

# Post Event Review

Power Outages 28 & 29 January 2018

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# Acronyms

## List of acronyms used in this report

°C	Degrees Celsius
ADPR	Annual Distribution Planning Report
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
BOM	Bureau of Meteorology
CBD	(Melbourne) Central Business District
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
DHHS	Department of Health and Human Services
DNSP	Distribution Network Service Provider
DPC	Department of Premier and Cabinet
EDC	Electricity Distribution Code (Victoria)
E-EMLO	Energy Emergency Management Liaison Officer
EMV	Emergency Management Victoria
ESC	Essential Services Commission
ESV	Energy Safe Victoria
GSL	Guaranteed Service Levels
IT	Information Technology
IVR	Interactive Voice Response
km/h	Kilometres per Hour
kW	Kilowatt
LOR	Lack of Reserve
LV	Low Voltage
MW	Megawatt
NEM	National Electricity Market
NER	National Electricity Rules (version 106)

NET	Network Escalation Team
RERT	Reliability and Emergency Reserve Trader
RIT-D	Regulatory Investment Test for Distribution
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCC	State Control Centre
SMS	Short Message Service
STPIS	Service Target Performance Incentive Scheme
TNSP	Transmission Network Service Provider
UE	United Energy
VCR	Value of Customer Reliability
VEEC	Victorian Energy Emergency Committee
VEECP	Victorian Energy Emergency Communications Protocol

# 1 Executive summary

Energy disruptions can be caused by a range of different events. Over the 2018 Australia Day long weekend, Victoria experienced unpredicted widespread electricity outages, which significantly impacted the community. On Sunday 28 and Monday 29 January, a total of 94 712 Victorian customers lost power at some point and for varying durations. Of those, 1 218 customers had life support equipment at their premises. Of those, 1 218 customers were registered as life support customers.

Energy is an essential service and Victorians deserve a reliable supply of electricity. Immediately following the outages, the Victorian Government commissioned a review of the event, to understand its causes and to identify how to improve outcomes for electricity customers during similar future scenarios.

This review found that power outages were not caused by a lack of electricity supply. Instead, the outages were due to a series of separate issues associated with localised network assets overloading from sustained high demand caused by Victorians attempting to cool their homes and businesses during a unique weather event. Weather conditions were unique due to the combination of high heat and humidity. According to Bureau of Meteorology data, the combination of sustained high heat and humidity was a 1 in 35-year event. While the weather increased electricity demand, the Australian Energy Market Operator (AEMO) reported more than sufficient supplies of electricity within the National Electricity Network (NEM).

Although Distribution Network Service Providers (DNSPs)<sup>1</sup> are responsible for restoring supply when outages occur, effectively undertaking the 'control' function as described in Victoria's emergency management framework, the Victorian Government remains responsible for managing the consequences of these events. The 2018 Australia Day power outage event highlights the importance of DNSPs considering and planning for unique environmental factors. Records for average monthly temperatures are continually being broken, and the frequency and length of heatwaves are increasing.<sup>2</sup> Therefore, it is important that the energy industry prepares for more unique and extreme heat events becoming more common.

This report makes 15 recommendations designed to reduce the volume of outages, improve consumer outcomes, and capture the key learnings to prevent similar events from occurring again. This report has been reviewed for factual accuracy by the DNSPs and AEMO. Recommendations are categorised into immediate and long-term actions. Immediate actions do not require a regulatory review or extensive consultation to implement and can be implemented before the 2018-19 summer. Longer-term actions are characterised as those which require further analysis and consideration by regulators, in consultation with industry. General themes of the recommendations include:

- implementation of demand side responses to address network constraints;
- increased DNSP customer engagement through proactive communications and more readily accessible information before, during and after outages;
- increased use of smart meter data and improved demand forecasting; and
- regulatory studies and assurance audits so that customer services and entitlement obligations are fulfilled.

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<sup>1</sup> Victorian DNSPs include: AusNet Services, Powercor, CitiPower, Jemena and United Energy.

<sup>2</sup> *Victoria's Climate Change Framework*. Victorian Government, Department of Environment, Land, Water and Planning. 2017, pg 36.



## **Network performance during the event**

Powercor had the highest number of customers (47 871) without supply on Sunday 28 January, largely due to a fault at a substation at Drysdale unrelated to the weekend demand. Powercor rectified the fault within 9.5 hours and restored supply to customers by the early hours of Monday 29 January.

United Energy had the next highest number of customers without power (25 266) and the most individual fuse operations<sup>3</sup>, partly explained by a 16 per cent increase in demand on its network (compared with an 8 per cent increase on the CitiPower network) when compared with the previous highest Sunday demand on record.<sup>4</sup> In addition, the impacts for customers from United Energy's outages were exacerbated by its website being unavailable for more than 18 hours during the event. This drove more customers to its call centre, which overloaded several times over the weekend. Restoration times were lengthened because outage sites were scattered over the network, making it difficult to get large volumes of customers back on supply quickly.

As the outages occurred across Victoria and all DNSPs were resolving issues on their individual networks, there were limited opportunities to offer and deploy mutual aid to support the most impacted distribution business, United Energy, until late on Monday 29 January 2018.

AusNet Services and Jemena conducted demand management trials over the weekend. Despite the small scale of the trials, AusNet Services reported the 22 participating customers in a localised area reduced their consumption by more than 40 per cent across the peak period from 4pm to 8pm. AusNet Services noted that "per customer, this is a very large reduction in demand and points to the value that can be achieved through residential demand response".<sup>5</sup> Of 600 registrations, 170 people participated in Jemena's 'Power Changers' event on January 28 achieved an average demand reduction of 28%.

The AusNet Services and Jemena trials highlight how demand management activities can help ensure a reliable and cost-effective energy supply for Victorians.

## **Communications during the event**

The events of the Australia Day long weekend highlighted opportunities to better coordinate activities and communications between DNSPs and the government and with the community, and to leverage best practice across the industry.

Victorian DNSPs use multiple channels to communicate with customers once an outage occurs. Two DNSPs proactively communicated with customers in advance of the outages that occurred on Sunday 28 January. Prior notification can be important for customers for planning ahead to avoid using appliances unnecessarily, or to make alternative arrangements. This can be particularly important for customers with life support equipment or other health needs that require a reliable energy supply.

There were multiple alerts and significant weather information available ahead of the weekend, but the cool change that was expected failed to arrive. Plans that relied on static inputs and did not adapt to changing circumstances quickly outdated, highlighting the importance of considering multiple inputs in determining what contingencies and communications are required during an event.

The importance of flexibility and considering multiple inputs also extends to government emergency planning and response, and to the operation of the Victorian Energy Emergency Committee (VEEC).

## **Obligations to Ensure Network Resilience**

The regulatory framework, under the National Energy Rules, places obligations on DNSPs to plan for emergencies and to restore supply when outages occur.<sup>6</sup> DNSPs do so under a regulatory framework intended to balance the interests of customers in regard to affordability and reliability of supply. To build a network that could withstand *any* environment, demand, or event would require investment that would significantly increase electricity costs.

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<sup>3</sup> A fuse is an electrical safety device that operates to provide overcurrent protection of an electrical circuit. Fuse operations or 'blowing out' is a design feature to protect network plant and equipment from damage caused by electrical overload.

<sup>4</sup> AusNet Services customer outages: 14,879; Jemena customer outages: 5,202; CitiPower customer outages: 1,494.

<sup>5</sup> The 22 customers participating in AusNet Services' residential demand management program are in the Clyde and Berwick area. AusNet Services does have a demand response program for large and medium sized customers, but it is designed to operate weekdays, whereas its residential program is designed for weekends as well as weekdays. The Australia Day event occurred on a weekend, and therefore only customers on the residential program participated in demand response activities.

<sup>6</sup> For information on the legislative framework, see appendix.

The framework requires DNSPs to consider the Value of Customer Reliability (VCR), which is a calculation used to determine how much the consumer is willing to pay for reliability<sup>7</sup>. This approach allows sufficient flexibility for DNSPs to respond as circumstances dictate, within the parameters of the expectations of customers. AEMO utilised customer surveys in each Australian state to understand the level of electricity reliability that customers are willing to finance from their network charges. Customers do not value reliability of supply 'at any cost' and it is reasonable to expect some electricity outages if energy prices are to remain affordable. It is also recognised that the VCR methodology should be applied with recognition that customer perspectives may change or be different depending on their proximity to an actual outage experience.

The regulatory framework has been in place for some time. The Australian Energy Regulator (AER) is currently reviewing the Service Target Performance Incentive Scheme (STPIS) which is designed to provide incentives to DNSPs to maintain the existing supply reliability performance and to make improvement balanced against customers' value on supply reliability.<sup>8</sup> The AER notes in its Issues Paper on the STPIS that overall service reliability by DNSPs improved from 2011 to 2015 (since implementation of the STPIS).

The Victorian *Electricity Distribution Code* (EDC) sets out requirements for DNSPs to have emergency plans and facilities to communicate with customers during an outage. The Essential Services Commission (ESC) has reviewed the information provided by DNSPs regarding their performance over the Australia Day long weekend. The ESC formed a preliminary view that, based on the DNSP information it has reviewed, EDC obligations were met. Therefore, there is value in examining if the obligations within in the EDC are adequate. However, this examination should be performed in the context of a regulatory framework designed to meet the needs of all Victorians, and accepts that expectations of some customers may not be adequately met due to prohibitive costs.

The EDC also places obligations on DNSPs to provide certain service levels to customers. Obligations in the EDC require DNSPs to make payments to customers when the service provided falls below the specified levels. These obligations are captured under the Victorian Guaranteed Service Level (GSL) scheme. In practice, the process to make GSL payments is automatically initiated (as DNSPs have full transparency of outages and service levels through smart meter data). While GSLs are assumed to be properly allocated by DNSPs, an auditing scheme could provide a level of transparency and potentially identify systemic network issues.

Customers can also claim compensation for losses experienced from DNSP performance (either related to voltage variations or outages that result from inadvertent actions by a DNSP). However, the circumstances where a DNSP would compensate customers for losses incurred through this channel are unclear.

### **Improving reliability**

DNSPs have access to a rich source of data through smart meter technology. While all DNSPs have been leveraging smart meter data at an aggregated level and analysing it to proactively monitor the performance of assets against demand and updating their asset replacement practices based on the results, only Jemena has utilised granular smart meter low voltage circuit data to manage their networks. CitiPower, Powercor, United Energy and AusNet Services hadn't begun granular smart meter data analysis programs prior to summer 2017–18. CitiPower, Powercor and United Energy have committed to doing this before Summer 2018-19 as a result of the Australia Day long weekend outages.

The analysis of smart meter data needs to consider all impacts on demand, including but not limited to the late afternoon reduction of embedded solar generation production which coincides with the beginning of residential peak demand periods. Further, there are opportunities to use low voltage circuit data to support demand forecasting performed by other organisations, such as the Australian Energy Market Operator (AEMO). DNSPs should be expected to share their granular level forecasts with AEMO to improve the granularity of AEMO forecasts which are used to inform other planning activities across the industry.

### **Recommendations and proposed Implementation**

Recommendations of the review are categorised into immediate and long-term actions:

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<sup>7</sup> At the request of the Standing Council on Energy and Resources, now the Council of Australian Government (COAG) Energy Council, AEMO was commissioned to determine the Value Customer Reliability (VCR). The VCR is utilised as a reference point for regulation. Between November 2013 and July 2014, AEMO surveyed 3000 customers across the NEM to determine their preferences for outages and determined that residential customers are prepared to pay a VCR of \$25.95 per kilowatt-hour (kWh). AEMO, Value of Customer Reliability Review, September 2014

<sup>8</sup> The AER is reviewing the scheme to reflect changes to reliability definitions resulting from a rule change, and considering other refinements to improve the operation of the scheme in meeting its objective to encourage DNSPs to maintain reliability while also pursuing efficiency improvements like non-network solutions.

- Immediate actions do not require a regulatory review or extensive consultation to implement and can be implemented before the 2018-19 summer.
- Longer-term actions are characterised as those which require further analysis and consideration by regulators, in consultation with industry. There are a number of important elements of the regulatory framework which influence longer-term network planning by DNSPs, some of which may need further examination to determine if improvements are required.

General themes of the recommendations include:

- Improved forecasting and targeted demand management programs.
- Increased DNSP customer engagement through communications and more readily accessible information before, during and after outages.
- Increased use of smart meter data for demand reduction programs, network reinforcement and analysing embedded solar generation and for such information to be made available to AEMO where required.
- Regulatory studies and assurance audits so that customer services and entitlement obligations are fulfilled.

To meet the demands of Summer 2018-19, DNSPs will need to accelerate their network analysis initiatives to identify cost effective measures to better prepare the network for next summer. Based on the positive results of demand management programs to date, expanding these programs so they capture a sufficient number of customers in high-risk areas to avoid similar outages next summer should be a central part of preparation for summer 2018-19. DNSPs should also continue to plan for unpredictability by:

- Adopting the most efficient solutions to network constraints, like demand side initiatives, regardless of the RIT-D capital expenditure threshold.<sup>9</sup>
- Planning a contingent workforce and deploying them quickly.
- Identifying and addressing weaknesses on their networks in advance, where possible.
- Improving proactive and consistent communications with customers.
- Providing customers with opportunities to engage in demand management options that can be implemented early to avoid outages in a cost-effective way.

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<sup>9</sup> The RIT-D is part of the planning framework under the National Energy Rules, with the objective of identifying investment options that maximise the present value of the net economic benefit to all parties that produce, consume and transport electricity in the NEM. It also explicitly requires DNSPs to consider non-network options and consult with third parties as part of the planning process, and requires DNSPs to make and publish a Demand Side Engagement Strategy.

## 2 Recommendations

### Immediate actions - to be in place by summer 2018-19

<b>Recommendation 1</b>	<p>DNSPs to utilise data gathered from the summer 2017-18 outage and inform the Minister for Energy, Environment and Climate Change of the results of their network analysis by 13 July 2018 including their plan to address their network weaknesses. This report should:</p> <ul style="list-style-type: none"><li>• Demonstrate how demand side measures, where most efficient, were adopted as an alternative to network augmentation;</li><li>• Details of demand side measures to be implemented in time for Summer 2018-19 including locations and any associated costs;</li><li>• Locations of fuse upgrades and asset replacement works which have taken place since Summer 2017-18;</li><li>• Locations of any planned network augmentation measures scheduled before Summer 2018-19; and</li><li>• Opportunities for future network resilience improvements beyond 2018-19.</li></ul>
<b>Recommendation 2</b>	<p>DNSPs to, wherever more efficient and regardless of the threshold of capital expenditure under the Regulatory Investment Test for Distribution (RIT-D) requirements, implement demand side measures as an alternative to network infrastructure upgrades.</p>
<b>Recommendation 3</b>	<p>DNSPs should work with the AEMO to identify network-led demand side measures which could be considered as part of the Reliability and Emergency Reserve Trader (RERT) scheme, if a RERT program is required for summer 2018-19 in order to address forecast supply shortfalls.</p>
<b>Recommendation 4</b>	<p>DNSPs should provide frequent and more granular level demand forecasts, sourced from smart meter data, to AEMO as soon as information becomes available and in time to inform summer 2018-19 preparedness measures.</p>
<b>Recommendation 5</b>	<p>To support recommendations 1, 2, 3 and 4, DNSPs should bring forward data analysis initiatives to better leverage smart meter data to proactively identify weaknesses on their networks.</p>
<b>Recommendation 6</b>	<p>DNSPs should send proactive communications to specific groups of customers (such as customers with life support equipment) in advance of potential events and share with the Department of Health and Human Services (DHHS). Communication channels should include, but not be limited to, the use of telephony, social media, websites and other community messaging channels.</p>
<b>Recommendation 7</b>	<p>The ESC to monitor Heat Relief Package payments made to customers.</p>
<b>Recommendation 8</b>	<p>DNSPs to collaborate and lead the development of a new website to provide up-to-date information before, during and after outages, using a common platform for all customers across Victoria.</p>
<b>Recommendation 9</b>	<p>DNSPs should prepare a consistent 'plain language' compensation factsheet for the public which explains the compensation process, assessment criteria and evidentiary requirements. The factsheet should be made available on each DNSP website and be consistent across all DNSPs.</p>
<b>Recommendation 10</b>	<p>The Victorian Energy Emergency Committee to conduct a review of the Victorian Energy Emergency Communications Protocol (VEECP), including consideration of VEECP teleconference activation triggers. Triggers to be considered include: Greater than 20,000 customers off supply on aggregate across all DNSPs, Heat Health Alerts, forecasts of Lack of Reserve notices, or unusual weather events, such as a combination of high heat and humidity.</p>
<b>Recommendation 11</b>	<p>To support recommendation 10, the Victorian Energy Emergency Committee should review the operations of the VEECP teleconference to identify opportunities to improve the quality, consistency and frequency of information exchanged between DNSPs, the AEMO and Government agencies during an energy emergency event.</p>

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## Actions for the longer term – to be initiated as soon as practical

- Recommendation 12** The ESC to consider whether an annual assessment of the GSL process is adequately addressing the outcomes for customers over consecutive years, and to explore methods to improve transparency of any potential systemic network issues.
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- Recommendation 13** The ESC to undertake a study to assess the DNSP emergency response plans to ensure compliance with the Electricity Distribution Code (EDC), and to provide advice regarding ongoing reviews of DNSPs performance during emergency events.
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- Recommendation 14** In future EDC review periods, the ESC to consider including:
- a) annual obligations for DNSPs to report on their use of smart meter technology. These reports should include information on how data is being harnessed to: (i) plan for increases in demand to guide network investment; (ii) better support power-dependant customers; (iii) improve reliability of the network; and, (iv) implement demand side response initiatives; and
  - b) options to improve public transparency by requiring publication on DNSP websites in simple, accessible formats of the location of network weaknesses; outage events; and trends over time.
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- Recommendation 15** The ESC to review the current regulatory framework to maximise incentives for, and reduce any barriers to, the adoption of demand side response initiatives.
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# 3 Introduction

## 3.1 Purpose of this review

Over the 2018 Australia Day long weekend, an estimated 94 712 Victorian electricity customers were without power for varying durations. While the Victorian Government was initially informed that 110 000 customers lost supply, this was reduced after distribution network service providers (DNSPs) reviewed their statistics and eliminated outage numbers that had been duplicated.

The Victorian Government launched a review to understand what caused the outages and to identify opportunities to improve network reliability, responsiveness and affordability for Victorian energy customers.

This report summarises the findings of the review and proposes recommendations to address opportunities for improvements.

## 3.2 Terms of reference

The review was guided by the following terms of reference:

1. The causes, nature and extent of the outages.
2. The communications and customer engagement undertaken by DNSPs before, during and after the event to assist them in preparing for, managing and recovering from its impacts.
3. The timeliness of activities undertaken by DNSPs to restore customer supply.
4. The known impacts and implications of the event, including any significant consequences identified for power-dependent individuals or businesses.
5. The approach adopted by DNSPs to the provision of Guaranteed Service Level (GSL) payments and requests for compensation from customers.
6. Activities to engage customers and support greater uptake and participation in demand response initiatives.
7. Opportunities for improved preparation by DNSPs for significant heat events, including in network planning and customer engagement.
8. The need for further reform of national or state regulatory frameworks related to the reliability performance of DNSPs.

9. If DNSPs are effectively using smart meter data to help prevent and manage planned and unplanned outages.
10. The roles, responsibilities and potential of other relevant energy industry stakeholders (such as retailers and customer groups) to contribute to improving electricity network reliability.
11. The adequacy of the policy and regulatory framework that DNSPs operate within.

## 3.3 Methodology and approach

The Department of Environment, Land, Water and Planning (DELWP) assembled a dedicated team to conduct the review.

The review was informed by research and analysis, as well as consultation with a broad range of industry and government stakeholders.

### 3.3.1 Stakeholder consultation

The review team consulted with industry and government stakeholders listed in Table 1. The review focused on understanding the causes of the outages. Information provided by DNSPs and government departments was considered sufficient for this purpose, particularly given the tight timeframes of the review.

Consumer groups will be consulted during implementation of the review's recommendations to ensure initiatives are appropriately designed to achieve customer and community benefit.

**Table 1. Stakeholders consulted for the review**

Stakeholders consulted
Australian Energy Market Operator (AEMO)
Australian Energy Regulator (AER)
Essential Services Commission (ESC)
Energy Safe Victoria (ESV)
Department of Premier and Cabinet (DPC)
Department of Health and Human Services (DHHS)
Jemena
CitiPower, Powercor and United Energy
AusNet Services

The review team met with stakeholders several times to build its understanding of the possible drivers of the Australia Day long weekend outages, along with regulatory settings and actions taken in response to the event. They included:

- A working group meeting comprising government and regulator representatives at the start of the review.
- Individual meetings with the AER, ESV, the ESC and DHHS.
- A meeting was also held with the CEOs of DNSPs and with DELWP staff to discuss issues surrounding the outages as well as the Terms of Reference of the review.
- A separate meeting was held with representatives of DNSPs to explore the detail of the reports provided (see below).

### 3.3.2 Data gathering

Data used in this report was sourced from reviews of existing documentation as well as responses to requests for information from DNSPs and through discussions with other key stakeholders.

The following documentation was provided to support the review:

- Weather information from the Bureau of Meteorology (Victorian State BOM Office and BOM Website).
- Maximum demand and National Electricity Market (NEM) demand information supplied by the AEMO.

- Information on the Victorian Energy Emergency Committee Protocol (VEECP), VEECP Emergency Communications Protocol, Single Industry Spokesperson for Electricity in Victoria, Mutual Aid Protocol, VEECP Situation Reports 28 and 29 January 2018, and the Electricity Statement of Opportunities September 2017 – all supplied to DELWP by the AEMO.
- Information, provided by all DNSPs, outlining activities that were undertaken before, during and after the event.
- DHHS provided a Power Outage Notification Protocol and summary of the impacts on power-dependant customers.
- Emergency Management Victoria (EMV) provided the State Strategic Impact Plan, Class 2 Electricity Emergencies 2017-2018.

An information request was also issued to DNSPs asking for information on the following topics:

- Preparation activities undertaken ahead of the event.
- The volume and nature of communications with customers before and during the outages (such as call volumes, SMS messages and online notifications).
- Any contextual information to assist the review team with interpreting the outages data (particularly around locations and duration). For example, if there were unique conditions in their network, or a part of their network, that would explain a significant number of outages or outages of particularly long duration.
- How smart meters were used to plan for or respond to the outages and if opportunities exist to better leverage smart meters for other unique events in future.
- Information gathered from individual DNSP post event reviews
- How customer expectations around reliability are accommodated in DNSP network planning activities.
- How DNSPs use available data and forecasts in network planning and asset management, and if anything in that process may be particularly relevant to understanding the causes, nature and extent of the Australia Day long weekend outages.
- Opportunities for improvement identified that can be implemented to better plan for, or respond to another unique event.

- Whether mutual aid was requested and if so, how effectively it was deployed.<sup>10</sup>
- Any regulatory barriers preventing DNSPs from implementing any identified improvements.
- An update on customer payment claims (such as Heat Relief Package payments) since the event.

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<sup>10</sup> Mutual aid is an agreed process to obtain, where possible, short term assistance in the form of personnel, equipment, materials, and other

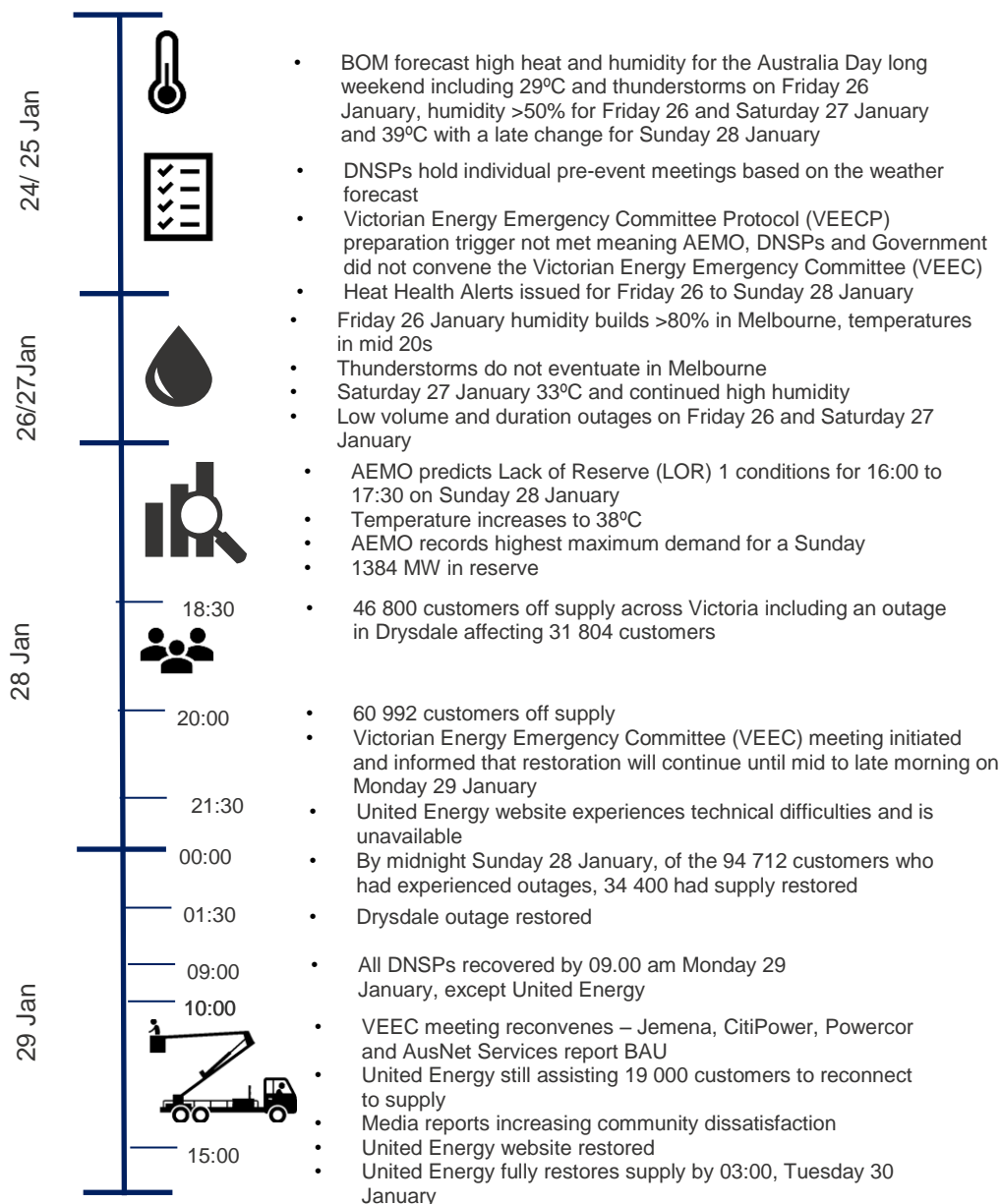
related services from other Victorian based DNSPs outside the area that a DNSP operates.



## 4 Event overview

This section provides an overview of the events of the Australia Day long weekend. A chronology of the events is illustrated in Figure 1 and described in more detail in subsequent sections.

Figure 1. Chronology of the 28 and 29 January outages and the contributing factors



## Extreme weather was forecast for the Australia Day long weekend and DNSPs began preparing for a possible outage event.

The Bureau of Meteorology (BOM) forecast extreme weather for the Australia Day long weekend. In particular, the BOM forecast relative humidity greater than 50 per cent and temperatures of 29°C and 33°C for Friday 26 and Saturday 27 January. Storms were forecast on Friday evening in central and north central Victoria. A temperature of 39°C with a cool change was forecast for Sunday 28 January.

In preparation for the extreme weather, all DNSPs held individual pre-event meetings on Wednesday 24 and Thursday 25 January to plan their response and recovery in anticipation of possible outages.

Temperatures recorded on Friday 26 and Saturday 27 January ranged from the mid-20s to low 30s, with the humidity greater than 80 per cent across the metropolitan and the greater Geelong areas. While temperatures were not extreme, the high humidity caused discomfort similar to extreme heat days. Thunderstorms did not occur in Melbourne as forecast on Friday 26 January.

## Fuses begin to 'blow out' on Sunday 28 January

The combination of high heat and humidity increased power demand as Victorians attempted to cool their homes.

The AEMO published a Market Notice (No 61006) at 10:43 am on Sunday 28 January, forecasting an anticipated Lack of Reserve 1 (LOR1) condition from 16:00 to 17:30 hours.

By late afternoon on Sunday 29 January, outages began to occur largely as a result of, what DNSPs term as fuse operations. The DNSPs indicated that fuses operated as designed; 'blowing out' to protect network plant and equipment from damage caused by electrical overload. DNSPs have explained these fuse operations were due to the sustained high demand.

United Energy noted that its network, which includes the Mornington Peninsula, experienced a 16 per cent increase in demand; much higher than other networks.

A notable exception of outages caused by fuse overloads was the outage at Drysdale, which

interrupted supply to approximately 32 000 Powercor customers on the Bellarine Peninsula. This was due to a major cable fault. Powercor obtained an independent forensic analysis of the failed cable, which found evidence of insulation damage that would have occurred during termination of the cable and therefore could have occurred at any time; therefore, not a result of demand overload.<sup>11</sup>

The outages peaked at a total of 94 712 customers without power across the state.<sup>12</sup> A breakdown of customers affected by outages on Sunday 28 January is provided in Table 2.

**Table 2. DNSP total customers affected by outages Sunday 28 January 2018** [source: DNSPs]

DNSP	Customer affected by outages
United Energy	25 266
Powercor	47 871
CitiPower	1 494
AusNet Services	14 879
Jemena	5 202
TOTAL	94 712

At 21.30 on Sunday 28 January, at the height of the outages, United Energy's website failed due to technical difficulties. Customers seeking information contacted United Energy's call centre, which overloaded, making it difficult for customers to obtain, or be provided with, information. The United Energy website was restored at 15.00 on Monday 29 January, more than 18 hours after it went offline.

The VEECP teleconference was activated at 20:00 on Sunday 28 January, when 50 000 customers were without electricity supply. The DNSPs informed the VEECP teleconference participants that recovery was anticipated by mid-morning Monday 29 January. Based on this advice, the VEECP teleconference recessed until 10:00 on Monday.

The VEECP teleconference recessed as the event continued to escalate into Sunday evening. As the volumes of outages grew, the recovery times

<sup>11</sup> Other DNSPs noted outages that were not attributable to heat and humidity. These outages were not as significant as the Drysdale outage.

<sup>12</sup> The number of outages on 28 January were initially over-reported at approximately 110 000, but have since been reviewed by DNSPs and a final figure of 94 712 has been established.

continued to extend. Communications between industry and government suffered and the extent of the event was not made apparent at this time.

The VEECP teleconference should have been recalled on Sunday evening when the magnitude of the event became apparent.

**The majority of customers are reconnected by Monday morning, 29 January**

The VEECP teleconference was stood down after the 10:00 meeting on Monday 29 January as the

majority of DNSPs had restored supply to affected customers.

The United Energy website remained offline until 15:00 Monday 29 January and frustrated electricity customers contacted media. The issue quickly attracted further media coverage.

United Energy had restored power to all customers at 15:00, Tuesday 30 January.

## 5 Event preparation

This section outlines the actions taken by various organisations in the days leading to the Australia Day long weekend.

### 5.1 Multiple factors considered

The industry had many factors to consider in preparing for the weekend, including:

- Weather forecasts
- Total Fire Ban declarations
- Heat Health Alerts
- Availability of staff and repair crews
- The impact of transient populations at holiday times.

#### 5.1.1 Weather forecasts

On Thursday 25 January, the BOM issued a weather forecast for the Australia Day long weekend. Of note were storms predicted for Friday 26 January and high heat for Monday 29 January. A summary of the Melbourne forecast is provided in Table 3.

**Table 3. Melbourne forecast issued 25 January** [source: BOM]

Date	Forecast high °C	Forecast low °C	Storms predicted
Fri 26 January	29	20	Yes
Sat 27 January	33	21	No
Sun 28 January	39	23	No
Mon 29 January	28	24	No

The BOM also predicted extreme heat for regional areas over the weekend including at Swan Hill and Mildura (40°C) and Bendigo (37°C).

#### 5.1.2 Total Fire Bans

No Total Fire Bans were declared for Friday 26 to Monday 29 January 2018.

#### 5.1.3 Heat Health Alerts

The Department of Health and Human Services (DHHS) regularly notifies local governments, DHHS program areas, hospitals, and state-wide or major metropolitan health and community service providers of forecast heatwave conditions likely to negatively impact human health.

DHHS has identified temperature thresholds for Victoria that are likely to increase heat-related illness and mortality. A Heat Health Alert is issued when the temperature threshold is reached in a specific weather forecast district.<sup>13</sup>

DHHS issued a Heat Health Alert for the Central, Mallee, North Central, Northern Country, South West and Wimmera forecast districts for Friday 26 and Saturday 27 January and a state-wide Heat Health Alert was issued for Sunday 28 January.

#### 5.1.4 Availability of staff and repair crews

Public holidays present challenges for DNSPs to secure resources and access materials, as staff take leave and are often not contactable for 'chance availability'. Chance availability is when an event occurs and the DNSP calls on workers not rostered on to respond to events.

Chance availability typically diminishes on public holiday weekends. An option for the DNSP is to secure additional resources before the public holiday by paying staff an availability allowance or placing contract companies on retainers.

United Energy implemented a change in service provider that weekend which affected the available resources that could be mobilised to respond to the event. United Energy did secure enough response resources to cover a normal level of fault activity during the transition (as it anticipated a cool change coming through, as per the BOM forecast).<sup>14</sup>

The change in service provider that weekend impacted the availability of additional resources during the event and presumably impacted the duration of outages experienced.

#### 5.1.5 Transient populations

Holiday areas attract additional populations that increase local energy demand. This impacts the maximum loads experienced in these areas. Road access to areas such as the Bellarine and

<sup>13</sup> According to Health Victoria, Heat Health Alerts are determined by temperature thresholds only and do not pick up combination heat and humidity.

<sup>14</sup> Information on exactly how many UE crews were available that weekend compared with how many were in fact required, was not shared by UE, nor was it explicitly asked for.

Mornington Peninsulas and other holiday spots can also become difficult due to heavy traffic.

## 5.2 Preparation immediately before the event

### 5.2.1 VEECP protocol

The VEECP has triggers for forecast and actual events which include forecasts of an extreme weather event. The VEECP triggers were not met until 22.00 Sunday 28 January and so the VEECP teleconference was not activated before the event.<sup>15</sup>

### 5.2.2 DNSPs

The DNSPs individually convened pre-event planning sessions based on weather forecasts and examined available resources against their anticipated needs.

The major variance in the event preparation activities between DNSPs was their different approaches to monitoring weather forecasts (and adapting their planning approaches accordingly) and the manner in which they secured appropriate resources, considering the scarcity of resources during public holiday weekends.

The other noticeable differences were that only two DNSPs issued proactive communications to customers in advance of the long weekend, and only one DNSP engaged customers in a demand management response to reduce consumption during the peak period.

### 5.2.3 AEMO

The AEMO considers the weather, the anticipated loads and the generation capacity with the NEM to understand supply and demand within the system. On Sunday 28 January, at 10:43 am, the AEMO forecast a LOR1 condition for 16:00 to 17:30, with a minimum forecast reserve of 1 015 megawatts.<sup>16</sup>

## 5.3 Longer term network planning and DNSP preparation

Each DNSP must make decisions about how it will invest in its network and submit its proposal to the AER every 5 years for approval. The AER

determines if the proposed investment is efficient and prudent to ensure that customers do not pay too much for the service they receive.<sup>17</sup>

All DNSPs prepare the following to support investment decisions:<sup>18</sup>

- A 5-year capital investment program and operational expenditure for approval by the AER.
- Distribution Annual Planning Reports which provide additional detail of where capital will be invested.
- A summer readiness program is prepared by DNSPs which studies performance of the network and remedies potential points of failure that can lead to reliability issues.

The DNSPs examine many factors when conducting network planning studies, including:

- Changes in demand including increased populations and the uptake of air-conditioning.
- The increasing amount of embedded generation being directly connected to the network.
- Improvements in system security required when an increase in demand is forecast.
- System studies as part of the new customer connection process.
- The volume and nature of ageing assets.

DNSPs use a Value of Customer Reliability (VCR), as set out by the AEMO when determining how and where to invest in its network. The VCR places a value on the benefit of reliability versus the cost of additional investment. The VCR mechanism is designed to prevent over investment which would ultimately increase network charges and add to customer costs.

DNSPs use similar criteria for managing their assets to maintain reliability and safety. DNSPs have reported they use maintenance performance data, asset condition data and asset failure data to forecast maintenance and replacement activities as well as to improve asset maintenance policies and adjust asset class strategies to balance customer network performance expectations, network safety risk and the cost to consumers.

<sup>15</sup> The VEECP was first established in 2011 and the triggers are subject to annual reviews. Triggers have only marginally over this time. More information about the triggers can be found in the appendix.

<sup>16</sup> To maintain power system reliability, AEMO will often inform the market of 'lack of reserve' (LOR) conditions to encourage a response from market participants to provide more capacity into the market: generators may offer in more supply, or consumers can reduce their demand. Both responses have the effect of improving the reserve

margins. In short, LOR levels are pre-determined electricity reserve levels.

<sup>17</sup> See the Appendix for further detail regarding the role of the AER in approving pricing proposals.

<sup>18</sup> Information on the longer-term network planning activities undertaken by DNSPs was provided by DNSPs to DELWP for the purposes of this review, and is summarised here.

### 5.3.1 Smart meter data in network planning

Smart meter data is used by all DNSPs to monitor the load on substations. The DNSPs utilise aggregated smart meter and interval metering data to calculate maximum demands on distribution substations. By utilising this data, the DNSPs develop an annual program to augment distribution substations and low voltage circuits. This enables DNSPs to target areas at the highest risk of failure.

In addition to using smart meter data to inform network planning, DNSPs could use smart meter data to help consumers intelligently manage energy use, especially at times when demand reaches significantly high levels or when a reduced energy demand is needed to support system reliability.

### 5.3.2 Summer preparation programs

DNSPs develop detailed summer preparedness programs primarily based on the previous year's network performance and maximum demand forecast for the current year. The DNSPs summer preparedness programs will address areas that require additional capacity, network augmentation

and contingency planning where a risk exists but augmentation is not justified.<sup>19</sup> DNSPs must deploy the most cost-efficient measures to address network constraints and should demonstrate in all instances how demand side measures have been adopted as an alternative to capital expenditure. DNSPs implement their summer preparation programs before November each year.

It is unclear if multiple scenarios, such as the combination of long periods of heat and humidity and a public holiday, are considered by DNSPs when preparing summer preparation programs. However, the review understands that when DNSPs are planning for a particular event, a range of other factors are also considered (such as if a major event is predicted).

### 5.3.3 Fuse replacement programs

Jemena and AusNet Services have programs in place to proactively identify fuses that have exceeded their ratings, and to replace them with higher rated fuses or investigate ways to prevent outages if the fuse cannot be upgraded.

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<sup>19</sup> Description provided by AusNet Services.

## 6 The outages

The AEMO reported that Victoria recorded its highest energy demand ever for a Sunday on 28 January 2018. Table 4 outlines the maximum demand over the weekend.

As 28 January was a Sunday, it is assumed that many commercial and industrial premises were closed and the increased load was due to greater residential consumption, presumably domestic air-conditioning.

**Table 4. Victorian maximum demand** [source: AEMO]

Peak demand date / time	Maximum operational demand MW
Thursday 25 Jan 2018 / 17:00	7 618
Friday 26 Jan 2018 / 16:00	6 896
Saturday 27 Jan 2018 / 18:00	7 761
Sunday 28 Jan 2018 / 18:30	9 144

The outages began during the late afternoon on Sunday 28 January and escalated until approximately midnight.

### 6.1 There were sufficient reserves to meet the increased demand

The NEM had sufficient reserve and LOR1 conditions did not occur on Sunday 28 January as forecast. Therefore, the outages experienced were not caused by generation or system capacity issues.

To illustrate the demand on Sunday, Table 5 displays the timing of the Peak Demand and Actual Reserves from Friday 26 January to Sunday 28 January.

**Table 5. Peak Demand times and Actual Reserves 26 to 28 January** [source: AEMO].

Peak demand date / time	Actual reserves MW
Friday 26 Jan 2018 / 16:00	3 333
Saturday 27 Jan 2018 / 18:00	2 697
Sunday 28 Jan 2018 / 18:30	1 384

### 6.2 The sustained high demand has been attributed to the weather conditions

According to the BOM, the combination of heat and humidity experienced over the Australia Day long weekend was a 1 in 35-year event<sup>20</sup>. Consumers would have increased their use of air-conditioning to remain comfortable during the unusual conditions. Table 6 summarises the weather experienced across Melbourne from Friday 26 January to Monday 29 January 2018.

**Table 6. Melbourne recorded weather 26 to 29 January 2018** [source: BOM]

Date	Highest temperature °C	Relative humidity %
Friday 26 Jan 2018	28.4	81
Saturday 27 Jan 2018	33.2	84
Sunday 28 Jan 2018	38.1	53
Monday Jan 2018	33.5	50

### 6.3 A significant number of customers lost supply

On Sunday 28 January, 94 712 Victorians lost their electricity supply, with some customers remaining without power until Tuesday 30 January.<sup>21</sup>

Table 7 lists the numbers of customers affected in each DNSP area.

<sup>20</sup> Information as provided by AEMO

<sup>21</sup> Figures for the number of customers who experienced an outage in each distribution zone was provided by each DNSP and added together to determine the final figure. The number of outages on 28 January were

initially over-reported at approximately 110 000, but have since been checked and a final figure of 94 712 has been established.

**Table 7. Number of outages and customers affected by DNSP area** [source: DNSPs].

DNSP	Outages	Customers affected by outages
United Energy	364	25 266
Powercor	134	47 871
CitiPower	37	1 494
AusNet Services	99	14 879
Jemena	20	5 202
<b>TOTAL</b>	<b>654</b>	<b>94 712</b>

United Energy experienced 364 outages affecting 25 266 customers. The number of outages that occurred in a single distribution area is significant, as it demonstrates how many locations required rectification works and directly impacts the level of resources and time required to rectify.

Powercor had the greatest number of affected customers, with 47 871 customers impacted by 134 separate outages. The outage at Drysdale accounted for approximately 32 000 customers and was attributed to a cable fault and was not load related. The Drysdale outage was significant as 32 000 customers on the South Geelong / Bellarine Peninsula area were affected for approximately 3 to 9 hours.

## 6.4 VEECP activation and real time reporting of outages

At 20.00 hours on Sunday 28 January, the VEECP teleconference was convened as Powercor and United Energy had exceeded the VEECP activation threshold of 20 000 customers in a single DNSP zone. Total customers off supply also exceeded 50,000 customers, a further trigger. The VEECP teleconference was held twice in relation to this event:

1. 20:00 on Sunday 28 January
2. 10:00 on Monday 29 January.

### 6.4.1 VEECP Victorian Power Update Situation Report 20:00 hours, Sunday 28 January

Table 8 summarises the VEECP teleconference 'Victorian Power Update Situation Report in terms of outages at 20:00 hours on Sunday 28 January.

**Table 8. Summary of customers affected by outages at 20:00 hours** [source: VEECP 'Victorian Power Update Situation Report' 20:00 hours, Sunday 28 January].

DNSP	Customers affected by outages at 20:00 hours Sunday 28 January
UE	20 000
Powercor	22 000
CitiPower	1 900
AusNet Services	4 700
Jemena	5 500
<b>TOTAL</b>	<b>54 100<sup>22</sup></b>

According to the VEECP teleconference situation report, all DNSPs expressed their expectation that supply would be restored by the early morning (or late to mid-morning in United Energy's case) of Monday 29 January. The VEECP teleconference closed with a resumption planned for 10:00, Monday 29 January.

### 6.4.2 VEECP 'Victorian Power Update Situation Report' 10:00 hours, Monday 29 January

Table 9 summarises the VEECP teleconference Situation Report in terms of outages at 10:00 hours Monday 29 January.

<sup>22</sup> Figures for the number of customers affected by an outage in each distribution zone were provided by each DNSP. DNSPs advise the

number of affected customers provided during a VEECP are preliminary only and subject to review.



**Table 9. Summary of customers affected by outages at 20:00 hours** [source: VEECP 'Victorian Power Update Situation Report' 10:00 hours, Monday 29 January].

DNSP	Customers affected by outages at 10:00 hours, Monday 29 January 2018
UE	15 079
Powercor	109*
CitiPower	9*
AusNet Services	4 600
Jemena	0
<b>TOTAL</b>	<b>19 797</b>

\*Data supplied from EM-COP dashboard as CitiPower and Powercor were unrepresented in the second VEECP teleconference.

The 10:00 Situation Report on Sunday 29 January noted that:

- United Energy had extended its expected outage duration to up to 24 hours
- All DNSPs other than United Energy were back to a business as usual state
- Mutual Aid was not formally requested by United Energy at the Sunday or Monday VEEC meetings.

The VEECP teleconference was deactivated during the meeting close, as the outage numbers had reduced to below 20 000 customers, an activation threshold for VEECP teleconferences.

Communications and coordination between the energy industry and DELWP, the controlling agency, reverted to information sharing outside the VEECP process.

There is limited guidance and requirements governing the required quality, granularity and frequency of information that needs to be provided during a VEECP teleconference. In addition, DNSPs are not required to participate in a VEECP teleconference although participation is implied in the VEECP. As a result, it is difficult to determine the true extent of the event at the time by evaluating consistent, equivalent and detailed information regarding outages across the Victorian network.

The VEECP was developed by the VEEC to facilitate timely sharing of information when responding to and recovering from an energy emergency. It is opportune for the VEECP and associated processes to be reviewed to assess improvement opportunities to increase coordination and communications and reduce community impacts. Areas for potential improvement include:

- Lowering VEECP preparation meeting trigger thresholds to encourage information sharing on potential impacts and preparatory steps by industry when high risk conditions are identified.
- Ensuring public messaging including safety and outage information is consistent and readily available.
- Aligning industry and government agency efforts to decrease community impacts during energy emergencies.
- Making provisions that ensure that the frequencies of meetings and the information exchanged are appropriate.
- Having a stand down process that ensures residual issues such as media management and community recovery are managed.

The participation and support of DNSPs and other industry participants will be essential.

## 6.5 Use of smart metering information during the outages

DNSPs all utilise smart metering data in their response to outages. Individual meters produce an alert when supply is not registering at the meter. This information is used to:

- Alert network control and dispatchers of an outage at the individual installation level.
- Allow dispatch to mobilise crews to investigate without customers logging a call.
- Provide dispatchers the ability to confirm if the outage is related to the network (no supply at the meter) or installation (supply at the meter without supply in the installation), which reduces network costs and provides the customer with information to engage an electrician if necessary.
- Update the website to relieve pressure on the call centre.

## 6.6 Communication to customers during the outages

The DNSPs reported they operate various communication channels for customers to report or gather information on outages, which are outlined in Table 10.

**Table 10. Customer outage communications** [source: DNSPs]

Communication type	CitiPower Powercor	United Energy	AusNet Services	Jemena
Call centre / Interactive Voice Response	✓	✓	✓	✓
Website	✓	✓	✓	✓
SMS advice	✓	✓	✓	
Mobile application	✓			
Social media	✓	✓	✓	✓
Website chat				✓
Email advice	✓			
Proactive communication			✓	✓

### 6.6.1 Performance of customer outage communications Sunday 28 January and Monday 29 January

All DNSPs recorded high volumes of communications with customers and all channels were operational throughout the Australia Day weekend, except for United Energy as previously noted.

According to United Energy, its outage website and Twitter feed were inoperable from 21:30 on Sunday 28 January (as the event was escalating) until 15:00 on Monday 29 January. To gain information, customers not subscribed to SMS messaging could only source updates by contacting United Energy's call centre. The call centre usually has an Interactive Voice Response (IVR) that enables customers to self-serve. United Energy informed this review that the IVR suffered multiple overloads during the event and customers had to phone the call centre again and wait to speak directly to an operator.

The inability of customers to get information from United Energy is likely to have contributed towards their frustration.

## 6.7 Most customers were reconnected by the morning of Monday 29 January

DNSPs restored supply on average within 4 to 5 hours, except for United Energy, which took an average of just under 11 hours. United Energy explained this was due to the wide geographic spread of outages on its network, making it difficult for small crews to get large numbers of customers back on supply quickly.

Powercor had an outage at Sunshine that affected 14 customers for up to 45.45 hours, which was an exception. Most of its customers affected by an outage lost supply for an average of 4 hours.

Jemena, AusNet Services, CitiPower and Powercor had restored all customers to power by early to mid-morning on Monday 29 January. United Energy's restoration was complete by 03:00 on Tuesday 30 January.

United Energy’s decision not to formally request Mutual Aid was due to an informal arrangement to supply resources between United Energy, CitiPower and Powercor, which were mobilised on Monday 29 January. While United Energy did not request Mutual Aid, other DNSPs would have been unable to provide staff anyway, as crews were fully utilised to restore supply on their own networks up until this point.

## 6.8 Impact of the outages on customers

Customer impacts are summarised in Table 11. The table shows that 1 218 customers with life support equipment experienced outages. When customers with life support equipment experience outages of more than 24 hours, DNSPs must provide the addresses of those customers to DHHS.<sup>23</sup> Customers with life support equipment off supply for extended periods can face significant health impacts, particularly in extreme weather conditions.

**Table 11. Summary of customer impacts** [source: DNSPs]

DNSP	Average outage duration hours	Longest outage duration hours > 1 customer	Life support customers affected	Life support customers > 24-hour outage
United Energy	10.46	24.48	339	0 <sup>24</sup>
Powercor	3.59	45.52	559	0
CitiPower	4.52	12.16	35	0
AusNet Services	4.20	14.58	224	0
Jemena	3.24	4.11	61	0

The outages occurred when the community was already fatigued following multiple days of heat and humidity, and so the extended outages for these customers would have increased the health risks. The impacts of climate change are likely to increase heat vulnerability events occurring more regularly. The potential impacts of risk experienced by members of the public due to these events means resilience planning for extreme weather should be considered by all DNSPs as a matter of course.

DHHS reported that the DNSPs complied with the *Power Outage Notification Protocol* and as of 8 March 2018, no adverse reports of health issues were recorded that are attributable to these power outages. However, as these customers had not been notified in advance of the potential event, they were not alerted to make alternative arrangements to reduce the risks posed to their health.

## 6.9 Community dissatisfaction

The community voiced its dissatisfaction with DNSP performance via the media. Generally, the public sentiment showed that the DNSP performance was well below community expectations. Community sentiment generally cited the lack of response, access to outage information and questioned the value for money of distribution charges.

<sup>23</sup> Source: DHHS,2016, Power Outage Notification Protocol, Life support customers experiencing power outages.

<sup>24</sup> United Energy advised that two of their customers that experienced a greater than 24-hour outage were not registered as power dependant customers with DHHS at that time of the event. These customers have since been registered as life support customers. However, for the purposes of this report they have not been referenced as life support customers.

## 7 Post event

Following the events of the Australia Day long weekend, DELWP immediately commissioned this review. The following actions were also taken in the immediate period after the event.

### 7.1 Heat Relief Package payments

The Victorian Government and DNSPs developed one-off Heat Relief Package payments totaling \$5 million designed to make payments to customers who lost power on Sunday 28 January and to generally improve communications before, during and after outage events.

As a one-off payment, customers who were without electricity during this event for 3 to 20 hours received an \$80 payment. Customers without electricity for 20 to 30 hours or more received \$120. Customers without supply for more than 30 hours received a \$180 payment. DNSPs have reported that all Heat Relief Package payments were completed by 27 February 2018.

The ESC has amended its audit program to monitor these payments to ensure that customers receive the payment they are entitled to under the Heat Relief Package.

### 7.2 Commitment to develop joint DNSP and EMV outage website

In discussions formalising the Heat Relief Package, the DNSPs agreed to work with EMV to develop a new website to support communications about outages. The website will provide customers and stakeholders with up to date outage information before, during and after outage events.

The website is not intended to replace existing information sources (such as the DNSP individual websites or government/EMV sites) but will provide consistent, publicly-oriented information to Victorian customers and stakeholders. Table 12 provides examples of the types of information that could be made available on the website.

Table 12 – Examples of information on DNSP / EMP website

Event period	Examples
Before	<ul style="list-style-type: none"> <li>• How to prepare for outages</li> <li>• Causes of outages</li> <li>• Weather warnings</li> <li>• Threats to supply</li> <li>• Life support registration</li> </ul>
During	<ul style="list-style-type: none"> <li>• Outage information including location, estimated time of restoration and cause</li> <li>• Personal and food safety</li> <li>• Life support</li> <li>• Links to report outages</li> </ul>
After	<ul style="list-style-type: none"> <li>• Event summaries</li> <li>• Information on compensation options</li> </ul>

### 7.3 Commitment of DNSPs to improvements beyond Heat Relief Package payments

DNSPs have undertaken independent reviews into the network outages that occurred on Sunday 28 January 2018 and their subsequent response.

Each DNSP has submitted a report to DELWP which include specific commitments and further opportunities to improve customer reliability and communications. Specific details about timelines and locations of these actions will be addressed as part of the plans to be submitted under Recommendation 1 to the Minister for Energy, Environment and Climate Change.

The willingness displayed by DNSPs to improve their performance is encouraging. They each describe similar initiatives which have potential for a greater community benefit if the industry aligns its efforts. An example includes individual demand management initiatives that could be aligned with the AEMO's Reliability and Emergency Reserve Trader (RERT) program to improve NEM reserve security as well as localised reliability. Aggregated DNSP and industry efforts form part of the

recommendations of this review and expectations for implementation.

As part of implementation, specific locations, timing for deployment and potential cost implications of these actions should be made clear to the Victorian Government.

#### 7.4 ESC compliance review

The ESC met with the DNSPs to discuss their compliance with the Electrical Distribution Code (EDC), especially in relation to:

- Customer information
- Appropriate response
- Efforts to restore supply.

The ESC will provide further advice to the Minister for Energy, Environment and Climate Change and is expected to report on the compliance outcomes of its discussions with DNSPs in its next *Victorian Energy Market Report*. The ESC informed the review that the available information at the time of the review indicates that DNSPs complied with their obligations under the EDC.

#### 7.5 Other customer entitlements

The EDC provides for DNSPs to make Guaranteed Service Level (GSL) payments to customers where certain reliability and service thresholds are not met.

GSL payments are not designed to provide payments for certain events, such as the Australia Day weekend, but seek to recognise poor service

provided over the balance of a year and create an incentive for improvement to DNSPs.

GSL payment amounts range from \$30 to \$360. Payments are made as soon as practicable after the calendar year of an outage event(s).

GSL payments are, to a certain extent, passed onto customers through the AER's revenue determinations, which set the charges DNSPs can apply to customers for a 5-year regulatory period. Revenue determinations include forecast costs for GSL payments. Where a DNSP outperforms the forecast, it is able to keep the difference between the forecast and its actual costs until the end of the regulatory control period. Where the DNSP does not outperform the forecast, it cannot pass on to consumers the cost of any GSL payments that exceed the forecast.

Generally, GSL payments are automatically issued (as DNSPs have full transparency of outages and service levels through smart meter data). However, DNSP compliance with GSL requirements are not usually audited.

Customers are also able to make compensation claims via DNSP websites for losses experienced as a result of DNSP performance (either related to voltage variations or outages resulting from inadvertent actions by the DNSP). However, the circumstances where a DNSP would compensate customers for losses incurred through this channel are unclear.

# 8 Conclusions

## 8.1 Network overload caused the outages

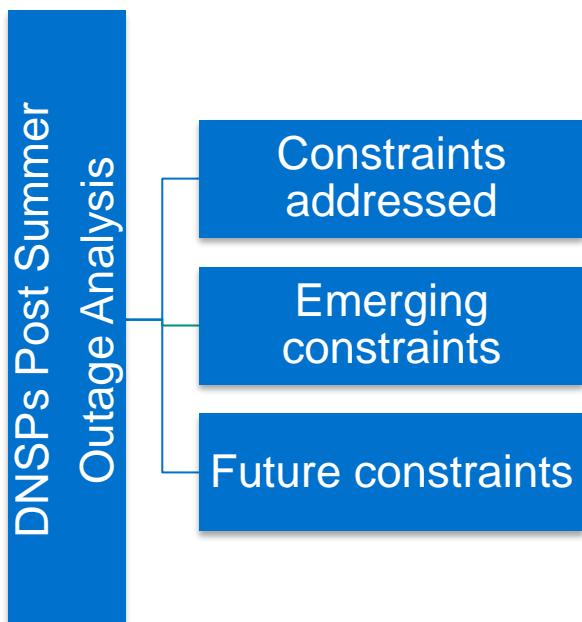
At the time of peak demand, Victoria had access to 1 384 MW of reserve capacity on Sunday 28 January 2018, despite the AEMO recording the highest maximum demand in Victoria for a Sunday. The outages on the Australia Day long weekend were not due to insufficient electricity supply.

Rather, most outages were caused by overloaded fuses in residential areas. There was also a significant outage caused by a cable failure in the Bellarine Peninsula and a substation fault at Anglesea.

## 8.2 Demand side initiatives should be accelerated

DNSPs analyse all outages that occurred over each summer at the end of the season to inform how they can address identified issues. The review has categorised this analysis as depicted in Figure 2: constraints addressed; emerging constraints; and future constraints.

Figure 2: DNSPs post summer outage analysis



Constraints addressed – this can include sites where a fuse was upgraded, a faulty connection or wiring was replaced as a part of the outage restoration. The DNSP analysis would conclude that there is a low probability of a repeat of the outage occurring under the same conditions during summer 2018-19.

Emerging constraints – the analysis suggests this segment of outages have high probabilities of recurring. DNSP use an economic decision-making framework to address the emerging constraint. Options are analysed including network and non-network solutions. Network options include traditional methods such as asset augmentation and non-network options include initiatives such as demand side measures. The DNSP deploys the option that is the most efficient to address the constraint adequately to ensure the best result for the community. The most efficient solution for each site will be scheduled for completion by 1 November.

Future constraints – A future constraint will require addressing in years beyond next summer. Utilising the economic decision-making framework described above, the DNSP plan to resolve these issues in future years. Sites with identified future constraints can be included in current demand side initiatives.

DNSPs will presumably be conducting their post summer 2017-18 analysis now to determine preparation activities for next summer.

Demand management allows new and traditional technologies to shape, shift, and shed demand. demand side initiatives are any action taken to reduce or reshape the demand for electricity, as an alternative to increasing energy supply, with the intent of supporting system reliability and/or minimising network, generation or consumer costs. DNSPs should demonstrate how and where they have adopted demand side responses regardless of the capital expenditure threshold identified in the RIT-D.

At every stage of network constraint identification and planning, DNSPs need to be implementing the most cost-effective and efficient measures to fix constraints. As the evidenced by this review, a number of the constraints experienced over 28 and 29 January were attributable to extended demand

on low voltage circuits caused by people using air conditioners.

During Sunday 28 January, AusNet Services and Jemena deployed their small scale demand reduction programs. Larger-scale demand reduction programs could mitigate the impact on customers if deployed in targeted areas under similar weather conditions in the future. DNSPs should therefore evaluate both larger scale demand reduction programs and the value of more flexible notice periods in their contractual frameworks, which they can call on demand response in shorter timeframes.

DNSPs have expressed a willingness to establish or expand their demand management initiatives and have cited they achieve tangible benefits. However, DNSPs will need to accelerate their outage analysis so that locations for demand management trials and other activities required to meet demand for next summer are identified, assessed and implemented by November 2018. DNSPs will need to have completed their analysis by 13 July 2018 to ensure networks are adequately prepared for the 2018-19 summer. All demand side measures will require customer engagement by DNSPs. Additionally, any singular DNSP demand side reduction program could deliver benefits at the network and NEM levels if combined with the AEMO's Reliability and Emergency Reserve Trader (RERT), by increasing reserve security. DNSP demand management program planning should therefore include the AEMO to achieve maximum community benefit.

### 8.3 Outages are expected from time to time

Victorians have experienced significant electricity outages in the past, the following provides examples of outages during heat events:

- 7 February 2016, 122 739 customers outages
- 15 -16 January 2014, approximately 50 000 customer outages
- 30 January 2009 500 000 customer outages

However, it was the combination of heat and humidity over a prolonged period that made the Australia Day long weekend 2018 event so unique.

The circumstances that resulted in the Australia Day long weekend outages have been partly attributed to the extreme weather (combination of high temperature and humidity) which the BOM has

described as a 1 in 35-year event. From a NEM perspective, the NEM demand levels did not exceed 1 in 10-year expectations, however the demand for the 28 January may have led to a distribution of demand not previously observed. For example, as the event occurred during a public holiday weekend, the demand was concentrated more heavily in residential areas than commercial and industrial hubs. This placed different load profiles onto DNSP network elements in residential areas than previously experienced.<sup>25</sup>

To require DNSPs to develop their networks to withstand a 1 in 35-year weather event will come at a significant cost to customers if traditional network augmentation solutions are deployed. Given the frequency and regularity of this type of event is likely to increase due to the impacts of climate change DNSPs need to deploy more innovative and non-network alternatives, like demand side response, as the first solution to addressing any current or potential constraint.

In Victoria, approximately 20 to 40 per cent of a customer's electricity retail account is related to regulated network tariffs.<sup>26</sup> Other non-network solutions, where economically viable, must be considered to increase reliability. Non-network solutions could maintain energy prices to an affordable level and to increase the resilience of distribution networks.

Acknowledging that outages will occur from time to time, the DNSPs and the energy industry must prepare, respond and recover these outages efficiently and communicate effectively to customers and stakeholders.

### 8.4 Flexibility is essential to plan for, and effectively manage, unique events

The flexibility to consider multiple factors and respond accordingly is an important element of the regulatory framework and should be retained. No evidence obtained during this review suggested the regulatory framework is insufficient in this regard.

This review found that DNSPs which performed best over the Australia Day long weekend and recovered the quickest considered multiple factors in their preparation, monitored the situation as it developed, and updated their actions accordingly.

For example, DNSPs that require staff to be available occasionally on public holidays as part of

<sup>25</sup> Source AEMO

<sup>26</sup> Source: AER

their contracts, and those that monitor weather forecasts and other public information sources regularly—such as Heat Health Alerts and Lack of Reserve (LOR declarations)—had sufficient crews to respond to outages and were able to update actions over the Australia Day long weekend in response to new information. DNSPs that didn't perform as well over the weekend have already committed to improving their procedures to consider the following factors:

- BOM weather forecasts predicting high humidity, high overnight and daytime temperatures
- Heat Health Alerts
- AEMO LOR forecasts

Despite many significant weather-related warnings, the VEECP preparation triggers were not met. Had there been a VEECP preparation meeting before Friday 26 January, it is possible that all parties would have benefited from understanding one another's evaluation of the upcoming event. Information such as anticipated weather and impacts, preparation activities and key contacts could have been shared to improve outcomes across networks. There is merit in examining the VEECP to ensure that a combination of lower threshold triggers would prompt a sharing of information in advance of an event.

### **8.5 Information supplied during an event should be clear, consistent and targeted to its audience**

During events, information provided by DNSPs to government and DELWP is not consistent, at a granular level, or frequent enough to enable DELWP to accurately assess the nature and extent of an event in real time.

While customers may expect occasional outages, they also expect to be kept informed about restoration times. The regulatory framework places obligations on DNSPs to do this. DNSPs have identified ways to improve proactive communication, such as by sending targeted SMS messages to select groups of customers (life support customers) in advance of a possible event. This would be a valuable way to empower customers to manage risks to their health in advance of an event. It would be beneficial if this information is provided in a clear, consistent and targeted manner so it addresses the

communication needs of this particular group of customers.

There is an opportunity for DNSPs to improve engagement levels with their customers before, during and after energy emergency events. Communications can be broad or narrow in their focus so people can prepare, make provisions or take action to reduce the impact of an outage event on their family and community.

Government may also wish to consider how it communicates with the public during an event, so that Victorians can rely on a trusted source of truth during an outage. This consideration should be informed by examining the communication techniques adopted by other sectors, such as bushfire notification practices.

### **8.6 Customers should have access to clear information on their entitlements**

The review found it is unclear if customers receive the GSL payments they are entitled to. GSL payments are generally automatically generated for outages – but GSL payments are also payable for a range of other instances (such as a DNSP representative not turning up to an appointment on time). The responsibility for audit and compliance with GSL payment obligations is unclear, but the question of responsibility is something that can be considered by the ESC when it reviews its EDC later this year.

If a customer experiences a loss (such as property damage) as a result of DNSP actions, they can claim compensation via the DNSP website. For example, a business may lose refrigerated food due to an extended outage which would not be covered by other means of compensation. However, the approval criteria for claims is unclear, making it difficult for customers to know if their claim for loss or damages will succeed, or how long a claim will take to process. This lack of transparency needs to be addressed so that customers are informed and consistently and fairly treated.

### **8.7 Better analysis of smart meter data is required**

Information gathered for this review indicates the widespread outages were caused by sustained high



demand due to high residential air-conditioner use. This overloaded circuits, which caused fuses to fail as they are designed to do, to protect network equipment.

Smart meter data enables DNSPs to gain a detailed insight into how, where and when energy is consumed to better inform their operations. This level of detail can be obtained potentially down to the street circuit of a distribution transformer.

Information provided by DNSPs suggests that limited analysis has been undertaken to date to establish air-conditioning loads, or the penetration of other energy intensive appliances. It appears that smart meter data is currently more generally used at an aggregate level to inform network planning and outage management. However, some DNSPs have indicated that data analysis projects to improve low voltage network planning have been brought forward as a result of the Australia Day long weekend event.

Better use of smart meter data could result in improved reliability for customers.

## **8.8 Leveraging learnings for better network summer preparation**

The weather conditions from Friday 26 January to Tuesday 30 January were unusual, with two days of high humidity followed by extremely hot conditions. While this is an unusual event, existing AEMO forecasts predict the 2018-19 summer to present similar conditions.<sup>27</sup> For this reason, lessons from this year's outages must be acted upon to avoid significant customer impacts next summer and build community resilience.

The recommendations from this review describe immediate actions that should be undertaken before next summer and those that can be addressed over a longer time period.

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<sup>27</sup> Electricity Statement of Opportunities AEMO September 2017

## 9 Recommendations and proposed implementation

This report makes 15 recommendations designed to capture the key findings and conclusions made through the review. DNSPs have all indicated their intention to improve reliability and services for customers in response to the events of the 2018 Australia Day long weekend, and there is an expectation that DNSPs will each implement the improvements. The following recommendations are designed to also engage DNSPs collectively with other stakeholders to derive greater outcomes for summer 2018-19 and beyond. These outcomes include aggregated efforts for improved network preparation, communications, use of smart meter data analysis reporting and demand management implementation.

It is important that all recommendations, where feasible, are implemented before summer 2018-19. Proposed implementation timelines are included in this report which demonstrate the need to expedite implementation so that improvements for summer 2018-19 are achieved. Central coordination will be required so all recommendations are governed, implemented, managed and monitored appropriately. The following high-level structure is suggested.

- Senior DEWLP executives, DNSP CEOs, AEMO representatives and regulators are engaged to commit to the recommendations and commit adequate resources to the tasks.
- A working group consisting of representatives from the agencies listed above to manage the recommendations through a coordinated approach so that all recommendations are thoroughly examined and implemented where feasible.

### 9.1 Immediate actions

#### Immediate actions - to be in place by summer 2018-19

<b>Recommendation 1</b>	DNSPs to utilise data gathered from the summer 2017-18 outage and inform the Minister for Energy, Environment and Climate Change of the results of their network analysis by 13 July 2018 including their plan to address their network weaknesses. This report should: <ul style="list-style-type: none"><li>• Demonstrate how demand side measures, where most efficient, were adopted as an alternative to network augmentation;</li><li>• Details of demand side measures to be implemented in time for Summer 2018-19 including locations and any associated costs;</li><li>• Locations of fuse upgrades and asset replacement works which have taken place since Summer 2017-18;</li><li>• Locations of any planned network augmentation measures scheduled before Summer 2018-19; and</li><li>• Opportunities for future network resilience improvements beyond 2018-19.</li></ul>
<b>Recommendation 2</b>	DNSPs to, wherever more efficient and regardless of the threshold of capital expenditure under the Regulatory Investment Test for Distribution (RIT-D) requirements, implement demand side measures as an alternative to network infrastructure upgrades.
<b>Recommendation 3</b>	DNSPs should work with the AEMO to identify network-led demand side measures which could be considered as part of the Reliability and Emergency Reserve Trader (RERT) scheme, if a RERT program is required for summer 2018-19 in order to address forecast supply shortfalls.
<b>Recommendation 4</b>	DNSPs should provide frequent and more granular level demand forecasts, sourced from smart meter data, to AEMO as soon as information becomes available and in time to inform summer 2018-19 preparedness measures.
<b>Recommendation 5</b>	To support recommendations 1, 2, 3 and 4, DNSPs should bring forward data analysis initiatives to better leverage smart meter data to proactively identify weaknesses on their networks.
<b>Recommendation 6</b>	DNSPs should send proactive communications to specific groups of customers (such as customers with life support equipment) in advance of potential events and share with the Department of Health and Human Services (DHHS). Communication channels should include, but not be limited to, the use of telephony, social media, websites and other community messaging channels.

<b>Recommendation 7</b>	The ESC to monitor Heat Relief Package payments made to customers.
<b>Recommendation 8</b>	DNSPs to collaborate and lead the development of a new website to provide up-to-date information before, during and after outages, using a common platform for all customers across Victoria.
<b>Recommendation 9</b>	DNSPs should prepare a consistent 'plain language' compensation factsheet for the public which explains the compensation process, assessment criteria and evidentiary requirements. The factsheet should be made available on each DNSP website and be consistent across all DNSPs.
<b>Recommendation 10</b>	The Victorian Energy Emergency Committee to conduct a review of the Victorian Energy Emergency Communications Protocol (VEECP), including consideration of VEECP teleconference activation triggers. Triggers to be considered include: Greater than 20,000 customers off supply on aggregate across all DNSPs, Heat Health Alerts, forecasts of Lack of Reserve notices, or unusual weather events, such as a combination of high heat and humidity.
<b>Recommendation 11</b>	To support recommendation 10, the Victorian Energy Emergency Committee should review the operations of the VEECP teleconference to identify opportunities to improve the quality, consistency and frequency of information exchanged between DNSPs, the AEMO and Government agencies during an energy emergency event.

Immediate actions are those that do not require a regulatory review or extensive consultation to implement, and that can be implemented before next summer.

DNSPs need to ensure greater utilisation of demand side response services. DNSPs are running a number of demand management trials, which should be accelerated and broadened to get the best outcomes for customers before next summer and aligned with key areas of network weakness. The outcomes of current trials must be analysed and acted upon early and should consider other factors relating to reliability, such as the impacts of embedded solar generation. Future trials need to be broader and more significant so that demand management can become a viable option to avoid or defer unnecessary investment, and to enable customers to actively prepare for and manage the impacts of peak events and avoid outages.<sup>28</sup>

DNSPs have advised that all Heat Relief Package payments to customers have been made paid, and the ESC has updated its audit program to monitor those payments to ensure that customers received the payments they were entitled to. There is an opportunity for the ESC to further this audit regime to examine DNSP GSL payments over consecutive years to improve transparency and identify any potential systemic network issues.

Energy customers should expect to be kept informed during outage events and engaged before during and after significant weather events. DELWP has also committed to working with other Victorian emergency management agencies to boost 'energy literacy' with respect to roles and responsibilities during an emergency, expectations of the energy industry, and energy systems and operating frameworks, including the legal obligations of industry. All relevant industry participants should be involved in the discussion to agree on a consistent approach to proactive engagement, so that all customers receive similar warnings and information regardless of where they live and the network that supplies them.

Through this process, the following options could be considered:

- DNSPs adopt contingency plans for providing information to customers in the event that a communication channel fails, or develop disaster recovery plans for their websites.
- Development of a new website developed by DNSPs with Emergency Management Victoria (EMV) to provide the public with information before, during and after outages. The website is not intended to replace the DNSP websites but to provide an aggregated alternative for the public to source information.
- How to improve the accuracy of estimated recovery times provided to customers.
- The criteria that would apply to trigger an SMS alert to customers with life support equipment in advance of a potential event.
- How to share outcomes of demand management trials and to leverage best practice engagement techniques across the industry.
- DNSPs working with the AEMO to identify network-led demand response measures which could be considered as a part of the Reliability and Emergency Reserve Trader (RERT) scheme. This option will require significant work to implement and identify any regulatory barriers that currently exist and resolve

<sup>28</sup> We note that the AER has developed a revised Demand Management Incentive Scheme, which will apply to Victorian businesses in the next regulatory period (2020).

them. However, it is important this work is completed so that demand response is properly embedded in DNSP planning and operations.

DNSPs must also improve the transparency around how compensation claims are processed and approved, which may be achieved through a plain language fact sheet and information provided on their websites.

The findings of this review also highlight the need for the VEEC to lead a separate review into the VEECP to consider how it can be updated to enable greater flexibility about when and why a VEECP teleconference should be held. For example, the preparation triggers could include the declaration of a Heat Health Alert by the Chief Health Officer, forecasts of Lack of Reserve or unusual weather events such as high heat and humidity combinations.

Further opportunities include a review of the VEECP to ensure adequate information is exchanged by key stakeholders. This information should include public information, use of agency and industry communication channels, key contacts, access to resources, specific areas of greatest community impact, planned works and public messaging. The inclusion of key contacts will allow for more efficient industry and agency interaction during future emergency events. The meeting threshold triggers should be revisited, for example initiating a VEEC meeting should include a trigger of 30 000 customer outages over 2 or more DNSPs.

## 9.2 Actions for the longer term

### Actions for the longer term – to be initiated as soon as practical

<b>Recommendation 12</b>	The ESC to consider whether an annual assessment of the GSL process is adequately addressing the outcomes for customers over consecutive years, and to explore methods to improve transparency of any potential systemic network issues.
<b>Recommendation 13</b>	The ESC to undertake a study to assess the DNSP emergency response plans to ensure compliance with the Electricity Distribution Code (EDC), and to provide advice regarding ongoing reviews of DNSPs performance during emergency events.
<b>Recommendation 14</b>	In future EDC review periods, the ESC to consider including:  a) annual obligations for DNSPs to report on their use of smart meter technology. These reports should include information on how data is being harnessed to: (i) plan for increases in demand to guide network investment; (ii) better support power-dependant customers; (iii) improve reliability of the network; and, (iv) implement demand side response initiatives; and  b) options to improve public transparency by requiring publication on DNSP websites in simple, accessible formats of the location of network weaknesses; outage events; and trends over time.
<b>Recommendation 15</b>	The ESC to review the current regulatory framework to maximise incentives for, and reduce any barriers to, the adoption of demand side response initiatives.

The longer-term actions recommended here can be characterised as those that require further analysis and consideration by regulators, in consultation with industry. A number of important elements of the regulatory framework influence longer-term network planning by DNSPs, some of which may need further examination to determine whether improvements are required.

The ESC has indicated that it intends to review the EDC this year so it meets the current expectations of customers. This offers an opportunity to consider if the compliance requirements relating to GSL payments are adequate, and if DNSP Emergency Response Plans should be reviewed by the ESC periodically for their suitability.

DNSPs have access to relatively granular demand information through smart meters, which is utilised to various levels by DNSPs. Victoria has made a large investment in smart meters and the ESC should examine if the use of smart meter data should be regulated in future versions of the EDC.

The central theme of recommendations 12 to 15 is to ensure that regulatory settings and the longer-term network planning performed by DNSPs are aligned to current expectations of customers.

# Appendix A: Industry structure and obligations

## Industry structure

Industry participants play various, but vital, roles in the event of an emergency or significant event, such as the outages which are the subject of this review. An overview of the role of each industry participant in an emergency is provided below.

### The market operator

The Australian Energy Market Operator (AEMO) is a federal government body responsible for operating the national gas and electricity markets, including ensuring that demand and supply are balanced at all times. As Australia's independent energy markets and power systems operator, the AEMO provides critical planning, forecasting and power systems information, security advice, and services to industry participants. The AEMO operates under the *National Electricity Rules (NER) version 106*.

Under the NER, the AEMO has many responsibilities which include monitoring short and long-term supply availability. Long-term supply availability is based on forecasting and recommending system upgrades, whereas short-term reliability is based on forecasts to ensure security of supply.

The AEMO also has the power to issue directions to 'Market Participants' under certain conditions and can issue load shedding and directions to industry during energy emergencies. The AEMO did not request load shedding during the 28 and 29 January 2018 event.

In Victoria, the AEMO is a support agency for energy under the *Emergency Management Act 2013*. To provide a method for communicating with other agencies under the *Emergency Management Act 2013*, the AEMO activates the Victorian Energy Emergency Committee meetings (VEEC). The VEEC was established to ensure timely advice and information is coordinated between stakeholders when responding to an energy incident. Membership of the VEEC includes the AEMO, Victorian DNSPs, the Victorian Government and emergency services across Victoria.

### Energy policy department

Under the *Emergency Management Act 2013*, DELWP is the controlling agency for all energy emergencies in Victoria (assuming the responsibility from DEDTJR when the responsibility for energy policy moved to DELWP). DELWP's responsibilities include:

- In preparation for energy emergencies, ensuring there are well-established emergency management arrangements and protocols in place in the energy sector. These arrangements and protocols link government agencies with other energy sector stakeholders, including the AEMO and energy distribution businesses.
- Monitoring energy industry response and reinstatement of services and return to reliable supply.
- Making proactive steps to escalate and inform the government of energy emergencies that affect the community.
- Liaising with the relevant government stakeholders and energy businesses during energy emergencies.

### Regulators

The Australian Energy Regulator (AER) sets network prices so that energy consumers pay no more than necessary for the safe and reliable delivery of electricity and gas services.

The AER administers the National Electricity Law and Rules (discussed in further detail in the following section) which set out the regulatory framework for electricity networks. DNSPs apply every 5 years to the AER to assess their revenue requirements.

The Essential Services Commission (ESC) is responsible for licensing all businesses involved in supplying electricity and gas in Victoria. The ESC regulates the consumer service standards that DNSPs must comply with and reports on how well DNSPs perform against those standards.

The ESC administers the *Electricity Distribution Code* (EDC) that places customer service standards on DNSPs and is authorised to enforce compliance with energy license requirements.

Energy Safe Victoria (ESV) administers a range of legislation relating to the networks including amongst others:

- *Electricity Safety Act 1998*;
- *Electricity Safety (Electric Line Clearance) Regulations 2015*;
- *Electricity Safety (Bushfire Mitigation) Regulations 2013*; and
- *Electricity Safety (Bushfire Mitigation Duties) Regulations 2017*.

ESV produces annual reporting on the safety performance of the transmission and distribution networks, safety audit reports and electrical incident and technical investigation reports.

These mechanisms provide the regulator with a number of avenues to improve the safety and resilience of the networks. Whilst the focus is on safety, improved safety will, in many instances, contribute to reducing the risk of supply issues.

### **Transmission businesses**

In Victoria, AusNet Services is the Transmission Network Service Provider (TNSP). As such, AusNet Services is responsible for the transmission infrastructure that takes electricity from the generation assets at extra high voltage and delivers it to the distribution network, and the DNSPs' assets.

During an emergency the TNSP must take direction from the AEMO and provide a supporting agency role under the *Emergency Management Act 2013*.

### **Distribution businesses**

The DNSPs are geographic monopolies in Victoria and are responsible for maintaining and operating the 'poles and wires' assets in their geographic area. There are five DNSPs operating in Victoria:

- AusNet Services – responsible for the network in outer northern and eastern suburbs and eastern Victoria
- CitiPower – responsible for the network in the Melbourne CBD and inner suburbs
- Jemena – responsible for the network in the northern and north-western suburbs
- Powercor – responsible for the network in the western suburbs and western Victoria
- United Energy – responsible for the network in the southern suburbs and the Mornington Peninsula.

Due to common ownership, CitiPower and Powercor have a shared management and operating structure, while United Energy shares the CitiPower and Powercor corporate management structure.

DNSPs are required to plan for emergencies, respond to and resolve outages, and communicate with customers appropriately. These requirements are placed on DNSPs through regulatory obligations (discussed in the following section).

## **Legislative and regulatory framework**

DNSPs have a number of obligations under national and Victorian legislative and regulatory frameworks to prepare for, monitor and resolve outages in a timely manner. DNSPs also have obligations to communicate regularly with the government, the market operator and customers throughout an emergency event.

The primary instruments that place direct obligations on DNSPs that are relevant to this review are listed in Table 13.

**Table 13. Relevant legislative and regulatory instruments**

Instrument	Relevance to this review
National Energy Rules (NER)	<ul style="list-style-type: none"> <li>• Service Target Performance Incentive Scheme (STPIS)</li> <li>• Efficiency Benefit Sharing Scheme</li> <li>• Capital Expenditure Sharing Scheme</li> </ul>
Electricity Distribution Code	<ul style="list-style-type: none"> <li>• Emergency Response Plans</li> <li>• Guaranteed Service Level (GSL) payments to customers in specific circumstances</li> <li>• CBD Security of Supply Plan</li> <li>• Annual Planning Reports</li> <li>• Single Industry Spokesperson Protocol</li> </ul>

**Obligations to plan for emergencies and major events**

Clause 8 of the Electricity Distribution Code (EDC) requires DNSPs to develop, and periodically test, emergency response plans in coordination with relevant organisations.

DNSPs must also comply with the Single Industry Spokesperson Protocol, which has been agreed to with the AEMO.

DNSPs supply an Energy Emergency Management Liaison Officer (E-EMLO) to the State Control Centre (SCC) during certain conditions or events.

**Obligations to plan for expected demand**

Clause 5.13 of the National Electricity Rules (NER) requires all DNSPs to annually prepare a forward plan for its distribution assets (called the Annual Distribution Planning Report or ADPR). The NER specifically require distribution businesses to prepare forecasts covering the forward planning period of maximum demands for sub-transmission lines, zone sub stations and primary feeders having regard to number of customer connections, energy consumption and total outputs of embedded generators.

In addition, clause 3.5 of the Electricity Distribution Code (EDC) requires DNSPs to prepare an Annual Distribution System Planning Report detailing how it plans, over the following 5 years, to meet predicted demand for electricity supplied through its sub-transmission lines, zone substations and high voltage lines.

As part of these annual reviews, it is expected that DNSPs would have sufficient information regarding maximum demands likely to occur in their distribution network on hot summer days, such as that of Sunday 28 and Monday 29 January 2018.

**Obligations to compensate for poor customer service**

The EDC provides for DNSPs to make Guaranteed Service Level (GSL) payments to customers where certain reliability and service thresholds are not met. GSL payments are not designed to provide compensation for particular events but seek to recognise poor service provided over the balance of a year.<sup>29</sup>

GSL payment amounts range from \$30 to \$360. Payments are made as soon as practicable after the calendar year an outages event(s) was experienced in.

GSL payments are, to a certain extent, passed onto customers through the AER’s revenue determinations, which set the charges DNSPs can apply to customers for a 5-year regulatory period. Revenue determinations include forecast costs for GSL payments. Where a DNSP outperforms the forecast, it is able

<sup>29</sup> The EDC does not provide for direct compensation other than in relation to voltage fluctuations outside of defined parameters.



to keep the difference between the forecast and its actual costs until the end of the regulatory control period. Where the DNSP does not outperform the forecast, it cannot pass on to consumers any GSL payments that exceed the forecast.

As the total GSL payments for each business is fixed, the framework provides extra incentives to DNSPs to improve supply reliability. If DNSPs are required to pay less than the historical average they keep the difference for the period. If they have to make higher payments because of poorer performance compared with historical levels, they must meet these from their current revenues – and cannot increase prices to recover the additional amount.

Neither the AER nor the ESC regularly audit GSL payments or monitor if customers have received payments they are entitled to.

DNSPs may apply to the AER for an exemption from making GSL payments if the outage is the result of a 'major event' outside the control of the DNSP. These exclusions do not specifically include weather events but do include interruptions to supply on a day where the interruption frequency exceeds certain thresholds. This review understands the Australia Day long weekend outages are not considered a 'major event' as per the definition applied by the AER.

### **Incentives to minimise the duration and frequency of outages**

To ensure DNSPs are adequately incentivised to minimise the frequency and duration of outages on their networks, they are subject to incentives under the Service Target Performance Incentive Scheme (STPIS).

Under this scheme, DNSPs are penalised where their performance drops below certain targets (as set by the AER based on a DNSP's past performance) and rewarded with increased revenue where their performance exceeds the targets.

The STPIS scheme in Victoria is comprised of three components:

1. Reliability of supply
2. Customer service.

The reliability of supply component allows the AER to increase or lower a DNSP's revenue by as much as 5 per cent based on changes in its reliability performance over the last 5-year period.

Reliability of supply is measured against three parameters: the average duration and the average frequency of unplanned; sustained outages per customer; and the average number of momentary outages per customer (of 1 minute or less).

The use of this incentive-based scheme recognises that regulators and governments are not best placed to determine how electricity distribution assets should be maintained or augmented to ensure reliability performance standards are appropriately met. Rather, this onus is placed on the DNSPs themselves (with oversight from the AER), given their unique access to private information.

STPIS contains guaranteed service levels (GSLs) components. In Victoria the ESCs GSLs are applied.

### **Reliability incentive amounts under the STPIS**

Given the need to ensure DNSPs balance reliability performance improvements with the sometimes prohibitive costs these network upgrades add to consumer bills, reliability incentives under the STPIS are based on the value that customers place on having reliable electricity supply under different conditions. This value is known as the 'Value of Customer Reliability' (VCR) which was last measured by the AEMO in 2014. AEMO advised that it is reviewing the VCR prior to the next AER regulatory period.

The VCR differs depending on customer type and jurisdiction, with commercial customers generally placing greater value on reliability than residential customers.

Under the EDC, before 31 December each year, a DNSP must publish on its website and in a newspaper circulating in the area of its distribution system, its targets for reliability of supply for the following year.

### **Balancing the trade-offs between reliability and energy prices**

Chapters 6 and 6A of the National Energy Rules (NER) lay out the framework the AER applies to set a ceiling on the revenues or prices that a DNSP can earn or charge during a regulatory period.

In determining the revenues or prices that a network business can charge, the AER forecasts how much revenue a business needs to cover its efficient costs (including operating and maintenance expenditure, capital expenditure, asset depreciation costs and taxation liabilities) and provide a commercial return on capital.

## Industry support measures

### Victorian Energy Emergency Committee

The Victorian Energy Emergency Committee (VEEC) membership includes AusNet Services as the Transmission Network Service Provider (TNSP), DNSPs, the AEMO, a representative from the energy retail sector, a representative from the generators, Victorian Government agencies including DELWP and DHHS and emergency services. The VEEC is chaired by a distribution business, rotating every three years. AEMO provides Secretariat services to the VEEC.

The VEEC is responsible for developing, reviewing and endorsing the Victorian Energy Emergency Communications Protocol (VEECP).

When predetermined triggers are met, asset owners will notify AEMO who then convenes the VEECP teleconference. The purpose of the VEECP teleconference is to communicate the key features and implications of potential and/or actual energy emergencies. The ultimate purpose of these VEECP teleconferences is to reduce community impacts through the sharing of information, potential shared resources and coordination during an event.

Subsequent to each VEECP teleconference, AEMO will issue Victorian Power Update Situation Reports summarizing the content of the teleconference.

During energy emergencies, the VEECP teleconference can be activated. The VEECP teleconference is designed to bring together DELWP (the Controlling Agency), government agencies, generators, transmission and distribution businesses during (and in preparation for) energy emergencies to communicate and encourage cooperation to lessen community impacts. The VEECP has agreed activation triggers, which include 'Preparation Triggers' and 'Response Triggers'.

VEECP Preparation Triggers include forecasts of an extreme weather event, such as:

- Two days with maximum forecast temperatures > 40°C in the central weather forecast district
- Two days with maximum forecast temperatures > 45°C in any other weather forecast district
- Forecast wind gusts over 110km/h, and 130km/h in alpine areas
- Fire danger rating of Extreme or Code Red.

VEECP Response Triggers include measures of the scale of impact, such as:

- Number of customers off supply > 20 000 customers in a single DNSP zone
- Any event where customers are expected to remain off supply > 24 hours
- Significant transmission or distribution equipment failure or an outage which would potentially impact > 50 000 customers following the next single credible contingent event which reduces redundancy
- Inadequate supply with potential for load shedding (forecast or actual LOR 3 conditions, where an event is likely to occur in the next 72 hours)
- External security threat or occurrence (such as a cyber security or activist group threat)
- High profile event or natural disaster (includes prolonged electricity related community emergencies).

The VEECP teleconference is convened by AEMO and the duration and frequency of these teleconferences will vary depending on the severity and duration of the event.