

# State code 23: Wind farm development

## Purpose statement

The purpose of this code is to ensure that the impacts arising from the design, construction, operation and **decommissioning** of **wind farms** do not result in unacceptable adverse impacts on individuals, communities and the natural environment.

Compliance with this code ensures that:

1. **protected wildlife**, habitats of **protected wildlife** and areas of **high ecological value** and associated habitat are not adversely impacted by the design, construction and operations of a **wind farm**;
2. those parts of the natural environment that are cleared and modified for the construction of a **wind farm** are **rehabilitated** to the maximum extent practicable;
3. the environmental values of receiving waters are not adversely impacted by the construction of or ongoing operations of a **wind farm**;
4. erosion and sediment run off from all areas cleared and disturbed during construction of a **wind farm** is appropriately managed;
5. all parts of the **wind farm** site that are modified to support ongoing operations and maintenance are stabilised to prevent erosion and sediment run off to surrounding landscapes, waterways and wetlands;
6. **wind farms** are responsive to **natural hazards** and humans on-site and in proximity are not exposed to unacceptable safety risks from **natural hazards** and **extreme weather events**;
7. the acoustic amenity associated with **sensitive land uses** is protected;
8. **workforce accommodation** associated with the construction of a **wind farm** does not cause unacceptable adverse impacts on surrounding communities and townships;
9. **wind farms** proposed in areas identified by state or local government planning instruments as having high **scenic amenity** and/or **landscape values** do not significantly compromise those values;
10. there is a safe, practicable and viable haulage route for all **wind farm** components and construction materials and their haulage does not cause unacceptable impacts on **transport networks** or local communities;
11. the safety, operational integrity and efficiency of **air services** and aircraft operations are not impacted or affected during the construction of and operation of a **wind farm**;
12. **wind farms** are **decommissioned**, in part after construction has finalised and then when operations are finalised, appropriately, sustainably and in a timely manner.

### Using this code

The assessment benchmarks for this code comprise:

- a purpose statement which identifies the overall intent of the code
- performance outcomes which set benchmarks to achieve the purpose statement of the code.

Development complies with the code where:

- it complies with all the performance outcomes; or
- development does not meet relevant performance outcome(s) and SARA determines, on balance, that the development complies with the Purpose statement.

There are no acceptable outcomes for this code.

This code also includes the glossary of terms for definitions relevant to this code and reference documents; including the guideline – **Planning guideline State code 23: Wind farm development**, which provides direction on how to address this code.

## Performance outcomes

Table 23.1: Material change of use

Performance outcomes
<b>Protected wildlife and associated habitats and areas of high ecological value</b>
<b>PO1</b> Development is located and designed to ensure that: <ul style="list-style-type: none"> <li>• <b>protected wildlife</b> and associated habitats; and</li> <li>• areas of <b>high ecological value</b> are protected from adverse impacts.</li> </ul>
<b>PO2</b> Development is constructed to ensure that: <ul style="list-style-type: none"> <li>• <b>protected wildlife</b> and associated habitats; and</li> <li>• areas of <b>high ecological value</b> are protected from adverse impacts.</li> </ul>
<b>PO3</b> Development operations ensure that <b>protected wildlife</b> and birds and bats are protected from adverse impacts.

## Performance outcomes

**PO4** Areas cleared for the construction of a **wind farm** are progressively **rehabilitated** to the maximum extent practicable following construction without impeding the safe and efficient operations and maintenance of the **wind farm**.

### Natural drainage patterns

**PO5** The **wind farm**, including ancillary infrastructure, is designed and sited to minimise crossings of and interference with natural drainage lines, waterways and wetlands.

### Protecting water quality and erosion control

**PO6** Development is designed to avoid areas of **high erosion risk**, where failure of erosion management devices would result in permanent and/or adverse impacts on receiving waterways or wetlands.

**PO7** Development is constructed to maintain or improve the water quality of receiving waters, waterways and wetlands by:

- minimising erosion and run off;
- managing drainage control; and
- preserving the bank stability of affected waterways and drainage lines.

**PO8** Areas cleared for construction are progressively stabilised during construction to ensure that erosion and run off to the surrounding landscape and waterways is minimised to the greatest extent possible.

### Natural hazards and extreme weather events

**PO9** Development is located, designed, constructed and operated to be responsive to **natural hazards** and **extreme weather events**.

**PO10** Development is constructed and operated to protect the safety of people in the event of **natural hazards** or **extreme weather events** occurring.

### Acoustic amenity

**PO11** The predicted acoustic level at all noise affected existing or approved **sensitive land uses** on **host lots** does not exceed the criteria stated in table 23.2.

**PO12** The predicted acoustic level at all noise affected existing or approved **sensitive land uses** on **non-host lots** does not exceed the criteria stated in table 23.3.

### Electromagnetic interference

**PO13** Development is designed and/or mitigation measures are used to protect pre-existing television, radar and radio transmission and reception from **electromagnetic interference**.

### Shadow flicker

**PO14** Development is designed, constructed and operated so that the modelled blade **shadow flicker** impacts on existing or approved **sensitive land uses** do not exceed 30 hours per annum and 30 minutes per day.

### Workforce accommodation impacts

**PO15** On-site **workforce accommodation** associated with the construction of the **wind farm**, does not result in adverse impacts on surrounding communities and townships.

### Areas identified by state or local government planning instruments as having high scenic amenity

**PO16** Development in an area identified by state or local government planning instruments as having high **scenic amenity** is sited and designed to protect the **scenic amenity** and **landscape values** of the locality and region.

### Transport networks

**PO17** Construction activities associated with the development do not adversely impact the efficiency and condition of **transport networks** and infrastructure nor compromise the safety of users of the **transport network**.

**PO18** Development delivers necessary upgrades to the **transport network** to ensure construction activities and ongoing maintenance do not adversely impact **transport networks** and infrastructure.

**PO19** Development demonstrates that a safe, viable and practical haulage route can be secured to accommodate the movement of **oversize/overmass vehicles** during construction and ongoing maintenance activities.

**PO20** Development provides safe, efficient, and sustainable vehicular access to the site for all vehicle types anticipated through the construction, operation, maintenance and **decommissioning** of the **wind farm**.

### Aviation safety, integrity and efficiency

**PO21** Development does not adversely affect the safety, operational integrity and efficiency of **air services** and aircraft operations as a result of its:

1. location;

### Performance outcomes

2. siting;
3. design;
4. construction;
5. operation.

**PO22** Development includes lighting and marking measures that ensure the safety, operational integrity and efficiency of **air services** and aircraft operations.

### Decommissioning

**PO23** Relevant components of development, both after completion of construction and at cessation of operations, are **decommissioned** in a timely and efficient manner. **Decommissioning** ensures that materials removed from site destined for landfill are minimised while opportunities to reuse, recycle and /or repurpose are deployed to the greatest extent practicable. **Decommissioning** at end of operations ensures disturbance footprints are **rehabilitated**, waterways and drainage patterns are reinstated.

## Reference tables

**Table 23.2: Acoustic criteria for host lots**

Acoustic criteria	
Noise description	Acoustic level does not exceed
The outdoor (free-field) night-time (8pm to 6am) A-weighted equivalent acoustic level (LA <sub>eq</sub> ), assessed at all noise affected existing or approved <b>sensitive land uses</b> .	<ol style="list-style-type: none"> <li>1. 45dB(A);</li> <li>2. the background noise (LA<sub>90</sub>) by more than 5dB(A);</li> </ol> whichever is the greater, for wind speed from <b>cut-in</b> to rated power of the <b>wind turbine</b> and each integer wind speed in between referenced to <b>hub height</b> .

**Table 23.3: Acoustic criteria for non-host lots**

Acoustic criteria	
Noise description	Acoustic level does not exceed
<b>Where a written agreement (deed) does not apply</b>	
The outdoor (free-field) night-time (8pm to 6am) A-weighted equivalent acoustic level (LA <sub>eq</sub> ), assessed at all noise affected existing or approved <b>sensitive land uses</b> .	<ol style="list-style-type: none"> <li>1. 35dB(A);</li> <li>2. the background noise (LA<sub>90</sub>) by more than 5dB(A);</li> </ol> whichever is the greater, for wind speed from <b>cut-in</b> to rated power of the <b>wind turbine</b> and each integer wind speed in between referenced to <b>hub height</b> .
The outdoor (free-field) day-time (6am to 8pm) A-weighted equivalent acoustic level (LA <sub>eq</sub> ), assessed at all noise affected existing or approved <b>sensitive land uses</b> .	<ol style="list-style-type: none"> <li>1. 37dB(A);</li> <li>2. the background noise (LA<sub>90</sub>) by more than 5dB(A);</li> </ol> whichever is the greater, for wind speed from <b>cut-in</b> to rated power of the <b>wind turbine</b> and each integer wind speed in between referenced to <b>hub height</b> .
<b>Where a written agreement (deed) applies</b>	
The outdoor (free-field) night-time (8pm to 6am) A-weighted equivalent acoustic level (LA <sub>eq</sub> ), assessed at all <b>non-host lots</b> affected existing or approved <b>sensitive land uses</b> .	<ol style="list-style-type: none"> <li>1. 45 dB(A);</li> <li>2. the background noise (LA<sub>90</sub>) by more than 5dB(A);</li> </ol> whichever is the greater, for wind speed from <b>cut-in</b> to rated power of the <b>wind turbine</b> and each integer wind speed in between referenced to <b>hub height</b> .

## Reference documents

Department of Housing, Local Government, Planning and Public Works, [Planning guideline State code 23: Wind farm development](#)

# Glossary of terms

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

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

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

**Decommissioning/decommissioned** means the removal, rehabilitation and remediation of the wind farm in part, after finalisation of construction, then in entirety at cessation of operations. Decommissioning will be in accordance with strategies prepared by proponents and all decommissioning activities undertaken at full cost to proponents/operators.

**Electromagnetic interference** means disturbance or degradation of telecommunications signals currently in operation over the land use area. Includes signals transmitted via microwave, very high frequency and ultra-high frequency systems.

**Extreme weather events** means an occurrence of a value of a weather or climate variable beyond a threshold that lies near the end of the range of observations for the variable.

**Height of a wind turbine** means the maximum **height** reached by the tip of the turbine blades at their highest point above **ground level**.

**High ecological value** means Matters of State Environmental Significance (MSES) as defined under Schedule 2 of the Queensland Environmental Offsets Regulation 2014. These matters can exist on publicly available resources such as Queensland Globe or be identified by a suitably qualified ecologist during a flora and/or fauna survey. Examples of MSES include, but are not limited to, threatened wildlife habitat and/or known populations under the *Nature Conservation Act 1992* (e.g. wildlife habitat for threatened or Special Least Concern (SLC) species, essential habitat, koala habitat etc), protected areas such as National Parks and Endangered or Of Concern remnant regional ecosystems.

**High erosion risk** see glossary of terms in IECA Best Practice Erosion and Sediment Control

**Note:** A high likelihood of soil erosion resulting from rain, wind or flowing water relative to a given risk rating (such as the various erosion risk ratings presented in Section 4.4 of Chapter 4 of IECA Best Practice Erosion and Sediment Control).

**Host lot** means a parcel of land (lot(s)) that accommodates any part of a **wind farm** development.

**Hub height of a wind turbine** means the **height** of the hub measured from **ground level** (i.e. the **height** of the **wind turbine** without blades).

**Landscape values** means areas protected under a regional plan and/or local government planning scheme, such as biodiversity networks, natural economic resource areas (including rural production), **scenic amenity** areas and landscape heritage areas.

**Natural hazards** see Part F: Glossary of the State Planning Policy 2017

**Note: Natural hazard** means a naturally occurring situation or condition, such as a flood, bushfire, landslide, coastal erosion or storm-tide inundation, with the potential for loss or harm to the community, property or environment.

**Non-host lot** see schedule 24 of the Planning Regulation 2017.

**Note: Non-host lot** means a lot no part of which is used for **wind farm** or part of a **wind farm**.

**Oversize/overmass vehicle** means a heavy vehicle or combination which alone, or together with its load, exceeds prescribed mass or dimension requirements, and is a heavy vehicle carrying, or designed for the purpose of carrying, a large indivisible item.

**Protected wildlife** means native wildlife that is prescribed under the *Nature Conservation Act 1992* as extinct wildlife, extinct in the wild wildlife, critically endangered wildlife, endangered wildlife, vulnerable wildlife, near threatened wildlife, least concern wildlife and special least concern plants or animals under the Nature Conservation (Animals) Regulation 2020 and Nature Conservation (Plants) Regulation 2020.

**Rehabilitate/Rehabilitated** means restoration of areas of disturbance created for the construction of and operations of a wind farm. Rehabilitate means the act of undertaking a range of activities that collectively endeavour to return the landscape (over time) back to its condition prior to the wind farm land use. These activities aim to achieve a safe, stable, non-polluting and sustainable landform (over time) through methods including, but not limited to:

1. **decommissioning** and removal of infrastructure;
2. remodifying some areas of civil works;
3. replanting with native vegetation species;
4. installation of habitat elements (e.g. fallen woody debris);
5. watering to enhance planting survival rates;
6. weed and pest management;
7. monitoring and reporting.

**Scenic amenity** means a measure of the relative contribution of each place in the landscape to the collective appreciation of open space as viewed from places that are important to the public.

**Sensitive land uses** see schedule 24 of the Planning Regulation 2017.

Note: **Sensitive land use** means any of the following as defined in the Planning Regulation 2017:

1. caretakers accommodation
2. child care centre
3. community care centre
4. community residence
5. detention facility
6. dual occupancy
7. dwelling house
8. dwelling unit
9. educational establishment
10. health care services
11. hospital
12. hotel
13. multiple dwelling
14. non-resident workforce accommodation
15. relocatable home park
16. residential care facility
17. resort complex
18. retirement facility
19. rooming accommodation
20. rural workers' accommodation
21. short-term accommodation
22. tourist park.

**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.

**Transport networks** mean the series of connected routes, corridors and transport facilities required to move goods and passengers and includes roads, **railways**, public transport routes (for example, bus routes), active transport routes (for example, cycle ways), freight routes and local, state and privately owned infrastructure.

**Wind farm** see schedule 24 of the Planning Regulation 2017.

Note:

- (a) means the use of premises for generating electricity by wind force, other than electricity that is to be used mainly on the premises for a domestic or rural use; and
- (b) includes the use of premises for any of the following, if the use relates, or is ancillary, to the use stated in paragraph (a)—
  - (i) a **wind turbine**, wind monitoring tower or anemometer;
  - (ii) a building or structure, including, for example, a site office or temporary workers' accommodation;
  - (iii) a storage area or maintenance facility, including, for example, a lay down area;

(iv) infrastructure or works, including, for example, site access, foundations, electrical works, substations or landscaping.

**Wind turbine** see schedule 24 of the Planning Regulation 2017.

Note: **Wind turbine** means a machine or generator that uses wind force to generate electricity and includes the blades of the machine or generator.

**Workforce accommodation** means the use of premises for accommodation of persons who perform work associated with the construction of a **wind farm**.

## Abbreviations

**dB(A)** – decibels measured on the ‘A’ frequency weighting network

**L<sub>Aeq</sub>** – the equivalent continuous (time-averaged) A-weighted sound level

**L<sub>A90</sub>** – the A-weighted noise level equalled or exceeded for 90 percent of the measurement period. This is commonly referred to as the background noise level