

# Crookwell 3 Wind Farm Fire

## Purpose

Local communities have expressed concern that wind turbines may increase the risk of bushfires due to the introduction of electrical and mechanical components on site and due to lightning strikes.

The potential risk to third party persons and property depends on a number of factors, including the inherent flammability of the turbine generators, the landscape in which the turbines sit, and the ability of local fire services to respond to any incident.

As a result of increased wind farm development in Victoria and NSW, the Victorian Country Fire Authority (CFA) and NSW Rural Service (RFS) have studied the potential for wind farms to cause fire, and the possible mitigation measures to reduce the risk.

The *Draft NSW Wind Farm Planning Guidelines* and studies and guidelines prepared by the CFA and RFS have been considered in the assessment of fire risk caused by the proposed Crookwell 3 Wind Farm.



## Key Findings and Impacts

The risk of fire at a wind farm can be associated with:

- malfunctioning turbine bearings,
- inadequate crankcases lubrication,
- cable damage during rotation,
- electrical shorting or arcing occurring in transmission and distribution facilities, and
- bushfires entering the site.

However, due to modern day manufacturing, the risk of fire at wind farms is considered by fire authorities as 'very low'.

The NSW Legislative Council (2009) concluded in their report that wind farms do not significantly increase the risk of bushfires in rural areas.

Wind farm developers are aware of the potential risks and implement appropriate management measures to prevent bushfires from occurring.

***In fact, the risk of fire is considered to be minimised by wind farm developments and their associated permit conditions because they introduce more intensive fire planning.***

It is also important to note that no bushfires have been started through wind farm activity in NSW.

Wind turbines manufactured today incorporate the highest quality and safety standard, equipped with safety devices to reduce the risk of fire, including:

- the flammable components are located high above the ground;
- there is normally no vegetation around the base of the turbine towers;
- Electrical cabling between turbines are underground;
- access tracks act as firebreaks and provide fire fighting access;
- comprehensive lightning protection devices are installed on every wind turbine, including internal lightning conductor rods running all the way to the blade tips; and
- dedicated monitoring and control systems shut down the wind turbines when the threshold temperatures of critical components are reached.

Additionally, wind turbines must comply with the Building Code of Australia and Australian Standards, and vegetation around transformers are generally kept below 100 mm.

While it is possible for an electrical failure to cause fire within a wind turbine, the system is designed to contain fire rather than spread it on to the surrounding area. The wind farm could be shut down in the event of a fire situation.

The risk of bush fire resulting from wind farm operations is not unduly greater than that resulting from other agricultural and industrial practices in a country area.

While the proposed wind farm may restrict aerial fire-fighting in the vicinity, the ground-based measures for fighting bush fires present a valid alternative.

A potential fire risk is the possible lack of experience of the local RFS volunteers in fighting fires on wind farms. A 'bush fire prevention and emergency response plan' would be prepared in consultation with RFS, the NSW Fire Brigade and the State Planning Department, and would address safety, communication, site access and response protocols in the event of a fire in at the proposed wind farm.

Applications for approval under Part 3A are assessed against *Planning for Bush Fire Protection 2006*, to ensure that the required measures have been incorporated into the proposal.

The key strategies ('Bush Fire Protection Measures') of the Planning for Bush Fire Protection guidelines are:

- *Control the types of development permissible in bush fire prone areas;*
- *Minimise the impact of radiant heat and direct flame contact by separating the development from the bush fire hazard;*
- *Reduce the rate of heat output (intensity) of a bush fire close to a development through control of fuel levels;*
- *Minimise the vulnerability of buildings to ignition from radiation and ember attack;*
- *Enable relatively safe access for the public and facilitate fire-fighting operations;*
- *Provide adequate water supplies for bush fire suppression operations;*
- *Implement community education programs, focusing on property preparedness, including emergency planning and property maintenance requirements; and*
- *Facilitate the maintenance of APZs [Asset Protection Zones], fire trails, access for fire-fighting and on-site equipment for fire suppression.*

The mitigation measures proposed seek to implement these strategies where relevant.



## Response to Findings

The following mitigation measures are to be implemented as part of the Crookwell 3 Wind Farm project:

- Consultation with the NSW Rural Fire Service in regard to the adequacy of bushfire prevention measures to be implemented on site during construction, operation and decommissioning.
- Preparation of a bush fire prevention and emergency response plan in consultation with the RFS, the NSW Fire Brigade and the State Planning Department and the Council.
- Development of workplace health and safety protocols to minimise the risk of fire for workers during construction and during maintenance in the control room and amenities.
- On-site vegetation management during construction and operation to minimise potential sources of fuel.
- Re-organisation of construction activities during periods of high fire danger, including ceasing use of explosives, and management of hot work activities such as welding or cutting.
- Use of materials and equipment during operation that minimise the likelihood of fire.
- Maintenance of vehicles to minimise sparking from exhaust systems.
- Automatic shutdown of any overheating turbine mechanism.
- Shut down of turbines during a bush fire in the area.
- Lightning protection on each turbine.

- Adequate road access for heavy fire-fighting equipment.
- Under-grounding of electrical and communication cables where practicable.
- Access to adequate provision of water supply.
- Vegetation management during a designated Fire Danger Period.
- Careful storage and handling of flammable materials and ignition sources brought onto the site, as per manufacturer's instructions.
- Storage of appropriate fire fighting equipment onsite during the construction phase, and ensure that a minimum of one person on site is trained in its use.
- Periodical inspection of overhead transmission easements to monitor any regrowth of encroaching vegetation.
- Vehicle turn-around facilities to be provided at every turbine tower site.
- Up to 6-metre wide internal access tracks to be provided that are driveable and permanently clear of vegetation.
- Direct internal access road alignments and direct paths between turbines, and the shortest possible route for the electrical conductors.
- Provision of wind turbine access tracks that continue onto adjacent paddocks and are not dead-ended.
- Implementing fuel breaks (i.e. wide access tracks, etc) in accordance with RFS, Council and State Government recommendations.



International example of a Wind Farm