Electricity Safety (Bushfire Mitigation) Regulations 2023

Regulatory Impact Statement

Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.

Executive Summary

As one of the most bushfire-prone regions in the world, ensuring the safety and regulation of electricity networks and assets in Victoria is essential in reducing bushfire ignition risk. The overall safety of electricity supply and usage is regulated within the State by the *Electricity Safety Act 1998* (Act). The Act contains a range of safety mechanisms. Specifically, the Act includes a requirement for Major Electricity Companies (MECs) and Specified Operators (SOs) to design, operate, maintain and decommission its respective supply networks and at-risk electric lines to minimise any hazards or risks to people and property, and minimise bushfire ignition risk from their electricity assets as far as practicable. The Act also promotes bushfire mitigation across electricity supply networks and electric lines through the implementation of Bushfire Mitigation Plans (BMPs), rigorous inspection requirements, and ensuring compliance through penalties within its provisions.

The Electricity Safety (Bushfire Mitigation) Regulations 2013 (the Regulations) make provision for the preparation of BMPs by MECs and SOs, and the inspection of overhead electric lines and supply networks. The Regulations specify the minimum inspection requirements of overhead private electric lines and supply networks by MECs, including frequency, timing, and other specifications to ensure the safety of the electricity network and to mitigate the likelihood of bushfire ignition risk from electricity assets. BMP and inspection requirement compliance are assessed by Energy Safe Victoria (ESV) through regular reviews, investigations and audits. These activities seek to ensure MECs and SOs are fulfilling their requirements under the Regulations.

Currently, the Regulations are due to sunset on 18 June 2023. In accordance with the requirements under the *Subordinate Legislation Act 1994* (SL Act), this Regulatory Impact Statement (RIS) has been prepared to review the effect of the current regulatory regime in reducing bushfire ignition risk from electricity assets and consider the impact of different options to replace the sunsetting Regulations (including re-instatement).

This RIS is part of the Department of Energy, Environment and Climate Action's (DEECA's) commitment, in collaboration with ESV, to assess and identify the best option for ensuring the safety and effectiveness of Victoria's electricity networks and assets in reducing bushfire ignition risks. The draft Electricity Safety (Bushfire Mitigation) Regulations 2023 (Proposed Regulations) have been prepared in line with:

- The requirements outlined under the Act;
- The problems highlighted in the findings of the 2009 Victorian Bushfire Royal Commission (VBRC) reports, which identified several key actions and recommendations to improve the safety of electricity networks and assets and reduce bushfire ignition risk; and
- The recommendations of the Powerline Bushfire Safety Taskforce and the subsequent key actions of the Powerline Bushfire Safety Program (PBSP).

Following careful consideration, the scope of the current remake of the Regulations within this RIS has been limited to minor amendments. This aligns with existing substantive policy analysis which has already been undertaken and resulted in a strong rationale for those amendments. DEECA will consider how issues that are outside the scope of the current remake might appropriately be addressed in future. DEECA will also continue to engage with stakeholders and ESV as needed.

This RIS is prepared in accordance with the Victorian Guide to Regulation (2016), which provides step-by-step guidance on drafting a RIS.

The problem being addressed in the Regulations

With 96 per cent of the State classified as a Hazardous Bushfire Risk Area (HBRA), and 34 major bushfires having been recorded since 1851, Victoria has many of the most bushfire prone areas in Australia.[1]

Bushfires can ignite from natural and human sources. Electricity assets can be an ignition source, and in the past have resulted in devastating bushfires. The 2009 VBRC final report identified five of the 11 Black Saturday fires as being caused by electricity assets, further noting that whilst the proportion of fires caused by electricity infrastructure is low, they are most likely to occur within circumstances (such as extreme

[1] Forest Fire Management Victoria, Past bushfires: A chronology of major bushfires in Victoria, https://www.ffm.vic.gov.au/history-and-incidents/past-bushfires, accessed 10 October 2022.

weather events) where there is greater risk of a fire getting out of control and resulting in catastrophic consequences.[2]

The VBRC developed 67 recommendations, eight of which specifically addressed the issue of bushfires ignited by electrical network failures.[3] Since then, significant policy and regulatory reforms have evolved to minimise the likelihood of bushfire ignition from electrical assets. The VBRC proposed a range of requirements on MECs and SOs to the State (through ESV) in response to identified inadequacies within the then-existing regulatory regime around inspection frequency and standards, asset construction and maintenance, vegetation management surrounding electricity assets, and bushfire mitigation planning.

In line with the VBRC recommendations, the Regulations aim to support the State's objective of minimising the likelihood of bushfire ignition risks from electrical assets and are part of a broader suite of regulatory measures that work in tandem to achieve electricity safety outcomes.

The overarching objective of the intervention is to mitigate or reduce the likelihood of bushfire ignition risk from electrical infrastructure and electric lines to people, property, and the environment. Achieving this objective will reduce the incidence of bushfire ignition and the consequent costs to the community.

The Victorian Government's Critical Infrastructure Resilience Strategy recognises that most of Victoria's critical infrastructure assets (which includes energy sector assets) are owned and/or operated by private entities that have strong incentives for risk management.[4] For MECs and SOs, there are strong business interests to minimise potential losses and to manage the risk of their electrical infrastructure and assets to cause, or be damaged by, bushfires.

While primary responsibility for critical infrastructure resilience rests with infrastructure owners and/or operators, the Critical Infrastructure Resilience Strategy notes that the community expects government to take appropriate measures to ensure that owners and/or operators are managing their risks and that vital service delivery is not interrupted.

The *Victorian Guide to Regulation* also notes that government intervention may be justified where it supports the management of public risks, which are a form of social regulation that seeks to reduce or manage the risk of harm to health, safety or welfare of individuals or the community.

Without further government action through regulation, ESV would be required to provide guidance to the sector regarding electricity safety and bushfire mitigation expectations. Stakeholders may also be less incentivised to undertake bushfire risk mitigation activities at regular intervals and to a standardised quality. Without government intervention, the Regulations will sunset on 18 June 2023. If this occurs, the general duties in the Act would remain, requiring MECs and SOs to submit compliant BMPs, minimising bushfire danger arising from SO at-risk electric lines (section 83B) and MEC supply networks (section 98(c)). ESV would continue to impose penalties under the Act and prosecute MECs and SOs for failure to comply with these requirements, including failure to comply with general duties. The absence of the Regulations, however, would result in large parts of section 84 (regarding the responsibility to maintain vegetation and trees around electrical lines) becoming inoperative. Ultimately, the risk of bushfire ignition from electricity infrastructure demands effective mitigation strategies, ongoing regulatory oversight and monitoring arrangements, and policy development. This supports safety and protection of life and property now and into the future.

Objectives of the Proposed Regulations

The Proposed Regulations aim to reduce bushfire ignition risks from Victoria's electrical infrastructure and electric lines owned and/or operated by MECs and SOs by:

1 **Reducing the likelihood of powerlines starting bushfires in HBRAs** through active and high-quality inspection processes in relation to private overhead electric lines, including partial fire-ban days and total fire ban day definitions within the regulation, requiring ongoing asset risk mitigation obligations for MECs and SOs and ensuring minimum standards for electricity asset safety that is reflective of current practices.
2 **Supporting local and State level bushfire mitigation and readiness activities** in the management of their above-ground assets through the provision of adequately specified BMPs.

[2] Victorian Bushfires Royal Commission (2009), Final Report Summary, page 12, http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC_Summary_PF.pdf, accessed 12 September 2022.
[3] Recommendations, and progress against implementation, are included in Table 0-**Error! Main Document Only.**, page 33.
[4] State of Victoria (Emergency Management Victoria) 2015, Critical Infrastructure Resilience Strategy, https://files.emv.vic.gov.au/2021-09/Critical%20Infrastructure%20Resilience%20Strategy%20-%20Sept%202016.pdf, accessed 7 October 2022.

3 **Promote public trust, transparency, and accountability** of MEC bushfire mitigation planning through requiring their BMPs, and specified details of these BMPs, to be made publicly available on their websites.

The Proposed Regulations support the corresponding objectives under the Act:

- Part 1, section 1 (a) and (b) (Purpose) of the Act to make provisions relating to the safety of electrical supply and use, and the reliability and security of electricity supply, and
- Part 2, section 6 (ca) (Objectives of ESV) of the Act for ESV to promote the prevention and mitigation of bushfire danger.

Based on the analysis in this RIS, DEECA recommends remaking the Regulations with several minor improvements.

As part of remaking the Regulations, minor amendments have been introduced to ensure the Regulations are consistent with contemporary practices regarding insulation on low voltage overhead lines in HBRA. It also seeks to provide greater clarity, accuracy and certainty, on the inspection standards for private overhead electric lines, in relation to 'hazard trees' as well as minimum clearance requirements for lines that were potentially constructed prior to the making of the current Wiring Rules.

Options for addressing the problem, method of assessment and preferred option

As part of this RIS, a range of high-level options were considered. Options ranged from a light touch review to inform the remaking of the Regulations, a more fulsome review of the Regulations feeding into a broader policy framework addressing identified issues, as well as considerations of greater use of technology to reduce the likelihood of bushfire ignition.

Three options have been identified to address the problems identified within this RIS and meet the overarching government objectives. The description of each option has been informed by a stakeholder survey sent to MECs and SOs as part of the RIS development process.

The high-level options are:

- Option 1: The Regulations cease to exist (base case)
- Option 2: Regulations reinstated – no amendments
- Option 3: Regulations reinstated, with two sub-options:
  - Option 3A: reinstated, with amendments for consistency with contemporary standards and other regulations; or
  - Option 3B: Administrative amendments (incorporating those suggested as part of Option 3A), and other amendments to provide greater clarity and certainty for prescribed safety requirements for existing and new electrical constructions and installations (**preferred**).

Based on the analysis in this RIS, DEECA recommends remaking the Regulations with minor improvements (Option 3B). As part of remaking the Regulations, minor amendments are recommended to ensure the Regulations are consistent with contemporary practices regarding insulation on low voltage overhead lines in HBRAs. These amendments also seek to provide greater clarity, accuracy and certainty on the inspection standards for private overhead electric lines. These standards relate to 'hazard trees' and minimum clearance requirements for lines that were potentially constructed prior to the making of the current Wiring Rules.

Outcomes of analysis and stakeholder consultations informing this analysis

A multi-criteria analysis (MCA) has been adopted for the purposes of comparative and consistent assessment of these options. An MCA is a decision tool that is used in cases where it is not possible to quantitatively estimate and value the costs and benefits of an identified option. An MCA applies a score (in the case of this RIS, ranging between -5 and 5) to various options based on an identified criteria (for example, cost to government or industry). Weightings of each score are then compared across each of the options to assess their impacts and translate findings into a preferred option based on the highest weighted score.

Three criteria were chosen to objectively assess the benefits and costs of each option, with consideration to the impacts on Victorian communities, businesses, and regulators. These are:

- **Likelihood of bushfire ignition risks, specifically arising from electrical assets, and the subsequent impact on the community.** This criterion assesses whether the proposed option supports a reduction in bushfire ignition risk from electrical assets. This has been given a weighting of 50 per cent, recognising the potentially severe consequences electrical asset related bushfires can have on public safety, health and wellbeing.
- **Cost to industry operators, in this instance being MECs, SOs and private overhead electric line owners.** This criterion recognises the 'shared responsibility' principle in emergency management, and the substantial costs to industry of applying bushfire mitigation risk controls (including asset upgrades) to their networks and at-risk lines. Under this criterion, the objective is to minimise the direct financial and administrative costs to industry that are not associated with risk-reduction or improved safety. The cost to industry has been given a weighting of 35 per cent.

- **Cost to government, in this instance, this includes ESV.** The cost to government, primarily to ESV, has been given a weighting of 15 per cent. As the energy safety regulator, ESV is responsible for promoting the prevention and mitigation of bushfire danger and monitoring and enforcing the provisions under the Act and prescribed regulations. As such, this criterion represents the regulatory costs associated with providing guidance to industry, monitoring, and enforcing activities to ensure bushfire mitigation activities undertaken by industry meet contemporary standards and community expectations in relation to public safety outcomes.

For each option, scores are assigned against each criterion, ranging from minus five to five, with five representing a high alignment to the criterion against the base case. A summary of all options, along with their relative scores (raw and weighted) compared to the base case (Option 1), is as follows:

Table ES - 1 Summary of MCA scoring of options

Option	Scores [weighted score]			
	Reduction in likelihood of bushfire ignition risk (50%)	Reduced cost to industry (35%)	Reduced cost to government (15%)	Weighted score
Base Case – Option 1: The Regulations cease to exist (provisions in the Act continue to apply)	0	0	0	0
Option 2 – Regulations are reinstated – no amendments	1 [0.5]	1 [0.35]	1 [0.15]	1
Option 3A – Administrative amendments for consistency with contemporary standards and other regulations	2[1]	1[0.35]	-1 [-0.15]	1.2
Option 3B – Administrative amendments (Option 3A), and other amendments to maintain ongoing obligations for prescribed safety requirements for existing and new electrical constructions and installations	4 [2]	-1 [-0.35]	-1 [-0.15]	1.3

Using the MCA framework, Option 3B is the preferred option because:

1. Clarifying the definitions and prescribed safety requirements for new and existing constructions and installations under the Proposed Regulations will have the greatest impact on the bushfire ignition risk from electrical assets. This is because the Proposed Regulation will require industry to detail preventative strategies and programs within their Bushfire Mitigation Plans (BMPs), as well as requiring compliance with prescribed safety requirements for existing and new electrical constructions and installations that relate to Automatic Circuit Reclosers (ACRs) and Rapid Earth Fault Current Limiters (REFCL) safety installations.
2. Industry costs associated with the implementation of the Proposed Regulation will relate to the completion of inspections at a prescribed frequency and to a minimum standard. Industry will also

incur costs through the development of BMPs. However, these costs to industry only partly offsets the additional benefits of the option in terms of reducing bushfire risk.

3. The Proposed Regulation outline government expectations regarding a BMP's content, as well as the quality and frequency of inspection activity. Option 3B provides industry with greater clarity and will likely reduce the number of inquiries or clarifications needing to be provided by government departments. Agencies will need to publish guidance and likely work with stakeholders to communicate initial changes occurring. As a result, government will incur some costs. These costs to government only partly offsets the additional benefits of the option in terms of reducing bushfire risk

Implementation, monitoring, and evaluation arrangements

The Proposed Regulations remake the existing sunsetting regulations, with minor clarifications and administrative amendments to align with common industry practice and updated standards.

The Regulations have been in place for over a decade, with industry stakeholder surveys confirming that the Proposed Regulations largely reflect business-as-usual activities for MECs and SOs. It is noted, however, that unlike the established MECs, SOs are a diverse and growing group of regulated entities and, as such, are likely to increasingly capture new market entrants who may not be familiar with the Regulations and whose potential contribution to bushfire ignition risks from electrical assets is currently unknown. Monitoring the development of this emerging sector will be an important role over the next 10 years.

Implementation planning for the Proposed Regulations will therefore consider both established businesses and emergent industry groups who may fall within the scope of the Regulations. To support this, industry should be notified of the Proposed Regulations through the public consultation processes associated with this RIS and publication of the finalised Regulations. ESV will also play an important role through its ongoing education and awareness activities with industry and other stakeholders. Industry will be advised of transition periods for the amendments, where applicable.

Given that there are only minor changes proposed in relation to the content of BMPs, industry would be expected to make any necessary changes when they are next required to submit a BMP. The proposed transition time for the proposed changes to the current inspection standard for existing overhead private electric lines (other than bare open wire conductors, for which there is no change) is six months after the commencement of the Proposed Regulations. This is to allow time for MECs to update their policies and practices, to comply with the new standard. It is proposed not to have a transition period for the proposed extension of the obligation for ACRs on overhead Single Wire Earth Return (SWER) lines to be an ongoing obligation, given the low impact on existing MEC practices. As the regulating entity, ESV will implement the Proposed Regulations using existing resourcing capabilities through well-established, existing processes that it undertakes for changes to regulatory requirements.

ESV will be responsible for monitoring the implementation of Proposed Regulations. ESV has already established auditing capabilities to determine whether the Regulations are being implemented as intended. These include:

- Auditing bushfire mitigation plans, including audits on MECs, SOs and network assets;
- Assessing the implementation of REFCLs; and
- Auditing the asset management practices (including vegetation line clearance practices) of major electricity companies and other regulated entities.[5]

ESV's data collection and analysis capabilities are demonstrated through multiple reports, including:

- Annual electrical safety performance reports on the safety performance of Victoria's MECs; and
- End of fire season summary reports. These summary reports provide an overview of the preparedness of the networks for a particular fire season. They include an analysis of fire events during the season, a comparison to previous years, and an update on investigations into the previous year's major fires.

ESV also receives detailed Annual Bushfire Mitigation Programs reports from MECs that relate to regulated safety programs which will reduce the risk of their networks starting bushfires.

[5] ESV_CorporatePlan2021-24.pdf

Noting the potential for new business entrants to the electricity industry over the next 10 years, ESV anticipates publishing guidelines for renewable energy installations, part of which will cover bushfire mitigation, in 2023.

Compliance with the Proposed Regulations will also fall under ESV's remit. As noted above, ESV will conduct audits of the commitments made in BMPs on an annual basis. The performance of the businesses is then contained in ESV's annual safety performance report, which is publicly available from the ESV website.

The development of an evaluation plan and implementation of a monitoring and evaluation framework will also support the timely assessment of the Proposed Regulations, along with subsequent impacts and outcomes. Key evaluation questions have been developed and mapped to possible indicators and high-level data sources. This, along with the identification of any other sub-questions or data sources, will support an assessment of the Proposed Regulations.

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Key terms and definitions

Term	Meaning
ACR	"Automatic Circuit Recloser" (ACR)[6] means a device in relation to a SWER line that— (a) may be remotely controlled; and (b) is able to automatically interrupt and reclose an electric circuit by means of a programmed sequence that involves one or more of the following— (i) opening and reclosing the electric circuit; (ii) resetting the electric circuit; (iii) holding the electric circuit closed; (iv) permanently interrupting the electric circuit.
BMP	Bushfire Mitigation Plan. Under the *Electricity Safety Act 1998*, a bushfire mitigation plan is defined as "a plan for [an] operator's proposals for the mitigation of bushfire in relation to the operator's at-risk electric lines" for Specified Operators (Section 83BA(1)) and as "a plan for the company's proposals for mitigation of bushfire in relation to the company's supply network" for Major Electricity Companies (MECs) (Section 113A).
CFA	Country Fire Authority
DEECA	Department of Energy, Environment and Climate Action (formerly known as 'DELWP')
DELWP	Department of Environment, Land, Water and Planning
ESMS	Electricity Safety Management Scheme. An ESMS outlines the safety management system in place for an MEC to meet its general duties. ESV has described ESMS as "a non-prescriptive form of regulation that enables industry to improve on the efficiency of its operation without compromising safety standards".[7] Under the Act, penalties apply to MECs if they fail to comply with their accepted ESMS.
ESV	Energy Safe Victoria
FRV	Fire Rescue Victoria
HBRA	Hazardous Bushfire Risk Area. Hazardous bushfire risk area is defined under Section 3 of the *Electricity Safety Act 1998* as an area to which a fire authority has assigned a fire hazard rating of "high" under section 80, whether or not the area is an urban area; or that is not an urban area (other than an area a fire control authority has assigned a fire hazard rating of "low" under section 80 of the Act).
LBRA	Low Bushfire Risk Area
MEC	Major Electricity Company. MEC is defined under section 3 of the *Electricity Safety Act 1998* as a distribution company or a transmission company (both having the same meaning as in the *Electricity Industry Act 2000*)— but does not include a distribution company or a transmission company, or a class of distribution company or transmission company, declared under section 3A not to be a major electricity company.
NAP	Network Assets Project
NEVA	*National Electricity (Victoria) Act 2005*
POEL	Private Overhead Electric Lines
PRF	Powerline Replacement Fund
Proposed Regulations	Electricity Safety (Bushfire Mitigation) Regulations 2023

[6] *Electricity Safety Act 1998*, section 120K Definitions
[7] Energy Safe Victoria (2022), Electrical Safety Management Schemes, accessed at Electrical Safety Management Schemes – Energy Safe Victoria (esv.vic.gov.au)

Term	Meaning
REFCL	Rapid Earth Fault Current Limiter – a smart technology that constantly monitors high voltage electric lines to detect and suppress faults that might otherwise start a bushfire. REFCLs work by detecting powerline faults within milliseconds and instantaneously divert electricity from the faulted line to non-faulted lines. It also acts as a diagnostic tool pinpointing any weak or ageing links, allowing for repair and ensuring a higher safety standard powerline network.[8]
RIS	Regulatory Impact Statement
SO	Specified Operator. SO is defined under section 83A of the *Electricity Safety Act 1998* and refers to the operator of an at-risk electric line, but does not include a major electricity company. An at-risk electric line is a defined term that means an electric line (other than a private electric line) that is above the surface of land, and is in a hazardous bushfire risk area as defined under the Act.
SWER	Single Wire Earth Return – A high voltage distribution network operating at 12.7kV
SWER line	"SWER line" means a single wire earth return electric line[9]
Act	*Electricity Safety Act 1998*
Regulations	Electricity Safety (Bushfire Mitigation) Regulations 2013
VBRC	Victorian Bushfires Royal Commission

[8]Department of Environment, Land, Water and Planning (2018), Introduction of REFCLs, accessed at Introduction-of-Rapid-Earth-Fault-Current-Limiters-REFCL-brochure.pdf (energy.vic.gov.au)
[9] *Electricity Safety Act 1998*, section 120K Definitions

1 Introduction

Victoria is one of the most bushfire-prone regions in the world.[10] While bushfires are a naturally occurring feature of Victoria's landscape, climate change is anticipated to bring about more extreme weather events that are likely to increase the frequency, intensity and duration of bushfires.[11]

For the increasing number of Victorian communities living in or near bushfire-prone areas, bushfires represent a real and ongoing risk to the safety and security of their livelihoods.

Recent catastrophic events demonstrate the scale of devastation that bushfires, once ignited, can inflict. The 2009 Victorian Black Saturday Bushfires led to 173 deaths, 2,000 homes lost, over 430,000 hectares burnt and an estimated $1.07 billion in costs due to damages to agricultural land, community infrastructure, homes, businesses and livelihoods at the time. The 2019-20 Eastern Victorian Bushfires resulted in five deaths, 396 homes lost, over 1.5 million hectares burnt, over 170 wildlife species impacted by habitat losses,[12] and over $2.1 billion (in real 2017-18 dollars) in overall welfare losses to the State.[13] This does not account for the profound and long-lasting physical and mental health impacts that bushfires have long after the flames have receded, with many Black Saturday bushfire-impacted communities continuing to experience a wide range of psychosocial issues over 10 years later.[14]

Bushfires can be ignited from a wide variety of natural and human sources. One such ignition source is from electricity assets. Over the past 30 years, bushfire ignition from electricity distribution sources has been low. However, in circumstances where this has occurred, resulting fires have been responsible for some of Victoria's most devastating bushfires. The 2009 Victorian Bushfires Royal Commission (VBRC) final report into the Black Saturday bushfires identified four of the eight Ash Wednesday (1983) fires and 5 of the 11 Black Saturday fires as being caused by electricity assets, further noting that:

> *Although the proportion of fires that are caused by electricity infrastructure is low—possibly about 1.5 per cent of all ignitions in normal circumstances—on days of extreme fire danger the percentage of fires linked to electrical assets rises dramatically. Thus, electricity-caused fires are most likely to occur when the risk of a fire getting out of control and having deadly consequences is greatest.*[15]

The VBRC developed 67 recommendations, 8 of which directly addressed the issue of bushfires ignited by electrical network failures.[16] Significant policy and regulatory reforms have since been enacted by the Victorian Government to minimise the likelihood of bushfire ignition from Victorian electrical assets, in response to the VBRC recommendations and other reforms.[17] Pertinently, this included amending the then Electrical Safety (Bushfire Mitigation) Regulations 2003 and later amending the Electricity Safety (Bushfire Mitigation) Regulations 2013 (which replaced the 2003 regulations) to address the VBRC's recommendations. These regulations – the Electricity Safety (Bushfire Mitigation) Regulations 2013 (Regulations) – are the subject of this Regulatory Impact Statement (RIS).

1.1 Victoria's electricity network

Victoria's electricity networks are over 200,000 km long. The electricity industry is currently wholly privately owned and operated, following the privatisation of Victoria's State-owned electricity assets in 1998. In 2022 the Victorian Government made an election commitment to bring back the State Electricity Commission

[10] Victorian Building Authority (2022), *Bushfire protection*, [online] Available at: https://www.vba.vic.gov.au/consumers/bushfire, accessed 6 September 2022.
[11] Bureau of Meteorology, State of the Climate 2020 report, http://www.bom.gov.au/state-of-the-climate/documents/State-of-the-Climate-2020.pdf, accessed 12 September 2022.
[12] Parliament of Victoria (2020), Research Papers: Bushfires 2019-20, https://www.parliament.vic.gov.au/publications/research-papers/download/36-research-papers/13904-bushfires-2019-20, accessed 29 September 2022.
[13] Department of Treasury and Finance (2021*), Victoria's Economic Bulletin -The Economic Impacts of The 2019-2020 Bushfires on Victoria*, vol.5, page 33-47. Available at: The economic impacts of the 2019-20 bushfires on Victoria | Department of Treasury and Finance Victoria (dtf.vic.gov.au), accessed 6 September 2022.
[14] Gibbs L, Molyneaux R, Harms L, Gallagher H C, Block K, Richardson J, Brandenburg V, O'Donnell M, Kellett C, Quinn P, Kosta L, Brady K, Ireton G, MacDougall C, Bryant R (2021), 10 Years Beyond Bushfires Report 2020, University of Melbourne, Melbourne, Australia, https://mspgh.unimelb.edu.au/__data/assets/pdf_file/0009/3645090/BB-10-years-report_spread.pdf, accessed 10 September 2022.
[15] Victorian Bushfires Royal Commission (2009), Final Report Summary, page 12, http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC_Summary_PF.pdf, accessed 12 September 2022.
[16] Recommendations, and progress against implementation, are included in 14 **Error! Reference source not found.**, page 29.
[17] Department of Environment, Land, Water and Planning (2022), *About the electricity sector*, [online] Available at: https://www.energy.vic.gov.au/about-energy/about-the-electricity-sector, accessed 5 September 2022.

(SEC) with the intention that it will be an active energy market participant. The broader electricity supply industry is comprised of five sectors:

- **Generation** refers to power plants which generate electricity either through combustion of fossil fuels (coal, gas); or the use of renewable resources (wind, hydro, solar);
- **Storage** includes grid-scale storage, hybrids and aggregators of small generation and storage units. This sector supports the transition of Australia's national electricity markets to a net zero carbon emission system. This will result in a market that will increasingly rely on storage to firm up the expanding volume of renewable energy and deliver the growing need for critical system security services as thermal generators retire. With the emergence of bi-directional energy flows, Victorian energy customers with generators or storage units (e.g. home batteries) are also able to participate in Victoria's electricity generation sector and benefit from access to a greater range of services and value streams;[18]
- **Transmission** refers to the movement of this power on large powerlines across the State, at very high voltages (500, 330 or 220 kilovolts). The electricity is taken to a limited number of network locations (terminal stations), for conversion to lower voltages;
- **Distribution** refers to that portion of the electricity supply network stemming from terminal stations and ending with individual customers. At a terminal station, sub-transmission voltage (66kV) is taken to several network locations ('zone substations') to be converted to a lower voltage (22kV) and distributed on individual feeders. Feeders then radiate outward, with further transformation to low voltage to service individual customers; and
- **Retailers** who maintain the billing interface between the industry and individual customers.

Bushfire ignition has historically been associated with Victoria's distribution network. ESV, the energy safety regulator responsible for electricity, gas and pipelines is not aware of any known instances of the transmission network igniting bushfires.[19]

The Regulations support the State's objective of minimising the likelihood of bushfire ignition risks from electrical assets. They currently apply to a diverse and growing group of Specified Operators (SOs), some of which operate at-risk electrical lines, and Major Electricity Companies (MECs) that operate within the transmission and distribution sectors.[20]

As a newly established sector, the bushfire ignition risks from electrical assets held by the storage sector are not currently fully known. Further policy analysis and consideration is required before adjustments to the existing regulatory framework can be made. ESV will continue to monitor industry trends and emerging risks within the sector.

Given this narrow focus, the remainder of this section describes the SOs and Victoria's transmission and distribution sectors.

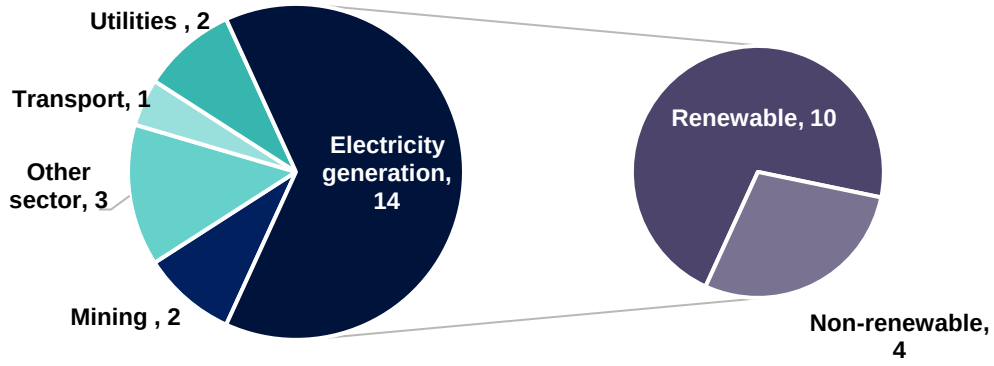
1.1.1 Specified Operators

SOs are a diverse group of entities that are, for the purposes of bushfire mitigation provisions of the Act[21], non-MEC operators of at-risk electric lines that are above ground and located in a HBRA. They currently include generators, paper mills, wood product manufacturers, Department of Defence facilities, water utilities, mines and railway operators. These entities are required to submit annual BMPs in relation to their at-risk electric lines to ESV for review and acceptance.

There are currently 22 SOs operating electric lines that are defined as 'at-risk' in accordance with the Act (Figure 1). With increasing trends towards small-scale, renewable energy business, the cohort has grown and now includes a significant number (64 per cent of SOs) of renewable energy businesses. With increasing investment in renewable energy and a trend towards microgrids, it is expected that the number of SOs that will be covered by the Regulations will continue to increase.

[18] Australian Energy Market Operator (2021), Integrating energy storage systems into the NEM, Rule determination, 2 December 2021, https://www.aemc.gov.au/sites/default/files/2021-12/1._final_determination_-_integrating_energy_storage_systems_into_the_nem.pdf, accessed 3 October 2022.
[19] ESV consultation.
[20] See definitions of these terms in the Key terms and definitions section.
[21] An SO is defined under section 83B of the Act to mean an operator of an at-risk electric line that does not include a MEC. An at-risk electric line is a defined term that means an electric line (other than a private electric line) that is above the surface of land, and is in a HBRA as defined under the Act. Any operator of an at-risk electric line is automatically specified for the purposes of the bushfire mitigation provisions.

Figure 1 Victorian electricity industry 'Specified Operator' participants



1.1.2 Victoria's electricity distribution sector

Victoria's electricity network is made up of the high voltage transmission network and medium to low voltage distribution network. The electricity distribution sector is made up of five major electricity businesses, each of which own and manage elements of the electrical network infrastructure (Table 1-1). Due to their service area location, Powercor and AusNet Services managed distribution networks tend to have the highest exposure to bushfire risk as their networks are predominantly located in HBRAs.

Table 1-1 Victoria's electricity distribution network

Business/Service area (km^2)	Customers (No.)	Powerline (overhead and underground cable)	Poles (approx. No.)	HBRA (%) (where stated, by pole population or geographic area)
Powercor (145,700km^2) (distribution in orange) 	844,000 customers (86% residential)	**77,900 km** (68,700 km overhead, 9,200km underground) (92% rural)	**589,100 poles** (489,000 poles, 100,100 public lighting poles)	51% of poles in HBRA (300,441)
AusNet Services (80,000 km^2) 	760,000 customers (90% residential)	**45,800** (38,200 km overhead, 7,600 km underground) (93% rural)	**430,600 poles** (333,200 power poles, 97,400 public lighting poles)	54% of poles in HBRA (220,135 poles)
United Energy (1,472 km^2)	640,000 customers	**13,930 km** (9,920 km overhead,	**204,300 poles** (168,500 poles and	60% geographic area

Business/Service area (km²)	Customers (No.)	Powerline (overhead and underground cable)	Poles (approx. No.)	HBRA (%) (where stated, by pole population or geographic area)
	(90% residential)	4,010 km underground) (25% rural)	35,000 public lighting poles)	(122,580 poles in HBRA)
CitiPower (157km²) 	332,000 customers (85% residential)	**5,250km** (2,550km overhead line, 2,700km underground) (75% CBD)	**57,800 poles** (48,800 power poles, 9,000 public lighting poles)	0%
Jemena (950km²) 	350,000 customers (89% residential)	**6,700km** (4,500km overhead line, 2,200km underground) (74% urban)	**122,300** poles (93,600 power poles, 28700 public lighting poles)	59% geographic area (72,157 poles in HBRA)
Total: 228,279km²	-	Total: 149,580 km (17% underground cable)	Total: 1,404,100 poles	

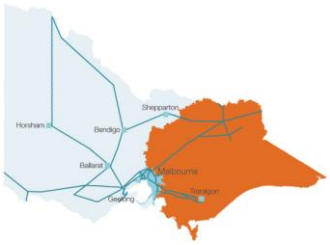
Source: Customer data from company websites, as at 12 September 2022. HBRA from company BMPs where available on their website; AusNet Services obtained from ESV report: AusNet Services Wood Pole Management: A review of sustainable wood pole safety outcomes. All other images and information sourced from ESV (2021), Safety performance report on Victorian electricity networks.

1.1.3 Victoria's electricity transmission sector

Once electricity is generated at a power station, it is transported to load centres in metropolitan and regional areas by a network of high voltage transmission lines (Table 1-2). Lower voltage distribution networks transport it from the transmission lines to customers. Victoria's 6,000 kilometre high-voltage electricity transmission system is owned and maintained by AusNet Services.

Table 1-2 Victoria's electricity transmission network

Business	Voltages	Powerline Length (km)	No. towers
AusNet Services (transmission lines in blue)	• 500kV AC and 220kV AC transmission across Victoria • 330kV AC on interconnector to NSW	6,560 km	13,200

Business	Voltages	Powerline Length (km)	No. towers
	• 275kV AC on interconnector to SA		
Basslink 	• 3.2km of 500kV AC overhead line • 57.4km of 400kV DC overhead line • 6.6km of 400kV DC underground cable	66.6 km	142
TransGrid 	• Operates and manages high voltage electricity transmission network in NSW and ACT; assets servicing specific customer projects in Victoria • Deer Park Terminal Station, Kiamal Terminal Station, Berrybank Terminal Station, Zone Substation	7.5km (220kv overhead transmission line from Berrybank Terminal Station to Berrybank Zone Substation).	Unknown
Australian Energy Operations (formally Transmissions Operations Victoria) 	• 132kV from Mt Mercer wind farm to Elaine Terminal Station	22km (132kV powerline)	2-3 % of towers and poles AusNet Services owns and maintains

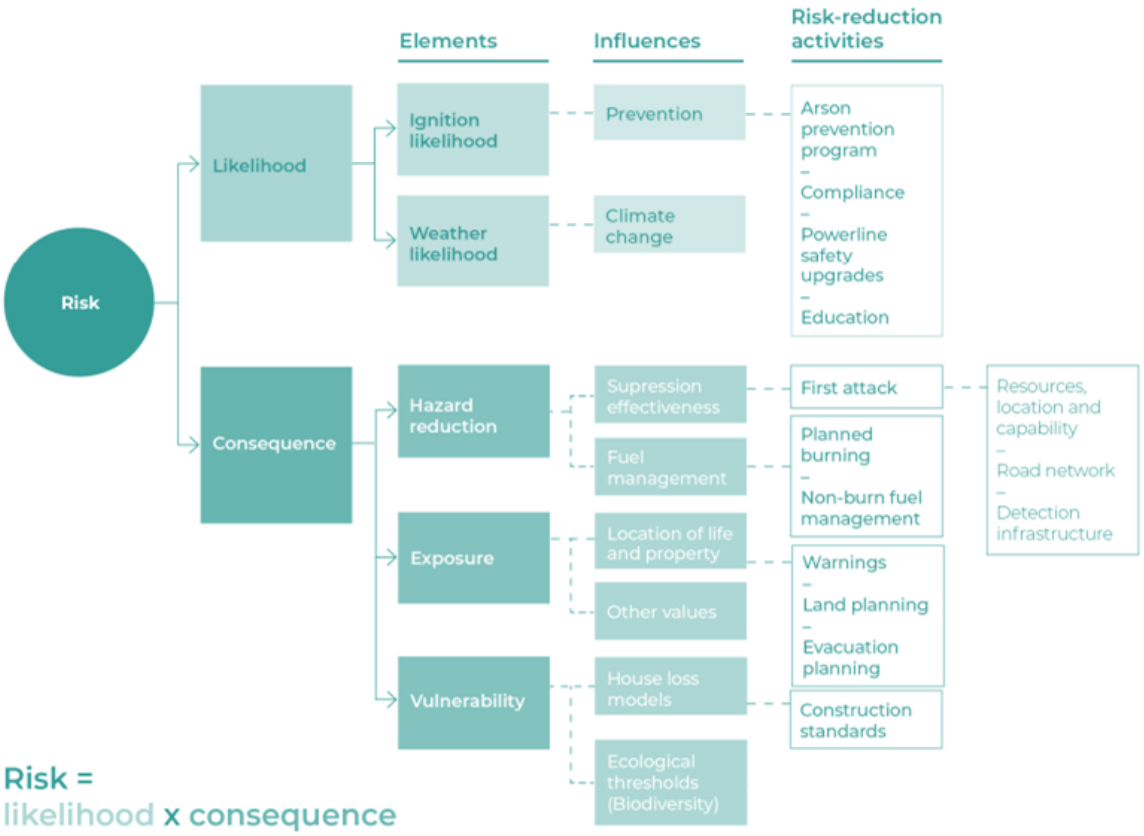
Source: Images and information sourced from ESV (2021), Safety performance report on Victorian electricity networks.

1.2 Legislative framework and related reforms

Bushfire risk is a combination of the likelihood of a fire igniting and spreading, and the consequences that the fire would have on people, property and the environment.

Victoria's bushfire risk reduction strategies (Figure 2) are underpinned by its electrical safety regulatory framework, as well as a suite of policies and programs that are aimed at reducing both the likelihood and consequence of bushfire ignitions, including from electrical assets.

Figure 2 Bushfire risk and risk reduction strategies



Source: Victorian Auditor-General's Office, Reducing Bushfire Risks, October 2020.

1.2.1 Victoria's electricity safety regulatory framework

The Regulations are part of Victoria's broader electricity network safety framework and work holistically together to minimise potential risks associated with the supply of electricity. Protecting the community from injury or death caused by electrocution or from the dangers posed by bushfires starting from electrical infrastructure is a key objective of the safety framework.

Victoria's electricity network safety framework is a mixture of prescriptive requirements and systems, and outcomes-based regulation and incentives. It has evolved over the past three decades to respond to the privatisation of the electricity industry, and in response to major bushfires.

1.2.1.1 Regulatory framework

Table 1-3 provides an overview of the regulatory settings along with key elements of the framework specifically addressing bushfire risk reduction in relation to Victoria's electricity networks.

Table 1-3 Current Victorian legislation related to bushfire risk reduction for the electricity distribution network

Legislation	Description and scope
Electricity Safety Act 1998	The Act regulates the safety of the electricity network and corresponding regulations that govern safety of the network. Links to bushfire mitigation: The Act contains multiple provisions to promote bushfire mitigation across electricity supply networks and electric lines and ensures compliance with these provisions through penalties. The Act requires each MEC and SO design, construct, operate, maintain and decommission its supply network (MEC) and at-risk electric lines (SOs) to minimise the following as far as practicable: • hazards and risks to the safety of any person; • hazards and risks of damage to the property of any person; and • the bushfire danger arising from their respective supply network and at-risk electric lines.

Legislation	Description and scope
	The Act requires all MECs to have an Electricity Safety Management Scheme (ESMS) that has been accepted by Energy Safe Victoria for each of their supply networks before it commences to commission or operate that supply network.
Electricity Industry Act 2000	The *Electricity Industry Act 2000* regulates the electricity supply industry in Victoria, placing requirements on those who generate, transmit, distribute, supply or sell electricity to obtain a licence from the Essential Services Commission (ESC) of Victoria or a licence exemption. The Act requires the ESC to promote the development of full retail competition and promote customer protections. Key provisions under this Act include a consumer safety net for customers.[22]
Energy Safe Victoria Act 2005[23]	The *Energy Safe Victoria Act 2005* enacted the establishment of Energy Safe Victoria as an independent statutory entity. ESV is Victoria's independent safety regulator of electricity, gas and pipeline safety across the State.[24]
Electricity Safety (Bushfire Mitigation) Regulations 2013[25]	The objective of the Electricity Safety (Bushfire Mitigation) Regulations 2013 is to make provision for the preparation of bushfire mitigation plans by SOs and MECs, and the inspection of overhead electric lines and supply networks. The Regulations specify the inspection requirements of overhead private electric lines and supply networks by MECs, including frequency, timing and other specifications to ensure the safety of the electricity network and mitigate the likelihood of bushfire ignition risk from electricity assets. These regulations have been made under sections 151, 151A and 157 of the Act. **Links to bushfire mitigation:** The BMP sets out how the MEC or SO will manage the bushfire risk presented by its networks and demonstrate to ESV how they will undertake capital improvements to improve network bushfire safety. The Regulations address recommendations 28 and 29 from the VBRC, taking action to include prescriptive requirements relating to inspection frequency of electricity assets and particulars for distributors' and operators' BMPs to improve inspection standards. Section 113A of the Act states that the BMP must "include the prescribed particulars", which are set out in the Regulations. A MEC must not operate a supply network unless a BMP has been accepted (or provisionally accepted) by ESV and the MEC complies with the BMP. Prior to considering whether to accept a BMP, ESV may require the BMP to be validated by an independent party. ESV must accept a BMP if it is satisfied that the BMP is appropriate for the "at-risk electric lines to which it relates". ESV may determine a BMP to apply to the MEC's supply network if an ESMS has not been submitted by the MEC or not accepted by ESV. The provisions relating to the revision of ESMSs also apply to BMPs
Electricity Safety (Bushfire Mitigation Duties) Regulations 2017[26]	The objective of the Electricity Safety (Bushfire Mitigation Duties) Regulations 2017 is to facilitate civil penalty provisions in Part 10A of the Act. **Links to bushfire mitigation:** The regulations prescribe certain matters for the purposes of Part 10A of the Act which places prescriptive bushfire mitigation duties on MECs.
Electricity Safety (General) Regulations 2019	The Electricity Safety (General) Regulations 2019 came into force on 6 December 2019. They set out new requirements and obligations on electricians, employers of electricians, registered electrical contractors and licensed electrical inspectors. This included prescribing methods and material quality and use to be followed in carrying out electrical installation work, providing for the testing and certification of electrical installation work, standards for design, construction, operation and maintenance of various electrical installations, and to protect individuals and property from risks associated with the distribution and use of electricity. **Links to bushfire mitigation:** Division 8 of Part 2 of these regulations specify requirements related to the construction of private electric lines in HBRA. This includes a requirement under regulation 234 to place constructed and substantially reconstructed private electric lines located in HBRA underground, and under regulation 237 for emergency restoration of private aerial lines in HBRAs. Regulation 506 under Division 2 of Part 5 of the regulations also sets out the maintenance duties related to private aerial line maintenance.

[22] Department of Environment, Land, Water and Planning (2017), Review of Victoria's Electricity Network Safety Framework – Issues Paper, pages 2-24, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/4914/9118/2983/Issues_Paper_-_Review_of_Victorias_Electricity_Network_Safety_Framework.pdf, accessed 5 September 2022.
Electricity Industry Act 2000 (Vic), available at Electricity Industry Act 2000 (legislation.vic.gov.au)
[23] Department of Environment, Land, Water and Planning (2017), Review of Victoria's Electricity Network Safety Framework – Issues Paper, pages 2-24, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/4914/9118/2983/Issues_Paper_-_Review_of_Victorias_Electricity_Network_Safety_Framework.pdf, accessed 5 September 2022.
[24] Energy Safe Victoria (2022), *Energy regulatory framework*, [online] Available at: https://esv.vic.gov.au/about-esv/energy_regulatory_framework/, accessed 5 September 2022.
[25] Electricity Safety (Bushfire Mitigation) Regulations 2013 (Vic) s. 1-13, available at: Electricity Safety (Bushfire Mitigation) Regulations 2013 (legislation.vic.gov.au)
[26] Electricity Safety (Bushfire Mitigation Duties) Regulations 2017 (Vic), available at: Electricity Safety (Bushfire Mitigation Duties) Regulations 2017 (energy.vic.gov.au)

Legislation	Description and scope
Electricity Safety (Management) Regulations 2019[27]	The Electricity Safety (Management) Regulations 2019 outline the content requirements that must be met for the acceptance of ESMS, which are a non-prescriptive form of regulation that enable industry to improve on the efficiency of business operations without compromising safety standards.[28] These regulations have been made under sections 150 and 157 of the Act. **Links to bushfire mitigation:** Part 10 of the Act states that an electricity distributor's ESMS must include a plan for the mitigation of bushfire danger in relation to the MEC's supply network.
Electricity Safety (Electric Line Clearance) Regulations 2020[29]	The Electricity Safety (Electric Line Clearance) Regulations 2020 prescribe the Code of Practice for Electric Line Clearance which sets out the requirements for the electric line clearance and removal of trees in the vicinity of electric lines, with standards and practices in place to protect the health of trees. These regulations also require some responsible persons to prepare and comply with electric line clearance plans. These regulations have been made under sections 151, 151A and 157 of the Act. **Links to bushfire mitigation:** Trees represent a significant hazard to electrical asset networks and have historically been the cause of electrical fires. Electric Line Clearance Management Plans detail the procedures required to inspect and maintain clearance of vegetation in accordance with the Regulations and are often referenced in BMPs as a critical control and may therefore form a part of the BMP and by extension, the ESMS.
National Electricity (Victoria) Act 2005	On 14 October 2010, the Energy and Resources Legislation Amendment Act 2010 amended the National Electricity (Victoria) Act 2005 (NEVA) to introduce an 'f-factor scheme'. **Links to bushfire mitigation:** The f-factor Scheme Order 2011 under the NEVA was published to provide incentives for Distribution Network Service Providers to reduce the risk of fire starts due to electricity infrastructure, and to reduce the risk of loss or damage caused by fire starts. The scheme works by rewarding distribution businesses for reducing the number of fire starts compared to their targets and penalising them if they go above their targets. The 2016 f-factor Scheme Order which revoked the previous 2011 f-factor scheme now uses a financial year measurement method to measure fire starts to coincide with the fire season.

1.2.2 Key bushfire risk reduction policies and programs.

The following section provides an overview of the key bushfire risk reduction policies and programs. This includes the Safer Together Program, which brings together communities, fire and land agencies, to collaboratively reduce the risk of bushfire.[30] The section also includes the activities undertaken by the Powerline Bushfire Safety Taskforce.

Safer Together Program

Safer Together aims to reduce the risks of bushfire in Victoria. It involves fire and land agencies working together with communities, combining in-depth local knowledge with the science and technology to reduce bushfire risk on both public and private land. The program was launched by the Victorian Government in late 2015 and has since been led by the Country Fire Authority (CFA) and DEECA (formerly known as DELWP) with the aim of improving collaboration and partnerships, as well as placing greater focus on working with local communities to engage in innovative and effective bushfire prevention and preparedness activities.

The program has evolved into a four-year pilot program with approximately $5 million managed by the CFA annually to conduct fire management programs in joint partnership with DEECA. Under the Safer Together Program, more than $1.25 million is provided to support vegetation management, including preparing and delivering planned burns and mechanical treatments to reduce bushfire ignition risk.

Fuel management is one of the actions under the program to protect lives, homes, the economy and the environment. From 1 July 2016, DEECA introduced a risk reduction target to maintain bushfire risk at, or below, 70 per cent of Victoria's maximum bushfire risk.[31] The target is tied to fuel management treatment programs on public land. This target recognises that there will always be a level of risk for a bushfire, with the

[27] Electricity Safety (Management) Regulations 2009 (Vic), available at: https://content.legislation.vic.gov.au/sites/default/files/1bf1ab1f-4388-34cf-b41a-d1da9db9e67d_09-165sra003%20authorised.pdf
[28] Energy Safe Victoria (2022), Electrical Safety Management Schemes, [online] Available at: Electrical Safety Management Schemes – Energy Safe Victoria (esv.vic.gov.au)
[29] Electricity Safety (Electric Line Clearance) Regulations 2020 (Vic) available at: Electricity Safety (Electric Line Clearance) Regulations 2020 (legislation.vic.gov.au)
[30] Victorian State Government DELWP_SaferTogether_FINAL_17Nov15.pdf
[31] Maximum risk: if bushfire risk is 100 per cent this means there has been no fire in the landscape and no fuel reduced and we are at maximum risk where fires will spread and impact.

residual risk being the percentage of risk left over after fuel loads in the forest have been reduced (either through fuel management or bushfire). The 70 per cent target level means that bushfire fuels have been reduced to the point where impacts to life and property are reduced by about one--third of the maximum risk.

In addition to supporting vegetation management, the program also funds a range of coordination and planning advisory roles to ensure the program is delivered effectively, as well as ongoing funding for the Planned Burn Task Force, who plays an important role in engaging volunteers to support planned burning and improve safety, often in joint partnership with Forest Fire Management Victoria[32].

The Safer Together Program also features a joint agency program called Community First, which aims to reduce bushfire risk through community engagement and collaboration with the fire management sector to build partnerships and trust between community and the sector more broadly.

Powerline Bushfire Safety Program (PBSP)

The VBRC recommended the establishment of an expert taskforce to advise on the best means of achieving recommendations 27 (new safer electric assets) and 32 (safer network operations).[33] A Powerline Bushfire Safety Taskforce was established in August 2010 to further consider the most cost-effective way to implement the recommendations.

The Taskforce recommended an accelerated 10-year schedule of works to significantly reduce bushfire risk on the 22kV and SWER network rather than waiting until 22kV distribution feeders reach the end of their engineering lives to replace them with underground or insulated lines, as the Royal Commission suggested.

In December 2011, the Victorian Government agreed to the accelerated approach. The PBSP was established to guide a $750 million investment in works to implement the recommendations and support the upgrading of electricity assets and networks across Victoria, with the aim of improving public safety and reducing risk of bushfire ignition due to electrical failures and accidents.

The Victorian Government funds all the projects under the PBSP (Table 1-4), except for the Network Assets Project (NAP), which customers of participating electricity distribution businesses fund through additional costs on their bills.

Table 1-4 Powerline Bushfire Safety projects

PBSP projects	Description
Powerline Replacement Fund (PRF)	The PRF provided approximately $200 million in funds for MECs to replace bare-wire, overhead powerlines with underground or insulated lines in high bushfire loss consequence areas.[34] The Fund involved replacing SWER powerlines and 22 kV powerlines with insulated and underground cabling, and other technology, including underground replacement of Private Overhead Electric Lines (POELs) in certain regions.
Research & Development Fund	Over 15 research projects, that included field testing Rapid Earth Fault Current Limiters (REFCLs) at 2 zone substations, fire loss consequence modelling and developing new technology and operating measures.
Local Infrastructure Assistance Fund	$40 million program to assure continuous back-up power to residential care facilities, cutting the risk of any disruption to power supplies during extreme bushfire weather conditions.
Network Assets Project (NAP)	Implements recommendations 27 and 32. Consists of works that must be undertaken by electricity companies pursuant to legislative changes implemented in 2016-17. This includes: • Installing REFCLs at 45 zone substations that serve or traverse high bushfire risk areas, enabling the required capacity to be achieved on all 22kV lines originating from those zone substations. In total, REFCLs are expected to be installed at all 45 prescribed substations by 1 May 2023. • Upgrading to new generation automatic circuit reclosers (ACR), which can be remotely controlled and are more sensitive to detecting faults. ACRs are used to stop power when a fault occurs to prevent bushfires. Works under the Network Assets Project are expected to be completed by mid-2023.

[32] CFA (2022), Safer Together – ongoing boost to fire services, available at Safer Together – ongoing boost to fire services | CFA News & Media
[33] See 14 **Error! Reference source not found.**, page 9.
[34] Department of Environment, Land, Water and Planning (2020), Powerline Bushfire Safety Program - Progress Report 2012-2019, available at: Powerline-bushfire-safety-program-Progress-report-2012-19.pdf (energy.vic.gov.au), accessed 12 December 2022.

The PBSP risk profiling model adopted a three-part, precautionary approach to consider the prioritisation of REFCL and ACR upgrades under the NAP. The model considered fire ignition likelihood (on any individual powerline), fire loss consequence (on lives and property, were a fire to originate from a powerline) and fire response complexity (of fighting a fire and protecting people, were a fire to originate from the powerline). Conditions similar to the Ash Wednesday bushfires were used as part of the fire loss consequence modelling. The risk reduction model also estimates the relative reduction in powerline ignition rates achieved when unprotected, high voltage bare-wire powerlines are protected by replacing bare-wire powerlines and installing ACRs and REFCLs – all of which are covered by the Regulations.[35]

While it is impossible to completely eliminate the risk of a bushfire being ignited by high voltage lines, the PBSP will have reduced the relative risk of powerline-ignited bushfires by 48 per cent across the State by the end of 2023, once all remaining in-train initiatives have been completed.[36]

1.3 Electricity Safety (Bushfire Mitigation) Regulations 2013

1.3.1 Overview of the Regulations

The Regulations came into effect on 20 June 2013 and make provisions for the preparation of BMPs by MECs and SOs, and for inspection requirements of overhead private electric lines and supply networks. Under regulation 13(1) of the Regulations, ESV can exempt an MEC or SO from any requirements outlined within the Regulations relating to BMPs and inspection requirements and may impose conditions on the exemption under regulation 13(2).

The following 3 tables provide an overview of the relevant sections within the Regulation and what's required from the SOs and MECs as part of the BMPs, as well as inspection requirements.

Table 1-5 Prescribed requirements for SOs under the Electricity Safety (Bushfire Mitigation) 2013

Regulation 6: Prescribed particulars for BMPs – SOs

1. **Contact details of SO and relevant persons (regulations 6(a) to (d)):** Details (name, address, telephone number, and position) of the SO and responsible persons preparing and carrying out the BMP, and the contact number of the SO's control room in case of an emergency where an action is required by the SO to mitigate danger of the bushfire;
2. **Bushire mitigation policy (regulation 6(e)):** To minimise the risk of fire ignition from its at-risk electric lines;
3. **Bushfire Mitigation Plan objectives and identification of location of at-risk electric lines (regulations 6 (f) to(g)):** Objectives of the plan include achieving the mitigation of fire danger arising from the SO's at-risk electric lines, and a description, map or plan of the land to which the bushfire mitigation plan applies. The map, description, or plan must identify the location of the SO's at-risk electric lines;
4. **Preventative strategies and programs (regulation 6(h)):** To be adopted by the specified operator to minimise the risk of the SO's at-risk electric lines starting fires;
5. **Prescribed inspection requirements of at-risk electric lines (regulations 6(i) to(k)):** Including a plan that ensures they are inspected at regular intervals of no longer than 37 months and details of the processes and procedures to ensure those inspecting such lines have satisfactorily completed an ESV-approved training course and are competent to carry out such inspections;
6. **Operation and maintenance plans for at-risk electric lines (6(l)):** In the event of a fire, during a total fire ban day, and during a fire danger period;
7. **Investigations, analysis and methodology for mitigation of fire ignition risks (6(m)):** From at-risk electric lines;

[35] Kucherhan J (2017), Presentation to Powerline Bushfire Safety Committee – 13 June 2017: Approach to targeting areas/powerlines of high bushfire risk, Powerline Bushfire Safety Program, https://esv.vic.gov.au/wp-content/uploads/2017/06/PBSC_13-06-2017_Minutes_Item-5.1-Public.pdf, accessed 14 October 2022.
[36] Department of Environment, Land, Water and Planning (2020), Powerline Bushfire Safety Program - Progress Report 2012-2019, available at: Powerline-bushfire-safety-program-Progress-report-2012-19.pdf (energy.vic.gov.au), accessed 5 September 2022.

8. **Monitoring and auditing (6(n)):** Details of the processes and procedures for monitoring and auditing implementation of the BMP, identifying deficiencies in the plan or its implementation and making changes to rectify it accordingly, and monitoring and auditing the effectiveness of inspections carried out under the plan; and
9. **Assistance in fire control authority investigations (6(o)):** SOs' policy on assistance to be provided to fire control authorities in the investigation of fires near the SO's at-risk electric lines.

Table 1-6 Prescribed requirements for MECs under the Electricity Safety (Bushfire Mitigation) 2013

	**Regulation 7: Prescribed particulars for BMPs – MECs**

1. **Contact details of MEC and relevant persons (7(1)(a) to (da):** Details (name, address, telephone number, and position) of the MEC and responsible persons preparing and carrying out the BMP, the contact number of the MEC's control room and a contact number the public can call in case of an emergency where an action is required by the MEC to mitigate bushfire danger;
2. **Bushfire mitigation policy (7(1)(e)):** To minimise the risk of fire ignition from its supply networks;
3. **Bushfire Mitigation Plan objectives and identification of land on which the BMP applies (7(1)(f) to(g)):** Objectives of the plan to achieve the mitigation of fire danger arising from the supply networks, and a description, map or plan of the land to which the bushfire mitigation plan applies;
4. **Preventative strategies and programs (7(1)(h) and 7(1)(ha), (hb), (hc) and (hd)):** To be adopted by the MEC to minimise the risk of the MEC's supply networks starting fires;
5. **Prescribed inspection requirements of MEC supply networks (7(1)(i) to (k)):** Including a plan that ensures the parts of the MEC's supply networks located in HBRA are inspected at regular intervals of no longer than 37 months, with Low Bushfire Risk Areas (LBRA) inspected at intervals not exceeding 61 months, details of the processes and procedures to ensure those inspecting MEC assets and private electric lines have satisfactorily completed an ESV-approved training course and are competent to carry out such inspections;
6. **Operation and maintenance plans for MEC supply networks (7(1)(l)):** In the event of a fire, during a total fire ban day and during a fire danger period;
7. **Investigations, analysis and methodology for mitigation of fire ignition risks (7(1)(m)):** From MEC supply networks;
8. **Monitoring and auditing (7(1)(n)):** Details of the processes and procedures for monitoring and auditing implementation of the BMP, identifying deficiencies in the plan/implementation of the plan and making changes to rectify it accordingly, and monitoring and auditing the effectiveness of inspections carried out under the plan;
9. **Assistance in fire control authority investigations (7(1)(o)):** MECs' policy on assistance to be provided to fire control authorities in the investigation of fires near the MEC's supply network;
10. **Processes and procedures for enhancing public awareness (7(1)(p)):** Details of the processes and procedures for enhancing public awareness of the responsibilities of private electric line owners that are above the surface of the land in relation to maintenance and mitigation of bushfire danger, and obligations of MECs to inspect private electric lines within its distribution area that are above the surface of the land;
11. **Measures to be used in assessing performance (7(1)(q)):** Description of the measures to be used to assess the performance of the MEC under the plan; and
12. **Prescribed range of information about BMPs (7A):** To be made publicly available by MECs.

Table 1-7 Prescribed requirements for private electric lines under the Electricity Safety (Bushfire Mitigation) 2013

 **Regulations 8-12: Inspections of overhead private electric lines**

Regulation 8: Prescribed parts of electric lines excluded (from the inspection requirement under section 113F(1) of the Act)**:** The prescribed part of a private electric line is the part of the private electric line that is installed after the point at which the line is connected to a building or other structure (not including a pole) on the land.

Regulation 9: Prescribed times of inspection of overhead private electric lines for MECs: are no later than 37 months after the previous inspection date where the lines are located in HBRA (reg 9(a)), and 61 months after previous inspection date for lines located in LBRA (reg 9(b)).

Regulation 10: Prescribed standards of inspection of overhead private electric lines:

1. Proper securing and serviceability of private electric line components (10(1)(a) to (e)), and requirements for the condition of private electric line poles (10(1)(f) to (j));
2. Compliance with the Code of Practice for Electric Line Clearance (10(1)(k) and (l)): Ensuring that private electric lines are compliant with Clause 3 of the Code, and that if during an inspection a hazard tree is identified, the hazard tree is notified to the responsible person; and
3. Compliance with the Australian/New Zealand Wiring Rules (10(1)(m)): ensuring that the lines comply with the minimum clearance requirements set out in Table 3.8 of the Australian/New Zealand Wiring Rules.

Regulations 11 and 12: Prescribe the period and form of notice to be given for inspections.

1.3.2 Authorising provisions under the *Electricity Safety Act 1998*

MECs and SOs have a general duty to minimise the likelihood of bushfire danger. MECs have a general duty to design, construct, operate, maintain and decommission their supply network to minimis, as far as practicable, the hazards and risks to the safety of any person arising from its supply network and the hazards and risks of damage to the property of any person arising from its supply network and the bushfire danger arising from its supply network (s.98 of the Act). SOs have a general duty to design, construct, operate, maintain and decommission at-risk electric lines to minimise as far as practicable the bushfire danger arising from that line (s.83B of the Act). Both MECs and SOs also have a duty to submit BMPs for acceptance and to comply with their BMPs. Penalties apply if MECs (including distribution businesses) and SOs do not comply with their respective obligations under the Act.

In addition, section 99 of the Act requires all MECs to submit a mandatory ESMS for acceptance by ESV for each of their supply networks, before it commences, to commission or operate that supply network. For MEC supply networks, an ESMS must incorporate a plan for the mitigation of bushfire danger, explaining a link to the BMP and electric line clearance management plan of the MEC as particular controls[37] (S.99 (2A)).

Under the Act, MECs are unable to operate a supply network between 1 November and 31 March unless a BMP has been accepted (or provisionally accepted) by ESV.

Table 1-8 sets out the key provisions of the Act, and corresponding parts of the Regulations, that specify requirements for submission and acceptance of BMPs for MECs and SOs, and for the inspection of overhead private electric lines.

Table 1-8 Provisions of the Act and corresponding Regulations setting out BMP and inspection requirements.

Bushfire Mitigation Requirements for SOs and MECs prescribed under the Act	Corresponding requirements under the Regulations
83BA (2)(b) Submission of bushfire mitigation plans for acceptance: Under Section 83BA of the Act, SOs are required to prepare and submit a BMP in relation to the operator's at-risk lines to ESV before 1 July each year.	**Regulation 6 Prescribed particulars for bushfire mitigation plans—specified operators:** Details the required information necessary for a compliant SO BMP.

[37] Energy Safe Victoria (2019), Electricity Safety Case (ESMS) Preparation and Submission Guideline for MECs, available at: ESMS Guideline for MECs 2019 (FINAL) 20191112.docx (esv.vic.gov.au)

Bushfire Mitigation Requirements for SOs and MECs prescribed under the Act	Corresponding requirements under the Regulations
113A (2)(b) and (3) Submission of bushfire mitigation plans for acceptance (MECs) Section 113A of the Act requires MECs to prepare and submit to ESV a plan for the business' proposals for mitigating bushfire ignition risk within their supply network, known as a BMP at the end of each period of five years commencing on the date of acceptance or most recent acceptance of a revision.	**Regulation 7 Prescribed particulars for bushfire mitigation plans – major electricity companies:** Details the required information necessary for an MEC to have a compliant BMP. **Regulation 7A Prescribed information about bushfire mitigation plans to be made publicly available by major electricity companies:** Details the information required to be made publicly available by MECs from an accepted BMP.
113F Inspection of overhead private electric lines A MEC that has a distribution area must cause an inspection to be carried out at such times as are prescribed, and in accordance with the prescribed standards (if any), of private electric lines that are above the surface of land within its distribution area, other than any prescribed parts of those lines.	**Regulation 8 Prescribed parts of electric lines excluded:** Specifies that parts of the electric line installed after the point at which the line is connected to a building or other structure (not including a pole) on the land is not required to be inspected. **Regulation 9 Prescribed times of inspection:** Specifies the frequency of inspection required. **Regulation 10 Prescribed standards of inspection:** Sets out the standards an overhead private electric line is required to meet when inspected. **Regulation 11 (Prescribed period in which notice of inspection is to be given) and Regulation 12 (Prescribed form of notice to be given before inspection)**: Identify the period within which notice of inspection is to be given before the inspection of a private electric line is carried out, as well as the form of notice to be given.
In 2016, amendments to the Regulations mandated that: • Each polyphase electric line originating from a selected zone substation of an MEC has the required capacity (section 120M of the Act); • From 1 May 2023, each polyphase electric line originating from each prescribed zone substation of an MEC has the required capacity (section 120M of the Act); • MECs must ensure that, before 1 May 2023, they install new generation ACRs on the entire 30,000 km SWER network (section 120O of the Act). This was later supported by Amendments to the Act in 2017 through the *Electricity Safety Amendment (Bushfire Mitigation Civil Penalties Scheme) Act 2017* and the making of the Electricity Safety (Bushfire Mitigation Duties) Regulations 2017.	**Regulation 7(1)(ha), (hb), (hc), (hd):** Prescribed particulars for bushfire mitigation plans – major electricity companies. **Regulation 7A(fa), (fb):** Prescribed information about bushfire mitigation plans to be made publicly available by major electricity companies

1.3.3 Amendments to the Regulations

The Regulations in their current form have supported the implementation of VBRC recommendations. Since their introduction in 2013, they were updated to implement VBRC recommendation 27, following the PBSP Final report, and have undergone non-substantive amendments to align with the Electricity Safety (Electric Line Clearance) Regulations 2020.[38] These amendments are described at a high level in Table 1-9.

Table 1-9 Overview of amendments to the Regulations

S.R. No.	Effective date	Description
50/2020	27/06/2020	In force. Consequential, minor amendments to substitute references to reflect the commencement of the Electricity Safety (Electric Line Clearance) Regulations 2020.
32/2016	01/05/2016	The amendment made provision for requirements for MECs to increase safety standards on specific components of their networks in order to reduce bushfire risk.

[38] ACIL Allen Consulting (2015) Regulatory Impact Statement, Bushfire Mitigation Regulations Amendment, Report to Department of Economic Development, Jobs, Transport and Resources. DELWP (2020) Powerline Bushfire Safety Program, Progress Report 2012-19.

S.R. No.	Effective date	Description
		They gave effect to a Powerline Bushfire Safety Taskforce recommendation for electricity distributors to implement the VBRC recommendation 27, including: a. installing new generation protection devices to instantaneously detect and turn off power at a fault on high fire risk days on SWER powerlines in the next five years (new generation SWER ACRs) and on 22kV powerlines in the next 10 years (REFCLs); and b. targeted replacement of SWER and 22kV powerlines with underground or insulated overhead cable, or conversion of SWER to multi-wire powerlines, in the next 10 years.
68/2015	29/06/2015	Amendments related to section 113A(3) of the Act and the inspection of overhead private electric lines. This included prescribing information about bushfire mitigation plans to be made publicly available by MECs (section 7(A) of the Regulations) and, in the case of an overhead private electric line that is horizontally constructed with bare open wire conductors, that a low voltage conductor spreader is fitted to each span of the line (section 10(1)(d) of the Regulations).
67/2015	28/06/2015	Consequential amendments related to the commencement of the Electricity Safety (Electric Line Clearance) Regulations 2015. This included prescribing under section 10(1)(k) of the Regulations that the standard for inspections of a private line include that the line complies with clause 3 of the Code of Practice for Electric Line Clearance in the Schedules to the Electricity Safety (Electric Line Clearance) Regulations 2015 (since amended to 2020).
62/2013	20/06/2013	The Regulations were introduced, remaking the Electricity Safety (Bushfire Mitigations) Regulations 2003. The main substantive provisions of the Regulations are that they specify the required content of the BMPs that MECs and SOs must submit to Energy Safe Victoria and that they require the inspection of electrical transmission and distribution equipment located in hazardous bushfire risk areas by qualified inspectors at least every 37 months. The Regulations revoked the: • Electricity Safety (Bushfire Mitigation) Regulations 2003; • Electricity Safety Amendment (Bushfire Mitigation) Regulations 2011; and • Electricity Safety (Bushfire Mitigation) Amendment Regulations 2012.

1.3.4 Regulatory framework roles and responsibilities

Managing bushfire risk is a shared responsibility between multiple agencies across different levels of government, communities and individual landowners. Government agencies play key roles in reducing the likelihood of bushfire's starting and lessening their impact.

1.3.4.1 Energy Safe Victoria

ESV is a statutory body established by the *Energy Safe Victoria Act 2005* which aims to prevent harm across Victoria's energy sector by regulating the safety, reliability and security of Victoria's electricity supply networks through enforcement of compliance with the State's energy safety legislative framework comprised of the Act and a broader suite of regulations, including the Regulations.[39] On 1 January 2021, ESV became the Victorian Energy Safety Commission, although it will continue to be known as ESV.

1.3.4.2 Department of Energy, Environment and Climate Action

DEECA has a primary responsibility within the energy sector to advise the Minister and government on the policy framework surrounding electricity safety regulation. DEECA also holds the primary responsibility for development of legislation relating to electricity safety that is then administered by ESV as the safety regulator. DEECA is also responsible for overseeing and delivering the PBSP and other electricity safety

[39] Energy Safe Victoria (2022), Legislation and Regulations, available at: Legislation and regulations – Energy Safe Victoria (esv.vic.gov.au)

programs, as well as providing ESV with policy inputs into safety matters relating to the use and supply of electricity, and support for ESV's corporate governance oversight.[40]

1.3.4.3 Country Fire Authority[41]

CFA plays an important role in supporting the preparedness of electricity distribution businesses and the community for bushfires caused or exacerbated by electrical assets.

To help understand and address bushfire risk across the State, CFA maintain a geographic information system (GIS) database that classifies various areas of land as having a fire hazard rating of low or high. Areas classified as high are defined as being HBRA for the purposes of the Act. These land classifications support risk awareness and bushfire preparedness, as well as directing the appropriate allocation of prescribed particulars for BMPs and inspection requirements under the Regulations to help ensure accountability for those responsible for at-risk lines in HBRAs. CFA is currently undertaking a review of fire hazard boundaries with the work funded by the distribution businesses. In the future, this will be incorporated into the ESV levy to ensure ongoing funding for this program.

CFA also cooperates with ESV and DEECA to support the sector in its bushfire mitigation and preparedness efforts by providing advice and recommendations to ESV and DEECA on the Regulations and proposed regulatory amendments.

1.3.4.4 Fire Rescue Victoria[42]

Fire Rescue Victoria (FRV) is a statutory authority established under the *Fire Rescue Victoria Act 1958* on 1 July 2020 as part of Victoria's Fire Service Reforms to deliver a modern, safe and sustainable fire and rescue service to the community. Under this Act, FRV is required to perform its functions and exercise its powers to contribute to a whole-of-sector approach to emergency management, provide operational and management support to CFA to deliver services within the country area of Victoria, and respond to requests from other States or Territories for assistance in preventing or suppressing fires or protecting life and property in those jurisdictions. FRV plays an active role in bushfire safety and mitigation by collaborating and coordinating with CFA and other partner fire services agencies to best meet the safety needs of the Victorian community. It also drives systemic change to the built environment through reforms to building design, regulations and legislation, and educates the community through fire prevention programs that improve community safety and build resilience. FRV's role in the State's bushfire risk reduction activities is expected to become more important as rapid urban expansion continues in Victoria, with more of the population living across Melbourne's rural-urban fringe zones, encroaching bushland and previously at-risk areas.

1.3.4.5 Forest Fire Management Victoria[43]

Forest Fire Management Victoria works alongside CFA, FRV and ESV to conduct public land management and vegetation clearance near electricity lines in accordance with the Code of Practice for Electric Line Clearance to support bushfire risk management.

1.3.4.6 Local Councils[44]

Local councils play an important role in conducting bushfire risk mitigation functions and working with emergency services and emergency management organisations to provide community awareness, identify hazards and risks in local areas to report to relevant authorities and industry bodies, implement risk management strategies and actively participate in bushfire mitigation activities (such as land use planning and vegetation management). Local councils also play an integral role in supporting communities and emergency management responses and recovery efforts in the unfortunate event that a bushfire occurs.

[40] Department of Environment, Land, Water and Planning (2017), Review of Victoria's Electricity Network Safety Framework – Issues Paper, pages 2-24, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/4914/9118/2983/Issues_Paper_-_Review_of_Victorias_Electricity_Network_Safety_Framework.pdf, accessed 5 September 2022.
[41] Country Fire Authority (2022), *Our Mission*, https://www.cfa.vic.gov.au/about-us/our-mission, accessed 6 September 2022.
[42] Fire Rescue Victoria (2021), Annual Report 2020-21, https://www.frv.vic.gov.au/sites/default/files/2021-11/FRV%20Annual%20Report%202020-21.pdf, accessed 20 September 2022/
[43] Forest Fire Management Victoria (2021), Managing Bushfire Risk, available at: Managing bushfire risk (ffm.vic.gov.au), accessed 6 September 2022.
[44] Emergency Management Victoria, State Emergency Management Plan: Role Statement – Municipal Councils, https://www.emv.vic.gov.au/responsibilities/semp/roles-and-responsibilities/role-statements/municipal-councils, accessed 13 September 2022.

1.4 About this RIS (purpose and structure)

In Victoria, regulations sunset (expire) every 10 years from enactment. The Regulations are due to sunset on 18 June 2023. In accordance with the requirements under the SL Act, a RIS must be prepared and consider the impact of different options for replacing the sunsetting Regulations (including re-instatement).

The purpose of this RIS is to identify the impact of the Proposed Regulations on Victorian businesses and the community. It has been prepared in line with best-practice approaches under the *Victorian Guide to Regulation*. The remainder of this RIS report is structured as follows.

- ***Chapter 2 – Nature and extent of the problem*** considers the nature and extent of the problem that the Proposed Regulations are designed to address, the likelihood that electricity distribution powerlines may start bushfires, the costs associated with bushfires, the market and regulatory failures that affect the likelihood that electricity distributors will take action to reduce the bushfire risk from powerlines, and the reduction in public risk if the likelihood that powerlines start bushfires is reduced.
- ***Chapter 3 – Objectives of the intervention*** defines the objective of the government intervention as to reduce the likelihood of bushfire ignitions from electrical assets and at-risk electrical lines in Victoria's HBRAs. This objective is framed to support the intended public safety outcomes, rather than being solution focused.
- ***Chapter 4 – Identification and assessment of options*** identifies a range of options to achieve the objective of the Proposed Regulations and provides an overview of the chosen option analysis method (multicriteria analysis) followed by a detailed assessment of all options that have been shortlisted for consideration.
- ***Chapter 5 – Preferred option*** outlines the objective, details and costs of the Proposed Regulations, which was found to be the preferred option following the options assessment.
- ***Chapter 6 – Implementation, monitoring and enforcement*** outlines the arrangements that will underpin industry notification of the commencement of the Proposed Regulations, including the transition period for the introduced administrative changes, policy and regulatory monitoring, and analysis considerations for emerging sectors (e.g. storage sector) and potential new market entrants.

- **Chapter 7**– ***Evaluation strategy*** provides an overview of how the regulation might be evaluated, including high-level evaluation questions and data sources that might support evaluation activities
  - ***Chapter 8 – Stakeholder consultation*** summarises the outcomes of the consultations undertaken with respect to the RIS and plans for the public consultation period.
  - ***Chapter 9 – Statement of compliance with National Competition Policy*** assesses the competition impacts of the Proposed Regulations against the National Competition Policy.
- Appendix A: The Act and the Regulations
- Appendix B: Proposed Regulations.

2 Nature and extent of the problem

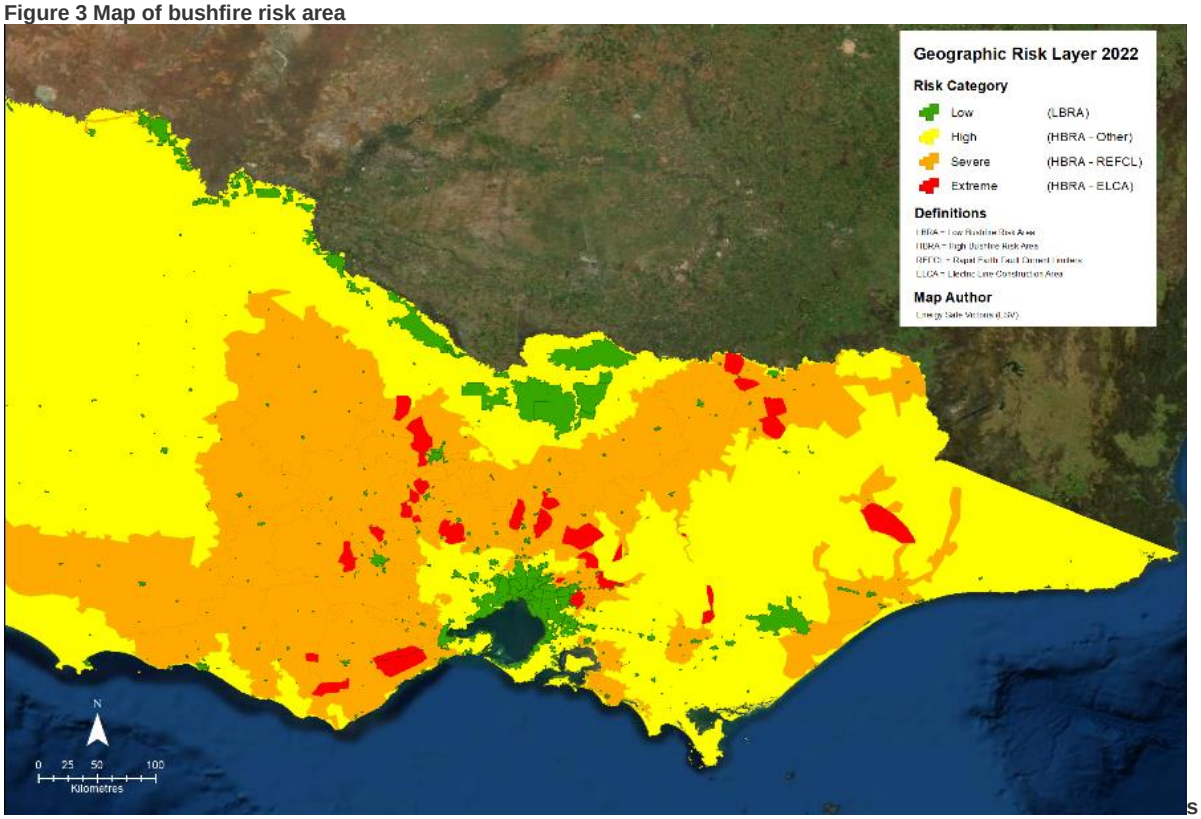
This section considers Victoria's overall risk landscape relating to bushfires, before focusing on the associated consequences of bushfire ignition risk due to electricity assets. As part of the problem definition, this section also considers the need for government intervention and the risks of non-intervention.

2.1 Overall problem

2.1.1 Victoria's bushfire risk landscape

Victoria is one of the most bushfire-prone areas in the world, with 96 per cent of the State classified as a HBRA (Figure 3), and 34 major bushfires having been recorded since 1851.[45]

Figure 3 Map of bushfire risk area



s of Victoria (2022)

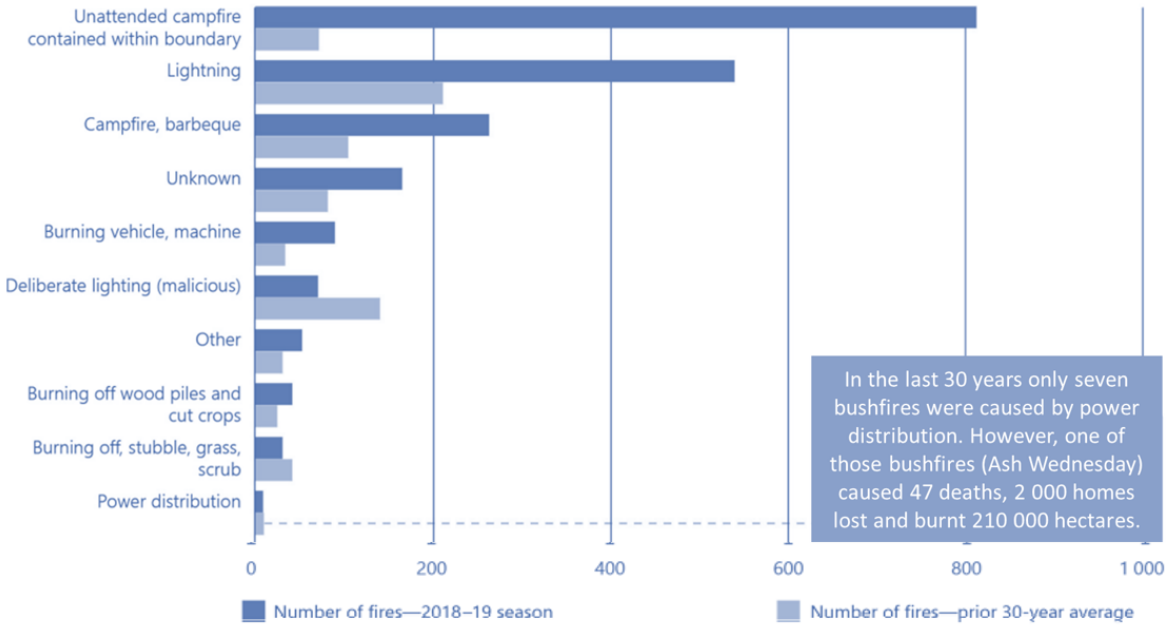
Source: ESV, supplied.

Bushfire risk is comprised of both the likelihood of bushfires occurring and consequences once they start.

All fires need heat, oxygen and fuel to ignite and continue burning. Bushfire ignition can occur from natural or human causes. Bushfires can be accidentally or deliberately ignited, for example, by lightning, arson, controlled burns, campfires, cigarettes, electrical asset faults or flammable chemicals. Figure 4 shows the top 10 bushfire ignition sources in the 2018-19 bushfire season compared to their long-term, historical average. The lightning ignitions have predominantly occurred in the eastern part of the State.

[45] Forest Fire Management Victoria, Past bushfires: A chronology of major bushfires in Victoria, https://www.ffm.vic.gov.au/history-and-incidents/past-bushfires, accessed 10 October 2022.

Figure 4 Bushfire ignition sources in Victoria (2018-19 bushfire season and long-term average)



Source: Adapted from Victorian Auditor-General's Office, Reducing Bushfire Risks, October 2020.

The risk of a fire occurring, and spreading once initiated, depends on a number of variables including the time of year, weather, longer-term climate (for example, drought), and type and curing of vegetation.[46] Bushfires tend to be located in more regional areas and in open areas with grassland vegetation.[47] Forests and woodlands dominated by eucalyptus species are the major vegetation in the coastal and mountainous hinterland areas and are capable of burning at very high intensities (> 50,000 kW/m[48]).[49] Mallee eucalypts in north-western Victoria also burn at high intensities (10,000–50,000 kW/m), while most other areas are either pasture, croplands or shrublands that burn at lower intensities (< 5,000 kW/m) and at lower frequency intervals (between 5–100 years).[50]

Bushfires, once ignited, can be costly, inflicting significant damage and disruption to property and services, with great risks to public safety and wellbeing (Case Study 1).

Case Study 1: 2019-20 Eastern Victoria Bushfires - Socioeconomic impacts of a catastrophic bushfire event

Impacts and consequences of the 2019-20 Eastern Victoria Bushfires

The 2019-2020 Eastern Victoria bushfires were Victoria's largest bushfires since 1939, resulting in significant destruction of the environment, wildlife, local infrastructure and devastating impacts on human life with many communities still recovering.

On 21 November 2019, a total fire ban and Code Red (catastrophic) fire danger conditions were forecast following record high temperatures and warmer and drier than average conditions throughout most of the year. Lightning ignited a series of initial fires in East Gippsland, with intense storm activity causing major power outages, fallen trees and infrastructure damage, and strong winds intensifying the initial blazes. On that day, 150 fires ignited, burning hundreds of thousands of hectares across Victoria's east.

As extreme heat and storm conditions continued throughout the summer period, bushfires continued to burn throughout Victoria through to February 2020, causing devastation and loss of integral property and infrastructure, natural habitats and ecosystems, wildlife, cattle and resulted in five tragic deaths.

[46] Energy Safe Victoria (2019), Safety performance report on Victorian electricity networks October 2019, https://esv.vic.gov.au/wp-content/uploads/2021/11/2021-Safety-Performance-Report-on-Victorian-Electricity-Networks.pdf, accessed 13 September 2022.
[47] Miller C, Plucinski M, Sullivan A, Stephenson A, Huston C, Charman K, Prakash M, Dunstall S (2017), Electrically caused wildfires in Victoria, Australia are over-represented when fire danger is elevated, Landscape and Urban Planning, Volume 167, 2017, pages 267-274, ISSN 0169-2046, https://doi.org/10.1016/j.landurbplan.2017.06.016.
[48] Fire intensity represents the heat released per meter of fire front (kW/m of fire front). Thus, fire intensity is represented as kW/m. Source: Tropical Savannas CRC & Bushfire CRC (2022) available at: Fire Fundamentals: Fire behaviour (cdu.edu.au)
[49] Collins KM, Penman TD, Price OF (2016), Some Wildfire Ignition Causes Pose More Risk of Destroying Houses than Others. PLoS ONE 11(9): e0162083,s https://doi.org/10.1371/journal.pone.0162083.
[50] Ibid.

Impacts and consequences of the 2019-20 Eastern Victoria Bushfires

The 2019-20 fires caused significant fire damage to power infrastructure, with damage to poles, pole-mounted substation sites, and hundreds of kilometres of overhead high voltage powerlines. Essential services including utilities and telecommunications require power to operate. In Victoria alone, 324 telecommunications facilities were impacted by fire, resulting in thousands of customers experiencing power outages averaging 4.6 days throughout the bushfire season.

The biggest consequence of power outages was the loss of communications, hampering emergency relief and response efforts, as most telecommunication towers are connected to electricity by transmission lines. In communities that lost power and communications, it was almost impossible for people to keep up to date with information about the fires, or to provide information to family and friends outside the fire area:

> *After the fire hit all communications went dead. This was an incredibly stressful time. We did not know if people were dead or alive – Community member quote from the IGEM Victoria (2021), Inquiry into the 2019–20 Victorian fire season.*

Table 2-1 below covers the initial direct impacts and costs attributed to the fires across the four emergency management recovery environments, as reported in Bushfire Recovery Victoria's *Eastern Victorian Fires 2019–20 State Recovery Plan*.

Table 2-1 Summary of impacts and costs of Eastern Victorian Fires 2019-20

Social	**Built**
120+ communities impacted **5** fatalities **313** homes damaged or destroyed **1000+** known registered Aboriginal heritage places impacted **1,371** evacuations from Mallacoota	**1,162** buildings destroyed, damaged or closed (including 458 residential, **51** business buildings and community facilities) **742** properties requiring clean-up (June 2020) **6,350km** fencing destroyed **$69m** fencing lost **1,400km** arterial roads closed **324** telecommunications facilities impacted, 4.6 days average lengths of telecommunications outage incidents
Economic	**Natural**
$330-350m lost tourism revenue in bushfire affected regions (Dec 19-Mar 20 period). (DJPR, 2020) **$325m** economic impact on East Gippsland and Northeast Victoria farms through loss and damage of assets (valued at $197m) and production in 2020 valued at $128m (Feb 20). (DJPR, 2020) **56** items of farm infrastructure damaged or destroyed **10,000** livestock lost	**1.5m+** hectares burnt **463,000 ha** National Parks and other Parks Victoria managed land impacted **57%** of State forests burnt in the three most directly hit LGAs **22%** agricultural land in the fire affected area was burnt **170** rare or threatened species have had over 50% of habitat impacted

There were broader indirect impacts of the Eastern Victoria bushfires, with the Victorian Treasury estimating overall welfare losses to Victoria to be $2.1 billion in net present value terms (in real 2017-18 dollars), with indirect impacts far exceeding the direct impacts noted above. The fires caused significant health impacts to the broader Victorian population. Preliminary evaluations revealed bushfire smoke had been associated with 120 excess deaths, 331 hospitalisations for cardiovascular problems, 585 hospitalisations for respiratory problems and 401 emergency department presentations for asthma in addition to the direct devastation caused.

Sources: Australian Institute of Disaster Resilience (2020) Black Summer Bushfires, VIC 2019-20. Bushfire Recovery Victoria (August 2020) Eastern Victorian Fires 2019–20 State Recovery Plan. Department of Treasury and Finance Victoria (2021), Victoria's Economic Bulletin: Volume 5, The economic impacts of the 2019-20 bushfires on Victoria. IGEM Victoria

Impacts and consequences of the 2019-20 Eastern Victoria Bushfires

(2021), Inquiry into the 2019–20 Victorian fire season. Department of Jobs, Precincts and Regions 2020, Victorian 2019-20 Bushfires Regional Business and Economy Recovery Plans (Hume and Gippsland).

2.1.2 Link between bushfire ignition and electricity assets

2.1.2.1 Factors contributing to bushfire starts from electrical assets and lines

Electricity can start bushfires when infrastructure is damaged[51] or foreign objects make contact with powerlines. The maintenance of network assets and related works, such as vegetation clearance, can affect fire starts. Vegetation fires involve the ignition of vegetation on the ground and can be caused by electrical asset contact with trees, animals or cars, or by fires started in an electrical asset. Poorly maintained or degrading assets, including power poles, can also pose a greater fire risk. If the conditions of the day are conducive to fire spread, such ignitions can escalate into bushfires.

ESV does not have a definition of 'bushfire', instead referring to 'ground fires' as any incident that results in a fire at ground level, i.e. there is a sign that grass or other vegetation has ignited. It excludes fires that are contained to electrical assets only, e.g. pole fires. ESV categorises ground fires by their size, Table 2-2.

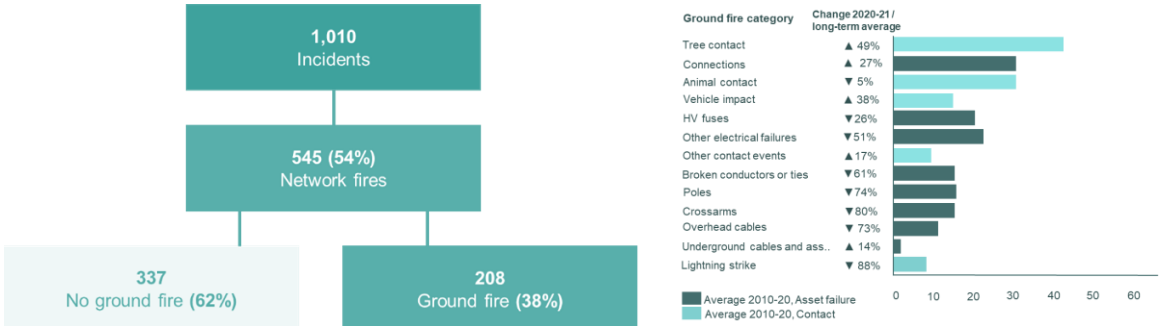
Table 2-2 Ground fire incidents from electrical assets, by fire size (2015-2021)

Fire Size	Proportion
Negligible: no ground fire	45%
Localised: less than 10m^2	20%
Small: 10 - 1000 m^2	24%
Medium: 1000 m^2 - 10 ha	8%
Large: more than 10 ha	3%
Grand Total	**100%**

Source: Supplied by ESV. Based on a sample of 441 reported incidents over a 2015-2021 period.

According to ESV data, in 2020-21, 208 reported fire incidents resulted in ground fire[52] events on Victorian electricity networks operated by MECs (Figure 5). The five most common causes of fires were tree contact, connection faults,[53] animal contact, vehicle impacts, and high voltage (HV) fuses. When compared to the long-term averages (January 2010 to June 2020), asset-related ground fires were lower than the long-term average across all categories apart from connection faults (27 per cent above historical average) and underground cables (14 per cent above historical average).[54]

Figure 5 Ground fire-related incidents reported to ESV occurring on Victorian electricity networks

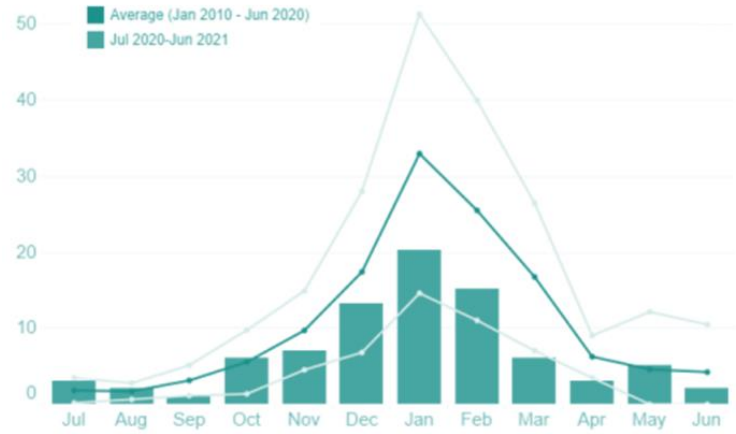


[51] This could include situations where arcs, molten and combusting metal particles are expelled when vegetation contacts wires, and from burning insulation fluids in equipment such as transformers and re-closers.
[52] A ground fire is defined by ESV as any incident that results in a fire at ground level, i.e. there is sign that grass or other vegetation has ignited. It excludes fires that are contained to electrical assets only, e.g. pole fires.
[53] Connection faults include all faults attributed by MECs to all high and low voltage connections, terminations and joints as reported to ESV.
[54] It is noted that MECs have measures aimed at reducing the number of fires caused by electrical assets, including certain types of fuses. Like other control measures, underground cables greatly reduce bushfire ignition risks compared to bare overhead conductors but do not eliminate all risks. Cables most often fail at joints or connection points, which will lead to fire. In most cases, joints will be underground or in pits, so in most cases, there is no risk of that fire resulting in a bushfire. Connections will be above ground, such as on a pole or inside a ground-mounted kiosk, which in some locations could lead to a bushfire.

Source: Adapted from ESV (2021), Safety performance report on Victorian electricity networks.

The key determinant for asset failure is weather. Ground fires from electrical asset failures reported to ESV have typically exhibited strong seasonality, with greater incidence of ground fires occurring over the December – February period (Figure 6).

Figure 6 Seasonality of ground fire incidents reported to ESV due to electrical asset failures



Source: ESV (2021), Safety performance report on Victorian electricity networks.

2.1.2.2 Incidence of electrical bushfire ignition

Compared to other bushfire ignition sources, electric fires represent a lower share of total bushfire events in Victoria. In a recent analysis of 35,109 Victorian fire incidents occurring over the period 1 January 2002 to 31 March 2013, Miller et al (2017) found that electrical fires accounted for only 2.68 per cent of bushfire ignitions, while the largest proportion were attributed to accidental causes, escaped fires and lightning.[55] It found that, although the number of bushfires ignited by electricity is very low, once started they have the potential to burn large areas (Table 2-3).

Table 2-3 Bushfire ignition causes, percentage of all bushfires and area burnt (2003-2013)

Ignition cause	% bushfires	% area burnt
Accidental	29.7	10
Escape	27.4	5
Unknown	17.8	11
Lightning	16.0	46
Arson	6.4	13
Electrical	2.7	14

Source: Miller et al, 2017.

While this result may be skewed by the inclusion of the 2009 Black Saturday bushfires, this pattern also appears in a dataset compiled by Collins et al over a longer time period (July 1951 to June 2015) of bushfires that destroyed houses in New South Wales and Victoria.[56] Analysing the dataset, power lines caused around 20 per cent (n=30) of bushfires with a known ignition source and fire size (n=152). Within powerline fires, 43 per cent (n=13) burnt over 10,000 hectares, a much higher rate than non-natural ignition sources such as deliberately lit fires (25 per cent of total deliberate fires).

Some of Victoria's large-scale bushfire events have been attributed to faults in the electricity distribution network with the majority occurring on days with extreme fire weather conditions. These include nine of the sixteen major 1977 fires (12 February, 1977), four of the eight major Ash Wednesday fires (16 February, 1983) and five of the eleven major Victorian Black Saturday fires (7 February, 2009) were all caused by faults in the electrical distribution network. Two of the Victorian Black Saturday fires that were caused by

[55] Miller C, Plucinski M, Sullivan A, Stephenson A, Huston C, Charman K, Prakash M, Dunstall S (2017), Electrically caused wildfires in Victoria, Australia are over-represented when fire danger is elevated, Landscape and Urban Planning, Volume 167, 2017, pages 267-274, ISSN 0169-2046, https://doi.org/10.1016/j.landurbplan.2017.06.016.

[56] Collins KM, Penman TD, Price OF (2016) Some Wildfire Ignition Causes Pose More Risk of Destroying Houses than Others. PLoS ONE 11(9): e0162083. https://doi.org/10.1371/journal.pone.0162083. Analysis pertains to Table 3 The number of wildfires that destroyed houses from 1951 to 2015 classified by ignition cause and fire size (ha).

faults in the electrical distribution network (Kilmore East and Murrindindi) resulted in the deaths of 159 people.[57]

2.1.2.3 Victorian Black Saturday Bushfires 2009

The devastating 2009 Black Saturday bushfires saw 11 major fires cause destruction across Victoria, five of which were caused by failures in electricity assets (Table 2-4). At the time, the bushfires were ranked amongst the world's 10 most deadly bushfires ever recorded, with the fires resulting in a tragic 173 deaths, a large proportion (approximately 44 per cent) of whom were young children, vulnerable elderly people and individuals with chronic or acute disability.[58]

In the lead up to the event, Victoria had endured one of its most severe heatwaves, with CFA, major bushfire agencies and the then Department of Sustainability and Environment (now DEECA) warning of forests and grasslands being the driest since the Ash Wednesday fires of 1983.

The Black Saturday bushfires started in Kilmore East, where electrical arcing after an old conductor on the Pentadeen Spur line broke[59] and ignited a fire on dry farmland, which then quickly spread through a pine plantation and across the Hume Freeway. Further destructive extreme weather conditions resulted in extreme winds of more than 100 kilometres per hour and storms that greatly intensified the spread of the fires across the State. Extreme winds blew fire embers across neighbouring areas, igniting further spot fires that developed to cause immense devastation and 119 deaths.

On 9 February 2009, the Victorian Government announced the intent to enact a Royal Commission into the fires, which came into effect on 16 February 2009. The VBRC conducted an investigation into the fires, revealing that of the 15 fires caused, five were associated with electricity assets. In particular, the age of electricity assets contributed to three electricity-caused fires on 7 February 2009 – this included the Kilmore East, Coleraine and Horsham fires. [60]

A sixth fire (Murrindindi) was not investigated by the VBRC as it was then under investigation by Victoria Police on suspicion of arson. Victoria Police subsequently concluded that arson was not the cause, and referred the matter to the Coroners Court for inquiry. On 27 November 2015, the Coroners Court found that this fire was also caused by electricity distribution assets.[61] Taking this fire into account, 159 deaths (or 92 per cent of total fatalities) were attributable to electricity distribution assets.[62]

The VBRC acknowledged that, in general, the proportion of fires caused by electricity assets and infrastructure is relatively low within normal circumstances. However, on days with unprecedented and extreme weather conditions, the risk of bushfire ignition due to electrical assets drastically rises.

> *"Electricity-caused fires are most likely to occur when the risk of a fire getting out of control and having deadly consequences is greatest." – VBRC Final Report.*

Table 2-4 Overview of the 2009 Black Saturday bushfires that were identified by the VBRC as being caused by electrical failures

Fire	Link to electrical failure
Kilmore East	The Kilmore East fire was the most devastating during the 2009 Black Saturday bushfires, with 119 fatalities and 232 casualties, 1,242 homes destroyed and over 125,000 hectares of land burnt. The fire began between two gullies in Kilmore East, where a SWER electricity line (conductor) ran across. The conductor failed as a result of fatigue on the conductor strands close to where a helical termination was fitted incorrectly, that a line inspection in 2008 failed to identify. As a result, the conductor came into contact with a cable stay causing arcing that ignited vegetation at the base of the pole.[63]
Beechworth-Mudgegonga	The Beechworth-Mudgegonga fire was discovered to have been caused by a tree falling on a powerline, tragically resulting in two fatalities and 12 casualties, destroying over 38 houses and

[57] ACIL Allen Consulting (2015) Regulatory Impact Statement, Bushfire Mitigation Regulations Amendment, Report to Department of Economic Development, Jobs, Transport and Resources. DELWP (2020) Powerline Bushfire Safety Program, Progress Report 2012-19.
[58] Climate Council (2017), Climate change and the Victoria bushfire threat: Update 2017. http://www.climatecouncil.org.au/uploads/98c26db6af45080a32377f3ef4800102.pdf, accessed 13 September 2022.
[59] Victorian Bushfires Royal Commission (2009), Electricity-caused fire, Vol 2, Chapter 4, http://royalcommission.vic.gov.au/Commission-Reports/Final-Report/Volume-2/Chapters/Electricity-Caused-Fire.html, accessed 13 September 2022.
[60] Victorian Bushfires Royal Commission (2009), 2009 Victorian Bushfires Royal Commission Final Report, various chapters, http://royalcommission.vic.gov.au/Commission-Reports/Final-Report/Summary.html, accessed 13 September 2022.
[61] Victorian Coroners Court, Finding into Fire Without Inquest – Murrindindi (27 Nov 2015), Court Ref 2009/1498
[62] The Murrindindi fires caused 40 deaths, while the Kilmore East fire investigated by the VBRC caused 119 fatalities. If the Beechworth-Mudgegonga fires are included, the total rises to 161 fires (or 93 per cent of total fatalities).
[63] Victorian Bushfires Royal Commission (2009), The Kilmore East fire, Vol 1, Chapter 5, http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter05_PF.pdf, accessed 13 September 2022.

Fire	Link to electrical failure
	burning more than 33,000 hectares of land.[64] The fire ignited on public land in a eucalypt forest, where a tree had fallen on a powerline, pulling the conductor off the supporting insulators. The conductor was energised when it fell and came into contact with another pole surrounded by vegetation at its base, with investigators inferring this event was likely the cause of the fire. The incident resulted in the power supply to Beechworth being cut, constraining communications, reporting and planning for emergency respondents.[65]
Horsham	The Horsham fire was ignited by the failure of a SWER electricity line that failed on a private property, causing a grass fire to occur that then rapidly spread due to the extreme weather conditions on the day. It was highlighted that the pole had not been inspected for around four and a half years, which may have prevented the fire ignition had inspection cycles been shorter.[66] Fortunately, the fire resulted in no fatalities or casualties, however, it did result in the destruction of 13 houses and burnt more than 2,300 hectares of land.[67]
Coleraine	The ignition of the Coleraine fire was also linked to electricity failures, when a SWER electricity line on private farmland failed, causing ignition of nearby grass and trees. The fire burnt across 713 hectares of land. destroying one house, farm infrastructure and local fencing. Fortunately, the fire resulted in no fatalities or casualties.[68]
Pomborneit-Weerite	The Pomborneit-Weerite grassfire was active for approximately five hours, causing damage to livestock, hay, fencing and some private infrastructure as it burnt across over 1,000 hectares of land. Fortunately, there were no fatalities, casualties or homes destroyed in the blaze. The fire occurred due to an electrical fault as the result of the clashing of the 66- and 22kV conductors on the Colac-Camperdown power line, causing emission of molten particles that ignited vegetation near the Prince Highway.[69]

Source: VBRC (2009) Final Report.

The VBRC recommended significant changes to Victoria's electricity distribution network and infrastructure, as well as the operations and management of the system to ensure bushfire risk is mitigated.[70] These changes addressed the inadequacies in electrical assets and networks that contributed to the electrical fires. Specifically, eight recommendations were developed to address the failures and risks that arose relating to electricity infrastructure during Black Saturday, to support policy developments and sector improvements aimed at reducing the risk and likelihood of such catastrophes occurring again. The VBRC proposed a range of requirements on electricity distribution businesses, MECs and SOs to the State (through ESV) in response to identified inadequacies within the then-existing regulatory regime around inspection frequency and standards, asset construction and maintenance, vegetation management surrounding electricity assets, and bushfire mitigation planning (Case Study 2).

The implementation of these recommendations (Table 2-5) has seen the regulatory regime evolve to incorporate more prescriptive requirements relating to inspection standards and BMPs beyond the general requirements set out under the Act. The VBRC viewed the provision of more prescriptive requirements across the electricity safety regulatory regime as necessary to provide the public with greater reassurance that previous electricity asset failures and lack of preparedness from the sector to respond to bushfire risks (as seen in the 2009 Black Saturday bushfires) would not be repeated.

Table 2-5 VBRC Recommendations in relation to electricity-caused fires

Recommendation	Progress to date
Recommendation 27: The State amend the Regulations under *Victoria's Electricity Safety Act 1998* and otherwise take such steps as may be required to give effect to the following:	This has been partially implemented through legislative amendments to the Act[71] and Regulations

[64] Victorian Bushfires Royal Commission (2009), The Beechworth-Mudgegonga Fire, Vol 1, Chapter 14, http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter14_PF.pdf, accessed 13 September 2022.
[65] Victorian Bushfires Royal Commission (2009), The Beechworth-Mudgegonga Fire, Vol 1, Chapter 14, http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter14_PF.pdf, accessed 13 September 2022.
[66] The VBRC subsequently recommended that the State (through ESV) require businesses change their asset inspection standards and procedures to require all 22kV feeders and SWER electricity lines located in HBRA to be inspected at least every three years.
[67] Victorian Bushfires Royal Commission (2009), The Horsham Fire, Vol 1, Chapter 6, http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter06_PF.pdf, accessed 13 September 2022.
[68] Victorian Bushfires Royal Commission (2009), The Coleraine Fire, Vol 1, Chapter 7, http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter07_PF.pdf, accessed 13 September 2022. http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter07_PF.pdf
[69] Victorian Bushfires Royal Commission (2009), The Pomborneit–Weerite Fire, Vol 1, Chapter 7, http://royalcommission.vic.gov.au/Finaldocuments/volume-1/PF/VBRC_Vol1_Chapter08_PF.pdf, accessed 13 September 2022.
[70] Victorian Bushfires Royal Commission (2009), Electricity-caused fire, Vol 2, Chapter 4, http://royalcommission.vic.gov.au/Commission-Reports/Final-Report/Volume-2/Chapters/Electricity-Caused-Fire.html, accessed 13 September 2022.
[71] Electricity Safety Amendment (Bushfire Mitigation Civil Penalties Scheme) Act 2017.

Recommendation	Progress to date
• The progressive replacement of all SWER power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives. • The progressive replacement of all 22kV distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.	(2016 amendments)[72] that have mandated ACR upgrades and REFCL installation under the NAP.[73] ESV is monitoring the progress of implementation by MECs of these technologies: • **REFCLs:** With respect to 22kV distribution feeders, the State supported the implementation of REFCL technology at 45 substations and the progressive end of life replacement of powerlines in electric line construction areas. MECs have completed installations under Tranches 1 and 2, with the remainder (Tranche 3) anticipated to be completed by 1 May 2023. This will partially meet the intent of recommendation 27 at the end of these programs. ESV notes that there remain bare wire lines that present a bushfire ignition risk. • **ACRs:** All MECs have now installed ACRs in relation to overhead SWER lines in their supply networks, as they were required to do under the existing Regulations by 1 May 2023. As at April 2020, 1,754 new-generation ACRs have been installed across MEC high-voltage single-wire earth return networks: AusNet Services has installed all 524 planned ACRs and Powercor has installed all 1,230 planned ACRs.[74]
Recommendation 28: The State (through ESV) requires distribution businesses to change their asset inspection standards and procedures to require that all SWER lines and all 22kV feeders in areas of high bushfire risk are inspected at least every three years.	Sub regulation 7(1)(i) of the Regulations requires that powerlines in HBRAs are inspected at least every 37 months, and other powerlines are inspected at least every 61 months.
Recommendation 29: The State (through ESV) require distribution businesses to review and modify their current practices, standards and procedures for the training and auditing of asset inspectors to ensure that registered training organisations provide adequate theoretical and practical training for asset inspectors.	Sub regulation 7(1)(j) of the Regulations requires a distributor's BMP to include the details of the processes and procedures for ensuring that asset inspectors are competent and have satisfactorily completed a training course approved by ESV.
Recommendation 30: The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees – that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.	Completed via a replacement of the Electricity Safety (Electric Line Clearance) Regulations 2010 with the Electricity Safety (Electric Line Clearance) Regulations 2015.
Recommendation 31: Municipal councils include in their municipal fire prevention plans for areas of high bushfire risk provision the identification of hazard trees and for notifying the responsible entities with a view to having the situation redressed.	The Bushfire Royal Commission Monitor assessed this recommendation as complete as at 31 July 2014.[75]
Recommendation 32: The State (through ESV) require distribution businesses to do the following:	Completed

[72] Relevant sub regulations of the Regulations (2016 amendments) include amendment to regulations 6 to 10 of the Principal Regulations (Electricity Safety (Bushfire Mitigation) Regulations 2013

[73] It has been noted that Regulation 7(1)(hc) in the Electricity Safety (Bushfire Mitigation) Regulations 2013 has also been impacted by this VBRC recommendation, with amendments in 2016 made to the Regulations to include details of the preventative strategies and programs by which MECs within an electric line construction area (ELCA) will ensure that on and from 1 May 2016, each electric line with a nominal voltage of between 1 kV and 22 kV that is constructed, or is wholly or substantially replaced, in its supply network is a covered or underground electric line.

[74] Powerline-bushfire-safety-program-Progress-report-2012-19.pdf (energy.vic.gov.au)

[75] As a result of this recommendation, Section 86B (municipal emergency management plans must specify procedures for the identification of trees that are hazardous to electric lines) was inserted into the Act.

Recommendation	Progress to date
• disable the reclose function on the automatic circuit reclosers on all SWER lines for the six weeks of greatest risk in every fire season; and • adjust the reclose function of the automatic circuit reclosers on all 22kV feeders on all total fire ban days to permit only one reclose attempt before lockout.	This recommendation was considered by the Powerline Bushfire Safety Taskforce which recommended that: • the reclose function on automatic circuit reclosers in the worst bushfire risk areas be adjusted to two fast protection operations on total fire ban days and one fast protection operation on Code Red days; • the reclose function on automatic circuit reclosers in the remaining rural areas be adjusted to one fast and one slow protection operation on total fire ban and Code Red days; and • until older style SWER automatic circuit reclosers are replaced, they be manually changed in the highest bushfire consequence areas during the worst bushfire period as declared by the Fire Services Commissioner. Electricity distributors are now operating automatic circuit reclosers in accordance with this recommendation.
Recommendation 33: The State (through ESV) require distribution businesses to do the following: • fit spreaders to any lines with a history of clashing or the potential to do so; fit or retrofit all spans that are more than 300 metres long with vibration dampers as soon as is reasonably practicable.	Completed On 4 January 2011, the Director of Energy Safety made two directions – one requiring the fitting of armour rods and vibration dampers, and one requiring the fitting of spacers (spreaders) on all spans of bare, low voltage conductors in HBRAs, and that all spans in HBRAs that do not comply with the required line separation standards be reconstructed or be fitted with spacers.
Recommendation 34: The State amend the regulatory framework for electricity safety to strengthen ESV's mandate in relation to the prevention and mitigation of electricity-caused bushfires and to require it to fulfil that mandate.	Completed A number of amendments were made to the *Electricity Safety Act 1998* in 2010 to strengthen the mandate of ESV, including: • adding an objective to promote the prevention and mitigation of bushfire danger; and • adding a function to regulate, monitor and enforce the prevention and mitigation of bushfires that arise out of incidents involving electric lines or electrical installations.

Source: VBRC (2009) Final Report, Summary pages 29-30. Progress has been reported in consultation with ESV and DEECA (formerly known as DELWP).

Case Study 2: Example of implementation of VBRC recommendations - Powercor Network Project: Pole Replacement Program

Powercor Network Project: Pole Replacement Program 2022-2026

Following implementation of the VBRC recommendations to conduct upgrades to electrical assets and at risk lines, and ensuring the safety of networks located in HBRAs or in the face of extreme weather events, ESV has strengthened its asset management capability and has taken steps to better hold duty holders (such as MECs) to account for investment in asset management and asset upgrades to ensure better network safety. Following the outcomes of the 2018 St Patrick's Day fires and the subsequent prosecution of Powercor for failure to comply with general duties to review assets and conduct adequate inspections and upgrades, ESV has required Powercor to take actions to improve their asset management practices following many years of under-investment.[76] Since ESV's wood pole management review and prosecution, Powercor has been held to greater account to regularly review its network safety inspection and upgrade programs to align its policies to the regulatory standards now in place, including a major investment to implement a program replacing poles across its network.[77] With one of the largest networks across Victoria, occupying almost 90,000 kilometres of wires and more than 588,000 poles and associated infrastructure, Powercor has been required to invest significantly into replacing or reinforcing existing network poles through its 2022 to 2026 pole replacement program.[78]

The aim of the program is to reinforce or replace at least 34,650 poles over the next five years to better protect the network and public from the impacts of extreme weather and consequential risk to bushfire ignition likelihood, demonstrating a 65 per cent increase and uplift in how Powercor is managing network safety following intervention from ESV.[79]

The number of poles that Powercor has committed to replace or reinforce has been outlined in the business' BMP. For 2022, Powercor made commitments under its BMP to replace 4,153 poles and reinforce 2,777 poles. As of 31 July 2022, the network has seen 2,420 power pole replacements and 1,042 pole reinforcements. The program is being undertaken across various locations in Victoria, including Ardeer, Geelong, Ballarat, Bendigo, Mildura, Shepparton, Cobram, Colac, Echuca, Horsham, Kyneton, Maryborough and Warrnambool.[80]

2.2 The need for intervention

Emergency management, including managing bushfire risks, is acknowledged by the Victorian Government as a shared responsibility across all layers of government and society.[81]

The Victorian Government's Critical Infrastructure Resilience Strategy recognises that most Victoria's critical infrastructure assets (which include energy sector assets) are owned and/or operated by private entities that have strong incentives for risk management.[82] For MECs and SOs, there are strong business interests to minimise potential losses and potential for their electrical infrastructure and assets to cause or be damaged by bushfires. Feedback from these stakeholders[83] identified bushfires as a major corporate risk for MECs and SOs operating in Victoria's highest bushfire risk areas, with bushfire preparation and mitigation activities seen as critical, ongoing business-as-usual activities across all survey participants.

In light of the above, this section considers the rationale for government intervention. It outlines: the need for government action to manage public risks arising from bushfires; market failures and constraints preventing socially optimal bushfire mitigation practices and investments by market participants; emerging trends that will influence the future likelihood of bushfires from electrical assets; and the gaps that would occur in Victoria's electricity safety regulatory framework should existing regulations cease to be in effect.

[76] Energy Safe Victoria (2021), Court imposes fine on Powercor over Terang fire, available at: Court imposes fine on Powercor over Terang fire – Energy Safe Victoria (esv.vic.gov.au)
[77] Energy Safe Victoria (2019), Draft Report: Powercor Wood Pole Management – An assessment of sustainable wood pole safety outcomes, Public Technical Report, available at: Public-Technical-Report-Powercor-wood-pole-management.pdf (esv.vic.gov.au)
[78] Powercor (2022), Network planning and projects, major projects: Pole replacement program, available at: Pole replacement program | CitiPower Powercor
[79] Powercor (2020), Fact sheet: pole replacement program, available at: https://media.powercor.com.au/wp-content/uploads/2022/05/27113316/Pole-Replacement-fact-sheet.pdf
[80] Powercor (2022), Network planning and projects, major projects: Pole replacement program – Program updates, available at: Pole replacement program | CitiPower Powercor
[81] This all-hazards principle is reflected in multiple emergency management strategies and plans, including the State Emergency Management Plan, Victorian Preparedness Framework, and the Critical Infrastructure Resilience Strategy (which includes the energy sector). The Victorian Government's response to the IGEM Review of Connecting and Collaborating with the private sector and community organisations noted the importance of the private sector who own and/or operate critical infrastructure assets (including the energy sector) that have valuable information and capability to assist in an emergency management context, and referenced the Safer Together Community First program that brings all fire agencies together, training them to better communicate and engage with communities and key stakeholders around bushfire risk.
[82] State of Victoria (Emergency Management Victoria) 2015, Critical Infrastructure Resilience Strategy, https://files.emv.vic.gov.au/2021-09/Critical%20Infrastructure%20Resilience%20Strategy%20-%20Sept%202016.pdf, accessed 7 October 2022.
[83] See Chapter 8 Stakeholder consultation, page 51.

2.2.1 Addressing the management of public risk

As discussed in the Victorian Guide to Regulation, government intervention may be justified where it supports the management of public risks, which are a form of social regulation that seeks to reduce or manage the risk of harm to health, safety or welfare of individuals or the community. Fuel load management on public land and regulations to reduce bushfire ignitions from electrical assets fall within the scope of managing public risks to the safety and welfare of Victorian communities.

The Victorian Government has committed to enhancing powerline bushfire safety by investing in the PBSP. The government has also introduced laws requiring MECs to implement bushfire mitigating new generation REFCL and ACR technologies. As Case Study 3 illustrates, government measures requiring the implementation of REFCL installations across substations supplying the highest bushfire consequence areas of Victoria, within a prescribed and accelerated timeframe compared to the rate of market investment, has directly contributed to preventing at least 33 potential bushfire starts across the 2019-20 bushfire season.

Case Study 3 Prevention of major electric fires through the mandated implementation schedule for bushfire risk reduction technologies

REFCL prevention of serious bushfires during the 2018-19 and 2019-20 bushfire seasons

In 2016, the government introduced laws requiring MECs to achieve the 'required capacity' performance standard across 45 prescribed substations supplying the highest bushfire consequence areas of Victoria. REFCL is currently the only technology that can achieve this performance standard. Delivery of the REFCL program was prescribed over three tranches and is due for completion by 1 May 2023. The Regulations were the mechanism through which these changes were prescribed and timelines enforced (ACIL Allen Consulting, 2015). Prior to amendments to the Regulations (2016), electricity distributors had not committed to the installation of REFCLs to reduce the likelihood that polyphase powerlines start bushfires, other than a small number of trial installations.

2018-19 bushfire season

REFCLs installed by Powercor and AusNet Services were activated in response to faults detected on the network a total of 12 times during total fire ban days during the 2018-19 bushfire season. On 3 February 2019, a total fire ban day, a REFCL operating at Powercor's Eaglehawk substation near Bendigo detected a permanent fault on the network and cut the power supply. Visual patrols of the powerline could not identify the fault, so power was restored with the Country Fire Authority (CFA) on standby in case the fault caused a fire. Shortly after re-energising the line, a capacitor mounted atop a power pole failed and sparks from the capacitor started a fire in a nearby paddock which was quickly detected and extinguished by the CFA crew on hand. Without the REFCL being in place, there could have been a fire with serious consequences.

2019-20 bushfire season

On 21 November 2019, for the first time in 10 years, Code Red conditions were declared in Victoria. Sixteen REFCLs were in operation and they reacted to nine permanent faults, interrupting power and preventing possible bushfire ignitions. They also detected numerous temporary faults but performed as designed and did not interrupt the power supply. A further three REFCLs came on-line during the 2019-20 bushfire season. These 19 REFCLs activated 57 times during the bushfire season with 33 of those activations in response to the types of electrical faults most likely to start a bushfire, thereby preventing serious bushfires at a time when many were already sweeping across the State.

Source: ACIL Allen Consulting (2015) Regulatory Impact Statement, Bushfire Mitigation Regulations Amendment, Report to Department of Economic Development, Jobs, Transport and Resources. DELWP (2020) Powerline Bushfire Safety Program, Progress Report 2012-19.

2.2.2 Addressing actual and potential for market failures

2.2.2.1 Gaps in existing incentivisation under economic regulatory regime

Electricity distribution networks have historically largely contributed to bushfire ignition starts from electrical assets. Electricity distributors are natural monopolies due to the high fixed costs of building an electricity distribution network. As outlined in Table 1-1 each electricity distributor has an electricity distribution area in which it is the sole supplier of electricity.

Along with the safety regulation overseen by ESV, the Victorian electricity distributors are also subjected to economic regulation by the Australian Energy Regulator (AER) in accordance with the National Electricity Law and the National Electricity Rules. The National Electricity Law aims 'to promote investment in, and efficient operation and use of, electricity services for the long-term interests of electricity consumers'.

The economic regulatory regime is an incentive-based framework. As the electricity distributors have an incentive to outperform the revenue determined by the AER by reducing costs and thereby increasing their

profits, this incentive is balanced by other provisions to encourage electricity distributors to maintain and improve performance and safety outcomes:

- **Service Target Performance Incentive Scheme:** to enhance supply reliability by maintaining and improving network performance, to the extent that consumers are willing to pay for such improvements. The scheme is intended to ensure that distributors' service levels do not reduce as a result of efforts to achieve efficiency gains.
- **F-factor Scheme:** introduced by the Victorian Government to encourage Victorian distribution businesses to reallocate resources towards better managing the risk of fires starting on the distribution network in high-risk areas, on high-risk days. An annual benchmark is set for each distribution business for bushfire starts on the network, based on the average number of fire starts in the previous five years. Distribution businesses are then rewarded or penalised for every network ignition above or below their historical five-year benchmark of ignitions. The incentive rate is multiplied by an Ignition Risk Unit, so that the penalty a bushfire attracts better reflects the potential harm the fire poses to the community.

Importantly, the f-factor Scheme is complementary to other regulations in place to enhance safety. While the f-factor Scheme has already incentivised distribution businesses to strengthen data governance and collect accurate fire start data, it is still too early to measure the effectiveness of the scheme in incentivising distribution businesses to reducing bushfire ignition risks from their electrical assets.

The f-factor Scheme has only recently been revised (in 2016) and data collection is required over a longer period of time and across multiple conditions and seasons before the scheme's effectiveness can be measured. A comprehensive evaluation is planned in 2026-27.

While these measures afford consumers important protections and help regulate energy prices, there is evidence that they do not provide Australian electricity network providers with sufficient incentives to promote network risk mitigation:

> *One of the biggest challenges is the lack of incentives in place to specifically improve resilience and a lack of clarity on acceptable decision points for future investment to reduce risk exposure. This includes risk mitigation and maintenance of assets such as powerlines.*[84]

As such, it is assumed that there remain residual problems with appropriate incentivisation levels. Two key market failures necessitate government intervention to ensure that bushfire risks are managed to a level acceptable to government.

2.2.2.2 Negative externalities

Negative externalities (or negative 'spill-overs') arise when an activity imposes costs (which are not compensated) on parties not directly involved in the activity. In the context of electricity networks, a MEC or SO may adopt bushfire mitigation practices that, while cost-effective for the business, may elevate the risk of bushfire starts with adverse consequences on other businesses, customers, and the general community. As Case Study 4 highlights, failures or issues with a small number of powerlines can create fires with significant costs that may not always be easily or fully recoverable to impacted parties.

Case Study 4 Failure to comply with general duties under the *Electrical Safety Act 1998*

St Patrick's Day fires

On the St Patrick's Day weekend in 2018 (17-18 March), there were six large network-related fires that occurred in southwest Victoria associated with high winds through the region — four involving trees falling onto power lines from outside the regulatory clearance space and two directly caused by assets. A significant amount of property and livestock was lost.

One of the asset-caused fires was ignited by a broken pole, and during the subsequent investigation of that incident, the community raised concerns about the potential for further fires from pole failures. ESV has conducted investigations into this fire since March 2018, concluding that Powercor's inspection regime at the time had failed to identify that the pole with which the fire was ignited had been compromised.

According to the investigations, an engineering analysis of the remaining pole sections following the fires concluded that the compromised pole had been caused by long-term material degradation due to termite infestation and decay,

[84] Bushfire & Natural Hazards CRC (2018), Australian electricity networks - a statement on national research priorities for natural hazards emergency management and resilience, https://www.bnhcrc.com.au/nationalpriorities/electricitynetworks, accessed 13 September 2022.

reducing the overall strength of the pole and capacity to withstand the extreme wind conditions. The following statement was made by ESV:

> *"A competent inspection and sound test of the pole in November 2017 would have identified the material degradation present when the pole failed."*[85]

As a result of the fires, ESV has required Powercor to improve and update its practices in conducting electrical asset inspections, reinforcements and replacements in accordance with its BMP requirements.

Reviewing the performance of wood poles

ESV worked with Powercor, the community and independent experts to determine whether there is an immediate risk of further pole failures in the region. Powercor's pole inspection and maintenance process was reviewed and, as an outcome of the investigation, as stated in the ESV report released in July 2019, Powercor changed its processes to increase the frequency of inspections and apply greater conservatism when deciding whether to replace a pole.

ESV also completed a further assessment of Powercor's asset management practices relating to wood pole management, and its capacity to deliver sustainable safety outcomes for the community. A draft technical report was published in December 2019 for public consultation. The December 2019 report found that:

- The wood pole management system in place at the time of The Sisters fire at Garvoc would not deliver sustainable safety outcomes for the future.

Court action

Following technical investigations of the fires, ESV laid charges against Powercor under section 98 of the *Electricity Safety Act* for failing to comply with its general duty and exposing individuals to hazards and risks including bushfire risk in relation to The Sisters fire at Garvoc and the P3 High Street Terang fire involving clashing powerlines. Powercor pleaded guilty to the Terang fire and was fined over $130,000, however, the five charges relating to the Garvoc fire were withdrawn. Whilst penalties such as this can be effective in deterring future non-compliance behaviour, in this case, it can be argued that the total fine is less of a cost to MECs than the cost borne by the community, revealing how negative externalities can implicate vulnerable third parties when non-compliance activities pose unintended and unfair costs. Despite having caused no major fatalities, victim impact statements revealed the Garvoc fire resulted in serious emotional and psychological impacts for those affected[86], demonstrating the impact of a negative externalities on community safety and the important responsibility MECs and SOs uphold in adhering to strict BMP and inspection standards. Many victims took civil action as a result, receiving compensation for losses incurred.

Improvements since the event

Since March 2018, Powercor has been required to take actions to review its wood pole management system, increasing the volume of wood pole replacements and reinforcements; however, these changes alone will not deliver sustainable wood pole safety outcomes for the future.

ESV made several recommendations to ensure that Powercor diligently implements its proposed improvements to its wood pole management regime. These recommendations include:

- improving inspection practice and rigour;
- improving the training and clarification of responsibilities for power pole inspectors;
- improving methods to predict the likelihood of pole failure over time, particularly in HBRAs;
- being cognisant of the consequences of failure when assessing poles for replacement by implementing risk-based asset management; and
- exploring options for technology to improve the accuracy of pole condition assessments.[87]

The report was finalised and published with a response to public submissions, and ESV is holding Powercor to account for the delivery of the plan. ESV is ensuring assessment and transparent reporting for delivery of the plan occurs, which is currently on track. While initiated by incidents on the Powercor network, ESV also committed to review the sustainability of pole management practices in all other Victorian distribution businesses.

Vulnerability to network-wide failures has been raised by electricity networks at a national level. In a 2018 statement, Australian electricity providers identified understanding the fundamental vulnerabilities of Australia's electricity networks, and strategies to minimise the risks, as key priorities for the sector over the next decade. Minimising risks to electricity networks included "achieving consistency across the sector for understanding vulnerability and defining risks", with "clarifying who owns the risk for network failure", "agreeing what is included in risk assessments" and "obtaining agreement on how to address those risks".[88]

[85] Energy Safe Victoria (2018), Garvoc Fire (The Sisters) 17 March 2018 Technical Investigation Report, available at: Garvoc-Fire-The-Sisters-Technical-Report-17-Mar-2018.pdf (esv.vic.gov.au)
[86] ABC News Southwest Victoria (2021), Powercor fined $130,000 over St Patrick's Day bushfires, available at: Powercor fined $130,000 over St Patrick's Day bushfires - ABC News
[87] Energy Safe Victoria (2022), ESV investigation requires safety improvements for Powercor pole regime, available at: ESV investigation requires safety improvements for Powercor pole regime – Energy Safe Victoria
[88] Bushfire & Natural Hazards CRC (2018), Australian electricity networks - a statement on national research priorities for natural hazards emergency management and resilience, https://www.bnhcrc.com.au/nationalpriorities/electricitynetworks, accessed 13 September 2022.

More broadly, they identified that there were shared vulnerabilities and risks that went beyond the exposure of individual networks. The Tatong bushfire (Case Study 5 Tatong bushfire – 16 January 2007: Cascading effects of electrical faults across the electricity network) while caused by a lightning strike, illustrates the criticality of managing risks beyond individual operator considerations. It shows how the failure of one network operator to adequately assess risk can create cascading effects across the entire electricity network both in Victoria and across Australia's national grid, thereby causing disruptions to millions of Australian customers, businesses and public infrastructure and services that depend on electricity services.

Case Study 5 Tatong bushfire – 16 January 2007: Cascading effects of electrical faults across the electricity network

Tatong Bushfire: loss of both transmission lines connecting Victoria to NSW

Victoria and NSW are primarily linked by two 330kV overhead transmission lines that pass through north-east Victoria, which are owned and managed by Ausnet Services (formally known as SP Ausnet).

The lines share a 340-kilometre easement from South Morang in Victoria to the Murray Power Station in New South Wales (NSW), via the Dederang terminal (Figure 7).

The Tatong bushfire was caused by a lightning strike on 11 January 2007, with spot fires merging over the next five days to cover a significant part of rural northeast Victoria. Authorities notified transmission network operators, including SP AusNet, that the fire could enter the easement, placing the electrical transmission lines connecting Victoria to NSW at risk. SP AusNet's assessment under-estimated the risk that both transmission lines would be locked out of service.

Figure 7 Electricity transmission lines connecting Victoria to NSW

Source: Deloitte Access Economics (2016), Building resilient infrastructure

While SP AusNet was aware that the two transmission lines were at risk, it did not expect the 'worst case scenario' that it would lose both lines at the same time. This assessment proved to be incorrect. At 3:50 pm, the fires entered the easement. Within 10 minutes, it caused one line to electrically discharge. While this line automatically reclosed (allowing supply through these lines to resume), a second flashover occurred soon after, causing the second transmission line to be locked out of service by the control system.

The transmission lines resulted in cascading effects that cut off parts of the national grid from each other.

The second line then experienced a flashover, cutting off NSW and Queensland from south-eastern states (South Australia, Victoria and Tasmania). This resulted in increased electricity flow from South Australia into Victoria to meet the supply shortfall from the loss of electricity from NSW, which then tripped the South Australia to Victoria transmission line. The national grid became separated into three 'islands': Queensland, NSW and parts of northern Victoria; most of Victoria and Tasmania; and South Australia.

The cascading effects on the national grid caused widespread disruptions to customers, businesses, public infrastructure and hospitals.

At 4:03 pm, to stabilise the system, an automated load-shedding process cut power to over 481,00 Victorian electricity customers. It took 4.5 hours to restore full supply, with a further 205,887 customers losing supply due to manual load shedding. It took another four hours to return to normal.

Overall, approximately 7,100,000 kilowatt hours of electricity was lost to 620,342 households and 66,890 businesses, with disruptions to major public infrastructure and public hospitals.

Source: Deloitte Access Economics (March 2016), Building resilient infrastructure, Australian Business Roundtable for Disaster Resilience and Safer Communities.

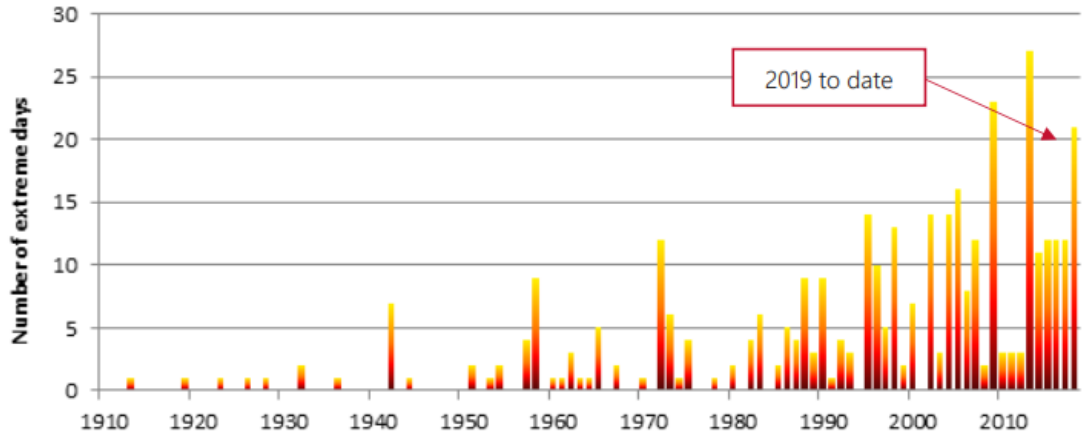
2.2.3 Accounting for future risks

While government-initiated risk reduction electrical asset upgrade and enhancement programs have demonstrably made Victoria's powerlines safer, it is not possible to completely eliminate the risk of a bushfire being ignited by electrical assets.[89] Future trends, including climate change and sector transformation, are anticipated to expose electrical assets to new environmental stressors and vulnerabilities, and thus greater potential for contribution to bushfire ignitions. These are detailed below.

2.2.3.1 Climate change

Like other disasters, bushfire risks are a function of hazard, exposure and vulnerability. Climate change is creating hotter, drier and stormier conditions over extended bushfire seasons. As Figure 8 shows, Bureau of Meteorology data between 1910 and 2019 illustrates a continuing trend towards increasing extreme mean temperature (above the 99th percentile). As a result, Victoria is likely to encounter an increased number of days in the year with weather conditions that pose extreme fire danger.

Figure 8 Number of days each year where the Australian daily area-averaged mean temperature is extreme (above 99th percentile)



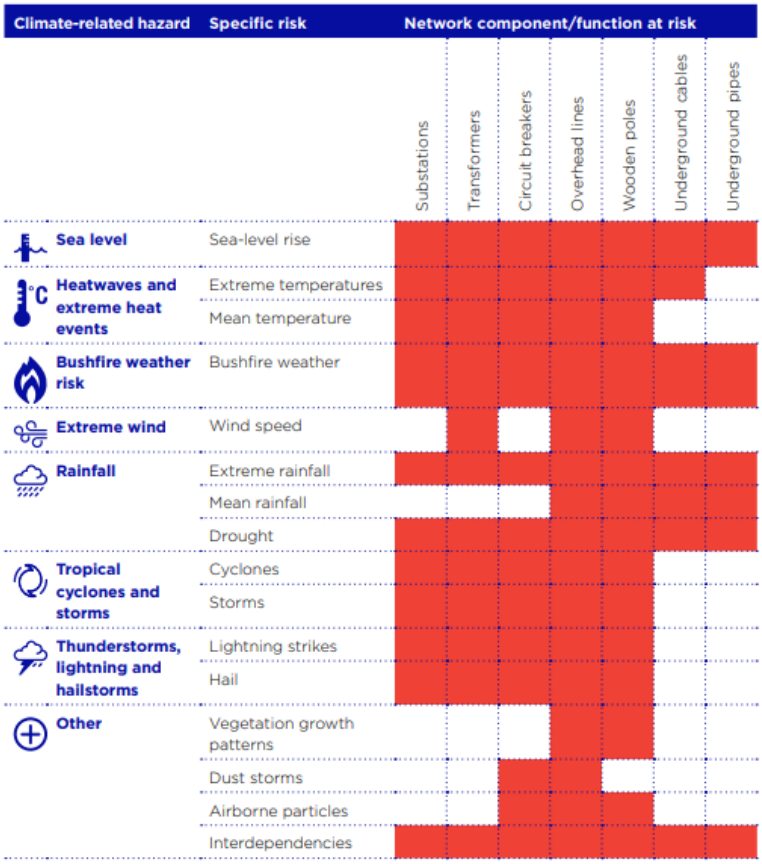
Source: BoM, as reproduced in the AEMO 2019| Summer 2019-20 Readiness Plan.

Extreme fire days are associated with a greater likelihood of bushfires being ignited by electrical assets. Analysis by Miller et al (2017) of a dataset containing 35,109 fire incidents, including 942 electrical fires, found that the proportion of large electrical fires during elevated fire danger conditions is the highest of any cause.[90] By comparison, at lower fire danger levels, electrical fires remain at proportions similar to the other causes. With the likely increase in extreme fire days for Victoria, this poses a risk to Victoria's electricity network by increasing the likelihood of electrical asset failures igniting bushfires.[91]

A recent analysis by Energy Networks Australia identified components of Australian energy networks that are vulnerable to climate-related hazards (Figure 9). Bushfire weather risk was found to present potential medium or high risk for all components, while heatwaves and extreme heat days (which are associated with increased potential for fire) were also found to carry significant risk to electrical networks – this includes components such as underground cables that are reducing the likelihood of bushfire ignitions based on today's climate.

[89] Victorian Auditor-General's Office, Reducing Bushfire Risks, October 2020, Independent assurance report to Parliament 2020-21:4, https://www.audit.vic.gov.au/sites/default/files/2020-10/20201014-Reducing-Bushfire-report_0.pdf, accessed 6 October 2022.
[90] Miller C, Plucinski M, Sullivan A, Stephenson A, Huston C, Charman K, Prakash M, Dunstall S (2017), Electrically caused wildfires in Victoria, Australia are over-represented when fire danger is elevated, Landscape and Urban Planning, Volume 167, 2017, pages 267-274, ISSN 0169-2046, https://doi.org/10.1016/j.landurbplan.2017.06.016.
[91] Climate Council (2017), Climate change and the Victoria bushfire threat: Update 2017. http://www.climatecouncil.org.au/uploads/98c26db6af45080a32377f3ef4800102.pdf , accessed 13 September 2022.

Figure 9 Components of Australian energy networks vulnerable to climate-related hazards



Source: Energy Networks Australia (2022), A guide to climate change and its likely effects, p. 34.

2.2.3.2 Technological and sector changes

As new risks and challenges continue to face the electricity industry, including climate change, rapid urban expansion and technological advancements, the nature of Australia's electricity system is transforming significantly. Shifting away from large-scale generators that operate over long distances to dispersed customers to a system where customers are situated at the heart of the electricity system through individual capacity to generate and store electricity will further support the broader network. Within this decentralised electricity market, there will however, still be a need for customers to be connected via networks to gain access to the market. Under this model, it is anticipated that by the year 2050, with further technological and sector advancements to a more decentralised electricity market, approximately 30-40 per cent of Australia's electricity will be supplied by customer-owned generators.[92]

As a result of these ongoing technological advancements within the sector, both electricity network operators and electricity sector regulators will need to respond to these significant changes, ensuring that emerging challenges, risks, complexities and dependencies that arise within a decentralised market are met with robust regulatory frameworks and risk mitigation strategies. A decentralised electricity market will rely on sound bushfire mitigation policy and responsive regulations in the future to ensure that the likelihood of bushfire ignition risk from electricity assets can be appropriately managed and mitigated for the safety of the broader community, particularly as climate change and consequential extreme weather events continue to become more frequent and impactful.

2.2.4 Conclusion

Victoria's ongoing economic prosperity and the future safety of its communities are intricately tied to how effectively government can mitigate and manage the increased bushfire risks driven by a changing climate and the risks and challenges associated with technological advancements and sector changes.

[92] Department of Industry, Innovation and Science (2019), Australian electricity networks: A statement on national research priorities for natural hazards emergency management and resilience, page 3.

These factors demand effective mitigation strategies, ongoing regulatory oversight and monitoring arrangements, and sound Regulations and policy development to ensure safety and protection of life and property now and into the future.

2.3 Contribution of the Regulations to resolving the problems

The Regulations are part of a suite of regulatory measures that work in tandem to achieve electrical safety outcomes and reduce the likelihood of bushfire ignition risks from electrical assets. As noted earlier, under the Act, SOs and MECs have general duties to minimise, as far as practicable, the bushfire danger arising from at-risk electric lines and MEC supply networks. The Act also contains various bushfire mitigation provisions, including requiring SOs and MECs to submit BMPs for acceptance by ESV.

Within this framework, the Regulations give practical effect to the provisions in the Act by ensuring that MECs and SOs adopt bushfire mitigation controls to a standard and within a timeframe that is in line with government expectations, and reduces the likelihood of negative externalities to third parties of any bushfire starts from their electric lines.

The Regulations prescribe the particulars to be included in the BMPs submitted to ESV for acceptance, as required under the Act. These particulars include the details and timing of implementation of bushfire prevention strategies and plans, including planned supply network upgrades and improvements by MECs. This includes, but is not limited to, details of the processes and procedures by which MECs ensure that they install ACRs to each SWER line in their supply network by 1 May 2023. As the Act requires MECs and SOs to comply with their accepted BMPs,[93] this supports ESV in monitoring progress of implementation of preventative strategies and programs within the timeframes set by government. Importantly, for NAP programs, this provides a supportive regulatory mechanism to enable the reduction of the relative risk of powerline-ignited bushfires by 48 per cent across the State by 1 May 2023, as estimated by the PBSP.

The Regulations also prescribe the parts of the BMP that an MEC must publish on their website, thus enforcing the obligation under section 113A of the Act. This provides external parties, including non-electricity businesses, with visibility over the bushfire mitigation controls in place by the MEC, and thus supports better decision making by these parties within the HBRA in which the electrical assets are located.

The Regulations also set out mandatory or non-negotiable minimum inspection requirements, including inspection intervals and minimum training for asset inspectors, as recommended by the VBRC. These requirements ensure that inspectors with the appropriate technical expertise monitor the condition of the lines – including private overhead electric lines within their distribution area – and decide when maintenance is required. The frequency of inspections by MECs ensures adequate monitoring of substantially reconstructed, private overhead electric lines located in a HBRA, which under the Electricity Safety (General) Regulations 2019 are required to be placed underground.

[93] *Electricity Safety Act 1998*, Sections 83BA and 113A.

3 Objectives of the intervention

The purpose of the *Electricity Safety Act 1998* includes making provisions relating to— (a) the safety of electricity supply and use; and (b) the reliability and security of electricity supply; and (c) the efficiency of electrical equipment. The Act contains multiple provisions to promote bushfire mitigation across electricity supply networks and electric lines. The Act requires that each MEC and SO design, construct, operate, maintain and decommission its supply network (MEC) and at-risk electric lines (SOs) to minimise the following, as far as practicable:

- hazards and risks to the safety of any person (only applies to an SO if their electric lines are a complex electrical installation, to which section 75 of the Act applies);
- hazards and risks of damage to the property of any person (only applies to an SO if their electric lines are a complex electrical installation, to which section 75 of the Act applies); and
- the bushfire danger arising from their respective supply network and at-risk electric lines.

The Act regulates the safety of the electricity network and corresponding regulations that govern the safety of the network. With respect to bushfires, the overarching objective of the framework is to mitigate or reduce the likelihood of bushfire ignition risk from Victorian electrical infrastructure and electric lines to people, property and the environment. Achieving this objective will reduce the incidence of bushfire ignition and the consequent costs to the community.

Constraining this objective to consider the *likelihood* of bushfire-ignition from electrical assets and networks, and not the *consequence* of bushfires starting, aligns with the nature of the problem and recognises that:

- while all bushfire ignitions can potentially lead to extreme bushfire events, the likelihood of such extreme events is greater on higher fire danger days and in high bushfire risk areas;
- aligning regulation with the *Electricity Safety Act 1998* can support the consistent identification and planning of activities which reduce the likelihood of bushfire ignition;
- this alignment would also support greater clarity regarding the State's risk management expectations in relation to electrical asset bushfire ignition risk, supporting a consistent level of inspection capability and enabling appropriate levels of oversight; and
- a reduction in the likelihood of bushfire ignition can be supported by risk reduction activities, including powerline safety upgrades and vegetation clearance around the electrical assets.

The remaking of the Proposed Regulations aims to support the objectives of the Act through making provision for the preparation of bushfire mitigation plans by specified operators and major electricity companies, and the inspection of overhead electric lines and supply networks. The Regulations specify the inspection requirements of overhead private electric lines and supply networks by MECs, including frequency, timing and other specifications to ensure the safety of the electricity network and mitigate the likelihood of bushfire ignition risk from electricity assets.

In delivering these objectives, the Regulations should support the reduction in the likelihood of bushfire ignition risks, minimise cost to industry and regulated parties and costs to government of administering the regime.

4 Identification and assessment of options

As part of this RIS, a range of high-level options were considered. Options ranged from a light-touch review to inform the remaking of the Regulations, to a more fulsome review of the Regulations feeding into a broader policy framework addressing identified issues, as well as considerations of greater use of technology to reduce the likelihood of bushfire ignition.

The light-touch review focussed on identifying regulatory inconsistencies and minor changes needed to refine the framework. This would include the consideration of known issues identified through previous activities, including prior inquiries, Royal Commissions, audits, stakeholder consultation, roundtables and surveys undertaken in response to other bushfire-related events.

A more fulsome review sought to build on the issues identified, but also took a more wide-ranging approach to consultation to further understand the degree of change required to best mitigate bushfire ignition risk, as well as cataloguing the possible costs and benefits associated with the wide range of changes potentially needing to take place. Based on preliminary stakeholder engagement and analysis undertaken by DEECA, a range of wider issues may potentially need to be addressed in the future through changes to the regulatory framework that go beyond the scope of the Regulations. In consultation with relevant stakeholders, it has been advised that this option is not feasible at this time.

The final high-level option considered was to look more closely at the use of technology to reduce the likelihood of bushfire ignition. DEECA is already exploring a range of technology options through small-scale pilots as a part of the PBSP. The PBSP provides grants to explore emerging powerline safety technologies and systems to further enhance the safety of electricity assets to protect people and property from bushfires. The scope of proposed changes to the Regulations is limited to items with a proven and agreed upon policy rationale. As the pilots have not been finalised, alternative technologies have not been included in this remaking. As pilots are completed, results will be made available to support decision makers to undertake an assessment of the technology product and the ability for it to contribute to reduced bushfire risk. As such, it was not feasible to consider this option at this time.

Following careful consideration, the scope of the current remake of the Regulations has been limited to a light-touch approach with minor amendments proposed only where substantive policy analysis has already been undertaken and resulted in a strong rationale for those amendments. DEECA will consider how issues that are out of scope of the current remake might appropriately be addressed in future and will continue to engage with stakeholders and ESV as needed.

Three options have been identified in consultation with DEECA and ESV. These three options are analysed in this RIS to determine the best option for addressing the problems identified above and support the overarching government objectives. The description of each option has been informed by a stakeholder survey sent to MECs and SOs as part of the RIS development process.

The high-level options are:

- Option 1: The Regulations cease to exist (base case)
- Option 2: Regulations reinstated – no amendments (status quo)
- Option 3: Regulations reinstated, with two sub-options:
  - Option 3A: reinstated, with administrative amendments for consistency with contemporary standards and other regulations
  - Option 3B: Administrative amendments (Option 3A), and other amendments to provide greater clarity and certainty for prescribed safety requirements for existing and new electrical constructions and installations.

4.1 Identification of options

4.1.1 Option 1: Regulations cease to exist (base case)

Under this option, the existing Regulations will not be re-instated when they sunset on 18 June 2023. From this period:

- The general duties in the Act would remain to minimise, as far as practicable, the bushfire danger arising from SO at-risk electric lines (section 83B) and MEC supply networks (section 98(c))
- MECs and SOs will continue to be required to submit BMPs for ESV's review and acceptance.
- The Act would require, in the absence of regulations, BMPs to set out a SO's or MEC's proposal for the mitigation of bushfire in relation to the SO's at-risk electric lines or MEC's supply network.
- ESV would still have the power to accept or reject BMPs on the basis of whether or not they are appropriate for the assets they cover. ESV would also still have the power to require independent validations of BMPs submitted, impose limitations on BMPs that have been provisionally accepted, and determine the BMP to apply to a MEC supply network or SO at-risk electric line.
- MECs and SOs will need to comply with the accepted BMP during a specified bushfire risk period.
- Currently, all REFCL installations under the Victorian REFCL program are on track to be completed by 1 May 2023.[94]
- ESV will continue to be able to impose penalties under the Act and prosecute MECs and SOs for failure to comply with these requirements, including failure to comply with general duties.

In the absence of the Regulations, multiple provisions in the Act will become inoperative or dormant:

- Without prescriptive requirements for content and critical risk controls, there would be a greater need for ESV to provide guidance for stakeholders regarding its expectations as to the content of BMPs.
- There would be no obligation for an MEC to publish any parts of their BMP on their website.
- There would be no mandatory or non-negotiable minimum requirements, such as minimum inspection intervals, minimum training for asset inspectors.
- There would be no requirement for MECs to inspect private overhead electric lines within its distribution area.

Where MECs do not continue to inspect private overhead electric lines, property owners would be required to monitor the conditions and decide when maintenance is required.

4.1.2 Option 2: Regulations reinstated – no amendments

The second option is to maintain the status quo by reinstating the existing Regulations as they currently stand. No clarifications or amendments would be made and industry would be required to comply with existing BMP, inspection, and REFCL installations to specified parts of their electricity supply network, in line with the existing regulatory requirements. Under this option, MEC and SO current practice would not be reflected under the Regulations. In addition, MECs would not have to disclose information within their BMPs on the details and procedures relating to ACR installations on SWER lines within the supply network, as this requirement currently expires on 1 May 2023. Section 1.3 describes the requirements of the Regulations as they currently stand.

Inconsistencies within the Regulation, including inaccurate legislative definitions and references to outdated regulatory requirements and best practice would remain. These can be found in Table 4-1

4.1.3 Option 3: Regulations reinstated – with amendments

Option 3 considers options for re-instating the Regulations, with amendments (Table 4-1) that have been informed by stakeholder consultations. From consultation, there are a range of individual issues that can be considered on their merits. For ease of analysis and presentation, the individual elements of Option 3 have been grouped into two sub-options.

[94] ESV publicly reports on the progress of Victorian REFCL program status: https://esv.vic.gov.au/about-esv/reports/technical-reports/victorian-refcl-program-status/.https://esv.vic.gov.au/about-esv/reports/technical-reports/victorian-refcl-program-status/.

4.1.3.1 Option 3A – Administrative amendments for consistency with contemporary standards and other regulations

Option 3A will reinstate the existing Regulations with administrative amendments. These amendments aim to ensure the Regulations are consistent with other regulations with respect to the definitions of Hazard Trees and Total Fire Ban days and that BMPs include email contact details.

4.1.3.2 Option 3B - Administrative amendments (Option 3A), and other amendments to provide greater clarity and certainty for prescribed safety requirements for existing and new electrical constructions and installations

This option reinstates the existing Regulations. In addition to the administrative amendments described in Option 3A, it also makes other amendments to prescribed safety requirements under the Regulations to provide greater clarity and certainty on the requirements for new and existing constructions and installations.

Among other things, this option recognises that while the implementation of ACR technologies actioned by MECs on their existing network assets is in compliance with the provisions under the existing Regulations, there is a need to ensure the obligations continue to apply to new and existing network assets and to any future regulated entities.

Under this option, the ongoing monitoring and evaluation of the effectiveness of these Regulations will include a review of any emerging technology that may provide comparable safety coverage. Any reviews considering this will be informed by evidence. Provisions supporting increased flexibility within the Regulations can be considered once the safety outcomes of new technologies have been confirmed.

Table 4-1 Summary of amendments included in the Proposed Regulations

Impacted regulations of the existing Regulations	Amendment	Rationale	Sub-Option
Regulation 5	Amend the definition of 'total fire ban day' to include a partial day of total fire ban.	This will align to the definition with section 40 of the *Country Fire Authority Act 1958*.	Options 3A and 3B
Regulations 6(a)–(d) and 7(1)(b)–(da) (revision)	Add a requirement that the specified operator or major electricity company provide email addresses for the prescribed key contact persons.	Current regulations do not require this information, however it is commonly provided. This would reflect existing practice.	Options 3A and 3B
Regulations 7(1)(ha) and 7(3) (revision and removal)	Retain the ongoing obligation, but remove the statutory deadline of 1 May 2023, for a major electricity company to ensure that, in its supply network, each polyphase electric line originating from every zone substation specified in Schedule 2 has the required capacity. Remove the 'Points' column (Column 6) from Schedule 2.	This proposed change will retain this as an ongoing obligation as originally intended by this Regulation, while removing the reference to the 1 May 2023 deadline. The 1 May 2023 deadline remains in the Act for enforcement purposes if required (see section 120M(1)(c)).	Option 3B
Regulation 7(1)(l)	Insert a new definition of 'covered' for the purposes of Regulation 7(1)(l) that substantially aligns with the definition of 'cover' in section 120N of the Act.	This definition clearly distinguishes 'covered' from 'insulated' which is used in proposed new Regulation 7(1)(m). The definition of 'covered' refers to 'a system of insulation' which is different in scope from the definition of 'insulated' in proposed new Regulation 7(1)(m).	Option 3B
7(1)(m) (new to be added)	Require all newly constructed, low voltage overhead electrical cables or wires in a HBRA to be insulated. For the purposes of this new regulation, insert new definitions as follows: • A new definition of 'insulated' that aligns closely with the definition of 'insulated' in the Electricity Safety (General) Regulations 2019	This reflects the contemporary practice of major electricity companies; including this requirement in the Regulation will lock this practice in as a minimum standard.	Option 3B

Impacted regulations of the existing Regulations	Amendment	Rationale	Sub-Option
	• A new definition of 'electrical cable or wire' that is limited to cables, wires or similar components of an 'electric line' under the Act.		
Reg 7 - (change)	This proposed change will continue the obligation of major electricity companies to install ACRs in relation to overhead SWER lines and require them to maintain existing SWER lines. This ensures that new overhead SWER lines are covered by this requirement and that existing ACR coverage is maintained.	All major electricity companies have now installed ACRs in relation to overhead SWER lines in their supply networks, as they were required to do under the existing Regulations by 1 May 2023. However, under the existing Regulations, there is no ongoing obligation to ensure that ACRs are installed on overhead SWER lines. This proposed change would create an ongoing obligation to do so. Future consideration may be given to reviewing this obligation to accommodate the use of other technologies that would achieve an equal or higher level of risk mitigation.	Option 3B
Regulation 10(1)(l) and 10(2) (revision)	In relation to inspection standards for overhead private electric lines, delete the note to Regulation 10(1)(l) and update the definition of 'hazard tree' in Regulation 10(2) to align with the meaning of 'hazard tree' that is implied in clause 9(2) and (3) of the Code of Practice for Electric Line Clearance.	The current Regulations 10(1)(l) and 10(2) refer to clause 8 (now clause 9) of the Code of Practice for Electric Line Clearance. This may cause confusion as clause 9 does not apply to hazard trees located on private land. In addition, the note to Regulation 10(1)(l) is inaccurate and misleading as it suggests that people other than the landowner are authorised to enter private property to remove a hazard tree that is threatening an overhead private electric line – this is not the case.	Options 3A and 3B
10(1)(m) (revision) -	In relation to inspection standards for overhead private electric lines – for existing private electric lines (other than existing lines constructed with bare open wire conductors), replace the minimum clearance requirements set out in Table 3.8 of the Australian/New Zealand Wiring Rules (Wiring Rules). Replace the existing requirements with an alternative set of minimum clearance requirements that represent a more relevant safety standard for lines that may have been constructed prior to the 2018 Wiring Rules.	This will remove an unintended consequence inherent in the existing Regulations (which currently imposes the requirements in Table 3.8 of the Wiring Rules for all private electric lines) and will provide greater clarity and certainty on the standard that applies in relation to minimum clearance requirements for lines that were potentially constructed prior to the making of the current Wiring Rules. The minimum clearance requirements in Table 3.8 of the Wiring Rules will continue to apply to private electric lines that have bare open wire conductors or that are newly constructed.	Option 3B

4.2 Approach to options analysis

Establishing causal links between options and subsequent reductions in bushfire ignition risks from electrical assets is challenging. Firstly, there is uncertainty as to the overall contribution of electricity assets to the costs imposed by bushfires. With multiple interventions already in place, it is also difficult to attribute the benefits to bushfire ignition risk reduction arising from individual risk control measures deployed by MECs or imposed by government. This issue is made more challenging by the limited available data, and the complex economic and safety regulatory framework in place that influences bushfire mitigation practices and subsequent bushfire ignition risks.

4.3 Estimation of costs to industry

4.3.1 Data sources and approach

The costing for the preferred option uses survey submissions received from industry stakeholders, including six MECs and four SOs. The responses are broadly representative of the industry composition, regulated activities, and bushfire ignition risk profile across Victoria's transmission and distribution networks, and at-risk electrical lines.

Given the small sample size, cost analysis is presented at the business type level (MEC, SO) to maintain stakeholder confidentiality. Costs associated with regulated activities exhibited a high level of variability due to multiple factors including each business' geographic area and risk profile. As such, median figures are reported for average industry costs.

The costings also incorporate regulatory costs incurred by ESV, associated with administering and enforcing the regulatory requirements.

4.3.2 Total costs

Cost inputs

To derive business costs associated with submitting a BMP, survey participants were requested to report the total internal staff hours required to prepare and submit a BMP, and the total internal staff hours required to make updates and revisions (including ESV amendments). This figure was then multiplied by a total assumed hourly internal cost, which was derived by multiplying an estimated base hourly rate of $93.10 and an adjustment of non-salary costs (1.75).[95] This was then added to any reported external costs (e.g. consultancy costs) and other costs to obtain the final cost to the business of BMP submission activities.

In converting the above hourly internal cost estimates, the following method has been followed:

- Internal labour inputs have been costed based on the average adult hourly rate in Victoria for persons working in the electricity, gas, water and waste services industry[96];
- Internal management inputs have been costed at twice this hourly rate to reflect the specialisation and expertise required; and
- The resulting figure for hourly internal costs has been multiplied by 1.75 to account for any corporate overheads and non-wage labour costs.

Population

An assessment population profile was constructed to determine both the number of businesses and frequency of BMP submissions. Under the proposed option, all MECs are required to submit a BMP to ESV for acceptance every five years, or after any changes to the Regulations or significant changes to company practices. All specified operators who own or operate a high-voltage, overhead line in a HBRA are also required to submit a BMP to ESV for acceptance every year, or after any similar changes.

Following consultation with ESV on industry trends over the life of the Regulations, it is assumed that the MEC population will remain stable (10 MECs), while the SO population will grow from a current base of 23 to

[95] Adapted from the approach utilised within the Electricity Safety (Bushfire Mitigation) Regulations 2013 Regulatory Impact Statement and is consistent with the Victorian Guide to Regulations.
[96] See ABS Employee earnings (2021) available at Employee earnings, August 2021 | Australian Bureau of Statistics (abs.gov.au). A rate of $46.55 per hour has been used in this calculation, based on the August 2021 estimate for median weekly earnings for the electricity, gas, water and waste services industry of $1,731, divided by a standard 38 hour working week.

43 at the end of the life of the Regulations. This will result in a total of 370 BMPs submitted to ESV for assessment throughout the 2023-33 period, with the majority (340) of submissions by SOs.

4.3.3 Inspection

Stakeholders have noted that the proposed minor amendments appear to be minimal and are unlikely to add significant costs. Potential business changes required may include:

- Update asset inspection manual and accompanying policy documents;
- Update asset management software to include new requirements and ensure relevant devices are updated;
- Communicate changes to asset inspectors and train them in the new materials and processes;
- Conduct initial checks that the new requirements are being enacted; and
- Follow up with an audit and assurance program around one year later to check actions and that governance is performing as intended (external audit costs to undertake).

4.4 Description of MCA

The Victorian Guide to Regulation suggests a range of analytical approaches to support option analysis.[97] Some of these options include a cost benefit analysis, where most benefits are known and can be quantified or estimated, a break-even analysis, where benefits can be estimated, as well as an MCA, for when It is not possible to quantitatively estimate the effects of, many or most of the impacts of an options. In this instance data relating to the benefits is limited, and it is not possible to quantitatively estimate the value of the costs and benefits of an identified option. As a result, an MCA has been adopted for the purposes of comparative and consistent assessment of these options. An MCA assigns and aggregates scores from identified criterion and compares weightings across options to analyse their impacts to translate findings into a preferred option based on the highest weighted score.

As an MCA is sensitive to both the criteria chosen and weightings applied, a brief discussion is provided below for transparency.

4.4.1 MCA Criterion and weighting

Three criteria (Table 4-2) were chosen to objectively assess the benefits and costs of each option, with consideration of impacts on Victorian communities, businesses and regulators. These are:

- Likelihood of bushfire ignition risks, specifically arising from electrical assets and the subsequent impacts to community;
- Cost to industry operators, in this instance being MECs, SOs and private overhead electric line owners; and
- Cost to government, which in this instance includes ESV.

Table 4-2 MCA criteria and weighting

No.	Criterion	Weighting (%)	Description
1	Reduction in likelihood of bushfire ignition risk	50	Options should look to reduce the likelihood of risk of bushfires caused by failures of electrical assets and the subsequent impacts to community and associated costs.
2	Cost to industry (MECs, SOs and private overhead electric line owners)	35	Options should minimise the cost and time taken to comply with regulations for industry operators, including MECs, SOs, and private overhead electric line owners.

[97] Victorian Guide to Regulation (2016). Available at How to prepare regulatory impact assessments | Victorian Government (www.vic.gov.au)

No.	Criterion	Weighting (%)	Description
3	Cost to government	15	Options should look to minimise implementation costs and administrative burden for government.

Reduction in bushfire ignition risk

The first criterion assesses whether the proposed option supports a reduction in bushfire ignition risk from electrical assets. This has been given a weighting of 50 per cent, recognising the potentially severe consequences electrical asset related bushfires can have on public safety, health and wellbeing. This also acknowledges the treatment of electrical asset related bushfires as a major 'corporate risk', and government stakeholder feedback that highlighted how non-compliance can pose significant risks to surrounding property, life and, in some cases, the broader electricity grid.

Cost to industry operators and private overhead electric line owners

The cost to industry has been given a weighting of 35 per cent. This recognises the 'shared responsibility' principle in emergency management, and substantial costs to industry of applying bushfire mitigation risk controls (including asset upgrades) to their networks and at-risk lines. Options should look to minimise the direct financial and administrative costs to industry that are not associated with risk-reduction or improved safety.

Cost to government

The cost to government, primarily to ESV, has been given a weighting of 15 per cent. As the energy safety regulator, ESV is responsible for promoting the prevention and mitigation of bushfire danger and monitoring and enforcing the provisions under the Act and prescribed Regulations.

As such, this criterion represents the regulatory costs associated with providing guidance to industry, monitoring and enforcing activities to ensure bushfire mitigation activities undertaken by industry meet contemporary standards and community expectations in relation to public safety outcomes.

Accordingly, options should reduce the implementation and administrative burden on the regulator associated with its regulatory functions in relation to bushfire electrical safety. The lower weighing for this criterion reflects the government's commitment to prioritise minimising the total financial and administrative costs on industry compared to the regulator. It is noted that ESV's operational costs are fully cost recovered from industry.

4.4.2 MCA Scoring

For each option, scores are assigned against each criterion, ranging from minus five to five, with five representing a high alignment to the criterion against the base case. The scoring framework is outlined in Table 4-3. The analysis framework has a limited scale (five points in the positive and negative scale) in order not to give the analysis a sense of false precision, as there are difficulties in accurately quantifying many of the impacts identified.

Table 4-3 MCA scoring

Score	Meaning
5	A score of five will be provided where the option is significantly more aligned with the criterion than with the base case.
4	A score of four will be provided where the option is much more aligned with the criterion than with the base case.
3	A score of three will be provided where the option is more aligned with the criterion than with the base case.
2	A score of two will be provided where the option is somewhat more aligned with the criterion than with the base case.
1	A score of one will be provided where the option is slightly more aligned with the criterion than with the base case.
0	A score of zero will be provided where there is no change to the base case.

Score	Meaning
-1	A score of minus one will be provided where the option is slightly less aligned with the criterion than with the base case.
-2	A score of minus two will be provided where the option is somewhat less aligned with the criterion than with the base case.
-3	A score of minus three will be provided where the option is less aligned with the criterion than with the base case.
-4	A score of minus four will be provided where the option is much less aligned with the criterion than with the base case.
-5	A score of minus five will be provided where the option is significantly less aligned with the criterion than with the base case.

4.5 Analysis of options

This section uses the above analysis framework to assess the base case under Option 1, and then appraises each option detailed in Section 4. Where appropriate, cost estimates from stakeholder consultations and relevant bushfire inquiries and reports are incorporated into the analysis.

4.5.1 Summary of analysis

A summary of all options, (Table 4-4) along with their relative scores (raw and weighted) compared to the base case option (Option 1), is as follows:

Table 4-4 Summary of MCA scoring of options

Option	Scores [weighted score]			
	Reduction in likelihood of bushfire ignition risk (50%)	Reduced cost to industry (35%)	Reduced cost to government (15%)	Weighted score
Base Case – Option 1: The Regulations cease to exist (provisions in the Act continue to apply)	0	0	0	0
Option 2 – Regulations reinstated – no amendments	1 [0.5]	1 [0.35]	1 [0.15]	1
Option 3A – Administrative amendments for consistency with contemporary standards and other regulations	2[1]	1[0.35]	-1 [-0.15]	1.2
Option 3B – Administrative amendments (Option 3A), and other amendments to maintain ongoing obligations for prescribed safety requirements for existing and new electrical constructions and installations	4 [2]	-1 [-0.35]	-1 [-0.15]	1.3

Detailed analysis overview

This section examines the impact of the different options. All options are underpinned by the requirements of the Act. Part 8 of the Act, *Bushfire Mitigation Requirements for Certain Operators,* outlines vegetation management responsibilities for the maintenance of electrical lines, the management of trees, and requirement for responsible parties to provide a BMP.

The Act requires the BMP be submitted and approved by ESV. The Act does not define the 'particulars' of the BMP. The particulars are captured within the regulations. Section 6 of the Regulations*, Prescribed particulars for bushfire mitigation plans – specified operators*, and Section 7, *Prescribed particulars for bushfire mitigation plans – major electricity companies*, detail what should be included. As the Act requires a BMP, all options analysed consider a version of the BMP. It is the particulars that vary in each option.

The Act also outlines MEC obligations within Division 2A- *Ongoing bushfire mitigation plan requirements for major electricity companies*. The Act requires an inspection of POELs by MECs to be carried out at "such time as are prescribed, and in accordance with prescribed standards". Section 7A of the regulation defines this timeframe, with private electrical lines located in hazardous bushfire risk areas needing to be inspected approximately every 3 year and private electrical lines located in other areas needing to be inspected approximately every 5 years. The regulation also outlines the prescribed standards for the inspection of these lines. As the Act requires inspections, each option analysed considers the requirement of an inspection. The specific timing and the diligence required as part of each inspection varies across the options.

The base case for this analysis includes the requirements of the Act; inspections at a frequency determined by the MEC or SO, and BMPs without any specified particulars. These activities result in an administrative burden, which is factored in as cost to industry and government. In the base case, it is considered that without regulatory guidance there would be an increased level of administrative work for both government and industry interpreting and applying the intent of the Act. Section 113A of Division 2A *Ongoing bushfire mitigation plan requirements for major electricity companies* states that a MEC must prepare a BMP annually for acceptance by ESV. Section 83B of Division 1A – *Bushfire Mitigation requirements for certain operators of at-risk lines* also requires SOs to submit an annual plan and it to be accepted by ESV. If these are deemed inappropriate, ESV can impose penalties between $55,746 and $277,380[98]. In the absence of Regulation detailing the requirement of BMPs, there could be increased back and forth between government and industry. The reinstating of the regulation (option 2, 3a & 3b) would comparatively reduce the costs of producing BMPs as content requirements would be clear and interactions between government and industry would reduce.

As previously noted Section 113F- *Inspection of overhead private electrical lines* requires MECs undertake inspection activities. The regulations outline the frequency. Under the base case ESV advised the inspection frequency would likely reduce. Results from the survey undertaken during consultation for this RIS show that inspections vary greatly, with some duty holders undertaking multiple per year, whilst others meet the minimum compliance requirements. The location of the private overhead electrical line and the associated risk profile of the region impacted the number of inspections. In the base case, it is likely that most duty holders would continue to meet these minimum requirements. As a result, there are likely to be minimal additional costs associated with the reintroduction of minimum inspection timeframes, as part of the Regulations

Base case – Option 1: The Regulations cease to exist (provisions in the Act continue to apply)

The base case – where the Regulations lapse on 18 June 2023 – is analysed to provide a point of comparison for the options which follow. It has been informed by consultations with industry and ESV.

Reduction in likelihood of bushfire ignition risks

As outlined under section 2.3, in the base case MECs and SOs would continue to have general duties under the Act to minimise "as far as practicable" the bushfire danger arising from their supply networks and at-risk electric lines. Without Regulations, ESV considers it likely that MECs may attempt to reduce the frequency and the quality of certain bushfire mitigation controls, such as extending inspection intervals which are currently governed by the Regulations. A variation in the quality of inspections or the frequency of inspections could result in a failure to identify faults in electrical assets and lines, leading to fire starts, as occurred in the St Patricks Day fires (see Case Study 3, page 36).

New risks may also be introduced. Regulations currently require MECs to undertake inspections of private electrical lines approximately every 3 years, if the line is in a high-risk area, and approximately every 5 years

[98] Penalties and values | Department of Justice and Community Safety Victoria

in other areas. With the regulation in place, the prescribed standards for inspections require suitably trained assets inspectors review and, where applicable, provide defect notices to the property owners. Under the requirements of the regulations, these inspectors are suitably trained to be able to identify defects. In the absence of regulations, section 84A(1) of the Act requires private electrical lines inspection to be undertaken by property owners and industry. Without the Regulations, inspections might be done by people who lack the technical expertise to accurately inspect and determine the condition of these lines. This could result in an increase in the risk of these lines starting bushfires.

MEC inspections also support ESV to enforce the requirement in the Electricity Safety (General) Regulations 2019, which require substantially reconstructed POELs located in HBRAs be placed underground.[99] Without the requirement to undertake inspections, MECs may not find out that a line has been reconstructed by a private land-owner until it is called on to connect the line to their distribution network. Without MECs inspecting and reporting on the condition of the POELs, ESV is unable to effectively enforce the Electricity Safety (General) Regulations 2019 that require the reconstruction of lines underground. ESV's remedial action would be limited to prosecuting or fining the electrical contractor for re-building the line above ground, in contravention of the regulations. Putting electrical lines underground significantly reduces bushfire risk. If these lines are reconstructed above ground then bushfire risk remains. The absence of regulation supporting inspections and reporting to ESV could result in increased bushfire risk

As this is the base case, a score of 0 was provided in the MCA.

Reduced costs to industry

In the absence of the Regulations, the Act will still require MECs and SOs to submit BMPs for ESV's acceptance and to undertake inspections, however there will be no prescribed content for their BMPs, prescribed minimal standards, timing requirements for inspections, or minimum standards outlining the quality of inspections. Without the Regulations the obligation within the Act to inspect overhead private electric lines becomes inoperative.

As the Act requires inspections and BMPs to be completed, the base case will include costs associated with inspections and BMP preparations. It is expected that inspections of at-risk and overhead private electric lines would occur at a reduced frequency relative to the base case for some lines. The frequency of inspections is more likely to decrease for lines in low bushfire risk areas.

Consultations undertaken as part of this RIS have provided a baseline of current costs incurred by businesses to undertake bushfire mitigation activities, including the submission of BMPs, and inspections.

In the absence of Regulation, industry stakeholders did not anticipate material cost changes to BMP submissions. For this reason, the base case uses estimates of the median costs associated with this activity under the current Regulations.

Without regulation ESV have suggested that the frequency of inspections may reduce for some lines, which would somewhat reduce costs to industry However, a median approach to costs has also been used because of the variation in inspections activities across duty holders. A median is more reflective of the typical cost to duty holders as the data from consultations is positively skewed. Some MECs inspect lines multiple times per year, more frequently than required, while other duty holders inspect at the rate they are required to, so the median aligns with the existing requirements. Under the base case, it is expected that most duty holders would continue to meet these minimum requirements to meet obligations under the Act and to ensure their assets are in good condition, so the median under base would likely align with existing requirements. It is also worth noting that inspections beyond the minimum requirements are voluntary and should not be considered part of the regulatory burden of the regulations. Cost estimates for BMPs and inspections are presented in Table 4-5.

Table 4-5 Median business costs incurred

Group	BMP costs			Inspection costs		
	Preparation cost	Review and update	Total	At-risk lines	Private electric lines	Total cost
MECs	$27,253	$3,999	$31,252	$4,650,000	$200,000	$4,850,000
SOs	$8,146	$3,259	$11,405	$5,000	$50,000	$55,000

[99] It is noted that there is a requirement for undergrounding but that there are exemptions or alternate compliance mechanisms in-place for existing lines

Source: Industry stakeholder survey submissions (n = 6 MECs and 4 SOs). BMP review and update costs include ESV feedback. Median figures for subcomponent costs are reported due to the skewness of the data.

As noted above, survey data has also been used to estimate the total cost to industry. Given limitations associated with the survey data, total costs are presented as a range. The lower bound of the range is based on median costs (excluding outliers), the upper bound is based on mean costs (excluding outliers).

- The total cost of inspections to MECs ranges between $50.6M and $77.0m.
- The total costs of inspections to SOs ranges from $1.15M to $1.32M.
- The total cost associated with the delivery of a BMP for MECs ranges between $0.32M and $0.35M.
- The total cost associated with the delivery of a BMP for SOs ranges from $0.74M and $0.80M.

According to industry stakeholders, compliance costs in relation to inspections are driven by multiple factors, including requirements to conduct regular asset inspections and condition assessments for low and high voltage lines, ground vegetation inspections, pole inspections and aerial inspections. For one distribution business, year-on-year variations in inspection costs arose from the cyclical nature of inspection requirements (e.g. HBRA assets are inspected more frequently than LBRA assets), and the condition of their assets. In addition to these costs, undertaking inspections in compliance with the regulatory requirements requires significant training and expertise to ensure safety and compliance of electrical assets, as well as ensuring the safety of inspectors and members of the community, resulting in further costs to the business.

ESV has advised that the lack of prescribed requirements within BMPs may cause a delay in its review and acceptance of BMPs. This would potentially influence the costs borne by businesses in reviewing and updating their BMPs. This process currently accounts for 24% of total BMP costs.

Industry stakeholders highlighted that broader compliance with the electrical safety framework has resulted in costs being incurred. Over the life of the Regulations, which has included implementation of VBRC recommendations and other upgrades to electrical assets and at-risk lines, other costs have included:

- REFCL installations
- SWER ACRs
- Armor rod and vibration dampers
- HV spacers and spreaders
- Outsourcing of training and capability costs to support the qualification of inspectors
- Safety programs
- Pole uplift programs.

Under the base case scenario, ESV has considered it likely that MECs may attempt to extend inspection intervals. Such changes may result in a reduction in inspection costs for this group.

As this is the base case, a score of 0 was provided in the MCA.

Reduced costs to government

Table 4-6 include current annual administrative monitoring and enforcement costs associated with the provisions in the Act (and prescribed under the existing regulations) for BMP assessments, and mitigation audits and investigations. This includes ESV's monitoring of industry compliance against accepted BMPs, and MEC's pre-summer preparation activities ahead of each bushfire season.

In the absence of the Regulations, ESV would still review BMPs per the Act, and have the power to accept or reject BMPs on the basis of whether or not they are appropriate for the assets they cover. ESV anticipates that duty holders may push for a reduction in risk mitigation activities, but otherwise ESV has the capability and knowledge to assess and accept BMPs without the regulations in place. However, in the absence of prescriptive requirements for content and critical risk controls, there would be a greater need for ESV to provide guidance to stakeholders regarding content expectations of the BMPs. ESV would need time to produce, consult on and publish comprehensive policy and guidelines to set expectations with respect to the content of BMPs in the absence of prescribed content. This will create additional assessment costs to government, though the specific quantum of these costs are unclear.

Table 4-6 Current costs incurred by ESV

Activity	Industry Group	Cost (approx.)	Overheads	Total Cost
BMP Assessment	MECs	$54,775	$41,081	$95,856

Activity	Industry Group	Cost (approx.)	Overheads	Total Cost
BMP Assessment	SOs	$11,259	$8,445	$19,704
Bushfire Mitigation Audits and Investigations	All	$1,025,501	$769,126	$1,794,627
Total		$1,091,535	$818,652	$1,910,187

As this is the base case, a score of 0 was provided in the MCA.

Option 2: Regulations reinstated – no amendments

This option is slightly more aligned with the criterion compared to the base case as it will improve safety outcomes. Within this option, the existing Regulations would be reinstated as they are, giving continued practical effect to the provisions of the Act by ensuring MECs and SOs incorporate bushfire mitigation measures to a required standard. Timeframes would also align with government expectation, as well as reducing the likelihood of negative externalities to unintended third parties or civilians for bushfire ignition that occurs due to their electrical assets or networks.

Reduction in likelihood of bushfire ignition risks

As detailed under Chapter 4 of this RIS, the existing Regulations prescribe the particulars to be included in the BMPs submitted to ESV. These particulars include the details and timing of bushfire mitigation strategies and details on planned supply network upgrades and improvements. By reinstating these Regulations, MECs and SOs will be held accountable to the accepted bushfire prevention strategies and programs within their BMPs, including both the nature and timing of their implementation. This process helps government manage the public safety risks associated with electrical assets. Without the regulation, BMPs may be submitted in a variety of forms, impacting the repeatability and consistency of administrational process that support the accurate assessment of bushfire risk. The reinstating of the Regulations in their current form would maintain the existing submission particulars leading to an improvement from the base case.

With the Regulations reinstated, MECs, SOs and owners of private overhead electric lines will also continue to be subject to inspection by an MEC at determined intervals. For private electrical lines located in hazardous bushfire risk areas this would need to occur no later than every 37 months, and no later than every 61 months in other areas. As compared to the base case, this guarantees an inspection within a risk-based timeframe. Without the Regulation, high risk areas could be inspected as frequently as low risk areas, or even over greater timeframes. Similarly, with the Regulation implemented, MEC inspectors will have also undertaken minimum training and complete their work at an allotted time, reviewing defined structures, and be following a clear process. The Regulations also help ensure that monitoring of these lines does not fall entirely on owners of private overhead electric lines (including property owners and industry) who may lack the technical expertise and financial incentive to efficiently and properly monitor the conditions of such lines in the base case, the Act still requires inspections to occur though the quality or specific requirements of the inspection are not detailed. This means that the inspection may not readily or consistently identify bushfire ignition risks. The reinstatement of the Regulation therefore contributes to a reduction in bushfire risk.

By requiring ESV approved training completion for inspectors, inspections across Victorian networks and distribution areas are more likely than in the base case to be carried out in a standardised and auditable manner, reducing the likelihood of bushfire ignitions risks. In addition to this, by prescribing requirements for the frequency that inspections should be undertaken in HBRA and LBRAs for private overhead electric lines located in MEC distribution areas, monitoring of ones that have been substantially reconstructed which are located in HBRA and required to be placed underground (as per the requirements of the Electricity Safety (General) Regulations 2019) will be more adequate than circumstances under the base case.

For these reasons, a **score of 1** was provided in the MCA as it is slightly more aligned with the criterion than the base case.

Reduced costs to industry

As noted in the Detailed Analysis Overview section, the introduction of the Regulations would result in:

- Greater clarity about requirements under the Act for activities associated with the delivery of the BMPs. Regulations introduce a formalised reporting structure that standardises inputs, creating efficiencies for industry who would not have to spend time interpretating what to provide. This approach provides greater clarity and clear expectations, regarding BMPs, inspections, and auditing standards. This clarity would reduce the number of interactions needing to occur between ESV and industry, as well as the risk of a penalty for non-compliance or a delayed submission.
- Increased frequency of inspections on some lines, which would increase costs. As compared to the base case, there would be the requirement to undertake inspections at a minimum frequency. It is expected that some SOs or MECs would inspect less frequently under the base case than the minimum under the Regulations, particularly in low bushfire risk areas.
- Overall, reinstating the Regulation would reduce costs to industry. The reduction in costs related to BMPs would be only partially offset by the increase in costs related to inspections.

For these reasons, a **score of 1** was provided in the MCA as it is slightly more aligned with the criterion than the base case.

Reduced costs to government

Compared to the base case, the reinstatement of the existing regulations will likely enable the maintenance of improved administrative and regulatory efficiencies for ESV. This could be achieved by having consistent and transparent standards, which reduces the need for guidance material to be developed to support industry stakeholders meeting ESV's expectations of BMPs. This would also reduce potential delays in assessment of BMPs and the potential for reduced labour costs for ESV with the reduction in time required to respond to individual industry clarifications and follow ups due to a more standardised process. By streamlining the process with more standardised requirements for BMPs and inspections, there are likely to be reduced costs to ESV through a reduction in effort duplication, clearer criteria of assessment to inform auditing processes, and a reduction in labour time and cost necessary for reviews and approval processes. This is an improvement on the base case, but it is acknowledged that the BMP review activity, and more broadly the proactive approach to regulatory engagement, would result in minor costs to government.

For this reason, a **score of 1** was provided in the MCA as it is slightly more aligned with the criterion than the base case.

Option 3A: Administrative amendments for consistency with contemporary standards and other regulations

The following administrative amendments are considered as part of Option 3A:

- Regulation 5 - Amend the definition of 'total fire ban day' to include a 'partial day' total fire ban. Rationale for amendment is that this will align the definition with section 40 of the Country Fire Authority Act 1958 ("*(1) The Authority may when it thinks fit declare a day or partial day of total fire ban in respect of the whole or any part or parts of Victoria and may at any time amend or revoke such a declaration.*")
- Regulation 6(a)–(d) and 7(1)(b)–(da) (revision) - Insert a requirement that the specified operator or major electricity company must provide email addresses for the prescribed key contact persons. The current regulations do not require this information, however it is commonly provided. This would reflect existing practice.
- Regulation 10(1)(l) and 10(2) (revision) - The current definition of 'hazard tree' in regulation 10(2) refers to clause 8 (now 9) of the Code of Practice for Electric Line Clearance, which outlines the conditions to cut down or remove a tree. This may cause confusion as clause 9 does not apply to hazard trees located on private land. Rather, the proposed changes will align the meaning of 'hazard tree' in 10(2) with the meaning implied in clause 9 of the Code of Practice (without, however, referring to the Code of Practice), and remove the note to 10(1)(l) which is inaccurate and misleading as it suggests that people other than the landowner are authorised to enter private property to remove a hazard tree that is threatening an overhead private electric lines – this is not the case.

Amendments to regulations 5 and 6(a)–(d) and 7(1)(b)–(da) were not consulted on but were considered to be immaterial and reflected current best practice. Regulation 10(1)(l) and 10(2) were consulted on with industry, who responded with a neutral or supportive comment to the proposed amendments given they were administrative changes.

The submissions and advice received from impacted stakeholders demonstrated few major concerns with the provisions of the Proposed Regulations. In relation to the revisions to regulations 10(1)(l) and 10(2) of the

existing Regulations, most stakeholders indicated they were neutral or very supportive of this amendment in order to ensure consistency across relevant Regulations and the change's appropriate application of existing standards, with some acknowledging that the proposed changes in Option 3A would result in no change to their existing business practices.

Survey respondents were asked to assess whether the proposed amendment will change their business's current inspection standards and practices by indicating 'Yes', 'No' or 'Unsure'. Results demonstrated the following views in relation to the proposed amendment:

- **Seven** survey respondents **did not** believe the proposed amendment would change their current inspection standards and practices
- **One** survey respondent indicated that the proposed amendment **would** in fact change their current inspection standards and practices
- **One** survey respondent was **unsure** whether the proposed amendment would change their current inspection standards and practices
- **One** survey respondent did not provide a response to the question.

Survey participants were asked to assess on a scale of being 'very opposed', 'opposed', 'neutral', 'somewhat supportive' or 'very supportive' whether their business would support this amendment to the regulations. Results demonstrated the following views in relation to the proposed amendment:

- **Four** survey respondents were '**very supportive'**
- **Five** survey respondents were '**neutral**'
- **One** respondent did not provide a response to the question asked.

Reduction in likelihood of bushfire ignition risks

By improving the Regulations and aligning with existing legislation and general duties, some small efficiencies are expected. Within the base case, section 84 of the Act requires trees be kept clear of electrical lines by responsible parties. The Regulation further clarifies this by introducing the need to remove hazardous trees. A hazardous tree is defined in the Electricity Safety (Electric Line Clearance) Regulations 2020 as being identified by a suitably qualified arborist, in respect to local conditions. These interplay with local government regulations and updating the Regulation through this option would provide a clear and consistent definition to support the timely removal of a hazardous tree. In both the base case and Option 2 there is the risk that administrational processes would need to be undertaken by the arborist to confirm the actual definition of the tree, delaying removal. By consolidating this definition, the likelihood of removal delay would be reduced, as would any residual bushfire ignition.

The Regulation requires MEC and SO BMPs detail the operation and maintenance plans for the specified operator's at-risk electric lines during a fire, during a total fire ban and during a fire danger period. This allows for stakeholders to be informed about how assets would be managed within these scenarios. The partial fire-ban day is an additional scenario that likely parallels the total fire-ban day, with some nuance relative to the reduced timeframe. Clarifying and including the partial fire ban day within the 'total fire ban day' would require MECs and SOs to provide some detail on how they would modify activities for this scenario. This updated definition may reduce confusion and streamline activities undertaken within the sector that directly reduce the likelihood a fire.

Requiring operators of major electricity companies to provide key contacts' email addresses may directly limit the consequence of a fire event by enabling efficient communication and enshrining contemporary practices into regulation for any new entrants. This could lead to an improvement on the base case.

For these reasons, a **score of 2** was provided in the MCA as the option is more aligned with the criterion than the base case.

Reduced costs to industry

Similar to Option 2, this option will also reduce costs to industry compared to the base case by providing a minimum clarity of expectations, regarding BMPs, inspections, and auditing standards. This would reduce the amount of interpretation needing to be undertaken by industry, when preparing and submitting BMPs. This would likely mean a reduction in time commitment from staff.

The addition of a field within the BMP requiring detail about the adherence to the new regulation is not likely to result in any significant cost to industry. Accounting for these costs and the minor nature of the

amendments, a **score of 1** was provided in the MCA, the same score as for Option 2. Like Option 2, Option 3A is slightly more aligned with the criterion than the base case.

Reduced costs to government

Similarly, compared to the base case, the administrational amendments may result in slight improvements to existing processes and procedures for government. Consistent definitions could streamline industry focussed communication activities and reduce the number of inquiries from industry stakeholder. However, It is likely that associated costs that come with a reduced inquires will be immaterial.

Once the changes are made and regulations are updated, Government will have to proactively provide guidance to industry and key stakeholders on the changes. Though small in change, there may be some wider consultation and engagement required to educate and inform those impacted. These will likely have to occur via a range of mediums and in sustained manner, especially where compliance or penalties (like with the removal of hazard trees) apply. Undertaking these changes will likely require a small time commitment. There may also be small changes to internal processes or guidance documents, as well as the publishing or removal of outdated advice. These changes would result in an initial cost to government.

For this reason a **score of -1** was provided in the MCA.

Option 3B: Administrative amendments (Option 3A), and other amendments to provide greater clarity and certainty for prescribed safety requirements for existing and new electrical constructions and installations

Participants were notified that as part of the remaking of the Regulations, DEECA has considered a new requirement to be included in regulation 7(1), intended to ensure the Regulations are consistent with existing contemporary practices in relation to insulation on low voltage overhead lines in HBRA.

In relation to inspection standards for overhead private electric lines, Option 3B also includes a revision to regulation 10(1)(m) that would replace the minimum clearance requirements for existing lines (other than bare open wire conductors) with an alternative set of minimum clearance requirements that represent a more relevant safety standard for lines that may have been constructed prior to the current Wiring Rules. This would remove an unintended consequence inherent in the existing Regulations, which currently impose the requirements in Table 3.8 of the Wiring Rules for all overhead private electric lines.

No significant concerns were raised by stakeholders in relation to the revision of regulation 10(1)(m) of the existing Regulations, with most noting that this change was likely minor and administrative, and were thus neutral in opinion for the proposed amendment. It was noted by some stakeholders that the proposed change may require training and implementation for personnel to identify and apply various clearance heights which may have associated costs for MECs. It is important to note that while there is some overlap, there are no identified inconsistencies between the Bushfire Mitigation Regulations and the Bushfire Mitigation Duties Regulations 2017. The matters that are duplicated, along with the corresponding provisions of the Act, are listed below to demonstrate how proposed amendments align with existing regulations and with the Act.

Table 4-7 Matters included in different regulations and the Act

Matter dealt with	Bushfire Mitigation Regulations 2013	Bushfire Mitigation Duties Regulations 2017	Electricity Safety Act 1998
Specification of which substations are zone substations	Schedule 2	Schedule 1	s.120K
Specification of the points values that apply to each zone substation	Schedule 2	Schedule 1	s.120K

Matter dealt with	Bushfire Mitigation Regulations 2013	Bushfire Mitigation Duties Regulations 2017	Electricity Safety Act 1998
Meaning of 'electric line construction area'	Reg 5	Reg 6	s.120K
Meaning of 'required capacity'	Reg 5	Reg 7	s.120K
Specification of which electric lines must be covered or placed underground	Reg 7(1)(hc)	Reg 8	ss.120N and 120P

There were no concerns raised from stakeholders to the implementation of 7(1) into the Proposed Regulations, requiring insulation on low voltage overhead electric lines in HBRA, with many noting that this is already established business practice for industry. Some stakeholders noted that they have no uninsulated low voltage overhead electric lines within their network and no intention to install any, thus positioning them as neutral in response to the proposed change.

Reduction in likelihood of bushfire ignition risks

By improving the regulations and aligning these with existing best practice, reflecting the work already completed by industry, there would be some improvement in transparency and understanding of bushfire ignition risk, across the State. More significantly, the amendments introduce an ongoing obligation for industry to detail in the preventative strategies and programs included in their BMPs. This also includes compliance with prescribed safety requirements for existing and new electrical constructions and installations that relate to ACR and REFCL safety installations. It also introduces an ongoing obligation to ensure that ACRs are installed on overhead SWER lines, in line with the VBRC recommendation. As these technologies have demonstrated effectiveness in preventing bushfire ignitions, compared to the base case, it is assumed that this Option will contribute to a relatively greater reduction in the likelihood of new electrical assets causing bushfire ignition. For this reason, a **score of 4** was provided in the MCA as the option is much more aligned with the criterion than the base case.

Reduced costs to industry

This option provides similar cost reductions to Option 3A compared to base case by enshrining and aligning to contemporary standards, providing greater streamlining and transparency over the required inspection standards and minimum set of requirements for acceptance of BMPs by ESV.

The alignment of the Regulations to contemporary standards and clarifications of arrangements for MECs regarding inspections of private overhead electric lines constructed prior to recent changes to wiring standards may support greater businesses efficiencies in relation to inspection activities, once minor costs are accounted for in amending existing processes or procedures to reflect the changes.

However, Option 3B introduces additional costs to industry compared to the base case and other options through ongoing obligations related to safety installations. Historical programs of work undertaken to improve bushfire mitigation controls were noted by industry stakeholders as significant in cost. Stakeholders specifically noted the complying with REFCL and ACR requirements, as impacting business cost-effectiveness. Requiring the implementation of new wiring standards and clearances, could have a parallel cost to the REFCL and ACR implementation.

Option 3B also embeds the ongoing obligation to install ACRs, (noting all MECs have installed ACRs). This requirement would mean that should MECs repair or replace overhead SWER lines they would also be required to install another ACR. This would be an additional cost borne. For this reason, a **score of -1** was provided in the MCA as the option is somewhat less aligned with the criterion than the base case.

Reduced costs to government

As with Option 3A, there would also be benefits associated with the aligning of definitions and technical standards, resulting in a reduction in inquiries from industry. There may also be some initial implementation, communication and stakeholder engagement cost associated which would require resourcing and the allocation of time. This would require government to complete new work associated with updating guidance, informing, or educating industry on the requirements, as well as publishing changes and amending old advice. For this reason, a **score of -1** was provided in the MCA as the option is slightly more aligned with the criterion than the base case. This is the same score as for Option 3A.

5 Preferred Option

5.1 Summary of the Proposed Regulations

Three options were identified in consultation with DEECA and ESV to address the problems identified within this RIS and meet the overarching government objectives. After conducting in-depth analysis of these options, the preferred option is Option 3B.

The Proposed Regulations aim to reduce bushfire ignition risks from Victoria's electrical infrastructure and electric lines owned and/or operated by MECs and SOs by:

1. **Reducing the likelihood of powerlines starting bushfires in HBRAs** through active and high-quality inspection processes in relation to private overhead electric lines, introducing partial fire ban days and total fire ban days, requiring ongoing asset risk mitigation obligations for MECs and SOs and ensuring minimum standards for electricity asset safety that is reflective of current practice.
2. **Supporting local and State level bushfire mitigation and readiness activities** in the management of their above-ground assets through the provision of adequately specified BMPs.
3. **Promoting public trust, transparency and accountability** of MEC bushfire mitigation planning through requiring their BMPs, and specified details of these BMPs, to be made publicly available on their websites.

The Proposed Regulations support the corresponding objectives under the Act:

- Part 1, Section 1 (a) and (b) (Purpose) of the Act to make provisions relating to the safety of electrical supply and use, and the reliability and security of electricity supply; and
- Part 2, Section 6 (ca) (Objectives of ESV) of the Act for ESV to promote the prevention and mitigation of bushfire danger.

Based on the analysis in this RIS, DEECA is recommending remaking the Regulations with a number of minor improvements (Option 3B).

As part of remaking the Regulations, minor amendments have been introduced to ensure the Regulations are consistent with contemporary practices in relation to insulation on low voltage overhead lines in HBRAs. It is also seeking to provide greater clarity, accuracy and certainty on the inspection standards for private overhead electric lines, in relation to 'hazard trees' as well as minimum clearance requirements for lines that were potentially constructed prior to the making of the current Wiring Rules.

Significant analysis and consultation have taken place to determine the scope and options for the Proposed Regulations. Following careful consideration, the scope of the current remake of the Regulations has been limited to minor amendments only, where substantive policy analysis has already been undertaken and resulted in a strong rationale for those amendments. DEECA will give consideration to how issues that are out of scope of the current remake might appropriately be addressed in future and will continue to engage with stakeholders and ESV as needed.

Table 5-1 Potential amendments to existing Regulations

Impacted Regulation of the existing Regulations	Amendment	Rationale	Impact on Stakeholders
Regulation 5	Amend the definition of 'total fire ban day' to include a partial day of total fire ban.	This will align the definition with section 40 of the *Country Fire Authority Act 1958*.	N/A
Regulations 6(a)–(d) and 7(1)(b)–(da) (revision)	Add a requirement that the specified operator or major electricity company provide email addresses for the prescribed key contact persons.	Current regulations do not require this information, however it is commonly provided. This would reflect existing practice.	Low impact on MECs and SOs. Change will require effort to provide a dedicated contact.
Regulations 7(1)(ha) and 7(3) (revision and removal)	Retain the ongoing obligation, but remove the statutory deadline of 1 May 2023, for a major electricity company to ensure that, in	This proposed change will retain this as an ongoing obligation as originally intended by this Regulation, while removing	MECs would be required to report on details of testing that will be undertaken before the specified bushfire risk period each

Impacted Regulation of the existing Regulations	Amendment	Rationale	Impact on Stakeholders
	its supply network, each polyphase electric line originating from every zone substation specified in Schedule 2 has the required capacity. Remove the 'Points' column (Column 6) from Schedule 2.	the reference to the 1 May 2023 deadline. The 1 May 2023 deadline remains in the Act for enforcement purposes if required (see section 120M(1)(c)).	year to ensure that its supply network can operate to meet the required capacity in relation to each polyphase electric line.
Regulation 7(1)(l)	Insert a new definition of 'covered' for the purposes of Regulation 7(1)(l) that substantially aligns with the definition of 'cover' in section 120N of the Act.	This definition clearly distinguishes 'covered' from 'insulated' which is used in proposed new Regulation 7(1)(m). The definition of 'covered' refers to 'a system of insulation' which is different in scope from the definition of 'insulated' in proposed new Regulation 7(1)(m).	No implications for MECs. New definition clarifies that 'covered' has a different meaning than the newly defined term 'insulated' in proposed new Regulation 7(1)(m). There is no practical change in the meaning of 'covered.'
Regulation 7(1)(m) (new to be added)	Require all newly constructed low voltage overhead electrical cables or wires in HBRAs to be insulated. For the purposes of this new Regulation, insert new definitions as follows: • A new definition of 'insulated' that closely aligns with the definition of 'insulated' in the Electricity Safety (General) Regulations 2019. • A new definition of 'electrical cable or wire' that is limited to cables, wires or similar components of an 'electric line' under the Act.	This reflects the contemporary practice of MECs; including this requirement in the Regulation will lock this practice in as a minimum standard.	Requires an ongoing obligation for MECs to ensure that any newly constructed low voltage lines in HBRAs are insulated in alignment with contemporary safety practices. Whilst this change may apply an ongoing cost to industry, the obligation reflects existing MEC practice and thus holds no substantive impact according to stakeholders consulted.
Regulation 7 (change)	This proposed change will continue the obligation of major electricity companies to install AERs in relation to overhead SWER lines and require them to maintain existing SWER lines. This ensures that new overhead SWER lines are covered by this requirement and that existing ACR coverage is maintained.	All major electricity companies have now installed ACRs in relation to overhead SWER lines in their supply networks, as they were required to do under the existing Regulations by 1 May 2023. However, under the existing Regulations, there is no ongoing obligation to ensure that ACRs are installed on overhead SWER lines. This proposed change would create an ongoing obligation to do so. Future consideration may be given to reviewing this	MECs would be required to ensure that all overhead SWER lines have ACRs in their supply networks ongoing.

Impacted Regulation of the existing Regulations	Amendment	Rationale	Impact on Stakeholders
		obligation to accommodate the use of other technologies that would achieve an equal or higher level of risk mitigation.	
Regulations 10(1)(l) and 10(2) (revision)	In relation to inspection standards for overhead private electric lines, delete the note to Regulation 10(1)(l) and update the definition of 'hazard tree' in Regulation 10(2) to align with the meaning of 'hazard tree' that is implied in clauses 9(2) and (3) of the Code of Practice for Electric Line Clearance.	The current Regulations 10(1)(l) and 10(2) refer to clause 8 (now clause 9) of the Code of Practice for Electric Line Clearance. This may cause confusion as clause 9 does not apply to hazard trees located on private land. In addition, the note to Regulation 10(1)(l) is inaccurate and misleading as it suggests that people other than the landowner are authorised to enter private property to remove a hazard tree that is threatening an overhead private electric line – this is not the case.	With the current definition in Regulation 10(2), and the note in Regulation 10(1)(l), are inaccurate and misleading, the proposed changes will provide stakeholders with greater clarity and accuracy regarding the inspection standards for private electric lines and vegetation clearance requirements.
Regulation 10(1)(m) (revision)	In relation to inspection standards for overhead private electric lines – for existing private electric lines (other than bare open wire conductors) – replace the minimum clearance requirements set out in Table 3.8 of the Australian/New Zealand Wiring Rules (Wiring Rules) with an alternative set of minimum clearance requirements that represent a more relevant safety standard for lines that may have been constructed prior to the 2018 Wiring Rules.	This will remove an unintended consequence inherent in the existing Regulations (which currently imposes the requirements in Table 3.8 of the Wiring Rules for all private electric lines) and will provide greater clarity and certainty on the standard that applies in relation to minimum clearance requirements for lines that were potentially constructed prior to the making of the current Wiring Rules. The minimum clearance requirements in Table 3.8 of the Wiring Rules will continue to apply to private electric lines that have bare open wire conductors or that are newly constructed.	Stakeholders will receive greater clarity and certainty on the minimum clearance requirement standard for lines that were potentially constructed prior to the making of the current Wiring Rules.

6 Implementation, monitoring, and enforcement

The proposed Regulations remake the existing sunsetting Regulations and include a number of administrative amendments. These amendments focus on improving a number of definitions to support a consistent understanding amongst stakeholders, as well as aligning the Regulation with contemporary standards and other regulations. Amendments also provide greater clarity and certainty on the prescribed safety requirements for existing and new electrical constructions and installations

These Regulations have been in place for over a decade, with industry stakeholder surveys confirming that the Proposed Regulations largely reflect business-as-usual activities for MECs and SOs. It is noted however, that unlike the established MECs, SOs are a diverse and growing group of regulated entities and, as such, are likely to increasingly capture new market entrants who may not be familiar with the Regulations and whose potential contribution to bushfire ignition risks from electrical assets is currently unknown. Monitoring the development of this emerging sector will be an important role over the next 10 years.

In light of these considerations, implementation planning for the Proposed Regulations will consider both established businesses and emergent industry groups who may fall within the scope of the Regulations.

6.1 Implementation

Industry will be notified of the Proposed Regulations through the public consultation processes associated with this RIS and publication of the finalised Regulations. ESV will play an important role through its ongoing education and awareness activities with industry and other stakeholders. Industry will be advised of transition periods for the amendments. The regulations are expected to commence on 18 June 2023. Where applicable, this will include a six-month transition period for the minimum clearance requirements as part of the prescribed standards of inspection for overhead private electric lines.

Businesses that meet the definition of MEC and SO will be responsible for complying with the Proposed Regulations.

Given that there are only minor changes proposed in relation to the content of BMPs, industry would be expected to make any necessary changes when they are next required to submit a BMP.

Established regulated businesses may need to implement changes to business practices, where required, from the minor amendments introduced as part of the Proposed Regulations.

Industry survey participants have indicated further potential adjustments for future consideration, including:

1. Updating existing BMPs and internal documents that refer to the note in Regulation 10(1)(l) and the definition of ‘hazard’ tree.
2. Updating business practices related to the issue of defect notices to private electric line owners and minor updates to software to apply the amendment to inspection standards for private overhead electric lines.

Consultation with ESV and DEECA suggest that the transition time for the proposed changes to the current inspection standard for existing overhead private electric lines (other than bare open wire conductors, for which there is no change) should be six months after the commencement of the Proposed Regulations. This timeframe is considered appropriate given that this change requires MECs to amend their existing policies and procedures (e.g. field manuals), provide additional training to staff and take steps to ensure the change is being effectively implemented in the field. The other proposed amendment that may require MECs to take new measures is the proposed extension of the obligation for ACRs on overhead SWER lines to be an ongoing obligation. Consultation with ESV and DEECA suggest that this change does not require a transition period as it does not require substantial changes to MEC practices.

As the regulating entity, ESV will implement the Proposed Regulations using existing resourcing capabilities, through well-established, existing processes that it undertakes for changes to regulatory requirements.

6.2 Monitoring

ESV, as the body responsible for enforcing the Regulations, will be responsible for monitoring implementation of the Proposed Regulations.

ESV already has established auditing capabilities in place to determine whether the Regulations are being implemented as intended. These include:

- Auditing bushfire mitigation plans, including audits on MECs, SOs and network assets;
- Assessing the implementation of REFCLs; and
- Auditing the asset management practices (including vegetation line clearance practices) of major electricity companies and other regulated entities.[100]

ESV's data collection and analysis capabilities are demonstrated through multiple reports, including:

- Annual Electrical safety performance reports on the safety performance of Victoria's MECs; and
- End of fire season summary reports: These summary reports provide an overview of the preparedness of the networks for a particular fire season. They include an analysis of fire events during the fire season, a comparison to previous years, and an update on investigations into the previous year's major fires.

ESV also receives detailed Annual Bushfire Mitigation Program reports from MECs that relate to regulated safety programs that will reduce the risk of their networks starting bushfires.

Noting the potential for new business entrants to the electricity industry over the next 10 years, ESV will be publishing guidelines in regard to renewable energy installations, part of which will cover bushfire mitigation. The guidelines are anticipated to be published in early 2023.

6.3 Enforcement

ESV will conduct audits of the commitments made in BMPs on an annual basis. The performance of the businesses is then contained in ESV's annual safety performance report, which is publicly available from the ESV website.

Under section 83BB of the Act, SOs must not operate an at-risk electric line between 1 November and 31 March unless a BMP that applies to the operator's at-risk electric lines has been accepted or provisionally accepted by ESV. In addition, the SO must comply with an accepted BMP. Penalties apply to SOs for failure to comply with these provisions, equating to 300 penalty units for individuals and 1,500 penalty units for bodies corporate. Section 113B of the Act makes similar provisions in respect of MECs.

[100] ESV_CorporatePlan2021-24.pdf

7 Evaluation strategy

The Victorian Guide to Regulation requires ex-post evaluations to be conducted of all regulations to enhance the effectiveness and efficiency of regulations in meeting government objectives.

An evaluation strategy supports appropriate evaluation of regulations and provides for the conduct of evaluations at regular intervals to ensure that the regulations remain relevant and keep up with social and technological developments.

The following provides an overview of the key steps that should be taken to support the development of an evaluation framework. This framework should align with the Department of Treasury and Finance's (DTF) Resource Management Framework (RMF) [101] which will help gather evidence to understand how the regulation was delivered in alignment with its intended objectives and priorities.

7.1 Key evaluation questions

Key evaluation questions (KEQs), align data sources and collection activities, supporting DEECA to understand the overall impact of the Regulations, particularly focusing on the achieved and stated outcomes. KEQs should also support the gathering of information and evidence required to indicate whether the program has achieved its intended outputs and outcomes. The evaluation questions and sub-questions required under the DTF RMF evaluation criteria include:

- **Program Justification:** What is the evidence of continued need for the regulation and role for government to continue supporting these activities?
- **Effectiveness:** What is the evidence of DEECA's progress in relation to stated objectives and expected outcomes, including alignment between its output, Departmental objectives and any stated government priorities?
- **Funding/ Delivery:** Has DEECA delivered its program of work within its scope, budget and expected timeframe, and in line with appropriate governance and risk management practices?
- **Efficiency:** Has DEECA demonstrated efficiency and economy in relation to its operations and delivery of programs?
- **Risk:** What would be the impact of ceasing these activities and what strategies can be used to minimise negative impacts?
- **Further funding requirements:** Does the current funding allocation reflect the true cost required to support operations and activities?

These questions can be broken into sub-KEQs to understand specific outcomes or deliverables. Two sub-KEQs that should be considered are:

1. Have the Regulations been effective in reducing the likelihood of bushfire ignitions from Victoria's electricity assets and at-risk electric lines?
2. Do the Regulations constrain the costs of doing so to the most efficient level?

7.1.1 Indicators

Indicators represent the specific quantitative and qualitative elements which provide the detailed data to support each of the evaluation questions and sub-questions. The indicators allow measurable change to be traced throughout the evaluation timeframe and thus provide specific data points for comparison.

To measure DEECA's impact, the KEQs and sub-KEQs should be aligned to proposed indicators encompassing both quantitative and qualitative descriptors. Key indicators may include:

- Number of fires started by electrical assets;
- Electricity distributors' commitments to deploy a quantum and type of asset in a given place, by a given time; and

[101] Department of Treasury and Finance (2022), Resource Management Framework, available at: Resource Management Framework | Department of Treasury and Finance Victoria (dtf.vic.gov.au)

- Number of inspections undertaken and audits evidencing the extent to which these commitments have been met.

7.1.2 Data to support

ESV will conduct audits of the commitments made in BMPs on an annual basis. The performance of the businesses is then contained in ESV's annual safety performance report, which is publicly available from the ESV website.

Electricity distributors must submit a BMP to ESV every five years. ESV can direct that the plan be updated at any point where there is a need to do so. The plans must detail how particular safety objectives will be achieved. With respect to the deployment of REFCLs, SWER ACRs and heightened powerline construction standards, the businesses will be required to commit to a particular quantum of asset deployment, indicating location and timing of completion. BMPs are publicly available documents from individual businesses' websites.

The *National Electricity (Victoria) Act 2005* establishes the powers for the operation of the 2016 F-factor Order-in-Council. The Order requires electricity distributors to report, on an annual basis, to the AER on the number fires that have been started by their networks. The Order then empowers the AER to reward or penalise businesses for fire start performance which deviates above or below their average historic level of fire starts (the F-factor). The AER publishes fire start data, and makes an F-factor determination, on an annual basis. This provides a sound measure of the ultimate impact of the Proposed Regulations.

7.2 Evaluation strategy

The following table provides an overview of the evaluation strategy.

KEQ	Indicator	Data source
What is the evidence of continued need for the Regulation and role for government to continue supporting these activities?	• Number of fires started by electrical assets • Electricity distributors commitments to deploy a quantum and type of asset in a given place, by a given time • Number of inspections undertaken and audits evidencing the extent to which commitments have been met	• BMPs • Safety performance reports • AER F-factor determination
What is the evidence of DEECA's progress in relation to stated objectives and expected outcomes, including alignment between its output, Departmental objectives and any stated government priorities?	• Number of fires started by electrical assets (trend) • Inspection and audit outcomes	• Safety performance reports • AER F-factor determination
Has DEECA demonstrated efficiency and economy in relation to its operations and delivery of programs?	• Number of inspections undertaken and audits evidencing the extent to which these commitments have been met • Technology and grants provided*	• Submission and reports from interested parties • Milestone reports from pilot technology programs
What would be the impact of ceasing these activities and what strategies can be used to minimise negative impacts?	• Number of fires started by electrical assets • Electricity distributors commitments to deploy a quantum and type of asset in a given place, by a given time	• Safety performance reports • AER F-factor determination • Consultation with interested parties
Does the current funding allocation reflect the true cost required to support operations and activities?	• Actual number of inspections undertaken and audits against targeted number • Actual number of BMPs reviewed against targeted number	• Internal performance reporting • Safety performance reports • BMP performance reports

* It will be important that any technology pilot program funded through the PSBP is able to feed into the review of these Regulations at the appropriate times. This will help ensure that future reviews of the Regulations are informed by the most up to date evidence of the effectiveness and safety of those technologies. This should be completed as information becomes available.

8 Stakeholder consultation

In Victoria, regulations sunset (expire) every 10 years from enactment. The existing Electricity Safety (Bushfire Mitigation) Regulations 2013 are due to sunset on 18 June 2023. In accordance with the requirements under the SL Act and in line with the Victorian Guide to Regulation, this RIS has been prepared to consider the impact of different options for replacing the sunsetting Regulations, and to identify the impact of the Proposed Regulations on Victorian businesses and the community. Consequently, several stakeholder consultation activities are being undertaken as part of this process.

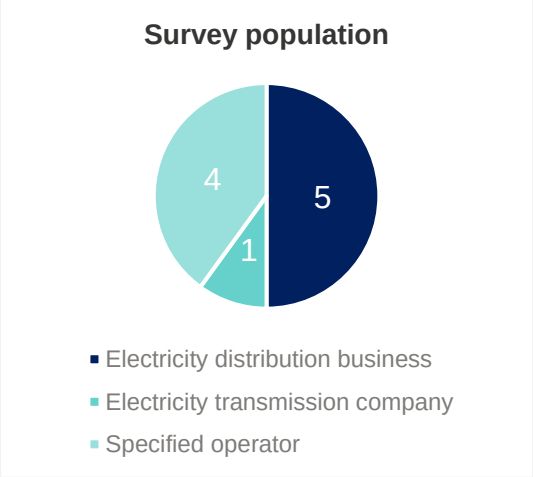
Further public consultation on the final analysis and preferred option provided in this RIS will allow opportunities for government to acknowledge and seek to fill gaps in knowledge, and test assumptions and conclusions made within the RIS with industry and third-party entities. The public consultation process will provide further access to a broader stakeholder sample, help locate issues that may have been missed in the creation of this document and validate and improve the implementation and evaluation strategy design for finalisation of the regulatory impact assessment.

In relation to the Proposed Regulations, consultation activities were undertaken with industry stakeholders and ESV. Stakeholders were questioned about their current practices in relation to BMPs and inspection requirements, as well as the expected costs associated with the Proposed Regulations as discussed in Sections 4 and 5 of this RIS. The below section provides a high-level overview of the survey population that participated in the consultation process.

8.1 Overview of survey population

An industry stakeholder survey was distributed to 26 industry stakeholders on 8 September 2022. The survey sought feedback from electricity distribution businesses, electricity transmission companies and specified operators on the costs and benefits to their business of complying with BMPs and inspection requirements set out in the current Regulations and proposed amendments. Consultation with industry is important in understanding the populations affected by the current and Proposed Regulations, as well as ensuring that the requirements for the development and implementation of Regulations are met.

Of the 26 stakeholders who received the survey questionnaire, 10 complete survey responses were received. Of those 10, six were received from MECs (five from distribution businesses, and one from an electrical transmission company) and four from SOs.



Some of these stakeholders also provided written submissions and further clarification following the closure of the survey questionnaire in addition to their initial responses. The below section provides a high-level summary of the profiles of industry stakeholders that were surveyed to provide a representative survey sample for analysis on the impacts of the Proposed Regulations to industry.

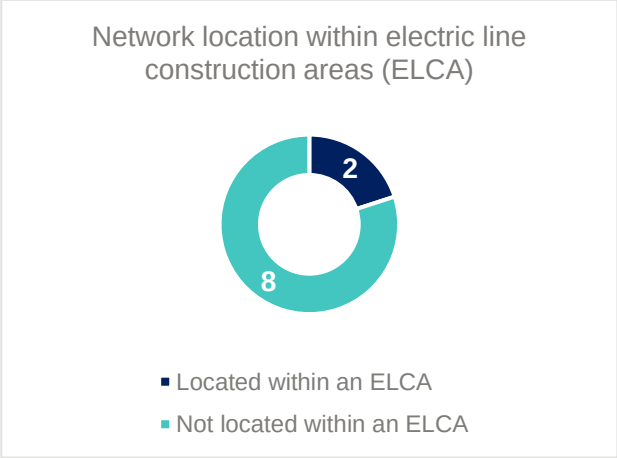
The survey population included a range of industry entities that may be affected by the Proposed Regulations. This included one electrical transmission company, five electricity distribution businesses and four SOs. Given that only one survey response was received from an electrical transmission company, we have identified said stakeholders alongside distribution businesses under the business category of MECs in

order to preserve survey anonymity and align the population to the characterisation of businesses as reflected within the Regulations.

Survey respondents were asked to identify characteristics of their electricity networks, including network size (in kilometres), the percentage of their network located within a HBRA, whether their networks are located within any electric line construction areas (ELCA) and the composition of their electricity networks (including bare wire, insulated and underground).

On average, network size for MECs was found to be approximately 24,610 kilometres, and for SOs, approximately 44 kilometres, demonstrating a significant difference in size between the two types of industry operators and consequential risk profiles in relation to bushfire ignition from electricity assets. Survey participants were asked to detail whether their networks are currently located within an ELCA. As demonstrated in Figure 10, there were two survey respondents who identified their networks as being located within an ELCA. Survey participants were also asked to identify what percentage of their networks are located within a HBRA. Given the varied size of MECs, some businesses only encounter a small percentage of their network as being located within a HBRA, whereas other businesses have the majority of their networks located within a HBRA. Due to the greater risk exposure for networks located within HBRAs, MECs and SOs operating with networks in HBRAs are responsible for complying with the various risk reduction requirements as stated under the Act and the Regulations.

Figure 10 Network location within ELCA



Survey respondents were also asked to identify the composition of their electricity networks, indicating the percentage of their networks composed of bare wire, insulated and underground electricity lines.

As seen in (Table 1-1), results indicated that for MECs and SOs, bare wire electricity lines comprise the majority of their electricity networks, with an average of 63.2 per cent and 79.5 per cent respectively. For MECs, results indicated that on average, 28.7 per cent of networks are composed of underground lines, with only 1.5 per cent insulated. Conversely, for SOs, on average, networks are comprised of 16.5 per cent underground lines and four per cent insulated.

Table 8-1 Electricity network composition (average percentage)

Electricity network composition (average %)			
Business Type	Bare wire %	Insulated %	Underground %
MECs	63.2	1.5	28.7
SOs	79.5	4	16.5

8.2 Further RIS consultation

The Victorian Guide to Regulation sets out several requirements in line with the SL Act for impact assessments and inclusion of minimum requirements for public consultation before and after a RIS is completed.

As such, the final stage in the consultation process in relation to the Proposed Regulations is the release of this RIS for public commentary. The RIS will be published on Engage Victoria's website, and notice of its publication will be published in the Victorian Government Gazette and across Victorian digital public notices. Copies of the RIS will also be emailed to the MECs and SOs that may be impacted by these Regulations.

Consultation on the RIS will be undertaken over the 28-day period, as required under the SL Act.

9 Statement of compliance with National Competition Policy

9.1 National Competition Policy

The National Competition Policy agreements set out specific requirements arising out of new legislation adopted by State and Territory Governments and the Commonwealth Government which are party to those agreements. Clause 5(1) of the Competition Principles Agreement sets out the basic principle which must be applied to both existing legislation, under the legislative review process, and to proposed legislation:

The guiding principle is that legislation (including Acts, enactments, Ordinances or Regulations) should not restrict competition unless it can be demonstrated that:

a) The benefits of the restriction to the community outweigh the costs; and

b) The objectives of the regulation can only be achieved by restricting competition.

Clause 5(5) imposes a specific obligation on parties to the agreement about newly proposed legislation:

Each party will require proposals for new legislation that restrict competition to be accompanied by evidence that the restriction is consistent with the principle set out in sub-clause (1).

Therefore, every RIS must provide evidence that the proposed regulatory instrument is consistent with these National Competition Policy obligations. The Organisation for Economic Co-operation and Development (OECD) Competition Assessment Toolkit provides a checklist for identifying potentially significant negative impacts on competition in the RIS context. This is based on the following four questions:

- Does the proposed regulation limit the number or range of suppliers?
- Does the proposed regulation limit the ability of suppliers to compete?
- Does the proposed regulation limit the incentives for suppliers to compete?
- Does the proposed regulation limit the choices and information available to consumers?

According to the OECD, if all four of these questions can be answered in the negative, it is unlikely that the Proposed Regulations will have any significant negative impact on competition and further investigation of competition impacts is not likely to be warranted.

9.2 NCP Assessment

It is unlikely that the Proposed Regulations will have any significant negative impact on competition within Victoria's electricity networks. This is detailed in the following sections:

Does the proposed regulation limit the number or range of suppliers?

The MECs operating within Victoria's electricity distribution and transmission markets are regulated, natural monopolies. Within this context, the Proposed Regulations are unlikely to impact the status quo level of competition.

Does the proposed regulation limit the ability of suppliers to compete?

It is unlikely that the Proposed Regulations limit suppliers to compete. Proposed Regulations are already proportionately targeted towards market participants operating within the State's most bushfire prone areas (i.e. HBRAs) and/or with at-risk electrical lines (SOs). They continue the minimum and well-established standards for bushfire mitigation and risk reduction activities related to electricity assets. According to feedback from industry survey participants,[102] bushfires are perceived by businesses as a major corporate risk, with the preparation of BMPs and conducting electrical asset inspections representing usual business activities.

[102] SOs and MECs.

Does the proposed regulation limit the incentives for suppliers to compete?

The Proposed Regulations include requirements for BMPs to include prevention strategies and programs to minimise the risk of the MECs' supply networks and SOs' at-risk electric lines from starting fires. The specified requirements have the potential effect of requiring industry to invest in technological upgrades to their networks and at-risk electrical lines, potentially at an accelerated rate and to a higher standard than what would have otherwise been undertaken by the business.[103] For example, this includes the requirement for electricity companies to achieve the 'required capacity' performance standard across 45 prescribed substations supplying the highest bushfire consequence areas of Victoria. REFCL is currently the only technology that can achieve this performance standard.

Three stakeholder survey responses have noted the costliness of implementation of the REFCL solution, with one noting that the REFCL requirements do not provide flexibility for application of more cost-effective risk controls, such as technology, risks and costs change. Thus, these requirements may represent a barrier to competition and have flow-on effects on electricity customers. It is noted that as at October 2020, the costs incurred were $65 million for the installation of 1,754 new-generation ACRs and $682 million for the installation of REFCLs at 45 zone substations. Following approval by the AER, electricity distribution businesses have passed the costs on to electricity customers through increased rates on their bills.[104] While the program was initially expected to cost $500 million, it is now forecast to cost customers $747 million.[105]

However, given the nature of the problem, the implications of such regulatory requirements on competition need to be weighed against the societal benefits gained from reducing bushfire ignition risks.

These requirements were inserted into the existing Regulations to implement VBRC recommendations (accepted by the Victorian Government) following the Black Saturday bushfires 2009 and have been designed to prevent bushfires starting from electrical assets that have historically adversely impacted public health, safety and economic wellbeing. While infrequent, electrical-caused fires are more likely to occur during extreme weather conditions, thus causing significant damage and potential loss of life and property. An economic analysis of the Black Saturday bushfires 2009 calculated net losses to the regions at $942 million in 2009 Australian dollar terms. While these losses cannot all be attributed to the electrical-caused fires, the calculated cost input from the fatalities alone was $643 million with 69 per cent linked to the Kilmore East electrical-caused bushfire.[106]

Investing in safety-enhancing installations that reduce bushfire ignition risks avoid such losses. The introduction of the 'required capacity' performance standard followed successful trials with ESV, suppliers and electricity companies to confirm their capability in reducing the risk of powerlines igniting bushfires. An independent cost-benefit analysis found that the investment in REFCLs was justified to reduce the risk of electrical assets igniting catastrophic bushfires.[107] As the **Error! Reference source not found.**illustrate, R EFCLs have already helped prevent over 30 potential fire starts from electrical assets over the 2018-19 and 2019-20 bushfire seasons. When the REFCL implementation is complete ahead of the 2023–24 bushfire season, the relative risk across all 33 ELCAs will be reduced by 58.6 per cent. This forms part of the 48 per cent risk reduction across the State that will be achieved under the PBSP.

On balance, it is therefore considered that the benefits of these restrictions to the community – both in enhanced public safety and prevention of economic losses – outweigh the potential costs from any reduced competition.

Does the proposed regulation limit the choices and information available to consumers?

Victoria's electrical networks are experiencing rapid change, with an accelerated transition to decentralised models of distribution and greater reliance on renewable energy. Based on these trends, SOs that are required to comply with the Proposed Regulations in the future could include small business and microgrid operators within high bushfire risk areas. DEECA and ESV are not aware of any evidence that existing Regulations are inhibiting current market competition or consumer choice. The Implementation Strategy and Evaluation Strategy that set out DEECA consultations and ESV monitoring activities will be undertaken as

[103] See changes introduced as part of the 2016 amendment to the RIS, as per **Error! Reference source not found.**Table 1-9 Overview of amendments to the Regulations , page 11.
[104] The decision to pass on the costs to customers was reviewed and approved by the AER. Source: Victorian Auditor-General's Office, Reducing Bushfire Risks, October 2020, Independent assurance report to Parliament 2020-21:4, https://www.audit.vic.gov.au/sites/default/files/2020-10/20201014-Reducing-Bushfire-report_0.pdf, accessed 6 October 2022.
[105] Ibid.
[106] Stephenson C et al., Estimating the net cost of the 2009 Black Saturday Fires to the affected regions Bushfire Cooperative Research Centre, https://www.bushfirecrc.com/sites/default/files/news/estimating_the_net_cost_of_the_2009_black_saturday_fires_to_the_affected_regions.pdf, accessed 7 October 2022.
[107] Rapid Earth Fault Current Limiter (REFCL) reports – Energy Safe Victoria (esv.vic.gov.au)

part of implementation planning and ongoing monitoring. These will ensure that robust consideration is given such that the preparation of BMPs and associated costs of specified inspection and technology implementation regimes are commensurate with the risk and scale of operation, and do not present an unnecessary barrier to entry for new and/or emerging market participants.

For these reasons, it has been concluded that the Proposed Regulations are fully compliant with the requirements of the National Competition Policy, subject to ongoing monitoring of impacts on emerging market participant groups in the Proposed Regulations addressed in part of the Evaluation Strategy.

Appendices

Appendix A: The Act and the Regulations

Appendix B: Proposed Regulations