

Essential Energy

10.06.11 Community Resilience Investment Case

January 2023



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1. Introduction

This investment case proposes investment in non-network assets and capabilities that will enable Essential Energy to assist our customers and communities become more resilient when major natural disasters and other disruptions occur.

Over the last few years Essential Energy customers have experienced a significant increase in the number of natural disasters that have impacted the availability and supply of electricity and other essential services. In particular, bushfires and floods have, at times, led to customers' electricity supply being disrupted for days at a time, causing significant hardship for our customers, on top of the direct personal impact of the natural disaster. In addition, disruptions to electricity services have impacted other essential services, such as telecommunications and water supply, causing further hardship for customers.

Extreme weather events are becoming more common, and this trend is forecast to continue and increase in the future. The increase in both the frequency and severity of extreme weather events and other natural hazards is forecast to lead to more regular and prolonged disruptions to customers' electricity supply. See **Attachment 6.01 - Climate Impact Assessment** and section 5 of **Attachment 6.02 - Resilience Plan** for more detail on this.

Essential Energy conducted extensive customer and stakeholder engagement sessions in the preparation of its 2024–29 Regulatory Proposal (Proposal) and the feedback has been clear. Customers are generally satisfied with their current levels of network reliability, but overwhelmingly want Essential Energy to invest to increase the resilience of the electricity distribution network.

We define reliability as how well we deliver power to customers under normal operating conditions. Our average availability of supply is around 99.96 per cent (excluding major event days).

On the other hand, resilience is the ability to resist, absorb, accommodate, adapt to, transform or recover from the effects of a natural hazard.

Community resilience is the ability of communities to withstand and recover from the impacts of natural disasters.

In the preparation of the Proposal, we conducted extensive engagement with customers and stakeholders. Over 90 per cent of customers surveyed in these sessions supported additional investment in non-network assets and capabilities such as back-up generators and Stand Alone Power Systems (SAPS) to assist Essential Energy restore electricity supply services to customers sooner.

This investment case proposes investments in domestic and industrial grade generators, portable SAPS, portable solar streetlights, a portable depot, and a communications van / hub. In addition, we are proposing to employ three additional employees who will be dedicated to working with our communities, councils and other stakeholders to help them become better prepared for and more resilient when natural disasters and other major shocks occur.

The domestic generators and SAPS will help and prevent the contents of refrigerators and freezers from thawing and potentially going off when the network is down. This benefit was a key point that customers raised in our engagement sessions. Depending on the set up and configuration of the medium and large generators, customers will also be able to use these to keep their lights and other electrical appliances on. The domestic generators are unlikely to be used to keep the lights on as lights are generally hard wired into internal electrical networks, whereas refrigerators, freezers and other appliances are not, and can be directly connected to a generator.

The portable solar streetlights will play an important role in keeping our communities safe and secure and will act as backup when streetlights are out of order. The communications van will become a community hub where customers can receive the information and other support they need, and the portable depot will enable our crews to respond in a quicker and more effective manner.

These investments will also enable Essential Energy to provide customers with a more reliable electricity supply service when planned maintenance disrupts electricity supply for significant periods.

The total investment over the 2024–29 Regulatory Period is forecast to be \$15.1 million (FY\$24) in capital costs (capex) with operating costs (opex) of \$3.4 million over the same period.

Essential Energy has used the Australian Energy Regulator's (AER's) Value of Customer Reliability (VCR) methodology to determine the value of the proposed investment to customers. Based on the assumptions

outlined in this investment case, the proposed investment will result in \$94.4 million of value to customers over the 2024–29 regulatory period.

The proposed investment is required to address the following drivers:

- **Reduced outage times for customers:** Power will be restored sooner using non-network solutions
- **Improved customer relations:** Relations with customers will be enhanced when it can be seen that Essential Energy is “thinking outside the box” to restore electricity supply services sooner using non-network solutions. It is also evidence of a customer-centric distributor.
- **Improved stakeholder relations:** Essential Energy’s reputation with other stakeholders will be enhanced if Essential Energy is able to restore service quicker using non-network solutions.
- **VCR benefits:** Using the AER’s VCR methodology, the proposed investment will result in \$94.4 million of customer benefits over the 2024–29 period.

This investment case considers three options:

- **Option A – More of the same (not recommended)**
Continue with reactive recovery assistance when customers are impacted during major events. No incremental investment, with no staff dedicated to working with councils and communities on resilience. No incremental costs and no incremental benefits.
- **Option B – Some improvement (not recommended)**
Continue with reactive recovery assistance, invest in three dedicated staff, 500 new domestic generators, 10 portable SAPS, 10 large generators, 10 medium generators, 50 portable solar streetlights. Total capex costs of \$7.3 million, plus \$3.4 million opex, offset by VCR benefits of \$47.4 million over the 2024–29 period.
- **Option C: - Further improvement (recommended)**
Invest in 1,000 domestic generators, 20 portable SAPS units, 20 large generators, 20 medium generators, 50 portable solar streetlights, a communications van / hub, and a portable depot. Recruit three dedicated community resilience personnel. Total capex costs of \$15.1 million, plus \$3.4 million opex, offset by total VCR benefits of \$94.4 million over the 2024–29 period.

Option C is proposed, with the capital investment commencing in FY25.

2. Program/Project Summary

Investment case – Community Resilience	
Costs	Capital expenditure of \$15.1 million over 2024–29 Operating expenditure of \$3.4 million over 2024–29
Benefits	Quicker power restoration times Reduced outage times Improved customer satisfaction Service Target Performance Incentive Scheme (STPIS) improvement is detailed in Attachment 8.04 – Service Target Performance Incentive Scheme (STPIS) Approach Improved stakeholder relations and reputation Quicker restoration of other essential services such as telecommunications VCR of \$94.4 million over the 2024–29 period
Corporate Strategy	Strengthen the core
Business Drivers	Reduced outage durations Improved customer satisfaction

Investment case – Community Resilience	
	Improved stakeholder relations
Date Needed	July 24

3. Business Drivers

Extreme weather events have become more common in recent years and this trend is expected to continue. The increase in both the frequency and severity of extreme weather events will have a major impact on many forms of infrastructure, especially those that rely on large networks that are exposed to extreme weather and other natural hazards such as bushfires, windstorms and floods.

In the preparation of our Proposal, we engaged extensively with customers to understand their views and priorities on a wide range of topics, including resilience. The engagement process and outcomes are explained in our Proposal; **Chapter 4, Appendix A and Attachment 4.02 – How engagement informed our proposal.**

Customers told us that they supported investment in our network to make it more resilient, and also that they supported us investing in non-system assets and capabilities to help them withstand and recover from major weather events and other shocks.

Accordingly, and as outlined in our Resilience Plan (**Attachment 6.02**), Essential Energy is planning a significant investment in our network to increase its resilience to extreme weather events and other natural disasters.

In addition, we are planning to invest in non-system assets and capabilities to help our customers and communities become more resilient when major weather events and other disruptions occur. The objective of this investment is to reduce outage times for electricity customers when major weather events occur, and to also use these assets for planned or unplanned outages when appropriate.

The generators and SAPS will help reduce customer outage times. The portable solar streetlights will play an important role in keeping our communities safe and secure when major natural events happen or when maintenance activities result in streetlights being out of order. The communications van will become a community hub where customers can receive the information and other support they need and will play an important role in supporting the State Emergency Management Committee (SEMC). The portable depot will enable our crews to respond in a quicker and more effective manner and will provide a base from which we can make quicker and better decisions.

In addition, equipping Essential Energy with a fleet of temporary generation solutions will support communities to maintain vital communications during natural disasters, as recommended in the 2019-20 NSW Bushfire Inquiry.

This investment case outlines our proposed investment in non-system assets and capabilities aimed at helping our customers and communities become more resilient when their normal electricity supply is disrupted.

4. How will it work?

The assets proposed under this investment case will be allocated across Essential Energy’s distribution area according to expected utilisation. Some areas, such as the Mid and Far North Coasts, will have more assets than other areas, due to the increased likelihood of a major weather event happening in that area. See **Attachment 6.01 – Climate Impact Assessment**, for more detail on the geographic areas most likely to be affected by major natural events.

If a major weather or other natural event occurs, the assets will be deployed, again to minimise outage times and disruption to customers while the network is being repaired, and to provide other support necessary. Since the assets are mobile, they will be transported where and when needed. The community resilience employees will play a key role – co-ordinating the distribution of the assets with customers, and being a liaison between our operations teams, customers and other stakeholders such as councils.

Under normal circumstances, the generators, solar streetlights and portable SAPS solutions will be used to reduce outage times and disruption to customers.

We forecast that the generators and portable SAPS units will be utilised on average for one week each year, with the portable streetlights being used for six months each year. The communications van and portable depot are forecast to be used an average of 11 days each year. These utilisation rate forecasts will be refined as we roll out these assets and gather more data.

Table 1 describes how each asset type will be utilised.

Table 1 – Utilisation of the assets

Asset	Quantity	Deployment
Domestic generators (3 kVA)	1,000	The small generators will be located around our distribution area and will be loaned to households and small businesses when there is an extended outage, either planned or unplanned. They will be primarily used to keep refrigerators and freezers on when the network is down. We will also assist customers by giving them fuel vouchers for the generators. When a major weather or other natural event results in many customers having a simultaneous outage, generators will be brought in from non-affected areas.
Portable SAPS (20 kVA)	20	Similar to the arrangements for domestic generators, the portable SAPS solutions will be loaned to homes and businesses when extended outages occur.
Large generators (500 kVA)	20	The large generators will be deployed to larger customer sites, such as hospitals, schools, business parks or small central business districts when extended outages occur. These may be integrated into the distribution network and operated and maintained by Essential Energy.
Medium generators (200 kVA)	20	Medium generators will be deployed at mid-sized customer sites when outages occur. Again, they may be integrated into the network and Essential Energy will operate and maintain these.
Portable Solar Streetlights (100 W)	50	The portable solar streetlights will play an important role in maintaining public safety and security when an extended network outage or maintenance activities result in normal streetlights being out of service.
Communications van / hub	1	The communications van will be used to provide information and other support to customers when a major outage occurs. This will also serve as the base for our community relations and customer resilience employees in the event of a major or extended outage. When not being used for emergency support, the hub can be used at local events to help educate communities on safety, resilience and other related matters.
Portable Depot	1	The portable depot will be used when our field teams need an operational base that is close to where the work is happening and may provide

		temporary cover if an existing base is rendered unavailable by the natural event, as happened when our Lismore depot was flooded in early 2022. This will reduce travel times and improve field crew response times
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5. Compliance Obligations

The proposed investment is aligned with the National Electricity Rules (NER) “capital expenditure objectives” as described below.

NER Capital Expenditure Objectives	Alignment
<p>6.5.7(a)(2) <i>the forecast capital expenditure complies with all applicable regulatory obligations or requirements associated with the provision of standard control services</i></p>	<p>The proposed investment will result in reduced outage times for customers of standard control services in the event of a major natural event or shock, and when planned or unplanned outages occur.</p>
<p>6.5.7(a)(3) <i>the forecast capital expenditure maintains the quality, reliability and security of supply of standard control services</i></p>	<p>Whilst the proposed investment in non-network solutions is not aimed at improving the reliability of our distribution network it will enable us to restore electricity supply to customers sooner and reduce outage times in the event of a major natural event or shock. It will also assist in ensuring improved availability of other essential services such as telecommunications that rely on the availability of electricity when natural disasters happen.</p>

The proposed investment addresses the NER “capital expenditure criteria” as described below.

NER Capital Expenditure Criteria	Alignment
<p>6.5.7(c)(1) <i>(i) the forecast capital expenditure reasonably reflects the efficient costs of achieving the capital expenditure objectives</i> <i>(ii) the forecast capital expenditure reasonably reflects the costs that a prudent operator would require to achieve the capital expenditure objectives</i> <i>(iii) the forecast capital expenditure reasonably reflects a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objective</i></p>	<p>Investment costs have been forecast with reasonable estimates derived from industry analysis and historical expenditure.</p> <p>Currently this document is a preliminary investment case for investment planning purposes. Prior to investment, the costs will be further validated in preparation of the final investment case, informed through competitive market tender processes.</p>

6. Corporate Strategy Alignment

The table below describes how the proposed investment supports Essential Energy's business strategies.

Essential Energy strategic themes	Investment relationship to strategic themes
Resilience and Reliability shaping our investment decisions consistent with a prudent risk appetite	The proposed investment will increase Essential energy's ability to provide electricity to customers in the event of a major natural disaster or shock event. The investment will also help reduce outage times when planned outages occur.
Other Essential Services customer service and more	The proposed investment will also mean that other essential services, such as telecommunications that rely on electricity may be available sooner than would otherwise have occurred.

7. Current State

The 2019–20 bushfires, and the floods of 2020, 2021 and 2022, significantly impacted the supply of electricity to customers in impacted areas. Service was restored as quickly and safely as possible using the means that Essential Energy had at its disposal at the time, primarily through the resumption of network services. Whilst we did everything reasonably possible to restore service quickly and safely, this sometimes led to customers being without electricity for days or even weeks at a time. In some cases, Essential Energy was able restore service to customers sooner using the limited supply of generators and / or SAPS solutions that was available at the time.

Whilst customers were highly appreciative of the Essential Energy's efforts to keep the lights on using non-network solutions, it was very clear that the quantity and variety of non-network solutions that Essential Energy had at its disposal was insufficient to meet customer expectations and requirements in the event of a major weather event or natural disaster. In addition, it was clear that communities were not well prepared to withstand and recover from these natural shocks when they occurred.

8. Customer Engagement

As described in section 3 above, our Proposal outlines the extensive engagement with customers on possible community resilience measures.

Customers told us that they thought that it was important for Essential Energy to build customer and community resilience, and that they wanted to be consulted on the options to achieve this. Three investment options were put to customers in the engagement sessions:

Community resilience

Option A - Do the same	Option B - Some improvement	Option C - More improvement
<ul style="list-style-type: none"> - Continue to help communities recover from extreme events - No investment in proactive community resilience - We currently have no staff dedicated to work with councils or communities on resilience 	<ul style="list-style-type: none"> - Continue to help communities recover from extreme events - 3 new staff to work with councils and critical infrastructure providers - 500 additional domestic generators - 20 large generators (suitable for hospitals and recovery centres) - 10 portable stand-alone power systems - 50 portable solar lights (street lighting) 	Option B plus <ul style="list-style-type: none"> - Further 500 domestic generators - Further 20 large generators - Further 10 portable stand-alone power systems - Portable community hub - Portable depot
\$0 \$0 annual bill increase	\$0.14 \$0.62 annual bill increase	\$0.29 \$1.25 annual bill increase
<ul style="list-style-type: none"> - Essential Energy assists communities and customers after extreme weather events occur 	Option A plus <ul style="list-style-type: none"> - Back-up plans developed in high-risk locations - Temporary generation provided to more customers and services - Improved night time safety through portable street lighting 	Option A and B plus an enhanced emergency response <ul style="list-style-type: none"> - Assist more customers and services with temporary generation - Provide more streetlighting - Formal hub for the community - Access to a portable depot

These bill impacts will last for the life of the assets

5 | Commercial-in-confidence

Essential Energy 2024-29 Regulatory Proposal



One per cent of customers surveyed supported Option A, nine per cent supported Option B, and ninety per cent supported Option C. Some customers indicated that they would support even more investment than that outlined in Option C.

Option C involves investment in the following assets:

- 1000 small domestic generators (3kVA)
- 20 medium generators (200 kVA)
- 20 large generators (500 kVA)
- 20 portable SAPS units
- 50 portable solar streetlights
- 1 portable community hub (communications van)
- 1 portable depot
- 3 employees dedicated to working with councils, communities and infrastructure providers to help them develop and implement resilience plans.

Option C would cost the average residential customer approximately \$0.29¹ per annum and the average business customer \$1.25 per annum, for the life of the assets. Overall, our engagement showed that community resilience was a high priority, with most customers happy to pay for the reassurance of reliable community support in the wake of a major natural disaster.

The recent floods and bushfires have heightened customers' awareness of the importance of supporting communities' abilities to withstand and recover from major natural disasters and other shocks. Stakeholders and Councils were also in favour of Option C, however a minority questioned the ability of Essential Energy to reach communities with portable generators and SAPs when there were road closures, so they preferred Option B.

Please refer to our Proposal - **Chapter 4, Appendix A and Attachment 4.02** – for more information on our customer engagement.

¹ The final cost per customer will differ depending on the AER's final 2024–29 determination for Essential Energy.

9. Option Analysis

Under Option A – more of the same – there is no incremental investment and no incremental VCR benefits. Option B would result in capital expenditure of \$7.3 million, as shown in Table 2:

Table 2 - Option B – Capital Investment \$FY24

Asset Type	Quantity	Cost per Unit	Total Cost
Domestic generators (3 kVA)	500		
Portable SAPS (20 kVA)	10		
Large generators (500 kVA)	10		
Medium generators (200 kVA)	10		
Portable Solar Streetlights (100 W)	50		
Communications van / hub	0		
Portable Depot	0		
TOTAL CAPEX	580 units		7,250,000

The recommended Option C will result in capital expenditure of \$15.1 million, as shown in Table 3:

Table 3 - Option C – Proposed Capital Investment \$FY24

Asset Type	Quantity	Cost per Unit	Total Cost
Domestic generators (3 kVA)	1,000		
Portable SAPS (20 kVA)	20		
Large generators (500 kVA)	20		
Medium generators (200 kVA)	20		
Portable Solar Streetlights (100 W)	50		
Communications van / hub	1		
Portable Depot	1		
TOTAL CAPEX	1,112 units		15,131,375

In addition to the capital investment, we are proposing to recruit three dedicated community resilience employees at a cost of \$150,000 each, plus 50 per cent on-costs per annum. The total cost of these employees is forecast to be \$675,000 in opex per annum.

The ongoing operations and maintenance costs of the non-system assets (approximately \$350,000 per annum by 2029) were not included in the costs shared with customers during the engagement forums and will be absorbed within the Base-Step-Trend opex forecasts.

10. Key Assumptions

1. The assumed average costs per unit of the assets to be procured are as shown in Table 2, but will be subject to competitive tender processes.

2. The average cost of each dedicated Community Resilience employee is \$150,000 per annum plus 50 per cent on-costs.
3. The key assumptions used in calculating the VCR of each asset are shown in Table 4 below:

Table 4 – Key Assumptions in determining VCR

Asset Type	Utilisation Rate	Hours per Day (when used)	Average Demand (kW)
Domestic generators (3 kVA)	2%	12	1.0
Portable SAPS (20 kVA)	2%	24	3.0
Large generators (500 kVA)	2%	24	100.0
Medium generators (200 kVA)	2%	24	50.0
Portable Solar Streetlights (100 W)	50%	12	0.1
Communications van / hub	3%	12	n/a
Portable Depot	3%	12	n/a

4. Average VCR of \$52.68 per kWh. Based on the Australian Energy Regulator’s (AER) 2022 published rates² escalated to \$2024, and Essential Energy’s FY22 load profile of 39 per cent residential, and 61 per cent business.
5. Essential Energy will absorb the operations and maintenance costs of the community resilience assets, including the cost of the fuel vouchers for domestic generators. These costs are not included in this investment case.
6. Pre Tax Real Discount Rate used to determine NPV is 3.54 per cent.
7. Discount period for NPV calculation is 20 years, in line with the longest lives for the proposed assets.
8. Assets with a life of 8 years will be replaced in years 9 and 17 in the NPV calculation.
9. Asset costs have been determined using a combination of recent costs and knowledge of current market rates for the different types of assets proposed. All assets purchased will be subject to Essential Energy’s competitive procurement process to ensure we are achieving optimum value for customers.
10. The assets procured under this investment case may, on occasion, be loaned or rented to other electricity distributors or organisations, although any rental income from this is likely to be minor and has not been factored into this investment case. Any revenue earned from this will be subject to the AER’s shared asset guideline.³

Please see document **10.06.12 – Community Resilience Investment Case Model** – for more detail on the key assumptions used in this investment case.

11. Financial Comparison

Table 5 shows the costs, benefits and Net Present Value (NPV) of the three options put to customers:

Table 5 – Costs and Benefits of Community Resilience Options (\$FY24)

Asset Type	Option A – More of the Same	Option B – Some Improvement	Option C – Further Improvement
Domestic generators (3 kVA)	0		
Portable SAPS (20 kVA)	0		

² [AER - Values of customer reliability update summary - December 2022.pdf](#)

³ [AER - Shared asset guideline - November 2013](#)

Asset Type	Option A – More of the Same	Option B – Some Improvement	Option C – Further Improvement
Large generators (500 kVA)	0		
Medium generators (200 kVA)	0		
Portable Solar Streetlights (100 W)	0		
Communications van / hub	0		
Portable Depot	0		
Total Capex	0	7,300,000	15,131,375
Total Opex	0	3,375,000	3,375,000
Total Expenditure	0	10,625,000	18,506,375
VCR Benefits (2024–29)	0	47,358,318	94,372,842
Net VCR Benefits (2024–29)	0	36,733,318	75,866,467
NPV (20 year)	0	131,861,513	265,337,078

Please refer to Supporting document 10.06.12 – **Community Resilience Investment Case Model** for more detail on the costs and benefits of the options.

Reference Documents

Reference	Document Name
1	6.01 Climate Impact Assessment (KPMG)
2	6.02 Resilience Plan
3	6.03.02 Network Risk Management Manual
4	6.03.03 Appraisal Value Framework
5	8.04 STPIS Approach
6	10.06.12 Community Resilience Investment Case Model

Glossary

The following terms or abbreviations are used within this document.

Term	Description
AER	Australian Energy Regulator
Community resilience	The ability of communities to withstand and recover from the impacts of natural disasters
DNSP	Distribution Network Service Provider
Microgrid	A small, local network of electricity customers with a local source of power that may, or may not, be connected to the main Network during normal Network operation.
NEL	National Electricity Law
NEO	National Electricity Objective
NPV	Net Present Value - NPV is a method of valuing the costs and benefits of a proposal over a time scale, considered in today's monetary value. We have used a 20 year timeframe to determine the NPV for this investment case, in line with the longest asset life for the assets proposed.
Network resilience	The ability to provide safe and reliable electricity supply in the ways customers expect before, during and after a disruptive event.
Network reliability	How well we deliver power to customers under normal operating conditions. Our average availability of supply is around 99.96 per cent (excluding major event days).
Resilience	The ability to resist, absorb, accommodate, adapt to, transform or recover from the effects of a natural hazard (Source: Resilience NSW, UNDRR)
SAIDI	System Average Interruption Duration Index, the sum of the durations of all the sustained interruptions (in minutes), divided by the customer base. Momentary interruptions of three minutes or less are excluded from the calculation of unplanned SAIDI.
SAPS	Stand Alone Power Systems
STPIS	Service Target Performance Incentive Scheme
VCR	Value of Customer Reliability