

# General duties of solar farm owners and operators

Guidance note, November 2024

## Purpose

This guidance note highlights the general duties of solar farm owners and operators for ensuring safety and bushfire risk mitigation and for reporting incidents to Energy Safe Victoria. It also gives information to support solar farm owners and operators to understand their general duties and Energy Safe's expectations, particularly relating to bushfire risk mitigation.

## General duties of solar farm owners and operators

Solar farms are typically complex electrical installations, being electrical installations that have an installed generation capacity of equal to or greater than 1000 kVA.

Under section 75(1) of the *Electricity Safety Act 1998* (Vic) (**Act**), owners and operators of complex electrical installations have general duties to minimise the hazards and risks and bushfire danger arising from the installation, as far as practicable (see Box 1).

### Box 1: General duties of solar farm owners and operators

**An owner or operator of a complex electrical installation must design, construct, operate, maintain and decommission the installation to minimise as far as practicable—**

- the hazards and risks to the safety of any person arising from the installation; and
- the hazards and risks of damage to the property of any person arising from the installation; and
- the bushfire danger arising from the installation.

The penalties for non-compliance with the general duties are:

- In the case of a natural person, 1800 penalty units (currently \$355,662); and
- In the case of a body corporate, 9000 penalty units (currently \$1,778,310).<sup>1</sup>

Under regulations 401 and 402 of the *Electricity Safety (General) Regulations 2019* (**Regulations**), operators of complex electrical installations also have obligations to report serious electrical incidents and other electrical incidents to Energy Safe (see Box 2).

### Box 2: Incident reporting obligations of solar farm owners and operators

**Serious electrical incidents:**

- An operator of a complex electrical installation who becomes aware of any serious electrical incident occurring within that complex electrical installation must report the incident to Energy Safe as soon as practicable after becoming aware of the incident.

**Other electrical incidents:**

<sup>1</sup> From 1 July 2024 to 30 June 2025, the value of a penalty unit is \$197.59. The value of a penalty unit is raised on 1 July each year in line with inflation.

- **An operator of a complex electrical installation who becomes aware of any on the following incidents occurring within that complex electrical installation must report the incident to Energy Safe within 20 business days after becoming aware of the incident.**
  - **An incident involving electricity in which a person has made accidental contact with any electrical installation; or**
  - **An incident involving electricity in which a person has received an electric shock as the result of direct or indirect contact with any electrical installation.**

For the purposes of the Regulations, a serious electrical incident is defined under the Act as any incident involving electricity that causes or has the potential to cause:

- the death of or injury to a person; or
- significant damage to property; or
- a serious risk to public safety.

Energy Safe considers that any incident involving fire originating from any part of the electrical installation or equipment is a serious electrical incident and must be reported. Fire includes any event with evidence of charring, smouldering or melting. Further information about reporting incidents to Energy Safe is available on our website at: <https://www.energysafe.vic.gov.au/about-us/contact-us/lodge-incident-report>.

## Understanding your general duties

As an owner or operator of a solar farm, you must identify all foreseeable hazards and risks arising from your complex electrical installation, identify the controls available to eliminate or reduce the risks and:

- implement the most effective control or combination of controls to eliminate each risk where that is practicable, or
- where it is not practicable to eliminate a risk, implement all practicable controls that contribute to the minimisation of the risk.

What is 'practicable' must be determined having regard to the following factors:

- the severity of the hazard or risk in question; and
- the state of knowledge about the hazard or risk and any ways of removing or mitigating the hazard or risk; and
- the availability and suitability of ways to remove or mitigate the hazard or risk; and
- the cost of removing or mitigating the hazard or risk.

No single factor (e.g., cost) should determine the outcome of the assessment. Rather, they should be considered collectively and through a lens of what a reasonable person taking proportionate action to eliminate or minimise risks ought to do in the circumstances. Importantly, if there are multiple controls that achieve the same result in eliminating or minimising a risk, then the most cost-effective option may be chosen. However, choosing a lower-cost option that is less effective on the sole basis that it is cheaper is unlikely to meet the 'practicable' test, especially if the severity of the potential harm is significant.

## Bushfire risk mitigation

Solar farm owners and operators must have appropriate controls in place to prevent the ignition and spread of fire. The following are examples of controls Energy Safe expects all solar farms to have, while solar farm owners and operators must also consider what additional controls are required in their circumstances in accordance with their general duties.

### Controls to prevent fire ignition

Proactive assessment management and maintenance plans, asset failure detection systems and vegetation management are essential to mitigate the risk of fire ignition.

## Asset management and maintenance plans

Solar farm owners and operators are to have proactive asset management and maintenance plans that document the following:

- Maintenance requirements and schedules. This helps to proactively manage assets to optimize performance, minimize downtime, reduce costs and improve the overall safety of the installation.
- Equipment inspection (including use of thermography) requirements and schedules. For example, use thermal cameras to detect hotspots on the electrical equipment such as inverters, solar panels, combiner boxes and transformers. Overheated areas may indicate a fire risk, so corrective measures should be taken immediately.
- Condition assessment criteria. Assessing asset's current condition, identifying potential risks and failures, and prioritising maintenance or replacement actions helps to ensure safe installation.
- Defect monitoring processes. Regular inspections and monitoring enable the early detection of defects, allowing for timely corrective actions to be taken based on their severity. Continuous tracking, follow-up inspections and root cause analysis help prevent recurring issues, ensuring fire safety measures remain effective and reduce the risk of ignition or fire related hazards.
- Replacement programs.
- Near miss reporting.
- Control performance monitoring. This involves continuously tracking and monitoring the effectiveness of key components and safety systems to ensure they function as intended. Regular analysis and corrective action based on this monitoring help to ensuring quick response in case of potential hazard.
- Monitoring of equipment recalls and industry safety alerts.
- Condition or status monitoring of key equipment, such as inverters, combiner boxes, fuses, connectors optimisers and panels.
- Arc fault detection devices, which are circuit breakers that automatically cuts the electricity supply at the event of an arc flash. See Energy Safe's [Arc flash hazard management guideline](#) for more information.

## Asset failure detection systems

Solar farm owners and operators are to implement monitoring systems to quickly detect electrical faults, equipment failures, or short circuits that could ignite fires. Faults must be immediately addressed, and any fire should be reported to emergency services. Any fire ignition from the complex electrical installation must also be reported to Energy Safe as required by regulation 401(1)(e) of the Regulations (see [General duties of solar farm owners and operators](#)).

## Vegetation management

One important control to prevent the ignition and spread of fire is managing grass height in and around solar farms. At a minimum, we expect grass height near any electrical installation or equipment to be no more than 100mm during the declared Fire Danger Period for your municipality in line with the Country Fire Authority's [Guidelines for renewable energy facilities](#).

More generally, accumulated combustible materials must be minimised, especially under solar panels and near combiner boxes during the declared Fire Danger Period. Where practicable, low-flammability vegetation (such as root vegetables) may be planted under solar panels, provided foliage does not extend beyond the panel footprint.

Solar farm owners and operators are to ensure vegetation is cleared well ahead of, and for the duration of, the declared Fire Danger Period. More information about the about the declared Fire Danger Period for each municipality is available here: [Fire restriction dates](#).

## Controls to minimise consequences of fire ignition

Vegetation management, fire-breaks, access to water supply and emergency plans are essential to minimise consequences if a fire ignites.

## Vegetation management

As outlined above, solar farm owners and operators must ensure vegetation is cleared well ahead of the declared Fire Danger Period, and for the duration of the declared Fire Danger Period.

## Fire-breaks

Fire-breaks are where land is cleared of all trees, shrubs, grass and other combustible materials to provide a 'fuel free' area. There should be a fire-break of at least 10 metres around key infrastructure such as battery storage systems, control rooms, substations, power conversion units and site perimeter.

Fire-breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock. They must be free of vegetation and obstructions at all times. No plant or equipment of any kind is to be stored in fire-breaks.

## Fire water supply

Ready access to an adequate and reliable water supply is critical. Static water tanks must be installed at every solar farm, with at least one 45,000 litre tank at the entrance and additional tanks based on the size of the facility. Additional static fire water tanks of at least 45,000 litre effective capacity must also be incorporated for every 100 hectares.

In addition:

- An external water level indicator must be provided to each tank and be visible from the hardstand area. Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.
- Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s).
- A minimum of two (2) suitable fire extinguishers must be provided within 3 – 20 metres of each Power Conditioning Unit (PCU).

## Emergency plans

Solar farm owners and operators must have comprehensive emergency management plans with fire response procedures, which have been routinely practised with all relevant personnel and validated/updated as necessary to ensure effectiveness. This should include procedures to isolate parts or all of the electrical installation in case of a fire.

Emergency plans should be developed in consultation with local fire authorities and other stakeholders who are involved in responding to emergencies or may be impacted in the case of a fire.

## Information for emergency responders

An Emergency Information Book must be developed and available to emergency responders in line with the Country Fire Authority's [Guideline for the provision of emergency information](#). They must be located in Emergency Information Containers, at each vehicle entrance point to the solar farm.

The Emergency Information Book must include:

- A description of the premises, its infrastructure and operations.
- Site plans that include the layout of the entire site, including buildings, internal roads, infrastructure, fire protection systems and equipment, dangerous goods storage areas, gas detectors, battery energy storage systems, substations/terminals, grid connections, drains and isolation valves, neighbours and the direction of north.
- Up-to-date contact details for site personnel, regulatory authorities and site neighbours.

Emergency Information Containers must be:

- Painted red and marked 'EMERGENCY INFORMATION' in white contrasting lettering not less than 25mm high.

- Located at each vehicle entrance point to the solar farm, installed at a height of 1.2 – 1.5 metres.
- Accessible with a fire brigade standard '003' key.
- Kept clear of obstructions, including products, rubbish, vehicles, vegetation and any hazards (e.g., pest infestation).

## Who we are

At Energy Safe we work to keep Victoria energy safe.

We regulate the energy industry and sector to ensure generation, supply and usage uphold safety standards, and engage with the community to raise awareness of energy safety risks.

In everything we do, we strive to deliver on our purpose to keep Victoria energy safe. Always.

[www.esv.vic.gov.au](http://www.esv.vic.gov.au)