Cost pass through application

2019-20 Bushfire disaster event

31 August 2020

CONTENTS

1. EXECUTIVE SUMMARY

The 'Black Summer' bushfires and our role in supporting affected communities

The 2019-20 bushfire season was the most devastating in NSW history. It was an unprecedented bushfire event in terms of conditions experienced, the loss of lives and property, and the threat to communities across large parts of the state. Across NSW over 11,400 bush and grass fires burnt through more than 5.5 million hectares, the equivalent of 6.2% of the state.[1] The fires destroyed 2,448 homes and claimed 25 lives. A number of regions across the state were issued with 'catastrophic' fire danger warnings including Greater Sydney for the first ever time. A State of Emergency was declared on three separate occasions by the NSW Government.

The bushfires caused significant damage to parts of Endeavour Energy's network and interrupted supply to over 55,000 customers. The bushfires were principally located in three major fire areas spread across each of our northern, central and southern operating regions. Although we occasionally experience bushfires and are prepared to manage these incidents, the severity, extensiveness and relentlessness of the fires in each of these regions during the 2019-20 fire season was unprecedented and in combination forms the relevant positive change event this cost pass through application is based.

Our priority during the bushfire event was to restore electricity supply to affected communities as quickly as possible whilst preserving the safety of customers and workers. This involved significant effort across our entire organisation. Our field crews restored supply within an environment of fire activity, challenging terrain, hot conditions, remote locations, heavy smoke, ash deposits, rapidly changing wind forecasts, road closures, back burning efforts and water bombing. These efforts involved the deployment of 95 portable diesel generators to provide temporary supply to customers facing lengthy delays in having their grid supply restored.

In addition to supporting customers through timely supply restoration we established a Customer Management Working Group and Bushfire Customer Liaison Roles to keep our customers safe and informed and to assist in coordinating internal and external customer response activities. Our customers were kept informed through our Contact Centre, website and social media pages. We also developed a bushfire assistance package which involved waiving reconnection fees, free electrical inspections, energy advice and gift vouches as well as participating in an Energy Charter working group of retailers and networks to share customer data, simplify communication and help coordinate the reconnection of customers.

Our response efforts, which include activities performed during and after the bushfire event, have had a material impact to our cost of providing direct control services. Endeavour Energy has incurred $31.3 million (real, 2019-20) in additional, eligible costs as a result of the 2019-20 bushfires, which was not accounted for in our 2019-24 distribution determination. Given the exogenous nature of this unforeseeable event and the materiality of its financial impact to our network business, we consider it appropriate for these additional costs to be recovered via the cost pass through provisions set out in clause 6.6.1 of the NER.

In accordance with clause 6.6.1(a) of the National Electricity Rules (NER) Endeavour Energy submits this application to the Australian Energy Regulator (AER) for approval to pass through the additional costs of providing distribution services to customers whose supply was affected by the catastrophic bushfires which occurred during the 2019-2020 bushfire season.

[1] Media release from the NSW Rural Fire Service, Fire season comes to a close in NSW, 31 March 2020

What is the pass through cost recovery mechanism?

The operation and maintenance of a distribution network involves managing a wide variety of events, this can include extreme weather events and natural disasters. The costs associated with managing these rare occurrences can be recovered via expenditure allowances, the rate of return or determination re-opener provisions like the contingent project and pass through mechanisms. We consider the latter remains fit-for-purpose for managing events of uncertain timing and cost. Pass throughs only require customers to fund the efficient costs associated with rare occurrences if they occur and as determined by the AER.

To minimise the costs associated with extreme events we plan, operate and maintain the network in accordance with industry standards and best practice asset management practices. We are becoming increasingly mindful of the effects of climate change and the importance of network resilience with an increasing frequency of extreme weather events.

We consider forecasts of fire risk associated with climate change based on Climate Council economic forecasts and Weatherzone's predictive models. We have also engaged with the CSIRO and a number of universities to better understand the growing risks of climate change. In this application we provide additional details on our approach to bushfire mitigation and vegetation management and the efficiency of our response to the bushfires.

We consider approval of this pass through application is consistent with the revenue and pricing principles in the National Electricity Law. In broad terms, we believe the AER should approve the proposed positive pass through amount because:

- the 2019-20 bushfire event meets the relevant requirements to qualify as a natural disaster pass through event (a nominated pass through event approved by the AER in Endeavour Energy's 2019-24 distribution determination);
- the costs incurred as a result of the bushfires exceed 1% of Endeavour Energy's annual revenue requirement for 2019-20, thus satisfying the materiality requirement in the NER;
- only efficient incremental costs which we expect to incur directly as a consequence of the bushfire event have been included in the eligible pass through amount; and
- the application addresses the requirements outlined in clause 6.6.1(c) and has been submitted within the AER approved timeframe for making a pass through application.

The revenue and pricing impacts of this pass through proposal

Currently, the distribution portion of electricity bills for the average residential and small business customer will reduce by $30 and $52 (real, 2020-21) respectively over the remaining three years of the current regulatory control period.

We propose to recover the positive pass through amount in each of the remaining three years of the current regulatory control period in order to minimise price variability and maintain a revenue profile that will result in real price reductions over the remainder of the period.

If approved, this pass through will still see real reductions for residential and small business customers over the next three years of $25 and $43 (real, 2020-21) respectively. This means we will continue to deliver real price reductions on some of the lowest network charges in the National Electricity Market (NEM) and the lowest electricity distribution charges in NSW.

2. THE COST PASS THROUGH FRAMEWORK

The cost pass through mechanism in the NER allows a Distribution Network Service Provider (DNSP) to apply to the AER to pass through to customers the costs for providing direct control services relating to a positive change event. A positive change event occurs if the requirements of one of the four prescribed pass through events defined in the NER, or a nominated pass through event approved in a distribution determination, are satisfied.[2]

In seeking approval to pass through these costs, the NER requires the DNSP to submit a written statement[3] to the AER within 90 business days of the relevant positive change event occurring. This statement must address the following matters outlined in clause 6.6.1(c)[4]:

- the details of the positive change event;
- the date on which the positive change event occurred;
- the eligible pass through amount in respect of the positive change event;
- the positive pass through amount Endeavour Energy is proposing in relation to the positive change event;
- the amount of the positive pass through amount that Endeavour Energy proposes should be passed through to Distribution Network Users in the regulatory year in which, and each regulatory year after that in which, the positive change event occurred;
- evidence of the actual and likely increase in costs referred to in clause 6.6.1(c)(3) of the NER;
- evidence that such costs occur solely as a consequence of the positive change event; and
- such other information as may be required under any relevant regulatory information instrument.

The NER also outlines the approach that the AER must take in assessing a pass through application. In making a decision on whether a positive change event has occurred, the AER must take into account a number of relevant factors which are listed in clause 6.6.1(j) of the NER. The AER may consult with the DNSP and other persons on any matters arising out of the relevant pass through event the AER considers appropriate.[5]

If the AER determines that a positive change event has occurred, it must then make a determination on[6]:

- the approved pass through amount; and
- the amount of that approved pass through amount that should be passed through to distribution network users in the regulatory year in which, and each regulatory year after that in which the positive change event occurred.

In addition, the NEL requires the AER, in exercising its economic regulatory functions and powers, to do so in a manner that will, or is likely to, contribute to the achievement of the National Electricity Objective (NEO). The NEL also specifies the revenue and pricing principles. Of relevance to this

[2] NER clause 6.6.1(a1)(1)-(5).
[3] At times the written statement is referred to as the 'application'. These terms should be read interchangeably and inclusive of the supporting attachments accompanying this application.
[4] Requirements pertaining only to a retailer insolvency event have not been listed.
[5] NER clause 6.6.1 (i)
[6] NER clause 6.6.1 (d)(1)

application is the principle that a regulated network service provider should be provided with a reasonable opportunity to recover, at least, the efficient costs the operator incurs in providing direct control services and complying with a regulatory obligation or requirement or making a regulatory payment.

2.1. Timing of the cost pass through application

On 9 April 2020, Endeavour Energy submitted a request to the AER under clause 6.6.1(k) of the NER for an extension to submit this cost pass through beyond the standard 90 business day limit. Due to the scale and impact of the damage to Endeavour Energy's network meant a submission with the degree of certainty of the cost associated with the event to enable a proper consideration of a pass-through application by the AER, was not possible within the 90-day timeframe.[7] Additionally, the impact of COVID-19 further reduced our ability to submit a compliant application within the standard timeframe.

Furthermore, our request acknowledged there was ambiguity in specifying the date on which the 2019-20 bushfire event occurred. Unlike a flood or storm event where the date of occurrence is more readily discernible, the rolling nature of the 2019-20 bushfire event and the unpredictability of multiple bushfire threats make identifying a single or specific effective date difficult.

The AER has kindly approved Endeavour Energy's request to extend the timeframe to submit the cost pass through application until 31 August 2020. By lodging this application no later than this date, the timeframe requirement for submitting cost pass through applications has been met.

For the purposes of complying with 6.6.1(c)(2) of the NER, we consider it is reasonable to nominate the final day of the statutory bushfire season in NSW - 31 March 2020 - as the effective date.

[7] Endeavour Energy, Request to extend the time period for submitting cost-pass through application, April 2020, p. 1

3. ENDEAVOUR ENERGY'S WRITTEN STATEMENT

This document and accompanying attachments constitute Endeavour Energy's written statement pursuant to clause 6.6.1(c) of the NER, seeking the AER's approval to recover a positive pass through amount totalling $31.1 million (nominal). This revenue amount is directly attributed to the 2019-20 bushfire event and is derived from the additional costs in providing direct control services which were not included in the AER's 2019-24 final regulatory determination.

This written statement has been developed to comply with the requirements under clause 6.6.1(c) of the NER. Within this document, information that enables the AER to determine whether: a positive change event has occurred; the resultant increase in costs; and, the eligible pass through amounts. This information is contained in the following sections:

- Section 4: provides an overview of the 2019-20 bushfire event and demonstrates how it satisfies the requirements of a positive change event as defined in the NER.
- Section 5: outlines Endeavour Energy's bushfire response efforts and details the incremental costs related to the provision of direct control services
- Section 6: specifies the eligible and proposed positive pass through amounts

It is noted that clause 6.6.1(c)(7) of the NER requires Endeavour Energy to provide additional information as may be required under any relevant regulatory information instrument. No such instrument has been issued by the AER at the time of submitting this statement. However, clause 6.6.1(e1) provides scope for the AER to request from Endeavour Energy additional information the AER requires for the purpose of making a determination on this application. Accordingly, Endeavour Energy is willing and able to respond to any request for further information from the AER to assist in the assessment of this application.

In Attachment 1 we provide a compliance checklist that identifies the sections within this application that address the various NER requirements for a pass through application. Our application contains some confidential material which, in accordance with the AER's confidentiality guidelines, is listed in the confidentiality template provided in Attachment 2.

3.1. The 2019-20 bushfires constitute a single bushfire event

A number of bushfires caused damage to different parts the network over the 2019-20 bushfire season. This disrupted business-as-usual (BAU) operations as we focussed on the immediate needs of the communities in fire affected locations across the network when managing our response. The timing and extent of the damage caused by multiple bushfires required us to coordinate the supply restoration activities with regard to the impact all bushfires across the network were having on our customers. From an incident management perspective, it was neither appropriate or feasible to manage the response to each bushfire individually and independently from other fires that were burning at the same time.

We propose that the 2019-20 bushfires and their associated impact be recognised as a single positive change event. From AusNet Services' Black Summer bushfire cost pass through application we understand that to be considered a single event, the AER would need to be satisfied the bushfires which impacted the network were sufficiently related, such that they:

- Share a similar underlying cause (such as extreme weather conditions); and

- Occurred in relatively close proximity and time, for instance as part of a generally characterised bushfire season like “Black Summer”.[8]

We broadly agree with this approach and are of the view that the AER should apply these considerations to this application.

The bushfires which damaged the network during the course of the 2019-20 bushfire season share a common underlying cause (which is detailed in section 3.1.3) and impacted communities to such an extent that they are recognised collectively as the NSW bushfires. The scale of the bushfire threat was reflected by the NSW Government declaring a State of Emergency across the entire state with the event obtaining formal natural disaster status in NSW. In recognition that other states were also impacted by bushfires during the summer, the 2019-20 Australian bushfire season is commonly referred to as “Black Summer”.

Both the NSW and Commonwealth Governments are conducting separate investigations into the bushfires. The NSW Independent Bushfire Inquiry is required to report to the NSW Premier on matters including:

- The causes of, and factors contributing to, the frequency, intensity, timing and location of, bushfires in NSW in the 2019-20 bushfire season, including consideration of any role of weather, drought, climate change, fuel loads and human activity.
- The preparation and planning by agencies, government, other entities and the community for bushfires in NSW, including current laws, practices and strategies, and building standards and their application and effect.
- Responses to bushfires, particularly measures to control the spread of the fires and to protect life, property and the environment.
- Any other matters that the inquiry deems appropriate in relation to bushfires.

The National Natural Disaster Arrangements Royal Commission (‘Bushfire Royal Commission’) is required to consider issues in response to the extreme 2019-20 bushfire season including:

- Improving natural disaster management coordination across all levels of government.
- Improving Australia’s preparedness, resilience, and response to natural disasters, across all levels of government.
- The legal framework for the Commonwealth’s involvement in responding to national emergencies and how that works with state and territory legal frameworks.

It is evident that each inquiry regards the 2019-20 bushfires as a single catastrophic event rather than individual and discrete bushfire events. In all respects the bushfires that occurred in NSW and across the Australia during the 2019-20 bushfire season are being treated within the context of a single catastrophe. This supports the case that the impact of the bushfires within the network area collectively comprise a natural disaster event.

We have provided formal written submissions to both inquiries and, in relation to the Royal Commission, also appeared on an industry panel of network participants. Broadly, Endeavour Energy’s submissions outline the impact the bushfires had on the network; Endeavour Energy’s preparedness for major bushfire events; and the measures taken to respond to these impacts. We

[8] AusNet Services, Cost pass through application – 2020 Summer Bushfires, May 2020, p. 13.

have also reflected on learnings from the 2019-20 bushfires to suggest the following changes which could mitigate the impact of future major bushfire events.

- Improved coordination protocols to ensure electricity worker safety in bushfire grounds
- Regulatory relief for stand-alone power systems
- Improved back-up power supplies by telecommunication providers to their towers
- Improved access protocols to network assets with National Parks and Wildlife Services
- Support for design standards for substations in bushfire prone regions

Our submissions to the NSW Independent Bushfire Inquiry and the National Natural Disaster Arrangements Royal Commission are provided in Attachment 3 and Attachment 4 respectively.

4. POSITIVE CHANGE EVENT

A positive change event is defined in the NER as[9]:

> *"**a pass through event** which entails the Distribution Network Service Provider incurring **materially higher costs in providing direct control services** than it would have incurred but for the event, but **does not include a contingent project** or an associated trigger event."* (Emphasis added).

The positive change event that is the subject of this application is the occurrence of the catastrophic bushfires during the 2019-20 bushfire season which burned through approximately 44% of the network area and caused significant damage to Endeavour Energy's electricity network infrastructure. The NER specifies that a pass through event for a distribution determination can be any of the events specified in 6.6.1(a1), namely:

1) a regulatory change event;
2) a service standard event;
3) a tax change event;
4) a retailer insolvency event; and
5) any other event specified in a distribution determination as a pass through event for the determination.

The relevant distribution determination is the AER's 2019-24 final determination for Endeavour Energy which was published on 30 April 2019. In the determination, the AER included the following pass through events in addition to the four events prescribed in the NER:

- insurance cap;
- insurance credit risk;
- natural disaster; and
- terrorism.

This application is in respect of a natural disaster pass through event, which is provided for under clause 6.6.1(a1)(5) of the NER. This section of the application demonstrates Endeavour Energy's eligibility to pass through the incremental costs associated with the 2019-20 bushfires by establishing that the occurrence of the bushfires constitute a positive change event. Specifically, the 2019-20 bushfire event meets the NER requirements of a positive change event as:

- it satisfies the definition for a 'natural disaster' pass through event for the reasons outlined in section 4.1;
- the event will result in Endeavour Energy incurring materially higher costs in providing direct control services as discussed in section 4.2; and
- the event is not a contingent project or trigger event as discussed in section 4.3.

[9] NER Chapter 10

4.1. Natural disaster pass through event

The AER approved 'natural disaster' pass through event is defined as follows:[10]

> *Natural disaster event means any natural disaster including but not limited to cyclone, fire, flood or earthquake that occurs during the 2019-24 regulatory control period that increases the costs to Endeavour Energy in providing direct control services, provided the fire, flood or other event was not a consequence of the acts or omissions of the service provider.*

Note: in assessing a natural disaster event pass through application, the AER will have regard to, amongst other things:

- *Whether Endeavour Energy has insurance against the event,*
- *The level of insurance that an efficient and prudent NSP would obtain in respect of the event,*
- *Whether a relevant government authority has made a declaration that a natural disaster has occurred.*

As evident in the above definition, the 2019-20 bushfire event must satisfy various conditions before it can be classified as a natural disaster nominated pass through event. Those conditions and their application in regard to this cost pass through application are discussed in sections 4.1.1 - 4.1.6.

4.1.1. Overview of the 2019-20 bushfires

The 2019-2020 bushfire season was the worst bushfire season in NSW history. A confluence of factors including a prolonged period of hot weather without significant rainfall (with 98% of NSW being drought affected at the time) provided the catalyst for an unprecedented level of bushfire activity across the state. The NSW Rural Fire Service (RFS) reported that 11,264 bush and grass fires burnt 5.5 million hectares or 6.2% of the state, destroyed 2,448 homes and claimed 25 lives over this period. The area burnt in NSW was three times larger than in any other bushfire season.

The catastrophic nature of the bushfires and the threat encountered by several towns and communities across the state led to the NSW Government declaring a State of Emergency on three separate occasions. Each declaration was in force for a week and it was the first time a State of Emergency had been made in NSW since October 2013. On announcing the third State of Emergency on 2 January 2020, NSW Premier Gladys Berejiklian stated:

> *"Declaring this State of Emergency is vital to the safety of communities in NSW as we face the most devastating bushfire season in living memory".*[11]

The bushfires ultimately burnt through approximately 11,000 km² or 44% of the network area. The fires either damaged or destroyed 840 homes and businesses connected to the network and interrupted supply to over 55,000 customers. Approximately 20,000 customers were without power at the peak of the bushfires during the New Year period, mostly in communities in the Shoalhaven and NSW South Coast.

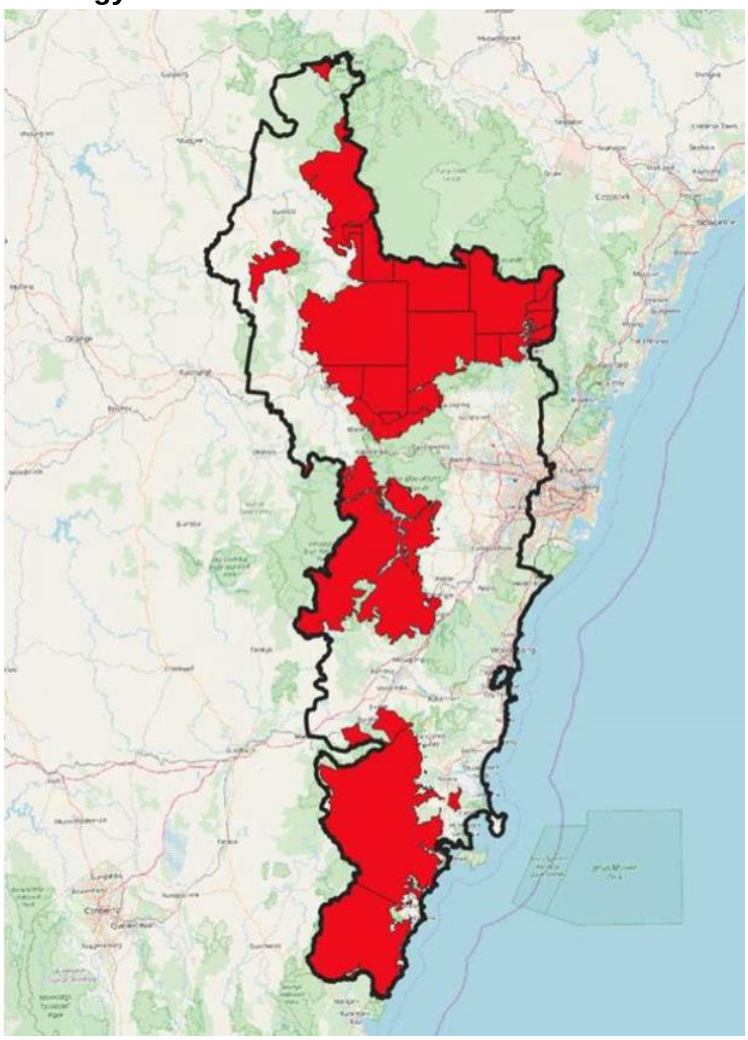
[10] AER, Final decision – Endeavour Energy distribution determination 2019-24 – Overview, April 2019, p. 44
[11] Media release from the NSW Government, Premier declares third State of Emergency, 2 January 2020

The worst affected areas saw some customers without power for more than 10 days as Endeavour Energy crews worked through challenging conditions to rebuild large sections of the network in the Blue Mountains, the Southern Highlands and the Shoalhaven/South Coast districts. These regions of the network were predominantly impacted by the Gospers Mountain, Green Wattle Creek and Currowan bushfires respectively from mid-November to early-February. Managing the multiple bushfire threats required a sustained, whole-of-organisation response and collaboration with several authorities led by the RFS. At all times during the response, our priority was to maintain the safety of our workforce and the communities we serve.

Gospers Mountain bushfire (Blue Mountains/Hawkesbury)

The Gospers Mountain fire was ignited on 26 October 2019 from a lightning strike in a remote and densely grown area of the Wollemi National Park north-west of Sydney. Over the course of November and December 2019, it would combine with other fires to become Australia's largest ever bushfire to have started from a single ignition point and is among the world's 10 largest bushfires on record.[12]

Figure 1 - Fire affect regions in Endeavour Energy's network area



In conjunction with the Grose Valley fire, it damaged properties in Bilpin, Colo Heights, Mount Wilson, Mount Tomah, Mount Irvine and Bell and threatened larger Blue Mountains towns including Mount Victoria and Blackheath. The fires forced the closure of Bells Line of Road - one of only two main roads traversing the Blue Mountains for almost two weeks.

The Gospers Mountain fire burnt through 512,000 hectares across the Lithgow, Hawkesbury, Hunter Valley, Cudgegong, Blue Mountains and Central Coast local government areas. The fire contributed to smoke haze which hovered over the Sydney basin for periods during the 2019-20 summer and prompted the NSW Government to establish an inquiry into the health impacts of exposure to poor levels of air quality resulting from bushfires.

The fire was contained on 12 January 2020 and extinguished on 7 February 2020.

Green Wattle Creek bushfire (Southern Highlands)

The Green Wattle Creek bushfire started on 27 November 2019 and burned through 279,000 hectares across the Blue Mountains, Wingecarribee, Wollondilly and Upper Lachlan local

[12] ABC News, Anatomy of a "mega-blaze", 27 July 2020

government areas. Fires also burned through large areas around the Sydney water catchment area including Oakdale, Orangeville and Werombi adjacent to Lake Burragorang which supplies the majority of Sydney's drinking water.

The townships of Balmoral, Bargo and Buxton were among the areas where the fires were most intense and suffered significant property damage. The fire was contained on 30 January 2020 and extinguished on 7 February 2020.

Currowan bushfire (Shoalhaven/South Coast)

The Currowan bushfire ignited in the Currowan State Forest approximately 20km north of Bateman's Bay on 26 November 2019. During December 2019, the fire spread and impacted properties and communities in the Shoalhaven and NSW South Coast. These communities were among the most severely impacted in the network and included Termeil, Bawley Point, Sussex Inlet and Lake Conjola.

The bushfire threat was at its highest during the New Year's period when it was fuelled by high temperatures and strong winds. The hazardous conditions forced the closure of sections of the Princess Highway which severely hampered access to and from affected communities. The Shoalhaven/South Coast fires were finally brought under control on 9 February after burning through 499,000 hectares in 74 days. A total of 312 homes were destroyed and 173 were damaged.

Table 1 - Major fires in Endeavour Energy's network area

Bushfire	Region	Network area burnt (km²)
Gospers Mountain	North	4,157
Currowan	South	3,185
Green Wattle Creek	Central	1,874
Kerry Ridge	North	686
Grose Valley	North	196
Erskine Creek Fire	Central	174
Upper Turon Rd, Palmers Oaky	North	168
Ruined Castle	North	166
Morton Fire	South	146
Meads Creek West	South	36
Forest Rd, Comberton	South	26
Total		**10,814**
Endeavour network area		**24,800**
% of network area impacted		**43.6%**

February 2020 “East Coast Low” storm event

The immediate bushfire threat came to an end on February 9, 2020 after a low pressure system formed over the Sydney Basin. The ensuing storms wreaked havoc across much of the network area with damage from high winds, heavy rainfall and flooding impacting customers across Greater Sydney, the Blue Mountains, the Hawkesbury district and Southern Highlands.

Due to the scale of the storm damage, a major incident was declared. We transitioned into “storm mode” and established storm centres at Penrith, Katoomba, Kings Park and Parramatta depots dedicated to coordinating repairs to the network. This required us to temporarily cancel all planned network maintenance to focus efforts on safely restoring power supply to customers as quickly as possible.

In total, the storm caused approximately 1,150 electrical hazards on the network and interrupted supply to over 93,000 homes and businesses. Local Northern and Central Region crews were supported by staff from the Southern Region who were deployed to help restore supply to customers without power for over 48 hours.

Poor weather impacted restoration efforts with floodwaters and landslides in remote townships north of the Hawkesbury River preventing access to the network. Customers in St Albans and Upper MacDonald were reconnected on February 13 after access was made to sites via alternative routes through the Central Coast.

On 18 February 2020, a second major storm event impacted supply in the Hills and Hawkesbury regions northwest of Sydney with wind gusts of 100km/h and 70,000 lightning strikes recorded across greater Sydney. Endeavour Energy crews were able to repair more than 450 electrical hazards and restore power to all 60,000 impacted customers within 48 hours.

We estimate the cost of repairing the damage to the network from these storms to be $2.1 million (real, 2019-20). Although we design, manage and maintain the network to provide an appropriate level of resilience against moderate seasonal storm events, the February 2020 storms were particularly intense and the costs to repair damage to the network was significantly above those normally incurred for storm damage.

The underlying climatic conditions and trends which were responsible for the 2019-20 bushfire event also contributed to the February storms. However, we have elected to fund the costs to repair storm damage from capex and opex allowances rather than seek to pass them through to customers via this cost pass through application.

4.1.2. Increase in direct control service costs

The bushfires caused substantial damage to the overhead network infrastructure which subsequently impacted the electricity supply to thousands of customers in bushfire affected communities. Our response involved mobilising internal workforce and contracted service providers (and supplemented by resources made available by other distributors in some instances) to promptly restore supply to customers mainly through replacing fire damaged poles and overhead conductors.

Where it was not possible to restore grid supply promptly, diesel generators were used to provide supply temporarily until the RFS deemed it safe for crews to access affected sites to repair or replace assets and restore permanent supply.

Initial field activities included inspection of firegrounds to assess the damage to network components. Scoping and inspections were important in enabling us to plan the work that would be required to replace damaged assets. Significant tree clearing work was also undertaken, primarily through contracted service partners. Initial vegetation management activities focussed on making locations accessible and worksites safe for crews to perform their supply restoration work. This was followed by more extensive vegetation rectification work to clear easements of fallen trees and to remove damaged trees at risk of falling within safe clearances of transmission and distribution conductors.

Performing supply restoration activities was challenging given the scale of the affected fire zones, difficult terrain, ongoing fire danger and the unpredictable nature in which bushfires were presenting across the network area. Despite these difficulties we were able to repair the network and reconnect supply to the vast majority of affected customers within ten days.

Responding effectively to the bushfire emergency required us to incur costs which were not included in the AER's 2019-24 distribution determination and use resources beyond what we consider business as usual requirements. Importantly, these additional costs pertain exclusively to the bushfire disaster event and would not have been incurred had these catastrophic bushfires not occurred.

From a service classification perspective, the cost increase predominantly relates to activities which fall into the category of common distribution services which the AER has classified as standard control services for the 2019-24 regulatory control period. Activities which fall within this category to which the increase in costs relate to include:

- the planning, design, repair, maintenance, construction and operation of the distribution network
- works to fix damage to the network (including emergency recoverable works) or to support another distributor during an emergency event
- training internal staff, accredited service providers (ASPs) and contractors undertaking direct control services
- emergency disconnect for safety reasons and work conducted to determine if a customer outage is related to a network issue

4.1.3. Cause of the 2019-20 bushfire disaster event

The role of weather and climate

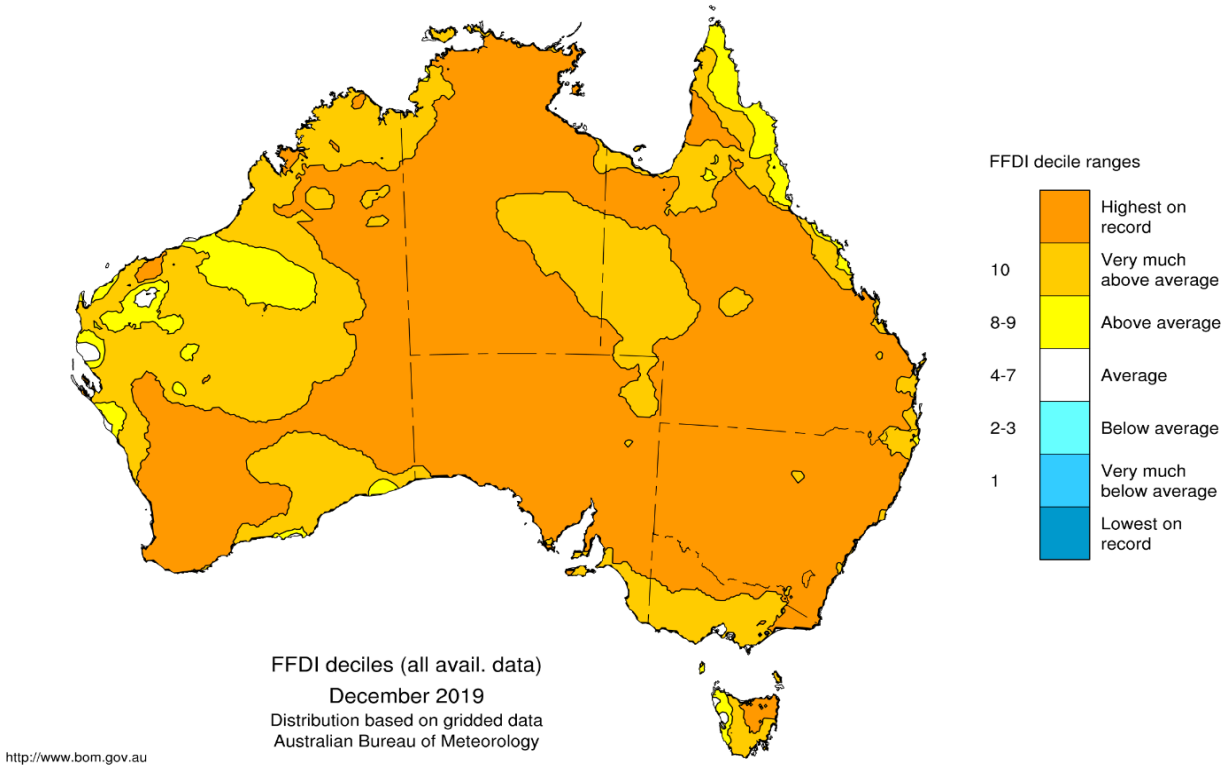
The underlying causes of the 2019-20 NSW bushfires is being investigated through the NSW Independent Bushfire Inquiry. However, the Bushfire Royal Commission hearings commenced in May 2020 with experts from the Bureau of Meteorology and CSIRO discussing in detail the influence of prevailing weather conditions and climate change patterns on the 2019-20 Australian bushfire season.

It was acknowledged, and has since become commonly accepted, that climate change is adding to Australia's natural climatic variability and is driving extreme weather which is a contributing to increased bushfire hazards. Specifically, a mix of climate drivers in the past few years that led to an extended dry period, hotter-than-average temperatures and reduced humidity in south-eastern Australian states played a significant role in the intensity and spread of the 2019-20 bushfires.

The link between climate change and the extreme fire weather both leading up to and during the 2019-20 bushfire season has been widely reported. For instance, in their submission to the Bushfire Royal Commission the Grattan Institute state that human-caused climate change had made the 2019-20 bushfires 80 per cent more likely to happen and if global temperatures continue to rise to 2°C above pre-industrial levels, bushfires in Australia like those of 2019-20 will be about eight times more likely[13]. The CSIRO also suggested that the impact of climate change has led to longer, more intense fire seasons and an increase in the average number of elevated fire weather days, as measured by the Forest Fire Danger Index (FFDI)[14].

The FFDI is a common measure of fire weather conditions and reflects longer-term rainfall and temperature patterns and shorter-term weather. The Bureau of Meteorology (BoM) explains that fire risk is driven by fire weather and fuel availability and the severe rainfall deficiencies and drought exacerbated the fire weather conditions which last year saw the highest annual accumulated FFDI on record.[15]

Figure 2 – Accumulated FFDI deciles for December 2019

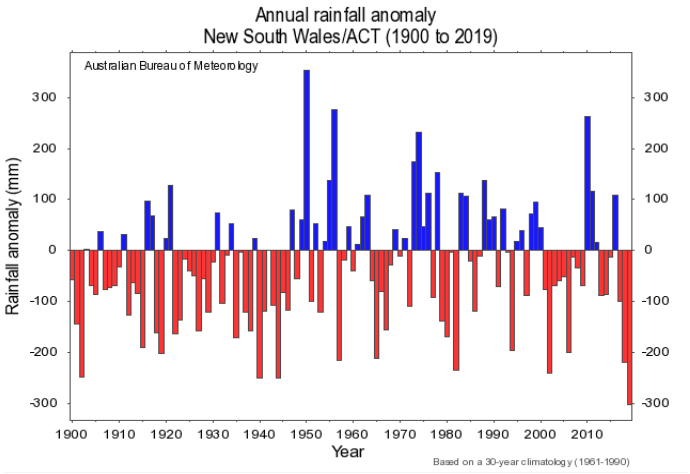


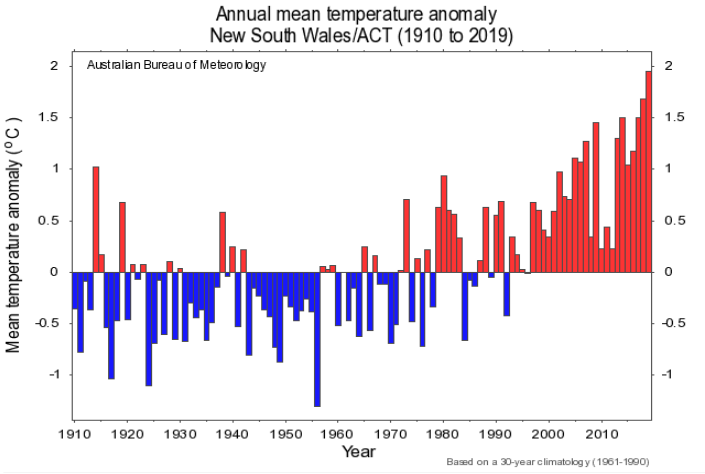
Source: Bureau of Meteorology

The BoM observed that by the start of September 2019, much of eastern Australia was primed for high fire danger ratings. Rainfall for January to August 2019 was very much below average to driest on record in some locations. In addition to 2019 being Australia's warmest on record, rainfall in spring 2019 was below average to lowest on record over many areas of Australia. For Australia as a whole, rainfall was 62% below average, making it the driest spring on record. The low rainfall added to pre-existing dry conditions and low soil moisture, exacerbating the drought conditions in eastern Australia (meaning forest fuels remained dry) with much of NSW in serious to severe rainfall deficiency.

[13] Grattan Institute, The health effects of the 2019-20 bushfires, April 2020, p. 9
[14] CSIRO, The 2019-20 Bushfires: A CSIRO explainer, February 2020
[15] Bureau of Meteorology, Special Climate Statement 72 – dangerous bushfire weather in Spring 2019, December 2019, p. 5

Figure 3 – Annual rainfall and temperature anomaly trends (NSW & ACT)





Source: Bureau of Meteorology

The BOM confirmed that hot conditions combined with the dry landscape and strong winds produced dangerous fire weather conditions during December 2019 and into early January 2020, extending the dangerous conditions they had reported in Spring 2019.[16] Over this period numerous temperature and (low) rainfall records were broken with the most notable being Australia's hottest average day recorded on 18th December (41.9°C)[17]. They also noted the increased temperature and reduced winter rainfall trends was at its largest in southern and eastern Australia.

Bushfire ignition

In discussing the likely source of ignition, NSW RFS Inspector Ben Shepard indicated that lighting strikes were responsible for the bushfire crisis:

> *"I can confidently say the majority of the larger fires that we have been dealing with have been a result of fires coming out of remote areas as a result of dry lightning storms."*[18]

The RFS have acknowledged that lighting strikes ignited the Gospers Mountain fire[19] and Green Wattle Creek fire and that all of the major blazes in the Snowy Mountains and South Coast which took hold over the Christmas and New Year's period were also started by lightning.

The findings of subsequent internal investigations conducted by the NSW RFS indicate that failed backburn operations designed to mitigate the risk posed by the Green Wattle Creek and Gospers Mountain fires led to fires in Balmoral in the Southern Highlands and in Bilpin and Mount Wilson in the Blue Mountains.[20]

Furthermore, Endeavour Energy has access to the NSW RFS ICON system which contains, amongst other things, situation reports for each fire incident. These situation reports state that causes of the eleven fires listed in Table 1 were; lightning (8), natural (1), external equipment use (1) and suspicious (1). Of note, the cause of the Gospers Mountain, Green Wattle Creek and Currowan fires are recorded as 'lightning', 'lightning' and 'natural' respectively.

[16] Bureau of Meteorology, Special Climate Statement 73 – extreme heat and fire weather in December 2019 and January 2020, March 2020, p. 9
[17] Six other days in the month also exceeded the previous record.
[18] ABC News, The truth about Australia's fires – arsonists aren't responsible for many this season, 18 January 2020
[19] Announcement from the NSW RFS, Gospers Mountain fire is now contained, 12 January 2020
[20] ABC News, Backburns backfired at Balmoral and the Blue Mountains, RFS investigation finds, 10 June 2020

4.1.4. Mitigating the impact of bushfires

Across Endeavour Energy's network area 89% of the land area is classified by the NSW Rural Fire Service as bushfire prone, with 48% of conductors and 36% of poles located in bushfire prone areas. Preventing network-related bushfire starts and the impact of fires on supply reliability is therefore a high-priority network management focus area.

A continuation of recent extreme weather trends, in terms of both frequency and severity, will continue to test the resilience of the network. Whilst we recognise it is not practical or efficient to build the network to withstand all potential weather events, we are committed to improving the understanding of how climate variability might impact the services we provide to our customers.

For instance, in network planning and investment decisions we consider the future forecast of fire risk associated with climate change based on Climate Council economic forecasts. Additionally, we have engaged with the CSIRO and various universities to understand the growing risks of climate variability. We also use Weatherzone's scientific prediction models for the coming year to improve preparedness for anticipated weather conditions and events.

Network maintenance and design

Endeavour Energy's network assets are maintained over the course of their serviceable life, consistent with industry standards and business objectives. Our policy is to ensure that the network is maintained to a standard appropriate to manage the risk of bushfire ignition, with respect to safety, reliability, quality of supply and impact on the environment.

Where shown to be cost effective, Endeavour Energy designs the network to protect it from bushfires. For instance, we make vulnerable zone substations located adjacent to bushland "fire proof" by using vegetation exclusion zones and protective fire walls. The benefit of this approach was demonstrated during the 2019-20 bushfire event when Tomerong sub-transmission substation was able to withstand fires that burned around it. Its design encompasses the recommendations from the NSW RFS publication *Planning for Bushfire Protection (PBP) 2006* and the Australian Standard - *Construction of Buildings in Bushfire Prone Areas (AS3959) 2000.*

Figure 4 - Bushfire mitigation features of Tomerong sub-transmission substation

Endeavour Energy also adopts prudent bushfire risk management and vegetation management strategies to reduce the risk of bushfires caused by network assets and aerial consumer mains to as low as reasonably practicable (ALARP) level. The approach to the reasonable management

and mitigation of the probability and consequences of bushfire incidents on the network is summarised below.

Bushfire risk management

In accordance with the requirements of the *Electricity Supply (Safety and Network Management) Regulation 2014* (NSW), Endeavour Energy has in place an Electricity Network Safety Management System (ENSMS), which also complies with Australian Standard AS 5577 – Electricity network safety management systems. The ENSMS details the risks associated with the operation of the electrical network as well as the controls that are used to eliminate these risks or reduce them to ALARP.

The assessment and management of these risks is discussed in a set of Formal Safety Assessments (FSAs). To minimise the bushfire risk, the Bushfire FSA (Attachment 5) detail the hazards and control mechanisms that Endeavour Energy applies to the risk that its network and activities associated with the design, construction, maintenance and operation of the network will start a bushfire or other vegetation-related fire.

We provide this as supporting evidence to demonstrate that Endeavour Energy has an effective risk management framework and was managing bushfire risks in accordance with good industry practice prior to the commencement of the 2019-20 bushfire season and the impact of the bushfires was therefore not exacerbated by any action or inaction on Endeavour Energy's behalf.

Vegetation Management Program

In accordance with Endeavour Energy's Vegetation Clearance Management standards, Endeavour Energy conducts a cyclic program of tree maintenance works that matches the risk profile of the vegetated network area. For example:

a) The 12-month program is undertaken in high bushfire risk areas that are generally in and around urban centres on Endeavour Energy's distribution network.

b) The 15-month program is conducted on the peri-urban interface with a combination of distribution and transmission assets; and

c) The 24-month program is generally conducted in rural areas on greater voltages within transmission easements.

The Vegetation Management Program (VMP) aims to maintain safe clearance distances between vegetation and the network's overhead power lines and associated assets (such as poles and towers), including identifying and addressing dead, dying or visually damaged vegetation.

We have a related program for overhead, ground and below ground line inspections across the network (OLI/GLI Program). The main focus of this program is to identify asset defects (namely defects in poles and overhead mains), however it also seeks to identify vegetation encroachments into clearance zones around the overhead mains.

We also perform an annual Pre-Summer Bushfire Inspection Program (PSBI) in bushfire prone areas, including the wide use of LiDAR (Light Detection and Ranging) technology to identify issues that could potentially lead to the ignition of a bushfire. The PSBI Program is focused both on network asset defects and vegetation encroachments affecting the network, with a target for the rectification of all identified bushfire defects before 1 September. The purpose of the PSBI Program is to operate as an extra layer of inspection and checking for the parts of the network within declared bushfire prone areas prior to the start of the designated bushfire season.

4.1.5. Insurance

Whilst Endeavour Energy utilises insurance as a mitigation control measure to managing exposure to bushfire liability and property damage (e.g. substations, depots and buildings), we do not insure against bushfire damage to poles, pole-top structures and overhead conductors.

Obtaining insurance coverage does not represent an efficient approach to managing the risk of damage to, or loss of, these assets. The main reasons for this include:

- The insurance market, both domestically and internationally, is very limited and does not provide us with access to coverage on commercial terms, particularly for assets in high bushfire risk locations. The increasing frequency and severity of bushfire events worldwide has contributed to the tightening of insurance markets for bushfire coverage for electricity networks in recent years.
- Where coverage is available, large premiums combined with a large policy excess have shown this class of business not to meet the risk for reward level.

High insurance costs and limited availability prevents us from relying on commercial insurance arrangements as a prudent risk mitigation measure against bushfire damage for these classes of assets. It should also be noted that the statutory charges that are charged on top of the premium, amount to an additional 50% of the cost. The premium would be based on the total value of poles and wires across the network that may or may not be involved in a fire.

Rather than insuring these assets, the approach to managing exposure to bushfires (and natural disaster events more broadly) is via a nominated pass through event as this represents the most cost effective and appropriate means for managing this type of risk. We understand the approach to managing this risk is generally consistent with comparable peer NEM networks including those also impacted by the 2019-20 bushfires.

4.1.6. Natural disaster declaration

Over the course of the bushfire season and acting on the recommendation of the RFS Commissioner, the NSW Government declared a State of Emergency three times under Section 33 of the State of Emergency and Rescue Management Act. These declarations were valid for seven days commencing on:

- 12 November 2019
- 19 December 2019
- 2 January 2020

The NSW Government also declared the 2019-20 bushfires a natural disaster in 51 Local Government Areas (LGAs) across the state.[21] This declaration applied to the NSW bushfires after 31 August 2019 and included the Lithgow, Blue Mountains and Hawkesbury LGAs (Gospers Mountain fire), Wingecarribee and Wollondilly LGAs (Green Wattle Creek fire) and Shoalhaven LGA (Currowan fire).

The information provided in this section 4.1 demonstrates the 2019-20 disaster bushfire event was an exogenous, uncontrollable event that was not a consequence of the acts or omissions of Endeavour Energy. We consider no prudent risk management framework could have prevented

[21] Resilience NSW, Natural Disaster Declarations 2019-2020

the bushfire event from occurring, nor mitigate its impact on the distribution network. Endeavour Energy's vegetation and bushfire risk management processes reflect prudent and effective actions to limit both the customer impact of the 2019-20 bushfire event and the magnitude of the pass through amount.

4.2. Materially higher costs of providing direct control services

We expect to incur additional costs totalling of $31.3 million (real, 2019-20) from providing direct control services solely as a consequence of the 2019-20 bushfires. A breakdown of these costs is provided in section 5.3.

The NER requires Endeavour Energy to demonstrate these costs are material with 'materially' for the purposes of cost pass throughs defined in the NER as:

> *an event results in a Distribution Network Service Provider incurring materially higher or materially lower costs if the change in costs (as opposed to the revenue impact) that the Distribution Network Service Provider has incurred and is likely to incur in any regulatory year of a regulatory control period, as a result of that event, exceeds 1% of the annual revenue requirement for the Distribution Network Service Provider for that regulatory year.*

The materiality of the additional costs as a result of the bushfires is shown in Table 2 below. This demonstrates that the 2019-20 bushfire event satisfies the NER materiality threshold requirement.

Table 2 - Materiality of the bushfire event (cost impact)

$(m); real 2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Incremental bushfire costs	15.1	18.0	(0.6)	(0.6)	(0.6)
ARR (unsmoothed)[22]	555.9	846.3	871.2	861.1	787.7
Materiality of bushfire event	**2.7%**	**2.1%**	**(0.1)%**	**(0.1)%**	**(0.1)%**

The definition clearly distinguishes the 'costs' of the event from the 'revenue impact' of the event as the basis for the materiality assessment. However, the term 'costs' is not defined in the NER and consequently has been subject to divergent views as to its precise meaning in the context of the pass through framework.

We consider the conventional meaning of the word 'costs' suggests materiality is assessed as the expenditure incurred by the DNSP as the result of the occurrence of the positive change event. This would ensure that unforeseeable and uncontrollable events that have not been provided for in a revenue determination, and have a material impact on the costs of providing distribution services, are assessed for eligibility on an equal basis irrespective of whether the network incurs additional capex or opex as a result of the event.

However, the AER has in previous cost pass through decisions considered that the term 'costs', in this context, refers to the sum of operating expenditure, return on capital, return of capital and tax (and other adjustments), consistent with the building blocks described in clause 6.4.3 of the Rules. In other words, the AER has assessed the materiality of the cost pass through event on the

[22] AER, Endeavour Energy 2019-24, Post-tax revenue model, 2020-21 return on debt update, March 2020

basis that the adjustment required to annual revenue, as opposed to costs, exceeds 1% of annual allowed revenues.[23]

Consequently, by incorporating the incremental bushfire costs into the PTRM approved by the AER for 2019-24 we also demonstrate how the materiality requirement is satisfied in a way that accords with the AER's historical position on the meaning of 'costs'. This is shown below in Table 3.

Table 3 - Materiality of the bushfire event (revenue impact)

$(m); nominal	2019-20	2020-21	2021-22	2022-23	2023-24
ARR (unsmoothed)	569.4	887.8	936.1	947.7	888.0
Incremental bushfire costs + ARR	579.4	906.2	935.8	947.4	887.6
Difference	10.0	18.4	(0.3)	(0.4)	(0.4)
Materiality of bushfire event	**1.8%**	**2.1%**	**(0.0)%**	**(0.0)%**	**(0.0)%**

The revenue impact of the 2019-20 bushfire event exceeds the threshold requirement in both the 2019-20 and 2020-21 regulatory years. The costs associated with the bushfires (i.e. the change in costs as the result of the event) therefore satisfy the pass through materiality criteria under both readings of the definition.

4.3. Contingent project or trigger event

Contingent projects or associated trigger events are not included within the definition of a positive change event. Endeavour Energy did not propose any contingent projects in the 2019-24 revised regulatory proposal.[24] Subsequently, the AER's final determination did not provide for a contingent project.

Therefore, the 2019-20 bushfire event cannot be excluded from consideration as a positive change event on the basis it is not a contingent project.

[23] This interpretation may have been due to previous drafting of the NER. Updates to the NER as part of the *AEMC's Economic Regulation of NSPs* rule change in 2012 have clarified the definition of "materially" to refer to 'cost' that aligns with Endeavour Energy's interpretation.

[24] The Western Sydney Airport Growth Area was initially included as a contingent project in our 2019-24 regulatory proposal. It was not included in our revised regulatory proposal as further certainty around the project needs and timeframe was obtained which meant it would not comply with the NER requirements for consideration as a contingent project.

5. BUSHFIRE RESPONSE AND COSTS

The bushfires damaged significant parts of Endeavour Energy's network in the three operational regions. Poles, conductors and other overhead assets across the range of operating voltages in the distribution and sub-transmission networks were impacted.

No major substations were destroyed despite the size, intensity & duration of the fires. Hartley Vale zone substation (Blue Mountains) suffered minor damage and Tomerong sub-transmission substation (South Coast) avoided destruction through its fire wall, maintaining supply to more than 30,000 customers.

Damage to the network triggered numerous faults that contributed to almost 150 bushfire related interruptions impacting over 55,600 customers during the bushfire event. The average outage was 2006 minutes (33 hours and 26 minutes) with some affected customers experiencing multiple outages.

Table 4 – Supply interruptions related to the 2019-20 bushfire event

Region	Number of interruptions	Customers affected
North	51	6,376
Central	44	7,244
South	51	42,691
Total	**146**	**55,658**

In this section, we outline Endeavour Energy's incident management framework which guided the bushfire response. This section also provides an overview of the costs we have incurred, or expect to incur, in responding to damage sustained to the network and managing the associated impacts this had on customers. We provide an explanation of these costs to demonstrate that they were incurred as a sole consequence of the bushfires.

Costs pertaining to the 2019-20 bushfire event have been captured in accordance with BAU costing methodology and processes. These processes are described in Endeavour Energy's Cost Allocation Method which was approved by the AER in March 2018.

5.1. Managing Endeavour Energy's bushfire response

The rapid spread of multiple bushfires and the increasing threat of property damages and the safety of customers in several communities necessitated a multi-agency response led by the NSW RFS. Effective engagement and communication with other emergency and essential service organisations, including other distribution networks, was critical to responding to the needs of our customers.

Endeavour Energy worked collaboratively with the RFS and was involved in critical decisions relating to sensitive loads that required a reliable electricity supply (e.g. water pumping stations, communications towers). This collaborative approach enabled us to determine areas which were safe to access to allow repair work and what areas were closed due to planned backburning and fire activity. To facilitate the response, we:

- provided an Endeavour Energy representative to the Energy and Utility Service Functional Area Committee (EUSFAC) which sits with the State Emergency Operations Centre (SEOC)
- allocated Liaison Officers to all Local Emergency Operations Centres (LEOC). The LEOCs facilitated coordination and prioritisation of response activities between multiple organisations including NSW RFS, local councils, police, ambulance, Rescue NSW, NSW Roads and Maritime Service, National Parks & Wildlife Service

Liaison Officers provided live updates of active fire areas and also monitored areas where field crews were located to provide advance warning of weather changes or backburning operations. Liaison Officers also controlled access to fire grounds for field crews.

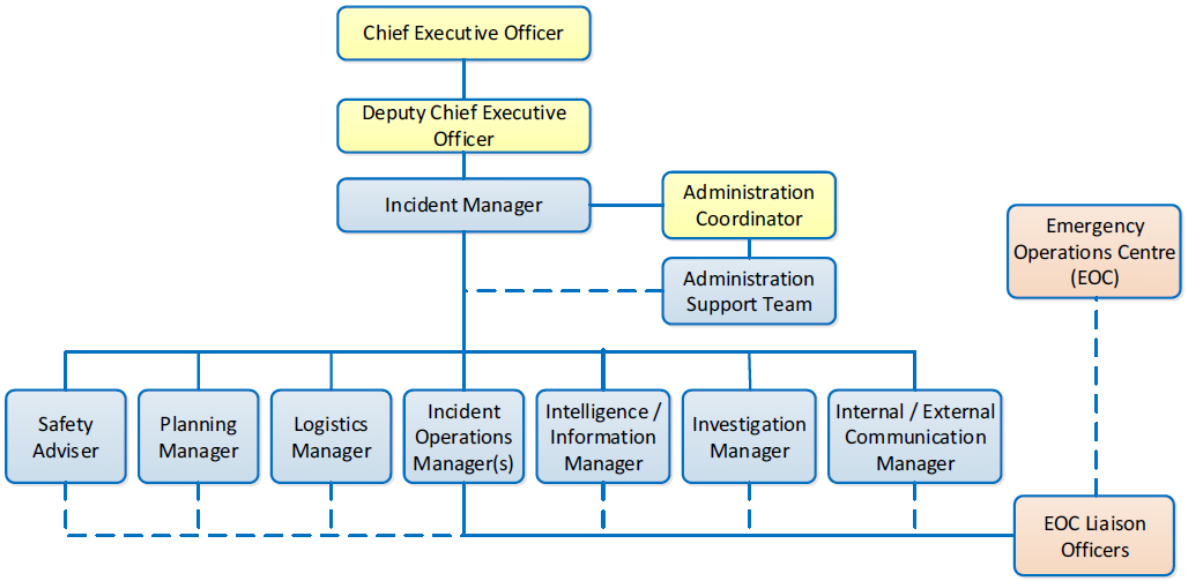
At an organisational level, we implemented the Incident Management Plan (IMP) once it became clear that managing the impact of multiple bushfires across each of the network regions required a coordinated response and significant re-prioritisation of the operational needs and resources. The IMP has a broad scope and has been designed to respond to a wide range of major network incidents. It defines the actions to be taken upon declaration of a major disruptive event by providing:

- guiding principles for response;
- the company's structure for management of an incident;
- roles and responsibilities for management of an incident;
- escalation and notification schedules;
- checklists for initial considerations upon activation of an incident;
- checklists to monitor that planning addresses all the relevant issues; and
- the type of documentation required to be retained.

In accordance with the IMP, an Incident Management Team (IMT) was formed to oversee the bushfire response. The expertise and capabilities of the System Control team was relied upon by the IMT and critical in providing a central coordination and support role throughout the bushfire event. Endeavour Energy’s General Manager Operations was designated as the Incident Manager and assigned a number of IMT roles to management level staff. These employees ceased their BAU activities and committed their full time and effort to their specific IMT role.

This structure allowed restoration strategies and priorities to be set by the IMT. The IMT ensured all of the information coming from the command centres was disseminated for decision making and also provided assistance with sourcing poles required for urgent repairs to the network.

Figure 5 - Incident Management Team structure



System Control was responsible for prioritising emergency response work with clear lines of communication established to ensure they were kept informed of developments across the network. Prioritisation of repairs was made with input from LEOC, EUSFAC and local storm centres based on sensitive loads, damage severity, customer impact and safety. As well as managing restoration after repairs, the Control Room also monitored for new faults on the network and liaised with the LEOC as fire fronts were approaching assets. They were also responsible for complying with requests (from the LEOC) to deenergise assets as fires were approaching.

Local management structures were relied upon for managing additional field crews. Regional Distribution and Transmission Managers were responsible for coordinating the required field work and ensuring depots were adequately resourced to complete this work. Decisions on staff resourcing requirements were made by field service centres and were typically based on assessments of localised damage; the type of work and skill required; fire activity and whether the RFS had granted safe access (or were likely to); and any relevant information provided by System Control regarding the required repair work (with sensitive loads given priority).

This also applied to decisions on engaging external resources to improve our ability to effectively plan and dispatch work. Local and regional contractors assisted internal staff to rebuild the network to restore supply and perform specialised activities which could not be provided by internal staff (e.g. tree clearing, traffic management). We also made requests to Ausgrid and Essential Energy for field staff and equipment to expedite supply restoration work.

Endeavour Energy's bushfire response required a whole-of-business effort with 92% of our total field staff engaged in bushfire recovery work. The response included significant contributions from several organisational branches including Field Operations; Delivery Excellence; Major Contracts; Customer Service; Procurement; Fleet and Logistics; Technology Operations and Corporate Affairs.

Figure 6 – Emergency and essential service representatives at a LEOC

Industry collaboration

The New South Wales distribution networks have had a long-standing protocol of working as an industry sector during times of major natural disasters. This enables rapid movement of additional skilled workers and equipment to other networks experiencing extensive damage where needed. This protocol formed part of the collective 2019-20 bushfire response and proved to be a valuable strategy in restoring power to customers quickly.

We sent lifter borer crews to Essential Energy to assist them in the task of replacing over 2,000 poles damaged by bushfires. We also provided crews to assist Essential Energy to repair their damaged sub-transmission network between Moruya and Batemans Bay on the South Coast, many of whom had been without power for nearly a week.[25] We received assistance from both Essential Energy and Ausgrid who provided plant (lifter borers) and crews to help replace poles and restore supply in the South Coast.

Recognising industry collaboration would be beneficial for distribution networks being impacted during the bushfire crisis, Endeavour Energy initiated a National Bushfire Networks Coordination Group. This group brought together networks from across NSW, Victoria, South Australia and Queensland to share information and identify areas for support and assistance. A key initiative from this group was an industry-wide stocktake of essential equipment, including poles and human resources. Also, satellite phones from Queensland distributors were sent to us to assist with communications difficulties we had experienced during our initial response in the South Coast.

Also, a Ministerial Roundtable at Parliament House was held to discuss the Electricity Sector Bushfire Response and Recovery. This led to the Australian Defence Force assisting by removing hazardous trees near assets in the Lithgow area (Blue Mountains).

5.2. Supporting our customers and communities

Recognising the disruption caused by the bushfires and the criticality of restoring power to communities so that they could protect themselves from the bushfire threat, we established a Bushfire Customer Management Plan.

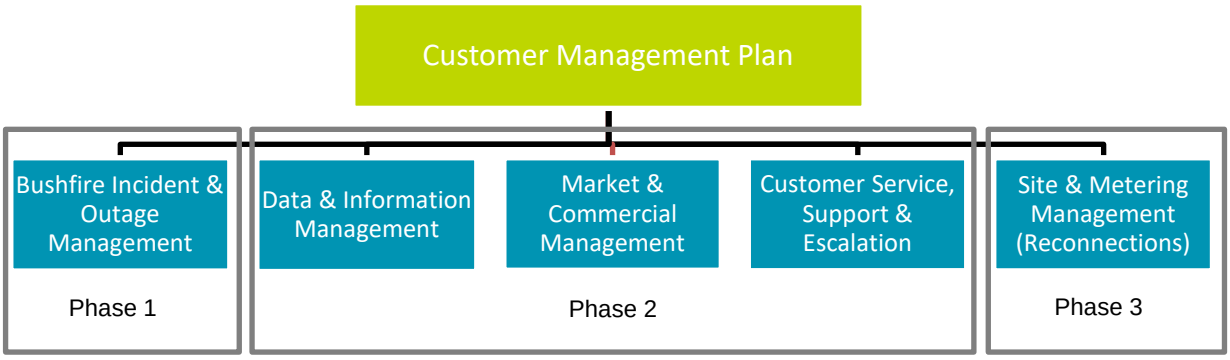
The plan was broadly focussed on keeping customers safe and informed and developing a simple process for restoration. Our customer response was multifaceted and focussed on: management of extended supply outages; auditing notifications of impacted connections and data cleansing to

[25] Costs incurred from providing assistance to Essential Energy to repair their network have not been included in this cost pass through application.

ensure accurate information capture; and simplifying the process for customers reconnecting to the network.

To achieve this, we established a Customer Management Working Group consisting of key senior stakeholders within Network Operations, Corporate Affairs, Customer Service and Network Connections to progress our customer response activities. Two Customer Service staff (with relevant skill sets in contact centre and back office market operations) were temporarily appointed to 'Bushfire Customer Liaison Roles' dedicated to assist internal and external customer response activities.

Figure 7 - Bushfire Customer Management Plan



In addition to Federal and State Government funded support services and financial assistance, we also developed a bushfire assistance package which was designed to make life easier for customers affected by the bushfires. Our customer assistance package included:

- waiving reconnection fees for residents and small businesses whose property was destroyed in the fires.
- free electrical inspections of fire damaged property, and
- tailored advice on how to reconnect where the customer's electrical services were damaged.

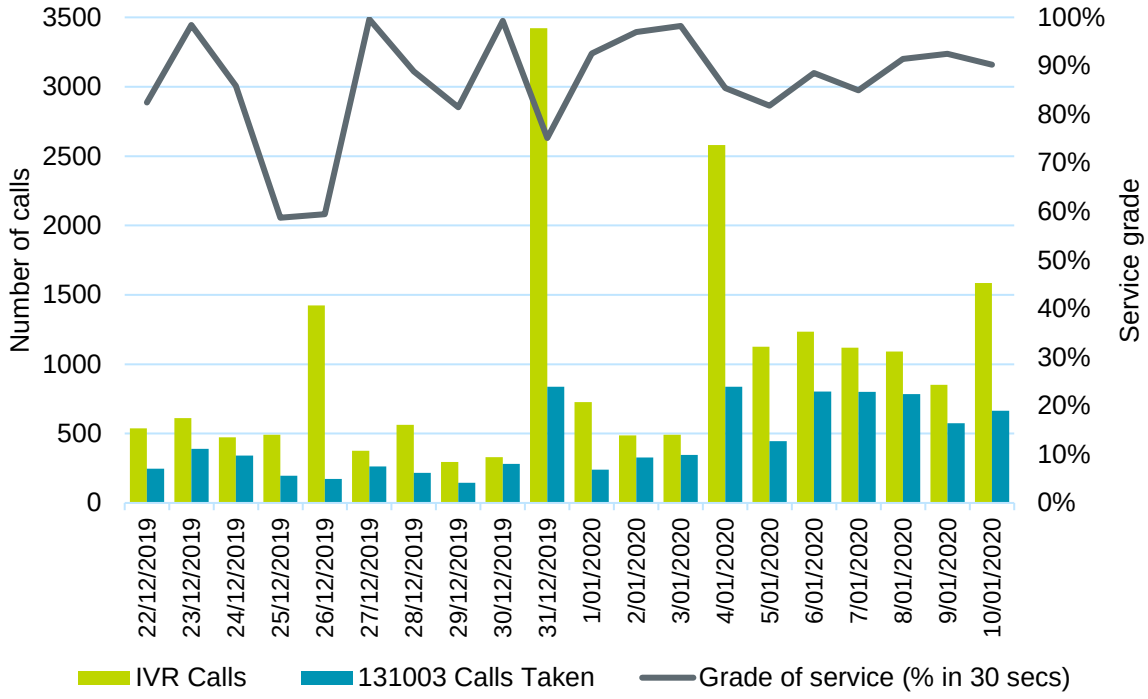
As part of the relief package, we provided $100 supermarket gift vouchers to cover food spoilage for those customers that endured extensive power outages. In total 246 vouchers were issued to affected customers.

Endeavour Energy also participated in an Energy Charter industry working group of retailers and affected networks. Customers benefitted from this initiative as retailers and networks worked collaboratively to share customer data, simplify customer communication, set minimum standards for incident updates between organisations and generate the best possible outcomes for re-connecting customers. This was also valuable for retailers who often did not have a high level of visibility of customers with damaged or destroyed properties.

We shared learnings with other network businesses through Energy Networks Australia's Communications and Engagement working group and provided regular updates to Endeavour Energy's Peak Customer and Stakeholder Consultative Committee about our progress and response to the fires. Endeavour Energy also worked closely with Essential Energy with regard to the management of customer queries on the South Coast.

Endeavour Energy's Contact Centre provided an important service of informing bushfire affected customers of supply restoration developments. As Figure 8 shows, we were able to maintain a high standard of service despite significant spikes in call volumes during the peak of the bushfire event.

Figure 8 - Call volumes and grade of service



Contact Centre team members were provided with updated information and key contacts in other nominated business sections to enable customer queries to be addressed promptly. New information received through calls was recorded in internal systems and relayed to Systems Operations where appropriate.

Information was also made readily available to customers through the Endeavour Energy website which was updated on a daily basis between mid-December until the end of January. This was supplemented with information updates communicated through Endeavour Energy's social media pages, namely Facebook and Twitter. We also provided information via a range of conventional media outlets with the General Manager Operations providing status updates on network outages, restorations and response activities as well as advice to affected customers on national TV news bulletins.

Figure 9 - Operational updates provided to Sunrise (Channel 7)

Temporary supply

Where affected customers faced lengthy delays in having their grid supply restored, temporary solutions were required. This included the deployment of mobile generators where the damage to the network was extensive and could not be repaired in a timely manner.

To supplement Endeavour Energy's existing stock of generators, a range of large and small fuel generators were leased from equipment hire providers (e.g. Aggreko, Kennards, Coates Hire).

We used generators more extensively in the 2019-20 bushfire event than ever before to provide a temporary supply to remote communities like Mt Wilson, Mt Irvine, Daragan (Blue Mountains), Kangaroo Valley (Shoalhaven) and Termeil (South Coast). During the bushfire event, we deployed 95 portable diesel generators to provide temporary supply to approximately 900 customers.

5.3. Overview of costs

The bushfire response effort has had a material impact on the costs of providing direct control services. After adjusting total reported costs (for reasons explained in section 6.2), we expect to incur a $31.3 million (real, 2019-20) increase in costs which was not included as part of Endeavour Energy's operating and capital expenditure allowance in the AER's 2019-24 distribution determination.

This increase in costs is directly attributable to our supply restoration efforts in bushfire affected locations and would not have been incurred had the 2019-20 bushfire event not occurred. The breakdown of the costs between capex and opex is outlined in the table below.

Table 5 - Incremental cost increase from 2019-20 bushfire disaster event

$(m); real 2019-20	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Operating expenditure	9.76	17.23	(0.60)	(0.60)	(0.60)	25.21
Capital expenditure	5.37	0.71	0	0	(0.02)	6.06
Total expenditure	**15.13**	**17.95**	**(0.60)**	**(0.60)**	**(0.62)**	**31.27**

The increase in opex is driven by a range of emergency response activities, with tree clearing and removal activities being the most significant contributor. The increase in capex mainly relates to the replacement of poles, conductors and other overhead network infrastructure damaged by the bushfires. A category level breakdown of the total bushfire opex and capex (i.e. prior to incremental cost adjustment) is provided in Tables 6 and Table 7 respectively.

Table 6 – Total Bushfire standard control service opex

Service category	Activities undertaken	($m); real 2019-20
Emergency response	Activities related to the immediate bushfire response (up to February 2020) and field work to repair network damage and restore supply site access was permitted. Activities include: network scoping and asset inspections, asset repair and maintenance, customer service and assistance. Costs include a portion of internal labour costs and charges for services provided by contractors and other DNSPs.	**3.32**
Vegetation management[26]	Initial "safe access": Tree trimming and clearing work to allow crews to access network assets and perform repair and replacement work.	**2.00**
	Distribution bushfire rectification work program: Remedial tree removal program to address "fall in" risk of bushfire impacted trees on the distribution network.	**11.46**
	Sub-transmission bushfire rectification work program: Remedial tree removal program to address "fall in" risk of bushfire impacted trees on the distribution network.	**9.24**
Other network opex	Ancillary support costs including plant and equipment hire, motor vehicle and fuel costs, travel and staff accommodation expenses and courier/delivery charges.	**0.29**
Total opex		**26.31**

Table 7 – Total Bushfire standard control service capex

Asset category	2019-20	2020-21	($m); real 2019-20
Low voltage lines and poles	1.57	0.19	1.76
Distribution lines and poles	6.64	0.59	7.23
Sub-transmission lines and poles	0.38	0.43	0.81
Transformers	0.06	-	0.06
Total capex	**8.66**	**1.20**	**9.86**

[26] The vast majority of these costs are attributed to the fault and emergency response cost category in accordance with our Cost Allocation Method. We have extracted vegetation management costs to improve transparency of these activities which contribute significantly to the pass through amount.

5.4. Our restoration activities

The broad objective of our bushfire emergency response was to restore services to homes and businesses as quickly as possible where it was safe to do so. This approach was centred on the understanding that, as an essential service, safely restoring electricity supply during and after a state of emergency event is critical to supporting affected communities and customers.

Our commitment to supporting affected communities was reflected in our efforts to restore supply to communication towers at Kingiman and Boyne to enable people to access emergency broadcasts and safety information. We also made power available to pump fuel to emergency service operations and assist holidaymakers leaving the South Coast following the NSW Government evacuation orders.

For all but approximately 200 customers on the South Coast we were able to restore supply within 10 days. Achieving this outcome required a large response from our staff many of whom returned early from or cancelled booked holiday leave to contribute to the restoration efforts over the Christmas and New Year's period. Utilising external third-party contractors for specific activities at various times during the bushfire event enabled us to expediate supply restoration work.

5.4.1. Vegetation clearing and tree removal

The most significant damage to the network was sustained in areas of heavy vegetation where fire affected trees had fallen directly on, or in close proximity to, network poles and conductors. This presented a safety and environmental risk which required rectification.

Numerous damaged trees outside of standard clearance zones also required trimming or removal to mitigate the risk of subsequent falls impacting the safety of the public and response workers and to protect existing or newly replaced network assets from further damage. This risk to safety was demonstrated in Balmoral during December when two RFS volunteers died after a burnt tree fell into the path of their RFS truck.

Clearing fallen and hazardous trees was a high priority activity in our bushfire emergency response. This work was required to provide safe access for crews and allow supply restoration and replacement work to take place and was the focus of the vegetation management activities during the initial stages of response (i.e. November 2019 - February 2020). This was mainly required around distribution conductors in urban distribution areas and was performed by external contracted service partners and in some locations the RFS and Army.

Once the initial fire period had abated, efforts turned to scoping all impacted areas to understand the scale of activities required to manage fire affected hazard trees that had the potential to fail onto the electricity network. We deployed staff trained in Endeavour Energy's Hazard Tree Identification Course to quantify the extent of the damage caused by the fires.

By June 2020, all impacted spans had been scoped with approximately [redacted] trees identified as requiring remediation. Specifically, scoping revealed:

- trees on approximately [redacted] impacted spans on the sub-transmission network (average 80 trees per span[27]) require removal and/or canopy modification to remove the fall in risk to the electricity network;
- trees on approximately [redacted] impacted spans on the distribution network (average 20 trees per span) require removal and/or canopy modification to remove the fall in risk to the electricity network; and
- approximately [redacted] spans located in fire affected areas require no work as it was deemed that these trees did not pose a greater than normal risk of failing onto the electricity network.

Following this investigation, remediation plans were developed with activities separated into sub-transmission and distribution work programs.

Sub-transmission work program

For the sub-transmission program, work involved tracing each transmission feeder through the impacted areas and removing trees that were damaged either in the easement or on the fringe of the easement and close enough to fall within an unsafe distance to the network. To minimise the cost of delivery and to facilitate completion before the start of the 2020-21 bushfire season, this was done using large machinery, such as Tree Harvesters.

Sub-transmission work is generally located in heavily treed (bushland) areas of the network and require large clearances to be established with distances between conductors and tree lines dependant on the operating voltage. The aim of the response was to ensure that trees that had the potential to fail on to the network were removed which in some cases required an additional 10 metres to be established from the existing tree line.

Distribution work program

A similar process was followed for managing vegetation impacting the distribution network. The distribution program is focussed on impacted vegetation around 11kV and low voltage powerlines feeding urban and rural townships in heavily treed areas and involved a significant amount of clean up works within the streetscapes of local communities. Remediation work involved removing large trees by deploying a range of plant (e.g. Elevated Work Platforms, Cranes, Chipper and Tippers) and field resources to assist in the dismantling and removal of material from site.

The scoped work packets that have been developed to remove trees that pose a risk to network safety and reliability for the distribution and sub-transmission network are expected to be completed by the end of FY21.

Figure 10 shows the proximity of tall burnt out trees to distribution powerlines and the removal of hazardous trees to provide a visual perspective of the tree clearing activities that need to be undertaken.

[27] Average number of trees is based on conservative estimates consolidated from field observations of the number of trees removed within an average span across the range of geographic areas affected by the fires and pre and post photographic information provided by our contractor Asplundh.

Figure 10 – Clearances before and after remedial tree clearing works

Examining hazardous trees

In efforts to identify hazard trees, Endeavour Energy's AQF Level 5 Consulting Arborists have been continually reviewing the conditions by which the impacts of high intensity fires affect the stability of root plates (the structural architecture of a tree) contributing to tree failures. Many hundreds of trees were individually reviewed and it was noted that in addition to the obvious destruction of large stands of burnt trees, the appearance of healthy trees (that is, trees that retained their canopies) were structurally compromised.

The intensity of the fires had a significant impact on soil biota as the soil retained a significant amount of heat after the initial fire storm, roots continued to smoulder and trees that would typically respond with the onset of epicormic shoots (a stress response after fire), were delayed or non-existent. Trees affected in this way were witnessed to fall on to the electricity network months after the fires had abated.

Upon closer examination arborists noted that the internal structures of the trees were burnt beyond their capacity to remain structurally viable, that is, greater than 80% of the internal tissue was completely burnt. Figure 11 shows some examples of trees that failed after the initial fire.

Figure 11 - Tree falls after the bushfire event

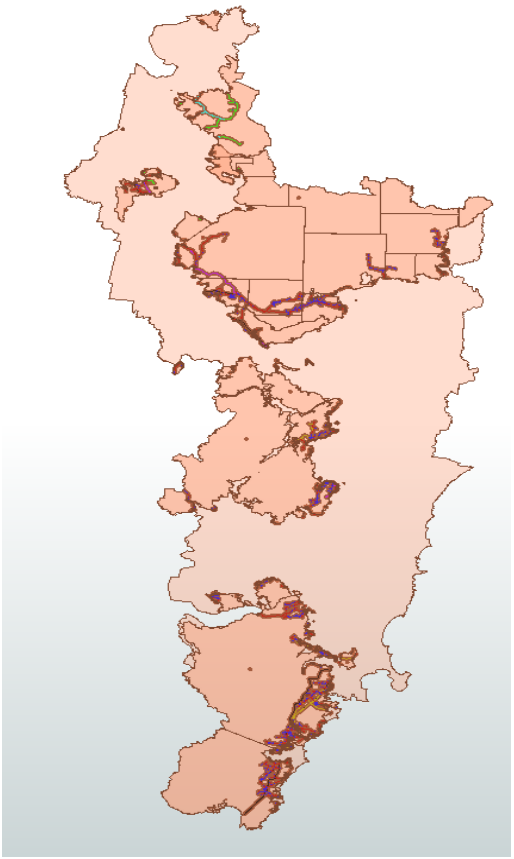
5.4.2. Network scoping and inspections

A critical activity in the initial stages of the recovery effort was patrolling and scoping the affected distribution and sub-transmission poles and lines to complete a safety assessment and establish the cause of network faults and extent of asset damage. Obtaining this information was a critical first step in the field response which was then used to plan and prioritise packages of work to be carried out by Endeavour Energy field crews and contractors.

This work was performed as soon as practically possible once approval for access was granted by the NSW RFS, recognising that for many affected residents restoring electricity supply was a high priority.

Figure 12 displays the location of Endeavour Energy's network assets within the bushfire impacted areas. Although not all these assets required a detailed inspection, it demonstrates the scale of the scoping and inspection activities required to assess the impact the fires had on the performance and safety of network assets.

Figure 12 - Network assets within the bushfire affected zones



In total, 16,183 individual components which make up the network were located within the bushfire affected areas. This includes 13,694 poles, 988 distribution substations and 648 switches. Almost 1,500km

of conductors are in the bushfire impacted zones. This represents approximately 6% of the total overhead network.

Table 8 - Overhead conductors within bushfire impacted areas

Length (km)	Bushfire impacted lines	Total overhead network	% of network impacted
LV conductor	214.57	8,694	2.5
11kV conductor	764.38	8,983	8.5
12.7kV SWER conductor	67.16	481	13.9
22kV conductor	22.16	1,697	1.3
33kV conductor	122.09	1,450	8.4
66kV conductor	65.22	532	12.2
132kV conductor	211.91	1,212	17.4
Total conductors	**1,467.5**	**23,049**	**6.4**

5.4.3. Asset replacement

Following the development of work packages, field crews were dispatched to replace assets that were damaged beyond repair and unfit for service. A variety of network assets across each operating voltage required replacement and included (wooden) poles, cross-arms, switches, conductors and conductor fittings. Replacement work was predominantly carried out by Endeavour Energy field crews often working collaboratively with external contractors.

Damaged assets were generally replaced on a like for like basis. The failure of wooden poles in high bushfire risk areas normally provides an opportunity to replace these with concrete or steel alternatives. This was done in some instances in accordance with Endeavour Energy's established standard design practices. However, the availability of poles was extremely limited throughout the event owing mainly to the large volume of pole replacement work that was occurring simultaneously across each of the regions and in other distribution networks. As a consequence, to restore power as quickly as possible to customers and to reduce public safety risks, wooden poles were used extensively in the pole replacement work.

In total, 999 poles in the distribution network required replacement after suffering damage from the 2019-20 bushfires. Most of these were replaced during FY20 with the remaining 144 poles expected to be replaced during FY21. Our general approach to replacing bushfire impacted poles has been to prioritise those which have been destroyed or damaged to such an extent that they pose a significant and immediate safety risk and are not fit to remain in service.

6. POSITIVE PASS THROUGH AMOUNT

The NER requires us to specify the positive pass through amount that we propose to recover from network customers in relation to the 2019-20 bushfire event and the years this amount will be passed through to customers. These requirements are addressed in this section.

6.1. Eligible pass through amount

The eligible pass through amount is defined as:

> *the increase in costs in the provision of direct control services that, as a result of that positive change event, the Distribution Network Service Provider has incurred and is likely to incur (as opposed to the revenue impact of that event) until:*
>
> *(a) unless paragraph (b) applies – the end of the regulatory control period in which the positive change event occurred; or*
>
> *(b) if the distribution determination for the regulatory control period following that in which the positive change event occurred does not make any allowance for the recovery of that increase in costs (whether or not in the forecast operating expenditure or forecast capital expenditure accepted or substituted by the AER for that regulatory control period) – the end of the regulatory control period following that in which the positive change event occurred.*

In accordance with the definition above, we have calculated an eligible pass through costs of $31.3 million (real, 2019-20) which includes costs incurred (and estimated to be incurred) from providing direct control services that are a consequence of the 2019-20 bushfire event.[28] Importantly, only incremental opex and capex has been included in this pass through amount.

These opex and capex amounts, and the year in which they have been incurred or are expected to be, are provided in Table 5 (section 5.3). These actual and forecast incremental costs have been inputted into Endeavour Energy's Final decision PTRM for the 2019-24 period (inclusive of the FY21 return on debt update) to derive the eligible pass through amount. Table 9 below shows the build-up of the eligible pass through amount by each building block category.

Table 9 - Eligible pass through amount

$m; nominal	2019-20	2020-21	2021-22	2022-23	2023-34	Total	NPV
Return on capital	0.0	0.3	0.3	0.3	0.3	1.3	
Return of capital	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	
Operating expenditure	10.0	18.1	(0.6)	(0.7)	(0.7)	26.2	
Tax	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	
Revenue adjustments	0.0	0.0	0.0	0.0	0.0	0.0	
Unsmoothed revenue	**10.0**	**18.4**	**(0.3)**	**(0.4)**	**(0.4)**	**27.4**	**25.1**

[28] Although the additional costs we have incurred in providing alternative control services are eligible for inclusion, we have elected to derive the eligible pass through amount using only costs attributed standard control services. The impact of this omission on the incremental bushfire cost amount is reflected in Figure 13.

As revenue for the first two years of the period cannot be adjusted, the revenue impacts of the eligible pass through amount is smoothed over the final three years of the period as specified in the table below.

Table 10 - Eligible pass through amount – smoothed revenue impacts

$m; nominal	2019-20	2020-21	2021-22	2022-23	2023-34	Total	NPV
Final decision (FY21 debt)	835.9	827.9	827.6	843.4	859.6	4,194.4	3,578.1
+ Bushfire pass through	835.9	827.9	837.8	853.8	870.1	4,225.5	3,603.2
Difference	**0.0**	**0.0**	**10.2**	**10.4**	**10.6**	**31.1**	**25.1**

6.2. Identifying incremental costs

6.2.1. Costs included in the 2019-24 final determination

To ensure that only incremental costs have been included in the pass through amount, we have investigated whether costs captured as part of the bushfire response have been funded in Endeavour Energy's 2019-24 expenditure allowances. We did this by reviewing the extent to which the 2017-18 opex included costs for bushfire response activities.

This is because 2017-18 was the efficient "base year" used by the AER to apply their base-step-trend opex forecasting methodology to forecast opex requirements for the 2019-24 regulatory control period. Therefore, any BAU bushfire related opex captured in this year would should be excluded from the incremental cost calculation to avoid recovering these costs from customers twice.

Emergency response

During 2017-18, Endeavour Energy responded to eight material weather related events. In each case, the fault and emergency response costs incurred were to repair the network following storm damage. As no costs were recorded against bushfire events, no adjustment for base year fault and emergency response opex is required.

Further, only in one instance did the costs of responding to a storm event in 2017-18 exceed $0.1 million (nominal). Despite this, and as discussed earlier, we have elected not to include the 2020 February storm event (with response costs in excess of $2 million (nominal)) in this pass through application.

Vegetation management

It follows that the 2017-18 base year opex did not include any costs relating to bushfire response related vegetation management.

Instead, base year opex includes a BAU, recurrent hazardous tree removal program costs (approximately $4.1 million (nominal)). This program involves removing large, low value amenity trees in towns and communities which are in close proximity to conductors and presented a high fall-in risk and a public safety hazard. This program targets medium and long-term cost savings by targeting trees growing under distribution mains which require regular tree maintenance work.

We work closely with local councils to identify trees for removal and in some instances, we provide them with semi-mature trees to replace those removed in urban areas for planting in alternative locations away from the network.

The bushfire tree rectification program discussed in section 4.4.1 is distinct and separate to BAU vegetation management program (which remains ongoing). The cost of these programs (outlined in section 4.3) reflect incremental costs only.

6.2.2. Changes to BAU costs

We also reviewed which BAU activities funded in the 2019-24 determination are no longer required or have a reduced scope as a result of activities undertaken as part of the bushfire response. These cost reductions need to be incorporated in the pass through amount costs to ensure customers do not pay for avoided BAU activities.

Tree clearing and spraying

As tree removal works contribute the majority of the costs associated with the 2019-20 bushfire event, we have carefully reviewed the extent to which future tree trimming and maintenance work might temporarily differ from pre-bushfire BAU requirements on the estimated [redacted] conductor spans where significant tree clearing works will have occurred.

Approximately 30% of these spans fall into either a 12 or 15 month maintenance cycle as they are in areas considered high or medium bushfire risk with the remaining 70% requiring work on a 24-month cycle (commonly in rural and remote areas with wide easements for the sub-transmission network). These cycle frequencies indicate that each of the bushfire impacted spans would have required at least one maintenance visit during the remainder of the 2019-24 regulatory control period.

Our review of tree maintenance requirements indicates that tree pruning and some ground lining activities (e.g. low lying vegetation “slashing”) will be avoided for a period of time as a result of the bushfire tree remediation programs. However, herbicide spraying not previously performed on the bushfire affected spans will be required to effectively manage post-bushfire regrowth within easements. Specifically, two herbicide applications will be required in the first 12 months and then once annually for at least the remainder of the current regulatory control period.

Our vegetation maintenance programs are delivered by external contractors under all-inclusive span-based contracts. Under these arrangements, costs are not itemised for individual activities which form the scope of the contracted BAU maintenance works. Therefore, we have apportioned the vegetation maintenance costs to activities in a manner that best reflects their contribution to the total BAU work on the bushfire affected spans.

We have estimated average tree cutting and mechanical slashing costs for urban/semi-rural and rural/remote conductor spans (which are generally attended during the 12/15 month cycle and 24 month cycle respectively) to reflect BAU activities avoided. Similarly, we have estimated herbicide application costs per span to capture spraying on work spans that represent a new maintenance requirement. Workings for these are shown in Tables 11 and 12 respectively.

Table 11 - Avoided BAU vegetation maintenance costs

$; real 2019-20	Cost per span ($0)		Bushfire work spans	% of cycle performed p.a.	Total avoided BAU cost p.a. ($000)
	Cutting	Slashing			
12/15 month cycle	[redacted]	[redacted]	[redacted]	100%	826.4
24 month cycle	[redacted]	[redacted]	[redacted]	50%	1,196.8
Total			[redacted]		**2,023.1**

Table 12 - Additional herbicide application costs

$000; real 2019-20	Cost per span ($0)	Work spans	FY21 cost	FY22-24 cost p.a.
Urban & semi-rural areas (distribution feeders)	[redacted]	[redacted]	237.1	118.5
Rural and remote areas (sub-transmission feeders)	[redacted]	[redacted]	2,888.6	1,444.3
Total cost		[redacted]	**3,125.7**	**1,562.8**

These figures would imply an incremental benefit of [redacted](real, 2019-20) should be removed from the eligible pass through costs. However, for the purposes of adjusting the eligible pass through amount we have made a further reduction of [redacted](real 2019-20), bringing the total reduction to $0.9 million (real, 2019-20).

This further reduction is an unscoped efficiency saving we are committing to achieving [redacted] We consider this estimate is therefore conservative (i.e. a larger reduction has been made than justifiable) [redacted]

Asset inspections

Scoping and inspection of network assets in bushfire zones performed during the initial response did not cover the range of BAU asset inspection tasks normally required (e.g. drilling and digging for pole inspections) and therefore were insufficient to reset inspection cycles (which for lines and poles are normally 5.5 years). However, for each pole replaced, inspections will not be required until the third cycle. This represents a moderate reduction in BAU asset inspection costs which have been factored into incremental cost calculations.

Asset replacements

We have reviewed the last reported condition of the bushfire damaged poles we expect to replace by the end of the period. The rationale for the retirement of assets is defined by Endeavour Energy's standards which set out conditions and health indices used to determine the need for the retirement of assets.

A small number were identified with a safety rating factor prior to the bushfires that indicated they would have likely required replacement during the 2019-24 period. An adjustment has been made equal to the value of these expected pole replacements.

6.2.3. Internal labour costs and oncosts

The costs of employing external resources to assist in the bushfire response and rectification work would not have been incurred had the 2019-20 bushfire event not taken place. However, this is not the case for Endeavour Energy staff temporarily reassigned from normal duties to support network repair and restoration efforts. Specifically, ordinary time payments to internal staff for bushfire response work represent labour costs which are funded by expenditure allowances for 2019-24.

Despite having deployed a significant amount of staff to the bushfire efforts, we believe we have the productive capacity and flexibility to work through any consequential backlog of BAU work within the regulatory period without incurring additional labour costs (i.e. overtime).

We recognise that including internal labour costs in the cost pass through amount may be compliant with NER. However, we have elected to exclude bushfire response internal labour costs attributed to normal hours as a measure designed to minimise the cost increase we propose to pass through to our customers.

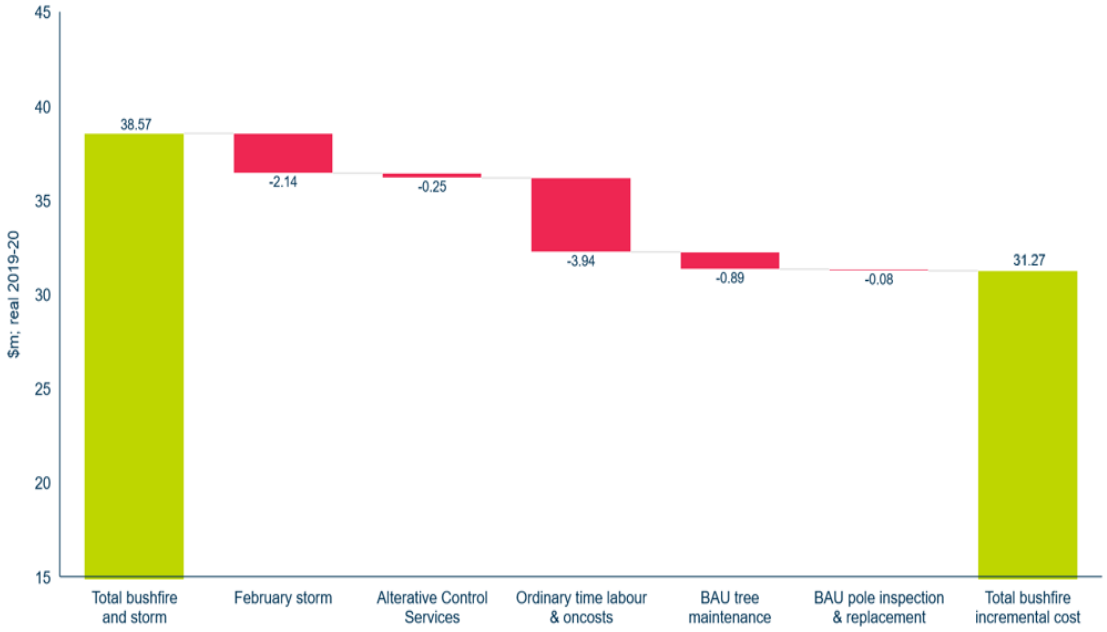
For similar reasons outlined above, we have removed the portion of internal labour costs attributed to oncosts to ensure only direct costs are included in the incremental cost build up. Together with the removal of "normal hours" costs, this results in bushfire "overtime" costs as the only component of internal labour to contribute to the pass through amount.

Table 13 details the adjustments made to total reported bushfire costs. It is worth noting that the total reported bushfire costs are already exclusive of overheads and any costs we incurred in supporting other networks and any charitable donations or financial support we provided customers.

Table 13 - Adjustments to derive incremental bushfire cost

Cost adjustments	Adjustment amount ($m; real 2019-20)					
	2019-20	2020-21	2021-22	2022-23	2023-34	Total
February storm event (opex)	(2.14)	-	-	-	-	(2.13)
Alternative Control Services (opex)	(0.25)					(0.25)
Ordinary time labour and oncosts (opex & capex)	(3.94)	-	-	-	-	(3.94)
BAU vegetation maintenance (opex)	-	0.83	(0.58)	(0.58)	(0.58)	(0.94)
BAU pole inspections (opex)	-	-	(0.02)	(0.02)	(0.02)	(0.60)
BAU pole replacements (capex)	-	-	-	-	(0.02)	(0.02)
Total	**(6.33)**	**0.83**	**(0.60)**	**(0.60)**	**(0.62)**	**(7.30)**

Figure 13 - Incremental bushfire cost build-up



6.3. Evidence of the 2019-20 bushfire event costs

Clause 6.6.1(c)(6)(i) of the NER requires Endeavour Energy to provide evidence of the actual and forecast increase in costs included in the eligible pass through amount. Clause 6.6.1(c)(6)(ii) of the NER also requires Endeavour Energy to provide evidence that the costs included in the eligible pass through amount occurred solely as a consequence of the positive change event.

Actual costs

As explained in section 6.2, we have included only incremental costs for activities that were incurred solely as a result of the 2019-20 bushfire event. These costs were captured in a manner consistent with Endeavour Energy's accounting framework.

The relevant costs for each bushfire work activity were booked to work orders that were in turn linked to one of four parent work orders created specifically to record the costs of the 2019-20 bushfire event. Where a bushfire expense item was not linked to one of these parent work orders, entries were reviewed and included in the overall bushfire expenditure amount where appropriate. The account code listed for each work order determined whether the expenditure was allocated to opex or capex.

This process ensured all incurred bushfire response costs were appropriately captured at a detailed level across the bushfire period and able to be easily separated and distinguished from BAU network expenditure.

Forecast costs

Forecast incremental costs consist exclusively of pole replacement works for capex and vegetation and tree clearing work for opex. The volume of pole replacements is based on identified pole defects directly caused by bushfire damage. Forecast volumes include required pole replacements which remain outstanding (with "open" work orders) as at 30 June 2020 with unit rate estimates for transmission and distribution poles based on past actuals.

Table 14 - Pole replacement forecast

$; real 2019-20	Quantity	Unit cost	Total cost
Distribution poles	103	7,500	772,500
Sub-transmission poles	41	10,500	430,500
Total poles	**144**		**1,203,00**

Forecast vegetation management costs are based on the unit costs incurred for the portion of the remedial tree removal programs (discussed in section 5.4.1) completed during FY20. This method is considered most appropriate given Endeavour Energy has not previously conducted a large scale remedial tree removal program involving widespread use of heavy machinery and therefore does not have robust historical cost data on comparable programs.

We expect the contractor will be able to deliver the remainder of the program in FY21 at a reduced cost per tree rate owing to higher work volumes resulting in reduced mobilisation of heavy plant and equipment. These economies of scale efficiencies are reflected in reduced cost per span and per tree forecasts in FY21.

Table 15 - Bushfire tree rectification program forecast

$; real 2019-20	Work spans[29]	Trees[30]	Cost ($000)	Cost per span	Cost per tree
Actual costs (FY20)					
Distribution program	[redacted]	[redacted]	1,305	[redacted]	[redacted]
Sub-transmission program	[redacted]	[redacted]	2,952	[redacted]	[redacted]
Forecast costs (FY21)					
Distribution program	[redacted]	[redacted]	10,154	[redacted]	[redacted]
Sub-transmission program	[redacted]	[redacted]	6,286	[redacted]	[redacted]
Total	[redacted]	[redacted]	**20,697**		

Clause 6.6.1(c1) of the NER requires that the proposed positive pass through amount not include any expenditure for a restricted asset, unless in conjunction with a request for asset exemption. Endeavour Energy has investigated whether any asset behind the connection point that would be classified as a restricted asset may have been subject to network restoration works arising from the bushfire event. We have not identified any work performed on restricted assets and confirm neither the eligible or proposed positive pass through amount include costs related to restricted assets.

[29] Work spans for FY21 were identified at the time of the initial scoping from March through to June 2020. However, due to changes in the environment with significant post-bushfire rainfall and changes in tree condition we anticipate variations (i.e. increases) in the number of spans which will require work.

[30] These are conservative estimates. For example, the average number of trees for a typical 300m sub-transmission span ranges from 100 trees on both sides of the conductor with much higher tree numbers on larger sub-transmission easements (up to 600 metres in length). For these spans, we have applied an estimate of 80 trees per span in our forecast.

6.4. Efficiency of eligible pass through amount

In determining the approved pass through amount, the AER is required to take into account the efficiency of Endeavour Energy's decisions and actions in relation to the risk of the positive change event[31]. This includes:

> *"whether the Distribution Network Service Provider has failed to take any action that could reasonably be taken to reduce the magnitude of the eligible pass through amount in respect of that positive change event and whether the Distribution Network Service Provider has taken or omitted to take any action where such action or omission has increased the magnitude of the amount in respect of that positive change event".*

We consider the decisions and actions prior to, during and after the 2019-20 bushfire event are prudent and efficient. The reasonableness of Endeavour Energy's approach is reflected in the customer sentiments towards the bushfire response. Messages we received from bushfire affected communities were overwhelmingly positive with an appreciation of the efforts of our field crews in working through challenging conditions. These customer sentiments are included in Attachment 7 and highlight the high value customers placed on having supply restored to facilitate the wider bushfire recovery efforts during a period of duress.

Prudent risk management and bushfire controls

As outlined in section 4.1.3, we have an extensive and effective bushfire risk management framework which is detailed in the Bushfire FSA (Attachment 5). As a condition of the Electricity Supply (Safety and Network Management) Regulation, we are required to outline in the Bushfire FSA the hazards and control mechanisms that we apply to the risk that the network and activities associated with the design, construction, maintenance and operation of the network will start a bushfire or other vegetation related fire.

The approach to managing vegetation near the network is detailed in Endeavour Energy's Vegetation Clearance Management standard (MMI 0013) which ensures vegetation clearing is carried out to reduce the risk of fire, service interruptions and possible safety and environmental impacts. The standard (provided as Attachment 8) stipulates vegetation clearances from powerlines which underpin planned vegetation maintenance works programs and takes into consideration the safety of the community, whilst minimising the risk of electrocution and the potential for bushfires within bushfire prone areas.

Importantly, the approach is based on the industry document ISSC 3 – Guide for the management of Vegetation in the vicinity of electricity assets (2016). By complying with this industry standard, we consider the vegetation maintenance practices reflect good practice and demonstrate a prudent and efficient approach that is consistent with community expectations.

As explained in section 4.1.4, we do not insure poles and wires against bushfire damage as this coverage is not available on reasonable commercial terms. Taking into account the nominated pass through event considerations in the NER, it is prudent to manage this risk through the cost pass through mechanism provided in the NER.

[31] NER, 6.6.1(j)(3)

A coordinated bushfire response

Endeavour Energy's overall response was guided by established, well documented plans and procedures specifically designed to ensure we are adequately prepared for major incidents. We consider that an effective operational response in the context of the bushfires appropriately focussed on balancing the priorities of minimising the duration of supply disruptions to customers and safeguarding worker, customer and public safety.

Our processes have improved over time to incorporate key learnings from bushfire incidents encountered by our business and other distributors. Without these plans and procedures, which are critical in ensuring the effective coordination and deployment of resources during major incidents, bushfire affected customers and communities would have waited longer to have their supply restored.

As discussed in section 5.1, Endeavour Energy's Incident Management Plan (Attachment 6) establishes the overarching framework that enables us to respond quickly and appropriately to network major network incidents including storms, floods and fires. This plan provides a clear and prudent management structure to guide our approach to responding to the bushfires in each fire zone and guided the development of our restoration strategies and prioritisation of our field operations and repair work. The effectiveness of our IMP was demonstrated by restoring supply to the vast majority of our bushfire impacted customers within 10 days.

From a system operation perspective, we followed Bushfire Response Procedures (NCB 0630) which focus on how Endeavour Energy monitors and manages supply during major bushfire events. It also outlines how information is conveyed from impacted or at risk field locations to the control room to allow system operators to make appropriate network response decisions and to ensure the safety of work crews and customers. Guidance for liaising with emergency services to coordinate activities and maintaining a presence at Local Emergency Operations Centres forms an important part of this procedure.

Appropriate use of external service providers

The use of external providers during the bushfire event was appropriate in light of the magnitude of the damage to the network and urgency to return supply to customers as quickly and as safely as possible. Had we relied on only Endeavour Energy staff and resources to perform the required restoration works, the timeframes for completing this work would likely have been significantly longer,

We sought to utilise internal capabilities by mobilising resources from other operational regions of the network less constrained by the bushfires to those more heavily impacted to reduce restoration times. For instance, field crews from the Central region were deployed in November and December to assist pole and conductor replacements in the Northern region. Central and Northern region crews were also deployed to assist Southern region crews restore supply during December and January. 92% of Endeavour Energy's field staff were involved in bushfire response efforts.

Endeavour Energy's reliance on external assistance was limited to circumstances where we did not have the capacity to utilise internal staff to perform the required activities safely and in the appropriate timeframe. We routinely monitored resourcing levels to ensure they were sufficiently matched to the volume of incident response jobs that were raised. This allowed us to ensure contractors were engaged for targeted activities and for a duration that was appropriate to complete identified and necessary works.

Efficiencies were achieved by leveraging existing third-party arrangements which had been market tested and had demonstrated cost effectiveness. Typically, we were able to negotiate with service delivery partners on the scope of external services based on contracted rates that could not be varied during times of crisis. We also benefitted from tree clearing and vegetation removal activities provided by Australian Defence Force at no cost.

Essential Energy and Ausgrid staff were deployed to the nearby affected regions to minimise travel times and allow them to be mobilised more quickly to assist in repair work. In turn, we provided crews to assist Essential Energy's bushfire response in communities close to the shared network boundary. The assistance we provided was limited to where we had the capacity to do so without adversely impacting response efforts to our customers. Costs incurred from assisting Essential Energy have not been included in the eligible pass through amount.

Minimising the cost of pole replacements

As outlined in section 5.4.3 poles were in high demand during the bushfire event. For instance, we issued 160 units of 12.5m/8kN poles in the first week of January which equivalent to 35% of poles issued in a typical year. By the end of January, this had risen to the equivalent of 6 months of stock.

We were able to avoid significant cost increases that might normally accompany a high volume of pole replacements in a short period of time. This was achieved through expediting supplier orders, using alternate suppliers, and calling on contractors as well as other distributors.

To keep the cost of pole replacements low, Endeavour Energy's Logistics team avoided double-handling of network hardware by arranging to deliver entire job packs directly to locations where they were required. In addition to poles, this typically included bundles of cross-arms, palette of concrete, HV insulators and accessories. Delays were avoided by delivering packs to sites before crews had arrived.

In locations such as along Bells Line of Road in the Blue Mountains, we took advantage of opportunities to redesign the network and use fewer poles to help restore power sooner. As well as reducing bushfire response costs, this delivers better value to customers in the long term by making replaced sections more robust and cheaper to maintain.

Also, estimate of pole replacements for FY21 includes unit rates lower than those in the Repex Model which was used to inform the 2019-24 capex determination[32]. Unit rates for both distribution poles ($7,500) and sub-transmission poles ($10,500) are less than both historical costs ($9,350 and $18,350) and the NEM average ($10,080 and $18,350).[33] This is despite actual and forecast pole bushfire replacement unit costs being inclusive of all asset replacement costs (i.e. poles, conductors, cross-arms, insulators etc).

Efficient tree removal program

The vegetation rectification programs currently being undertaken across 4,390 bushfire affected spans is the largest contributor to the bushfire cost increase. Measured against similar (albeit much smaller) tree removal work completed in previous years as part of BAU (non-bushfire) Hazard Tree Program, the cost effectiveness of this program is evident. This difference is predominantly because of the use heavy plant and machinery to remove a large number of trees

[32] AER, Endeavour Energy 2019-24 Draft Decision – Repex Model, November 2018

[33] Based on '> 11 kv & < = 22 kv; wood' and '> 22 kv & < = 66 kv; wood' asset categories

in remote locations generally along sub-transmission spans which is not a suitable technique for smaller scale and individually targeted tree removal work in urban (and often rural) environments along the distribution network.

Table 16 shows the average removal cost per tree from the program is substantially lower than work performed across the network from 2017 through to 2019.

Table 16 - Tree removal cost comparison

$; real 2019-20	Hazard tree removals	Program cost ($000)	Cost per tree ($)
2017-19 BAU	[redacted]	5,123	[redacted]
Bushfire rectification program	[redacted]	20,697	[redacted]

As detailed in section 5.4.3, we have scoped each individual bushfire impacted span so only at-risk spans are included in the scope of the vegetation rectification program. To monitor the effective delivery of the program, completed tree removal work is confirmed by Endeavour Energy Tree Management Officers (TMOs) who review the work against the defined scope. To assist, each work span is photographed prior to and after completion and used as evidence of the completed work and expenditure. Monitoring work in this way ensures that customers receive value for money and identified risks are appropriately mitigated.

Innovative use of technology

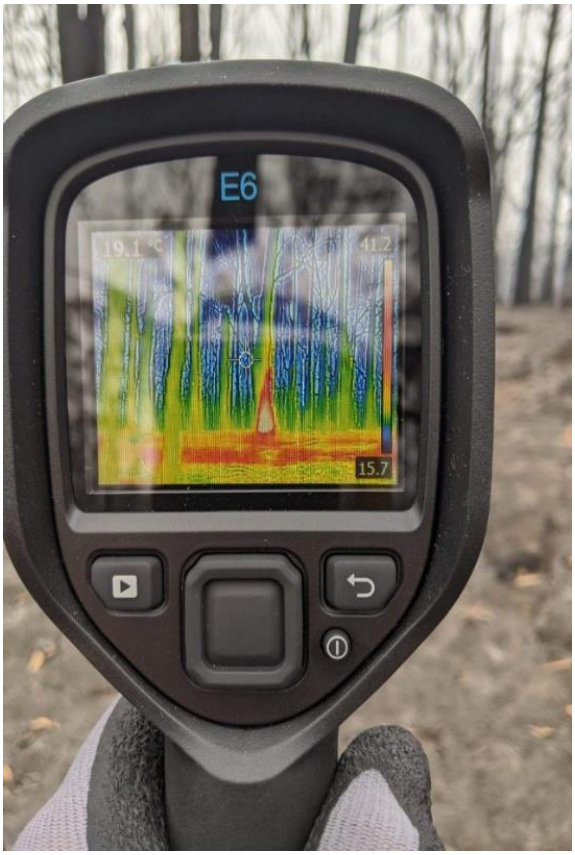
We utilised technology in a range of innovative ways to provide visibility of bushfire areas, crew locations and customers without supply.

This provided field staff and management with up to date information on the bushfires and developments on network to help better target repair work and improve productivity. Some examples are detailed below.

Typically used to identify “hot spots” on network infrastructure, we deployed Thermovision cameras as a quick and effective means to identify bushfire affected trees at risk of falling and manage the safety of workers.

Pinpoint (Endeavour Energy’s vehicle GPS tracking system) was used extensively to keep workers safe in firegrounds and to provide advanced warnings of road closures and backburning activities. It was also used to monitor staff movements and their proximity to bushfire related network constraints. This allowed us to assess the capability of nearby crews to address localised network issues and coordinate a quick and effective response.

Figure 14 - Thermovision cameras assessing tree fall-in risk



OneNote was used to mark-up maps and prepare jobs so critical field information was effectively captured. Inspectors and scopers marked up maps on their iPads which were then turned into project packages and assigned to crews (in many cases from other regions) to complete.

Daily map updates of fire grounds provided by the NSW RFS were imported into Endeavour Energy's GIS system to build an overlay of active firegrounds. In combination with Pinpoint, this ensured work crews stayed out of dangerous fire grounds, and if they did go in under clearance or RFS escort, we could track their position.

6.5. Positive pass through amount

Clauses 6.6.1(c)(4) and (c)(5) of the NER requires Endeavour Energy to specify the positive pass through amount that it proposes in relation to the 2019-20 bushfire positive change event and the regulatory year or years the amount will be passed through. The positive pass through amount is defined as an amount not exceeding the eligible pass through amount.

We propose to pass through an amount of $31.1 million (nominal). This amount is equal to the revenue impact of the eligible pass through amount specified in section 6.1.

Endeavour Energy has calculated this amount as the change in required revenues for the 2019-24 regulatory control period as a result of the positive change event. That is, the proposed positive pass through amount incorporates the opex and return on capital and return of capital for the 2016-20 regulatory control period arising from the incremental capex arising from the 2019-20 summer bushfires, as well as the impact of the incremental costs on the cost of corporate income tax building block.

The PTRM used to derive the pass through amount is provided as Attachment 9.

6.6. Pass through amount in each regulatory year

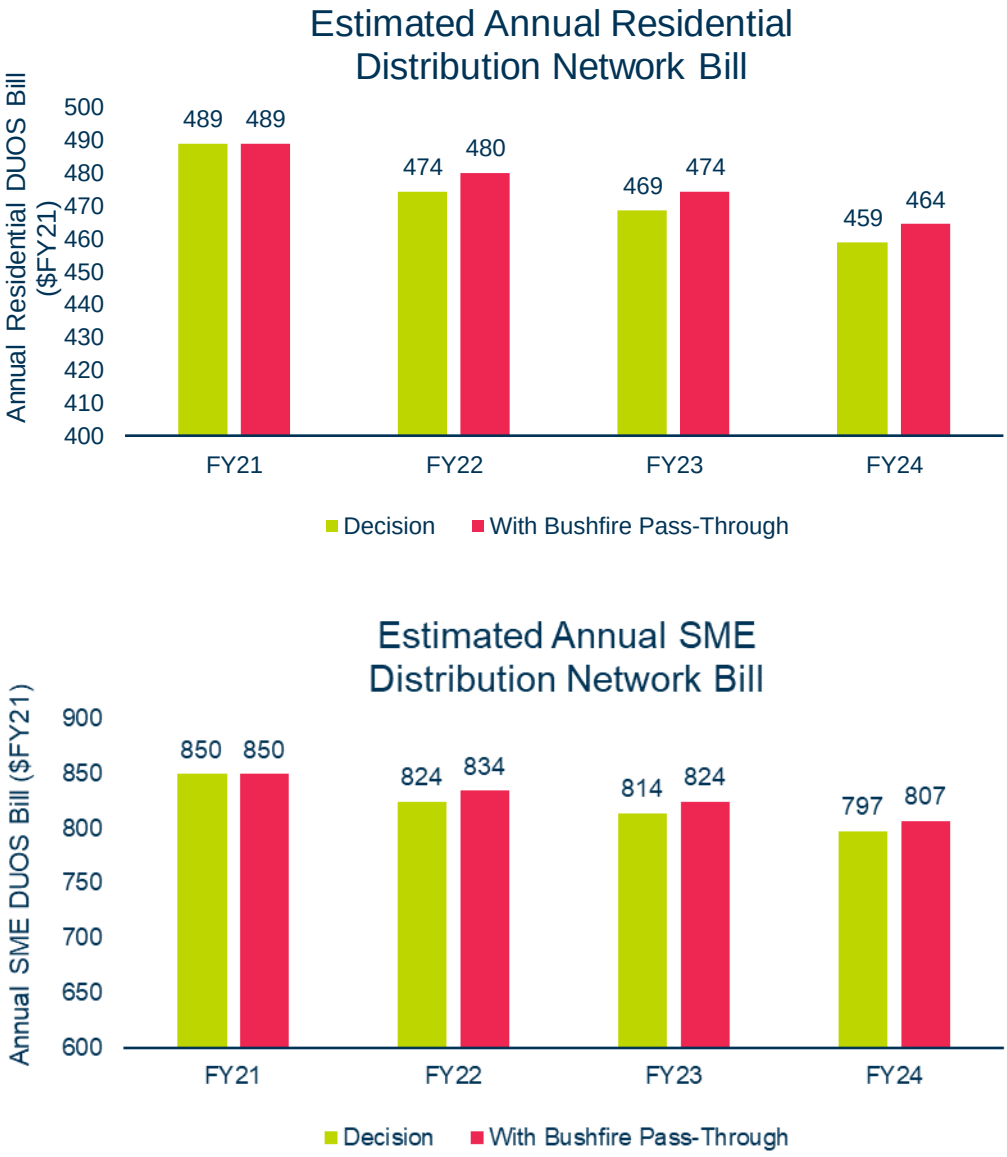
Clause 6.6.1(c)(5) of the NER requires Endeavour Energy to specify the amount that we propose to pass through to customers in the year, and each regulatory year after that, in which the positive change event occurred. This information is provided in Table 10.

Our customers have consistently expressed a preference for low and stable electricity prices and we have sought to respond to this preference by delivering real network price reductions each year since 2012. We have sought to smooth the revenue impact of the eligible pass through amount in a manner that will allow us to continue delivering real price reductions to our customers.

We estimate the 2019-20 bushfire event will increase the DUOS charged to the average residential and small business customer by approximately $17 and $30 (real, 2020-21) respectively in total over the remaining three years of the regulatory period commencing from FY22. Noting that overall the average residential and small business customer will still receive a real reduction in prices over the remaining three years of the regulatory period of $25 and $43 respectively.

This increase is reflected in Figure 15. It also demonstrates how the smoothing approach avoids bill volatility and maintains the downward trend in network prices.

Figure 15 - Indicative customer bill impacts



APPENDIX A: LIST OF ATTACHMENTS

Attachment 1 - Compliance checklist

Attachment 2 - Confidentiality claim

Attachment 3 - Endeavour Energy's submission to the NSW Independent Bushfire Inquiry

Attachment 4 - Endeavour Energy's submission to the Royal Commission into National Natural Disaster Bushfire Arrangements

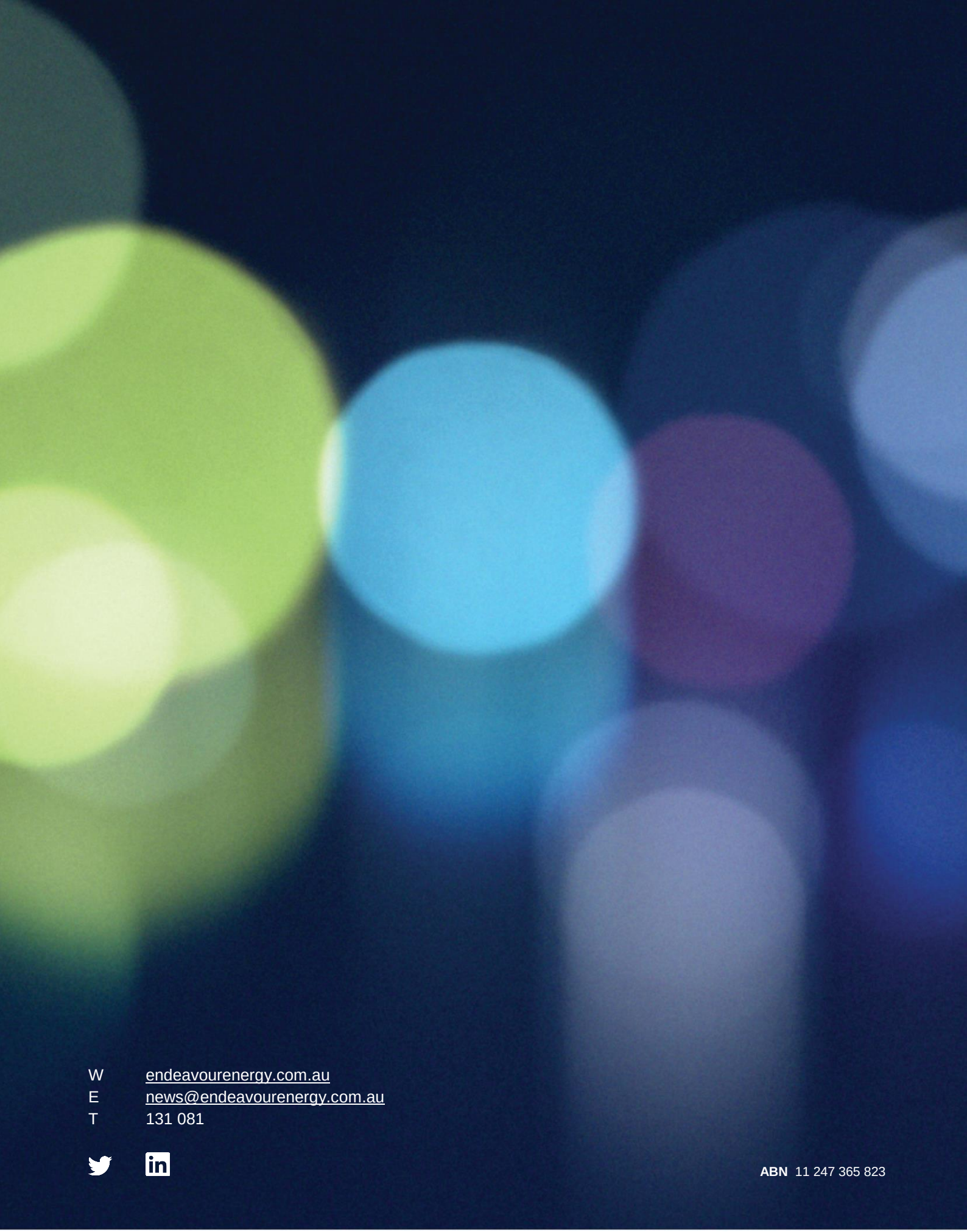
Attachment 5 - Bushfire Formal Safety Assessment

Attachment 6 - Endeavour Energy Incident Management Plan

Attachment 6 - Media engagement, customer sentiments and assistance package

Attachment 8 - Vegetation Clearance Management Standard (MMI 0013)

Attachment 9 - Post Tax Revenue Model



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