



Bendemeer

Renewable Energy Hub

WIND FACTS



Noise

Noise Wind turbines generate most noise via movement of the blades through the air, however in recent times, technical improvements have reduced noise levels (**NSW Farmers Association's Renewable Energy Landholder Guide**). The NSW Government has adopted the 2009 South Australian EPA **Wind Farms Environmental Noise Guidelines** (2009). Under these Guidelines noise levels should not exceed 35 A-weighted decibels or existing levels of background noise by more than 5 A-weighted decibels, whichever is greater. This is one of the strictest limits in the world. The noise threshold limits apply to surrounding landholders that are not associated with the wind farm (referred to as 'receivers'). The following image highlights relative noise comparisons.

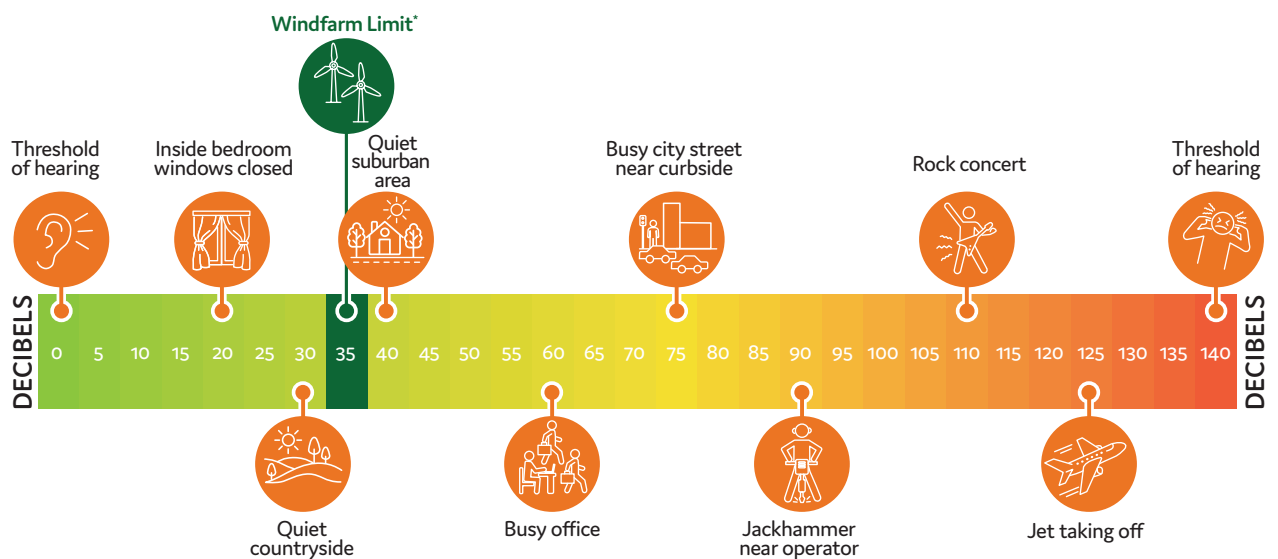
During the EIS process a detailed noise assessment must be undertaken, which must include the following:

- The model used to predict the wind energy project noise levels and input assumptions and factors used in the model, noting that noise management mode or sector management (i.e. stopping individual turbines or combinations, or operating in low noise mode, during identified meteorological conditions) should not be used in the primary modelling or predicting of noise levels. Any modelling and predictions which incorporate noise management mode or sector management must be reported separately

- Background noise measurement locations including time and duration of the background noise monitoring program
- Wind speed monitoring locations within the project area, heights above ground and graphical correlation plot of hub height wind speed versus background noise level data
- A summary of the environmental noise criteria for the project at each integer wind speed based on the above correlation
- Make and model of the representative wind turbine(s) along with the positions of the wind turbines; predicted noise levels at the closest non-associated dwellings to the wind energy project at each integer wind speed
- A comparison of the predicted noise levels against the criterion at each integer wind speed for the closest non-associated dwellings to the wind energy project
- Modifications or operating strategy that would be employed to address any unforeseen non-compliances. The error margins of the noise model used should be considered in developing such modifications or strategies.

The Department and the EPA will assess the noise assessment report to determine whether it has been undertaken in accordance with the requirements of SA 2009 and this Bulletin, and whether the predicted noise levels comply with the applicable criteria.

Noise Levels



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Decommissioning

Decommissioning refers to the process of ceasing operations and removing infrastructure at the end of the project's operating life. The NSW Government requires renewable energy projects to be decommissioned at the end of their operational life and land to be returned to its original condition. This means any turbines or other ancillary infrastructure, such as cables, inverters and fencing, need to be removed through recycling, reusing or disposing materials and waste products. The site must be also be returned to its land and soil capability class and pre-existing use.

If a proponent fails to meet the decommissioning and rehabilitation obligations as prescribed by the NSW Department of Planning and Environment, the proponent is then liable and subject to prosecution by the Department.

The proponents are following industry best practice and recommendations from the Australian Energy Infrastructure Commissioner 2021 Annual Report in their decommissioning plan. This report recommends the proponent set aside funds from the beginning of the project to cover decommissioning.

The Bendemeer Renewable Energy Hub project includes a decommissioning fund which forms part of the development of the proposed wind farm. The project has two key channels to support and guarantee the decommissioning of the proposed wind farm – via a Decommissioning Fund Deed and a Decommissioning Guarantee.

Decommissioning Fund Deed

This requires the proponent of the wind farm to make ongoing contributions to the Decommissioning Fund throughout the life of the wind project. These contributions are paid per \$/Megawatt of installed capacity for the entire project. The contributions are made annually and increase in percentage during the lifetime of the wind project. The contribution amount escalates every 5 years. Importantly the \$/Megawatt of installed capacity of the project will be assessed by an independent expert consultant to ensure it will adequately cover the costs of decommissioning. If the fund contributions are determined to be insufficient, the proponent must make additional contributions as agreed with the independent expert.

Decommissioning Guarantee

Additionally, some properties with the highest number of wind turbines and other infrastructure will qualify for a 'Decommissioning Guarantee'. This requires the proponent to hold an independent guarantee PRIOR TO the commencement of the wind farm construction to guarantee the cost of make good and decommissioning works specific to that property.

This proposal is considered industry best practice and sets Bendemeer Renewable Energy Hub uniquely amongst other renewable energy developments in the region and provides assurance of decommissioning commitments.

Community Benefits

According to the NSW Farmers Association's Renewable Energy Landholder Guide, renewable energy projects can have significant social and economic benefits to the host communities.

The impact of renewable projects on social and economic factors has been outlined in several studies both in Australia and Internationally, which include the below:

Social Benefits:



- environmental benefits from reduced CO2 emissions
- creation of deeper social connections to community
- community development and liveability
- education and training of contractors and local residents

Economic Benefits:



- allow the local community to share in the benefits of the project
- boost of jobs and skills in the area increasing local employment

- improvements in local infrastructure
- energy & income security are not impacted by weather with landholders drought proofed
- increase in property value

Several studies have been completed in both Australia and overseas exploring the impact of renewable energy projects on property value. It was concluded that property markets and regional economies greatly improved in value. The key drivers for these increases include:

- population growth, meaning higher property demand
- increased job opportunities
- higher average incomes, leading to growth in local business spend
- lower unemployment rates in region
- reduced rental vacancy rates and rent increases

All these are driving forces behind growth and prosperity from renewable projects, leading to a positive impact on property prices and the economic value of the communities they operate in as a whole.

Community Benefits Scheme:



The proponent has developed a community benefits scheme for the project, which would see a financial commitment contributed annually for the lifetime of the project. The community benefit scheme would be managed and administered by a committee of local community members. The funds accumulated in the scheme would be used to fund local community projects or infrastructure. The proponent is committing to the below contribution each year for the lifetime on the project. The final contribution total will be dependent on the finalised registered capacity of the project:

COMMUNITY BENEFIT SCHEME

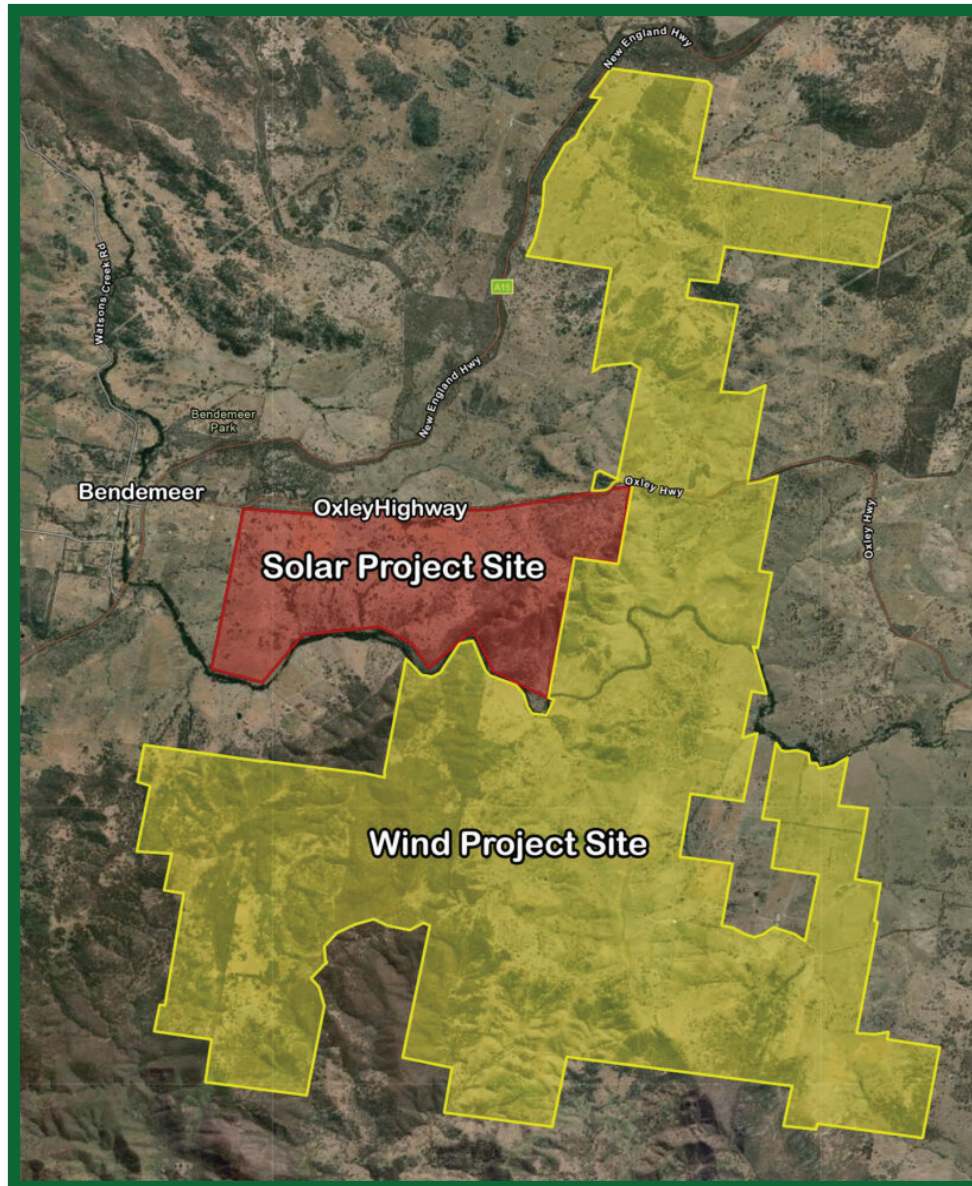
Bendemeer Renewable Energy Hub	(MWac) Registered	Contribution \$/MWac	Total \$/yr
Wind Project	365	\$850	\$310,250
Solar and Battery	200	\$250	\$50,000

Wind Farm Project Site

The construction phase of wind farms may cause some short-term disruption to the usual community day to day living. However the long-term economic benefits to the community and remuneration from hosting wind turbines is considered to outweigh any temporary loss of production.

Wind farms are compatible with farming and grazing, and they provide an alternative income stream that is not rainfall dependent. Due to this, NSW Climate and Energy Action consider wind farms to be environmentally, socially and economically beneficial.

The NSW Farmers Association’s Renewable Energy Landholder Guide outlines that an independent assessment from the Australian National Health and Medical Research Council (NHMRC) has found no conclusive evidence that wind farms cause adverse health effects in humans.



Visual Assessment

EIS Assessments

The Bendemeer Renewable Energy Hub team will work with expert independent consultants to undertake a visual assessment for the wind project. This process will include, as determined by the NSW Department of Planning and Environment's Wind Energy: Visual Assessment Bulletin:

- A baseline study that includes analysis of the landscape character, scenic quality and visibility from viewpoints of different sensitivity levels
- Establishment of visual influence zones from viewpoints using data collected in the baseline study

- Assessment of the proposed layout against visual performance objectives
- Justification for the final proposed layout and identification of mitigation and management measures

The assessment will take into account all turbines, ancillary facilities and infrastructure required and will also assess shadow flicker, which is caused by moving turbine blades.

Mitigation Strategies

The visual assessments for large-scale wind projects will also include proposed mitigation strategies, which will be determined by the level of defined visual impacts. Some common mitigation strategies include:

The Bendemeer Renewable Energy Hub team will work closely with stakeholders to ensure they understand the location and detail of the wind farms, so effective mitigation strategies can be implemented.



LANDSCAPING



VEGETATION SCREENING



NEIGHBOUR AGREEMENTS



Wind FAQs

Q Are renewable energy projects considered industrial development?

A Renewable energy projects meet the definition of “electricity generating works” which are defined in Clause 2.35 of Transport and Infrastructure State Environmental Planning Policy (T&I SEPP).

Renewable energy developments in NSW are permissible with consent on rural zoned land (e.g. RU1). Industrial developments are prohibited on rural zoned lands and require the land to be zoned as industrial (either General Industrial or Heavy Industrial).

This is because the potential impacts during construction and operation of renewable energy projects would not be considered to result in the same level of impacts on the environment and neighbouring properties as industrial developments.

Q Will existing land management practices including farming continue on the project site?

A Absolutely. Renewable energy developments such as large scale solar and wind projects can work in harmony with existing agricultural activities. Grazing livestock such as sheep has been proven time and again for solar farms in Australia. In fact, grazing is a key part of the operation and maintenance strategies for land and weed management and are intended to be adopted on the Bendemeer project.

Wind projects present even less restrictions on farming, enabling both cropping and grazing to continue. We are working closely with our landowners to ensure whatever activities and developments occur on their land are designed to minimise farming impact wherever possible.

Q What is the rating of the turbines considered for Bendemeer?

A Wind turbines in the 5MW to 7MW are emerging as the industry standard size in Australia as manufacturing and transportation techniques improve, further lowering the cost per MW installed and reducing the construction material and labour burden. Installing higher capacity individual turbines allow less turbines to be installed per project as project size is typically limited by the available grid capacity. The Bendemeer wind project is currently in the early Scoping phase. Consequently, the final turbine quantity, dimensions and make are subject to change through detailed design optimisation processes and in possible response to future impact assessments.

Q Where will the wind turbines be located on the site? What will the visual impact be?

A The majority of the proposed wind turbines are located behind the Moonbi Range to the southeast of Bendemeer, with the closest proposed wind turbine being approximately 5kms from the Bendemeer Hotel when measured directly.

The EIS will assess impacts on all dwellings (e.g. visual, noise) regardless of distance described from the Bendemeer village or otherwise.

A proposed layout of the wind farm will be included in the project’s Scoping Report.

The visual assessment will be undertaken by recognised experts for visual impact assessments for renewable energy developments. The visual impact assessment for the Bendemeer Solar Farm will be undertaken in accordance with the recently revised NSW Large Scale Solar Guidelines (DPIE, 2022) which places further burden of assessment than previously required.

The visual impact assessment for the wind development will be undertaken in accordance with the Wind Energy: Visual Bulletin (DPE, 2016).

The visual impact assessments will include a combination of:

Zone of visual influence – to determine the potential locations and dwellings in the area which may be able to see the solar farm.

Public viewpoint analysis – assessment of potential impacts from public locations.

Detailed dwelling assessments – where desktop analysis, modelling and site visits identifies dwellings they may have visual impacts. This may include undertaking photomontages at specific dwellings.

Assessment of impact significance – assessing the sensitivity (e.g. dwellings have high sensitivity) and the visual effect (how much of the solar or wind development can be seen) to calculate the overall potential visual impact.

Cumulative visual assessment – considers other proposed developments in the area.

Glint and glare assessment – assessing glint and glare from public roads and dwellings surrounding the solar development.

Mitigation measures – proposed mitigation measures to reduce visual impacts if determined to be required based on the level of impact assessment (e.g. visual screening).

Q Can wind turbines harm, injure, or kill birds from turbine strike? How will biodiversity impacts be assessed?

A The Bendemeer Wind Farm EIS’s will include assessment of all scientifically verified potential impacts to wildlife from wind developments during construction and operation. This will include impacts from wind turbine bird strike. Accredited ecologists experienced in wind project impact assessment have been engaged and the outcomes of their assessments will be taken into consideration in the detailed design and construction of the project, including but not limited to wind turbine direction and blade design. The turbines may be relocated or even removed based on the studies to minimise impacts on bird and wildlife communities. There will also be extensive monitoring and reporting requirements relating to impacts on wildlife for the entire project life.

Wind FAQs (continued)

Q How are noise impacts from the wind farm assessed?

A The NSW Government has several guidelines and policies that must be addressed when for assessing noise impacts of renewable energy projects.

In relation to the Bendemeer Wind Farm detailed modelling will be undertaken, with the results to be included in a Noise Impact Assessment, which is required as a part of the project's EIS. Modelling is undertaken for noise sources during daytime and night time periods, noting that construction would be restricted to the following standard construction hours:

- Monday to Friday: 7 am to 6 pm;
- Saturday: 8 am to 1 pm; and
- No work on Sundays or public holidays.

Noise modelling will predict the noise levels from construction, operation and traffic of the Bendemeer Wind Farm and compare with the allowable limits set by the NSW Government. The allowable limits for construction and operation are provided in the tables below (including sleep disturbance limits). The Bendemeer Wind Farm cannot exceed these limits and it is a requirement that all reasonable and feasible measures are taken to reduce noise levels as much as possible.

It is noted that New South Wales is recognised as having some of the lowest allowable noise limits at a global scale.

Construction Noise Management Levels

Receptor Type and Time of Day	Daytime Rating Background Level (RBL), dB(A)	Noise Affected Management Level, Leq (15 min), dB(A)	Highly Noise Affected Management Level, Leq (15 min), dB(A)
Residence - Recommended Standard Hours	35	45	75

NSW Noise Policy for Industry Criteria

Receiver	Assessment period	Project Noise Trigger Level LAeq, 15min dB(A)	Sleep Disturbance LAmax
Residential	Day	40	-
	Evening	35	-
	Night	35	52

An indicative noise assessment will form part of the Scoping Report which will be submitted to request the Secretary's Environmental Assessment Requirements (SEARs), which are the minimum requirements for inclusion in the EIS.

A detailed noise impact assessment will be undertaken for the wind's EIS. This will involve a comprehensive ground-based monitoring campaign to quantify existing noise conditions (and meteorological conditions) at non-associated properties. From this data, wind speed-based noise levels and limits specific to the Project would be established.

Q What are the impacts on soil and water quality?

A Wind projects require minimal use of substances that post a risk of soil and water contamination. The primary substance that may be considered as a contamination risk are insulation and lubrication oils. These will be effectively prevented from entering water tables and soils through bunding within the wind turbine structures and ancillary equipment internal structures. These methodologies have been well proven for many decades across the electricity industry including electricity transmission and renewable energy infrastructure.

As required on all renewable energy developments, post-development water flows must be equivalent to pre-development flows in terms of both water quality, path and volume. Extensive hydrology models will be developed for the site to inform the design process to ensure these objectives are achieved during and after construction.

Q How high will the wind turbines be? Will they impact aircraft, in particular fighting bushfires?

A The Bendemeer wind project is currently in the early Scoping phase. Consequently, the final turbine quantity, dimensions and make are subject to change through detailed design optimisation processes and in possible response to future impact assessments.

The wind turbine dimensions currently under consideration for the Bendemeer wind project are as follows:

- Hub height of 169 m
- Maximum tip height 250 m
- Rotor diameter of 162 m with a blade length up to 80 m.

This turbine size represents the emerging market standard and is now being considered for many new projects in development in NSW and other Australian jurisdictions.

A preliminary review of aircraft landing areas (ALAs) has been undertaken, encompassing the project and its surrounding regions. An Aviation Impact Assessment (AIA) will be undertaken for the EIS, which will assess any potential impacts to aviation safety associated with the Project.

The assessment will address any aviation concerns raised during consultation with the community and key stakeholders and identify relevant mitigation strategies to be implemented where required. Consultation with the Civil Aviation Safety Authority (CASA), Royal Australian Air Force, Air services Australia, NSW Rural Fire Service and other relevant regulators.

Wind FAQs (continued)

Q How will bushfire hazards be managed?

A The project will be designed to comply with the NSW Rural Fire Service Planning for Bushfire Prevention guideline, which requires asset protection zones to be established around the perimeter of key infrastructure such as wind turbines and substations. In these areas, vegetation must be strictly managed to a high standard for the life of the project.

The vast majority of high voltage cabling throughout the project will be undergrounded, mitigating bushfire risk in the event of a cable fault. Overhead electricity lines are only expected to be used for the key connector to the NSW transmission network. A wide buffer zone between these power lines and high growth vegetation such as trees will be maintained as is standard practice for all transmission level voltages.

Q What are the proposed transportation routes for equipment deliveries?

A The construction of wind turbines requires oversize heavy vehicle movements for equipment deliveries. The Bendemeer Renewable Energy Hub has been selective by utilising major highways such as the New England and Oxley Highways for the delivery of oversized materials without impacting local roads. Delivery of materials will be highly coordinated with extensive notice provided to the local community on the delivery timeframes. Rigorous traffic controls including escort vehicles will be in place.

Road dilapidation reports will be developed prior to and after construction. Any damage due to construction must be remediated as a condition of consent.

Q How is the project team engaging with the local community?

A The Bendemeer Renewable Energy Hub team have been engaging with the Bendemeer community and surrounds since early 2022. As well as regular meetings with host landholders and neighbours to the project, the BREH team has also proactively engaged with local community groups, including the Bendemeer CWA and McDonald River Land Care Group. The project team have also been engaging with local business, Council and suppliers from the wider region, who are keen to learn about what opportunities this project may bring to the region.

In addition to providing updates to the community through our monthly newsletter, factsheets and website, we also continue to hold bi-monthly community information sessions at the Bendemeer Hotel. As the project progresses, we remain open to discussion and feedback and encourage all members of the community to reach out to us with any questions either via email or call 0402 949 462 number. We can also arrange face to face discussions where necessary.

Q What happens if project ownership is transferred or sold?

A The Bendemeer Renewable Energy Hub is the flagship project of Athena Energy Australia (Holdings) Pty Ltd (Athena), a member of the Metis Group. Athena is committed to developing, constructing, and operating renewable energy projects across Australia. However, in the event project ownership is transferred, all land agreements have been structured so that any incoming owner will be legally bound by the same terms including those established for decommissioning and rehabilitation as Athena Energy Australia (Holdings). Furthermore, the development consent conditions expected to be imposed for the project will be applied to the development directly, not the development company. Consequently, any existing or future asset owners will be bound by the same conditions of consent for the life of the project.

Q Will the project impact the value of my property?

A There have been several studies undertaken both in Australia and overseas in regard to land and property values and renewable energy projects. A study completed by Preston Rowe Paterson in 2013 looked into the impact of wind farms on surrounding land values.

The NSW Farmers Association has also developed the Renewable Energy Landholder Guide, which includes a section on land values. The guides includes the following commentary:

"A 2016 review considered the potential impact of wind farm developments on nearby property values. The review used the best available data and traditional valuation sales analysis techniques, to compare the change in values around wind farms over time and qualitative information from a review of the international literature on the impact of wind farms on property values."

The review concluded as follows:

"Based on the outcome of these research techniques, it is our expert opinion that windfarms may not significantly impact rural properties used for agricultural purposes. The literature review of Australian and international studies on the impact of wind farms on property values revealed that the majority of published reports conclude that there is no impact or a limited definable impact of wind farms on property values."

In reference to the real estate values of other New England towns such as Glen Innes and Inverell with operational wind farms a recent Domain housing price report for the December 2022 quarter shows a median house price increase of 30.8% for Glen Innes to record highs, representing the highest year-on-year increase for any town or city in Australia over that recorded period. Inverell similarly showed strong growth of 9.5%. This strong price growth data clearly shows the proximity to wind developments has not subdued real estate prices in the region.

Wind FAQs (continued)

Q Will the wind turbines be left to rust on the hills once operations cease or will they be decommissioned?

A Decommissioning refers to the process of ceasing operations and removing infrastructure at the end of the project's operating life. The NSW Government requires renewable energy projects to be decommissioned at the end of their operational life and land to be returned to its original condition. This means any turbines or other ancillary infrastructure, such as cables and fencing, need to be removed through recycling, reusing or disposing materials and waste products. The site must also be returned to its land and soil capability class and pre-existing use.

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