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Regulatory Impact Statement: Electricity Safety (Electric Line Clearance - ELC) Regulations 2020

Energy Safe Victoria

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Deloitte
Access Economics

Contents

Glossary

Acronym	Full name
AER	Australian Energy Regulator
AS	Australian Standard
Code	Code of Practice for Electric Line Clearance
CFA	Country Fire Authority
DELWP	Department of Environment, Land, Water and Planning
DBH	Diameter at breast height (with reference to tree trunk)
EB	Electricity Business
ELC	Electric Line Clearance
ELCCC	Electric Line Clearance Consultative Committee
ES Act	*Electricity Safety Act 1998* ('the ES Act'),
ELC Regulations	Electricity Safety (Electric Line Clearance) Regulations 2015
ESV	Energy Safe Victoria
HBRA	Hazardous Bushfire Risk Area
LBRA	Low Bushfire Risk Area
MAV	Municipal Association of Victoria
MEC	Major electricity company (definition included in the ES Act)[1]
MFB	Metropolitan Fire Brigade
OCBR	Office of the Commissioner for Better Regulation
ORP	Other responsible persons
RIS	Regulatory Impact Statement
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SEC Act	*State Electricity Commission Act 1958*
STPIS	Service Target Performance Incentive Scheme
VBRC	2009 Victorian Bushfires Royal Commission

Executive summary

Background

In Victoria approximately 2.2 million residential and small business customers use electricity delivered via powerlines. This supports a State economy producing output worth $429 billion, or 23.4 per cent of Australia's economic output. The electricity system is critical to the Victorian community and Victoria's economy.

Much of the electricity network is also in areas that support vegetation, commonly trees, valued by the community for biodiversity and amenity.

History has shown that contact between trees and electric powerlines can lead to fires, electrocutions and power supply interruption. The consequences can include catastrophic loss of life and property, injuries, economic costs and social disruption.

The management of trees and electric lines has, therefore, been a significant aspect of the electricity safety context in Victoria. The current Electricity Safety (Electric Line Clearance) Regulations 2015 (the 'ELC Regulations'), which are made under the Electricity Safety Act 1998 ('the ES Act'), govern arrangements to manage trees near powerlines. The Regulations were developed in order to balance safety and supply reliability with the amenity and environmental values provided by trees.

The ELC Regulations, which include the Code of Practice for Electric Line Clearance ('the Code'):

- Prescribe standards and practices to be adopted and observed in tree cutting or removal in the vicinity of electric lines and the keeping of the whole (or any part) of a tree clear of electric lines
- Prescribe management procedures to minimise danger of electric lines causing bushfire (and fires in urban environments) or electrocution
- Establish the minimum distances between trees and powerlines
- Set out other matters with respect to the maintenance of electric lines
- Provide for management plans relating to compliance with the Code to be prepared by certain responsible persons
- Provide for other matters authorised under the ES Act relating to electric line clearance.

The ELC Regulations are due to expire in June 2020. However, the ES Act states "*There shall at all times be in force regulations prescribing the Code but no such regulations shall continue in force for more than 5 years after the date of their coming into operation*".

This Regulatory Impact Statement (RIS) assesses the remaking of the ELC Regulations.

Problem being addressed in this RIS

The total length of Victoria's electricity distribution aerial lines is around 200,000 km. Along much of this length are trees that can come into contact with the electric lines, with the potential to cause three types of problem:

1. Fire ignitions leading to bushfires in rural areas, resulting in loss or damage to property, injury or loss of life, loss of flora and fauna, loss of production, reduced tourism activity, effects of smoke pollution and emergency services costs.
2. Electrocution and electric shocks, leading to loss of life or injury, for people working on or near powerlines, the public and fauna.
3. Power supply interruptions, resulting in economic costs (loss of production, closure of schools/businesses/workplaces, loss of communication, loss or damage to equipment),health costs (loss of cooling and heating in extreme weather conditions, failure of life support machines) and consumer losses (loss of consumables, plus other costs such as anxiety).

The first two problems present the most immediate and direct risks to human safety, however their significance varies depending on the different contexts of rural and urban environments. Generally, the risk of fire caused by powerlines is greatest in rural/regional areas, while electrocution and interruptions to the power supply because of trees are larger problems in metropolitan areas due to population size. Power outages can also indirectly result in illness or fatalities, and so all three classes of problem raise issues for human health.

Fire

The result of any fire ignition can be catastrophic, as illustrated by the February 2009 Black Saturday fires where 173 lives were lost, and with an estimated cost to Victoria of $4.4 billion[1].

Prior to the introduction of tree clearance legislation in 1984, the interaction between trees and electrical lines contributed to major bushfires, typically in conditions of severe heat. The major fires of 1962, 1969, 1972 and 1977 and 1983 were all, at least in part, caused by electric lines contacting trees.

In general, powerlines are the cause of a very low percentage of bushfires, but under certain conditions (such as extended hot and windy weather) the percentage of bushfires caused by powerlines increases dramatically, combined with large fire spread. Therefore, while infrequent, the impact is likely to be devastating. This was the case in Victorian and Californian fires[2], although causation is not well understood.

In the four years to 2018-19, there has been an average of 44 fires per year caused by contact between tree branches and powerlines across Victoria[3]. Contact may occur by tree branch grow-ins to the clearance space and fall-ins (including branches blown in to contact with powerlines during wind storms). The ELC Regulations primarily address grow-ins. Data indicates that about three fires each year (6%) are caused by tree contact due to grow-ins. The impact of such fires can be significant, although in recent years the impact of most “grow-in” fires has been small and local.

Overall, this evidence suggests that the ELC Regulations, as part of a broader regulatory framework including stricter compliance and enforcement of the bushfire mitigation regulations and the f-factor scheme[4], have been effective in reducing the risk of fires caused by vegetation contact with powerlines. Improved risk management processes adopted by distribution business to manage their commercial risk is also a driver of reduced fire risk. Weather conditions, which can vary from year-to-year, also influence fire ignitions and impact of fires to a significant degree.

Electrocution

Over the past four years, there has been one fatality due to electrocution arising from the interaction between people, trees and powerlines. There was one injury requiring medical attention and an average of three injuries per year related to minor shock. This suggests the current ELC Regulations, together with other regulations, including ‘No Go Zones’ near powerlines[5], have been largely effective in preventing electrocutions. The risk of electrocution is considered a very real, but currently well-contained risk.

Supply reliability

Power outages can be caused by contact between powerlines and trees, and can lead to costs to society, businesses and individuals. This includes poor health outcomes, and potential death, due

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[1] While several of the Black Saturday bushfires of 2009 were found by the 2009 Victorian Bushfire Royal Commission to have been caused by electricity assets, these were not attributed to contact between powerlines and trees arising from non-compliance with line clearance regulations, although only a limited number of the fires were considered by the Bushfire Royal Commission.

[2] California Department of Forestry and Fire Protection (2019). *CAL FIRE Investigators Determine Cause of the Camp Fire,* Accessed at: https://www.fire.ca.gov/media/5038/campfire_cause.pdf

[3] ESV incident data

[4] The f-factor scheme provides EBs with an incentive to lower the number of fire starts on their networks. It is described in more detail in chapter 1.

[5] The No Go Zone rules describe minimum safety requirements that are dependent on the distance between overhead powerlines and the work being performed (https://esv.vic.gov.au/technical-information/electrical-installations-and-infrastructure/no-go-zones/).

to life support machines not functioning or a lack of cooling or heating, as well as business closures and other productivity losses.

Australian Energy Regulator (AER) data shows that there has been a slight downward trend in power outages per customer from 2006 to 2017. This excludes power outages caused by 'force majeure events' or other outages primarily caused or initiated by third parties, or weather events such as storms.

On average between 2014 and 2018, there were 244,315 hours of grow-in related outages per year, compared with 453,336 hours per year between 2010 and 2013. The Value of Unreserved Energy (VUE), which captures the Value of Customer Reliability and the Value of Social Disruption, is estimated on average to cost $212 million annually, at present. This is a proxy for the cost of supply interruptions, with costs affecting individuals, businesses and public services. This RIS estimates that in the absence of Regulations, contact between trees and powerlines would increase and the cost of supply interruptions would almost double to just over $400 million annually.

Options

A range of legal, legislative, regulatory and non-regulatory mechanisms currently exist to reduce risk of fire (including bushfire), risk of electrocution and risk of power supply interruption. These include:

- Common and Statute Law
- Improved network protection assets
- Electricity Safety (Bushfire Mitigation) Regulations
- Electricity Safety Management Schemes and Bushfire Mitigation Plans
- f-factor and s-factor Incentive Schemes
- Occupational Health and Safety Act and Regulations.

The range of feasible options for addressing the problem is considered within this broader legal context.

While perspectives regarding the current 2015 ELC Regulations differ between stakeholders on certain points, there is broad consensus across all stakeholders consulted that, while changes could be made, the current regulatory framework is performing well.

Further, as noted above, it is mandatory that ELC Regulations and the Code remain in force in some form. Trees must be cut and it is the manner in which they are cut that is being determined in the remake of these Regulations.

Reflecting these factors, it is not considered feasible, desirable, or cost effective for this RIS to consider options that involve significant alternatives or changes to the current Regulations.

In summary, the options include:

- **Base Case:** the ES Act is in place, but with minimal Regulations and Code. A minimal Regulations scenario would mean very limited controls imposed and could simply involve Regulations stating that trees need to be cleared from electrical lines in a safe manner, with no further prescription beyond this. The Base Case is a counter-factual scenario used in cost benefit analyses to provide a common point of comparison for all options.
- **Option 1:** Re-make the current Regulations with no changes. This would effectively result in the continuation of the 2015 Electric Line Clearance Regulations for another five years.
- **Option 2**: Re-make the current Regulations as in Option 1, but with targeted changes. These changes are described in the table below.

Table 0-1 Targeted changes to 2015 ELC Regulations in Option 2

Category of change	Description of change	Location
Broad change	Change to the objective of the regulation to include a reference to protecting the health of trees Wording of new regulations The objectives of these Regulations are… (b) to prescribe— (i) standards and practices to be adopted and observed in tree cutting or removal in the vicinity of electric lines and the keeping of the whole or any part of a tree clear of electric lines, including standards and practices to protect the health of trees that require cutting in accordance with the Code; and (ii) a requirement that certain responsible persons prepare management procedures to minimise the danger of trees contacting electric lines and causing fire or electrocution or interruptions to electricity supply; and … (c) to require responsible persons to minimise the impacts of cutting on indigenous and significant trees and the habitat of threatened fauna; and	Part 1, Regulation 1
Management plans	Re-worded the regulations such that responsible persons excluding a major electricity company must prepare a management plan annually	Part 1, Regulation 9(2)
Management plans	Change to the requirement such that major electricity companies must prepare and submit a management plan relevant for a 5 year period. Wording of new regulations (3) A responsible person that is a major electricity company must before 31 March 2021 prepare and submit to Energy Safe Victoria for approval a management plan relating to compliance with the Code for the period from 1 July 2021 to 30 June 2026	Part 1, Regulation 9(3) Part 1, Regulation 10(2)
Management plans	Included an additional requirement of a map in the management plan to show HBRA (High Bushfire Risk Area) and LBRA (Low Bushfire Risk Area) that are related to area covered by the plan	Part 1, Regulation 9(4)(f)
Management plans	Change the word ‘native’ to ‘indigenous to Victoria’	Part 1, Regulation 9(4)(g)
Management plans	Change so that management plans no longer have to be available for inspection at the responsible persons primary place of business – they only need to be on their website	Part 1, Regulation 10(6)(b)
Insulating cover	Updated the definition of an insulated cover and links to related standards	Schedule 1, Part 1, Regulation 1

Category of change	Description of change	Location
Insulated cable	Change the definition of an insulated cable based on new definition of an insulated cover.	Schedule 1, Part 1, Regulation 1
Suitably qualified arborist	Change the definition of a suitably qualified arborist from Certificate 4 in arboriculture to a Certificate 3 in arboriculture, including a ground based tree assessment training module. This has been prompted by training providers no longer providing Certificate 4 in Victoria.	Schedule 1, Part 1, Regulation 1
Exceptions to minimum clearance	Allows branches to be 150 mm from the line if the span is less than 40 m in length. It used to have to be 300 mm away from the line. The exception clause can only be used under increased tree management requirements designed to monitor or manage risk to acceptable level.	Schedule 1, Part 1, Regulation 4(c)
Exceptions to minimum clearance	New clause has been added introducing exceptions to minimum clearance distances for small branches growing under uninsulated low voltage electric lines. The exception clause can only be used under increased tree management requirements designed to monitor/manage risk to acceptable level.	Schedule 1, Part 1, Regulation 5A
Indigenous vegetation	Change the words 'specified significant tress' to include 'indigenous or significant trees'. The regulation aims to minimise the cutting or removal or indigenous or significant trees reflecting changes in definitions.	Schedule 1, Part 1, Regulation 10
Public notification	Change the requirements so notifications can be published on the responsible person's website or published in a newspaper. <u>Wording of new regulations</u> A written notice published under subclause (2) must be published on the responsible person's Internet site or in a newspaper circulating generally in the locality of the land in which the tree is to be cut or removed.	Schedule 1, Part 1, Regulation 16(3)
Dispute resolution requirement	This has been removed from the Code and is in the Regulations as a requirement to include detail of dispute resolution procedure in the plan rather than as a stand-alone procedure.	

Analysis

Options were assessed using Multi-Criteria Analysis (MCA):

Criteria	Description	Weighting
Costs	The cost to (i) responsible persons of complying with the Regulations, (ii) to government of monitoring and enforcing compliance with the Regulations, and (iii) the cost of the Regulations to the community.	50%
Total costs weighting[6]		**50%**
Safety	The benefits to the community and individuals from reduced risks of fire and electrocutions.	25%
Reliability of the electricity supply network	The benefits to the community from reducing power supply interruptions.	15%
Protection of amenity and tree value/ environment	The benefits to the community and environment from protection of trees as a result of responsible persons preparing and implementing a management plan and clearing trees in accordance with the Regulations.	10%
Total benefits weighting[7]		**50%**

Results of the analysis are summarised below. Options 1 and 2 are both preferred to the Base Case of minimal regulations. This reflects that:

- Options 1 and 2 increase safety compared to the Base Case (from reduced fires, electrocutions and supply interruptions) as Councils are expected to undertake a greater level of clearance than they would with minimal regulations. Whilst it is difficult to estimate whether electricity businesses would undertake more or less clearance, historical factors show that the presence of the ELC Regulations led to improved safety outcomes.
- Options 1 and 2 are expected to provide an increase in amenity and tree health compared to the Base Case because of the requirements placed on responsible persons, including employing suitably qualified arborists, consulting with affected parties, and complying with Australian Standard (AS) 4373 – Pruning of amenity trees.

The benefits that arise under Options 1 and 2 outweigh the increase in costs under these options as a result of having to prepare a management plan, undertake consultation, and cut trees according to AS 4373 within practicability. The societal costs associated with either poor or inadequate tree cutting practices that could readily arise under the base case, may also outweigh costs associated with having increased regulation in Options 1 and 2.

Option 2 has the highest score and is preferred to Option 1 because it implements targeted changes to improve the effectiveness and efficiency of the current ELC Regulations, and better balances safety and amenity outcomes, by:

- Updating the objectives of the Regulations to include maintaining the health of trees in accordance with the Code.

[6] The total cost weighting comprises costs to responsible persons, Government and the community. Costs between various stakeholders are equally weighted so that $1 incurred by Government is the same as $1 incurred by the community.

[7] Total benefits weighting includes (safety, reliability of the electricity supply network protection of amenity.

- Including exceptions to certain aspects of minimum clearance distances to limit the cutting requirements in some circumstances where the safety risks are low. This will reduce unnecessary over pruning in these instances, where there is no associated safety benefit.
- Changing the words 'specified significant tress' to 'indigenous or significant trees' to minimise their cutting or removal by providing greater clarity in the Regulations and Code.

It is important to note that there is some subjectivity in relation to the scoring, for example the potential impacts on EBs' clearance activities under the Base Case versus Options 1 and 2. Different judgements and scoring could potentially impact the difference between Option 1 and 2 given the closeness of the weighted scores.

Table 0-2 MCA results

Criteria	Base case score	Option 1 score	Option 2 score	Weighting
Costs	0	-2[8]	-1	50%
Safety	0	+4	+4	25%
Reliability of the electricity supply network	0	+5	+5	15%
Protection of amenity and tree value/ environment	0	+3	+5	10%
Weighted score	**0**	**+1.1**	**+1.8**	

Preferred option

The preferred option is Option 2: Re-make the current Regulations, but with targeted changes to improve effectiveness and efficiency of Regulations.

Competition and small business

The preferred option is expected to have very small, in fact almost negligible impacts on competition and small business.

Implementation plan

Implementation of the preferred options is not expected to differ substantially from the application of the current Regulations.

One notable difference since the introduction of the 2015 ELC Regulations is ESV's increased compliance activities. ESV has significantly and progressively increased the number of staff auditing and inspecting tree management of the electricity distribution businesses (EBs)[9]. This has resulted in ESV identifying instances of significant and ongoing non-compliance issues and failure

[8] Scoring reflects relativity of the costs across stakeholders. The estimated gross costs of the proposed Regulations are approximately $85m per year and include $72m in tree clearance costs for Electricity Businesses, $11m in tree clearance costs for Councils and $1.6m in regulatory costs for ESV.

[9] The ES Act and ELC Regulations prescribe requirements that must be complied with by either MECs or Distribution Companies. Under the ES Act and ELC Regulations these terms are not directly interchangeable. However, in order not to detract from the readability of this RIS, the term "electricity businesses" (EB) has been used when referring to MECs or Distribution Companies that have responsibilities under the ES Act and ELC Regulations.

to clear trees that presented a clear and present risk of starting a fire (see also discussion of compliance in section 2.2.3). ESV is continuing to strengthen its audit and inspection activities.

ESV's Evaluation Strategy

Evaluating the effectiveness of the Regulations in the past has proven to be inherently difficult, for a few reasons. There are other factors external to the Regulations and the legislative environment which can have a substantial impact on the incidence and scale of fires and electricity supply interruptions due to contact between trees and powerlines, notably weather events and climate conditions. There are also cases where incidents may occur from contact with a compliant tree. The impact of these factors is likely to be greater than the impact of any specific changes introduced via different editions of the Regulations.

Despite this, ESV will review its data collection practices for improvements in the following areas:

- Collection of 'incident' data according to whether the tree contact was a blow-in or grow-in, and categorisation of incidents based on 'type' (i.e. fire, electrocution, supply interruption), 'location' (e.g. declared area), and 'responsible party' (e.g. EB, Council, or other responsible person (ORP)). It is important to note that there are challenges in terms of whether a fire is a blow-in or grow-in. These include physical limitations. For example it is normally possible for first responders to determine whether a fire was caused by tree contact, however it is difficult to determine whether a fire was caused by a blow in or a grow in. Recorded causes of fire incidents, whether a blow or grow in, are often arrived at based on an informed guess by the CFA or EBs. It is noted that there is potential for data improvement in this area due to technology improvements such as laser or drone technology.
- Collection of data by ESV related to compliance and non-compliance with the Regulations, including the number of inspections carried out, findings and corrective actions.
- As ESV strengthens its data and analytics functions it will review its own data and the optimal frequency of data collection and review by the EBs in particular, due the scale and risks associated with their line clearance responsibilities.

It is noted that work is already being undertaken by ESV to increase its data analytics capability, coupled with improving data capture, analytics tools and cooperation with other regulators and agencies, which will provide greater insights into how community harm and risk can be further reduced over coming years.[10] This is part of ESV's implementation of recommendations of the *Review of Victoria's Electricity and Gas Safety Network.*

Additionally, the ELCCC meetings will continue to be the forum through which ESV will consult with responsible persons on the effectiveness of the Regulations. This advisory group model, which includes representatives for key responsible persons, is a means of seeking feedback on specific issues associated with the implementation and practical adherence with the Regulations, and will assist with the development of any future changes.

ESV will, in conducting a future evaluation of the proposed Code of Practice for Electric Line Clearance, ensure that this data is analysed and provided to the ELCCC to assist in its deliberations. As part of this, ESV shall also make compliance and enforcement data available. ESV will continue to consult with electricity distributors and other responsible persons on key questions of cost and effectiveness.

[10] ESV 2017-18 Annual Report p.9.

1 Background

This chapter outlines the purpose of the RIS, background to the Regulations being proposed, and how the key steps in the RIS process will be applied to the development of the 2020 Electric Line Clearance Regulations

1.1 Introduction

The ELC Regulations have been developed in order to balance electrical safety and supply with the amenity and environmental values provided by trees.

Contact between trees and electric powerlines can lead to fires, electrocutions and power supply interruption. The consequences can include catastrophic loss of life and property, injuries, economic costs and social disruption.

The management of trees and electric lines has therefore historically been a significant element of the electricity safety framework. The Electricity Safety (Electric Line Clearance) Regulations 2015 (the 'ELC Regulations') govern arrangements for managing the cutting of trees near powerlines. The ELC Regulations incorporate the Code of Practice for Electric Line Clearance ('the Code'). The ELC Regulations are due to expire in 2020 however the Electricity Safety Act 1998 ('the ES Act'), under which the ELC Regulations are made, states "*There shall at all times be in force regulations prescribing the Code but no such regulations shall continue in force for more than 5 years after the date of their coming into operation*".

ESV has engaged Deloitte Access Economics to prepare a Regulatory Impact Statement (RIS) in accordance with the Commissioner for Better Regulation's Victorian Guide to Regulation (2016) and the Subordinate Legislation Act 1994. This RIS considers the impact of different options for replacing the sunsetting regulations. Any proposed Regulations that impose a significant burden should be subject to a RIS in accordance with the provisions of the *Subordinate Legislation Act 1994*. The rigorous assessment of regulatory proposals within a RIS ensures that regulation best serves the Victorian community. This RIS is subject to independent assessment by the Office of the Commissioner for Better Regulation (OCBR) and a public consultation process.

1.2 Legislative and regulatory framework

Voluntary tree management policies in Victoria date back to the mid twentieth century. These policies targeted the separation of trees from powerlines, however these, essentially voluntary, instruments were insufficient to curb bushfires arising from contact between powerlines and trees in the 1960s and 70s.

Following the 1977 Victorian bushfires, an inquiry found that it was vital to separate trees and powerlines to reduce fire ignition arising from contact. The inquiry encouraged the establishment of a committee and voluntary Code of Practice, which was subsequently formalised via an amendment to the *State Electricity Commission Act 1958* (SEC Act), following the destructive Ash Wednesday bushfires in 1983. The SEC Act required the State Electricity Commission of Victoria and Councils to maintain a safe clearance distance between electric powerlines and trees. It also established the principle of Declared Areas, under which councils took responsibility for pruning trees on public land they manage in urban, low bushfire risk areas (LBRA).

In 1998, the ES Act formally replaced the SEC Act. The ES Act describes the requirements of electricity businesses (EBs)[11] in relation to electricity safety, which includes bushfire mitigation.

[11] The ES Act and ELC Regulations prescribe requirements that must be complied with by either MECs or Distribution Companies. Under the ES Act and ELC Regulations these terms are not directly interchangeable. However, it would be impractical and detract from the readability of this RIS to use both terms. For the purpose of this RIS, the term "electricity business" (EB) has been used when referring to both MECs and Distribution Companies that have responsibilities under the ES Act and ELC Regulations.

The ES Act identifies 'responsible persons' who are required to comply with the ELC Regulations by undertaking electric line clearance activities to ensure compliance. The ES Act also provides for ESV to make regulations which further prescribe requirements on responsible persons.

The ELC Regulations, which include the Code:

- Prescribe standards and practices to be adopted and observed in tree cutting or removal in the vicinity of electric lines and the keeping of the whole (or any part) of a tree clear of electric lines
- Prescribe management procedures to minimise danger of electric lines causing bushfire (and fires in urban environments) or electrocution
- Establish the minimum clearance distances between trees and powerlines
- Set out other matters with respect to the maintenance of electric lines
- Provide for management plans relating to compliance with the Code to be prepared by certain responsible persons
- Provide for other matters authorised under the ES Act relating to electric line clearance.

Sections 84 and 84A to 84D of the ES Act specify who is responsible for keeping trees clear of electric lines.

The ELC Regulations provide that each major EB operating in Victoria is responsible for compiling an annual electric clearance line management plan for the maintenance of the clearance space around aerial electric lines. The plan is submitted to ESV for approval and thereafter must be made publicly available on the EB website as well its principal offices. ESV actively monitors the EBs to ensure compliance with the Code, and the approved management plan, and where necessary undertakes enforcement action. The ELC Regulations also describe the requirements for use of suitably qualified arborists in stipulated situations by responsible persons, primarily EBs and Councils.

Section 81 of the ES Act notes that "*The Governor in Council, by Order published in the Government Gazette, may declare an area of land in an urban area for the purposes of this Part".* Section 84C of the ES Act provides that Councils responsible for the management of public land in a declared area are responsible for keeping trees clear of electric lines. Similarly, responsible municipal councils in declared areas have an obligation to compile annual management plans, and a responsibility to maintain minimum clearance distance in accordance with the Code. Sixty-seven of the 79 councils have responsibilities for keeping trees on public land they manage clear of powerlines in declared areas. This generally includes managing trees on nature strips along streets where there are also powerlines.

Owners or operators of powerlines (other than EBs) are also responsible for keeping trees clear of powerlines under section 84D. Examples of such businesses may include a tram operator or renewable energy business. These businesses are required to compile an annual management plan and maintain the minimum clearance distances.

Clearance responsibilities also extend to occupiers or owners of land featuring private electric lines. Section 84A and 84B of the ES Act prescribes that "*An occupier of land above or below the surface of which there is a private electric line is responsible for the maintenance of that line*."[12] This obligation also extends to occupiers of land that is contiguous to land on which there is a private electric line through section 84B of the ES Act. Many of the requirements of the ELC Regulations and Code however, do not apply to these responsible persons (for example, occupiers and owners of land do not need to submit a management plan, do not need to publish a notice before cutting or removing trees, and are not required to consult before cutting or removing trees).

[12] Owners or occupiers of a residential property are required to keep vegetation clear of the overhead service line that is connected to the house. EBs often send residential property occupiers/owners notice of non-compliance.

Electric Line Clearance Consultative Committee (ELCCC)

Under section 87 of the ES Act there is a statutory committee constituted by 13 members appointed by the Minister. The Committee must:

- Provide advice to ESV with regard to the preparation and maintenance of the Code
- Provide advice on any matter relating to clearance of electric lines when requested by ESV or the Minister
- Report before 30 September each year to the Minister on the performance of its functions.

ESV must refer all matters to the ELCCC with respect to the content of the regulations before amending or varying the Code.

Energy Safe Victoria

Energy Safe Victoria (ESV) is the independent technical regulator responsible for electricity, gas and pipeline safety in Victoria. It is responsible for administering and ensuring compliance with the ES Act and the ELC Regulations, including the Code.

Activities undertaken by ESV include:

- Evaluating the electric line clearance management plans prepared by EBs, municipal councils and other organisations with electric line clearance responsibilities
- Conducting system audits and line inspections to ensure compliance with the ES Act, the ELC Regulations and management plans
- Providing technical support and advice to responsible persons and the community
- Requiring compliance, and where necessary taking enforcement action under the ES Act and ELC Regulations
- Assisting other government agencies such as Country Fire Authority (CFA), Metropolitan Fire Brigade (MFB), WorkSafe and Victoria Police, where they require technical expertise in relation to electricity line clearance and tree management.

1.3 Context

In Victoria approximately 2.2 million residential and small business customers use electricity delivered via powerlines. This supports a State economy producing output worth $429 billion, or 23.4 per cent of Australia's economic output. The electricity system is critical to the Victorian community and Victoria's economy.

The electricity system is critical to the Victorian community and Victoria's economy. The total length of Victoria's electricity distribution lines is around 200,000 km.[13] Along much of this length are trees that can come into contact with the electric lines with the potential to cause three major classes of problem:

1. Fire ignitions (bushfire in rural areas), leading to loss or damage to property, injury or loss of life, loss of flora and fauna, loss of production, reduced tourism activity, smoke pollution and emergency services costs.
2. Electrocution and electric shocks, leading to loss of life or injury, for people working on or near powerlines, the public and fauna.
3. Power supply interruptions, resulting in economic costs (loss of production, closure of schools/businesses/workplaces, loss of communication, loss or damage to equipment),health costs (loss of cooling and heating in extreme weather conditions, failure of life support machines) and consumer losses (loss of consumables, plus other costs such as anxiety).

The first two problems are considered to present the most immediate and direct risks to human safety, however their significance varies depending on the different contexts of rural and urban environments. Generally, the risk of fire is greatest in rural/regional areas, while electrocution and

[13] Department of Environment, Land, Water and Planning (Victoria), *About the electricity sector.* Retrieved from https://www.energy.vic.gov.au/electricity/about-the-electricity-sector

interruptions to the power supply are larger problems in metropolitan areas due to population size. Power outages can also indirectly result in illness or fatalities, and so all three classes of problem raise issues for human health.

The figure below maps tree density across Victoria against the service areas of each of Victoria's EBs. Areas of darker green illustrate a higher density of trees. Of the EBs, Powercor and AusNet Services have the largest geographical supply networks across Victoria and are most exposed to high density tree cover.

Figure 1-1 Map of tree density across Victoria[14]

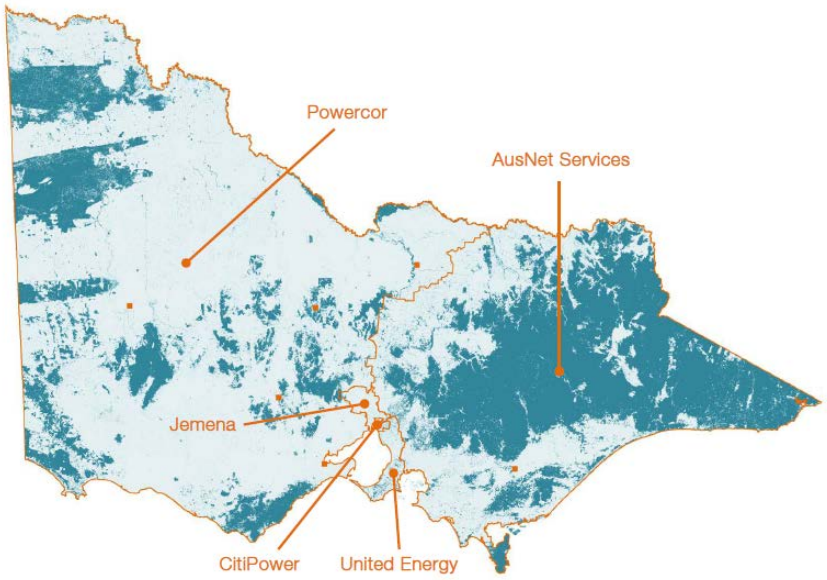


Table 1.1 provides summary statistics on Victoria's five EBs.

Table 1-1: Summary statistics (EBs)

Distribution business	Service Area (km^2)	Powerline length (km)	Number of poles
Powercor	145,651	76,840km (92% rural, 10% underground)	488,200 power and 83,600 public lighting
AusNet Services	80,000	44,900 (85% rural, 15% underground)	335,000 power and 86,600 public lighting
United Energy	1,472	12,360 (25% urban, 26% underground)	168,700 power and 35,800 public lighting
Jemena	950	6,340 (86% urban, 30% underground)	81,200 power and 26,100 public lighting
CitiPower	157	5,680 (25% CBD, 55% underground)	49,100 power and 9,100 public lighting

Source: ESV

Contact between trees and powerlines can occur due to a range of reasons:

[14] ESV, *2016 Safety Performance Report on Victorian Electricity Networks*, p.81.

- Trees growing into the clearance space ('grow-ins')
- Trees falling onto powerlines from outside the clearance space (this includes branches blowing onto the powerlines from outside the clearance space)[15].

While there is an obligation under the ES Act to keep trees clear of powerlines,[16] this duty is expressed in general terms and does not provide any specification about how it should be complied with. This can result in a broad range of responses by responsible persons that do not adequately address the level of risk.

In the absence of clear requirements, there is a risk that:

- Inadequate cutting will occur and there will be potential for unsafe contact between trees and powerlines that increases the risk of fire ignition, electrocution or power supply interruption. These risks may increase over time.
- Over-cutting (or poor cutting) will occur, causing excessive environmental damage or loss of aesthetic value or damage to tree health – this is particularly the case where EBs are trying to minimise their legal and commercial risks by clearing as much as possible
- Both of the above will occur, but in different geographic areas of the state or in different circumstances
- There may be different interpretations of appropriate clearance levels.

The ELC Regulations are primarily concerned with prescribing standards and practices for tree cutting or removal near electric lines in order to keep trees and powerlines separated. This requires cutting trees certain distances below the powerlines, horizontally away from the powerlines and vertically above the powerlines depending on the type of powerline and area (LBRA or HBRA). The Regulations permit removal of trees that may fall-in to powerlines (known as hazard trees). In practice tree cutting routinely addresses tree branches that 'grow-in' to the clearance space. Events that cause tree failures or blow branches from trees into the powerlines ('fall-ins') are largely influenced by external forces (for example storms) and not in the purview of the ELC Regulations.

Given this distinction, it is important to delineate the cause of contact being a grow-in, before estimating the costs from tree contact and powerlines. Costs considered in this RIS include the cost of fires, electrocutions or other injuries and power outages explicitly caused by grow-ins.

1.4 Other regulation impacting electric line clearance

The ES Act and ELC Regulations are part of a broader framework of legislative mechanisms aimed at reducing bushfire risk from electric lines.

Electricity Safety (Bushfire Mitigation) Regulations 2013 and Electricity Safety (Bushfire Mitigation Duties) Regulations 2017

The Electricity Safety (Bushfire Mitigation) Regulations 2013 make provisions for:

a) The preparation of bushfire mitigation plans by specified operators and major electricity companies
b) The inspection of overhead private electric lines and supply networks.

These two sets of Regulations, supporting requirements under the ES Act, also impose an obligation on EBs to install network fault detection and suppression devices and to undertake powerline replacement in areas of greatest bushfire risk through the application of mandated operational performance standards and end-of-life asset replacement.

[15] The regulations permit overhanging branches that are outside the clearance space for some powerlines.
[16] Section 84 to 84D apply to EBs within their distribution areas, councils responsible for the management of public land in areas of land declared under section 81 of the Act (except for private electric lines), and a person (other than EBs) who owns/operates an electric line, or installs/uses an electric line under a Commonwealth Act.

Electricity Distribution Code

EBs also have regulated obligations to operate safe networks under the Electricity Distribution Code. Requirements of the Electricity Distribution Code are aligned with requirements of the ELC Regulations.

F factor scheme

The f-factor[17] scheme is an existing regulatory instrument under the National Electricity (Victoria) Act 2005, which provides EBs with an incentive to lower the number of fire starts on their networks. The Victorian Government introduced the f-factor as one of several measures in response to the 2009 Black Saturday bushfires. The objective of the f-factor is to reduce harm to human life and property by powerline-caused bushfires, without imposing additional costs on consumers. The scheme commenced on 1 January 2012.[18]

The f-factor was modelled on the AER's Service Target Performance Incentive Scheme (STPIS) which applies to EBs. The STPIS sets a five-year supply reliability benchmark for each EB and then rewards or penalises them according to whether they meet their benchmarks. The STPIS has created an incentive to improve reliability, and network performance has improved accordingly. The f-factor seeks to provide a similar incentive for businesses to lower their bushfire risk with businesses either penalised or rewarded $25,000 for every network ignition above or below their five-year benchmark of ignitions.

A RIS was prepared by the Department of Environment, Land, Water and Planning (DELWP) in 2016 to consider policy options to revise the existing f-factor scheme with a view to improving its efficiency. The preferred option determined by the RIS was to revise the f-factor scheme to use detailed ignitions information to weight the penalty for each network fire by its bushfire risk.[19]

1.4.1 RIS process

Deloitte has prepared this RIS in accordance with the *Victorian Guide to Regulation,*[20] which provides a best practice approach to analysing any proposed regulatory intervention. This RIS estimates the impact of the proposed Regulations on Victorian businesses and community. Key steps in the process to introduce the proposed Regulations are:

- Preparation of the RIS (this document)
- Public comment on the proposed Regulations
- Addressing public comment.

These steps are discussed in more detail below.

1.4.2 Preparation of the RIS

The key purpose of this RIS is to assess the impact of different options for replacing the sunsetting regulations. The general approach to the assessment is as follows:

(1) Identification of the problem

This involved consideration of the nature and extent of the problem that the proposed Regulations aim to address, including the need for government intervention, the risks of non-intervention and the objectives of such intervention.

(2) Identification of the options to achieve the objectives of the proposed Regulations

The proposed Regulations and alternative options were developed by Government in consultation with stakeholders (ELCCC, EBs, councils, peak bodies, industry and community representatives) and informed by the RIS consultation (see Appendix C for details of consultation undertaken). The

[17] 'f' stands for fire.
[18] Victorian Department of Environment Land Water and Planning: Powerline Bushfire Safety Program, f-factor Incentive Scheme: Regulatory Impact Statement, p.5.
[19] DELPW, f-factor Incentive Scheme: Regulatory Impact Statement, 2016.
[20] Commissioner for Better Regulation (2016). *Victorian Guide to Regulation: A handbook for policy-makers in Victoria*, Accessed at: http://www.betterregulation.vic.gov.au/Guidance-and-Resources

establishment of options allowed possible costs and benefits to be examined as part of the stakeholder consultation.

(3) Stakeholder consultations

Stakeholder consultation was undertaken by Deloitte to gather relevant information on the impact of the proposed Regulations and possible alternatives for different groups. The consultation process included:

- 4 one-to-one meetings with businesses and government agencies.
- 7 one-to-one meetings with Councils and ORPs
- 1 focus group with EBs
- A web-based survey which received 27 completed responses from Councils, EBs and ORP representatives.

ESV directly engaged with the ELCCC regarding the Regulations (and Code), proposed amendments, policy considerations and rationale for proposed inclusions or exclusions to the Regulations. ESV provided this information to Deloitte.

(4) Assessment of the costs and benefits

Assessment of the costs and benefits under all options, relative to a Base Case of minimal regulations, was undertaken consistent with the requirements of the *Victorian Guide to Regulation*. The analysis included the quantification, where possible, of benefits to businesses, councils and the Victorian community from improved management of trees and electric lines. It also included the costs to businesses and councils of complying with regulations, and costs to Government of implementing and administering regulations. The analysis reflected data held by ESV, data gathered through independent research and information provided by stakeholders.

(5) Assessment of the other impacts

We have considered the likely impacts of the preferred option on small businesses and general competition amongst firms. This part of the RIS draws on stakeholder consultations.

(6) Implementation, enforcement and evaluation

These sections describe the arrangements for implementation, enforcement and evaluation of the preferred option.

1.4.3 Public comment

The proposed Regulations and this RIS will be released for a 90 day period to provide businesses, members of the public and other interested parties the opportunity to provide feedback on these items. Section 89 of the ES Act requires ESV to consider any comments made on the draft Code during that period.

The process for public commentary is outlined in the Foreword to this report. The proposed Regulations and RIS will be made available on Engage Victoria, which is the Victorian Government's Online Consultation platform, and ESV's website.

1.4.4 Addressing public comment

ESV will consider all submissions received during the period of public review. ESV will prepare a formal Response to Public Comment summarising the submissions received and ESV's response. Submissions to the review, and the formal Response to Public Comment document, will also be made available on Engage Victoria and ESV's website.

1.5 Structure of the report

The remainder of this report is structured as follows:

Chapter 2 – Problem analysis
Chapter 3 – Identifying the options
Chapter 4 – Options analysis and preferred option
Chapter 5 – Implementation plan
Chapter 6 – Evaluation strategy

2 Problem analysis

This chapter outlines the nature and the extent of the problem, which provides the case for regulation

2.1 Nature of the problem

2.1.1 Implications of contact between trees and powerlines

EBs are subject to a range of market factors (legal costs, insurance, damage to assets, and loss of supply revenue) which mean they have a strong incentive to avoid contact between powerlines and trees. However this incentive to avoid negative events does not necessarily mean that these businesses are appropriately incentivised to achieve the socially optimal level of separation between powerlines and trees.

This is because the majority of the costs of harm, such as consequences from bushfires, are not directly borne by EBs. While EBSs do bear some costs (such as asset damage), the bulk of the costs arise from losses experienced by the broader community (life, houses, livestock, timber etc.) or the environment.[21] In economic parlance, the full costs of adverse events are not incurred by the EBs, giving rise to 'externalities'.

Externalities refer to a cost or benefit incurred or received by a third party who had no control over the creation of that cost or benefit. In order to generate the greatest level of net benefit for Victorians, careful consideration must be given to balancing safety, economic factors, viability, aesthetics and the environment in order to arrive at the 'socially optimal' level of tree management.

In some cases, external costs may be recovered from EBs through litigation. For example in the case of the Black Saturday bushfires, AusNet Services' costs totalled approximately $660 million.[22] More recently, Powercor is facing a class action over the 2018 St Patrick's Day fires in south-west Victoria that destroyed 22 homes and killed thousands of livestock. The fire in Terang was result of powerlines clashing in high winds, which caused electrical arcs and ignited surrounding trees. It is reported that the damage bill could reach $40 million. Whilst these fires were not caused as a result of a breach of the ELC Regulations, they demonstrate the harms of bushfires related to electricity assets, and the subsequent litigation costs.

Nevertheless, EBs may try and avoid paying the costs of externalities where there is plausible deniability as to the cause of fires, given the range of other potentially contributing factors. EBs may also not bear the legal cost of adverse events where negatively affected persons wish to avoid litigation, with its risks, even though they have suffered harm. A simple example is if non-compliance with the Code leads to a 'grow-in' which causes a short-term power outage. While electricity consumers have suffered a loss, whether inconvenience or from loss of perishables, the relatively small cost means litigation against EBs would be highly improbable. For small costs, individuals and businesses are unlikely to invest the time and money into litigation. Similarly, if the externalities are diffused or widespread (for example, a bushfire may damage the tourist industry for a long time period) litigation may not be an effective remedy for those impacted.

Even where persons are incentivised to pursue litigation, there is not necessarily a sufficient incentive for EBs to make an optimal decision in minimising risk to third parties arising from bushfire. This is because EBs are regulated monopolies, and efficient costs are recoverable from consumers.[23] Efficient costs comprise compliance with regulatory obligations and include public

[21] Victorian Bushfires Royal Commissions (VBRC), *Final Report* Volume 2.
[22] Victorian Department of Environment Land Water and Planning: Powerline Bushfire Safety Program, 2016 *f-factor Incentive Scheme: Regulatory Impact Statement*, p.9.
[23] ibid.

indemnity insurance. As subsequent increases in premiums constitute a legitimate cost of doing business, they may be recovered from consumers through regulated prices.

As well as the risk of social harms not being adequately incorporated into EBs' cost profile, there is also a positive environmental and amenity value from trees. If EBs face only financial risks from trees in the proximity of powerlines, their theoretical incentive could be to clear all trees in proximity to electric lines. EBs may also have a financial incentive to clear trees as deeply as possible, to reduce the frequency of the pruning cycle. This may lead to a loss of amenity and environmental degradation (including harm to tree health). This points to a need for regulation that balances the need for keeping trees clear of powerlines (as required under the ES Act), while not unduly eroding amenity and environmental benefits.

Councils responsible for clearance activity have different incentives to EBs. As councils are not electricity asset owners, they do not have the same commercial risks as EBs and therefore may have less incentive to clear trees from powerlines. In this sense, it is likely to be EBs that suffer the immediate financial cost from asset damage and loss of supply to customers. It may be possible for EBs to recover loss through litigation against councils, but the ability to recover full costs is limited because of the complexity of the legal framework and because litigation is often difficult and costly.

Councils also come under pressure from local residents who value trees for the amenity they provide and their contribution to property values. Well-managed trees provide economic benefits, increase house prices, and can reduce energy use in buildings. The community also values trees for shading and cooling, habitat for native birds and animals, and for aesthetic values they provide. Councils are responsible for planting many of the trees on nature strips and recognise that these are important elements of canopy cover, i.e. urban forest. Councils often receive complaints from residents when street trees are cut heavily or unattractively by EBs. In addition, private land owners may be less aware of the risks associated with trees contacting electric lines. Finally, tree clearing activities are very costly, and Councils face a range of pressures on their budgets.

The minimum clearance requirements in the ELC Regulations ensure, as far as practicable, that tree clearance is undertaken in a competent manner which preserves the health of the tree as well as minimising any harm to its aesthetic values. This consideration is highlighted particularly by Councils which argue that, in the absence of specific guidance for tree pruning, clearance activity would be excessive and unsightly, and beyond what is required to achieve safety and supply reliability outcomes. However EBs are generally of the view that the safety risks far outweigh the benefits of maintaining the aesthetic appearance of trees, and therefore they are likely to prioritise safety outcomes over maintaining amenity.

2.2 Extent of the problem

This section considers some evidence of the impact of failures to prevent contact between trees and powerlines, and notes the continuing extent of the problem, even in the presence of the current ELC Regulations:

- Fire ignition bushfire risk in rural areas)
- Electrocution and electric shock
- Power supply outages.

2.2.1 The problem pre-1984

The potentially catastrophic impact of contact between powerlines and trees has been extensively discussed in previous RISs relating to the ELC Regulations (2015, 2010). Prior to the introduction of tree clearance legislation in 1984, the interaction between trees and powerlines had historically been a cause of major fires in severe weather conditions. Electricity assets were involved in the major fires of 1962, 1969, 1972 and 1977, as well as the Ash Wednesday fires of 1983. The Ash Wednesday fires at East Trentham and Mount Macedon were attributed to powerlines arcing when they came into contact with trees. This fire alone resulted in seven fatalities, the loss of 157

houses, 628 other buildings, 7,700 head of cattle or sheep and an area of over 29,000 hectares being burnt.[24]

The 2015 RIS estimated the economic cost of fires due to contact between trees and powerlines at $113 million per annum from 1975 to 1983 (in 2019 dollars). In contrast, annual economic losses from the cost of fires due to contact between trees and powerlines were estimated at $0.14 million per annum (2019 dollars) in the decade or so following the adoption of the Code.[25] The 2015 RIS noted that both estimates were likely to constitute significant under-estimates of the true costs of fire ignition due to contact between trees and powerlines since the estimate reflects only a subset of the total cost of fires and is based on quantifiable costs that can be measured by evidence such as insurance payouts.

The above quantification refers to the changes in costs related to fires and does not reflect to cost impacts related to electrocutions or power outages; the other two causes of harm. We are not aware of any similar estimates of the decline in costs after 1983 related to power outages caused by tree contact. However, since all three categories of harm have a common cause - trees contacting powerlines - it follows that there is likely to have been a fall in the incidence of these two categories of harm as well.

2.2.2 Recent evidence of the problem

This section considers the three categories of cost associated with tree grow-ins; fires, electrocution (or other injury) and power outages. It builds on the evidence that was provided in the 2015 RIS, which included significant analysis of bushfire incidents due to tree contact pre and post introduction of legislative/regulation regimes.

However, as noted in the 2015 RIS, the episodic nature of the problems being addressed and the complexity of the natural environment mean measures of effectiveness of individual versions of the ELC Regulations are subject to uncertainty.[26]

Furthermore, since a legislative framework addressing trees near electric lines has been in place in some form since 1983, it is difficult to accurately quantify the size of the problem that would exist if there were no forms of regulation relating to tree clearance. That is, there has been no readily observable counterfactual for some time.

There are however notable international examples of tree contact with powerlines that have led to catastrophic bushfires, which can demonstrate the impact, including the 2018 Camp Fire in California. The Camp Fire is the deadliest and most destructive fire in California history which was started by tree contact with a powerline. The California Department of Forestry and Fire Protection has determined that the Camp Fire was caused by electrical transmission lines owned and operated by Pacific Gas and Electricity located in the Pulga area.[27]

[24] 2015 RIS in relation to the ELC Regulations, p.22.
[25] The 2015 RIS is not clear about which period this average cost was measured, but assumed to be for the period between 1984 and 1996.
[26] 2015 RIS, p.3.
[27] California Department of Forestry and Fire Protection (2019). *CAL FIRE Investigators Determine Cause of the Camp Fire,* Accessed at: https://www.fire.ca.gov/media/5038/campfire_cause.pdf

2.2.2.1 Fires

The result of a bushfire can be catastrophic, as illustrated by the February 2009 Black Saturday fires where 173 lives were lost, and which cost an estimated an estimated $4.4 billion.

Prior to the introduction of tree clearance legislation in 1983, electricity infrastructure, including interaction between trees and electrical lines, had been a cause of major fires. The devastating fires of 1962, 1969, 1972 and 1977 and 1983.

In general, powerlines are the cause of a very low percentage of bushfires, but under certain conditions (such as extended hot and windy weather) the percentage of bushfires caused by powerlines increases dramatically, combined with large fire spread. This has been observed in Victorian and Californian fires, although causation is not well understood.

In the four years to 2018-19, there have been, on average, 44 fires caused by vegetation contact across Victoria. A spike in 2017-18 was due to adverse weather conditions in March 2018. Data indicates approximately 6% (about 3 per year) of the fires caused by tree contact are due to grow-ins. The impact of such fires can be significant.

Overall, this evidence suggests that the ELC Regulations, as part of a broader regulatory framework including bushfire mitigation regulations and the f-factor scheme, have been effective in reducing the risk of fires caused by contact between trees and powerlines. Improved risk management processes adopted by distribution business to manage their commercial risk is also a driver of reduced fire risk. Weather conditions, which can vary from year-to-year, also influence fire starts and impact of fires to a significant degree.

Number of fires reported to be caused by contact between trees and powerlines

Table 2-1 shows the number of fires reported to be caused by contact between trees and powerlines per annum, grouped by distribution business. The total number of fires has varied between 38 and 88 over the last four years.[28]

Importantly tree contact events causing ground fires are not necessarily an indication of non-compliance with the Code, as they can stem from:

- Grow-ins, where trees planted close to powerlines grow into the clearance space – these are non-compliant with the Code
- Trees falling across powerlines from outside the clearance space (not identified as hazard trees, and includes branches blowing onto the powerline from outside the clearance space) – these instances are not in contravention of the Code/Regulations

It is only the first type of contact with powerlines, i.e. grow-ins, which is relevant to the ELC Regulations and this RIS. However, the numbers in Table 2-1 capture all of the above types, not just grow-ins. Incident data presented in the section below attempts to distinguish between the proportion of grow-ins compared with other types of tree contact.

ESV's annual 'Safety performance report on Victorian electricity networks' (October 2018) noted three fires in January 2018 were attributed to non-compliant vegetation[29] contacting high voltage powerlines.

[28] Including fire contained to the asset.
[29] This RIS generally uses the term tree or trees instead of vegetation. The term 'vegetation' is used in this section instead of trees to ensure consistency with source data.

Table 2-1: Fires due to vegetation contact

Incident details		Unit of measurement	2015-16	2016-17	2017-18	2018-19
Months in sample		No. months	9	12	12	10
Fires due to vegetation contact – **AusNet Services**[1]	Contained*	No. fires p.a.	5	1	2	0
	Local	No. fires p.a.	9	4	9	7
	Small	No. fires p.a.	6	3	11	8
	Medium	No. fires p.a.	3	3	5	3
	Large	No. fires p.a.	0	0	2	0
Fires due to vegetation contact – **CitiPower**[1]	Contained	No. fires p.a.	0	0	0	0
	Local	No. fires p.a.	1	0	1	2
	Small	No. fires p.a.	0	0	0	0
	Medium	No. fires p.a.	0	0	0	0
	Large	No. fires p.a.	0	0	0	0
Fires due to vegetation contact – **Jemena**[1]	Contained	No. fires p.a.	1	2	1	1
	Local	No. fires p.a.	2	0	0	1
	Small	No. fires p.a.	0	0	0	0
	Medium	No. fires p.a.	0	0	0	0
	Large	No. fires p.a.	0	0	0	0
Fires due to vegetation contact – **Powercor**[1]	Contained	No. fires p.a.	2	4	1	1
	Local	No. fires p.a.	1	7	10	3
	Small	No. fires p.a.	4	6	13	3
	Medium	No. fires p.a.	3	3	9	3
	Large	No. fires p.a.	0	1	6	1
Fires due to vegetation contact – **United Energy**[1]	Contained	No. fires p.a.	2	4	8	9
	Local	No. fires p.a.	5	1	8	2
	Small	No. fires p.a.	3	0	2	2
	Medium	No. fires p.a.	1	0	0	0
	Large	No. fires p.a.	0	0	0	0
Fires due to vegetation contact – **all EBs**[1]	Contained	No. fires p.a.	10	11	12	11
	Local	No. fires p.a.	18	12	28	15
	Small	No. fires p.a.	13	9	26	13
	Medium	No. fires p.a.	7	6	14	6
	Large	No. fires p.a.	0	1	8	1

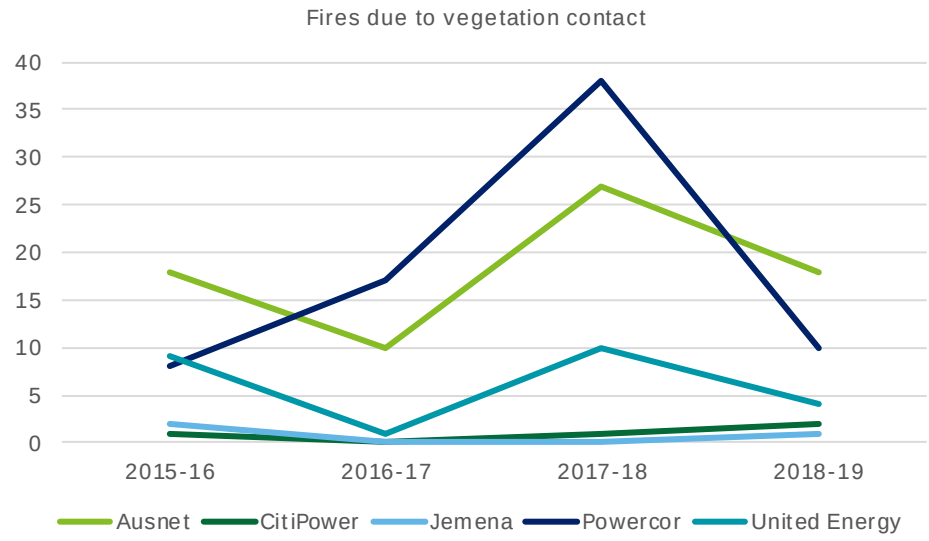
Source: ESV. Notes: [1] ESV incident reports: local (<10m^2), small (10-1000m^2), medium (1000m^2 – 10 ha), large (>10 ha). * Fire contained to asset.

Figure 2-1 shows the number of fires accruing to different EBs in recent years.[30] The differing number of fires across EBs reflects a range of factors, including the scope of their operations and geography. As a result, the number of fires across EBs should not be seen as readily comparable or necessarily reflective of fault.

Figure 2-1 shows that AusNet Services and Powercor experienced the most fires due to tree contact, followed by United Energy. Fires in the CitiPower and Jemena areas are very infrequent. AusNet Services and Powercor have by far the largest service areas, which contributes to the fact that they have the largest number of fires.

[30] Excludes contained fires.

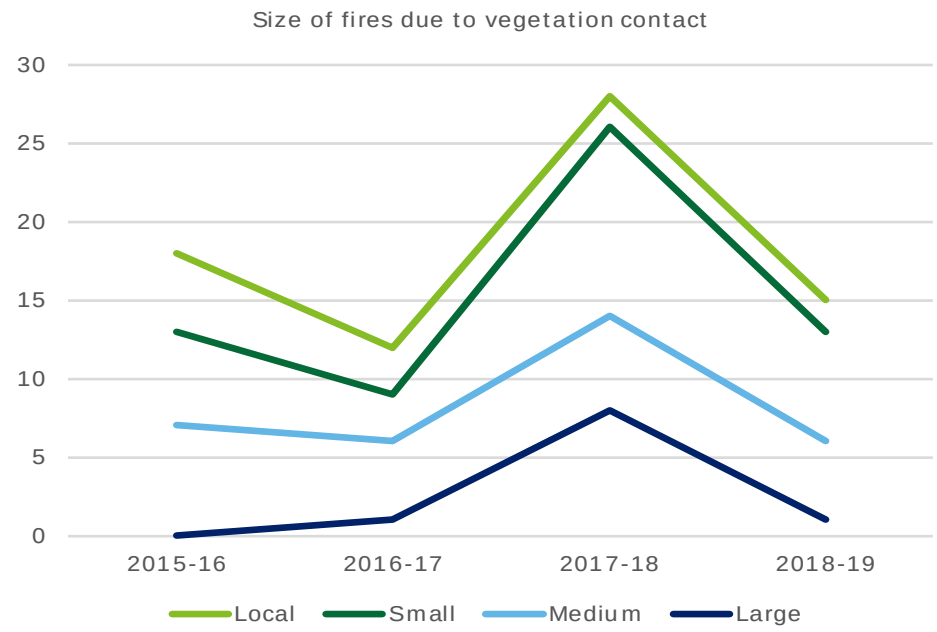
Figure 2-1 Fires due to vegetation contact



Source: ESV. Note figures in this graph do not include fires contained to asset.

Figure 2-2 breaks down fires into their sizes; localised, small, medium or large. The majority of fires have been localised or small in nature. There have been 33 medium fires over the past four financial years, with 14 of those in 2017-18. Of the 10 large fires, 8 of them were in 2017-18. This reflected adverse weather conditions and there were 44 fires between 17 March 2018 and 22 March 2018 due to severe winds across the state, primarily in the southwest.[31]

Figure 2-2: Size of fires due to vegetation contact



Source: ESV. Note figures in this graph do not include fire contained to asset.

[31] Energy Safe Victoria, 2018, *End of Fire Season Summary*, p.9. < https://www.esv.vic.gov.au/wp-content/uploads/2018/07/ESV-End-of-season-fire-report-2017-2018.pdf >.

As reported in the 2015 RIS, OSIRIS incident data showed that there were 252 fires caused by contact between trees and powerlines in the five years between 2008-09 and 2012-13, with 29 (11.5%) attributed to grow-ins. This was an average of 50.4 fires per year caused by vegetation contact, and 5.8 fires per year caused by grow-ins over this time period.

There was an average of 44 fires per year due to contact between vegetation and powerlines between 2015-16 and 2018-19.

Recent ESV data[32] shows that for 23% of incidents, the type of contact was not specified.[33] Of those where the contact mechanism was identified, 43% were due to blown branches, 51% were due to fallen branches and **6% were due to contact by trees within the clearance space**.

If that 6% share is applied to the fire data presented in Table 2-1, we can estimate the number of fires caused due to 'grow-ins' over the past four financial years. In this estimate, it is assumed vegetation grow-ins have the same distribution of fire size as the broader sample of fires caused by vegetation contact. The resulting estimates shown in Table 2-2 also give rise to fractions of fires which evidently cannot occur in reality, but occur here as a mathematical assumption. On this estimate, the average annual number of fires caused by 'grow-ins' (2.7) is half that compared to that reported in the 2015 RIS (5.8).

Table 2-2: Estimated fires due to vegetation 'grow-ins'

	2015-16	2016-17	2017-18	2018-19	4-year average
Local	1.1	0.7	1.7	0.9	1.1
Small	0.8	0.5	1.6	0.8	0.9
Medium	0.4	0.4	0.8	0.4	0.5
Large	0.0	0.1	0.5	0.1	0.2
Total	**2.3**	**1.7**	**4.6**	**2.1**	**2.7**

Source: ESV, OSIRIS incident reports

In this comparison, it is important to note that weather conditions vary from year-to-year, and this can influence fire starts to a significant degree. For example ESV analysis shows that consecutive days of high temperature result in substantially more major bushfires caused by electricity.[34]

No details on tree management responsibility were provided for 74% of incidents. Of those where responsibility was identified (via EB reporting), EBs had clearance responsibility for 29% of trees making contact, councils were responsible for 38% and private property owners 33%.[35]

Cost of fires

The 2015 RIS noted the difficulty of estimating an economic cost of the fires caused by tree grow-ins. A rough figure of $1m (2014 dollars) was used, implying an annual cost of $5.8 million for the 5.8 fires per annum. This estimate came from one EB which indicated this figure was assumed to be the long-run average cost of a fire involving its assets.[36]

[32] ESV 2019, *Data and analyses for the reset of the Electric Line Clearance regulations*, p.11.
[33] There is an element of human involvement in the collection of data on fires, which may result in inconsistent reporting on some fire events. Steps to reduce this data gap for future RISs are outlined in ESV's Evaluation strategy. For the purposes of this RIS however, 6% is the best available estimate for the proportion of fires prompted by contact between trees and electric lines within the clearance space.
[34] ESV analysis.
[35] ibid, p.12.
[36] 2015 RIS, p.23.

A review of literature suggests that the economic cost of bushfires depends upon the length and intensity of bushfires. Measuring the true cost of a bushfire is challenging as bushfires create economic, social and environmental costs. Bushfires create economic losses by damaging assets, disrupting business supply chains and reducing tourism. The displacement of families, injury of individuals and the cost of lives give rise to a social cost from bushfires, while environmental costs include the loss of flora and fauna, increased air pollution and impaired water quality.

Insurance data is the most readily available information with which to estimate the cost of bushfires. This data, however, doesn't capture many costs associated with bushfire (e.g. environment damage, health implications and many indirect economic or tourism losses). It also will only capture a subset of bushfires i.e. those that a claim is made for. Recognising these limitations, it is the best available quantifiable data to give an indication of the size of the costs associated with bushfires.

The Victorian Black Saturday bushfires of 2009 for example cost an estimated $4.4 billion, of which $1.2 billion was reflected in insurance claims.[37] While this was a catastrophic event, and is on the upper bound of insurance claims, the Insurance Council of Australia has recorded claims associated with bushfires ranging between $12 million and $171 million per event over the past few years, as shown in Table 2-3.

Table 2-3 Cost of bushfires (insurance claims)

Event	Year	Number of claims	Value of claims
Perth bushfires	2011	410	$35 million[38]
Margaret River bushfires	2011	392	$52 million
Tasmanian bushfires	2013	1900	$89 million[39]
NSW bushfires	2013	1500	$12 million
WA bushfires	2014	300	$13 million[40]
Victorian bushfires	2015	527	$110 million[41]
South Australia bushfires	2016	2030	$171 million[42]
Yarlopp bushfires (WA)	2016	1358	$71 million
NSW bushfires	2017	2000	$33.5 million[43]
Bunyip bushfires (VIC)	2018	365	$20 million[44]

Source: Insurance Council of Australia

While several of the Black Saturday bushfires of 2009 were found by the 2009 Victorian Bushfire Royal Commission to have been caused by electricity assets, these were not attributed to contact between powerlines and trees arising from non-compliance with line clearance regulations, although only a limited number of the fires were considered by the Commission. Available data

[37] Gray, Darren. (2010). *Black Saturday cost $4.4 billion*
[38] Insurance Council of Australia. (2011). *Cost of 2011's catastrophes passes $4.3 billion as builders take a break*
[39] Insurance Council of Australia. (2013). *Catastrophe update: claims for 2013 pass $670 million*
[40] Insurance Council of Australia. (2014). *WA bushfire update: Assessors enter bushfire zones*

[42] Insurance Council of Australia. (2016). *Victorian bushfire losses push summer catastrophe bill past $550 million*
[43] Insurance Council of Australia. (2017). *Insurance Council declares a catastrophe for Victorian Hailstorms*
[44] Insurance Council of Australia. (2019). *Insurance bill for summer catastrophes passes $2.2 billion*

from EBs for the period from 2009 to 2013 (that is, under the existing and previous Codes) shows that electricity supply interruptions resulting from contact between trees and electric lines due to failure to maintain the required clearance distances (so-called "grow ins") are far more frequent than fires by the same cause. However, while the data suggests that fires are a far less likely result of contact between powerlines and trees than power supply interruptions, the consequences of any bushfires that do occur can be catastrophic.[45]

2.2.2.2 Electrocutions and other injury

Electrocution and other injuries can occur where people are near or in contact with trees in close proximity to powerlines. The tree may become 'live', resulting in risk of injury or death upon human or animal contact with the tree. Those working with electric lines or tree management are at higher risk, but electrocutions have the potential to affect the broader community as well.

Table 2-4 shows the number of injuries due to tree related-contact in recent years, noting the data relates to both direct contact of trees and for workers removing tree branches too close to powerlines. Over the past four years, there has been one fatality due to electrocution. There was one injury requiring medical attention and an average of three injuries per year related to minor shock. This suggests the current ELC Regulations, together with other regulations including 'No Go Zones' near powerlines[46], have been largely effective in avoiding electrocutions.

It is also worth recalling that tree-related contact is broader than just incidents related to 'grow-ins'. If the 6% share were applied to these injury numbers, the numbers would be close to zero. However, while low likelihood, electrocutions have a huge human and financial cost.

Table 2-4: Number of injuries due to vegetation related contact

	2015-16	2016-17	2017-18	2018-19	4-year average
Fatalities (electrocution)	0	0	0	1	0.25
Fatalities (non-electrocution)	0	0	0	0	0
Injuries (medical attention)	0	1	0	0	0.25
Injuries (minor shock)	3 (4*)	5	3	0	3
Near-miss fatalities (animal electrocution)	0	0	0	0	0

Source: ESV. Note: * Incident numbers factored up to account for shorter reporting period for incidents in 2015-16 and 2018-19.

It follows that power outages and fires are currently the major categories of cost associated with 'grow-ins', with risk of electrocution a very real, but currently well-contained risk.

[45] ibid

[46] The No Go Zone rules describe minimum safety requirements that are dependent on the distance between overhead powerlines and the work being performed (https://esv.vic.gov.au/technical-information/electrical-installations-and-infrastructure/no-go-zones/).

2.2.2.3 Power outages

Power outages can be caused by contact between powerlines and vegetation, and can lead to a number of costs to society, businesses and individuals. This can include poor health outcomes, and potential death, due to life support machines not functioning or a lack of cooling or heating, as well as business closures and other productivity losses.

AER data shows that there has been a slight downward trend in power outages per customer in the period from 2006 to 2017. This excludes power outages caused by 'force majeure events' such as storms.

On average between 2014 and 2018, there were 244,315 hours of grow-in related outages, compared with 453,336 hours in 2010-13. The Value of Unreserved Energy (VUE), which captures the Value of Customer Reliability and the Value of Social Disruption, is estimated to be an average annual cost of $212 million. This RIS estimates that in the absence of Regulations the cost of supply interruptions due to grow-ins would double to just over $400 million.

Power outages can occur due to a range of causes, including contact between trees and powerlines. Power outages can impose costs on society, businesses and individuals including:

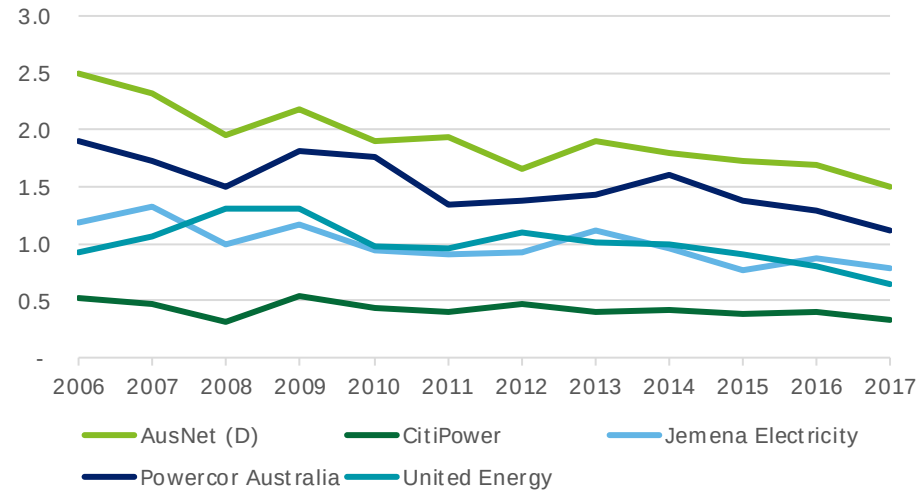
- Business closures: resulting in a loss of productivity
- Lost perishables: affecting households and food-related businesses
- Risks to life: for example, people reliant on life support machines
- Lack of air-conditioning or heating: with potential negative health impacts, including death[47], particularly for vulnerable people such as the elderly and young children.

Data from AER shows that outages per customer have shown a slight downward trend over the period from 2006 to 2017. This may reflect the success of the s-factor and f-factor schemes. While the f-factor scheme has been in place since late 2011, the s-factor scheme was introduced in the 2006-10 Price Review. The s-factor affects future distribution tariffs. EBs are rewarded for exceeding the reliability targets through higher revenue (tariffs), and penalised if they don't meet the targets through lower revenue.

Outage frequency is measured using a System Average Interruption Frequency Index (SAIFI). This shows the number of supply interruptions each customer experienced in a year when averaged over all customers on the distribution network. The data does not include outages caused by 'force majeure events' or other outages primarily caused or initiated by third parties (for example damage to power pole by vehicle). This means that it excludes many of the most significant events, including tree or branch and powerline contact that arises from large storm events.

[47] Between 2000 and 2009, 532 people died in Australia due to heatwave-related causes. 432 of these were during the 2009 extreme heatwave in Victoria and South Australia, which also caused the Black Saturday fires. Whilst direct causation of these deaths has not been established, a lack of access to air conditioning due to power blackouts is considered to be a large contributing factor (Source: https://theconversation.com/australias-deadliest-natural-hazard-whats-your-heatwave-plan-90165).

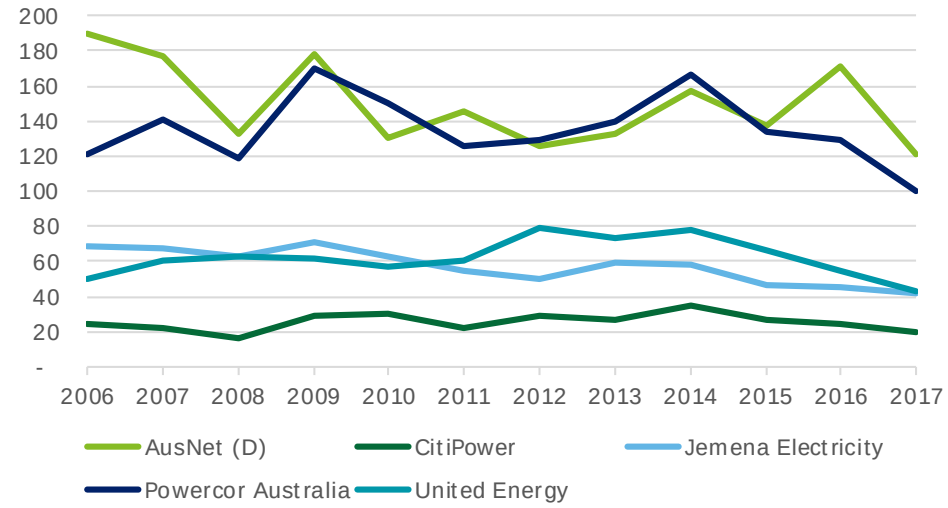
Figure 2-3 Outages per customer



Source: AER

A small reduction in minutes per customer off supply is also observable. This data is measured using the System Average Interruption Duration Index (SAIDI). This shows the average length of time each customer was without supply when averaged over all customers in the distribution network. Again, the data does not include outages caused by force majeure events or other outages primarily caused or initiated by third parties.

Figure 2-4 Minutes per customer off supply



Source: AER

It is important to note that the AER SAIDI and SAIFI data does not identify the cause of the outage; many factors, in addition to trees, cause outages. It is not possible to quantify the number, duration and frequency of interruptions explicitly due to tree or tree branch contact, let alone due to clearance activities or tree contact from within (or from outside) the clearance space, from the AER data.

ESV incident data may be used to provide a percentage split between 'grow-ins' and 'fall-ins'. While a EB can list as part of the causes for an incident whether the tree was *fallen, blown branch/vegetation* and/or w*ithin clearances*, there is no mandatory requirement to provide this level of detail for all incidents to ESV. ESV notes that no type of tree contact was specified for 23% of incidents that were listed as being caused by trees. Of those where the contact mechanism was

identified, 43% was due to blown branches, 51% was due to fallen branches and **6% was due to contact by trees within the clearance space (grow-ins)**.

The 6% figure is similar to the 2015 RIS, which found 8.2% of interruptions in 2010-13 were due to 'grow-ins'. Using the 6% figure, we can provide an estimate of the economic cost of outages due to 'grow-ins'.

The table below provides an estimate of the annual cost of electricity supply interruptions due to 'grow-ins'. The average hourly electricity demand was estimated to be 13.54 kW, the same number used in the 2015 RIS.[48] This reflects the relatively unchanged profile of electricity demand in recent years. The 2015 RIS estimated the Value of Unreserved Energy (VUE) was $59.55 in 2014 terms. This number is equivalent to a value of $64.04 per kW hour in 2018.

The VUE figure captures:

- The Value of Customer Reliability (VCR) - the weighted average measure of the economic cost to consumers for a given amount of unserved load (i.e. the cost of being without an electricity supply). A wide range of customers is considered in developing an overall VCR measure, including residential, agricultural, commercial and industrial users. In addition, a wide range of interruption durations (up to 24 hours) is modelled, given that interruption costs do not change in a linear fashion with interruption duration.
- Value of Social Disruption - defined as the economic cost to social services across the state of Victoria in the event of outages.

The current cost of supply outages related to 'grow-ins' is therefore estimated at an average annual cost of $212 million in 2018 dollars. This is a proxy for the cost of supply interruptions, with costs affecting individuals, businesses and public services. Due to the data limitations discussed above, this estimate should be treated with caution.

Table 2-5: Electricity supply interruptions

	2014	2015	2016	2017	Average
Number of interruptions	3,559,596	3,271,943	3,204,131	2,823,008	3,214,670
Average duration (mins)	83	76	76	70	76
Grown-in related outages (hours)	295,446	248,668	243,514	197,611	244,315
KW per hour	13.54	13.54	13.54	13.54	13.54
$ per KW/hour	64.04	64.04	64.04	64.04	64.04
Cost ($ millions)	256	216	211	171	212

Source: ESV

This is a 'residual cost' to the extent that it reflects the cost of electricity supply interruptions in the current environment under the ELC Regulations.

To our knowledge, no data is available on the historical incidence of outages due to grow-ins prior and post the ELC Regulations first being introduced in 1983.

The 2015 RIS made the assumption that incidence of outages declined in proportion to the decline in fires, by around 95%. This assumption regarding the relationship between power outage and fires does not appear to be unreasonable as both are caused by contact between trees and powerlines. To obtain the cost of supply outages in an unregulated environment, the 2015 RIS

[48] 2015 RIS, p.26.

used a multiple of 20 (i.e. 1/(1-95%)). This implies that if there was minimal regulation, the cost of supply interruptions due to grow-ins would be:

$212 million x 20 = $4.24 billion per annum[49].

However, such a high cost of supply interruptions if there were minimal regulations seems unlikely. Given how practices have evolved over time regarding minimising the risks related to bushfires, and other incentives that exist to maximise safety outcomes, it is unlikely that a removal of regulations would result in responsible persons reverting fully to pre-1984 behaviours/actions. It is also likely that more regulatory focus from ESV on reducing the risk of major bushfires rather than minimising supply interruptions means the decline in supply interruptions would not be in proportion to the decline in fires. In the absence of more accurate data, we have assumed the reduction is half of 95%. Applying a 47.5% reduction implies that with minimal regulation, the cost of supply interruptions due to grow-ins would be almost 2 times greater (i.e. 1/(1-47.5%) than the current cost, at around $402.8 million. Illustrating how sensitive this estimated cost is to the assumptions used, we observe that assuming a 37.5% reduction implies that the cost of supply interruptions in an unregulated environment would be $339 million; assuming a 57.5% reduction implies that the cost of supply interruptions with no regulation would be $498 million.

2.2.3 Compliance with the regulations

In administering the ELC Regulations, ESV undertakes approval and monitoring functions to verify responsible persons are complying with the responsibilities required of them under the Act and the ELC Regulations. These are:

1. Electric line clearance management plan evaluation and approval – under the Act responsible persons must prepare management plans outlining how they will achieve regulatory compliance, in line with compliance with the Code. Some plans must also be submitted to ESV (i.e. EB plans) for approval. The plans are evaluated by ESV to ensure they meet the minimum criteria and expectations.
2. Audits – ESV conducts system audits to determine whether responsible persons are conforming to the processes and procedures outlined in their management plans. If a responsible person cannot demonstrate compliance, they are found to be noncompliant.
3. Electric line clearance inspections – ESV conducts inspections of spans of electric lines and trees to assess that clearance compliance is being demonstrated by responsible persons. Compliance observations are classified as either high risk non-compliant, non-compliant, or compliant.

In the past 12 to 18 months ESV has commenced collating compliance data about the EBs and more recently the councils through the desktop audits and inspections. The initial focus was the EBs due to the risk and scale of their responsibilities, as they are responsible for the majority of line clearance in HBRA. This all means the EBs have a greater risk profile when compared to Councils if they do not comply with the Code.

The electricity businesses produce well developed electric line clearance management plans that outline the tree management systems, methods and programmes that they use to keep trees compliant. Typically when a EB manages its electric line clearance responsibilities in a manner that is consistent with their plan they produce good standards of compliance. ESV observation and regulatory practice however shows that when a EB's tree management systems, methods and programmes are not applied in a manner that is consistent with their plan, or if they fail, the compliance standards are reduced. This can result in reduced electricity safety standards and enhanced bushfire threats.

Following an investigation in 2018, ESV found widespread non-compliance in an area of Victoria, leading to the prosecution of one of the EBs, Powercor. Six charges related to three grass fires

[49] In simple terms, in an unregulated environment, the cost of supply interruptions could be up to 20 times great than the annual current cost estimated at $212 million.

connected with tree branches hitting high voltage powerlines.[50] A further 51 charges incorporated 189 breaches of the ELC Regulations where Powercor had allowed trees to get too close to powerlines along a corridor between Benalla and Mildura (see case study in text box below).

ESV auditing of Councils shows Council plans and tree management systems, methods and programmes are less well developed than those of the EBs. Consequently the compliance standards that are being achieved by Councils are lower than those of the EBs. This has prompted ESV's inclusion of Councils within its formal audits protocols as of FY18. The risks that Council non-compliance presents to the community, however, are also much less than the EBs. To contextualise this point further it is worth noting that most Councils only manage trees in urban declared areas (only small areas of HBRA, if at all) and the geographical area of responsibility for an individual Council is comparatively small.

Case study: Powercor prosecution

In January 2018 grass fires occurred near the townships of Rochester (6 January 2018), Strathmerton (20 January 2018) and Port Campbell (28 January 2018). ESV investigation of the three grass fires concluded that ignition of the fire was most likely caused by tree branches coming into contact with high voltage powerlines. ESV also investigated breaches of the Code in an area from Benalla to Mildura during January 2018.

In July 2018, Powercor was charged for each of these fires and for 189 breaches of the Code of Practice for Electric Line Clearance. The charges for each fire include:

- Breaching key provisions of the Code of Practice for Electric Line Clearance in contravention of section 90 of the *Electricity Safety Act 1998*.
- Failing to minimise the risks to property from a supply network (section 98(b) of the *Electricity Safety Act 1998*).
- Failing to comply with a bushfire mitigation plan (section 113B(2) of the *Electricity Safety Act 1998*).

In October 2018 the scheduled first mentions hearings were adjourned (at the request of Powercor) to be heard on 23 October 2018 at Shepparton Magistrates Court; which was subsequently adjourned (again at the request of Powercor) to 11 December 2018.

In November 2018 Powercor submitted an offer to settle prior to the matters being put before the courts. ESV proposed a counter offer. Powercor made a further offer to settle, which was considered by ESV.

On 11 December 2018 at the first mention hearing Powercor advised it would plead guilty to two of the three charges that had been laid for each of the three fire events, that is to offences under section 90 relating to breaches of the Code (51 charges that incorporated the 189 Code breaches) and breaches of the bushfire mitigation plan under section 113B(2). ESV agreed to accept this plea when the case resumed in the Shepparton Magistrates Court in April 2019.

On 10 April 2019 at the Shepparton Magistrates Court Powercor pleaded guilty to each of the charges associated with the three fire events and the Code breaches. The magistrate acknowledged the seriousness of the charges but noted that Powercor had pleaded guilty at the earliest opportunity.

The magistrate imposed on Powercor fines of $374,000; consisting of $200,000 for the line clearance breaches and $58,000 for each of the three fires. The Magistrate also required Powercor to pay $165,000 in costs to ESV.

[50] Energy Service Victoria, *Powercor to plead guilty to ESV powerline charges,* < https://www.esv.vic.gov.au/news/powercor-to-plead-guilty-powerline-charges/ >.

2.2.4 Risks of non-intervention

If there were only minimal regulations, without any other intervention, there would be adverse effects on the Victorian community in a number of areas.

Firstly, the lack of guidance about how responsible persons (mainly EBs and Councils) should comply with the requirements of the ES Act would lead to uncertainty. This uncertainty would result in EBs and Councils spending significant amounts of time interpreting what the ES Act requirements mean for them and identifying what measures would need to be put in place to comply with them. Added to the time and cost, would be the cost of external legal advice in relation to these matters. This cost would be duplicated across businesses and councils, and could result in a greater number of legal disputes over ESV enforcement actions. Disputes are also likely to arise between EBs, councils, other responsible persons and private parties (such as land owners) as these stakeholders adopt various approaches to compliance under the ES Act.

On the one hand, given minimal regulations, responsible persons may spend more to reduce risk close to zero and avoid legal action or reputational damage. The incentives for this behaviour by EBs is discussed earlier in this chapter.

On the other hand, the greater risks arise where sole reliance on the ES Act results in some responsible persons, either intentionally or unintentionally, forming a relaxed interpretation of what the duties mean for them and what needs to be put in place to uphold them. This may result in some responsible persons failing to identify hazards and/or failing to control risks in certain areas. This could lead to higher incidences of power outages, fires caused by tree contact, or injury due to electric shock or electrocution. It is very difficult to attempt to quantify how large these incremental costs would be.

However, as responsible persons already have management plans and clearance activities in place, the impact of this would not be immediate. Instead, the level of compliance with the ES Act would be expected to decline over time. Some of the impact may also be lessened because of other components of the Government's broader bushfire mitigation framework that would remain in place, such as the f-factor scheme. However, these other instruments do not balance the need for powerline safety versus amenity and environment value. They purely direct or incentivise EBs to clear trees from electric lines.

2.3 Differing interests: stakeholder satisfaction with 2015 Code

A number of Councils and other responsible persons consulted during the RIS development process, have argued that EBs (as commercial entities) undertake excessive pruning, thus negatively affecting the amenity value of street trees and compromising tree health. Councils have also argued EBs systematically overestimate the negative consequences of contact between trees and powerlines. This extends to ascribing the problem as contact with trees, even when no significant evidence of this is available.

In contrast, a number of EBs have argued that Councils exercising clearance responsibilities in declared areas frequently undertake too little clearance activity, resulting in non-compliance with the Code. Consequently, EBs argue they suffer unreasonable economic loss due to this failure to comply with regulatory obligations, through for example, reduced supply reliability as a result of increased tree contact.

There has also been a broader debate about the level of flexibility in the ELC Regulations. The 2015 RIS noted submissions arguing the 2010 Regulations had resulted in a loss of flexibility relative to its predecessor. The 2005 Regulations allowed for reduced clearances in certain situations, on the condition that appropriate risk mitigation activities were carried out to ensure an equivalent safety outcome was achieved despite the reduced clearance dimension. ESV's experience was that, in practice, responsible persons were cutting to the reduced clearance dimensions, without undertaking the necessary risk mitigation.

As part of remaking the 2015 ELC regulations ESV addressed these deficiencies by introducing exceptions that permit reduced clearances under certain conditions, in certain situations. An additional exception is proposed for the new Regulations.

3 Options

This chapter outlines the feasible set of options considered in this RIS, an explanation of how feasible options were selected, and why other options were considered infeasible.

3.1 Options development

As part of the RIS process, it is necessary to consider different options that could achieve the Victorian Government's objectives. The *Subordinate Legislation Act 1994*, the *Subordinate Legislation Act Guidelines,*[51] and the *Victorian Guide to Regulation* recommend that this includes considering a range of approaches, including co-regulation and non-regulatory approaches, and those that reduce the burden imposed on business and/or the community.

As noted in Chapter 1, a range of legal, legislative, regulatory and non-regulatory mechanisms currently exist to reduce risk of fire (including bushfire), risk of electrocution and risk of power supply interruption:

- Common and Statute Law
- Improved network protection assets
- Electricity Safety (Bushfire Mitigation) Regulations
- Electricity Safety Management Schemes and Bushfire Mitigation Plans
- f-factor and s-factor Incentive Schemes
- Occupational Health and Safety Act and Regulations.

The range of feasible options for addressing the problem is considered within this broader legal context.

While perspectives regarding the current ELC Regulations differ between stakeholders on certain points, there is broad consensus across the wide range of stakeholders consulted that, while changes could be made, the current regulatory framework is performing well.

Further, as noted in Chapter 1, it is mandatory that ELC Regulations and the Code, in some form, remain in force.

Reflecting these factors, it is not considered feasible, or desirable, to include options that involve significant alternatives or changes to the current Regulations.

This Regulatory Impact Statement (RIS) therefore considers the regulations proposed to replace the current ELC Regulations.

3.1.1 Potential changes to the ELC Regulations

The following process was used by ESV to evaluate proposed changes to the ELC Regulations:

- ESV identified potential changes to the Regulations through discussion with stakeholders, the Electric Line Clearance Consultative Committee (ELCCC), and through ESV internal processes and review of its administration of the current Regulations
- ESV then assessed whether proposed changes were feasible and in line with the principles and objectives of the ES Act
- A series of options papers were prepared for review and advice by the ELCCC, which is a formal committee mandated under section 87 of the ES Act
- Taking into account ELCCC advice, proposed changes to the Regulations were finalised for consideration in this RIS.

[51] Office of the Chief Parliamentary Counsel, *Subordinate Legislation Act Guidelines*.

- Deloitte consulted with a number of key stakeholders to evaluate their views on the costs and benefits of the proposed Regulations, including changes to the Regulations.

The options draw upon ESV's data and field experience, the experience of responsible persons (primarily EBs and councils) with the Regulations to date, and extensive consultation by ESV with key stakeholders over the period of the current Regulations (four years). To support development of this RIS, Deloitte has also conducted a consultation process with EBs, government agencies (including DELWP) and representative peak bodies including the Municipal Association of Victoria (MAV).

3.2 Feasible options

All options retain the broad regulatory framework. In summary, the options include:

- **Base Case:** the ES Act is in place, but with minimal Regulations.
- **Option 1:** Re-make the current Regulations with no changes.
- **Option 2:** Re-make the current Regulations as in Option 1, but with targeted changes.

These options are described below.

3.2.1 Base case – the ES Act is in place, but with minimal Regulations

The Base Case is a counter-factual scenario used in cost benefit analyses to provide a common point of comparison for all options. In the context of this RIS, the Base Case represents a situation where **the ELC Regulations would be replaced with minimal regulations.** A minimal regulations scenario must be used for this RIS instead of no regulations because the ES Act requires regulations to be in place and consequently precludes the 'no regulations' option.

A minimal regulations scenario would mean very limited controls imposed, and could simply involve Regulations stating that trees need to be cleared from electrical lines in a safe manner, with no further prescription beyond this. Defining the Base Case in this way ensures that the existing regulations can be evaluated in terms of their effectiveness in achieving the policy objectives during the life of the regulations. This is also important in terms of explaining to stakeholders why the regulations continue to be needed beyond the requirements of the ES Act.

While we have assessed the case where minimal regulations are not in force, as noted above, this is not actually a feasible option under the ES Act.

In practice a Base Case of minimal regulations would mean that the detailed prescription in the regulations about how responsible persons meet their duty of keeping trees clear of electric lines would not exist.

3.2.2 Option 1: Re-make the current Regulations with no changes

Under Option 1, **the existing regulations would be re-made in their current form** (see summary of current Regulations in Appendix A.) This would result in the continuation of the 2015 Electric Line Clearance Regulations for another five years.

The inclusion of this status quo option provides for an evaluation of the effectiveness of the current regulations, which is important in the context of sunsetting regulations.

Under the status quo scenario, risks from tree contact with electrical lines experienced over the last five years would be expected to continue into the future. However, the changes identified leading up to the preparation of this RIS would not be made.

3.2.3 Option 2: Re-make the current Regulations as in Option 1, but with targeted changes

Option 2 involves **re-making the current ELC Regulations but with targeted changes aimed at improving the effectiveness and efficiency of the Regulations.** These changes are described in Table 3-1.

The process for determining the changes outlined below involved the following:

- ESV reviewed its administration of the Regulations, stakeholder feedback that has been provided over time, and policy rationale for each regulation.
- ESV led discussion of proposed changes at a series of ELCCC meetings, involving representatives from EBs, MAV, ORPs, CFA, DELWP and community members. Individual members on the ELCCC also liaised with other interested parties, such as timber plantation operators, to understand their perspectives. Some parties also provided submissions to ESV. The policy decisions made during these meetings are outlined in Appendix B.
- Assessment of the impact of proposed changes by ESV representatives, including arborists and engineers, considering factors such as safety, efficiency, and amenity outcomes.

Table 3-1 Targeted changed to regulations in Option 2

Category of change	Description of change	Location
Broad change	Amend the objective of the regulation to include a reference to protecting the health of trees <u>Wording of new regulations</u> The objectives of these Regulations are… (b) to prescribe— (i) standards and practices to be adopted and observed in tree cutting or removal in the vicinity of electric lines and the keeping of the whole or any part of a tree clear of electric lines, including standards and practices to protect the health of trees that require cutting in accordance with the Code; and (ii) a requirement that certain responsible persons prepare management procedures to minimise the danger of trees contacting electric lines and causing fire or electrocution or interruptions to electricity supply; and … (c) to require responsible persons to minimise the impacts of cutting on indigenous and significant trees and the habitat of threatened fauna; and	Part 1, Regulation 1
Management plans	Re-word the regulations such that responsible persons excluding a major electricity company must prepare a management plan annually	Part 1, Regulation 9(2)
Management plans	Change the requirement such that major electricity companies must prepare and submit a management plan relevant for a 5 year period. <u>Wording of new regulations</u> (3) A responsible person that is a major electricity company must before 31 March 2021 prepare and submit to Energy Safe Victoria for approval a management plan relating to compliance with the Code for the period from 1 July 2021 to 30 June 2026	Part 1, Regulation 9(3) Part 1, Regulation 10(2)

Category of change	Description of change	Location
Management plans	Include a requirement for a map in the management plan to show HBRA and LBRA that are related to area covered by the plan	Part 1, Regulation 9(4)(f)
Management plans	Change the word 'native' to 'indigenous to Victoria'	Part 1, Regulation 9(4)(g)
Management plans	Change so that management plans no longer have to be available for inspection at the responsible person's primary place of business – they only need to be on their website	Part 1, Regulation 10(6)(b)
Insulating cover	Update the definition of an insulated cover and links to related standards	Schedule 1, Part 1, Regulation 1
Insulated cable	Change the definition of an insulated cable based on new definition of an insulated cover	Schedule 1, Part 1, Regulation 1
Suitably qualified arborist	Change the definition of a suitably qualified arborist from Certificate 4 in arboriculture to a Certificate 3 in arboriculture, including a ground based tree assessment training module. This has been prompted by training providers no longer providing Certificate 4 in Victoria	Schedule 1, Part 1, Regulation 1
Exceptions to minimum clearance	Allow branches to be 150 mm from the line if the span is less than 40m in length. Previously it was 300mm away from the line. The exception clause can only be used under increased tree management requirements to manage risk to acceptable level	Schedule 1, Part 1, Regulation 4(c)
Exceptions to minimum clearance	Insert new clause introducing exceptions to minimum clearance distances for small branches growing under uninsulated low voltage electric lines. The exception clause can only be used under increased tree management requirements manage risk to acceptable level	Schedule 1, Part 1, Regulation 5A
Indigenous vegetation	Change the words 'specified significant trees' to 'indigenous or significant trees' to increase clarity	Schedule 1, Part 1, Regulation 10
Public notification	Change so that notifications can be published on the responsible person's website or published in a newspaper. <u>Wording of new regulations</u> A written notice published under subclause (2) must be published on the responsible person's Internet site or in a newspaper circulating generally in the locality of the land in which the tree is to be cut or removed.	Schedule 1, Part 1, Regulation 16(3)
Dispute resolution requirement	Amend to require only in the Regulations to include detail of dispute resolution procedure in the plan and not also as a stand-alone procedure.	

4 Options analysis

4.1 Method of assessment

The options in this RIS have been assessed using Multi-Criteria Analysis (MCA) supported by quantitative information i.e. where possible establishing a dollar value of costs and benefits. This approach has been chosen because it provides a robust way of evaluating the disparate and qualitative data that is available. The MCA provides a structured and transparent approach that can balance the different impacts, for example safety versus amenity/environment.

MCA requires judgement of how the proposed options will contribute to a series of criteria that are chosen to reflect the benefits and costs associated with each option. Each criterion is assigned a weight reflecting its importance to the policy decision, and a weighted score is then derived for each option. The option with the highest weighted score is the preferred option. The MCA technique is outlined in Box 4.1.

Box 4.1 Multi Criteria Analysis

MCA refers to a range of techniques to assess policy options against decision criteria. MCA enables options to be compared in a way that utilises quantitative and qualitative evidence fully. The approach enables the inclusion of a wider range of criteria — including social and environmental considerations for example — than those used in a typical financial analysis. In addition, the approach is transparent — necessary subjective judgements and assumptions made to determine options and criteria, and to assign scores and weights are made explicitly. The preferences of the decision maker reflected in these judgements and assumptions can be readily changed in a sensitivity analysis or to incorporate alternative indicators of community preference.

4.1.1 Criteria

The options have been assessed based on a framework that considers the following criteria:

Criteria	Description	Weighting
Costs	The cost (i) to responsible persons of complying with the Regulations, (ii) to government of monitoring and enforcing compliance with the Regulations, and (iii) to the community.	50%
Total costs weighting[52]		**50%**
Safety	The benefits to the community and individuals from reduced risks of fire and electrocutions.	25%
Reliability of the electricity supply network	The benefits to the community from reducing power supply interruptions.	15%
Protection of amenity and tree value/ environment	The benefits to the community and environment from protections of trees as a result of responsible persons preparing/submitting a management plan and clearing vegetation in accordance with the Regulations.	10%
Total benefits weighting[53]		**50%**

[52] The total cost weighting comprises costs to responsible persons, Government and the community. Costs between various stakeholders are equally weighted so that $1 incurred by Government is the same as $1 incurred by the community.
[53] Total benefits weighting includes (safety, reliability of the electricity supply network protection of amenity.

4.1.2 Weighting

For the purpose of this assessment, benefits and costs have been weighted equally at 50% each. The criteria of **Safety** is weighted most heavily (25%) reflecting the objectives of the ELC Regulations, which aim to minimise the danger of electric lines causing fire or electrocution. It also reflects the objectives of the ES Act, which makes further provisions relating to the safety of electricity supply and use. **Protection of amenity and tree value / environment** is weighted at 10%, reflecting the Government's objective to ensure that tree value and environment is taken into account when assessing the appropriate level of tree clearance. The remaining 15% is allocated to **Reliability of the electricity supply network**, reflecting a consideration of the ES Act (under the functions) which makes further provisions relating to the reliability and security of electricity supply.

4.1.3 Scale

The criterion rating scale has a range of –10 to +10, where a score of zero represents no change from the Base Case.

Table 4-1 MCA Scale

Score	Description
-10	Much worse than the Base Case
-5	Somewhat worse than the Base Case
0	No change from the Base Case
+5	Somewhat better than the Base Case
+10	Much better than the Base Case

Costs and benefits captured in this chapter include the items that are directly relevant and attributable to the ELC Regulations.

Given the level of uncertainty around data collected for this RIS, the general approach to estimating the costs and benefits in this RIS is to report conservative estimates. Where a range of plausible values is available, we have selected the average value as a representative of the sample.

This RIS also identifies costs and benefits that are difficult to quantify. In such circumstances, survey data, stakeholder consultations and relevant literature are used to inform a qualitative discussion of the cost or benefit.

4.2 Costs

Summary of cost analysis

Costs are considered across responsible person costs, government costs and community costs.

- **Responsible persons** incur the largest costs associated with the ELC Regulations, comprised of (i) vegetation clearance costs, (ii) the costs to prepare management plans, and (iii) the costs of consultations, notifications and disputes. These costs are considered to be highest under Option 1, due to the increased vegetation clearance and associated activities as compared with a context of minimal regulations. Changes to the exceptions to minimum clearance distances in Option 2 will reduce costs to responsible persons, relative to Option 1.
- **Government costs** to administer and enforce the ELC Regulations are primarily incurred by ESV. Government costs are expected to be higher in the Base Case, relative to Options 1 and 2. This reflects the absence of a regulatory framework, which makes ESV's role more difficult and time consuming.
- **Community costs** are higher under minimal regulations (Base Case). This is due to the absence of a legal framework for vegetation clearance activities, without which, frequent disputes are expected to arise between responsible persons and members of the community.

This analysis assesses the following costs of the Options:

- Costs to responsible persons of complying with the Regulations under each Option (section 4.2.1)
- Costs to the Government of implementing, administrating and enforcing the Regulations under each Option (section 4.2.2)
- Costs to the community that arise as a result of the Regulations under each Option (section 4.2.3).

While the discussion is structured to highlight the different costs incurred by various stakeholders, for simplicity these costs have been scored as an aggregate against a single cost rating criteria outlined in the MCA framework in section 4.1.1.

4.2.1 Responsible person costs

As responsible persons under the Act, Councils and EBs (along with other responsible persons) incur costs to comply with the Regulations. Stakeholder consultations suggest that the major compliance costs for responsible persons include:

- Tree clearance costs (section 4.2.1.1)
- Costs to prepare and submit management plans (section 4.2.1.2)
- Costs associated with consultations, notifications and disputes (section 4.2.1.3).

Whilst noting that the costs associated with the Regulations apply to EBs, Councils and other responsible persons such as land owners, rail businesses and windfarm businesses, the costs reported in this RIS only include costs of Councils and EBs. This is because an insufficient number of survey responses were received from other responsible persons.[54] This is not considered to be a material problem for this analysis, as the costs incurred by EBs and Councils are the most substantial.

4.2.1.1 Tree clearance costs

The largest cost of compliance for Councils and EBs is the cost of co-ordinating and undertaking tree clearance activities to ensure that trees remain outside of the minimum clearance space at all times. Tree clearance is undertaken by both Councils and EBs as some Councils are responsible for

[54] Deloitte received one completed survey response from other responsible persons

declared areas of land in urban areas (under sections 81 and 84c of the Act). Councils are responsible for undertaking tree clearance activities on public land within their 'declared area'. EBs are responsible for undertaking tree clearance on both private property (that is within a declared area) and on any land that is outside of a declared area, but within their service area.

Option 1

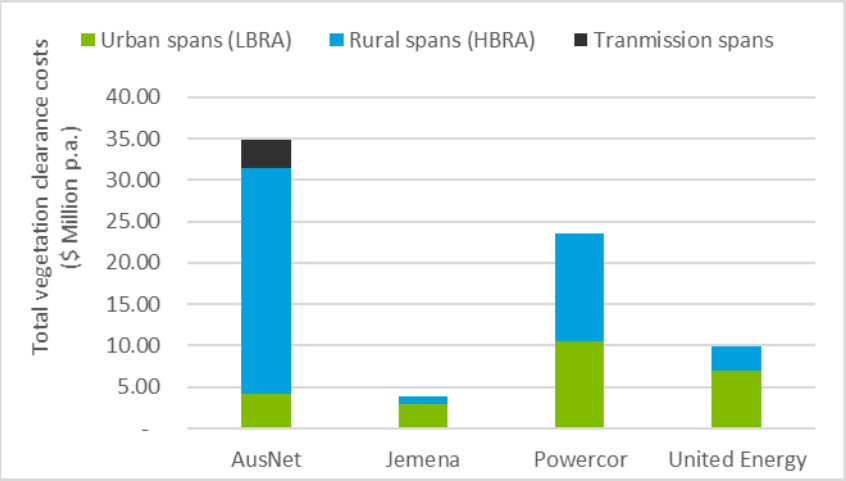
EBs

In consultations, EBs stated that they are incentivised to conduct tree clearance activities because trees impact the performance of their assets (i.e. electric lines). Ensuring safety, security and reliability of the network is the EBs' primary motivation for conducting tree clearance activities.

Tree maintenance activities are typically carried out by EBs using a mixture of external contractors and internal staff. Most EBs use a system whereby all spans within their network are subject to an annual inspection to identify spans that require maintenance. The exceptions are AusNet Services and Jemena, who maintain set cutting cycles within different areas of their network.

As noted in Chapter 1, AusNet Services and Powercor are responsible for managing the majority of the line clearance activities across Victoria – most of which falls within rural areas (refer to Figure 1.1). United Energy, Jemena and CitiPower maintain smaller areas in both rural and urban areas. Consistent with these responsibilities, AusNet Services and Powercor recorded the highest tree clearance costs of $34.9 million and $23.5 million per annum respectively. The aggregate cost of tree clearance activities for EBs (taking into account all four survey responses) is $72.1 million per annum. The chart below illustrates the average cost of tree maintenance activities reported by each EB[55].

Figure 4-1 Total tree clearance costs for EBs



Source: Deloitte RIS consultation/survey data

Councils

While some Councils have responsibilities for tree clearance under the ES Act, it is important to note that there are other factors influencing tree clearance activities within their declared areas. For example, Councils observed during consultation that they undertake tree clearance as part of public safety and road management. Councils' tree clearance activities (in relation to electricity lines) generally fit into, or alongside, a broader tree management plan that they have in place. The

[55] Citipower was the only EB who did not submit an individual response to the survey, and therefore individual costs are not included. However as Citipower and Powercor are owned by the same business group, it is assumed that Powercor costs included Citipower.

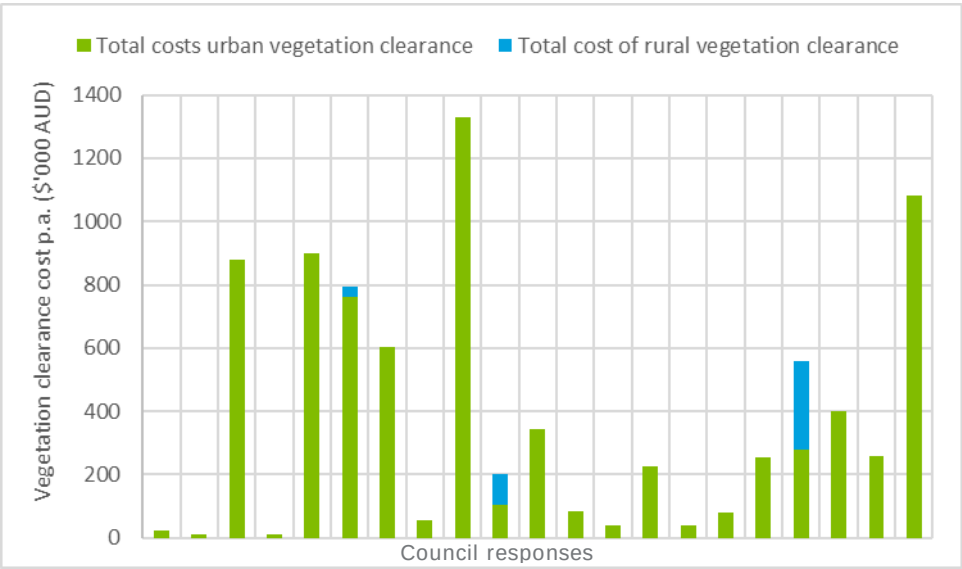
City of Bendigo for example, has prepared and published an Urban Tree Management Policy, which is intended to provide a framework for an equitable, transparent and consistent approach to the management of urban trees. The Policy references the legislative requirements that the Council has in relation to electric line clearance.

Consultations with Councils highlighted that most Councils rely on a team of contractors to undertake tree clearance works. Councils observed that tree clearance activities around electric lines were often delivered through separate tree clearance contracts (i.e. separate from tree clearance undertaken by the Council for other purposes); enabling accurate costing for the purposes of the RIS.

There is a large variation in the size of the declared area that each Council is responsible for, which is also reflected in the costs. For example, survey data suggests that Monash City Council is responsible for maintaining 70,000 trees per annum while the Central Goldfields Council is only responsible for maintaining 175 trees per annum. Despite variation in the total number of trees maintained per annum, Councils are generally responsible for maintaining more trees in urban areas than rural areas.[56]

The variation in the number of trees that are maintained by each Council results in disparity between the tree clearance costs reported by Councils. In rural areas, estimated clearance costs range between $32,000 and $280,000 p.a. while in urban areas the costs range between $4,590 and $1.33 million. The average cost of tree clearance activities (in urban and rural areas) is estimated to be $163,664 p.a. per Council. This average cost applied to the 67 councils that undertake tree clearance activities gives a total cost of $10.97 million per annum. It is not considered reasonable to translate these cost figures into a 'cost per tree figure' or a 'cost per span figure' due to insufficient data received in the survey. Instead, the graph below illustrates the range of aggregate costs reported by Councils. Green data points indicate the cost of maintaining clearance space around urban or LBRA spans, while the blue data points indicate the cost of maintaining rural or HBRA spans.

Figure 4-2 Annual tree clearance costs for Councils



Source: Deloitte RIS survey data

[56] On average, Council maintained roughly 12,827 trees p.a. in urban areas versus only 260 trees per annum in rural areas.

Base Case

In the Base Case, with minimal regulations, it is expected that EBs and Councils will continue to cut and clear trees away from powerlines, but there are varying views on how much this would differ from Option 1.

EBs

EBs would continue to clear trees as they are financially incentivised to avoid s-factor penalties, f-factor penalties and any damage to their assets. There are however some conflicting views as to the extent to which trees would be cleared in the Base Case.

During face to face consultations, some EBs expressed that they are likely to cut even more vegetation if there were minimal Regulations. Moving towards longer cutting cycles (where more aggressive pruning is undertaken without a formal requirement to consider things such as amenity and tree health) further mitigates the risk of financial losses and enables a reduction in the cost of vegetation maintenance. Despite results from the survey suggesting that, in the Base Case, EBs would maintain their current level of vegetation clearance, 75% of EBs reported through the survey that the current Regulations do not achieve an optimal balance between safety and amenity. EBs argued that the Regulations were "*weighted too heavily towards the amenity or environmental value of the trees, rather than the safety and reliability*" and that "*the current regulations weighted amenity higher than safety and supply reliability.*"

ESV expect that EBs would have incentive to cut less frequently but more aggressively if there were minimal regulations, as this may reduce costs to EBs. Overall, this will increase the volume of vegetation cleared. This is based on current and historical levels of non-compliance, as discussed in section 2.2.3. Over time, with no prescriptive framework to guide decision-making, clearance activities are likely to become more inconsistent across EBs. The continuing passage of time since the Black Saturday fires, if no other similarly catastrophic fires occur in Victoria, might also lower the perceived safety risk and weaken current risk management processes. Similarly, changes in management or ownership could also lead to a decline in resources committed to ensuring safety over time. The case of Powercor's breach of ELC Regulations, where it was fined substantially for not keeping trees clear of powerlines during 2016-2018 (with most breaches in assigned LRBAs), provides evidence to support ESV's view that the level of risk management in relation to clearance may decrease if there were minimal regulations.

Councils

In the Base Case, Councils are likely to decrease the amount of tree clearance that they undertake. This reflects Councils' different objectives and responsibilities compared to EBs that include balancing public safety, road management, amenity and environmental value of trees. Councils in general are likely to gradually transition towards more of a 'selective pruning model' whereby trees are cut or removed only if they present a clear safety risk.[57] For example, trees would be cleared if trees obscured the visibility of roads or if trees were encroaching on high voltage lines.

Survey data suggests that, if there were minimal regulations, five out of 24 Councils (or 21% of Councils) would reduce the amount of tree cutting, relative to Option 1. This is particularly true in urban areas. 48% of Councils do not believe that the current ELC Regulations appropriately balance safety and amenity, with many Councils arguing that not enough emphasis is placed on amenity. Given the high value that Councils place on amenity, it is reasonable to assume that Councils would gradually decrease the volume of cutting of trees maintained in the Base Case, relative to Option 1. As such, the cost of tree clearance for Councils is expected to be lower under the Base Case, relative to Options 1 and 2.

[57] There might be some variation in response at an individual Council level, but in general most Councils are expected to move towards more of a 'selective pruning model'.

Overall, this RIS concludes that tree clearance costs will be higher under Option 1 relative to the Base Case. This is because Councils would likely decrease their tree clearance under a minimal regulations scenario, and EBs would alter their cutting cycles to reduce costs.

Option 2

In Option 2, the proposed changes to the Regulations are expected to result in a marginal decrease in the costs of tree maintenance for responsible persons, relative to Option 1. In Option 2 the Regulations incorporate greater flexibility in the exceptions to minimum clearance distances; permitting small branches to grow under non-insulated low voltage lines. While not quantifiable, it is reasonable to assume that this would result in a marginal reduction in the volume of tree clearance undertaken on this type of span.

In addition, the proposed Regulations will amend and target the qualification requirements for suitably qualified arborists from a Certificate IV to a Certificate III in Arboriculture, including a specific module for tree assessment. Survey results suggest that 46% of Councils currently experience difficulties in contracting the services of arborists due to a shortage of suitably qualified candidates. 80% of Councils and EBs indicated that the change in the Regulations is not expected to have a material impact on the cost of compliance. Other Council survey respondents suggested that the change could decrease their cost of compliance between $2,000 and $10,000 a year.

Considering the limited supply of Certificate IV arborists, and the change in qualification requirements to Certificate III, it seems reasonable to conclude that the costs to contract the services of a suitably qualified arborist would be slightly lower in Option 2, relative to Option 1.

In Option 2, the proposed Regulations have altered the definition of an insulated cover due to the expiry of AS 1931.1. The new definition of an insulated cover replaces the term ‘electric line’ with the term ‘a conductor’. Ten out of 11 (or 91%) survey respondents said that they supported the proposed change to the Regulations, and all survey respondents indicated that this change would have no material impact on the costs of their tree clearance activities.

This RIS therefore concludes that tree clearance costs are lower in Option 2, relative to Option 1, but higher than in the Base Case.

4.2.1.2 Preparation of management plans

Option 1

The current Regulations require EBs to prepare and submit a management plan to ESV every calendar year. Councils also need to prepare a management plan annually, although they are not required to submit their management plans to ESV for approval. ESV does however undertake regular audits, reviewing a sample of management plans from Councils each year. This results in each Council’s management plan being audited at least once approximately every 5 years.

During consultations, Deloitte was informed that the time taken to prepare a management plan varies. Many stakeholders were of the opinion that more time is required to prepare the first management plan, following the introduction of new Regulations, which occurs every five years. Once the first management plan for the current Regulations is established, there is only a small amount of time required to update the plan for the next four years. This is because subsequent management plans that are prepared under the same regulations do not typically require any material amendments from what is already in place.

To cost this activity, survey respondents were asked to estimate the cost associated with preparing a management plan under the current Regulations. In summary, Councils estimated an annual cost of between $150 and $60,000 per annum to prepare their management plans, with the average Council spending approximately $3,863 per annum.

EBs reported slightly higher costs than Councils, reflecting the incremental cost associated with obtaining the ESV’s approval for each management plan. EBs reported costs of between $10,000 and $40,000 per annum to *prepare* management plans, with the average cost estimated at $22,750 p.a. Survey data also suggested that the cost of *amending* management plans, or

providing additional information to ESV during the review process, ranges between $4,000 and $20,000 per annum. These figures reflect Deloitte's consultations with EBs where EBs unanimously expressed the view that ESV's current review process of their management plans is very time consuming. EBs noted that the review process was the largest cost component of their annual management plan process.

Base Case

In the Base Case, survey data indicates that 59% of Councils would continue to produce their management plans, but only 25% of these respondents would continue to produce this plan every year. The most frequently cited reason for Councils to continue to produce a management plan is for risk management purposes, although public guidance and safety were also cited.

Similarly, all EBs said that in the absence of regulation, they would continue to produce management plans. However, only one EB indicated it would continue to produce their management plan on an annual basis. Other respondents said that they would prepare their management plan either every 3 years or every 5 years. EBs said that they would continue to produce management plans for the following reasons:

- Management plans are practical risk management tools that set out the plans, procedures and protocols for tree clearance activities
- Management plans are presented to the Board to demonstrate compliance
- Management plans are a key tool to manage the network.

In summary, the costs to prepare management plans under the Base Case are likely to be less than those in Option 1. This reflects the fact that some responsible persons will cease to prepare a management plan in the Base Case, while those that choose to continue, will generally do so less frequently than in Option 1.

Option 2

In Option 2, the draft Regulations include a provision enabling EBs to prepare and submit management plans every five years, instead of annually (as per Option 1). A group consultation with all EBs illustrated unanimous support for this change. EBs claimed that this adjustment to the Regulations would enable a more harmonious planning cycle within their businesses. It would enable management plans to be prepared in the same planning cycle as other critical safety documents such as the Bushfire Mitigation Plan, which EBs are required to prepare and submit to ESV for approval every 5 years under the ES Act.

In Option 2, responsible persons will no longer be required to make a copy of their management plans available for inspection at their primary place of business. Under Option 2, responsible persons are now only required to publish their management plans on their websites - where previously both actions were required. This change is expected to have a negligible impact on the cost of compliance for responsible persons.

Although not quantifiable, it is reasonable to assume that these proposed changes to the Regulations would decrease the costs to EBs in Option 2, relative to Option 1.

4.2.1.3 Consultations, notifications and disputes

Under Division 3 of the current Regulations, responsible persons have certain regulatory responsibilities in relation to consultations, public notifications and dispute resolution.

Option 1

Consultations

The current Regulations grant Councils the right to consult with EBs (and other parties) on any queries related to the safe cutting (or removal of trees), for which the Council has clearance responsibilities. Should a Council wish to consult with a EB, the EB is obligated to assist the Council. To cost this requirement, Deloitte sought views from Councils and EBs to understand how frequently this type of consultation occurs. Responses varied depending on the nature of the

relationship between EBs and Councils. Some Councils were frequently in contact with the EB, others stayed in contact through a series of formal meetings at fixed time periods, while others described their working relationships as weak with limited communication.

In accordance with clause 17 of the Code, Councils and EBs are also required to consult with the occupiers or owners of private property prior to cutting or removing trees. Survey responses suggest that Councils and EBs undertake anywhere between 10 and 4,000 of these consultations per year. The costs of facilitating these consultations ranges between $2,000 per annum and $450,000 per annum, but Councils reported lower costs than EBs.

In Clause 22 of the Code, EBs are required to consult with an occupier of the land above which there is a private electric line that falls within the EBs service area. In such cases the EB needs to inform the occupier of the land regarding their duties under the Code and the dangers associated with cutting trees. Survey data suggests that all EBs participate in these consultations, but that the number of consultations differs significantly. Data suggests that between 600 and 7,818 occupiers are consulted with per annum by a EB, costing between $5,500 and $10,000 per annum.[58] It is however important to note that EBs do not all address these consultations in the same way. Some EBs prefer to call residents while others supply written notifications to resident mailboxes.

Notifications

Clause 15 and 16 of the current Code require responsible persons to notify private land holders or the local community regarding planned tree clearance activities. Responsible persons must notify the public of any tree clearance activities through an advertisement placed in a locally circulating newspaper. Survey data suggests that Councils spend between $100 and $5,000 per annum on issuing notifications, with the average cost estimated at $448 per annum. The average cost of notifications is estimated to be $116,000 per annum for EBs, with a minimum cost of $100,000 and a maximum cost of $132,000 reported by EBs.

Disputes

Councils and EBs are required to establish a procedure for the independent resolution of disputes under the Regulations. This procedure must subsequently be made available for inspection at the responsible person's primary place of business and published on their internet site. No information is available on the costs of producing the procedures, however it seems reasonable to assume that the costs incurred by EBs and Councils would be small and once off costs. It is also reasonable to assume that EBs and Councils might be able to tailor their existing dispute resolution procedures to assist in disputes under the Regulations. This is particularly the case given the negligible number of disputes that stakeholders indicate go to formal dispute resolution.

In summary, while the current regulatory requirements pertaining to consultations, disputes and notifications do create compliance costs for responsible persons in Option 1, these costs are fairly small compared to the tree clearance costs presented in section 4.2.1.1.

Base Case

For the assessment of the Base Case, EBs and Councils were asked if they would continue their consultation and notification responsibilities outlined in clause 15 to clause 22 of the Code under minimal regulations. In summary:

- 73% of respondents indicated that they would continue to notify private land holders or the local community regarding planned tree clearance activities.
- 90% of respondents indicated that they would continue to consult with owners and/or occupiers prior to removing trees.
- 100% of EBs indicated that they would continue to consult with occupiers of the land above which there is a private electric line.

[58] Based on the only two survey responses Deloitte received to this section.

In summary, survey data suggests that in the Base Case, Councils and EBs will continue to notify and consult the community regarding their tree clearance activities however, the cost of consultation and notification undertaken in the Base Case would be less than that in Option 1.

It is likely that the costs of disputes would increase under the Base Case. This is based on the logic that there would be no framework under which to negotiate the terms of tree clearance activities extending the dispute processes and making disputes more complex to resolve.

Given these different potential effects, it is difficult to conclude that the cost of notification, consultation and dispute resolution would be materially different in the Base Case, relative to Option 1.

Option 2

In Option 2, the proposed Regulations will be amended to allow written notification to be published on the responsible person's internet site, or in a newspaper circulating in the locality of trees that will be cut. This adjustment enables greater flexibility to responsible persons as they are given a choice as to how they wish to notify the public. Data collected through Deloitte's consultations indicated that all Councils and EBs support this change to the Regulations. 55% of survey respondents said that this change would decrease their cost of compliance, while 41% of survey respondents were uncertain as to how this change would impact their cost of compliance.

Another proposed change to the Regulations is that responsible persons will no longer be required to retain a copy of their dispute resolution procedure at their primary place of business. Under Option 2, responsible persons will only need to publish a copy of their dispute resolution procedure on their internet site - whereas previously, responsible persons were required to do both. This is a minor alteration to the Regulations, which is expected to have a negligible impact on the cost of compliance.

Given these results, it is reasonable to assume that there is no material difference in the cost of compliance related to notifications, consultations and disputes between Options 1 and 2.

4.2.2 Government costs

Under Section 7 of the ES Act, the function of ESV is to "*monitor and enforce compliance with this Act and the regulations*". More specifically, only one section of the Act (Section 84) prescribes that trees are kept clear of electric lines. It is therefore important to acknowledge that ESV's enforcement role is much broader than just enforcing the Regulations assessed in this RIS.

Option 1

To monitor the compliance with the ELC Regulations, ESV conducts audits and inspections on responsible persons. Infringement notices may be issued, and compliance requests and notices are issued to responsible persons to enforce compliance with the ELC Regulations. While other organisations do assist ESV in conducting its compliance role,[59] the costs to administer and enforce the ELC Regulations are primarily incurred by ESV.

ESV's current costs associated with the administration and enforcement of the ELC Regulations are outlined in the Table 4-2. These represent the costs to the Government in Option 1.

[59] For example, the CFA shares information on fires with ESV on a need to know basis.

Table 4-2 Costs to ESV to enforce the Regulations

Activity	Quantity FY 18/19	Cost per unit	Total cost p.a.
System audits	20	$28,912	$578,240
ELC inspections	16,000[60]	$41	$656,000
Warning letters & section 86 notices	3	$1853	$5,559
Administer noncompliance from system audits	155	$933	$144,615
Administer Code breaches from ELC inspections	2,150	$101	$217,150
TOTAL COST			**$1,601,564**

Source: ESV

In addition to the above, there has been one prosecution with a cost of $240,900, however this amount has not been included in Table 4-2 as it represents a once off (to date). This prosecution cost includes Line Clearance Assurance costs, but not other internal or external legal support costs. Given the small number of prosecutions, and the significant uncertainty of the outcome of these events, any revenues awarded upon successful prosecution are not considered in this analysis.

Base Case

Under minimal regulations, ESV will continue to bear the costs of administering the ES Act. However, without the Regulations, ESV's current enforcement role is likely to become more complex. The reason for this is because the ELC Regulations provide a framework that guides responsible persons on how to comply with Section 84 of the ES Act.

In the absence of clear instructions on how to comply with the ES Act (as currently provided in the ELC Regulations), it is possible that increased activity will be required by ESV to try and maintain a similar level of compliance with the ES Act. These activities include:

- Providing additional information, guidance and education because many responsible persons will be uncertain as to how they should comply with the ES Act. This will be particularly relevant with the passage of time as existing knowledge about the current ELC Regulations begins to erode.
- Undertaking more inspections to ensure responsible persons remain compliant in a world of increased uncertainty.

Therefore, under minimal regulations, it is likely that ESV's enforcement function will become more difficult and costly to carry out, relative to Option 1. While it is very difficult to quantify the extent of this increased Government activity under the Base Case, relative to Option 1, it does seem reasonable to conclude that these costs will exceed those under Option 1.

Option 2

In Option 2, the draft Regulations include a provision enabling EBs to prepare and submit management plans every five years, instead of annually (as per Option 1). This change will reduce

[60] The ESV line clearance inspection programme targets the inspection of 16,000 spans per year as an appropriate sample size. ESV may inspect more than this number depending on factors such as, emerging compliance issues, regulatory focus, etc.

the total amount of time that ESV spends reviewing management plans. Theoretically this should reduce the costs to ESV in Option 2, relative to Option 1. ESV however have advised that these resources would most likely be redirected towards other productive compliance and enforcement activities, with more time expected to be spent on responding to areas of non-compliance. As such it is likely that the Government costs in Option 2 would not be materially different from those in Option 1.

4.2.3 Community costs

For the purposes of this RIS, community costs are the uncompensated costs that the community incurs when responsible persons undertake activities to comply with the ELC Regulations.

Examples of community costs include:

- Costs of time spent consulting with Councils or EBs to understand why trees are being pruned or cut.
- Costs of anxiety and stress in regard to trees being cut in a way that doesn't match community values and expectations.
- Costs of disruptions to road traffic or public transport that is caused by tree maintenance activities e.g. cost of time delays.
- Costs of noise caused by the removal of tree branches (for example the use of noisy chainsaws)
- Costs of time spent disposing of debris left by responsible persons following line clearance maintenance activities[61].

Option 1

EBs and Councils have confirmed that they are regularly contacted by members of the community (following the release of public notifications) to explain why line clearance maintenance activities are scheduled for the area. Under the current ELC Regulations, responsible persons are able to refer to the framework for tree maintenance; because it is a legal and transparent framework, it assists in resolving such discussions and avoiding further disputes.

Stakeholder consultations with landowners suggested that the removal of debris is a cost that can be incurred by the community.

Base Case

Under the Base Case, it is reasonable to assume that communicating the need for tree maintenance activities to the public would be harder without the framework provided by the current ELC Regulations. As such, the costs to the community are likely to be higher in the Base Case relative to Option 1.

Option 2

In Option 2, the proposed changes to the Regulations are expected to result in a marginal decrease in the costs to the community, relative to Option 1. This is because in Option 2 the Regulations incorporate greater flexibility in the exceptions to minimum clearance distances; permitting small branches to grow under non-insulated low voltage lines. These exceptions are expected to reduce the volume of tree cutting required along these types of spans thus decreasing the noise and traffic disruptions to the community.

While not quantifiable, it is reasonable to assume that this change in the regulation would create a slight decrease in the costs borne by the community in Option 2, relative to Option 1.

[61] This is the role of responsible persons, however anecdotal evidence reported in consultations suggest that this does not always occur. As such, members of the community sometimes dispose of debris left by responsible persons.

4.2.4 MCA scoring: costs criteria

Table 4-3 shows the MCA scoring of costs of the Regulations under the Base Case, Option 1 and Option 2.

Table 4-3 MCA Criteria: costs

MCA Criteria	Base case	Option 1	Option 2
Costs	0	-2	-1

Since responsible person costs (and more specifically the line clearance costs incurred by responsible persons) are the single largest cost associated with the Regulations, these costs have a substantial influence on the results presented in Table 4-3. The following summarises responsible person, government and community costs.

Responsible person costs

Responsible person costs comprise of (i) tree cutting and removal costs, (ii) the costs to prepare management plans, and (iii) the costs of consultations, notifications and disputes. Tree cutting and removal (line clearance) costs are the most significant cost incurred by responsible persons.

Line clearance costs are the highest under Option 1, and the lowest in the Base Case. In the Base Case, Councils are expected to decrease tree cutting (relative to Option 1) as they seek to preserve the amenity value of trees. EBs are expected to engage in more aggressive cutting in the Base Case (relative to Option 1) to increase maintenance cycle times or reduce their cutting standards over time, thus reducing costs. Changes to the exceptions to minimum clearance distances in Option 2 will reduce costs to responsible persons in Option 2, relative to Option 1.

Government costs

The Government's costs to administer (and enforce) the ELC Regulations are primarily incurred by ESV. At present, ESV spends approximately $1.6 million per annum on this function. Since the cost reported by EBs to undertake tree clearance activities is estimated at $72.1 million per annum it is evident that line clearance costs will drive the costs reflected in Table 4-3.

Nonetheless, Government costs are expected to be higher in the Base Case, relative to Options 1 and 2. This reflects the absence of a regulatory framework, which makes ESV's role more difficult and time consuming.

Community costs

Community costs are higher under the Base Case, relative to Option 1. Without a legal framework to guide tree cutting and removal activities as part of line clearance more frequent disputes are expected to arise between responsible persons and members of the community. Meanwhile, changes to the exceptions to minimum clearance distances under Option 2 will reduce costs to the community, relative to Option 1.

Scores of 0 for the Base Case, -2 for Option 1 and -1 for Option 2 have been given.

4.3 Benefits

Summary of benefits analysis

Safety

There has been a significant decrease in the number of fires caused by interaction between trees and electricity assets since the introduction of the ELC Regulations. More recently there has been one fatality due to electrocution in the past four years. This suggests the ELC Regulations are effective in managing this risk.

Despite there being a range of factors that can influence the reduced incidence of fires and electrocutions, including improved practices and attitudes towards risk, and other frameworks and incentives to mitigate fires, Options 1 and 2 increase safety outcomes as opposed to the Base Case. This is ultimately because the ELC regulations hold responsible persons accountable for line clearance activities.

Supply reliability

When applying a conservative estimate of 47.5% effectiveness compared with if there were minimal regulations, the avoided VUE costs under Options 1 and 2 are estimated to be approximately $190.8 million (compared to an annual cost of $212 million currently) i.e. the cost of supply interruptions as measured by VUE would almost double if here were minimal regulations.

Options 1 and 2 are both considered to increase supply reliability compared to the Base Case because they hold responsible persons accountable for clearance activities in their declared areas, and provide a framework for EBs to consult with Councils regarding supply interruptions on their distribution lines. In the absence of this framework, the risk of non-compliance would no longer exist, and therefore Councils would face little incentive to clear for the purpose of reducing supply interruptions.

Amenity and environmental benefits

The minimum clearance requirements in the ELC Regulations ensure, as far as practicable, that tree clearance is undertaken in a competent manner which preserves the health of the tree as well as minimising any harm to its aesthetic values.

Option 2 is considered to present the greatest benefit in terms of amenity outcomes. This is because it provides a regulatory framework with which to manage tree clearance activities, and builds on the current regulations in terms of acknowledgement of the need to balance safety and amenity outcomes.

The following section discusses the major benefits associated with the ELC Regulations as they relate to the three benefit criteria outlined in the MCA framework in section 4.1.1.

4.3.1 Safety

4.3.1.1 Reduced fire incidence

As has been discussed in Chapter 2, the primary concern of the ELC Regulations, and a core reason for their initial establishment, is to reduce the incidence of fires related to tree contact with powerlines.

There is clear evidence that, since the introduction of the ELC Regulations (including the Code), there has been a decline in the number, and therefore the cost, of fires caused by tree contact with powerlines. The 1996 RIS outlined that the costs associated with fires ignited due to tree contact changed from an average of $113 million per annum prior to the establishment of the Regulations, to around $0.14 million per annum, based on insurance costs (in 2019 dollars).

Insurance data offers a mechanism by which to compare the costs of fires, using readily available information. However, estimates using insurance data do not capture the broader range of costs associated with a bushfire (e.g. environment damage, health implications and indirect economic or tourism losses). These estimates also under-estimate the value of the total cost due to both the incidence of losses by uninsured persons and under-insured persons. The 2009 Victorian Bushfire Royal Commission found a significantly higher rate of non-insurance among residential properties destroyed by the Black Saturday bushfires, estimating this at 13% of the total. It was reported that insurance covered only 43% of the damage. Additionally, ASIC found that under-insurance ranged from 27% to 81% following the 2003 Canberra bushfires.

Based on similar findings, the 2015 RIS derived an estimate of the true cost of fires caused by contact with powerlines and trees to be 50% higher than the reported insurance pay out figures. In the absence of any new evidence to suggest otherwise, the same figure is used for this RIS. Applying this indicative 50% uplift to the above figures suggests that the average annual cost of such fires in the period before the adoption of the ELC Regulations was equivalent to around ($113m x 1.5) = $169.5 million per annum. By contrast, the average annual cost in the years immediately following implementation was ($0.14m x 1.5) = $0.21 million.[62]

This assessment suggests that the introduction of the ELC Regulations was effective in reducing the number and associated cost of fires relating to tree contact with powerlines. However, given the episodic nature of the problem, and the number of factors that can influence fire ignition and damage, including improved practices and attitudes towards risk, and other frameworks and incentives to mitigate fires, the impact is subject to uncertainty.

The most recent data related to fires resulting from contact between powerlines and trees, as outlined in Chapter 2, suggests that the ELC regulations continue to be effective in minimising the number of fires due to this cause.

Recent ESV data shows that:

- There was an average of 44 fires per year due to contact between trees and powerlines between 2015-16 and 2018-19.
- If the average long term "cost per fire" estimate of $1 million adopted by the AER in the context of the 2011-15 Electricity Distribution Pricing Review is adopted, the total costs of these fires over the course of the year would be equivalent to around $44 million.
- However recent incident data from ESV's online incident reporting system OSIRIS reporting shows that only 6% of incidents were due to contact by trees within the clearance space. This suggests that the average number of fires per year due to this cause is 2.7 and the value of the "residual risks" associated with fire starts due to failure to maintain adequate clearance distances between trees and power lines is around $2.7 million per annum on average.

While the estimated cost per fire of $1 million should be seen as indicative, $2.7 million per annum is nonetheless a significant reduction in costs from previous levels prior to the ELC Regulations being introduced.

4.3.1.2 Reduced loss of life and injury

In addition to avoidance of property, environmental, and other damage caused by fires, the ELC Regulations can also be understood in terms of lives saved and injuries avoided.

As discussed in Chapter 2, over the past four years, the following injuries and fatalities have occurred as a result of tree-related contact:

- One electrocution fatality
- One injury requiring medical attention
- An average of three injuries per year related to minor shock.

[62] 2015 RIS

These statistics suggest that the current ELC Regulations have been effective in reducing the risks of fatalities and injuries due to tree contact. Historical data on fatalities and injuries is not available, making it difficult to directly compare current outcomes to the period prior to the ELC Regulations being introduced.

One comparison that can however be made is the seven fatalities due to the fires caused by tree contact with powerlines on Ash Wednesday. Since that day in 1983, there have been no known fire-related fatalities caused by contact between trees and powerlines. It is therefore reasonable to assume that the ELC Regulations have had some effect on reducing the number of fatalities and injuries due to electrocution.

It is also worth recalling that tree-related contact is broader than just incidents related to 'grow-ins'. If the 6% share (see section 4.3.1.1) were applied to these injury numbers, the numbers would be close to zero. There is therefore limited value in attempting to estimate the benefit associated with reduced loss of life and injury.

By ensuring ongoing compliance and maintaining the minimum clearance space between powerlines and trees, there is a reduction in risk of electrocution of line clearance workers. It becomes more dangerous to clear trees once they are growing through powerlines. It also becomes more costly because lines may have to be removed from power supply to cut safely.

4.3.1.3 Options assessment

Base Case

Consultation with both EBs and Councils highlighted that maintaining safety was the primary motivation for tree clearance activities. Even in the absence of regulations for clearance requirements, both parties would continue to maintain a clear distance between trees and powerlines for this purpose. It is unlikely that there would be a complete reversion to historical practices if the ELC Regulations were significantly reduced. This is because:

- Practices and attitudes towards risk have developed over time
- Business practices have developed significantly since the introduction of the Regulations (for example Council and EBs produce risk management policies and practices)
- There are other bushfire mitigation requirements in place (e.g. f-factor scheme)
- The consequences of tree growth are now better understood than prior to the introduction of the ELC Regulations.

However, as discussed in Section 4.2.1, it is difficult to predict whether EBs would increase or decrease their clearance activity should the ELC Regulations be replaced with minimal regulations, and the implications of these actions on safety. Some EBs might cut more aggressively, but less frequently, which could reduce the risk of fires and electrocutions e.g. due to clearing beyond current minimum clearance requirements. Particularly within HBRAs, where the EBs have the greatest coverage responsibilities and where the risk of fire is greater, a greater level of clearance is likely to occur. On the other hand, there may be less clearance activity in an urban environment due to cost incentives or the absence of a framework to guide decision-making, or because EB processes change over time (e.g. due to the passage of time since the Black Saturday fires, or change in ownership or management). If there was no structured framework for line clearance, it would also be more difficult for ESV to monitor and enforce the requirements under the ES Act to keep trees clear of electric lines, thus increasing the chance of adverse safety outcomes.

Councils face more pressure than EBs to balance safety with community expectations of tree coverage and amenity. A number of Council representatives consulted stated that the ELC Regulations are overly conservative in managing safety, as a result of more stringent requirements introduced following the Black Saturday fires. Under the Base Case, Councils are likely to adopt a 'selective pruning model' assessing fire safety against other factors such as amenity and tree value, rather than compliance to regulated minimum line clearances standards. Whilst the potential difference in clearance activity is difficult to measure, it is unlikely that this would have a significant impact on the number of fires, as Councils typically do not have responsibility for

HBRAs. It may though increase the chance of electrocutions, particularly in urban areas, where there is more human activity in the vicinity of powerlines.

On balance, taking the above factors into account, and the evidence that the ELC Regulations have contributed to an improvement in bushfire safety since they were introduced, we consider there would likely be a reduction in safety as a result of an expected decline in tree clearance activities and practices over time.

Option 1

Generally, stakeholders consulted consider the current ELC Regulations are effective in managing the risk of fire due to contact between trees and powerlines.

Since the 2015 RIS, the average number of fires per year caused by contact with trees within the clearance space has slightly decreased. This number is significantly less than prior to the introduction of ELC Regulations, as discussed above. However, it is worth noting that the data does not necessarily show the complete picture i.e. it does not capture the risk or the likely increased frequency of a catastrophic event in the face of the impacts of climate change, such as heat waves, or increasing development in peri-urban areas. Similarly, with one fatality due to electrocution in the past four years, this could suggest the ELC Regulations are effective in managing this risk; however, it is not possible to conclude this with certainty because we do not have data to indicate the number of electrocutions if there were minimal regulations.

Option 2

Based on advice provided by ESV, the proposed changes to the ELC Regulations are considered unlikely to have a substantial impact on the safety outcomes related to preventing contact between trees and powerlines, as compared to the current arrangements. The changes relating to exceptions to minimum clearance distances, reducing the need for clearing in some cases, will only apply to LBRA, and have been assessed by ESV to not cause an increased risk of adverse safety outcomes.

Reflecting the discussion above, and the difficulty in estimating the change in tree clearance activity of EBs under the Base Case, Options 1 and 2 are both considered to increase safety compared to the Base Case. MCA scoring for safety is provided in the following table.

Table 4-4 MCA Criteria: safety

MCA Criteria	Base case	Option 1	Option 2
Increased safety	0	+4	+4

4.3.2 Reliability of the electricity supply network

Further benefits can be attributed to the ELC Regulations through reduced power outages caused by contact between trees and powerlines. Whilst stakeholders consulted did note that the number of power outages over recent years has not been above expected levels, this does remain the most likely consequence of tree contact with powerlines.

As noted in Chapter 2, on average between 2014 and 2018, there have been 244,315 hours of grow-in related outages, compared with 453,336 hours in 2010-13. The VUE for 2014-2018 is estimated to be $212 million per annum.

In order to consider the benefits of the ELC Regulations, it is necessary to consider the likely effectiveness of the ELC Regulations in reducing the frequency of these outages. As discussed in detail in section 2.2.2.3, it is estimated that the cost of supply interruptions due to grow-ins would nearly double to $403 million if there were no regulations.

This is a smaller estimate than in the 2015 RIS, reflecting a more conservative assumption about the decline in incidence of outages due to grow-ins, as well as the continued decline in outages more broadly and also a lower assumed share of outages due to grow-ins (6% vs 8.2%).

4.3.2.1 Options assessment

Base Case

Whilst the incentives are not as great, a similar logic can be applied to reliability outcomes under the Base Case, as was applied to safety outcomes. The ELC Regulations are not the only driver for cutting trees for the purposes of preventing supply interruptions. EBs are faced with s-factor penalties if supply targets are not met, and bear the cost of supply interruptions even within council declared areas. Therefore, if the current regulations were to be replaced with minimal guidance for line clearance, it is unlikely that EBs would significantly decrease their trees clearance. However they would have more flexibility regarding clearance distances, and therefore may reduce clearance frequency, in order to minimise costs where possible.

In urban areas, where Councils tend to have responsibility for clearance of trees on public land, the impact of supply interruptions are greater, due to larger populations and more intensive electricity use. However Councils have less incentive than EBs to cut trees for the purpose of reducing supply interruptions, as they are not responsible for electricity supply. When an interruption occurs, EBs will be faced with both the financial costs and complaints from customers. Councils are more concerned with meeting the community's expectations regarding tree coverage and amenity, and therefore in a largely unregulated environment are more likely to reduce line clearance activity in their declared areas. It is therefore reasonable to assume that, under a scenario of minimal regulations, there would be an increase in supply interruptions, particularly in urban areas for which Councils are responsible for.

Option 1

Stakeholders acknowledged that, whilst interruptions are the most commonly reported incident caused by tree contact with powerlines, the current regulations are effective in maintaining an acceptable level of supply reliability. Since the 2015 RIS, the average number of supply interruptions caused by trees within the clearance space has decreased, indicating that current practices are increasingly effective in managing this risk. Whilst there is no data to indicate the number of supply interruptions due to tree related causes in the period prior to the adoption of the Code, a conservative estimate of 47.5% effectiveness compared with an unregulated environment has been applied. Using this assumption, the avoided VUE costs under Option 1 are considered to be approximately $190.8 million ($408.2 million - $212 million).

Option 2

The proposed changes to the ELC Regulations are unlikely to have an impact on the safety outcomes related to preventing contact between trees and powerlines, as compared to the current arrangements. The changes relating to exceptions to minimum clearance distances that apply to LBRA will not impact on supply reliability as separation is still to be maintained, and the increased management responsibility is designed to better monitor risk.

Reflecting the discussion above, Options 1 and 2 are both considered to increase supply reliability compared to the Base Case because they hold Councils accountable for clearance activities in their declared areas, and provide a framework for EBs to consult with Councils regarding supply interruptions on their distribution lines. In the absence of this framework, the risk of non-compliance would no longer exist, and therefore Councils would face little incentive to clear for the purpose of reducing supply interruptions.

Table 4-5 shows the MCA scores given for reliability.

Table 4-5 MCA Criteria: Reliability

MCA Criteria	Base case	Option 1	Option 2

Reliability	0	+5	+5

4.3.3 Amenity and environmental benefits

Whilst safety is the main objective of the ELC Regulations, the Regulations do aim to balance this with amenity and environmental considerations.

Clause 9 of the Code requires a responsible person to cut trees, as far as practicable, in accordance with Australian Standard for the Pruning of Amenity Trees (AS 4373). AS 4373 requires that whilst trees often require pruning to maintain clearance from utility services, they are also pruned to improve the amenity of sites to enable successful cohabitation between trees and people. AS 4373 states:

> *Assessment of trees and specification of their pruning should be carried out by a suitably qualified arborist. Pruning should be carried out by arborists or tree workers who are familiar with the principles, techniques and hazards of this work.*

The minimum clearance requirements in the ELC Regulations ensure, as far as practicable, that tree clearance is undertaken in a competent manner which preserves the health of the tree as well as minimising any harm to its aesthetic values. This consideration is highlighted particularly by Councils which argue that, in the absence of specific regulations for tree pruning, clearance activity would be excessive and unsightly, and beyond what is required to achieve the safety and supply reliability outcomes.

The Nature Conservancy and Resilient Melbourne 2019 *Living Melbourne* report discusses the ecosystem services and benefits of an urban forest in Melbourne. The report lists the following benefits of maintaining an urban ecosystem:

- People prefer vegetated urban areas to non-vegetated urban landscapes, and their choices bring about the resultant health and well-being values.
  - Physical health benefits by encouraging physical activity, thus lowering obesity levels and reducing the incidence of diseases such as heart disease
  - Mental health and well-being by reducing stress.
- Social cohesion by providing a welcoming shared space, increasing community and neighbourhood connection, and reducing levels of fear and crime.
- Biodiversity and native species conservation through benefits for species richness, and habitat for native and threatened species.
- Ecosystem services via cooling and improved air quality. Trees generally, and large trees in particular, reduce urban heat both at street and neighbourhood levels. Urban trees, and especially trees, capture and filter air pollutants.

4.3.3.1 Value of trees

Reducing the required clearance distances will also contribute to reductions in the aesthetic costs imposed by tree clearance activity. Indicative estimates of the potential benefits of this change can be developed by assessing the current amenity value of trees and inferring a likely proportionate gain in this value.

The City of Melbourne has established a formula for the amenity costs of tree valuations for the purposes of reimbursing property owners or representatives for public tree removal in relation to a development. The Amenity Value Formula used by the City of Melbourne was derived from the Maurer-Hoffman Formula.

The Amenity Value Formula includes a number of factors such as the basic value, species, aesthetics, locality, and condition. The basic monetary value of a tree is determined by matching the trunk diameter at breast height (DBH) with its corresponding base value, devised by the American Council of Tree and Landscape Appraisers and the International Society of Arboriculture.

This ranges from $342 for a tree with a DBH of 6cm, to $199,539 for a DBH of 145cm (in 2019 dollars). Based on an estimated average urban tree size across Victoria of DBH of 20cm to 30cm[63], we have used a DBH value of 25cm. The City of Melbourne assigns a value of $5,978 to trees of this size. It is noted that this is significantly higher than the value used in the 2015 RIS which estimated the annual value of an urban street tree to be $234, based on the Killicoat et al. (2002) assessment.

RIN reporting from EBs indicate that they are responsible for clearance activities in respect of approximately 518,000 trees in LBRA. Given the definition of LBRA contained in the legislation, this number can be taken as broadly representing the number of trees located near power lines in the urban context across Victoria that are managed by EBs. In addition, among the Councils with tree management responsibilities that were able to identify or estimate the total number of trees near power lines that they managed, the average was 12,300 trees. If this average is multiplied by 67 (i.e. the number of Councils who undertake this role, this implies that around (12,300 x 67) = 824,100 urban trees are being managed by Councils to prevent their contact with powerlines. This implies that the total number of street trees in this category is equal to (518,000 + 824,100) = 1.3 million.

Because this estimated number solely comprises urban trees, the above valuation of a street tree can be regarded as broadly suitable for the purposes of calculating the amenity value of these trees and, by implication, the reductions in amenity value that occur due to the need to prune these trees. Using the value of $5,978 indicated above, the total value of urban street trees subject to the clearance requirements of the regulations and Code (i.e. option 1) is in the order of $7.77 billion. It is not possible to reliably estimate the impact on trees that changes in tree clearance activities will have under the Base Case and Option 2. In the absence of such information we consider it reasonable to provide an indicator of impacts on tree amenity by assuming a one-to-one relationship between reducing tree pruning and increasing value of trees. Trees might be pruned under the Base Case by, say, 10% or 20% more[64] (on average across all urban trees). If clearance activities were reduced by 10%, and assuming a linear relationship between the extent of pruning and the value of the tree, the value of trees would be $8.55 billion (a $777.1 million increase in tree value).[65]

Given uncertainty around this value and that our estimate is based on informed judgement rather than actual data, it is useful to understand the sensitivities of this result. A DBH of 15cm gives a tree value of $2,181 and an increased amenity value of $283.5 million when applying a 10% reduction in clearance, while a tree DBH of 100 cm gives a tree value of $96,951, and an increased amenity value of $12.6 billion. This illustrates the high level of sensitivity of this analysis to assumptions about tree value.

4.3.3.2 Environmental sustainability

In a report on the value of urban trees during climate change (Moore 2010), the benefits of tree cover on environmental sustainability are discussed. The loss of tree cover can significantly reduce the environmental benefits provided by trees, and places future environmental sustainability at risk.

There are a number of benefits provided by tree cover, which contribute to environmental sustainability (Moore 2010; Killicoat, Puzio and Stringer 2002):

- Shade – the shade provided by trees can lower temperatures by up to 8 degrees. In the Australian context, an associated benefit of this is the reduction in the use of air conditioners, which saves on electricity and reduces carbon emissions.

[63] Based on ESV's assessment of City of Melbourne tree population data and judgement about tree size across Victoria more broadly.
[64] This is a hypothetical indicator to give an insight into the sensitivity of tree value to clearance activities. This assumes a stronger effect of EBs clearance activity.
[65] This assumes a direct linear relationship between clearance activities and tree value i.e. increase in clearance activity by 10% decreases tree value by 10%. This may not actually hold, but is simply used as a best possible estimate in the absence of better evidence.

- Removal of air pollutants - trees remove gaseous air pollution and some airborne particles. Some particles can be absorbed into the tree and others returned to the atmosphere. Mature trees can sequester atmospheric carbon dioxide for very long periods of time.
- Land stabilisation – trees on a property or area of land can prevent 'landslip'. In addition to the environmental benefits of reducing erosion, this also has benefits for building infrastructure.
- Wind speed – tree canopy can lead to reductions in wind speed of up to 10 per cent, which can cause small increases in cooling load.

4.3.3.3 Options assessment

Base Case

In an environment where there is minimal regulation or guidance on the appropriate practices for tree cutting as part of line clearance, it is anticipated that there would be a significant reduction in tree canopy cover and amenity value. Consultation with EBs suggests that they believe the safety risks far outweigh the benefits of maintaining the aesthetic appearance of trees, and therefore without any obligation under the ELC Regulations to maintain amenity, they would undertake clearance for the sole purpose of increasing safety. This would ensure they meet their obligations under the ESA Act to keep "the whole or any part of a tree clear of an electric line within its distribution area", which does not specify obligations regarding amenity. Under minimal regulations, EBs would not face the current clearance-related barriers such as the requirement to employ a suitably qualified arborist for certain practices, restrictions for certain tree types, or the requirement to consult with affected parties. This perspective was shared by a Council representative and other responsible persons consulted in preparing the RIS, who stated that in an unregulated environment, they believe EBs would not maintain amenity standards for tree pruning, which would damage amenity and environmental outcomes.

In urban declared areas where Councils have responsibility for line clearance, it is likely that amenity outcomes would improve in the context of minimal regulations. This is because Councils would undertake less clearance in order to maintain a greater level of tree coverage in their declared areas, which may not be possible under the current regulations. As noted in section 4.3.1, Councils would be more likely to undertake clearance based on tree by tree, street by street assessments with more flexibility to take into account amenity and tree value than is currently allowed. This may come at the cost of reliability outcomes in some cases, as discussed above.

Overall it is expected that the volume of vegetation cleared in urban areas would be higher in the Base Case than the current Regulations (Option 1). This is because a lack of clear guidelines is expected to lead to more clearance by EBs, outweighing the lower level of clearance by Councils.

Option 1

Some stakeholders expressed concern that the current regulations have a lack of emphasis on maintaining the amenity value of trees. In particular Councils believe that the changes to minimum clearance distances following the Black Saturday fires led to the ELC Regulations becoming unnecessarily prescriptive, particularly in urban areas where the risk of bushfires is low. Councils and landowner representatives believe that currently there is too much flexibility for maintaining amenity standards, and this lack of any clear penalty means that the incentive to adhere to AS 4373 is low. For example, one stakeholder pointed to the wording in the current ELC regulations which states that a person cutting a tree must "as far as practicable" cut in accordance with AS 4373. Whilst EBs are required to receive approval from ESV if they are unable to comply with AS 4373, there is limited enforceability of the standards. Another stakeholder suggested that the current ELC regulations are not grounded in science to prove that safety and network reliability is enhanced through extensive clearance, particularly in urban areas.

Overall, it is expected that Option 1 will lead to larger benefits in amenity and tree health than the Base Case. Option 1 might reduce Councils ability to weigh amenity and tree health considerations more heavily in their clearance activities (i.e. requiring Councils to adhere to minimum clearance requirements), but will require EBs to employ a suitably qualified arborist, impose restrictions for certain tree types, consult with affected parties, and apply amenity standards. The EB effect (increase amenity and tree health) is expected to be greater than the Councils effect (decrease amenity and tree health) under Option 1, because Councils will still strongly take into account

amenity and tree health under Option 1 even if less than under the Base Case. EBs have much less incentive to take into account amenity and tree health under the Base Case, thus Option 1 will have a more significant impact on their clearance activities.

Option 2

The proposed changes to the ELC Regulations include a selection of updates which are aimed at improving the amenity outcomes of tree cutting under powerlines. This includes:

- Updating the objectives of the regulations to include reference to the standards and practices for improving the health of trees in accordance with the Code, and to minimise the cutting of indigenous trees. This was included in response to ELCCC member requests to include recognition of balancing fire safety, reliability of electricity supply, with the conservation of the environment and amenity.
- Exceptions to certain aspects of minimum clearance distances to limit the cutting requirements in some circumstances where the safety risks are low. This will reduce unnecessary over pruning in these instances, where there is no associated safety benefit.
- Changing the words 'specified significant trees' to 'indigenous or significant trees'. The regulation aims to provide clarity about and enhance amenity of these trees by minimising their cutting or removal.

Whilst the above points are likely to have a positive impact on amenity outcomes, the potential impact of amending the required arborist qualification from a Certificate 4 in Horticulture to a Certificate 3 in Arboriculture is less certain. Stakeholders had varied views on whether this would have any significant impact on the current quality of tree cutting, with some believing it would lead to lower standards, whereas others suggesting they would not change their current practices due to community expectations and safety outcomes. Overall, the impact is likely to be very minor as the requirement for a suitably qualified arborist is only necessary for specific situations.

Reflecting the discussion above, Option 2 is considered to present the greatest benefit in terms of amenity outcomes. This is because it provides a regulatory framework with which to manage tree clearance activities, and builds on the current regulations in terms of acknowledgement of the need to balance safety and amenity outcomes.

Table 4-6 shows MCA scores for amenity and environmental benefits.

Table 4-6 MCA Criteria: Amenity and environmental benefits

MCA Criteria	Base case	Option 1	Option 2
Protection of amenity and tree value/ environment	0	+3	+5

4.4 Summary of multi criteria analysis results

Scores for each criteria are summarised in Table 4-7. Options 1 and 2 are both preferred to the Base Case of minimal regulations. This reflects that:

- Option 1 and 2 are expected to increase safety (reduced fires, electrocutions and supply interruptions) as Councils are expected to undertake a greater level of clearance than they would with minimal regulations. Whilst it is difficult to estimate whether EBs would undertake more or less clearance, historical factors show that the presence of regulations led to improved safety outcomes.
- Option 1 and 2 are expected to provide an increase in amenity and tree health compared to the Base Case because of the requirements on EBs e.g. requirement to employ suitably qualified arborist, consult with affected parties, and comply with AS 4373.

This increase in benefits under Options 1 and 2 outweighs the increase in costs under these options as a result of having to prepare a management plan, undertake consultation, and meet tree clearance requirements.

Option 2 has the highest score and is preferred to Option 1 because it implements targeted changes to improve the effectiveness and efficiency of the current ELC Regulations, and better balances safety and amenity outcomes, by:

- Updating the objectives of the Regulations to include improving the health of trees in accordance with the Code.
- Exceptions to certain aspects of minimum clearance distances to limit the cutting requirements in some circumstances where the safety risks are low. This will reduce unnecessary over pruning in these instances, where there is no associated safety benefit.
- Changing the words 'specified significant tress' to 'indigenous or significant trees' to clarify and minimise their cutting or removal.

However, as discussed in the Costs and Benefits sections, there is some subjectivity and limited variations between the options in relation to some scores, for example potential impacts on EBs' clearance activities under the Base Case versus Options 1 and 2. Option 2 is expected to have the same safety and reliability benefits as the current Regulations (Option 1), while it is expected to have strictly the same or better amenity and tree value benefits. At the same time, Option 2 is expected to have the same or lower costs as the current Regulations (Option 1). Therefore, even if the magnitude of impacts were higher or lower, Option 2 would remain the preferred option.

Table 4-7 MCA results

Criteria	Base case score	Option 1 score	Option 2 score	Weighting
Costs	0	-2[66]	-1	50%
Safety	0	+4	+4	25%
Reliability of the electricity supply network	0	+5	+5	15%
Protection of amenity and tree value/ environment	0	+3	+5	10%
Weighted score	**0**	**+1.1**	**+1.8**	

4.5 Preferred option

The preferred option is Option 2: Re-make the current Regulations as in Option 1, but with targeted changes to improve effectiveness and efficiency of Regulations. Option 2 is described in detail in Table 3.1.

[66] Scoring reflects relativity of the costs across stakeholders. The estimated gross costs of the proposed Regulations are approximately $85m per year and include $72m in tree clearance costs for Electricity Businesses, $11m in tree clearance costs for Councils and $1.6m in regulatory costs for ESV.

4.5.1 Competition and small business

The preferred option is expected to have very small, in fact almost negligible impacts on competition and small business.

In relation to competition, there might be a small barrier to entry relating to requiring an arborist to have Certificate III qualification i.e. preventing any person from entering the market to provide tree services or work as an employee for Councils or EBs. However, feedback provided by EBs and Councils indicate some level of qualification would be required regardless of requirements prescribed in the ELC Regulations. The risk of electrocution (particularly in a Workplace Health and Safety context) and supply interruptions (e.g. EBs want workers trained sufficiently to not cause supply interruptions when clearing trees) provide incentives for responsible persons to maintain qualification standards regardless of what is required in the ELC Regulations (although noting different views on suitability of specific standards). The Government is also prepared to impose restrictions on qualification standards to reduce fire risk. The ELC Regulations are not expected to impose disproportionate impacts on any small business versus other industry participants. The Regulations mainly impact compliance costs of EBs, which are very large, and Councils.

5 Implementation plan

Implementation of the preferred options is not expected to differ substantially from under the application of the current Regulations.

One notable difference in ESV's current practices which has changed since the introduction of the current Regulations is greater effort directed at compliance and enforcement activities. As part of its building regulatory capability and responding to the *Review of Victoria's Electricity and Gas Safety Network* chaired by Dr Paul Grimes PSM, ESV has significantly increased the number of staff auditing and inspecting the vegetation management activities of the EBs. This has resulted in ESV identifying instances of significant and ongoing non-compliance and failure to clear trees that presented a clear risk of starting a bushfire (see also discussion of compliance in section 2.2.3). ESV is continuing to strengthen its audit and inspection activities.

ESV shall review current guidance, and re-issue updated guidance to responsible persons to enable understanding and therefore compliance with the proposed Regulations.

It is intended that the proposed Regulations shall come into effect June 2020 after plans have been prepared for the 1 January 2020 financial year (by 31 March 2020). ESV shall liaise with relevant responsible persons to ensure that proposed plans enable compliance with the proposed Regulations. ESV will also monitor for advances in automation or other technology which may assist in the monitoring of line clearance.

6 Evaluation strategy

Evaluating the effectiveness of the Regulations in the past has proven to be inherently difficult, for a few reasons. There are other factors external to the Regulations and the legislative environment which can have a substantial impact on the incidence and scale of fires and electricity supply interruptions due to contact between trees and powerlines, notably weather events and climate conditions. There are also cases where incidents may occur from contact with a compliant tree. The impact of these factors is likely to be greater than the impact of any specific changes introduced via different editions of the Regulations.

There is an absence of data relevant to the implication of not applying the current minimum clearance spaces under the regime, however the risk exposure due to not having the regime in place is considered extreme or potentially catastrophic.

Despite this, ESV will review its data collection practices for improvements in the following areas:

- Collection of 'incident' data according to whether the tree contact was a blow-in or grow-in, and categorisation of incidents based on 'type' (i.e. fire, electrocution, supply interruption), 'location' (e.g. declared area), and 'responsible party' (e.g. EB, Council, or ORP). It is important to note that there are challenges in terms of determining whether a fire is due to a blow-in or grow-in. These include physical limitations. For example it is normally possible for first responders to determine whether a fire was caused by tree contact, however it is difficult to determine whether a fire was caused by a blow in or a grow in. Recorded causes of fire incidents, whether a blow or grow in, are often arrived at based on an informed guess by the CFA or EBs. It is noted that there is potential for data improvement in this area due to technology improvements such as laser or drone technology.
- Collection of data by ESV related to compliance and non-compliance with the Regulations, including the number of inspections carried out, findings and corrective actions.
- As ESV strengthens its data and analytics functions it will review its own data and the optimal frequency of data collection and review by the EBs in particular, due to the scale and risks associated with their line clearance responsibilities.

It is noted that work is already being undertaken by ESV to increase its data analytics capability, coupled with improving data capture, analytics tools and cooperation with other regulators and agencies, which will provide greater insights into how community harm and risk can be further reduced over coming years.[67] This is part of ESV's implementation of recommendations of the *Review of Victoria's Electricity and Gas Safety Network.*

Additionally, the ELCCC meetings will continue to be the forum through which ESV will consult with responsible persons on the effectiveness of the Regulations. This advisory group model, which includes representatives for key responsible persons, is a means of seeking feedback on specific issues associated with the implementation and practical adherence with the Regulations, and will assist with the development of any future changes.

ESV will, in conducting a future evaluation of the proposed Code of Practice for Electric Line Clearance, ensure that this data is analysed and provided to the ELCCC to assist in its deliberations. As part of this, ESV shall also make compliance and enforcement data available. ESV will also continue to consult with electricity distributors and other responsible persons on key questions of cost and effectiveness.

[67] ESV 2017-18 Annual Report p.9.

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Appendix A: 2015 Regulations Summary

Clause no	Requirement	Who	Key details
Part 2 regulation 9(2+3)	Before 31 March in each year, a responsible person must ensure that a management plan relating to compliance with the Code for the next financial year is prepared.	Responsible person … can include an electricity company (part 2 regulation 10(2)	20 penalty units for non-compliance Plan must include the following the name, position, address and telephone number of the following stakeholders: • Responsible person • Individual who was responsible for preparing the plan • Persons responsible for carrying out the management plan • Person who can be contacted in an emergency that requires clearance of a tree from an electric line The plan must include the objectives of the plan, the land to which is applies, the management procedures that the responsible person is required to adopt to ensure compliance with the Code amongst other things (see Part 2 regulation 9((3))
Part 2 regulation 10(3)	The responsible person must provide a copy of the management plan to Energy Safe Victoria on request within 14 days or such longer period as specified by Energy Safe Victoria.	Responsible person	Part 2 regulation 10(4) says that if requested to do so by Energy Safe Victoria, the responsible person must provide further information or material in respect of the management plan within 14 days (or within period specified) to Energy Safe Victoria.
Part 2 regulation 10(5)	The responsible person must amend the management plan if instructed to do so by Energy Safe Victoria	Responsible person	Part 2 regulation 10(6) says that the responsible person must not contravene a requirement of the management plan if the management plan is approved by Energy Safe Victoria
Part 2 regulation 10(7)	The responsible person must ensure that a copy of the management plan is published	Responsible person	The plan must be published on the responsible person's Internet site and is available for inspection at the responsible person's principal office in the State during normal business hours.

Clause no	Requirement	Who	Key details
Part 2 regulation 11(1&2)	Energy Safe Victoria may exempt a responsible person from any of the requirements of these Regulations (assumed to be Part 2 regulation 9&10)	ESV & except responsible person	Exception is subject to any conditions specified by Energy Safe Victoria. If you are a responsible person you must ensure that a copy of the exemption is published on your website and is available for inspection at your principal office in the State during normal business hours.
Schedule 1 Part 2 Division 1 regulation 3(1)	The responsible person must keep minimum clearance space clear of trees	Responsible person	A responsible person must ensure that no part of a tree (for which the person has clearance responsibilities) is within the minimum clearance space for a span of an electric line. The responsible person must not cut a tree further than 1 metre from the clearance space for a span of an electric line – Schedule 1 Part 2 Division 1 regulation 13(2) **There are 3 exceptions to this see next three lines of table**
Schedule 1 Part 2 Division 1 regulation 3(1)	The responsible person must keep minimum clearance space clear of trees	Responsible person	**(Schedule 1 Part 2 Division 1 regulation 4 Exception:** the responsible person is not responsible if all of the following circumstances arise: • The electric line is an insulated cable with a low electric voltage line • The branch is wider than 130mm at the point at which it enters the minimum clearance space • The branch is more than 300mm from the electric line • Within the last twelve months a suitably qualified arborist has inspected the tree, they advised that the branch does not have any visible structural defect, the responsible person had done an assessment of the risks posed by the branch and had implemented measures to effectively mitigate the identified risks. If a responsible person leaves a tree (subject to the abovementioned exception) within the minimum clearance space then they are responsible for keeping certain records for 5 years.
Schedule 1 Part 2 Division 1 regulation 3(1)	The responsible person must keep minimum clearance space clear of trees	Responsible person	**Schedule 1 Part 2 Division 1 regulation 5 exception** the responsible person is not responsible if all of the following circumstances arise: • The electric line is an insulated cable with a low electric voltage line • The branch is less than 10 millimetres wide at the point at which it enters the minimum clearance space • The branch has been removed from the minimum clearance space within the last twelve months.
Schedule 1 Part 2 Division 1 regulation 3(1)	The responsible person must keep minimum clearance space clear of trees	Responsible person	**Schedule 1 Part 2 Division 1 regulation 6 exception** the responsible person is not responsible if all of the following circumstances arise: • The electric line is an insulated cable with a low electric voltage line • It is located in located in a low bushfire risk area • The branch that comes within the minimum clearance space around the middle two thirds of the

Clause no	Requirement	Who	Key details
			span, the span is fitted with— (a) a one cable spreader if the span is less than 45 meters or (b) 2 cable spreaders if the span exceeds 45m • The branch is more than 130mm wide at the point at which it enters the minimum clearance space • The branch is no more than 500 millimetres inside the minimum clearance space • Within the last twelve months a suitably qualified arborist has inspected the tree, they advised that the branch does not have any visible structural defect, the responsible person had done an assessment of the risks posed by the branch and had implemented measures to effectively mitigate the identified risks If a responsible person leaves a tree (subject to the abovementioned exception) within the minimum clearance space then they are responsible for keeping certain records for 5 years.
Schedule 1 Part 2 Division 1 regulation 7(2)	Owner or operator of transmission line must manage trees around minimum clearance space	Owner or operator of transmission line	A responsible person who owns or operates a transmission line must (a) manage trees below the transmission line to mitigate, as far as practicable, the fire risks associated with the fuel load below the transmission line; and (b) manage trees adjacent to the transmission line to avoid, as far as practicable, a tree entering the minimum clearance space around that line if the tree falls.
Schedule 1 Part 2 Division 1 regulation 8(2) & 9	Responsible person may cut or remove hazard tree	Responsible person	May cut or remove a tree for which the person has clearance responsibilities if a suitably qualified arborist has assessed the tree having regard to foreseeable local conditions and has advised that the tree (or part thereof) is likely to fall onto (or come into contact with) an electric line. If the responsible person is permitted to cut down the tree, they should (as far as practicable) cut the tree in accordance with AS 4373.
Schedule 1 Part 2 Division 1 regulation 10	Responsible person may cut or remove hazard tree BUT cutting or removal of specified trees must be minimised	Responsible person	If the responsible person is permitted to cut down (regulation 8) the tree, the tree must not (as far as practicable) be cut more than is necessary to either ensure compliance with Division 1 or make the situation safe.
Schedule 1 Part 2 Division 1 regulation 10	Responsible person may cut or remove hazard tree BUT must not remove a tree of a specified kind unless certain conditions are met	Responsible person	A tree of a specified kind in subclause (3) must not be cut unless the following conditions are met: • The tree needs to be removed to ensure compliance with Division 1 or to make the situation safe or if a suitably qualified arborist has inspected the tree and advised that cutting the tree would make the tree unhealthy. Specified trees include native trees, trees listed in a planning scheme to be of ecological, historical or aesthetic significance, or trees of cultural or environmental significance.

Clause no	Requirement	Who	Key details
Schedule 1 Part 2 Division 1 regulation 11	A responsible person must not cut or remove a tree that is the habitat for threatened fauna during the breeding season	Responsible person	Exceptions include where cutting the tree in breeding season is required to restore safety or where cutting the tree outside of the breeding period is not practical
Schedule 1 Part 2 Division 1 regulation 12	Restriction on timing of cutting or removal if notification is required	Responsible person	A responsible person cannot commence cutting or removal of the tree on a day that is prior to the first day that is specified in the notice.
Schedule 1 Part 2 Division 1 regulation 14	Restriction on urgent removal of trees	Responsible person	The responsible person must not remove the tree unless the tree has the tree has fallen or become damaged needs to be removed to keep the minimum clearance space for a span of an electric line. Alternatively, the tree can also be removed if a suitably qualified arborist has assessed the tree having regard to foreseeable local conditions and advised the responsible person that the tree is likely to fall onto (or come into contact with) an electric line.
Schedule 1 Part 2 Division 3 regulation 15	Responsible person must provide notification before cutting or removing certain trees	Responsible person	This clause applies to a responsible person who is required by clause 3 or 7, or who intends under clause 8, to cut or remove a tree that is (a) on private property or (b) public land or (c) a tree of cultural or environmental significance or (d) listed on a planning scheme as significant. If you are cutting done a tree that conforms to the above, The responsible person must give a written notice in accordance with this clause before cutting or removing the tree to (a) an owner or occupier of the property if the tree is within the boundary of a private property or (b) the Council if the tree is on land that is managed by a Council that is not the responsible person or (c) an owner or occupier of the property if the tree is on land that is contiguous to private property and the use of that property may be affected during the cutting or removal. The notice must include the contact details of the responsible person, details of the intended cuttings, advice that the responsible person has procedures for resolving disputes and details on how to obtain access to the procedures. It should also include a diagram of the cutting, the trees location, whether or not the tree is listed, the consultation procedure and the date that cutting will commence. The notice should be published in a newspaper circulating generally in the locality of the land in which the tree is to be cut or removed - Schedule 1 Part 2 Division 3 reg16(3)
Schedule 1 Part 2 Division 3	Cutting cannot commence prior to the date in the notice and the date in the notice is	Responsible person	The responsible person must not specify in its public notice (under subclause (6)) a day that is (a) earlier than 14 days from the date of the notice or (b) later than 60 days from the date of the notice.

Clause no	Requirement	Who	Key details
regulation 15	subject to certain requirements		
Schedule 1 Part 2 Division 3 regulation 17	Responsible person must consult with occupier or owner of private property before cutting or removing certain trees	Responsible person	This clause applies to a responsible person who is required by clause 3 or 7 or who intends under clause 8 to cut or remove a tree that is within the boundary of a private property which the responsible person neither occupies nor owns. The responsible person must consult with the occupier of the property if the tree is to be cut within the boundary of the property or the owner of the property if the tree is to be removed. No consultation is required when the cutting or removal is urgent.
Schedule 1 Part 2 Division 3 regulation 18	Notification and record keeping requirements for urgent cutting or removal	Responsible person	In the event that cutting or removal is urgently required The responsible person must, as soon as practicable after completing the cutting or removal, give written notice of that cutting or removal to (a) an owner or occupier of the property if the tree that was cut was within the boundary of private property or (b) notify the Council if the tree was on land managed by the council. The notice must state where the cutting or removal occurred, why it occurred and the date of the last inspection. Thereafter, the responsible person must also keep a record of the written notice for at least 5 years.
Schedule 1 Part 2 Division 3 regulation 19	The responsible person must establish a procedure to be followed for the independent resolution of disputes relating to electric line clearance.	Responsible person	The responsible person must ensure that a copy of the procedure is available for inspection at their principal office during business hours and publish it on their website.
Schedule 1 Part 2 Division 4 regulation 20	Council has the right to consult	Council	If a Council has concerns about the safety of cutting or removal of a tree for which the Council has clearance responsibilities, the Council may consult. If the councils concerns relate to a span of an electric line that is part of a railway supply network or tramway supply network they can consult with the owner or operator of that supply network. If the council has any other concerns not related to the span of the electric line they can consult with the relevant distribution company. An owner, operator or distribution company that is consulted by a Council must advise the Council on (a) the safe limits of approach to electric lines for cutting or removing the tree; and (b) safe methods for cutting or removing the tree.
Schedule 1 Part 2 Division 4 regulation 21	Council has the right to consult and must keep records		If a Council considers that, for the purpose of determining a minimum clearance space in accordance with Division 1 of Part 3, the Council requires assistance to determine an additional distance that allows for cable sag and sway, the Council may consult with the owner or operator of a railway supply network or with a distribution company. If consulted, by the council these parties

Clause no	Requirement	Who	Key details
			must assist the council and the council are then responsible for keeping a record of the additional distance referred to in subclause (2) for at least 5 years.
Schedule 1 Part 2 Division 4 regulation 22	Duties relating to management procedures to minimise danger	Distribution company	A distribution company must give annual advice about the following matters to each occupier of land above which there is a private electric line that is within the distribution company's distribution area— (a) the duties of the responsible person under this Code; (b) the dangers of cutting and removing trees; (c) the precautions that should be taken to safely maintain the line. A distribution company must also, on the request of a person who has clearance responsibilities for a tree within the distribution company's distribution area, advise that person on (a) how to identify places within that area where the cutting or removal of trees will be required and (b) where to obtain advice and information on methods for maintaining clearance between electric lines and trees.
Schedule 1 Part 2 Division 4 regulation 24-30	Minimum clearance for various electrical lines	Specifications for responsible person	Specs for Insulated electric lines in all areas (regulation 24), Uninsulated low voltage electric line in a low bushfire risk area (regulation 25), Uninsulated high voltage electric line (other than a 66 000 volt electrical line) in a low bushfire risk area (regulation 26), Uninsulated 66 000 volt electrical line in a low bushfire risk area (regulation 27), Uninsulated low voltage and high voltage electric lines (other than a 66 000 volt electrical line) in a hazardous bushfire risk area (regulation 28), Uninsulated 66 000 volt electric lines in a hazardous bushfire risk area (regulation 29) and Transmission lines (regulation 30)
Schedule 1 Division 2 regulation 31	Application for approval of alternative compliance mechanism The responsible person must, if requested to do so by Energy Safe Victoria, provide further information or material about the application.	Responsible person	A responsible person may apply to Energy Safe Victoria for approval to use an alternative compliance mechanism in respect of a span of an electric line or a class of spans. The application must include all of the following: • Details on the alternative compliance mechanism • the procedures to be adopted for commissioning, installing, operating, maintaining and decommissioning the alternative compliance mechanism • Identify the published technical standards that will be complied with for installing etc. • Either specify the location of the span or describe the class of span (whichever is relevant) • specify the minimum clearance space that the applicant propose • include a copy of formal safety assessment (legal requirements in regulation 32) • a copy of the written agreement
Schedule 1 Division 2 regulation 33	Energy Safe Victoria may approve an application under clause 31 if ESV are satisfied	ESV & Responsible person	The approval may be subject to any conditions that Energy Safe Victoria thinks fit including the responsible person may need to communicate with ESV, may need to undertake any ESV specified actions or may need to report and/(or) monitor the use of the alternative compliance mechanism in

Clause no	Requirement	Who	Key details
			a ESV specified manor.
Schedule 1 Division 2 regulation 33	Energy Safe Victoria to provide written approval if granted to the Responsible person	ESV	ESV must (if it approves the application) provide a written approval including any conditions to which the approval is contingent upon and clearly identify the span of an electric line, or describe the class of span of electric line, to which the approval applies. The written approval must specify the minimum clearance space that is to apply under the approval, the durations for which the approval is relevant and any acts or omissions that will constitute major noncompliance and result in the revocation of the approval.
Schedule 1 Division 2 regulation 33	In the event that Energy Safety Victoria rejects the application.	ESV	If Energy Safe Victoria refuses an application for approval of an alternative compliance mechanism, Energy Safe Victoria must give written notice of the decision to the responsible person who made the application; and set out reasons for the decision.
Schedule 1 Division 2 regulation 34	Amendment of approval	ESV	Energy Safe Victoria may amend an approval for an alternative compliance mechanism. The amendment can amend or revoke a condition attached to the approval or impose a further condition on the approval. Upon making the amendment, Energy Safe Victoria must give the responsible person a written notice outlining the amendment and the date from which the amendment takes effect from.
Schedule 1 Division 2 regulation 35	Suspension or revocation of approval Energy Safe Victoria may at any time revoke the suspension of an approval by giving written notice of the revocation to the responsible person.	ESV	Energy Safe Victoria may suspend or revoke an approval for an alternative compliance mechanism if Energy Safe Victoria considers that (a) there has been a failure to comply with a condition of the approval and the failure is so serious that it cannot be dealt with by increased monitoring requirements under the arrangement or (b) the responsible person has committed an act or omission that constitutes a major noncompliance with the approval. If Energy Safe Victoria suspends or revokes an approval it must give the responsible person a written notice stating that (a) that the approval has been suspended or revoked and (b) the reasons for the suspension or revocation and (c) if it's a suspension – the period for which it is suspended for and (d) if the approval is revoked – the date from which the approval is revoked.

Appendix B: Policy decisions

Policies Reviewed	Policy Decision	Rationale
Public Notification Requirements This paper discussed the type of media that is appropriate for publicly notifying the community of scheduled line clearing Definition of 'written' notice	Able to use electronic notification and/or hardcopies Up to the responsible person as to what method is used 'written' notice can be interpreted as hard or soft copy Content requirements remain the same	Public Notification Requirements Private land only: Written or electronic notice including the required information – applicable to clearing of vegetation on private land Public land: Notice by the responsible person's website or by publication in newspaper circulating in general area - applicable to clearing of vegetation on public land NOTE: all current requirements for the content of each form of notification is maintained for both private and public land
Timber Plantations This paper explored the option of including specific requirements in the ELC regulations addressing timber plantations Discussions will speak to the need for consultation with the timber industry	No change to the current requirements in the regulations ESV will seek to work with DELWP to amend the Code of Practice for Timber Productions at earliest opportunity in future revision	Timber Plantations No changes proposed to the 2015 regulations in regards to timber plantations Existing regulation 7(b) in current regulations to remain unchanged Timber plantation owners/operators are not responsible persons under the Electricity Safety Act ESV will monitor line clearance compliance of plantations
Suitably Qualified Arborists The purpose of this paper was to discuss an appropriate qualification for arborists implementing the ELC regulations	Will include the Certificate III in Arboriculture (AHC30816), including the 'Perform a ground-based tree defect evaluation' (AHCARB403) training qualification module	Suitably Qualified Arborists This qualification meets the skill level required for the effective implementation of the ELC regulations i.e. supports and is aligned to the regulatory intent Certificate III courses are availability and relevant, whereas the Certificate IV course has limited availability and uptake, and course content includes modules that are not relevant to ELC

Policies Reviewed	Policy Decision	Rationale
		This training is aligned with the requirements of AS 4373
Definition of Native Vegetation This paper provided the basis for discussion as to whether an additional descriptive note should be included in the proposed regulations to clarify the term ' native vegetation'	Include as a reference note in the regulation to the VPP definition of 'native' vegetation (Clause 73.01): "plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses"	The proposed Regulations now refer to trees that are "indigenous", rather than "native". Allows Responsible Persons to better manage 'native' vegetation to the intent of the Regulations Improved electric line clearance management practice and efficiency Minimises inadvertent regulatory breaches due to misunderstanding or use of the term 'native' vegetation The Cambridge dictionary defines indigenous as: "naturally existing in a place or country rather than arriving from another place"
Suitable trees The purpose of this paper was to provide information as the basis to discuss the provision of suitable or unsuitable trees for planting near powerlines, in order to prevent future unsafe electrical situations	ESV will establish a working group to develop guidance materials on: Factors to be considered when identify trees for planting near powerlines The use of clause 86A for both: Unsuitable trees Hazard trees	Suitable trees ESV will not be publishing a list of either suitable or unsuitable trees due to: Difficulty to identify plants that will grow to a specific height under all conditions Difficulty to develop a solution that takes into consideration all factors impacting tree growth and weather in various regions EBs have the ability under Sect 86 to apply to ESV can make owners remove or maintain trees
Insulating Covers The intention of this paper was to discuss how to address the issue created by the withdrawal of an Australian standard that is referred to in the current regulations	Use current definition with the following changes: Substitute 'electric line' with conductor Include a reference to new standards (AS IEC 60060.1 and AS IEC 60060.2)	Insulating Covers The inclusion of a reference to the new AS IEC standards provides the necessary information required to effectively implement the ELC regulations The changes to the definitions for insulated covers in the new AS IEC

Policies Reviewed	Policy Decision	Rationale
		standards: Are minor and focus on clarification Will not impact the line clearing practices of EBs Ensures that Australia is in line with international requirements
Clearance space This paper provided an overview of both the method for calculating the minimum clearance space and the ELC 'clear to the sky' requirements	Sag and sway: Maintain current regime EBs to collaborate and provide an agreed solution for sag and sway Clear to the sky: Maintain current regime – 'clear to the sky' can be used in specified situations	*Sag and sway:* Difficult to obtain agreement on one calculation Work completed to date has been inadequate to agree on alternative option to address the majority of situations It is a longer-term activity to identify an agreed approach If a standard approach is to be developed this would be best done through the VESI forum and administered by the EBs through individual ELCMPs *Clear to the sky:* Current regime in the Code: Provides appropriate safety and amenity outcomes Requires clear to the sky in specified situations Does not include a maximum clearance space restriction EBs are able to consult with stakeholders and implement clear to the sky in additional areas if agreement can be reached There are other mechanisms available to consider specific electric lines
Exceptions This paper discussed whether variations or	ESV will: Amend the existing clause 4 to reduce the	Exceptions The proposed changes maintain existing electricity safety standards,

Policies Reviewed	Policy Decision	Rationale
additions should be made to the exception clauses of the Code	clearance distance Develop a new exception clause that allows the growth of small branches in the clearance space in specified circumstances Note: The details of the proposed exception are being finalised, specifically in regards to the MFB area included in the paper presented to ELCCC at the June meeting	while reducing the need for clearing This will facilitate improved environmental and amenity outcomes
Management Plan cycles This paper discussed the frequency that of preparation and approval of ELC management plans	The ELC management plan cycle will: Maintain current cycles for annual ELC management plan preparation for other responsible persons, including councils, required to prepare management plans Be changed to a five year preparation and submission cycle for EBs.	Management Plan cycle Enables alignment between ELC and other regulatory plan requirements applying to the EBs such as bushfire mitigation plans, and electricity safety management scheme, both of which have a five year cycle Experience with the other regulatory plans (listed above) has established that EBs are able to manage safety risks effectively on a five year development and submission cycle Allows for capture of longer term or strategic line clearance objectives Potential for this change in ELC management plan cycle to result in improved EB plans, and enhancements in ESV evaluation and approval efficiencies Current cycles for ELC management plan for other responsible persons has been evaluated and found to be appropriate to effectively manage safety risks

Appendix C - Stakeholder consultation

Who was consulted?

ESV undertook stakeholder engagement with responsible persons in developing the proposed changes to the Regulations. This predominantly occurred via the ELCCC forum, as discussed in the main body of the RIS.

During the process of this RIS, Deloitte also conducted stakeholder consultations with EBs, tree clearance businesses, Councils, Victorian Government departments and agencies, and private land owners. In total, Deloitte consulted with (conducted either face-to-face or over the phone):

- Five EBs
- Two tree clearance businesses
- Six Councils
- Three Victorian government agencies
- Three private land owners

Furthermore, Deloitte conducted a survey to supplement this information with further responses from responsible persons about the costs, benefits and other impacts of the current and proposed ELC Regulations. This online survey was completed by 28 participants, comprising:

- 23 Councils
- Four EBs
- One other responsible person.

How were they consulted?

Stakeholders were consulted in one of two ways:

- Online survey
- Semi-structured interviews

What information was collected?

During consultations, questions were asked about the impact of the current and proposed ELC Regulations, the cost of the current and proposed ELC Regulations and the likely response to a situation where minimal regulation existed. Stakeholders were asked whether or not they believed the current ELC Regulations achieve an appropriate balance between safety and amenity. Some organisations presented strong views about the environmental implications of the ELC Regulations, which have been reflected in the relevant sections of this RIS.

Consultations with organisations government agencies focused on understanding the effectiveness and implications of the current and proposed ELC Regulations.

How information collected has been incorporated into the RIS?

The information collected has been incorporated into the RIS primarily to inform the analysis of the costs and benefits associated with the proposed ELC Regulations.

Key themes by topic

A number of key themes emerged from the stakeholder consultations. These are summarised below.

Table 20-1 Consultation themes

Theme	Key discussion points
Management plans	Councils generally reported that the time taken to prepare a management plan varies. Many stakeholders were of the opinion that more time was required to prepare the first management plan, following the introduction of new ELC Regulations, which occurs every five years. EBs generally viewed their management plans as a critical risk management tool that is presented to their respective Boards. EBs highlighted that ESV's review process was the largest cost component of their annual management plan process. There was strong consensus from EBs that the preparation of management plans should occur every 5 years to align with the preparation of other critical safety documents such as the Bushfire Mitigation Plan.
Tree clearance activities	Councils generally rely on a team of contractors to conduct vegetation clearance activities. The area or the number of trees that each Council is responsible for varied significantly, producing an array of vegetation clearance costs. Many Councils were of the opinion that the current Regulations result in excessive pruning, particularly in residential areas. Most EBs rely on a mixture of in-house operations and external contractors to deliver their vegetation maintenance program. EBs say that they are incentivised to conduct tree clearance activities because trees impact the performance of their assets (i.e. electric lines). Tree clearance is a core component of the operations of any EB, and it is primarily undertaken to protect assets and mitigate risks to these businesses.

Theme	Key discussion points
Consultations and notifications	Councils are responsible for informing the community of their vegetation clearance activities through advertisements placed in a locally circulating newspaper. All councils supported a proposed change in the ELC Regulations that permitted the use of modern communication platforms to facilitate communication with the community. EBs have more extensive public notification and consultation duties than local councils. EBs use a range of platforms to communicate planned vegetation works with the community. EB's said that previous versions of the ELC Regulations contained a diagram illustrating that trees can't be in close proximity to electric lines. This diagram was often used to communicate the need for vegetation clearance works however, the removal of this diagram has since made community consultation slightly more challenging for EBs.
Safety	All stakeholders agreed that the Regulations are critical to protect the community from injuries, deaths and fires. The general consensus was that the current Regulations were fulfilling their objective to protect the safety of the community. CFA observed that the current Regulations are performing well when it comes to preventing bushfires in Victoria. Tree clearance businesses raised concerns that some aspects of the current ELC Regulations increase the risk to arborists who are suspended many meters from the ground to conduct vegetation clearance works.
Amenity	Councils generally raised concerns about excessive pruning in urban and residential areas. It was noted that the current minimum clearance spaces in urban areas are excessive and require vegetation to be removed when it does not pose a risk to the safety of the community. EBs are generally of opinion that there should be more of a focus on safety than amenity in HBRA and that there should be more focus on amenity and reliability in LBRA.

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