

Aviva Wind Turbine

Environmental Statement
Volume 1 - Non-Technical Summary
February 2022



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FOREWORD

This document is Volume 1 of the Environmental Statement (ES) for the proposed Aviva Wind Turbine. The ES has been prepared by Purple Renewables to accompany an application for planning permission submitted to Perth and Kinross Council.

Inspection of the planning application, Environmental Statement and Supporting Documents

Copies of the Environmental Statement may be inspected free of charge at the following location:

Perth and Kinross Council
Pullar House
Kinnoull Street
Perth
PH1 5GD

Digital copies of the Non-Technical Summary are available free of charge from Perth and Kinross Councils Planning Portal or from www.aviva-renewables.co.uk

Further hard copies of the Environmental Statement are available at a cost of £400.

DVD copies are also available at a cost of £25.

For further information please contact:

Purple Renewables Ltd
3-2-4 Storey House
White Cross Business Park
Lancaster
LA1 4XQ

www.purple-renewables.co.uk

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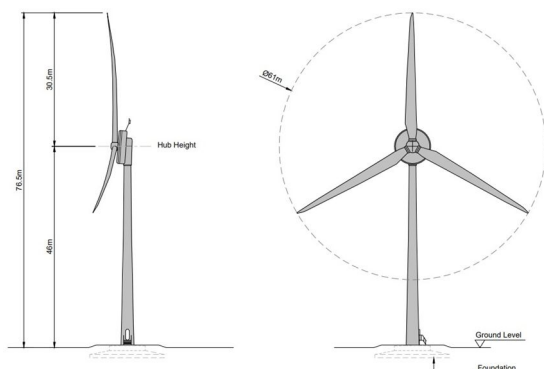
1. Introduction

This Non-Technical Summary (NTS) forms part of the Environmental Statement (ES) which has been prepared to accompany the submission of a planning application under the Town and Country Planning (Scotland) Act 1997, as amended to Perth and Kinross Council for planning permission to construct a wind turbine at Aviva, Perth.

This Non-Technical Summary is meant as an outline only and in order to understand the detail of the Environmental Assessment it is suggested that the reader consult the Environmental Statement Main Text.

Project Description

The planning application is for a single wind turbine up to 77 metres (m) tip height with associated infrastructure such as a crane hardstanding, upgraded access track, and a temporary construction compound. The candidate turbine is upto 1megawatt (MW) capacity. Full details of the proposed development are provided in Chapter 2, Volume 2 of the ES.



The proposed layout is presented in Figure 3, Volume 3 of the ES and displayed at the back of this document.

Aviva

Aviva plc is a British multinational insurance company, with over 15.5 million customers in the UK. Aviva is the largest general insurer and a leading life and pensions provider in the UK.

Aviva owns and currently operates from the former General Accident Headquarters in Pitheavlis, Perth. This site has approximately 1000 employees working across a range of departments in the company.

Aviva takes climate change very seriously, it's impact on air quality, weather events and flooding, and its impact on people. Aviva wants to do all they can to try to reduce global greenhouse gas emissions. Aviva began purchasing electricity from renewable sources for their UK estates in 2004 and they have reduced their worldwide carbon emissions by 53% since 2010. Aviva strongly believes that where it is feasible to produce green energy on their own sites, they should be reinvesting to make the business as economically and environmentally sustainable as possible for the future.

In response to the international climate change emergency, Aviva aims to achieve operational net zero carbon status across their entire estate by 2030. As a site of some historic significance, Perth is considered to provide a significant opportunity to create an exemplar site for what can be achieved through positive action regarding climate change, for the Aviva Group worldwide.

2. Environmental Impact Assessment (EIA)

The purpose of an EIA is to inform the decision makers of the environmental impacts of a proposed development, both positive and negative. Throughout the process information is collected about the possible environmental effects which is evaluated and presented in a transparent manner to enable decision makers to take account of these effects when making their planning decisions.

The ES is divided into four documents:

- **Volume 1 Non-Technical Summary (This document)**
- Volume 2 Main Text
- Volume 3 Figures and Photomontages
- Volume 4 Appendices

In addition, a Planning Policy Statement has been provided which assesses the development against the Local Development Plan and other material consideration.

3. Environmental Effects

3.1 Introduction

The pre-application and consultation exercises identified any potentially significant effects and these were then subject to detailed assessment using methodologies appropriate to the different environmental topics. These methodologies are based on recognised good practice guidelines and legislation. The environmental topics considered in the ES are:

- Landscape and Visual Impact;
- Cultural Heritage;
- Ecology;
- Ground and Water
- Shadow Flicker;
- Noise;
- Infrastructure;
- Tourism, Recreation and Socio-economics.

The findings of the assessments are intended to assist PKC and others in coming to a view about whether or not, and how, the proposed development should proceed.

3.2 The Proposed Development

The proposed development is for a single wind turbine located at Aviva's commercial premises in Perth. The proposed development site is located on the south west fringe of Perth and is bounded by the M90 motorway running north-west / south-east, Craigie Hill golf club to the east and residential housing to the north west. The proposed layout is presented in Figure 3, Volume 3 of the ES and displayed below



The planning application is for a single wind turbine up to 77 metres (m) tip height with associated infrastructure such as a crane hardstanding, upgraded access track, and a temporary construction compound. The candidate turbine is up to 1 megawatt (MW) capacity.

The proposed development would take approximately 4-6 months to construct on site from start to completion including the removal of any temporary works.

The components for the turbine would be brought to site separately. The overall installation process for the turbine would take approximately 1 - 3 days depending on weather conditions and would not start until weather conditions were suitable.

Once the turbine is in operation, it would be monitored remotely and not staffed. Maintenance personnel would make routine visits by car and or van approximately once a month with intermediate visits as and when necessary.

The Aviva wind turbine would have an operational life of approximately 25 years. After this time, the development would be decommissioned in order to return the land to its former use. If at the end of the wind turbine's operational life, there remained an environmental or economic requirement for its operation a planning application to the Local Authority for the refurbishment or replacement of the turbine would be considered.

3.3 The Need for the Development

3.3.1 The imperative for the installation of the proposed wind turbine at Aviva, Perth is twofold:

- To create an exemplar for Aviva's global aspirations to achieve operational net zero carbon status across their entire estate, by 2030.
- To reduce the running costs of the building to future-proof the viability of the present general configuration of the building.

Aviva is committed to 'act now on climate change' and significantly reduce their carbon footprint. As part of their work to deliver on this commitment they want to develop their own Aviva wind turbine, on land adjacent to their flagship Scottish property in Perth, which has one of the largest carbon footprints of buildings in the Aviva estate.

Aviva’s commitment to the environment is a key strategic priority. As such, they have set the challenging target for their own operations and supply chain to be Net Zero by 2030. This includes all their occupied UK property.

The wind turbine will make the site an exemplar within the Aviva portfolio and can be used as a showcase by Perth and Kinross Council to help demonstrate the area’s commitment to green energy. This will support PKC’s ambition to be Europe’s first net zero small city.

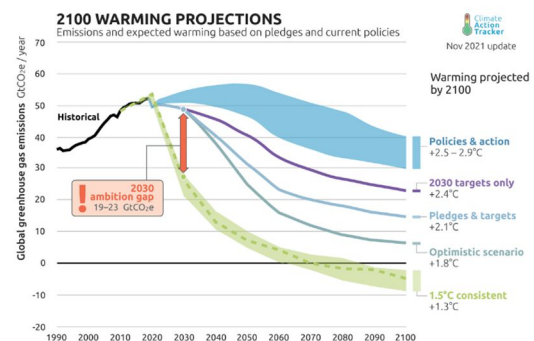
The current drive to increase the use of renewable energy sources is rooted in the recognition that the burning of fossil fuels is a major contributor to the emission of greenhouse gases, the primary cause of global climate change. As part of the response to climate change, the UK and Scottish Governments have entered into binding international agreements, committing to reducing greenhouse gas emissions.

In 2018 the IPCC produced a special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways

The report concluded that pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems. These systems transitions are unprecedented in terms of scale, but not necessarily in terms of

speed, and imply deep emissions reductions in all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in those options

According to the Climate Action Tracker current policies presently in place around the world are projected to result in about 2.7°C warming above pre-industrial levels.¹



The UN Climate Change Conference (COP26), the latest round of climate talks that took place in Glasgow was a defining moment. Renewing targets for 2030 that align with limiting warming to 1.5 degrees Celsius and an agreement on accelerating the phase-out of coal were not realised.

“Climate change is no longer a future problem. It is a now problem,” said Inger Andersen, Executive Director of the United Nations Environmental Programme (UNEP). ***“To stand a chance of limiting global warming to 1.5°C, we have eight years to almost halve greenhouse gas emissions: eight years to make the plans, put in place the policies, implement them and ultimately deliver the cuts. The clock is ticking loudly.”***²

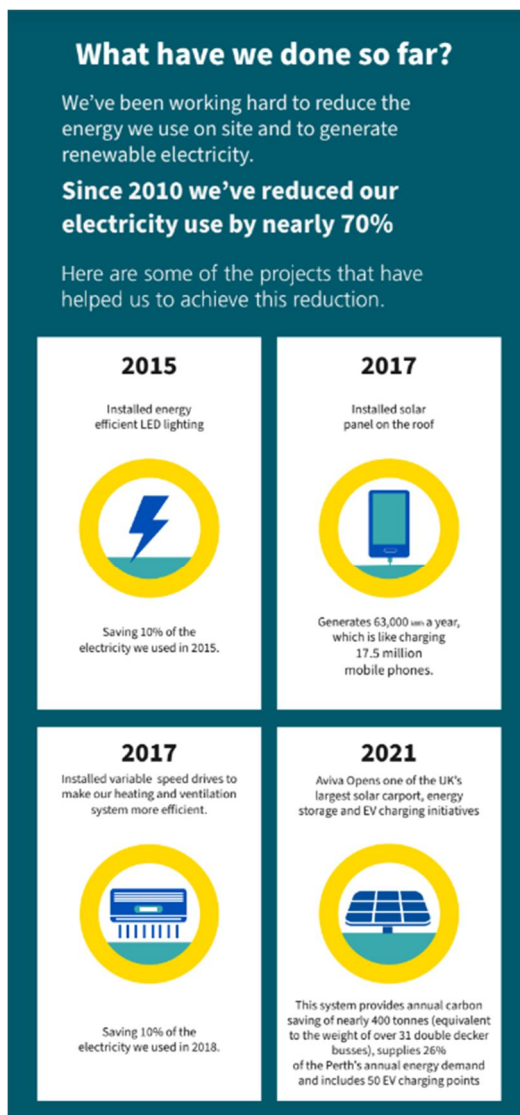
¹ <https://climateactiontracker.org/global/temperatures/> (2.7°C is the median of the low and high ends of current policy projections (2.0 to 3.6°C).)

² <https://www.unep.org/news-and-stories/press-release/updated-climate-commitments-ahead-cop26-summit-fall-far-short-net>

3.4 Planning the Development

Aviva is committed to ‘act now on climate change’ and significantly reduce their carbon footprint. Aviva’s commitment to our environment is a key strategic priority. As such, Aviva has set the challenging target for all their own operations and supply chain to be Net Zero by 2030. This includes all occupied UK property.

Significant investment has already been made at the Perth site to reduce electricity consumption through several energy conservation projects including:



Significant investment has been made at the Perth site to produce electricity from renewable energy technologies including:

- 0.1MW solar panels on the roof of the building
- 1.1MW solar carport which has a 1.8MW energy storage battery

Despite these impressive energy reduction and generation projects, currently only 27% of Aviva’s electricity demand is met from renewable sources.

Without significant technology advancements, additional energy efficiency measures will only make small contributions to overall energy conservation savings.

Perth has an energy use intensity 45% greater than any other building in the Aviva estate which clearly shows the challenge Aviva face with operation of this building. This effectively means that the energy costs Aviva incur in Perth, are 45% more per sqm than other buildings in their estate. Whilst Aviva are proud of their listed building, the design features for which it is celebrated, such as high ceilings and terraced garden/soil rooftops do lead to heat loss and create inefficiencies.

Over the next few years, Aviva are seeking to refocus their operational property portfolio to align with their Environment, Social and Governance (ESG) agenda and buildings which cannot meet that criterion have questionable longevity. The current energy usage at Perth, presents an operational challenge for Aviva from a cost perspective, particularly considering current global instability and fluctuation in energy prices. The turbine will future proof running costs by stabilising energy prices. The turbine will

also enable Aviva's staff and visitors to use cost effective and green supply EV charge points and allows investment in removing gas from the site.

The installation of a single 1MW wind turbine could potentially provide enough electricity to power over 75% of Aviva's site, taking the site to Net Zero in terms of electricity. Wind energy is the only technology that can provide the level of renewable energy generation required to reach Net Zero on the Perth site. For further information on Aviva Perth's Zero Carbon Journey please see Figure 4.1, Volume 3 - Making Aviva Perth an Energy Independent and Zero Carbon Location.

Conversion of the Perth site to 100% self-generated renewable energy will substantially improve the prospects for the long-term future use of the building in its current configuration and encourage new businesses to locate their offices in Perth. The building is now 50% vacant and onsite energy generation will improve attractiveness to new tenants to share the space available. The ESG agenda is a significant focus for potential occupiers. Current enquiries for the vacant space at Pitheavlis are on the whole from organisations who recognise what has already been achieved on the site and the potential for further diversification via a wind turbine to be erected in the future.

High overheads are not attractive to incoming tenants. The cost of space (rent, rates, service charge, utilities) is also a major consideration for most organisations who like costs to be known. A wind turbine at Pitheavlis will smooth some of the current volatility in the utilities market where ongoing high prices are forecast and provide certainty of supply.

Whilst there will be an economic saving on electricity costs for Aviva, the overwhelming drive for installing the wind turbine has always been to meet Aviva's operations Net Zero ambition by 2030.

Site Design

Aviva has been considered a suitable site for wind energy development because it has met the following criteria:

- Available land
- Existing site access
- Good wind resource
- Grid Connection in close proximity

In addition, the following environmental requirements influence directly on the site design. These were identified and considered during the development of the project:

- Landscape and Visual Impact
- Cultural Heritage
- Ecology
- Ground and Water
- Shadow Flicker
- Noise
- Infrastructure
- Tourism, Recreation and Socio-economic

Further information relating to the detailed assessment of these aspects is considered below.

Public Consultation

The approach to public consultation for this development has been guided by planning officers at Perth and Kinross Council and the current operational covid environment. Although this development is below the 20MW limit for formal pre-application consultation, Aviva has exceeded the minimum requirements set out for considerably larger scale developments.

The www.aviva-renewables.co.uk website was launched in July 2018 to provide a source of information about the proposed development. This website has been maintained through the course of the project and updated periodically to reflect current progress.

Over a month period from 16th January to 14th February 2022 there were 534 unique visitors to the Aviva Renewables website. The peak activity was the week before the virtual exhibition 25th to the 31st January with website traffic peaking on the day of the virtual exhibition the 31st January 2022.

A virtual exhibition introducing the proposed development for a wind turbine at Aviva was held on the 31st January from 3pm until 7pm online, hosted by the Hopin platform. The virtual exhibition allowed members of the public and staff at the Aviva site to view plans and predicted photomontage views of the proposed development.

An article was placed in the Perth Courier on Monday the 24th January 2022 inviting people to visit the Open Day and or the Aviva Renewables Website. The developer Purple Renewables created an event for the Open Day on the social media platform Facebook. Two Facebook campaigns were undertaken reaching over 8549 and 8606

respectively, targeted to people in the Perth area. The event generated 253 and 170 clicks and was shared and commented on by a number of people.

A live online virtual exhibition introducing the proposed development for a wind turbine at Aviva was held on the 31st January from 3pm until 7pm online, hosted by the Hopin platform. The virtual exhibition allowed members of the public and staff at the Aviva site to view plans and predicted photomontage views of the proposed development. Staff from both Purple Renewables and Aviva were available via live chat to answer any questions regarding the proposed development

25 external guests were registered to have visited the virtual, peaking at 40 users. We had a 92% turnout rate which is 15% above the industry average for a Hopin event of this type.

13 people filled out the online exhibition survey. Of the 13 responses 8 were in favour and 5 opposed to the development. For people who are supportive of the proposal, clean energy for future generations was sighted as the main benefit, identified 7 times. Supporting the low carbon growth of a local business was also sighted as a key benefit to the proposed development. The 5 people surveyed that registered as being somewhat opposed or strongly opposed cited visual impact and noise as their main concerns.

The survey responses showed that social media was the most popular method of communicating the event, followed by the local press advert and word of mouth.

There were fewer survey results collected than the previous application primarily due to

the location of the event being online only. It is believed that the information reached a wider audience given the social media, Hopin and website statistics, however very few people (13) chose to fill out a survey questionnaire.

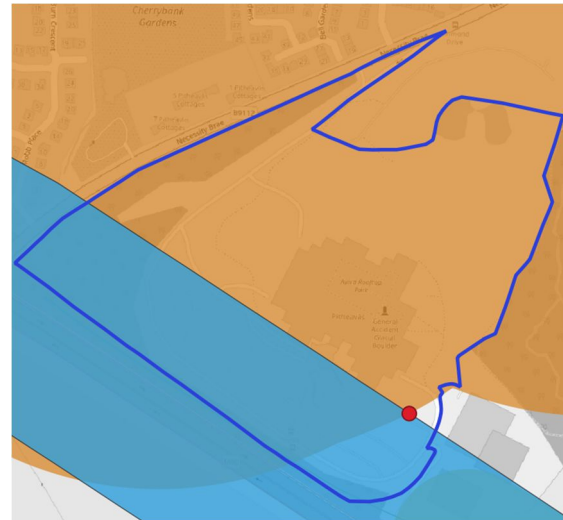
Design Evolution

All information and consultation responses were analysed in relation to the technical, environmental and operational safety requirements of each element of the wind turbine development. This led to a process of detailed design development as the relevant factors were taken fully into account, as detailed knowledge of the site and feedback from the public was obtained.

Design 1 represents the original technically based desktop design for the site. The initial design consisted of one wind turbine up to 80 m in height. The height was limited due to the proximity of the M90 motorway and nearby residential dwellings.

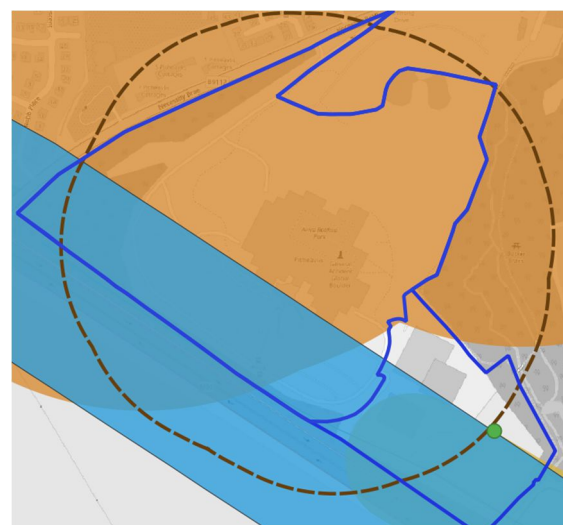
Design 2 resulted in a slight relocation of the turbine position, to place the turbine away from the centre of the road into an area currently used for car parking. There was a slight reduction in height of the turbine due to the size of the candidate turbines currently available. This design was submitted to Perth and Kinross Council for Planning in September 2018.

Following planning refusal of Design 2, predominantly due to the proximity to the listed building, a search of neighbouring land was undertaken for suitability of wind energy development.



Design 2 – Original Turbine Location

Design 3 is located southeast of the Aviva building beyond the sports centre complex within an unused field. The revised turbine location introduces a 200m separation buffer from the listed building, mitigating setting issues raised by HES in the previous planning submission. The location of the turbine allows for a simple grid connection to the site's existing services and continues to be close enough to be viewed as within the Aviva site.



Design 3 – Revised Turbine Location

The development has been designed to minimise the impact on the local environment and is considered by Purple Renewables to be an appropriate and responsible design.

The final design presented in Figure 3, Volume 3 and appended to this document has been submitted with the planning application and is assessed within the Environmental Statement.

3.5 Landscape and Visual Impact

The landscape chapter evaluates the landscape and visual impacts associated with the proposed development, to determine the likely effects to the landscape character and visual amenity of the area.

Landscape character – which is the physical makeup and condition of the landscape itself. Landscape character arises from a distinct, recognisable and consistent pattern of physical and social elements, aesthetic factors and perceptual aspects; and

Visual amenity – which is the way in which the site is seen and appreciated; views to and from the site, their direction, character and sensitivity to change.

A number of Figures and photomontages have been created to aid assessment of the landscape and visual effects and can be viewed in Volume 3 of the ES.

No part of the site lies within a statutorily designated landscape (e.g. National Park or National Scenic Area). The River Tay National Scenic Area is located approximately 20km north of the proposed turbine and no intervisibility is predicted. Two non-statutory landscape designations lie within 5km of the proposed turbine and comprise the Ochil Hills Special Landscape Area (SLA), located 4km to

the south of the Site and The Sidlaw Hills SLA, located 2.7km east of the site at the closest point. It is assessed that there would be no significant adverse effects upon the Sidlaw Hills and Ochil Hills Special Landscape Areas and the overall integrity of both designations would remain intact.

The effect upon the ‘Urban’ landscape character type and the adjacent rural landscape covered by the ‘Lowland Hills’ would be moderate adverse and not significant in EIA terms.

The landform in the wider locality identifies the site as being located on a slope of the River Tay Valley with land falling away to the north and west but rising to the south. Within the Aviva grounds there is a circa 40m fall in levels, noting that along the B9112 the land rises to the north within the urban area of Perth and views are available from the Cherrybank estate. Further afield and beyond the city, land to the south and southeast of the site gently rises initially and then more steeply to an east-west ridgeline. High points include Mailer Hill to the south and further to the southeast Moncreiffe Hill. Northeast of the site, beyond the urban area of Perth, the land rises steeply above the River Tay to Kinnoull Hill.

The nearest residential dwelling is located approximately 500m from the proposed turbine, within a recently constructed housing estate on Bell Gardens, off the B9112. Due to the orientation of the dwellings relative to the proposals, no direct view of the turbine would be available, noting that nearby properties including the listed Pitheavlis Cottages are separated from the proposed turbine by mounding along the boundary of the Aviva grounds and mature coniferous tree planting.

Further afield, potential visibility from dwellings within the Cherrybank estate would be frequently restricted by intervening planting and buildings and where direct views occur, in particular from upper floor rear windows, it is predicted that the turbine would have a significant effect upon visual amenity but not overbearing.

The road network in close proximity to the site includes the M90 motorway corridor to the south and the B9112 running past the site. At close range there is the potential to have significant localised effects.

The edge of Perth in this location comprises a range of man-made development and a range of building styles and ages, dominated by modern post-war housing (typically 1-2 storey) and occasional larger buildings including flats, offices and the motorway service station. Vertical infrastructure in the rural landscape to the south of the M90 includes pylons that lie approximately 1.2km southwest of the proposed turbine at the closest point and the telecommunication masts on Mailer Hill and St. Magdalene's Hill that lie a similar distance to the southeast.

The effects of the proposed turbine upon the visual amenity of recreational users would be significant from several core paths close to the M90 and from parts of the Craigie Hill Golf course. The visual amenity of users of other more distant core paths within the ZTV would not be significant.

There are many operational wind energy schemes in the UK where residents would be located in close proximity to commercial scale wind turbines. An example is the operational 100m tall turbine at FMC which is located approximately 300m from the nearest housing on the edge of Dunfermline. The

Little Raith windfarm comprising 9 turbines at 125m to tip is located approximately 800m distant from the edge of Cowdenbeath at the closest point.

The proposed turbine would have some localised significant adverse effects upon parts of the suburbs of Pitheavlis and Cherrybank within the urban area of Perth, a section of the M90 and B9112, parts of the Craigie Hill Golf course, and several core paths in close proximity to the proposed wind turbine.

The turbine would be prominent from a relatively modest number of visual receptors, and whilst some Significant adverse effects upon visual amenity are assessed, the proposed turbine would not be visible from the overwhelming majority of the urban area of Perth. Significant adverse effects upon visual amenity would also not be experienced from receptors in the wider landscape including key hill-top summits to the east of the city.

Careful review in the field and analysis of the other wind energy schemes, that there is no potential for any significant cumulative landscape or visual effects with the proposed development.

3.6 Cultural Heritage

The cultural heritage chapter presents an assessment of the effects of the proposed development on the historic environment in light of the revisions made to the scheme previously submitted for planning permission in September 2018.

A heritage asset (or historic asset) is any element of the historic environment which has cultural significance.

Designated assets include Scheduled monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields and Historic Marine Protected Areas. Other assets may also be locally designated through policies in the Local Plan.

The potential for previously unrecorded cultural heritage assets within 350m is considered to be low and negligible for the construction footprint of the proposed turbine itself. It is considered that the potential for construction impacts on previously unrecorded cultural heritage assets is very limited.

The erection of a wind turbine can result in effects on the settings of historic assets at a distance from the development, by affecting views towards or from the historic asset. None of the locally designated heritage assets within 2km has a wider landscape setting that contributes substantively to its cultural significance. The assessment, therefore, is concerned solely with potential impacts upon the settings of the conservation area, inventory battlefield and listed buildings within the study areas.

There is one Category A listed building within 350m and a further five within 2km.

The Perth Central Conservation Area (CA577) lies to the northeast of the site at a distance of approximately 1.5km. The Conservation Area and the listed buildings within it, including the Category A listed A K Bell Library (LB39323), have been assessed as a group.

The Inventory Battlefield, The Battle of Tippermuir (BTL39) has also been assessed for potential operational impacts.

Aviva Listed Building

The revised proposal is made in response to HES's indication within their consultation response that "Given that the proximity of the proposed turbine to the A listed building is particularly problematic to us, we consider that the worst of the impacts could potentially be addressed by relocating the turbine a relatively short distance.

Detailed discussions were held with HES when the opportunity arose to locate the previously proposed wind turbine on land further to the east of the listed building in 2021. Following the submission of a full draft of the Heritage Statement prepared by the Hurd Rolland Partnership, HES provided an early indication that indicated that "*our previous concerns have been addressed to the point that a future application would be unlikely to merit an objection.*" Recommending that "*the exact same viewpoints are used to illustrate the difference in potential impacts between the current proposal and the previous one as the proposals are developed further.*"

In terms of the guideline criteria set out in the Environmental Impact Assessment Handbook published by HES, the revised location of the wind turbine will substantially reduce the previously assessed magnitude of impact on the setting of the listed building.

The revised proposal specifically seeks to address the assessed adverse effect of the previous proposal by re-siting the wind turbine such that the magnitude of impact will be substantially reduced. In this respect, the principal physical mitigation offered under the revised proposal is the re-siting of the wind turbine on adjacent land 200m east southeast of the listed Aviva building beyond

the neighbouring unlisted recreational hall and intervening tree line.

In wider mitigation, and largely overlooked in relation to the previous application, Aviva's aspiration to convert Pitheavlis to 100% self-generated renewable energy, facilitated by the new wind turbine, will substantially improve the prospects for the long-term future use of the building in its current configuration with no physical impact on the fabric of the listed building and might reasonably be considered beneficial.

In addition, a programme of enhancement measures will be proposed to offset the impact of the proposed development. These include;

- Improving access to the interior of the Aviva Building to allow appreciation of the qualities for which the building was listed. This will be facilitated through a number of guided tours specific to the cultural heritage and architecture of the building.
- An annual fund of £1000 to support archaeological research in Perth and Kinross.

No other heritage assets in the study areas will be affected by the proposed development.

3.7 Ecology

The Ecology Chapter provides an assessment of potential effects upon ecological and ornithological features in relation to the construction, operation and decommissioning of the proposed wind turbine.

A desk study was undertaken to collate existing information on the presence of designated sites for nature conservation with ecological interests and existing records of protected or notable species where available.

The following field surveys were completed:

- Extended Phase 1 habitat survey (July 2021, as a revision of the 2017 survey); and,
- Bat activity surveys (May to September 2021).

Ornithology surveys were not undertaken. The Site is set within an urban fringe area and does not provide suitable habitat for those species considered sensitive to wind energy developments in NatureScot (SNH, 2018) guidance '*Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas*'. Whilst occasional flights over the Site by such species may occur, these are considered highly unlikely to be regular enough to constitute any risk through collision to the conservation status of each species within the 'Eastern Lowlands' Natural Heritage Zone (NHZ).

The Proposed Development will not lead to direct impacts on any protected or notable habitats and nearby watercourses will be protected through standard pollution control measures and therefore significant effects avoided.

Potentially significant effects on sensitive bird species are not considered likely to occur.

The site is considered unsuitable for regular use by protected or notable terrestrial mammal species. The possible presence of badgers in the surrounding area is

acknowledged; however no evidence of presence has been observed.

Whilst potentially significant adverse impacts upon terrestrial mammals are considered highly unlikely, mitigation measures are recommended as a precaution to ensure legislative compliance during the construction and decommissioning phases.

The site provides limited habitat for reptiles, although the possible presence of slow worms is acknowledged. Given the protection afforded to individual reptiles against intentional or reckless killing and injuring reptiles are considered for mitigation, to ensure legislative compliance during the construction and operational phases.

The construction of the proposed scheme will not result in the permanent and temporary loss of habitats, which are typically of low foraging and commuting value to bats.

- NatureScot guidance (2021) states that wind farms can affect bats in the following ways:
- Collision mortality, barotrauma and other injuries (although it is important to consider these in the context of other forms of anthropogenic mortality);
- Loss or damage to commuting and foraging habitat, (wind farms may form barriers to commuting or seasonal movements, and can result in severance of foraging habitat);
- Loss of, or damage to, roosts; and / or
- Displacement of individuals or populations (due to wind farm construction or because bats avoid the wind farm area).

However operational impacts on bats can be difficult to characterise due to the limited evidence base pertaining to bats and wind

farms in the UK, which prohibits mortality risks to be accurately quantified and predicted.

Following NatureScot guidance (NatureScot, 2021), a Stage 2 ‘Overall Risk Assessment’ (ORA) should be carried out separately for all high collision risk species recorded, which comprises the following species recorded during 2017 and 2021 bat activity surveys:

- Noctule bat
- Common pipistrelle
- Soprano pipistrelle

In the absence of mitigation, the Proposed Development is considered to represent a Medium level impact, which represents a Major Adverse Effect on a receptor of Regional Value, and therefore a potentially Significant effect in EIA terms. However, given the limited evidence available on actual effects on bat populations this conclusion should be considered highly precautionary, further so given the scale of the development is a single wind turbine.

A Construction Environmental Management Plan (CEMP) will be produced prior to the commencement of construction works, with reference to current industry guidance. Measures detailed within the CEMP will ensure construction is undertaken in compliance with relevant environmental and ecological legislation and good practice construction methods.

Mitigation is proposed following the methodology detailed in NatureScot guidance (2021), which states that there is evidence that bat casualties at wind farms are reduced by pitching the blades out of the wind (“feathering”) to reduce rotation speeds below 2 rpm while idling. The reduction in

speed resulting from feathering compared with normal idling may reduce fatality rates by up to 50%. Following the implementation of mitigation, effects arising from the Proposed Development are considered reduced to a Minor Adverse Effect on a receptor of Regional value, and therefore not significant in EIA terms.

Any construction related impacts, such as pollution or noise, will be minimised through implementation of standard control measures.

3.8 Ground and Water

This chapter addresses the assessment of the potential effects of the proposed wind turbine at Aviva on the surface water and groundwater environment. In addition, the chapter addresses the potential effect of the proposed development on soil and geology.

The following sources of information have been utilised during the assessment:

- Ordnance Survey mapping, Openstreetmap and Google aerial imagery
- British Geological Survey Portal
- Envirocheck Data
- Consultation with SEPA
- Published Sources on the SEPA website

The potential risks of the proposed development, relate wholly to the construction phase of the development, based on an assessment of activities occurring during the construction of the wind turbine and associated infrastructure.

The potential effects from the construction of the proposed development are:

- Potential risks to surface water and groundwater quality resulting from the use and storage of fuels, oils and other potentially polluting substances.
- Potential risks to surface water and groundwater quality resulting from, transporting and pouring of concrete for turbine foundation.
- Mobilisation of potentially contaminated soils and groundwater.

The following mitigation measure will be actioned:

- A Construction Method Statement (CMS) containing details of the proposed and agreed working practises to be adopted on site for all construction activities. This will include a pollution prevention plan, accident management plan and waste management plan.
- A Construction Environmental Management Plan (CEMP) to incorporate detailed pollution prevention and mitigation measures for all construction elements potentially capable of giving rise to pollution during all phases of construction and reinstatement after construction.
- A location map of all potential chemical contamination sources, including all fuel, oil and chemical storage areas, vehicle compounds, refuelling sites, waste depots and on-site sewage systems:
 - Procedures for dealing with water contaminated from cement and the excavations into which the cement is to be poured: and
 - Timing of works, including a programme of works which takes into

consideration and avoids working during high rainfall events.

The assessment found that there are no significant hydrological, hydrogeological or geological issues affecting the site. Additionally, there are no significant flooding, mining or water quality and abstraction issues affecting the site.

No mitigation measures other than following the relevant Pollution Prevention Guidelines and implementing best practice measures, during the construction phase of the development, will be required.

3.9 Shadow Flicker

Shadow flicker effects that may be perceptible near an operational wind turbine generator are most commonly defined as follows:

“Under certain combinations of geographical position, time of day and time of year, the sun may pass behind the rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off; the effect or impact is known as shadow flicker”.

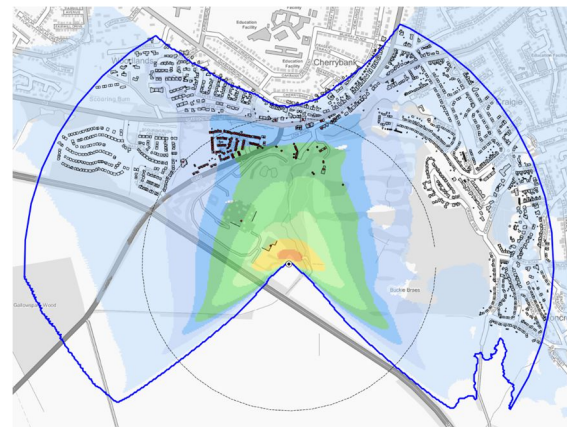
The area within which an observer may be subjected to shadow flicker surrounding a wind turbine is constrained in size and shape by astronomical and geometrical parameters, such as the trajectory of the sun and the position and dimensions of the wind turbine. It is possible to predict when, where and for how long shadow flicker could theoretically occur using commercially available computer programmes.

A modelling scenario with assumptions referred to as the “astronomic worst-case” has been used as this yields a conservative estimate of the impact as it does not take into

account a number of naturally occurring mitigation factors, such as the possibility of cloud cover or the actual orientation of the rotor.

An initial calculation was carried out using the modelling parameters, with the purpose of identifying the theoretical zone of influence, i.e. areas within which an observer inside a building could potentially be subjected to shadow flicker.

The diagram below displays the outcome of the initial calculation and identifies the theoretical zone of influence. Outside this area, no shadow flicker effects should be expected.



As pointed out by the climateXchange report, a consistent assessment of shadow flicker effects within the context of the Scottish Planning System is currently hampered by the lack of agreed significance criteria. Once formally adopted, the Perth & Kinross Supplementary Guidance Renewable & Low Carbon Energy would go some way in addressing the issue.

In the meantime, the 30 hours per year and 30 minutes per day limits as per astronomic worst-case stated in the German Guidelines, were adopted to discard effects as not significant in receptors in which neither of

these two criteria was found to be exceeded based on the modelling results. 130 of the 1829 modelled receptors in the assessment area were found to exceed one or both of these criteria and it is suggested that technical mitigation measures are to be implemented to limit the actual exposure of these receptors.

Shadow flicker can be easily mitigated. The wind turbine would be equipped with an electronic controller that pauses the rotor automatically during periods when an exceedance of the limit may occur at a receptor and provided that the meteorological conditions are favourable for the occurrence of the effect. With mitigation measures implemented there will be no significant environmental effects resulting from shadow flicker.

3.10 Noise

The noise chapter considers the likely significant effects with respect to the noise associated with the operation of the proposed development.

An initial desktop assessment was undertaken in 2018 to identify the nearest noise sensitive receptors to the site and to determine potential Noise Assessment Locations (NALs). In total, seven NALs to the north of the site were identified and the same seven NALs have been considered in this assessment.

The background noise survey was undertaken in the Summer of 2018 at one dwelling (16 Arthur Park) and also within the grounds of the Aviva office complex. The chosen monitoring locations were deemed to be representative of the noise environment at the other noise sensitive receptors. The data collected during this survey was re-analysed

by the consultant for the purposes of this assessment. No additional monitoring was undertaken.

The assessment has been undertaken in accordance with ETSU-R-97 and current good practice, as specified in the Policy, Legislation and Guidance section (Section 10.2). ETSU-R-97 provides a robust basis for determining acceptable noise limits for wind turbine developments. Consequently, the test applied to operational noise is whether or not the calculated wind turbine noise levels at nearby noise sensitive receptors would be below the noise limits derived in accordance with ETSU-R-97.

For the noise assessment, the daytime fixed minimum Noise Limits have been set at 35dB or 5dB(A) above prevailing background whichever is the higher.

For night-time periods the noise limits have been set at a fixed minimum level of 43dB $L_{A90,10min}$ or 5dB(A) above prevailing background whichever is higher.

The assessment shows that the predicted wind turbine noise emissions levels for the proposed development meet the Noise Limits under all conditions and at all locations for both daytime and night-time periods, therefore, the predicted noise levels are not significant.

3.11 Infrastructure

This chapter addresses the potential effects of the proposed wind turbine on microwave links and other electromagnetic signals (such as those associated with airfields), which are transmitted throughout the country by a wide range of operators, including both statutory agencies and commercial companies. There is potential for interference to the

transmission of these signals from large structures, including wind turbines, which may be sited close to the signal path.

A comprehensive consultation process has been undertaken with organisations with an interest in telecommunications, aviation, safety and infrastructure for the proposed development site.

The proposed development lies outside the consultation zone for nearby airfields. NATs have confirmed that they do not anticipate any safeguarding issues with the DVOR or any other assets as a result of the proposed development.

The MoD was consulted for the previous application and raised no objection to the proposed development. The MoD no longer comments on pre-planning applications, therefore it is anticipated that a 200m change in the turbine location would not trigger an objection from the MoD.

Should aviation lighting be required, the specification would be agreed with the aviation authorities and such lighting would likely be infrared or directional which would not be visible to the human eye from ground level.

There is a very low probability that the proposed development could interfere with domestic television reception. Sources of interference is caused by the physical blocking of the transmitted signal, or by introducing multipath interference where some of the transmission signal is reflected through different routes causing the signal to break up.

Given the national switchover to a wholly digital transmission, and the large take up of satellite TV, analogue interference is now a

reasonably rare occurrence. If interference is deemed to have occurred, then simple mitigation measures can be undertaken.

Several microwave links have been identified within a 1km radius of the site and the potential effects on these have been taken into consideration. The turbine is located so the majority of these links will be unaffected, however there are Joint Radio Company (JRC) links which may have the potential to be impacted upon. Consultation is ongoing with the JRC and the applicant is confident that mitigation can be implemented and agreed upon.

Appropriate safety set back distances have been applied within the site design for infrastructure such as overhead power lines, high pressure gas pipelines, trunk roads, rights of way and Aviva's on-site services.

With the implementation of appropriate mitigation measures, the proposed development will have no significant environmental effects on infrastructure.

3.12 Tourism, Recreation and Socio-economic

This chapter considers the potential effects of the proposed development at Aviva on tourism, recreation and economic activity.

The Scottish Executive's commitment to renewable energy is driven both by environmental imperatives and by the potential for new economic development. An increase in renewable electricity generation as a means of reducing carbon emissions forms an important part of Scotland's efforts to tackle climate change.

Scotland's long-term climate change targets will require the near complete

decarbonisation of our energy system by 2050, with renewable energy meeting a significant share of their needs.

At the centre of Scotland's green recovery is a commitment to increase the number of good, green jobs and to enable people to access these jobs, including through training and reskilling. This is fundamental to the National Mission for Jobs set out in the 2020-2021 Programme for Government.

The green recovery offers an opportunity to accelerate retraining and bring much needed skills and labour into sectors scaling up for the transition to net zero, including where there is immediate demand for skills and labour such as in construction, land-based roles in woodland creation and peatland restoration and in energy³

Economic benefits will arise in the local area as a result of this proposed development. Direct benefits could result from the construction and operation of the project, subject to suitable local civil and electrical contractors being identified. In addition, there will be a local community fund linked to the operation of the wind turbine which would provide a minimum of £5,000 per year to support local organisations and charities.

There will be indirect benefits in the local area through the support of investment into a significant local employer.

The reduction and stabilisation of Aviva's electricity demand will directly benefit Aviva and contribute to Aviva's aspiration to convert the site to 100% self-generated renewable energy. A Net Zero site, facilitated by the new wind turbine, will substantially

improve the prospects for the long-term future use of the building.

Aviva has downsized office space requirements by 50% recently, offering their staff increased flexibility in where and how they work which has resulted in vacant office space in Perth which is unsustainable in the long term. Aviva are keen to attract new like-minded occupiers to join them in the Perth office, who will be attracted by a low carbon and cost-effective location. Providing high quality office space within Perth will hopefully attract new significant employers into the area, improving the economic opportunities in the area.

The reduction and stabilisation of Aviva's electricity demand will not only directly benefit Aviva, but will also benefit the local community through the high-quality job opportunities they are able to provide, ongoing support and investment in community projects, along with the benefits to the economy through local sourcing of goods and services in the supply chain.

It has been consistently shown in surveys that support for onshore wind energy is high and importantly for Aviva a recent survey shows that consumers are now more environmentally and socially conscious when making purchasing decisions identifying that 73% of consumers would choose a retailer that uses renewable energy, over one that doesn't and 86% of consumers believe it's worth buying products made using 100% renewable energy, thus aligning with Aviva's ambitions to make the Perth facility 100% supplied by on-site renewable energy.

³ <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/pages/4/>

It has been consistently demonstrated that well sited on-shore wind farms do not have a detrimental impact on tourism. The proposed development has the potential to increase tourism in Perth and Kinross by improving access to the interior of the listed category A listed building, through a series of dedicated cultural heritage and archaeology tours.

It is worth noting that at the local scale the currently observable social and economic impacts of climate change may be difficult to identify, the cost of such changes, over time will inevitably be felt at all scales. The contribution of this scheme towards limiting and offsetting those costs is a significant benefit which should be measured in its favour at all scales.

A socio-economic assessment has been completed at a range of scales concluding that the development would have the most significant impacts, both positive and negative, at the local scale but that significant benefits are derived from the proposal at all scales and those benefits significantly outweigh any perceived local harm.

3.13 Summary of Effects

The identification of potential positive and negative impact of a proposed development is at the heart of the EIA process. The process of reduction of adverse environmental impacts is considered through-out the design process.

It should be noted that by definition all EIA projects are likely to have significant environmental effects, and this does not mean that the impact of the proposed development, as a whole, is significant in the context of the EIA regulations.

The proposed development will give rise to significant benefits, both in terms of supporting measures to tackle climate change and implementing Scottish Government Policy and in terms of the local economy. Significant weight should be applied to these benefits in the determination of the planning application.

The imperative for the installation of the proposed wind turbine at Aviva, Perth is twofold:

- To create an exemplar for Aviva's global aspirations to achieve operational net zero carbon status across their entire estate, by 2030.
- To reduce the running costs of the building to future-proof the viability of the present general configuration of the building.

Although Aviva are incredibly proud of their listed building, the evolution of smart working following the Covid pandemic has resulted in 50% of the open plan office space at Perth being vacated. The present disproportionately high running costs makes returning the building to full occupancy, in its present general configuration, problematic.

Aviva cannot continue to operate the Perth building at 50% occupation therefore they are keen to attract new like-minded occupiers to lease out vacated space. For Aviva to be successful in attracting new businesses to Perth they will need to demonstrate that the Perth site is a low carbon and a cost-effective location.

The wind turbine will make the site an exemplar within the Aviva portfolio and can be used as a showcase by Perth and Kinross Council to help demonstrate the area's commitment to green energy. This will

support PKC's ambition to be Europe's first net zero small city.

The proposed development would give rise to some localised significant effects, in EIA terms, upon the setting of the listed building and landscape impacts.

The proposed turbine would have some localised significant adverse effects upon parts of the suburbs of Pitheavlis and Cherrybank within the urban area of Perth, a section of the M90 and B9112, parts of the Craigie Hill Golf course, and several core paths in close proximity to the proposed wind turbine. The turbine would be prominent from a relatively modest number of visual receptors, and whilst some significant adverse effects upon visual amenity are assessed, the proposed turbine would not be visible from the overwhelming majority of the urban area of Perth.

The revised proposal specifically seeks to address the assessed adverse effect of the previous proposal on the setting of the listed building, by re-siting the wind turbine such that the magnitude of impact will be substantially reduced. In this respect, the principal physical mitigation offered under the revised proposal is the re-siting of the wind turbine on adjacent land 200m east southeast of the listed Aviva building beyond the neighbouring unlisted recreational hall and intervening tree bund.

In wider mitigation, Aviva's aspiration to convert the site to 100% self-generated renewable energy, facilitated by the new wind turbine, will substantially improve the prospects for the long-term future use of the building.

Perth has an energy use intensity 45% greater than any other building in the Aviva

estate which clearly shows the challenge Aviva face with operation of this building. This effectively means that the energy costs Aviva incur in Perth, are 45% more per sqm than other buildings in their estate. Whilst Aviva are proud of their listed building, the design features for which it is celebrated, such as high ceilings and terraced garden/soil rooftops do lead to heat loss and create inefficiencies.

Over the next few years, Aviva are seeking to refocus their operational property portfolio to align with their Environment, Social and Governance (ESG) agenda and buildings which cannot meet that criterion have questionable longevity. The current energy usage at Perth, presents an operational challenge for Aviva from a cost perspective, particularly considering current global instability and fluctuation in energy prices. The turbine will future proof running costs by stabilising energy prices. The turbine will also enable Aviva's staff and visitors to use cost effective and green supply EV charge points and allows investment in removing gas from the site.

A wind turbine is the only renewable energy technology that can deliver the amount of electricity required, on the land available, for Aviva to reach 100% on-site generated renewable electricity in the Pitheavlis office

In addition to the community fund of £5000 per year, a programme of enhancement measures specific to cultural heritage, will be proposed to offset the impact of the proposed development. These include;

- Improving access to the interior of the Aviva Building to allow appreciation of the qualities for which the building was listed. This will be facilitated through a number of guided tours specific to the

cultural heritage and architecture of the building.

- An annual fund of £1000 to support archaeological research in Perth and Kinross

The proposed development as a whole will not give rise to only localised significant adverse effects upon the receiving environment. It is clear from this assessment that the proposal, subject to certain mitigation measures, which can be secured by planning conditions, will comply with the provisions of the development plan.