Essential Energy response Notice to Give Information - Royal Commission into National Natural Disaster Arrangements

May 2020

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Shortened Forms

Shortened form	Full title
ABC	Australian Broadcasting Corporation
AEMC	Australian Energy Market Commission
AI	Artificial Intelligence
ALARP	As Low as Reasonably Practicable
BCMF	Business Continuity Management Framework
BFCC	Bush Fire Coordinating Committee
BFMC	Bush Fire Management Committee
BIA	Business Impact Assessment
BNHCRC	Bushfire and Natural Hazards Cooperative Research Centre
BoM	Bureau of Meteorology
BRMP	Bushfire Risk Management Plans
Capex	Capital expenditure
CCC	Crisis Coordination Centre
CCT	Covered high voltage Conductors
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEMC	District Emergency Management Committee
DNSP	Distribution Network Service Providers
EMPLAN	New South Wales State Emergency Management Plan
ENSMS	Electricity Network Safety Management System
EOC	Emergency Operations Centre
ESG	Energy Sector Group
ESO	Electrical Safety Office
EUSFA	Energy and Utilities Functional Area
EUSFAC	Energy and Utilities Functional Area Coordinator
EUSPLAN	Energy and Utility Service Supporting Plan
FSU	Field Service Units
GIS	Geographic Information System
GRN	Government Radio Network
HD	High Definition
ICCP	Inter-Control Center Communications Protocol
ICT	Information and Communications Technology
IPART	Independent Pricing and Regulatory Tribunal
KML	Keyhole Markup Language
KMZ	Compressed KML
LAT	Large Aerial Tanker
LEMC	Local Emergency Management Committee
LGA	Local Government Area
LiDAR	Light Detection And Ranging

Shortened form	Full title
NSP	Network Service Provider
Opex	Operating expenditure
PESAP	Public Electrical Safety Awareness Plan
PV	Photo-Voltaic
RFS	New South Wales Rural Fire Service
SAPS	Stand Alone Power Systems
SCADA	Supervisory Control and Data Acquisition
SEMC	State Emergency Management Committee
SES	State Emergency Service
SFAIRP	So Far as is Reasonably Practicable
SMS	Short Message Service
SOC	State Operations Centre
TELCOFAC	Telecommunications Functional Area Coordinator
TELCOs	Telecommunication providers
TISN	Trusted Information Sharing Network
UTR	Utilities Technical Regulation
VBRC	Victorian Bushfires Royal Commission

Executive Summary

Essential Energy suffered extensive damage to its electricity infrastructure during the 2019-2020 bushfire season. More than 3,000 power poles have already been replaced, and our initial modelling indicates that nearly 25,000 poles still need to be inspected in bushfire impacted areas, with up to 8,000 potentially requiring modification or replacement. Regrettably, damage to our network leads to power outages for our customers. During the 2019-2020 bushfire season, nearly 191,000 Essential Energy customers were affected by power losses due to fire-related events.

Essential Energy welcomes the opportunity to respond to the questions and requests in the Notice to Give Information dated 8 May 2020 issued by Air Chief Marshal Mark Binskin AC (Retd), Commissioner of the Royal Commission into National Natural Disaster Arrangements.

Essential Energy highlights, by way of summary, the following themes that recur throughout this response:

- **Stand Alone Power Systems**. Essential Energy has trialled the use of SAPS as part of its response to the 2019-2020 bushfire season. We provided SAPS as a temporary solution to a number of customers, including some telecommunications customers, located in areas where the replacement of damaged infrastructure will be both costly and take time to complete. Essential Energy hopes to be able to expand the use of SAPS, particularly in fire-prone areas, in lieu of the more expensive and vulnerable poles and wires. However, we are concerned that the regulatory arrangements proposed by the Australian Energy Market Commission are likely to slow the deployment of SAPS in rural and regional areas of NSW, where those systems offer the greatest potential.
- **Composite Power Poles**. Essential Energy has trialled the use of composite power poles as part of its response to the 2019-2020 bushfire season. Composite poles are more resilient to fire risk than timber poles, and are currently being deployed in a targeted way in areas where timber poles are more prone to bushfire damage. While it is noted that composite poles are approximately four times more expensive than timber poles and manufacturing capacity is currently limited, the total cost of ownership may be comparable to timber when accounting for factors such as bushfire and termite resistance. Essential Energy is also assessing the use of other fire-resistant infrastructure such as fibreglass crossarms, which performed well during the 2019-2020 bushfire season, as well as low-cost options such as the application of non-toxic fire retardant on existing treated timber poles.
- **Smart Meters**. The low penetration and dysfunctional rollout of smart meters in New South Wales, because of Power of Choice, has place constraints on the efficient collection of data. Where data is collected by smart meters it can assist in identifying which parts of an electricity network are still energised, and which parts have been damaged. Currently, however, distribution network service providers in NSW such as Essential Energy are not permitted to have full access to smart meter data. Rather, those service providers only have access to limited smart meter data for billing purposes. Essential Energy considers that distribution networks should have greater access to the data collected by smart meters, in order to assist emergency recovery by targeting those areas of the network most severely affected by a natural disaster.
- **Co-ordinating Authority**. A more formal process of communication, and greater clarity around the roles and responsibilities of different agencies, would assist in co-ordinating responses to natural disasters such as the 2019-2020 bushfires. Distribution network service providers such as Essential Energy have the expertise to play an important role in such a process, although the allocation of costs associated with that work calls for more considered attention by governments. Essential Energy considers that the establishment of a new co-ordinating authority with responsibility for natural disaster responses would facilitate more effective communication and more efficient targeting of emergency efforts, particularly with respect to electricity network damage and customer outages.
- **Pride in Our People**. Essential Energy is proud of the way the entire organisation responded to the devastating bushfires in 2019-2020. Our success in efficiently restoring electricity supply to customers can be attributed to the enthusiasm, professionalism and commitment of our employees. Our people made themselves available and showed themselves willing to support the response effort throughout a protracted bushfire season. Most importantly for our organisation, Essential Energy operated injury free throughout the bushfire response efforts in the North and South Coast.

Essential Energy wishes to thank the Commissioners for this opportunity to contribute to the important work of the Royal Commission.

1. Question 1

How does Essential Energy identify infrastructure at risk from natural disasters and then look to manage and protect its network infrastructure against natural disasters? In your response, please address, with reference to any applicable development codes and land use planning arrangements, how, if at all, natural disaster risk is a factor in the construction and use of assets owned by Essential Energy.

Background

- For context it should be noted that Essential Energy is a predominantly rural overhead network which comes with inherent vulnerability to natural disasters particularly in the case of storms and bushfires. Up until the 2019-20 fire season losses of infrastructure to bushfires, storms, and floods had been relatively small as a percentage of total assets and were quite manageable in terms of impact on our business, customers, and communities. Any repairs or reconstruction were typically completed within a relatively short period of time (most restored within a few days as a worst case) and within normal fault & emergency budget allocations. However, the loss of assets (mainly timber poles) due to the 2019-20 bushfires is vastly different from this norm, setting new records for volumes of assets damaged or destroyed in one specific fire season by far (3,000+ poles required replacement). The response nonetheless was remarkable by Essential Energy working collaboratively with other state agencies resulting in favourable community support for our efforts.

Identification of Infrastructure at Risk

- 80 percent of Essential Energy's network is in bushfire prone areas. 90 percent is overhead which is subject to natural events such as floods, storms and bushfires. Essential Energy has a long experience of managing electricity infrastructure under these conditions. Whilst it would be cost prohibitive to customers to rebuild the existing network in a way to survive all natural disasters (i.e. 1 in 50 or 100-year events), it is recognised that a risk based approach is required. Essential Energy is transitioning to a risk based approach which results in building greater levels of resilience in those parts of the network which carry the greatest risk. Climate change provides challenges for network operators in predicting exposure to natural hazards. We are focussed on better understanding the variation in risk profile across our network to allow targeted investment in those parts of the network with high community consequence, for example from natural events such as bushfires.
- The threat of bushfires in rural environments is well understood for Network Operators and many millions of dollars are invested in opex and capex programs which take account of bushfire risk. The fire risk is incorporated into planning, design, construction, inspection and maintenance functions. The risk is also considered in Asset Management functions, including operating the network, and corporate risk strategies and frameworks. For example, assets in identified high fire risk areas are inspected more frequently, are given a higher maintenance priority in regard to assets and vegetation clearances, and on days of high fire risk have their protection schemes altered such that fire safety is prioritised over reliability as recommended by the Victorian Bushfires Royal Commission (VBRC). The findings of the VBRC and other bushfire inquiries are considered, and recommendations adopted into our policies and practices.
- Essential Energy has developed strategic relationships with experts on natural disasters nationally. This includes close collaboration with organisations such as the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and researchers from numerous Universities. For example,
    - fire risk profiles are developed across the networks in NSW utilising fire risk modelling tools such as Phoenix Rapid Fire (developed by BNHCRC and the University of Melbourne) where bushfires can be simulated under a variety of conditions to understand loss consequences. This modelling is undertaken in collaboration with relevant experts from RFS and University of Melbourne Fire Ecology Department.
    - We collaborate with our industry colleagues on a regular basis in regard to disaster management and in particular to the highest risk for networks (bushfire hazard), to share knowledge and experience.
- Essential Energy representatives participated in a national workshop in 2018 called the Natural Hazards Resilience for Electricity Networks where the issues of natural perils were work-shopped and a subsequent report developed for the industry. This was facilitated by the BNHCRC.

Management and Protection of Infrastructure

- Essential Energy uses a risk management framework called the Electricity Network Safety Management System (ENSMS) which includes adherence to Australian Standard AS5577-2013 Electricity network safety management systems, for amongst other things, ensuring networks are prepared for impact of natural disasters and in particular for bushfire hazard. This is a state government legislative requirement (Electricity Supply (safety and network management) regulation 2014). These requirements are subject to regular performance reporting to the safety regulators. For Essential Energy, these safety regulators include IPART (NSW); ESO (QLD); UTR (ACT)). The safety regulators also conduct independent external audits of Essential Energy's ENSMS and associated activities. These requirements include managing risk such as bushfire to the So Far as Is Reasonably Practicable (SFAIRP) principle, and providing evidence of Formal Safety Assessments associated with all hazards including natural hazards. An independent audit was conducted on behalf of IPART in late November 2019 relating to bushfire management. Essential Energy was found to be compliant in respect of managing bushfire risk. Further, the audit found Essential Energy to be compliant with the Vegetation Management Implementation Plan for ISSC3 Compliance – April 2018 as submitted to IPART.
- The network risk management structure is set out in the diagram below:

Table 1: Context and relationship between governing documents

			
Electricity Supply Act 1995	**Electricity Supply (Safety and Network Management) Regulation 2014**	**AS 5577-2013 – Electricity Network Safety Management Systems**	**IPART Electricity Network Audit Guidelines**
The operation of each NSW NSP is governed by the Electricity Supply Act 1995 (the Act) and subordinate regulations.	The subordinate regulation dealing with safety requires that a safety management system be prepared in accordance with the Australian Standard for electricity network safety management systems (AS 5577).	AS 5577 establishes the requirements for planning and preparing, implementing, measuring and evaluating, and management reviews and change management of an ENSMS.	IPART, as the safety and reliability regulator for the NSW electricity networks requires independent audits of the NSPs ENSMS to determine compliance to the Regulation and AS 5577.

- CEOM8047 ENSMS is our Safety Management plan which has a number of subordinate related policies, for example for management of hazards associated with Loss of Supply; Bushfire; Public Safety; Worker Safety; Environment.
- The ENSMS covers all interactions with the electrical network, minimising the risk to people near or working on the network, property and equipment as well as the environment, by addressing the management of the following aspects of the electrical network:
    - Design
    - Construction
    - Commissioning
    - Operations
    - Maintenance
    - Decommissioning

- The ENSMS outlines the risks associated with the operation of the electrical network as well as the controls that are used to eliminate these risks or reduce them to SFAIRP, and if it is not reasonably practical to do so, reduce those risks to As Low as Reasonably Practicable (ALARP).
- The ENSMS considers when the electricity network is in a normal, foreseeable abnormal state and emergency state. Examples of foreseeable abnormal circumstances are outlined in AS5577 Electricity Network Safety Management Systems as follows:
    - Operating connected to emergency power sources
    - Operating without normal supply assets such as powerlines or transformers (e.g. N-1 network now in N state)
    - Operating at other than normal voltage levels
    - Operating under communication outages (e.g. SCADA unavailable)
    - Operating under changed conditions to avoid further damage to the network

Construction and Use of Assets

- Overhead Powerlines in Australia are generally built to an Australian Standard (currently AS/NZS7000 Overhead Line Design). This accommodates common climatic conditions experienced across Australia in the design and construction of overhead power systems. For example, overhead conductors and pole design requirements include designing for specific maximum wind speeds based on wind speed zones mapped for Australia. Our standard designs provide an inherent level of resilience to natural disasters given the design parameters factored into the standards.
- Essential Energy has adopted the Safety in Design principle. This means the integration of control measures early in the design process to eliminate or, if this is not reasonably practicable, minimise risks to health and safety throughout the life of the structure being designed. There is also a level of collaboration with local workers for their experience associated with known lightning strike areas, tornado prone areas and flood prone areas. Essential Energy's local depot response crews typically know from experience what network assets have a history of impact from natural disaster events large and small.
- Design and Construction policy allow for the use of more expensive construction methods and materials in high risk locations. For example, design options allow for use of covered conductors, underground cables and line relocations.
- Stand Alone Power Systems (SAPS) have been recently trialled as part of the 2019-20 bushfire response. In the 2019-20 fire response, deployment of temporary SAPS to a number of customers impacted by the South-East NSW bushfires occurred. We discuss the benefits of SAPS deployment in more detail in **section 10**.
- In bushfire affected areas Essential Energy has utilised a number of composite poles for the first time as a trial. These poles provide an increased resilience to fire risk when compared to timber poles.
- Essential Energy is reassured that these hazards are managed appropriately through the scrutiny of exposure to external audits undertaken by the safety regulator on a regular basis. Any improvements identified through this process must be dealt with to a satisfactory level to the safety regulator in follow up audits. We also acknowledge the importance of internal and external or industry related post event reviews, including our attention to inquiry findings for understanding of lessons learned. This provides for continuous improvement in our hazard management.

2. Question 2

Identify the emergency management plans currently employed by Essential Energy to prepare its assets, resources and staff for natural disasters. In your response, please describe:

(a) how the plans address:
  i. mitigation of natural disaster risk;
  ii. coordination with emergency services; and
  iii. protection and preservation of assets;
(b) whether and to what extent these plans were implemented in the 2019-2020 bushfire season

Identified Essential Energy Emergency Management Plans:

- Emergency Response & Recovery Plans
  - Health, Safety and Environmental Manual: Emergency Management CECM1000.05
  - Company Manual: Incident Management CECM1000.03
  - Major Incident Management Plan CEOP8078
  - Zone Substation: Emergency Response Plan CEOP2153
  - Stores: Emergency Response Plan CEOP2131
  - Network Services Escalation and Recovery Plan - Supporting Documentation and Key Contacts for each of the 10 regions.
- Business Continuity Plans:
  - Business Continuity Management CECP0002.06
  - System Operations Emergency Communications CEOP2060
  - eTech Business Continuity Incident Management CEOM7602
  - Operational Manual: Business Continuity Plan: Overarching Business Continuity Strategies CEOM7551
  - Operational Manual: Business Continuity Plan: Warehouse – Grafton, Wagga CEOM7590
  - Operational Manual: Business Continuity Plan: SCADA Incident Management CEOM7609
  - Operational Manual: Business Impact Assessment – Asset Management Division CEOM7531
- Other plans relating to natural disasters:
  - Vegetation Management Plan CEOP8008
  - Bushfire Risk Management Plan CEOP8022
  - Public Electrical Safety Awareness Plan (PESAP CEOP8005)
  - Local Emergency Plans with other agencies (LEMC's and BFMC's) this includes the development of NSW State Emergency Management Plan's (EMPLAN) and Bushfire Risk Management Plans (BRMP).
  - Electricity Supply Emergency Sub Plan e.g. Black system event
  - Energy and Utility Service Supporting Plan (EUSPLAN)
  - Industry Safety Steering Committee codes and guidelines such as ISSC 3 Guideline for managing vegetation near power lines and ISSC 33 Guideline for Network Configuration During Bush Fire Risk Days
- Other relevant documents relied upon for emergency management include:
  - Electricity Network Safety Management System (ENSMS) CEOM8047
  - Formal Safety Assessment – Worker Safety CERM8047.01
  - Formal Safety Assessment – Public Safety CERM8047.02
  - Formal Safety Assessment – Loss of Supply CERM8047.04
  - Formal Safety Assessment – Bushfire CERM8047.06

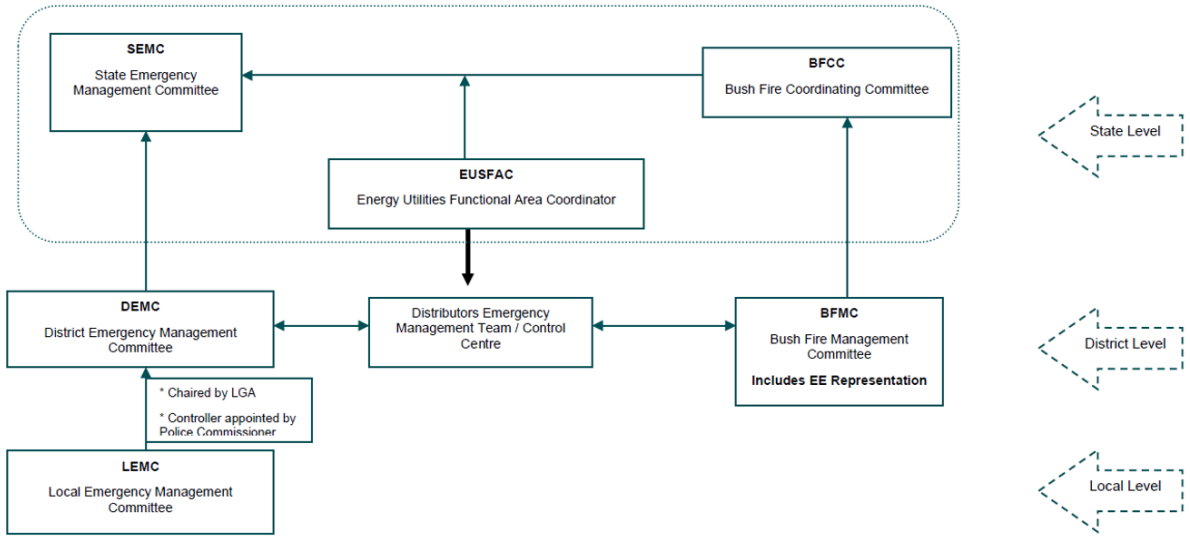
Mitigation of natural disaster risk

- The engagement with researchers across Australia through various universities and professional bodies eg BNHCRC and CSIRO, play an important role in understanding the threat of natural disasters and how to deal with them from both a customer and network perspective. Other important forums include participation in the TISN (Trusted Information Sharing Network), ESG (Energy Sector Group) and CCC (Crisis Coordination Centre) for industry on a regular basis, including providing short updates as required.
- The ENSMS requires Formal Safety Assessments of all potential hazards associated with the network. These assessments identify the hazards, evaluate the risk and define controls. These are subject to regular reviews internally and by IPART. The ENSMS considers when the electricity network is in a normal, foreseeable abnormal state and emergency state. Examples of foreseeable abnormal circumstances are outlined in AS5577 Electricity network safety management systems as follows:
    - Operating connected to emergency power sources
    - Operating without normal supply assets such as powerlines or transformers (e.g. N-1 network now in N state)
    - Operating at other than normal voltage levels
    - Operating under communication outages (e.g. SCADA unavailable)
    - Operating under changed conditions to avoid further damage to the network
- Key stakeholders are kept informed and engaged in regard to network risks associated with natural disasters. These include but not limited to our customers, employees, local members, portfolio Ministerial offices, etc. We also have pre-established arrangements with media outlets to assist with this communication.

Coordination with emergency services

- During a major event, NSW distribution network service providers (DNSPs) coordinate with the Emergency Command through the Energy and Utility Services Functional Area Coordinator (EUSFAC). This ensures a direct line of communication between the State Operations Centre (SOC) and utilities involved.
- In preparation for major fire events across NSW, the RFS facilitate a number of district Bush Fire Management Committees (BFMC's) made up of Land managers. The BFMC's meet several times a year. Their purpose is to develop a district Bushfire Risk Management Plan which identifies hazards and critical community assets and services. These plans are submitted to the NSW Bushfire Risk Management Coordinating Committee for approval and must be provided/updated at least every 5 yrs. This is a legislated requirement under the Rural Fires Act. Essential Energy representatives attend and participate in these stakeholder meetings. Refer to the below image extracted from Essential Energy's Bushfire Risk Management Plan.

Agency Relationships (State & District Emergency Hierarchy)



- Strategic relationships with state and district emergency management Coordinators provide the opportunity for Essential Energy to assist response and recovery, but also provides for state resources to provide protection of vulnerable assets e.g. by diverting fire suppression effort to critical infrastructure.
- Risk plans developed by the LEMCs and BFMCs outline the arrangements for preparation for major events and the response and recovery from such events. The plans describe the interdependent relationships both internally and with external agencies. Activities include:
    - Coordination for access to disaster impacted areas.
    - The running of local Emergency Operations Centres (EOC) and the SOC which includes Essential Energy representatives.
- Other preparedness briefings and training include:
    - Black start training – scenario based large scale incident training to gauge our preparedness in relation to large scale supply loss
    - Pre-Storm and Bush Fire Regional Preparedness sessions with leaders from across the business and Systems Control with the intent to review policy, plans, resources, equipment and discuss the season ahead.
    - Accredited training with the RFS for bushfire awareness, how to conduct work in bushfire prone areas, as well as how to implement fire ground protocols with fire agency staff. Essential Energy also provides training for the RFS on electrical dangers and how to work safely with electrical assets in a bushfire.
    - Annual pre-season multiagency briefings conducted by the RFS with invitees from the Police, Dept Defence, SES, Ambulance, utilities, BoM, NSW Parks and Wildlife Service and other relevant agencies.

Protection and preservation of assets

- The emergency management, recovery and continuity plans all play a role in the protection and preservation of assets, although the plans predominantly focus on the restoration of supply to our customers in a safe, efficient and coordinated manner.
- Essential Energy engages with the emergency services during active events to ensure protections are put in place in relation to the preservation of critical electricity infrastructure for example:
    - Strategic hazard reduction burning
    - Utilisation of powerline corridors as strategic asset protection zones
    - Focussed fire suppression activity on specific critical site e.g. telecommunications, pole storage facilities, zone substations
    - Emergency coordinators providing vehicle escort for powerline workers to enable power restoration and generator fuel delivery
- The plans provide for rapid deployment of stores, resources and staff to enable prompt repair, replacement and removal of damaged components thereby protecting the remainder of the network and aid in power restoration.
- The plans also provide for increasing or deploying human resources (employees, agencies, contractors) across all business functions from the call centre through to field resources. There is also an established arrangement with other DNSP's for sharing of resources for large scale events.
- Our System Operational procedures enable real-time visibility of emerging threats to the network that allow for proactive network reconfiguration. For example, targeted de-energisation of assets under planned conditions or back feeding from an alternate source. Additionally, after a power outage due to a fault, the power line is patrolled by field staff to identify defects prior to re-energisation to reduce the likelihood of ignition or further asset damage.

Plans implemented during the 2019/2020 bushfire season

- A significant number of our plans were implemented during the 2019/2020 bushfire season, with actions implemented falling within the scope in many cases of multiple plans.
- As an example of the implementation of one such plan - *CEOP8022 Network Bushfire Risk Management Plan* included across the entire season the following actions:

- Preventatives strategies deployed e.g. Vegetation management.
- Preventative work programs undertaken e.g. Asset Inspection, remedial maintenance programs
- Preparations for the bushfire danger period e.g. Pre-summer bushfire inspections
- Total Fire Ban days and Fire emergencies operational requirements
  - Network protection reconfiguration was implemented and applied in accordance with *ISSC 33 Guideline for Network Configuration During Bush Fire Risk Days*.
  - Activation of the Essential Energy Crisis Management Team.
  - Establishment of response hubs including safety briefings, fire ground protocols, lines of communication and debriefing.
  - Monitoring fires via System Operations
  - Fleet provision and servicing at response sites.
  - Staff mobilisation, fatigue, rotation, accommodation, meals management.
  - Sourcing of additional field resources & ensuring supply of materials through Essential Energy warehouses and their respective suppliers.
- LGA & Fire agency relationships e.g. emergency plans & protocols
  - Provision of representatives to district Emergency Operation Centres and State Operations Centre as per the state EUSPLAN.
  - Continuous monitoring of active fire fronts for staff safety, network preparation and response.
- Communications
  - Media engagement to keep stakeholders informed of outages and associated network responses
  - Employee and contractor briefings both prior to and during fire events.
  - Communication of outages for communities including communication directly with critical services and customers e.g. Hospitals and Life support customers.

3. Question 3

Does Essential Energy have a Business Continuity Plan or any other type of plan to ensure continuity of services during natural disasters? If so:

(a) Describe to what extent this plan considers the impact on communities;
(b) Was this plan implemented in the 2019-2020 bushfire season?

If so, how successful was implementation of the plan?

Business Continuity Plans

Essential Energy has in place Business Continuity Plans that ensure continuity of services during natural disasters and other major incident or business interruption. Essential Energy's Business Continuity Plans are encapsulated under our Company Procedure CEOP0002.34 Business Continuity, which details our Business Continuity Management Framework (BCMF).

Essential Energy has three layers of response to natural disasters, major incident or business interruption:

- Strategic response is required for major incidents that have a reputational or regulatory impact. Typically, the executive team would lead these types of incident, using the Corporate Incident Management Plan (CEOP8078)
- Tactical response is required when more than one business unit is impacted by the incident and a level of coordination is required. There are tactical plans in place for loss of office (Controller of Premise plans), loss of ICT (CEOM7602) and Network Emergencies (CEOP2137).
- Operational response is required for each business unit that is impacted by an incident. Each of our ten Operations Area's is supported by an Escalation and Recovery Plan specific to that area:
    - Coastal CEOP2137.01
    - Mid North Coast CEOP2137.02
    - Northern Tablelands CEOP2137.03
    - Ranges CEOP2137.04
    - Macquarie CEOP2137.05
    - North Western CEOP2137.06
    - South Eastern CEOP2137.07
    - Riverina Slopes CEOP2137.08
    - Central CEOP2137.09
    - Murray CEOP2137.10
- Under our BCMF, we undertake a Business Impact Assessment (BIA) that assists with understanding the impact of different disruptive events on the operations of the company, as well as a basis to determine appropriate response and recovery strategies. Using the application of a consequence/impact matrix assessment tool, we assess the consequence/impact of the following areas;
    - Safety
    - Network
    - Finance
    - Compliance
    - Reputation
    - Environment
    - Security (ICT and Physical)
    - Service Delivery

Impact upon Communities

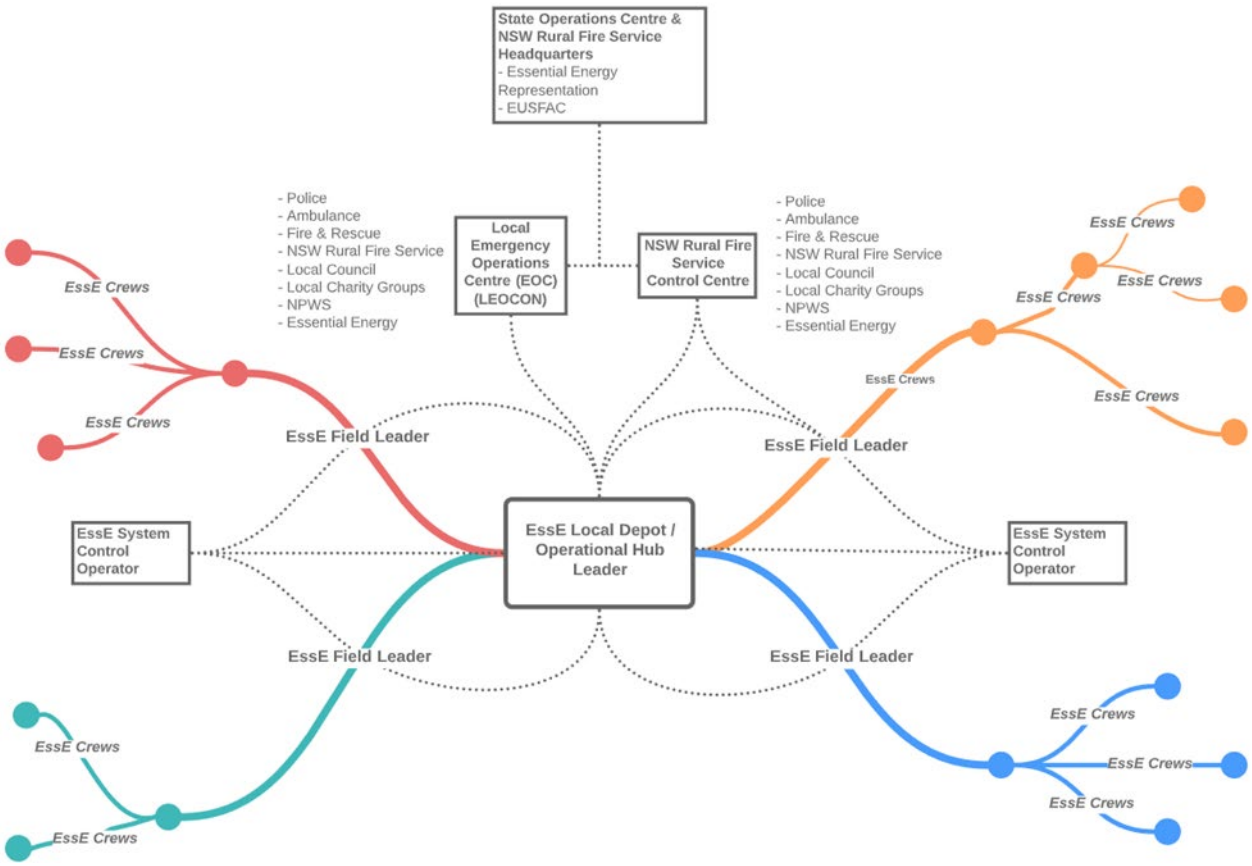
- Our assessment of the Network is specifically customer and community focussed which assesses power outage impacts based on duration, sensitive load customers and community/economic impact to CBD customers.
- Essential Energy's purpose is to enable energy solutions that improve life. Our assessments of the impacts and consequences resulting from the fires throughout the 2019-2020 bushfire season indicated longer than normal

outage durations to be experienced by customers in some circumstances due to the extensive and protracted nature of response to some of the fire events of the season.

Implementation of Plans

- The application of our Business Continuity Plans enabled the strategic placement of Essential Energy employees at each of the SOCs during the 2019/2020 Southern NSW bushfires as detailed in **image 1** below. This worked well, benefiting the affected communities, as we were able to collaborate with all supporting agencies and emergency teams with assessing the risks and being able to then prioritise our response efforts with safely restoring supply in a timely manner.
- As part of the Business Impact Assessment, Essential Energy also provided generators to some parts of the affected regions. Essential Energy distributed up to 100 2.2kVa generators to customers who had been without power for an extended period and fuel cards to support their use. We also distributed up to 60 of those existing 100 generators to Ausgrid on a short-term hire arrangement to help them with some customer impacts on an island on the Hawkesbury River as a result of bushfire impact in months following the cessation of the Southern NSW bushfires.
- Ausgrid also supplied Essential Energy with 2 large generators and support personnel that assisted with the temporary supply for the two evacuation centres located at Narooma and Batemans Bay during the 2019-2020 bushfire season. Essential Energy also used its own 500Kva High Voltage generator as a temporary supply arrangement to the coastal community of Wonboyn which was impacted by upstream damage and devastation to the electrical distribution network that suppled that community. This arrangement was in place for up to three weeks while repairs and rebuilding of the electrical infrastructure were carried out.
- As part of our framework for communication during an incident, there are three elements that are addressed in supporting the needs of targeted groups :
    - Business Continuity event communication
    - Internal communication
    - External communication
- At the outset of an incident or event, Essential Energy's Community Relations team which are regionally embedded across our footprint, works with Corporate Communications as part of the communication plan, with Community Relations primarily concerning itself with external communications to local Members of Parliament, Council General Managers and Mayors and local media outlets.
- Our Community Relations team works with other internal stakeholders regarding communication to customers such as using Short Message Service (SMS) and social media to ensure customers are receiving appropriate messages prior and during any incident or event.
- The Community Relations team's activities provided on-ground support for the community. Team members attended community meetings and provided literature ensuring communities had the information they require.
- Our Business Continuity Plans have requirements that support the Emergency Management Arrangements for NSW. Specifically, in response to natural disasters or significant events, Essential Energy is proactively involved with supporting adjoining agencies through participation in emergency response committees and actively seeks representation at each of these centres or hubs when set up in natural disaster events or state of emergency declarations.
- **Image 1** below encapsulates the level of continuity Essential Energy was able to provide during the recent 2019-2020 bushfire event with having members of our team work in collaboration with all the interagency teams in person at each of the state emergency operation centres. This had great benefit to the communities with regards to ensuring the electrical safety of all interagency respondents and additionally supporting a safe and timely response to restoring power supply to all communities.

Image 1: Essential Energy Operational Plan with Local EOC, NSW Rural Fire Service Control Centre and State Operations Centre at Homebush



- Given the significance and protracted nature of the 2019-2020 bushfire season, all three layers of response plans were enacted throughout the season.

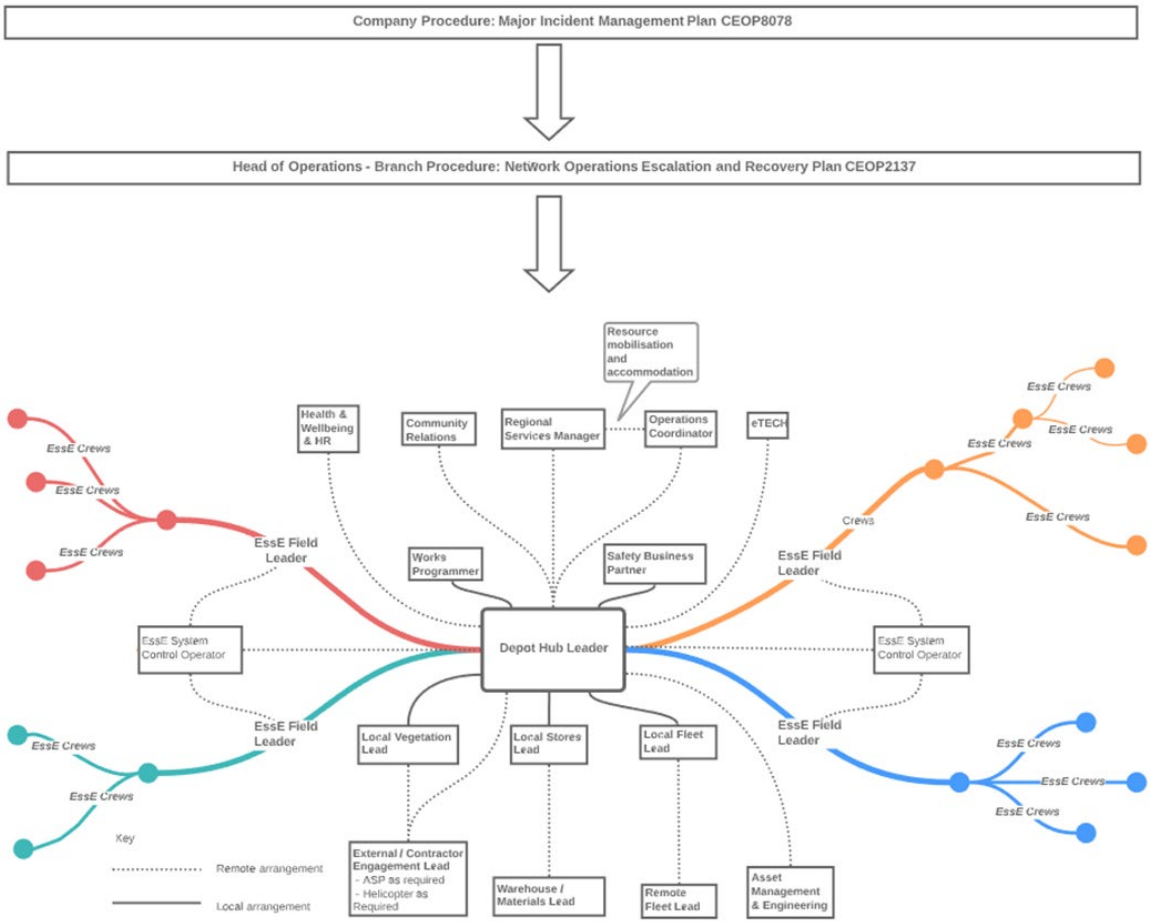
Successful implementation

- The implementation of the plans under the BCMF were successfully implemented and can be attributed to the enthusiasm, professionalism and commitment of our employees being readily available and willing to support the response efforts throughout the season in its entirety.
- Throughout the 2029-2020 bushfire season, Essential Energy was adaptive and agile in supporting a safe and timely response to all situations and circumstances experienced.
- Adoptions of new ways of working and supporting workforce flexibility, was a key aspect in supporting a NSW Bushfire Safety Fatigue Management Guideline being developed to support employees with managing their safety and wellbeing with the interim implementation of 24 hour and 48 hour fatigue rest days over and above existing rest period entitlements in the enterprise agreement.
- Essential Energy's Incident Management Team implemented a hub and spoke approach to support the significance and size of the recurring bushfire events throughout the 2019-2020 bushfire season. The hub and spoke approach with team structure and support functions is detailed in **image 2** below and represents the operational plan under the subsequent BCMF. Each of these roles and functions were meeting up to twice a day as a collective team in actively pursuing and ensuring a safe, steady and sustainable operation throughout the 2019-2020 bushfire season.
- Across the FY20 bushfire season operational hubs were established at the following locations with over one third of our field facing workforce across the state mobilising and participating as required:

- Grafton
- Coffs harbour
- Nambucca
- Kempsey
- Port Macquarie
- Taree
- Tumut / Tumbarumba
- Moruya
- Bega

- A core function of Essential Energy's operational plan was our internal Fleet team managing our mobile assets such as light and heavy vehicles. Our internal fleet operation team had fleet hubs set up in conjunction with each depot hub and supported business continuity with the internal provisions of the following services:
    - Fleet corrective, planned and preventative maintenance and inspections
    - Coordination and transport of heavy and specialist vehicles from across the state to support effort
    - Machine marshalling, staging and dispatch (on/offline management)
    - Fuelling and fluid (hydrocarbon and other) management
    - Tyre inspection, replacement and management
    - Asset recovery and breakdown services
    - Fleet advisory (operational, regulatory, road condition and access, etc) and support functions
- Each fleet hub provided services around the clock, with major maintenance scheduled after hours to maximise asset uptime. Three regional fleet maintenance facilities further supported these onsite services. Each facility had field service and response capabilities which are delivered by Field Service Units (FSUs). It is these FSUs that are heavily relied upon during natural disaster recovery efforts.
- The fleet hub engaged with local businesses to assist in the delivery of these services, under the management of Essential Energy's Fleet Division. Local businesses provide materials, fluids (fuel, other), specialty equipment and logistical support to the Fleet Hub.
- During the event, meetings are held both internally and externally to review the natural disaster status, fleet activity and performance and network recovery progress. These meetings are of both informal and formal nature and ensure that all parties are kept informed of requirements, activities and plans. Post the event the Fleet Division engages with local businesses to provide feedback and understand future opportunities for improvement.
- In supporting the 470 peak crew on the ground, the combined hubs:
    - Mobilised 160+ specialist fleet assets for response efforts;
    - Dispatched 130,000+ litres of fuel;
    - Proactively replaced 150+ damaged or defective tyres; and
    - Completed 1700+ preventative and corrective maintenance activities.
- Most importantly and well recognised within the organisation, Essential Energy operated injury free throughout the bushfire response efforts in the North and South Coast.

Image 2: Essential Energy Internal Operations Plan



4. Question 4

How does Essential Energy communicate the service risks it identifies to affected entities and the community? In your response, please describe how Essential Energy communicates outage risks to essential services (such as telecommunication providers) that rely on Essential Energy's services.

Over the course of the bushfire season, Essential Energy implemented a communication plan, with the key objective to keep customers and key stakeholders informed throughout impacted communities about Essential Energy's bushfire response. These key stakeholders included various providers of essential services including by way of example, Rural Fire Service, TransGrid, local councils and telecommunication providers.

Communication plan

- The communication plan involved various channels of communication including written regular updates, radio interviews, media releases, media statements, social media, Essential Energy website, Short Message Service (SMS) and printed community notices.
- The strategy behind the communication plan was to provide timely and accurate information to a wide range of stakeholders, such as customers including providers of essential services, communities, media, emergency services and government regarding outage risks, restoration efforts, and to inform and assist with decision making.
- Regular written updates, usually daily, were emailed to relevant local Members of Parliament, local councils, mayors, media outlets, key organisations, NSW and Commonwealth Departments including State and Federal Ministers. Multiple updates were also provided to various NSW Departments including Treasury and the Department of Planning Industry and Environment, relevant Ministerial offices, as well as the Federal Minister for Energy and Emissions Reduction.
- Essential Energy's website was utilised heavily, with a dedicated bushfire page quickly established. The regular written updates were posted to the website informing customers and stakeholders about restoration progress. Details of estimated power restoration times were also posted on the website.
- SMSs were sent to customers informing of expected delays and estimated restoration times. In cases where customers were identified to be without power for an extended period, attempts were made to telephone those customers.
- Essential Energy spokespeople regularly spoke on local radio including ABC's emergency broadcast, to inform communities about Essential Energy's power restoration efforts.
- Essential Energy's Contact Centre increased staff through its "ramp-up" program, established for such events. This enabled Essential Energy to provide timely information to customers who had a preference to telephone, email or communicate through social media.

Essential services

- As indicated in **section 2** above, Essential Energy's operational role within local EOC and the RFS SOC, enabled clear communication and collaboration with RFS, local councils, first responders, Telecommunications Functional Area Coordinator (TELCOFAC), support agencies and community-based organisations. Essential Energy had a senior representative as part of the membership of the local EOC which provided direct network updates through to all organisations represented on the committee.
- This was vital to protect critical services essential for communities enabling quick and safe power restoration to identified essential services such as electricity zone substations, water supply including pumping stations, identified health care facilities, telecommunications and emergency evacuation centres.
- Outage risks to essential services were identified and communicated face-to-face to provider representatives in the EOC, RFS SOC and also through the communication plan as indicated above.
- Telecommunication towers were treated as an essential service - they support the Government Radio Network (GRN) in which RFS and many other authorities utilise. Telecommunication operations are critical during events such as bushfires given the wide range of emergency services working and community members who rely on them.

- Many of these towers were compromised due to being located in bushfire impacted areas and needing a power supply to operate.
- As a result of this impact, customers in some areas were without internet access and mobile service. Essential Energy worked with telecommunication carriers regarding temporary power generation in numerous locations.
- As communities in some areas were without internet or mobile phone service, Essential Energy dispatched printed updates to emergency evacuation centres, local EOCs and community hubs, and arranged for employees to attend community information meetings.

5. Question 5

Describe the process for coordination with emergency services and/or broader government in the event of a power outage caused by a natural disaster.

When there are outages caused by natural disasters, Essential Energy coordinates and communicates with emergency services and/or broader government in several ways.

Reporting Requirements

- Formally, as part of regulated requirements, Essential Energy has Incident Reporting requirements in NSW that are regulated by IPART. Under their specific reporting requirements any major power outage, bushfire event, or safety incident must be notified to the NSW Minister for Energy and to IPART within 24 hours[1].

Community Relations

- For all unplanned events, but also including general enquiries, Essential Energy maintains a manned call centre to support customers with up to date communication as well as supporting online messaging to support community, government and other agencies with up to date information for awareness regarding outages across the network. The platforms used to share this information is primarily the essential energy website outage notification portal[2], but also social media platforms such as Facebook and Twitter.
- Essential Energy also maintains a Community Relations team being communication focussed specialists to coordinate with all necessary stakeholders including government.
- Regarding broader government communication, regular updates of outage status and other topical information, e.g. aerial flights, are provided as part of greater community engagement.
- In the early stages of an Essential Energy response for larger events, initial updates include details such as customer numbers without supply and their location, the severity of the damage (if known), location of damage and how Essential Energy is currently responding. These updates are sent to local media, local government members and State and Federal MPs daily, although in the case of significant events these updates are sent multiple times a day and will include the Minister.
- As Essential Energy's response progresses from safety management and emergency services coordination to restoration, further details are added to the updates including:
    - Safety Messaging
    - Total number of customers off by locale
    - Total number of customers who have had their power restored
    - Crews efforts
    - Out of Area crew support (business mobilisation)
    - How Essential Energy has communicated with customers
    - Total number of effected power poles
    - Challenges or safety concerns that may impact our ability to respond
    - Estimated Restoration Forecasts where the ability to reasonably predict exists
- Essential Energy's Community Relations team also work closely with the local State MP and their office to respond to any further details they require based on request. On occasion, the MP will also represent a constituent through a "question on notice process" seeking further information or action regarding power supply. Where information is available, Essential Energy will provide any information or act on the MP's request.

[1] IPART Incident Reporting - https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/energy-network-regulation-administrative-energy-licensing-website-documents/electricity-networks-reporting-manual-incident-reporting-october-2019.pdf

[2] Essential Energy outage notification portal - https://www.essentialenergy.com.au/outages-and-faults/power-outages

NSW Emergency Services

- Operationally, Essential Energy has had a long experience in working with the governing emergency bodies within the state, and many of the communication protocols have been established and are working effectively from our perspective. The Emergency services plans are built from the local areas up. They cascade from the local or district level to state level, including supporting Local Emergency Management Committees (LEMC's) facilitated by councils with representatives of all emergency services groups and support agencies.
- Essential Energy representatives attend the local EOC's to ensure up to date information flows between coordinating agencies and Essential Energy in regard to supply impact including outages and threats to critical infrastructure.
- From a strategic and preparatory perspective, Essential Energy needs to be highly engaged in local and state-wide Emergency and governing communities. This extends to compensating employees that work within their communities volunteering in local RFS and State Emergency Services (SES) organisations.
- This work results in the development of local preparedness and response plans for major events. As a supplier of a critical service, and manager of electrical safety scenarios Essential Energy representatives participate in these committees with these plans being overseen at the state level.
- Essential Energy also participates in District Bushfire Risk Management Committees facilitated by NSW RFS. Participants in these committees include land managers, agencies, and support organisations. The district committees prepare bushfire risk management plans for application in each fire season. These plans are submitted to the state level Coordinator Committee for Bushfire Management. EOCs are also managed at the district level with activities coordinated by agency representatives in attendance, coordinating with the SOC where required.
- NSW RFS run pre-season multi-agency briefings prior to the fire season commencement. These briefings provide insights into the predicted climatic conditions (by BOM representatives), fire threat conditions, and operational matters across the state. RFS also debrief on the previous season activity levels and any learnings or changes for the ensuing season to be considered or adopted. Essential Energy representatives participate in these briefings. The Multi-agency briefings are often followed by a State-run Mock Exercise to test the procedures and protocols.
- Essential Energy invite RFS Senior Management representatives to meet with Essential Energy Managers, and internal Bushfire Risk Management committees in Port Macquarie each year before the fire season to provide the seasonal briefing messages to a broader audience within Essential Energy and other key messages. This arrangement provides the opportunity for dialogue between both organisations on a range of matters of interest and fosters a good working relationship between our organisations. This is an annual occurrence practiced over many years now.

Broader Government engagement

- Within the NSW Department of Planning, Industry and Environment resides the Energy Emergency Management Team. This team facilitate the Energy and Utility Services Functional Area (EUSFA), representing a committee of industry and other Functional Area representatives. Essential Energy has 2 senior team members (System Control Support Manager, Distribution & Sub-transmission Network Maintenance Manager) who are committee members on the EUSFA committee supporting the EUSFA Coordinator and their team.
- Engagement in this committee ensures that Essential Energy is situationally aware, but also provides information into the EUSFAC for their situational awareness and alignment of strategic initiatives across committee members industry or functional area including points of co-dependency etc. This committee participation includes presentations from SMEs and participants. Essential Energy has long recognised that it's one thing to have an emergency contact list, but there needs to be a known and participating member of these groups for information to flow freely and coordinated support mechanisms to exist and function such that they can be depended on.
- When emergencies are declared at a state level, the NSW Utilities have a state-based representative (EUSFAC) acting as Coordinator between the agencies and the SOC. This includes a permanent desk position in the ICC for attendance during major events.

- For the 2019-20 fires Essential Energy recognised the overwhelming nature of the bushfire scenarios and during the peak of fire events requested the opportunity to support the EUSFAC in the SOC. As the EUSFAC saw merit, it allowed Essential Energy to place a representative at the SOC to ensure effective communication and coordination existed.
- This collaborative approach with RFS, local councils, support agencies and community-based organisations was critical to supporting local communities. The embedding of staff in the RFS' SOC and EOCs was essential to a timely and safe response to this season's bushfires. In particular, the embedded staff member in the SOC performed a crucial liaison role between Essential Energy's own crisis management processes and the State emergency services.
- The SOC were necessary for co-ordination with other NSW emergency services allowing Essential Energy direct access to up to date information about developing situations, and the outlook for the days ahead. This in turn assisted Essential Energy to make considered and strategic decisions. The embedded staff member in the SOC also served as a valuable facilitator and conduit across other government agencies who were also embedded in the SOC, for example the NSW Police Service, RMS and the SES.
- Refer to **image 1** for additional context.

6. Question 6

Describe any challenges encountered by Essential Energy during the 2019-2020 bushfire season in relation to power outages, connectivity and infrastructure. Where there any differences between States and Territories?

Challenges encountered

Essential Energy encountered numerous challenges throughout the 2019-2020 bushfire season, in relation to power outages, connectivity and infrastructure:

- Put most simply, bushfire has the propensity to destroy or damage Essential Energy's infrastructure which leads directly to power outages.
- The challenge arises to prevent or mitigate damage to infrastructure, or otherwise remediate that infrastructure that is damaged or destroyed.
- Essential Energy will isolate power (create power outages) to mitigate damage to property and people, this can be in advance, during and after fire.
- In the event of damage to the network, protection settings will operate to isolate power.
- In this instance, the challenge is to repair or restore damaged infrastructure or look to alternate temporary solutions.
    - Temporary solutions can include generators and SAPS, such as a combination of solar/battery/generation
    - Supplies and resources of alternate generation were limited
- There were impediments to Essential Energy being able to access the infrastructure to carry out repairs:
    - Access to fire grounds is prevented by the RFS, particularly while fires are still being managed
    - Access issues also arose where tree clearing and other make safe requirements needed to be completed before work was conducted
    - Extended delays in access prevented early restoration of power
    - The remote and disparate nature of the Essential Energy network often meant inherent delays to access sites
    - Subsequent rain on firegrounds caused dangerously slippery conditions also resulting in delays to restoration
    - Clearance to enter asbestos sites was hampered by availability of qualified asbestos testers
- When work could be carried out, challenges included:
    - Briefing and inducting workers to new areas and teams
    - Seeking to ensure work prioritisation and efficiency was maintained
    - Having sufficient staff trained in the various work tasks – e.g. underground qualifications
    - Having adequate supplies and equipment available on short notice, including accommodation
- Telecommunications sites were impacted and often impaired, resulting in:
    - Essential Energy's own internal communications (radio network and SCADA) being limited, placing constraints on being able to identify and safely undertake repairs
    - The absence of mobile coverage impacted the safe mobilisation of our crews
    - This also made it challenging to communicate with our customers as we rely of the telecommunication infrastructure to call or SMS our customers with updates. Some customers did not have internet access or telephone service preventing them from obtaining information such as estimated power restoration times, possible delays, etc
    - In some cases, Essential Energy was able to overcome this challenge by utilising local radio stations to distribute information to the community, as well as attending community meetings held by local councils

    - Further, to assist with overcoming the challenge, Essential Energy prioritised worked with telecommunication carriers to provide temporary power where possible, utilised local media and distributed hard copies of updates to various locations including community evacuation centres

- Communication between the relevant governmental stakeholders, including:
    - Having a clear understanding of responsibilities between department agencies and other entities
    - Whether Rural Fires Services directives applied
    - Who was and was not obliged to supply emergency generation
    - Lack of proper co-ordination
- Essential Energy were also constrained by not having visibility of other networks – in particular the transmission level. It would assist to extend the Inter-Control Center Communications Protocol (ICCP), a secured AEMO connection – which would provide improved visibility of network configuration between distribution and transmission levels. This would ensure outages are kept to a minimum.
- Different standards of resourcing, management and mitigation of bushfire risk were displayed between networks and commercial activities in the same locations. Similar standards would be beneficial to ensure the bushfire risks were mitigated.

Differences between States and Territories

It is acknowledged that while Essential Energy operates electricity network predominantly in New South Wales, it also has small portions of network in Queensland and the Australian Capital Territory. However, there were no events of significance in Essential Energy's network outside of New South Wales, and Essential Energy is unable to provide any commentary or share experiences of different challenges that may have arisen in the various States and Territories.

7. Question 7

How many customers, including telecommunications providers, in Essential Energy's distribution area lost power during the 2019-2020 bushfire season? In your response please include information regarding their locations, the period of time that these customers were without power, and the cause of the power loss/outage

During the 2019-2020 bushfire season, there was a total of 190,915 customers affected by power outages stemming from fire damage to assets. This total also represents those customers impacted more than once due to any one or separate fire related event. The following Table 1 represents the customers affected by Local Government Area (LGA).

Table 1: Customers Affected by LGA during the 2019-2020 Bushfire Season

Local Government Area (LGA)	Max of Duration (Hours)	No. of Customers Affected	Total Customer Hours Lost
Armidale Regional Council	48	120	5,597
Ballina Shire Council	4	23,494	16,690
Balranald Shire Council	12	54	558
Bega Valley Shire Council	1,067	6,730	783,074
Bellingen Shire Council	42	2,736	5,409
Blayney Shire Council	4	626	886
Bourke Shire Council	4	29	68
Byron Shire Council	107	18,619	14,104
Clarence Valley Council	255	2,706	59,300
Coffs Harbour City Council	253	486	8,011
Cootamundra-Gundagai Regional Council	7	2576	1,377
Dungog Shire Council	4	103	133
Eurobodalla Shire Council	1,710	43,946	2,901,542
Forbes Shire Council	3	22	32
Glen Innes Severn Shire Council	55	95	2,841
Goondiwindi Regional Council	4	12	44
Goulburn Mulwaree Council	424	1,433	12,779
Greater Hume Shire Council	311	181	20,178
Griffith City Council	0	53	15
Hilltops Council	10	316	1,032
Inverell Shire Council	28	147	688
Kempsey Shire Council	360	3,374	128,801
Kyogle Council	170	6,187	14,969
Lismore City Council	1	21,582	11,168
Mid-Coast Council	316	20,722	321,172
Nambucca Shire Council	278	2,695	34,347
Narrabri Shire Council	6	72	402
Oberon Council	79	23	197
Orange City Council	2	1	2
Parkes Shire Council	3	92	302
Port Macquarie-Hastings Council	289	1,054	32,568

Local Government Area (LGA)	Max of Duration (Hours)	No. of Customers Affected	Total Customer Hours Lost
Port Stephens Council	2	144	139
Queanbeyan-Palerang Regional Council	384	514	7,262
Richmond Valley Council	168	13,263	43,686
Snowy Monaro Regional	1,356	682	29,410
Snowy Valleys Council	1,965	13,730	584,422
Tamworth Regional Council	121	639	8,515
Tenterfield Shire Council	29	466	5,853
Tweed Shire Council	32	784	1,513
Uralla Shire Council	16	21	327
Wagga Wagga City Council	30	64	1,704
Walcha Council	69	311	2,050
Warrumbungle Shire Council	14	1	14
Yass Valley Council	3	10	31
Grand Total	**1,965**	**190,915**	**5,063,211**

Table 2 below refers to the telecommunication provider sites impacted by fires during the 2019-2020 bushfire season. Essential Energy's interagency relationship with emergency services, assisted with some sites being prioritised from a bushfire mitigation process such as firebombing retardant and RFS escort services for the ongoing fuel requirements. Essential played an important role with assisting to have some of these sites prioritised for Large Aerial Tanker (LAT) runs or bulldozing clearances as part of coordinating with EUSFAC and TELCOFAC directly.

In total there were 85 telecommunication provider sites affected by power outages stemming from fire damage to assets during the 2019-2020 bushfire season. There were 223 interruptions of supply across those 85 sites.

Table 2: Telecommunication Provider Sites affected by supply interruptions during the 2019-2020 Bushfire Season

LGA and Telecommunication Provider Site Details	Count of Interruptions	Customer Hours Lost
Armidale Regional Council	**1**	**48**
EE Radio Comms Repeater Sub 16-1355 Port Macquarie, Armidale, Coffs Harbour radio channels	1	48
Ballina Shire Council	**1**	**1**
EE Radio Site Sub 41-994293 Ballina Radio Channel	1	1
Bega Valley Shire Council	**24**	**6,993**
EE Radio Site Sub 15-1865 Moruya & Bega Radio Channels	4	1,965
EE Radio Site Sub 15-872 Bega Radio Channel	1	0
Major Comms Site, Optus & Vodafone Sub 15-2460	5	1,263
Major Comms Tower Sub 15-1865 - NSW Police, Optus, Telstra, Vodafone	4	1,965
Major Coms Site Sub 15-872 - NSW Police - Telstra	1	0
NBN and Optus Comms Site Sub 15-2590	7	1,611
Optus and Telstra Comms Site Sub 15-2805	2	189
Blayney Shire Council	**2**	**5**
EE Radio Site Sub 10-12L12 Orange Radio Channel	1	2
Telstra Comms Tower Sub 10-12L12	1	2

LGA and Telecommunication Provider Site Details	Count of Interruptions	Customer Hours Lost
Byron Shire Council	**3**	**1**
EE Radio Site Sub 41-4016 Ballina Radio Channel	1	0
Major Comms Site Sub 41-4016 - Police - Optus - Telstra - Vodafone	1	0
Telstra Intercapital Transmission Links Sub 41-1195	1	0
Clarence Valley Council	**2**	**127**
EE Radio Channel Sub 51-992149 Grafton Radio Channel	1	118
EE Radio Site 51-75862 Grafton Radio Channel	1	8
Cootamundra-Gundagai Regional Council	**5**	**2**
EE Radio Site Sub 78-100680 Tumut Radio Channel	1	0
Telstra Optical Repeater Sub 78-107300	1	1
Telstra Optical Repeater Sub 78-122970	1	0
Telstra Optical Repeater Sub 78-867402	1	0
Major Comms Site Sub 78-100680 - AMBULANCE SERVICE OF NSW - NSW POLICE FORCE - OPTUS NETWORKS PTY LIMITED - VODAFONE PTY LTD	1	0
Eurobodalla Shire Council	**73**	**9,697**
EE Radio Site Sub 31-1045 Moruya Radio Channel	1	74
EE Radio Site Sub 31-1435 Moruya Radio Channel	3	96
EE Radio Site Sub 31-295 Moruya Radio Channel	5	304
Major Comms Site Sub 31-1045 - NSW Police - Vodafone	1	74
Major Comms Site Sub 31-1435 - Optus - Telstra - Vodafone	3	96
Major Comms Site Sub 31-295 - NSW Ambulance - NSW Police - Optus - Telstra - Vodafone	5	304
Major Comms Site, NSW Police, Optus & Telstra Sub 31-510	17	1,677
Major Comms Site, Optus Mobile, NBN, Police Radio, NSW Telco Authority Sub 31-1339	2	828
Major Comms Site, Telstra, Optus Mobile Sub 31-563	1	37
Major Comms Site, Telstra, Optus Mobile Sub 31-972	2	59
Optus and NBN Co Comms Site Sub 31-981	2	122
Optus Mobile Phone Tower Sub 31-1355	6	455
Optus Mobile Tower Sub 31-143	1	37
Optus Mobile Tower Sub 31-1436	5	547
Telstra Mobile Phone Tower Site Sub 31-1205	6	1,273
Telstra Mobile Tower Sub 31-1037	13	3,713
Goulburn Mulwaree Council	**2**	**191**
Optical Repeater Sub 21-4559	2	191
Hilltops Council	**2**	**10**
EE Radio Site Sub 26-5037 Young Radio Channel	1	5
Telstra Comms Site Sub 26-5037	1	5
Inverell Shire Council	**2**	**6**
EE Radio Site 82-5409 Inverell Radio Channel	1	3
Major Comms Site 82-5409 - NBN Tower - Optus Networks PTY Limited	1	3
Kempsey Shire Council	**2**	**188**

LGA and Telecommunication Provider Site Details	Count of Interruptions	Customer Hours Lost
Sub 2-83141 TELSTRA CORPORATION LIMITED	2	188
Kyogle Council	**12**	**61**
EE Radio Site Sub 41-5100 Lismore Radio Channel	1	1
EE Radio Site Sub 41-5798 Lismore Radio Channel	1	1
Major Comms Site Sub 41-5798- NSW Police Force - Telstra Corp Property Services	1	1
NSW Police Radio Tower Sub 41-5100	1	1
Telstra Intercapital Transmission Links Sub 41-5795	1	1
Telstra Intercapital Transmission Links Sub 41-83362	2	3
TransGrid, RFS and Other Radio Sites Sub 41-78006	5	55
Lismore City Council	**2**	**1**
EE Radio Site Sub 41-993071 Tweed, Ballina & Lismore Radio Channel	1	0
Telstra Optical Repeater Sub 41-665	1	1
Mid-Coast Council	**18**	**723**
EE radio Site Sub 88-15821 Taree/Bulahdelah Radio Channel	1	1
EE radio Site Sub 88-17611 Bulahdelah/Taree Radio Channel	2	31
Optical Repeater Sub 2-21678	12	658
Telstra Intercapital Transmission Links Sub 88-6988	1	1
Major Comms Site Sub 88-17611 - Fire Brigade - Water - Telstra	2	31
Narrabri Shire Council	**2**	**7**
EE Radio Site Sub 75-160001 Narrabri Radio Channel	1	4
TransGrid Comms Site Sub 75-160001	1	4
Port Macquarie-Hastings Council	**4**	**570**
Australian Rail Track, Optus and TransGrid Communications Tower Sub 2-40516	3	562
Optical Repeater Sub 2-40394	1	8
Queanbeyan-Palerang Regional Council	**2**	**16**
Comms Tower Sub 34-1132 - VODAFONE PTY LTD - BROADCAST AUSTRALIA PTY LTD	1	8
EE Radio Site Sub 34-1132 Queanbeyan Radio Channel	1	8
Richmond Valley Council	**20**	**439**
EE Radio Site Sub 41-5961 Lismore Radio Channel	1	1
EE Radio Site Sub 41-7396 Ballina Radio Channel	4	118
Major Comms Site Sub 41-7396 - Police - Telstra - Vodafone	4	118
Telstra Intercapital Transmission Links Sub 41-6246	4	21
Telstra Optical Repeater Sub 41-4359	7	182
Snowy Monaro Regional	**3**	**149**
Telstra Intercapital Transmission Links Sub 11-2844	3	149
Snowy Valleys Council	**32**	**2,860**
EE Radio Site Sub 78-331430 Tumut Radio Channel	2	51
EE Radio Site Sub 78-348510 Tumut Radio Channel	3	769
EE Radio Site Sub 78-512660 Wagga & Tumut Radio Channels	4	485
EE Radio Site Sub 78-520371 Tumut Radio Channel	1	1

LGA and Telecommunication Provider Site Details	Count of Interruptions	Customer Hours Lost
Major Comms Site Sub 78-331430 - AMBULANCE SERVICE OF NSW - NSW POLICE FORCE	2	51
Major Comms Site Sub 78-512660 - NSW Rural Fire Service - Forests NSW	4	669
Major Telstra Repeater for Tumbarumba 78-867434	6	286
NBN Comms Tower Sub 78-317830	6	286
Telstra Mobile Tower Sub 78-514270	4	263
Tamworth Regional Council	**2**	**163**
Telstra Communications Sub 18-795	2	163
Tenterfield Shire Council	**2**	**45**
Telstra Intercapital Transmission Link 86-1003	2	45
Wagga Wagga City Council	**2**	**12**
EE Radio Site Sub 71-2681 Wagga Radio Channel	1	6
Major Comms Site Sub 71-2681 - SOUTHERN CROSS AUSTEREO PTY LTD - TELSTRA - NSW POLICE FORCE - OPTUS NETWORKS PTY LIMITED	1	6
Walcha Council	**1**	**2**
EE Radio Comms Repeater Sub 16-1281 Armidale Radio Channel	1	2
Yass Valley Council	**2**	**6**
Telstra Optical Repeater Site Sub 25-2359	1	3
Telstra Optical Repeater Site Sub 25-2413	1	3
Grand Total	**223**	**22,322**

8. Question 8

During the 2019-2020 bushfire season, describe the extent of damage to electricity infrastructure, in Essential Energy's distribution area

Essential Energy suffered extensive infrastructure damage specifically to the overhead network during the 2019-2020 bushfire period. Primarily the damage was encountered in rural areas of our distribution network whilst some parts of our underground network were also affected specifically in some parts of our coastal communities.

Infrastructure Impacts across Essential Energy's footprint

- ~3,200 power poles damaged and replaced
- ~4,500 cross arms damaged and replaced
- ~430,000 materials and components such as bolts, nuts and pole top fittings were used to complete repairs
- 170 underground service pillar replacements
- 1 underground padmount station replaced
- 3 high voltage underground switching stations replaced
- 3 low voltage underground cubicles replaced
- ~11 underground cable joints carried out inclusive of both low voltage and high voltage cables

Resources used during the bushfire season

- ~540 peak employees involved
- ~470 peak crew on the ground
- ~665 individual items of vehicles, plant and equipment involved
- Multiple air and ground patrols

Residual impacts

- Residual impacts that are still being investigated, include the charred/burnt poles that remain in service. They are undergoing an inspection process for their integrity, and assessment to have a protective sealant applied over the charred/burnt area at the base of the poles.
- Essential Energy's initial modelling suggests there are 24,600 poles to inspect, with sampling indicating that close to one third may require modifications or replacement.

9. Question 9

Describe any new technologies or approaches being adopted by Essential Energy to mitigate the risk to power supply to customers caused by fires in the future (for example, replacing destroyed power poles with composite poles)

Essential Energy has a broad approach to managing bushfire risk which goes beyond just new technologies. We have done significant work over the last 2- 3 years including a major review of our bushfire risk strategy and our risk modelling tools and approach to better understand the risk exposure conditions. We are investing significant time and resources in research, data analytics, risk modelling, data collection and stakeholder engagement.

A general summary of the activities associated with management of bushfire risk can be seen in the graphic below.

Essential Energy has adopted and/or trialled various new technologies and/or approaches, including:

Technologies

- Adoption of SAPS recognising the vulnerability of poles and wires in fire prone landscapes. Examples provided in **section 10** regarding their application in lieu of rebuilding expensive, vulnerable overhead lines.
- Use of storm and fire-resistant products and composite materials such as fibreglass crossarms and poles, steel and concrete poles.
- Utilising aerial HD imagery and LiDAR to better understand the health and condition of our network.
- Essential Energy's System Control team is finalising the procurement of a Power System Simulator to analyse and train for Critical Incident Responses.
- Investigating fault detection products which have the potential to alert of impending faults before they occur.
- Essential Energy is presently deploying a number of composite poles in areas of high risk throughout the network. Given the relative cost difference between timber and composite (four times) and integration with current pole installation practices, further assessment is being undertaken. This will provide a better understanding of the value composite poles may provide in the longer term.
- Trial use of Fusesaver devices to limit operation of older fuses (Expulsion Drop-Out fuses) and hence mitigating fire starts.
- The growth in embedded generation and battery storage may provide new opportunities for operation of our network and ongoing resilience for customers from network outages during natural disasters.

Approaches

- Spray on fire retardant was used on a number of high value at risk timber poles.
- In-house GIS software platform Smallworld was utilised in conjunction with the RFS' ICON system to help identify at risk areas ahead of the fire fronts to plan/mitigate against fire impacts.
- Improved Fire Risk Management models. We have collaborated with BNHCRC, University of Western Australia and University of Melbourne to further develop our fire risk modelling capability to better understand the community cost of major bushfires and the relationship with electricity networks. This is known as the IGNIS project which was funded and sponsored by the Electricity Networks Australia for the benefit of the whole industry.
- Refresh of our Phoenix bushfire modelling via Melbourne University, in cooperation with other NSW DNSP's.
- Utilising electronic switching devices with remote access capability and the ability to reconfigure protection settings for high fire risk days to reduce the probability of network ignitions.
- Increased investment associated with the Vegetation Strategy and how "big data" and AI can help mitigate risk such as detection of at-risk vegetation.
- Review of materials and procurement in light of the risks associated with potentially more frequent major events to provide greater resilience in the supply chain.

The adoption of new technologies or approaches typically come at a cost that needs to be balanced with energy affordability and our customers. We are always considering the balance between safety, service and affordability.

Other Technologies and Approaches

In addition to the above, technologies and approaches that Essential Energy adopts to mitigate risk include:

- Building additional clearances between conductors in our network e.g. make delta construction mandatory for new construction. When the opportunity arises converting flat construction to delta. This improves the resilience of the network.

- Exclusive use of storm and fire resistant crossarms since 2012. Although more expensive, these have insulation values twice that of wood without the degradation problems of timber due to weather. The crossarms are also more fire resistant. This was evident in the 2019-20 bushfire season aftermath.
- Use of spark free surge arresters has been deployed across the network for many years.
- Use of fire and lightning puncture resistant post style porcelain insulations since 2012.
- Use of higher creepage insulators when replacing older insulators on existing conductive poles and on the coast. These provide greater physical clearance distances providing greater resilience.
- Use of Covered high voltage conductors (CCT) for 11-33kV OH distribution in high risk, densely vegetated areas.
- Essential Energy has mandated the use of Underground cable for new service mains in rural areas to reduce the fire risk as the difference in cost for low voltage installations is minimal.
- Low Voltage spreaders are applied on low voltage overhead bare conductor spans in rural areas.
- Zone substation fire design requirements such as the provision of fire hydrants and fire separation and clearance zones internal and external to the substation yard, CO2 fire extinguishers, and fire detection alarm panels with SCADA connectivity.
- Increased training/awareness of the RFS' ICON incident response management system.
- Several technologies and approaches adopted by other network operators across Australia and Internationally are being considered by Essential Energy as part of our ongoing research and engagement. We continue to monitor the progress of these developments and their applicability to our network.

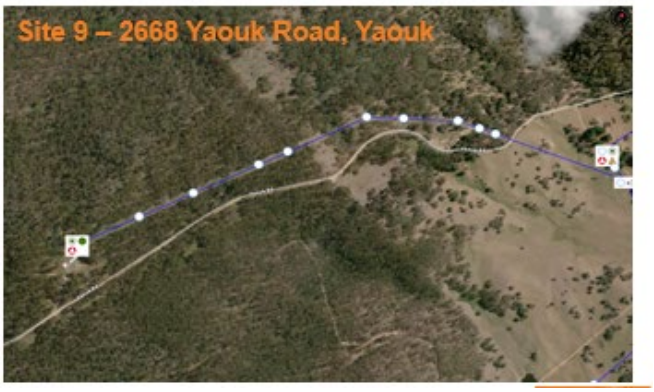
10. Question 10

Does Essential Energy propose to undertake any upgrades to the electricity networks in the State of New South Wales to install bushfire prevention mechanisms? If so, please describe the proposed upgrades

Specific network augmentation projects are underway in respect to bushfire prevention. Such projects include the use of SAPS, composite poles and intelligent reclose devices. Other network upgrade programs are also encapsulated within our existing opex and capex expenditure. These are further detailed below:

SAPS

- SAPS allow for the decommissioning of high bushfire risk assets as shown in the pictures below. By removing network infrastructure from bushfire prone areas there is a reduced chance that fires will be started in the first place. Off-gridding customers in those areas means that even if a fire event does occur it is likely that fewer customers will be left without power, less network repairs will be required and the cost of responding to the natural disaster will be lower.
- Additionally, the cost to supply these customers will fall, leading to a reduction in network charges for the entire customer base. The cost of rebuilding the lines to reconnect these customers to the grid, as well as ongoing maintenance, vegetation management and costs to restore power after a fault on the network are likely to be considerably higher than a SAPS solution.
- These also provide for the supply by an alternate technology rather than conventional poles and wires.



- These sites are presently being reviewed for line substitution using a combination of generation technologies such as solar, batteries, diesel generators as shown below.

- Discussions are ongoing with telecommunication providers in relation to alternate power supply options. These sites are typically towers located on remote mountain tops currently powered by an overhead network.
- Essential Energy has created full time engineering roles to progress the use of SAPS.

Composite Poles

- The use of composite poles to replace timber poles is being assessed for areas of high risk and consequential value. This includes consideration of consider bushfire exposure rates, accessibility issues, National Parks and other Conservation areas, and sites with a high consequential value.

Intelligent Reclose Devices

- Upgrading protection functionality of electronic reclose devices to reduce the potential of fire ignition. This also includes progressive replacement of existing reclosers that do not have the same functionality.

Other Network Upgrade Programs

- The following is a list of capex and opex programs that are part of the Essential Energy's Bushfire Mitigation Strategy - these also provide benefits associated with network resilience e.g. storms:

  Capex
  - Pole top Switchgear replacement – this category includes ABS failures.
  - Pole top Recloser Replacement / Upgrading
  - Replacement of Bare OH Conductors.
  - Pole Replacement and Reinforcement – Distribution
  - Poor Performing Feeders (eg CCT conversion).
  - Worst performing feeder segments.
  - LV Spreader Installation
  - Service Overhead Replacement.
  - Overhead Rural LV conversion to UG for bushfire prevention.
  - Overhead Substation Refurbishment Program
  - Pole Top Refurbishment – Sub-transmission
  - Pole Replacement and Reinforcement – Sub-transmission
  - LIDAR - Capitalised Overhead Data Capture

  Opex
  - Public education programs and information provision. E.g. Public Safety Group information and communications to agri-businesses.
  - Public awareness information provided on Essential Energy website
  - Operation and maintenance of protection schemes and systems
  - Inspections: Aerial Patrol and Analysis

- Vegetation management programs
- Lidar inspection
- Ground line pole and line inspection (including inspection of private lines)
- Zone substation maintenance
- Pole and line maintenance
- Operation centres
- Engineering and risk management functions

11. Question 11

Describe any opportunities that Essential Energy can identify, in the context of the 2019-2020 bushfire season, to revise, update or enhance its systems and procedures to:

(a) reduce the risk of compromise to its infrastructure during a natural disaster; and
(b) expedite the restoration of power (including via alternative forms of distribution) following an outage

As discussed in **section 1**, Essential Energy has a comprehensive risk management framework that includes managing the business to prepare for and respond to natural disasters. The 2019-20 bushfires, which were unprecedented on many levels, have resulted in a review of these measures.

Reducing the risk of compromise to infrastructure during natural disasters

- Collaboration with the RFS for fire forecast and prediction maps, resulted in:
    - timely decisions around the coordination of field responses, the operation of the network and the protection of network assets.
    - two occasions where field crews, working to restore power on the North Coast, were evacuated as their exit routes would have been cut off.

  However, the data integration was a 'one-off' exercise during the bushfires:
    - further work is being done to be able to access this on a regular basis and automatically import them in formats suitable for GIS platforms (KML, KMZ etc.)
    - the provision of GIS layers could address feedback for timelier access to mapping data
    - the overlaying of the Essential Energy network on the RFS GIS platform may provide useful operational intelligence to RFS
- Essential Energy is also taking the opportunity to refresh the existing fire risk models. The University of Melbourne has been engaged to undertake this work across NSW in collaboration with other NSW DNSPs and the NSW RFS.
- The growth in embedded generation (solar PV) and battery storage technologies are expected to reduce the impact to the community due to network outages, or where Essential Energy needs to proactively isolate the grid supply for impending disasters.
- Whilst there are obvious benefits to SAPS customers directly in natural disasters, there are benefits to all other customers due to reduced overall costs - of ongoing maintenance, vegetation management and costs to restore power to edge of grid customers particularly after outages. In addition, the removal of network infrastructure from bushfire prone areas reduces the risk of network initiated fires. The use of SAPS improves the network resilience and improves the reliability of supply for our worst served customers.
- Assessing fire-resistant materials. Comparisons of composite fibre, treated timber, and concrete poles. Also, low-cost options such as non-toxic fire retardant on existing treated timber poles in high bushfire risk areas. Fibreglass crossarms already in use performed well during the bushfires - these are now the standard for all new constructions, with the use of timber crossarms being phased out.

Expediting the restoration of power following an outage via with the use of alternative forms of distribution

- Following outages in the recent bushfires, Essential Energy expedited power restoration by providing generators to:
    - evacuation centres and local council critical infrastructure such as water and sewerage supplies.
    - residential and business customers who were impacted for extended periods, and for those customers with their own generators we provided fuel vouchers.
- Essential Energy also replaced private assets to habitable dwellings in the aftermath of the bushfires and will replace private assets to destroyed premises at no cost to the landowner up to the value of the previous installation.

- 11 SAPS were provided as temporary solutions to customers (including some telecommunication customers). The customers were located in areas where the rebuilding of the network would take some time to complete.
- Customer expectations are that Essential Energy will deploy appropriate solutions to power outages quickly, and at scale, during its disaster response. None of the above activities above are currently contemplated within the regulatory framework that Essential Energy operates in. Generators and other equipment subsequently deployed were not part of Essential Energy's inventory. If there are governmental and community expectations that the business should continue to undertake these types of activities in emergency situations, then changes to the regulatory frameworks that Essential Energy operates in, are recommended. For example:
    - The *Electricity Supply Act 1995* (NSW) could be altered to include requirements to provide such services in emergency situations. This would allow distribution networks to plan for the associated expenditure (including capital expenditure and internal capability build) for inclusion in regulatory proposals submitted to the AER. The AER will assess the proposed expenditure to determine if it is prudent and efficient. If the expenditure is approved by the AER it will be included in regulatory determinations and subsequently recovered from customers – see **section 13** for more detail on SAPS regulatory issues.

Further opportunities for improvement have been identified:

- Smart meter data, which is limited in New South Wales and which DNSPs cannot access fully, would assisted in investigating which parts of the network were still energised and which had been damaged. DNSPs should have access to this information to assist expediating emergency recovery.
- Greater use of network visibility information to reduce the requirement for on-the-ground checking of infrastructure, putting people's safety at risk. Information was not always reliable due to poor visibility, and lack of knowledge (non-Essential Energy personnel).
- Generation dispatch to impacted communities could be undertaken by the NSW Disaster Recovery (or other appropriate agency)
- Increased understanding by EOCs of Essential Energy assets and procedures will assist in applying the most efficient response and recovery to an event
- Regular multi-agency and local simulations and training would assist in better preparation for disasters
- Communication, governance and coordination issues with, and within, other agencies such as the RFS.
- Commercial activities (e.g. pine plantations) do not evidence the same focus or resourcing to manage and mitigate bushfire risk as networks do. There is benefit in requiring relevant commercial activities to adhere to the equivalent bushfire management standards. Consideration should also be given to a cross-utilities Steering Group for all government and non-government entities operating in high bushfire risk prone areas - this would be a constructive platform to proactively manage and govern the risk.

12. Question 12

Describe any opportunities to improve communications and/or information sharing between relevant Commonwealth, State and Territory agencies and industry as to natural disaster risk conditions, from the perspective of ensuring the safety and uninterrupted operation of key electrical infrastructure.

Background

- Overall, communications with and at the State Level worked well - primarily with the NSW state-based agencies such as SES, RFS, Police, local government/councils.
- Essential Energy actively maintains engagement with researchers across Australia through various universities and professional bodies like the BNHCRC and CSIRO. The level of cooperation and collaboration is appropriate and meets our needs and that the value of these relationships must be fostered and supported by governments where possible.
- As explained in **section 5**, due to the overwhelming nature of the bushfire events and the forecast scenarios, the acceptance and support of the EUSFAC within the SOC was well received.
- As part of this effort, active two-way communication between agency RFS, telecommunication providers (TELCOs) via the TELCOFAC and the RFS Communications team enabled safe electrical hazard management through the provision of local area insight, and Essential Energy identification of assets, electrical condition and advice for safety- in the lead up to response.
- In relation to recovery for power supply for critical infrastructure, there is a need for a more formal arrangement on what resilience Essential Energy is responsible to provide for supply continuity of critical infrastructure sites, and a plan to support this regardless of the asset type needs to be formulated as part of working through the Office of Emergency Management and Engineering Functional Areas.
- Essential Energy maintains and operates its own Radio Network, as it has recognised the gaps in Mobile communications carriers' coverage for its day to day operations. As part of this, Essential Energy also provides a fleet of UHF and Satellite communications devices for its crew.
- UHF has the limitation of short transmission and reception range, supporting large worksite coverage, and satellite communications is limited where environmental conditions such as cloud, storms or smoke exists.

Opportunities to improve

- Essential Energy, as a member of EUSFA participate in a small trial of GRN handsets, deployed in the Southern Control Room based in Fairbairn Canberra, and feel that there is merit in having greater supported access to this highly resilient radio network to improve communications in situations like natural disasters where traditional communication systems become unavailable.
- In relation to tactical communication during response and recovery, Essential Energy identified gaps in the operational coordination of Emergency Services where overarching coordination at a state level was lost in some cases against the more local challenges and the local coordination. The RFS ICON Portal worked well to assist in this, however, there are limitations on the capacity to share and consume information, with changes to plans not being realised until effort was expended on previous arrangements. Essential Energy believes that this is an area where learnings from this and creating a better information and response coordination process will result in safer, more timely response outcomes.
- Across the business, the use of the "Fires Near Me" app was promoted as a means of generally obtaining a view as to the extent of the bushfire impacts. This, in conjunction with the ICON Portal enabled visibility of fire fronts and potential network impacts upon manipulation into our GIS system. Better integration with our GIS system Smallworld would enhance this capability, and better inform the business both during and post events for network rectification works.

Opportunities to improve information sharing

- As a result of the vast area of fire damage, and Essential Energy's vast network, and its intersections with Transmission networks, there were a number of occasions where there were competing needs between

Network Service Providers (NSP's) to gain access to their own assets, increasing the risk to further outages being experienced by Essential Energy customers for extended periods of time.

- Whilst operational protocols are negotiated, maintained and exercised between NSP operations teams and worked well in the scenario, it was limited when needing to coordinate into the greater State response.
- NSPs come together each June to attend a "Critical Incident" Training session, hosted by TransGrid, but co-facilitated with representatives from NSPs like Essential Energy Operations Management. In 2018, this scenario was played out as part of a greater State Emergency Services response scenario as Exercise "Lumen Tenebrous".
- Essential Energy recommends that there be higher priority given to these larger scenario training events, including the standing up of organisational emergency response teams with greater emphasis put on the visibility into the various dependencies of networks, their interdependency based on connectivity as well as critical infrastructure impacted by these scenarios for better understanding. Essential Energy recognises that whilst this has significant Critical Infrastructure security implications, done correctly, NSW could reap the benefits of heightened awareness for preparation and response plan alignment, between all required response and recovery participants including prioritisation plans to each Critical Infrastructure node based on dependency hierarchy.

13. Question 13

Describe (in summary terms) any other matters which Essential Energy considers relevant to its responses to this Notice, or the Commissioners' inquiries regarding preparing for, responding to and recovering from natural disasters within Australia, in response to the Terms of Reference.

Co-ordination

- A more formal process is required to co-ordinate the various entities involved in the response – clarity on the roles and responsibilities of different agencies would be helpful.
- Electricity distributors have the expertise to undertake some of these roles, however, consideration is needed by Government on the cost recovery of undertaking this work.

Network Resilience

- Regulatory and market frameworks should be reviewed so that they support alternative lower cost options when rebuilding damaged electricity infrastructure, such as SAPS (see below) – this is particularly relevant in high bushfire risk areas.
- The use of fire resistant assets such as composite poles and fire-retardant coatings for timber poles is being assessed, particularly in high bushfire risk areas. Essential Energy needs to ensure that cost and benefits are justified.
- Improving overall network resilience is becoming increasingly relevant due to expectations that climate change will impact the frequency and severity of weather events.

Access to data & information

- Distribution networks only have access to some smart meter data for billing purposes.
- Distribution networks should have access to more smart meter data to assist in emergency recovery and to target efforts to areas of the network we know are not energised and may be damaged.
- Separately, as noted in **section 6**, improved visibility between distribution and transmission networks, via ICCP, would create better oversight of network configurations, allowing for more efficient assessment of threats and management of the networks – reducing the risk of more large-scale outages.

Stand Alone Power Systems (SAPS)

- Essential Energy is concerned that the regulatory arrangements proposed by the Australian Energy Market Commission (AEMC) will not lead to the best customer outcomes for regional and rural customers and are likely to slow the deployment of SAPS in areas of NSW where they could be most beneficial.
- The regulatory framework that would allow distribution networks to transition customers to off-grid supply via a SAPS is currently being designed. The work conducted so far has not considered the issue of network resilience in any detail. Essential Energy believes that regulated networks should be permitted to take customers off-grid using systems such as SAPS in order to realise the benefits outlined in **section 10** (better network resilience and lower costs for all customers) and that there should be:
    - Flexibility in the regulatory arrangements governing SAPS provision to account for the wide variety of circumstances where a SAPS may be a viable alternative to traditional poles and wires.
    - Customer-focused rules that put customer experience and preferences at the centre of service provision.
    - Cost-reflective price signals so that SAPS are effectively utilised and costs are minimised.
    - A pragmatic approach that recognises the realities of SAPS provision in remote areas or parts of the network where access is difficult due to vegetation or terrain.
- In advance of the changes to the national framework to include SAPS, the jurisdictional arrangements could be put in place so that SAPS can be deployed as soon as changes to the National Electricity Law are passed. This includes changes to the *Electricity Supply Act 1995* (NSW) that are currently under consideration by the

Department of Planning, Industry and Environment. The NSW government framework should be agnostic to any future service delivery model and include:

- extension of consumer protections to SAPS customers, regardless of whether a retailer is involved;
- price protections for SAPS customers through a mechanism not related to retailers
- jurisdictional reliability standards that are appropriate for SAPS customers;
- ability for distributors to recover the efficient costs of SAPS provision (regardless of whether the SAPS is owned by the network or provided by a third party); and
- appropriate safety and technical standards.