on green networks – particularly riparian zones – through the construction, operation and decommissioning phases of schemes.
Biodiversity, Flora & Fauna	Hydro energy developments have the potential to negatively affect biodiversity, flora and fauna and associated habitats (including protected species and designated sites), during the construction, operational and decommissioning phases. Key identified effects include direct impacts on biodiversity such as hydrological or habitat changes, or forest/woodland loss.
Soil	Hydro energy developments have the potential to result in the loss of important soil resources, particularly carbon rich soils located close to existing water bodies which could be removed and/or degraded through the construction of infrastructure such as tracks and pipes.
Water	Hydro energy developments – by their nature - have the potential to significantly affect the water environment, either directly or indirectly. Negative effects could take place during construction and decommissioning (e.g. construction waste/soil disturbance) as well as during the operation of schemes.
Climatic Factors	Hydro energy developments have the potential to contribute to Scotland's renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality. Hydro energy developments can also result in the direct loss of woodland/forest cover and/or carbon rich-soils which may have negative implications in terms of climate, particularly when considered cumulatively.

Material Assets	Hydro energy developments have the potential alter existing land uses/cover, particularly where large-scale proposals are proposed. In addition, inappropriately designed and/or managed schemes could have resultant negative effects on water quality/abstraction. Also, hydro energy developments have the potential contribute to Scotland’s renewable energy resources and adaptation to climate change, with resultant improvements to air quality.
Cultural Heritage	Hydro energy developments have the potential to negatively affect cultural heritage, including designated and non-designated sites, features and buildings, during both construction and operational phases.
Landscape	Hydro energy developments have the potential to negatively impact on landscape, particularly where large-scale proposals are proposed. Landscape impacts can be associated with both designated and non-designated sites.
Air	Hydro energy developments have the potential to contribute to Scotland’s renewable energy resources, with resultant improvements to air quality. Hydro energy developments also have the potential to result in localised negative air quality impacts particularly during the construction phase.
Solar	
Population & Human Health	Solar energy developments have the potential to significantly contribute to Scotland’s renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality. Solar energy developments also have the potential to negatively effect on green networks and corridors – particularly the removal of existing field boundaries.
Biodiversity, Flora & Fauna	Solar energy developments have the potential to negatively impact on biodiversity, flora and fauna through changes to land cover and impacts from construction/decommissioning processes. Conversely, solar energy developments have the potential to have positive impacts through temporary cessation of intensive agricultural processes which may otherwise limit biodiversity allowing the land to be rested and creating opportunities for further beneficial land management such as wildflower meadows.
Soil	Solar energy developments have the potential to result in the loss of valuable soil resources, including carbon rich soils and/or prime agricultural land, particularly during the construction phase of associated infrastructure and any subsurface works.
Water	Solar energy developments have the potential to negatively affect the water environment, particularly during the construction and decommissioning phases, and where surface run-off is not adequately addressed.

Climatic Factors	Solar energy developments have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, with resultant improvements to air quality. Solar energy developments can also result in the direct loss of carbon rich-soils and/or prime agricultural land which may have negative implications in terms of climate, when considered cumulatively.
Material Assets	Solar energy developments have the potential to result in the loss of prime agricultural land with resultant loss of food production. In addition, solar energy developments have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, with resultant improvements to air quality.
Cultural Heritage	Solar energy developments have the potential to negatively affect cultural heritage, including designated and non-designated sites, features and buildings, during construction, operational and decommissioning phases.
Landscape	Solar energy developments have the potential to negatively impact on landscape, particularly where large-scale proposals are proposed and visible sites are utilised. Landscape impacts can be associated with both designated and non-designated sites.
Air	Solar energy developments have the potential to significantly contribute to Scotland's renewable energy resources, with resultant improvements to air quality.
Biomass	
Population & Human Health	Biomass energy developments have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, however there are potential negative impacts to air quality from inappropriately managed biomass developments from particulate matter emissions.
Biodiversity, Flora & Fauna	Biomass energy developments have the potential to result in significant negative effects as a result of the planting of large areas of monoculture biomass, which have low biodiversity value and are difficult for species to move through. The planting of existing vacant and derelict sites for biomass crops could also have significant negative effects as these areas can be rich in biodiversity. As such any new planting proposals will be required to consider and be sensitive to existing habitats and species both within the site and those out-with it but which move through it. Potential for secondary negative impacts on biodiversity, particularly in respect of particulate emissions, due to diminished air quality as a result of the widespread adoption of biomass. However, woodfuel is, at least in theory, carbon neutral, and has the potential to displace fossil fuels.
Soil	Sensitive soil types should be identified and avoided, and the SG should also promote the avoidance of new planting of biomass crops on deep peat soils and promote the application of the UK Forestry Standard and Guidelines and sustainable forest management practices. In addition, it should seek the targeting of the right tree in the right place in order to

	avoid potential significant negative environmental effects.
Water	The measures used to increase biomass yields from existing woodland and forests e.g. extraction of harvesting residues could contribute to increased soil and water acidification. In addition a range of threats are associated with the growing pressure to harvest tree stumps for woodfuel. These include: increased risk of ground damage leading to erosion and siltation, with potential secondary negative effects on water quality.
Climatic Factors	Biomass energy developments have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change. There is the likely potential for negative impacts on air quality as a result of any biomass development, due to particulate matter emissions, the significance of the effect will be dependent on management practices and the location of the development which will be considered in detail at the planning application stage.
Material Assets	Biomass energy developments have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, however there are potential negative impacts to air quality from inappropriately managed biomass developments.
Cultural Heritage	No significant effects identified.
Landscape	No significant effects identified.
Air	Biomass energy developments have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change. However there are potential negative impacts to air quality from inappropriately managed biomass developments from particulate matter emissions, particularly where there are multiple developments and there may be cumulative effects on population and human health.
Heat Pumps	
Population & Human Health	Heat pump technologies have the potential to significantly contribute to Scotland's renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality.
Biodiversity, Flora & Fauna	Medium and large-scale water source heat pump schemes have the potential to negatively affect water-based species and associated habitats including designated and non-designated species and sites, during both construction and operation phases.
Soil	No significant effects identified.
Water	Medium and large-scale water source heat pump schemes have the potential to negatively affect the water environment, in terms of species and habitats as well as hydrological processes, during construction, operational and decommissioning phases.
Climatic Factors	Heat pump technologies have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, with resultant improvements to air quality.
Material Assets	Heat pump technologies have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, with resultant improvements to air quality.

Cultural Heritage	Heat pump technologies have the potential for direct and indirect negative effects on designated and non-designated buildings, sites and features where sited inappropriately.
Landscape	No significant effects identified.
Air	No significant effects identified.
Other Renewables	
Population & Human Health	Other renewable technologies and processes have the potential to significantly contribute to Scotland's renewable energy resources and mitigation against the effects of climate change, with resultant improvements to air quality. However, anaerobic digestion, energy from waste and landfill gas technologies have the potential to result in negative air quality impacts from emissions.
Biodiversity, Flora & Fauna	Hydro micro-generation schemes have the potential to negatively affect water-based habitats and species, during construction and phasing, including designated and non-designated sites and species.
Soil	No significant effects identified.
Water	Hydro micro-generation schemes have the potential to negatively affect water-based habitats and species, during construction and phasing, including designated and non-designated sites and species. Potential pollution to the water environment from Anaerobic Digestion and Energy from Waste.
Climatic Factors	Other renewable technologies and processes have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, with resultant improvements to air quality. The use of waste heat from various technologies may have a positive effect as it reduces resource use. However, anaerobic digestion, energy from waste and landfill gas technologies have the potential to result in negative air quality impacts from emissions.
Material Assets	Other renewable technologies and processes have the potential to significantly contribute to Scotland's renewable energy resources and adaptation to climate change, with resultant improvements to air quality.
Cultural Heritage	Micro-generation and other renewable technologies may enhance designated historic buildings by providing affordable heating and energy, which may allow them to become more affordable to repair, maintain and use. There may also be negative impacts on some designated historic buildings due to inappropriate design and siting.
Landscape	No significant effects identified.
Air	Other renewable technologies and processes have the potential to significantly contribute to Scotland's renewable energy resources, with resultant improvements to air quality. However, anaerobic digestion, energy from waste and landfill gas technologies have the potential to result in negative air quality impacts from emissions.



9. Mitigation, Enhancement and Monitoring

- 9.1. A crucial part of the Environmental Assessment process is the identification of mitigation measures, and enhancement measures if applicable, where significant environmental effects have been identified. We have identified the necessary mitigation measures under each of the 12 SEA Objectives which can be found in Section 6.7 of the Environmental Report and Section 6.3 of this document.
- 9.2. In addition, monitoring the potential environmental effects associated with using the Guidance is a fundamental part of the assessment process and is crucial to informing future policy-making. Therefore, we have prepared a detailed monitoring framework (see Appendix 6) which will be supported by the required Post-Adoption Statement.



10. Consultation and Next Steps

- 10.1. The draft Supplementary Guidance and SEA Environmental Report have now been submitted to the Consultation Authorities (SEPA, SNH and Historic Environment Scotland) and also published for public comment.
- 10.2. The proposed timetable for the draft Guidance and associated SEA actions are set out in the table below.

Timescale	SG	SEA
19 August – 30 September 2019	Consultation on Draft SG	Consultation on Draft ER / Submit to SEA Gateway
Autumn 2019	Consider Responses	Consider Responses
Autumn/Winter 2019	Council Approval - Finalised SG	Council asked to note content of Finalised ER
Winter 2019	Submit SG and Participation Statement to Scottish Ministers	Submit ER to Scottish Ministers
Winter 2019 / Early 2020	Adopt SG	
2020		Post-adoption Statement
2020 onwards	Ongoing Monitoring	Ongoing Monitoring

How to Comment on the Environmental Report

- 10.3 The consultation will run for a period of 6 weeks from 19 August to 30 September 2019 and the Council welcomes anyone who is interested in commenting on both the SEA and draft Guidance to do so before the end of those 6 weeks.
- 10.4 Following the consultation closing, all comments received on time will be considered before the Guidance is finalised and presented to the Council for approval, prior to being submitted to the Scottish Ministers.
- 10.5. Comments can be submitted to the Council in the following ways:
-  **Online:** www.pkc.gov.uk/ldp2renewables
 -  **By emailing them to:** developmentplan@pkc.gov.uk
 -  **In writing to:** Planning and Development, Housing & Environment Service, Perth & Kinross Council, Pullar House, 35 Kinnoull Street, Perth PH1 5GD

Where Can I View More Information?

- 10.6. Further information on the draft Renewable and Low Carbon Supplementary Guidance and its SEA can be found online at: www.pkc.gov.uk/ldp2renewables or alternatively, all of the documents can be viewed in hard copy at the Council's Offices at Pullar House.

Data Protection

- 10.7. For further information on how the Council collects and uses personal information please visit our website www.pkc.gov.uk/dataprotection, or contact the relevant team via email at: dataprotection@pkc.gov.uk or by phone on 01738 477933.



11. Contacts and Team Credits

Planning & Development
Housing & Environment Service
Perth & Kinross Council
Pullar House
35 Kinnoull Street
Perth PH1 5GD

Email: developmentplan@pkc.gov.uk

Online: www.pkc.gov.uk

Tel: +44 (0) 1738 475300

The James Hutton Institute

Craigiebuckler

Aberdeen

AB15 8QH

Email: alessandro.gimona@hutton.ac.uk

Online: www.huttonltd.com

Tel: +44 (0)1382 568568

Fax: +44 (0)1382 568501

PKC Team

Andrew Ballantine, Graham Esson, Ciara Gray, Shelley McCann, and Robert Wills

JHI Team

Andrea Baggio Compagnucci, Marie Castellazzi, Alessandro Gimona, and Laura Poggio