BONDO
WIND FARM

Bushfire Prevention & Management

Neoen takes fire safety and risk mitigation very seriously across all its projects.

We work closely with fire authorities from the early stages of development, through construction and operation, the key ones for the Bondo Wind Farm being Fire & Rescue NSW (FRNSW), NSW Rural Fire Service (NSW RFS) and NSW Forestry Corporation (FCNSW).

Our projects involve the delivery of new infrastructure, and we are committed to ensuring that this does not place unnecessary additional pressure on firefighting services or introduce unmitigated risks to the environment and surrounding communities. This approach is particularly important for the Bondo Wind Farm, given the Project's location within a pine plantation.

Fire prevention, mitigation and management are essential considerations for all activities in forest environments, including renewable energy development. These matters are central to the site selection process by the primary land-manager, FCNSW, and the development process.

To ensure responses are proportionate and fit-for-purpose, mitigation, monitoring and management measures are designed early for implementation throughout the project's life.

We have worked closely with local authorities over the past decade:

Tasmania Fire Service

How wind farms can be beneficial

① Asset Protection Zones around site infrastructure keep vegetation height low, free of debris and create fire breaks.

② Lightning protection system that safely conduct electrical energy to the ground and heat and smoke detection system.

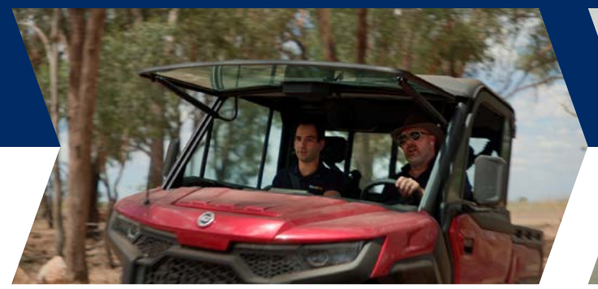
③ Electrical connections will be underground.

④ Road/access tracks upgrades and maintenance support emergency response.

⑤ Water tanks reserved for fire fighting to guarantee reserves.

24/7 remote monitoring and on-site cameras for extended FCNSW coverage.
Additional eyes on the ground can detect and alert during an emergency.

What to expect



Site selection

FCNSW is a recognised firefighting authority in New South Wales.

In 2021, FCNSW assessed the feasibility of wind farm developments within NSW softwood plantations. Assessments included:

- Active, early engagement with other fire authorities, wind farm proponents and key stakeholders.
- Bushfire hazard assessments to understand how a wind farm could change the risk profile and/or impact ground or aerial firefighting.
- Lessons from previous state fires, with corrective actions and additional mitigation measures.

Subject to further site-specific investigations and risk assessments, FCNSW considered wind farm construction and operations compatible with their operations.

OUTCOMES

- FCNSW launched a competitive process to select proponents to investigate wind farms across four NSW State forests.
- Neoen received an investigation permit in May 2024 within the Bondo State Forest.

WE ARE HERE

Development

To ensure bushfire risk mitigation is proportionate, fit-for-purpose and practical, Neoen is working with FCNSW and the NSW RFS on the project's design and management plans.

Neoen is conducting assessments for potential bushfire hazards and risks in compliance with NSW RFS standards and NSW laws.

- Bushfire Assessment: assess potential bushfire hazards and risks and in compliance with *Planning for Bush Fire Protection 2019*[1]. This will be available for community review and comment during Development Application exhibition (Q1 2027 expected).
- Preliminary Hazard Assessment[2]: prepared for the proposed project batteries.
- To help FCNSW fire detection capability, Neoen recently installed a camera on one of the project's meteorological masts (met masts) to enhance bushfire surveillance coverage. The met masts have council development approvals separate from the wind farm's Development Application.

OUTCOMES

After approval and before construction, we will prepare:

- ***Bushfire Management Plan***: outlines mitigations for bushfire ignition, fire consequences and ensure the project can safely coexist with the forest environment and firefighting.
- ***Emergency Response Plan***: establishes site-specific procedures, roles and responsibilities for emergency responses.
- **Fire Safety Study**[3]: a technical report prepared in compliance with RFS NSW guidelines that will model fire and thermal-runaway scenarios for battery technology and assess separation distances, propagation risk and emergency response capability.

Construction

The measures identified from the *Bushfire Management Plan* and *Emergency Response Plan* will be implemented by Neoen.

OUTCOMES

- Neoen will **upgrade and maintain roads** for faster access to the forest by ground-based fire-fighting resources in the event of bushfire.
- **Turbines will be spaced at least 400 metres apart** to allow firefighting aircraft and helicopters to operate between them under appropriate conditions.
- All turbines will comply with relevant **aviation requirements** such as marking, lighting and navigation.
- **Undergound cabling** will connect wind turbines to the substations.
- **Asset Protection Zones are** areas around the turbine hardstands, substations and batteries that will be cleared, fuel-reduced and made of gravel. Final setbacks and requirements will be determined during the detailed design and bushfire risk assessment processes.
- A dedicated firefighting **water supply** will be provided at appropriate locations to strengthen firefighting.
- All Neoen employees and contractors will receive **fire-awareness and emergency-response training** in compliance with FCNSW operational and fire-safety requirements.

Operations

The *Bushfire Management Plan* and *Emergency Response Plan* use established industry standards and regulatory requirements, as well as fire authority experience. Neoen will also maintain regular engagement with the local RFS.

OUTCOMES

- All turbines will have **lightning protection systems** that safely conduct electrical energy to the ground. As the tallest structures in the area, turbines can intercept lightning strikes that might reach the surrounding landscape.
- All turbines will have **heat and smoke detection systems**. Automatic fire suppression systems are also present in some of their components such as electrical cabinets, converters, transformers.
- All turbines will have **remote shutdown** capability to support safer aircraft operations around the wind farm.
- Neoen will remotely **monitor the project** from our central control room in Canberra which is staffed 24/7 for all projects Australia-wide (turbine suppliers also include their own 24/7 surveillance). The wind farm's control system issues immediate alerts if a fault, smoke or other abnormal condition is detected. Specialist operations personnel in the forest will also support early fire detection, investigation and rapid response.
- **Additional cameras** or other equipment may be installed on turbines or meteorological masts (where FCNSW considers them beneficial).
- **Firefighting exercises** with FCNSW, FRNSW and NSW RFS will be undertaken periodically with lessons learned incorporated into continuous improvement.

In coordination with FRNSW and the local RFS, Neoen will implement and regularly update the *Bushfire Management Plan* and *Emergency Response Plan* throughout the project's life

1 rfs.nsw.gov.au/__data/assets/pdf_file/0005/174272/Planning-for-Bush-Fire-Protection-2019.pdf

2 planning.nsw.gov.au/sites/default/files/2023-03/hazardous-industry-planning-advisory-paper-no-6-hazard-analysis.pdf

3 fire.nsw.gov.au/__data/assets/pdf_file/0012/2451/Tech-info-sheet-Large-scale-external-LiBESS.pdf

Frequently asked questions

Could the presence of a wind farm complicate aerial firefighting operations within Bondo State Forest?

Yes, to some degree — wind turbines are new, tall structures, and pilots will need to factor them into their flight planning, just as they already do for other aviation obstacles such as transmission lines, towers, telecommunications masts and cranes. However, several characteristics of wind turbines mean this is a manageable rather than prohibitive challenge. Turbines are tall and highly visible from the air — this is consistent with the Australasian Fire and Emergency Services Council's (AFAC) position paper on *Wind Farms and Bush Fire Operations* (2018) and its case-study findings[4], which found that turbines were clearly visible to pilots during an actual bushfire event, whereas transmission infrastructure and meteorological masts were harder to see and posed a greater safety risk. The turbines for this project will be spaced at least 400 metres apart — a project design commitment intended to support safe aircraft manoeuvring between towers.

The type of aircraft involved also matters. Direct water attack on a fire is usually carried out by helicopters and Single Engine Air Tankers (SEATs), which are the aircraft most likely to operate close to or within the wind farm. Large Air Tankers (LATs), by contrast, typically lay fire retardant ahead of an active fire to establish containment lines, rather than attacking the fire directly — so they are less likely to need to fly through the turbine array itself.

To support safe operations, Neoen will continue to work with FCNSW and the RFS throughout the development of the project so that appropriate bushfire management measures are built into the project's design. These measures will be set out in the Bushfire Risk Assessment and a greater level of detail will be provided in the Emergency Response Plan, and are expected to include:

- mapping of turbine and met mast locations for pilots
- appropriate aviation marking and lighting on turbines
- remote turbine shutdown capability
- electrical isolation where required for safety or requested by emergency services.

Ultimately, what can and can't be done safely will be determined by the pilot and relevant firefighting authorities on the day, based on conditions.

Detailed discussions will be undertaken with RFS and Fire & Rescue NSW to confirm the types of aerial firefighting operations that can be conducted safely in and around the wind farm, considering the weather, fire behaviour, visibility, aircraft capability, and the directions of emergency services. At their request, simulations and / or full-scale field exercises may also be carried out for training purposes.

Are wind turbine fires frequent and do they increase fire risk?

As with any electrical infrastructure, fires in wind turbines can result from lightning, electrical or mechanical faults, but they are rare. There is currently no national database of fire-related incidents relating to wind turbines, but global estimates indicate that there may be around one fire per 2,000 turbines each year (based on international turbine fire data)[5]. However, in the vast majority of cases these incidents are confined to the turbine components themselves and do not reach the surrounding environment. There are approximately 4,500 turbines currently operating across Australia.

Modern turbines are fitted with lightning protection systems, and as tall structures, they may also intercept some lightning strikes that might otherwise reach the surrounding landscape, though there is limited scientific data available on this topic currently. According to FCNSW, lightning has been the leading identified cause of fire in NSW pine plantations over the past 33 years[6], so the presence of wind turbines may help reduce lightning-related ignitions within the forest and reduce the overall number of fires occurring in the area.

Learn about Neoen's collaboration with NSW RFS at our Culcairn Solar Farm: youtube.com/@neoen1252

4 afac.com.au/resources/wind-farms-and-bushfire-operations
5 interestingengineering.com/science/windmill-aflame-why-wind-turbine-fires-happen-how-often-and-what-can-be-done-about-it
6 forestrycorporation.com.au/__data/assets/pdf_file/0003/1625907/Jamie-Carter.pdf