



# Fact sheet

Managing fire risk – electricity transmission network

**AusNet**  
services

## The transmission network

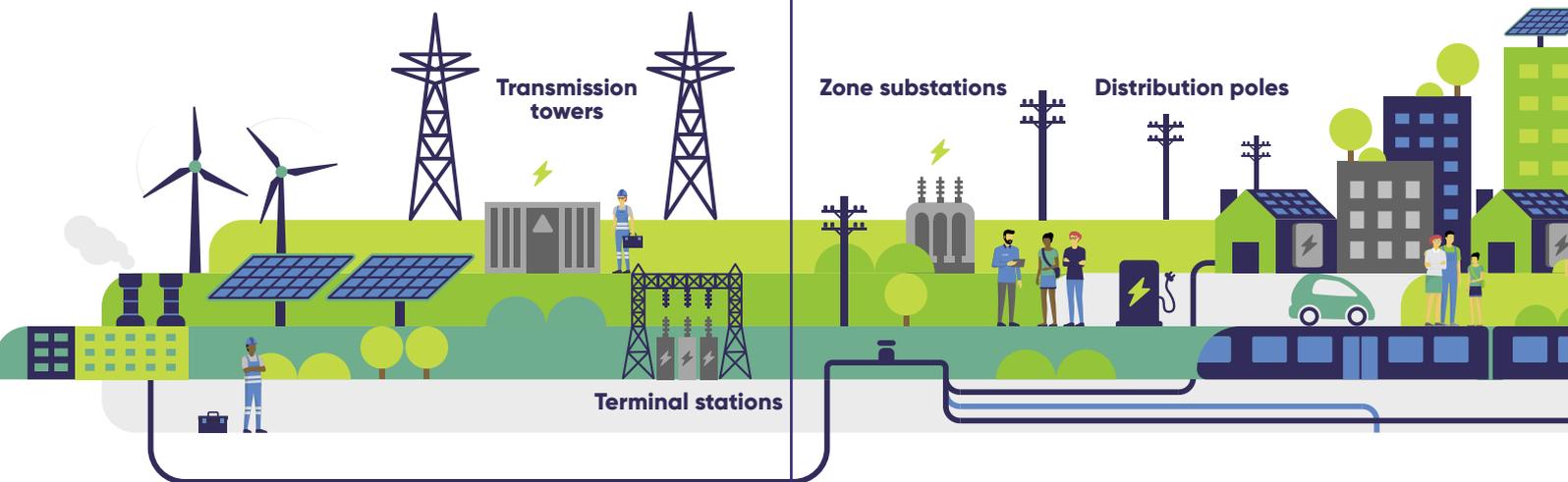
Voltage range 132,000V (132kV) up to 500,000V (500kV)

Transports electricity long distances at extra high voltages from large scale generators. The network is made up of terminal stations, transmission lines and towers.

## The distribution network

Voltage range 240V (0.24kV) up to 66,000V (66kV)

Feeds lower-voltage electricity to homes and businesses.



AusNet Services owns and operates the electricity transmission system in Victoria. This fact sheet provides general information about managing fire risk across the electricity transmission network.

There is no record of the Victorian transmission network being the cause of a bushfire. Design standards, operation and maintenance of transmission assets mitigate risk and enable assets to withstand bushfire conditions.

## The difference between transmission and distribution lines and networks

Electricity travels via two types of power lines – transmission lines and distribution lines.

**Transmission power lines** transport electricity at extra high voltages from generators such as a coal-fired power stations, wind or solar farms, to terminal stations. They generally range in voltage from 132kV up to 500kV.

The voltage of electricity from the transmission network is stepped down at the terminal stations and substations to a lower voltage before it is transferred to the distribution network.

**Distribution power lines** transport the electricity from the substations and carry electricity through many of our residential streets to homes and businesses. They range in voltage from 240V up to 66,000V (66kV).

While there is no record of the Victorian transmission network starting a bushfire, the distribution network has been the cause of bushfires.

The transmission network and distribution networks are different types of infrastructure and require a different management approach. Each network has specific management plans that set out processes and procedures for fire prevention and vegetation management.



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### Transmission lines and easements

Wherever there are transmission lines, there are transmission line easements. An easement is a right held by one person to access, occupy and/or use part of the land owned by another person, for a particular reason. Transmission line easements are needed to protect public safety and provide access to infrastructure to help maintain a reliable transmission network.

AusNet Services and its contractors have the right to access transmission line easements at any time to ensure safe operation. This includes routine tasks such as inspecting the lines and making any necessary repairs. We also need to manage vegetation that could interfere with lines. Routine inspections ensure that vegetation is maintained so that a safe clearance is provided between the line and vegetation.

### Regulation

In Victoria, the maintenance and operation of the transmission network system is highly regulated by the Victorian Government. AusNet Services must implement processes and procedures outlined by Energy Safe Victoria (ESV), the energy safety regulator, responsible for electricity, gas and pipelines safety.

In compliance with ESV regulations, we have prepared Vegetation Management Plans and Bushfire Mitigation Plans for both the distribution and transmission networks that are audited annually by ESV. The plans are available here: [www.ausnetservices.com.au/en/About/Network-Regulation/Regulatory-Publications](http://www.ausnetservices.com.au/en/About/Network-Regulation/Regulatory-Publications)

The Vegetation Management Plan for the Electricity Transmission Network outlines the vegetation easement inspection and maintenance program for our transmission network. The Bushfire Mitigation Management Plan for the Electricity Transmission Network outlines how the electricity transmission network is managed to mitigate bushfire risk.

### Transmission Vegetation and Easements Program

AusNet Services also has a Transmission Vegetation and Easements Program that focuses on maintaining safe clearances between vegetation and transmission lines to reduce bushfire risk.

As part of the regular inspection and maintenance program we monitor from the air, using high-resolution cameras to enable light detection and ranging (LiDAR) data and aerial imagery to be taken. LiDAR data provides important detail of the height and type of vegetation across the transmission line easements and identifies areas where vegetation management is required.

Within transmission line easements, mature tree and shrub growth of up to three metres in height is permitted. For vegetation above three metres in height, an AusNet Services safety assessment is required to ensure that minimum clearances and fuel load densities are maintained. Maximum height cannot exceed eight metres.

### Total Fire Ban days

On days of Total Fire Ban, AusNet Services undertakes a risk assessment of all its planned construction and puts work measures in place to manage the work safely.

### What happens to the transmission network during a bushfire?

AusNet Services has a commitment to provide its customers with a reliable and safe electricity supply. In the event of a bushfire, we work closely with Emergency Management Victoria (EMV), Fire Rescue Victoria (FRV), Country Fire Authority (CFA) and Forest Fire Management Victoria (FFMV) and follow all agreed and mandatory directions. If required, this can include turning off the power across parts of the transmission network.

### Using easements to support firefighting efforts

As transmission easements are largely free of vegetation, they have a low fuel load and can act as a line of defence against bushfires.

AusNet Services works with FFMV on backburning operations. A backburn is a fire lit close to the edge of an active bushfire, which burns out the fuel between the bushfire and an established control line. Backburning helps reduce the intensity of a bushfire by reducing fuel load. FFMV is responsible for planned control burns and preparedness activities, like slashing, mowing and creating fuel breaks on public land.

### Use of aerial firefighting

AusNet Services works with EMV and CFA to ensure aerial firefighting can operate in the vicinity of high-voltage transmission lines.

The transmission towers and lines are well defined on aeronautical maps. The safe flying distance from the transmission towers is determined by the individual pilot based on their experience and regulations set by the Civil Aviation Safety Authority (CASA).

AusNet Services regularly inspects the transmission network as part of its aircraft inspection program and adheres to CASA regulations.

### Planned burning

Planned burning is undertaken to manage and reduce fuel load. This can help reduce the intensity of a bushfire, by slowing it down and increasing the likelihood of suppression during the early stages of the fire. FFMV and the CFA notify AusNet Services in advance of planned burns. Planned burns are organised on days when weather conditions are suitable, and the wind is heading away from transmission infrastructure. In general, smoke from a planned burn is not a risk to electricity infrastructure.



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## Fire prevention control

Terminal stations and transmission lines are remotely operated so that they can be shut down when required. If a fault were to occur on the transmission network, the protection systems will detect and switch off the power in a very short period of time to prevent an electrical fire.

For a fault on a 220kV transmission network, power is turned off within 120 milliseconds (0.12 of a second). Similarly, for a fault on a 500kV transmission network, power is turned off within 80 milliseconds (0.08 of a second). Once the power has been turned off, there is no longer any risk of electricity sparks starting a fire. Fire is unable to travel along transmission lines because the lines are not flammable.

## Lightning strikes

Transmission lines have ground/earth wires installed above the lines at the top of the transmission tower. The ground wire is designed to shield the transmission lines from lightning strikes. If lightning strikes the ground wire on top of the tower, the power in the strike is directed safely into the ground through the ground wire and towers without putting the transmission lines at risk of strike.

Redirecting lightning strikes safely to ground allows the electricity supply to be maintained without interruptions, avoids damage to network infrastructure, and reduces the risk of a bushfire being ignited from dry lightning strikes in the immediate area. Ground wires form an essential part of a safe and reliable transmission network.

## 2009 Victorian Bushfire Royal Commission

The 2009 Victorian Bushfires Royal Commission made, among others, eight key recommendations focused on reducing the risk of fires related to electricity distribution infrastructure. This included more inspections, better hazard management plans, improved training and infrastructure upgrades.

The commission did not place any recommendation on the operation or maintenance regime of the electricity transmission network for Victoria.

The 2009 Victorian Bushfires Royal Commission final report is available online at <http://royalcommission.vic.gov.au/Commission-Reports/Final-Report.html>

## Further information

### AusNet Services

1300 360 795 (8am-5pm, Monday to Friday) or  
[customersupport@ausnetservices.com.au](mailto:customersupport@ausnetservices.com.au)

## Related websites

**Country Fire Authority** - [www.cfa.vic.gov.au](http://www.cfa.vic.gov.au)

**Emergency Management Victoria** - [www.emv.vic.gov.au](http://www.emv.vic.gov.au)

**Energy Safe Victoria** - [www.esv.vic.gov.au](http://www.esv.vic.gov.au)

**Forest Fire Management Victoria** - [www.ffm.vic.gov.au](http://www.ffm.vic.gov.au)

**Fire Rescue Victoria** - [www.frv.vic.gov.au](http://www.frv.vic.gov.au)

**Planned Burns Victoria** - [plannedburns.ffm.vic.gov.au](http://plannedburns.ffm.vic.gov.au)

## Publications

**AusNet Services regulatory publications** - [www.ausnetservices.com.au/About/Network-Regulation/Regulatory-Publications](http://www.ausnetservices.com.au/About/Network-Regulation/Regulatory-Publications)

**CFA's, Can I or Can't I?** - [www.cfa.vic.gov.au/warnings-restrictions/total-fire-bans-and-ratings/can-i-or-cant-i](http://www.cfa.vic.gov.au/warnings-restrictions/total-fire-bans-and-ratings/can-i-or-cant-i)

**CFA's Annual Readiness Checklist and Guidelines for Operating Private Equipment at Fires** - [www.cfa.vic.gov.au/plan-prepare/how-to-prepare-your-property/farms/private-firefighting-equipment](http://www.cfa.vic.gov.au/plan-prepare/how-to-prepare-your-property/farms/private-firefighting-equipment)