

Module X. Wind farm developments

1.1 Wind farm state code

1.1.1 Purpose

The purpose of the code is to:

- 1) facilitate the development of new wind farms or the expansion of existing wind farms in appropriate locations
- 2) ensure potential adverse impacts on the community and environment are avoided during the construction, operation and decommissioning of wind farms.

Editor's note—The *Wind farm state code Planning Guideline* has been prepared to assist applicants in:

- demonstrating compliance with the performance outcomes or acceptable outcomes contained in this code, and
- demonstrating compliance with the purpose of this code.

Stakeholder consultation plays a key role in promoting understanding and acceptance in a local community of the development of a wind farm. Consultation should be undertaken prior to lodgement of a development application—refer to Appendix 1 of the *Wind farm state code Planning Guideline*.

1.1.2 Criteria for assessment

Development mentioned in column 1 below must be assessed against the assessment criteria in the table mentioned in column 2.

Column 1	Column 2
Material change of use	Table 1

Table 1 Material change of use

Performance outcomes	Acceptable outcomes
Connectivity	
PO1 Development: <ol style="list-style-type: none">1. is readily connected to existing high-voltage electricity transmission lines; and2. once connected, will generate electricity that can be accommodated by the existing capacity of the electricity network (including substations and transmission infrastructure).	No acceptable outcome is prescribed.
Location	
PO2 The safety, operational integrity and efficiency of air services are not adversely affected by the location or siting and design of the development.	A02.1 For strategic airports: <ol style="list-style-type: none">(i) the wind farm is not located on land under the vertical projection of the outer edge of the outer horizontal surface for the relevant obstacle limitation surfaces applicable to the airport;(ii) wind turbines over 150 metres above ground level are not located on land within 30 kilometres of the aerodrome reference point (ARP). A02.2 For other aerodromes and public airfields, the wind farm is not located: <ol style="list-style-type: none">(i) within 15 kilometres of the ARP; or,(ii) if no ARP has been identified—within 15 kilometres of each end of a permanent runway and 10 kilometres parallel to either side of the runway. A02.3 Towers, turbines and other structures over 150 metres above ground level are designed and constructed to incorporate physical obstacle warnings in accordance with the requirements of the Civil Aviation Safety Authority.

Table 1 Material change of use

Performance outcomes	Acceptable outcomes
<p>PO3 Development is designed and sited to ensure minimal electromagnetic interference to pre-existing television, radio reception or transmission.</p> <p>Editor's note: To demonstrate that the performance outcome can be achieved, an electromagnetic impact assessment report prepared by a qualified electromagnetic engineer, is to be submitted—refer to the <i>Wind farm state code Planning Guideline</i>.</p>	No acceptable outcome is prescribed.
<p>PO4 Development ensures the impacts on flora and fauna species and habitat are avoided and minimised through siting, design and operation measures which minimise:</p> <ol style="list-style-type: none"> 1. bird and bat collisions with wind turbines; 2. the clearing of native vegetation and management of weeds for construction of internal roads and turbine hardstands; and 3. the impact on important flora species and fauna habitats for the construction of roads and turbine hardstands. <p>Editor's note: To demonstrate that the performance outcome can be achieved, an ecological assessment report prepared by a qualified ecologist is to be submitted—refer to the <i>Wind farm state code Planning Guideline</i>.</p>	No acceptable outcome is prescribed.
<p>PO5 Development is designed and constructed to accommodate safe, convenient and efficient access to and from the wind farm.</p> <p>Editor's note: To demonstrate that the performance outcome can be achieved, a traffic impact assessment prepared by a Registered Professional Engineer of Queensland is to be submitted—refer to the <i>Wind farm state code Planning Guideline</i>.</p>	No acceptable outcome is prescribed.
Amenity	
<p>PO6 Development does not adversely impact on landscape character, landscape values or view sheds of significance.</p> <p>Editor's note: To demonstrate that the performance outcome can be achieved, a visual assessment report prepared by a Landscape Architect is to be submitted—refer to the <i>Wind farm state code Planning Guideline</i>.</p>	No acceptable outcome is prescribed.
<p>PO7 Development avoids or minimises blade glint and shadow flicker on nearby sensitive land uses.</p>	<p>A07.1 The modelled blade shadow flicker impact on any existing dwelling does not exceed 30 hours per annum and 30 minutes per day.</p> <p>AND</p> <p>A07.2 Turbine blades are finished with a low reflectivity.</p>
<p>PO8 Audible noise emissions resulting from the development do not result in unacceptable levels (including cumulative impacts) of nuisance to sensitive land uses.</p>	<p>A08.1 The predicted equivalent noise level (LAeq, adj,10min), including tonality adjustment, does not exceed, whichever is the greater of:</p> <ol style="list-style-type: none"> (i) 35dB(A) at relevant sensitive land uses; (ii) the background noise (LA90,10min) by more than 5dB(A); <p>from cut-in wind speed to rated power of the wind turbine and each integer wind speed in between.</p>

Table 1 Material change of use

Performance outcomes	Acceptable outcomes
	<p>Editor's note: To demonstrate that the acceptable outcome can be achieved, a noise impact assessment report prepared by a qualified acoustic engineer is to be submitted—refer to the <i>Wind farm state code Planning Guideline</i>.</p>
<p>PO9 Low frequency noise emissions resulting from the development do not result in unacceptable levels (including cumulative impacts) of nuisance to sensitive land uses.</p> <p>Editor's note: To demonstrate that the performance outcome can be achieved, a noise impact assessment report prepared by a qualified acoustic engineer, is to be submitted – refer to the <i>Wind farm state code Planning Guideline</i>.</p>	<p>No acceptable outcome is prescribed.</p>
<p>PO10 Development complies with an environmental management plan that identifies standards and procedures for the construction, operation and decommissioning of the development.</p>	<p>AO10.1 The environmental management plan demonstrates how all aspects relevant to the construction; operation and decommissioning of the development will be managed, including:</p> <ul style="list-style-type: none"> (i) how construction activities will not significantly alter the existing natural drainage pattern; (ii) how services will be co-located with access trails to reduce impact on surrounding environment; (iii) how the site will be rehabilitated upon decommissioning. <p>Editor's note: To demonstrate that the acceptable outcome can be achieved, it is recommended that environmental management plan is prepared in accordance with the <i>Wind farm state code Planning Guideline</i>.</p>

1.2 Reference documents

Department of State Development, Infrastructure and Planning, 2014, *Wind farm state code Planning Guideline*

Department of State Development, Infrastructure and Planning, 2014, *Wind farms state code Fact Sheet*

Department of State Development, Infrastructure and Planning, 2013, *State Planning Policy*

Clean Energy Council, 2013, *Best Practice Guidelines for Implementation of Wind Energy Projects Australia*

Australian Wind Energy Association and Australian Council of National Trusts, 2007, *Wind Farms and Landscape Values National Assessment Framework Final Version*

The National Airports Safeguarding Advisory Group, 2012, *The National Airports Safeguarding Framework*

1.3 Glossary of terms

Air services means a premises used for any of the following:

- the arrival and departure of aircraft
- the housing, servicing, refuelling, maintenance and repair of aircraft
- the assembly and dispersal of passengers or goods on or from an aircraft
- any ancillary activities directly serving the needs of passengers and visitors to the use
- associated training and education facilities
- aviation facilities.

Aerodrome reference point means the origin point used for aerodrome mapping.

Blade glint means a flash of light that occurs under certain circumstances when sunlight is reflected from wind turbine blades when in motion. The amount of reflected light will depend on the finished surface of the blades and the angle of the sun.

Cut-in wind speed means the wind speed at which a wind turbine starts power production.

Electromagnetic interference telecommunications systems currently in operation over land use microwave, very high frequency and ultra-high frequency systems. Interference with telecommunications systems is known as electromagnetic interference.

Environmental management plan means a document that articulates a proponent's commitment to minimise the potentially significant adverse environmental impacts of the development. The environmental management plan facilitates the integration and implementation of the environmental management commitments, conditions, and statutory requirements that may or must be observed for the construction, operation and decommissioning of a wind farm.

Ground level means the level of the natural ground, or, where the level of the natural ground has been changed, the level as lawfully changed.

Landscape character means a description of the physical (e.g. landform, vegetation, water features, land use) and social/cultural elements which make one landscape different from another.

Landscape values means the 'existence value'¹ of a landscape or its value to present or future biodiversity, geo-diversity, historic and aesthetic values.

¹ This term refers to the concept that landscape values may include biodiversity, geo-diversity, historic and aesthetic values. Landscape values can be visual or non-visual. Non visual values include associations, memories, knowledge or experiences or other cultural or natural values (e.g. historic land use patterns, presence of indigenous flora and fauna). Values held by

Low frequency noise means noise from 20Hz to 200Hz.

Obstacle limitation surfaces are the series of surfaces that define the limits to which objects may project into the operational airspace of an airport.

Sensitive land uses see the *State Planning Policy*.

Shadow flicker means a shadow that is cast under certain combinations of geographical position and time of day, when the sun passes behind the blades of a wind turbine and as the blades rotate, the shadow flicks on and off. The duration of this effect, which varies according to the time of the year, can be calculated from the machine geometry and the latitude of the site.

Strategic airport see the *State Planning Policy*.

View shed means a region visible to an observer, defined by the extent of potential or theoretical visibility (influenced by for example topographic and atmospheric effects).

Wind farm means development that comprises one or more wind turbines—including any existing wind turbines at the site - with a generation capacity of over 500 kilowatts. The definition of wind farm includes the associated infrastructure and works, including site access works (including internal roads), foundations, buildings and electrical works. The term does not include a single wind turbine used for domestic, industrial or agricultural purposes where generation capacity is less than 500 kilowatts.

Wind turbine means a machine or generator driven by wind.

1.4 Abbreviations

dB(a) - A-weighted decibel

LAeq – Energy Averaging

communities about landscapes will vary and may not be universally agreed. Instead identification of landscape values should involve consideration of the aggregate community perceptions the values of a landscape and identification of values that are shared between communities or amongst community members.