Final Project Assessment Report - MSM

Essential Energy

26th April 2022

Contents

Glossary

Acronym	Full name
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CAPEX	Capital Expenditure
DPAR	Draft Project Assessment Report
FPAR	Final Project Assessment Report
FRMP	Financially Responsible Market Participant (Retailer)
MSM	Master-Subtractive Metering
NEM	National Electricity Market
NER	National Electricity Rules
NMI	National Metering Identifier
NPV / C	Net Present Value / Cost
OPEX	Operational Expenditure
RIT-D	Regulatory Investment Test for Distribution

Executive summary

This report is the final stage in a RIT-D investigating the most economic option for rectifying the non-compliant Master-Subtractive Meter sites in Essential Energy's service area.

This Final Project Assessment Report (**FPAR**) has been prepared by Essential Energy. It represents the conclusion in the application of the Regulatory Investment Test for Distribution (RIT-D) to assess options for rectifying the non-compliant MSM sites.

Essential Energy is a state-owned electricity infrastructure company which owns, maintains, and operates the electrical distribution networks for much of New South Wales, covering 95 percent of the state. It also owns the reticulated water network in Broken Hill through Essential Water.

While master-subtractive metering (MSM) has not been installed for over 20 years, Essential Energy is the distributor for around 13,400 premises, in mostly rural areas, where this type of metering is still in place. A master meter measures total power consumption at a premise where downstream meters exist. The downstream (or subtractive) meters measure a subset of consumption already measured by the master meter, such as consumption by controlled load hot water systems, shearing sheds, bore pumps, etc. At the time of installation this configuration was deemed to be the most efficient way for customers to access concessionary tariffs. Complexities which can arise at sites that still have MSM include having one master meter for multiple National Metering Identifiers (NMIs), having multiple Financially Responsible Market Participants (FRMPs) for the various meters and having the meters located on properties which have since been subdivided.

Complex premises arrangements with one master meter servicing multiple NMIs are not consistent with the requirements of National Electricity Rules (NER) clauses 7.2.1(a), 7.8.1(a), 7.8.2(d) and 3.15.3(a) (in summary, a connection point is required to have only one metering installation, one NMI and one FRMP).

The billing process employed by Essential Energy for all MSM sites is technically non-compliant with clause 7.9.3 of the NER and 12.5(c) of AEMO's Metrology Procedure Part A because data published to the market, while correct, does not match the actual master meter reading, and cannot be reconciled back to the metering installation. The reason for this is that, to avoid double billing, Essential Energy subtracts the energy recorded on subtractive meters from the master meter before sending the data to market. While the consumption is correct, the reading published for the master meter does not match the actual meter reading and therefore cannot be reconciled back to the metering installation. Rectification of MSM's is required to ensure compliance with AER Regulations.

Essential Energy is responsible for the rectification of MSM sites due to its role as the initial or legacy Metering Coordinator. Six technical solutions are available for the rectification of sites, Table 1, involving consolidation of metering to the main switch point or more complex installation of sub-circuits or alteration of the distribution network. The appropriate solution will be determined following site assessment and is dependent on the existing NMI and MSM configuration. The specifics of the solution are independent of the requirement for rectification and therefore the assessment of credible options in this document is focussed on feasible options relating to program timing and resourcing.

Table 1 MSM Solution Methods

Item	Solution	Description
1	Customer main switchboard consolidation	Consolidate metering in the customers main switchboard
2	Central Metering point consolidation	Consolidate metering in the central metering point switchboard
3	Multiple metering points	Install individual metering points as required to maintain existing tariff structure

4	Subtractive metering sub-circuit	Install sub-circuits as required to maintain existing tariff structure
5	Multi-premise	Solutions for sites with multiple NMI's or any other single NMI solution including installation, alteration, or removal of distribution network
6	Non-network	Installation of non-network solution (e.g. Stand alone power units or solar hot water system)

The NER require that, subject to certain exclusion criteria, investments for meeting service standards for a distribution business are subject to a RIT-D. Essential Energy has determined that network investment is essential in this case for it to comply with the regulatory requirements. Accordingly, Essential Energy has decided that this investment is subject to a RIT-D.

The Draft Project Assessment Report (DPAR) was released for public consultation from 16th February 2022 to the 30th of March 2022. No comments were submitted during the consultation.

A DPAR for this RIT-D was published on 16th February 2022. The DPAR presented five (5) credible options for rectifying the non-compliant MSM sites. These options are assessed in accordance with the RIT-D framework. Essential Energy concluded that the preferred option was rectify all MSM sites with a mix of internal and external resourcing in two regulatory periods. The estimated net present cost of this option inclusive of interest, risk, contingencies and overheads is $31.54 million. The estimated project delivery timeframe has design commencing in 2022 and works completed by June 2029.

The DPAR also summarised Essential Energy's assessment of the ability of non-network solutions to address the identified need, and it concluded that no non-network solutions are viable for this particular RIT-D project. The DPAR was accompanied by a separate Non-network Options Screening Notice, which contains further details on this assessment, in accordance with 5.17.4(d) of the NER.

The DPAR called for submissions from parties by 30 March 2022, with no submissions received. Consequently, the option determined by the DPAR as most economically prudent will be pursued as the rectification method.

This report therefore presents the original assessment in the draft report and maintains the conclusion that Option 5 is the preferred option.

Considering there being no submissions made to the DPAR, nor any significant changes to the circumstances that affect this RIT-D assessment since the DPAR was released, this FPAR re-presents the assessment undertaken in the DPAR.

Five potentially feasible options have been investigated and compared with varying project delivery plans.

1 Arrange for the rectification of all MSM sites in one regulatory period 2019-24 requiring external resourcing
2 Arrange for the rectification of all MSM in one year requiring external resourcing
3 Arrange for the rectification of all MSM over two regulatory periods 2019-29 with internal resourcing
4 Undertake the rectification work reactively when the MSM fails – expected to be completed over five regulatory periods 2019-2044 with internal resources
5 Arrange for the rectification of all MSM sites before end of Financial Year 2029 with internal and external resourcing

All options are subject to Essential Energy's internal resource constraint. Essential Energy has a responsibility to ensure that higher risk work such as fault and emergency takes precedence over lower risk projects such as MSM rectification work. Essential Energy resources may also need to be diverted to other electricity networks during times of major events such as storms and bushfires. Essential Energy will always look to mobilise crews from across the State to assist in emergency situations. Since September 2019, nearly 168,000 additional resource hours including overtime has been required to respond to unforeseen events such as bushfires.

Delivery of the MSM rectification works should be completed so as to maintain Essential Energy's flexibility and capacity to respond to unforeseeable events and to accomplish planned business as usual activities. This includes consideration of the use of external contractors where appropriate to reduce the internal resourcing constraint, albeit at a cost. A combination of internal and external resources has also been considered to meet compliance requirements while minimising the expenditure impacts of the use of contractors, and associated training and management requirements.

Essential Energy's preferred solution to address the identified need is Option 5 -to rectify all non-compliant sites by Financial year 2029 using a combination of internal and external resourcing.

Any submissions or queries relating to this FPAR for the MSM rectification program are to be sent to: RegInvestment@essentialenergy.com.au

1 Introduction

This FPAR provides both technical and economic information regarding possible solutions for MSM and has been prepared in accordance with the requirements of clause 5.17.4 of the NER. This FPAR represents the final stage of the consultation process in relation to the application of the RIT-D to potential credible options to address the identified need for regulatory compliance. In preparing the RIT-D, Essential Energy is required to consider reasonable future scenarios. Essential Energy has, in good faith, included as detail where practical while maintaining necessary customer confidentiality.

1.1 The Role of this Final Report

The purpose of this FPAR is to:

- Describe the identified need Essential Energy is seeking to address, together with the assumptions used in identifying it
- Provide a description of each credible option assessed
- Quantify relevant costs and market benefits for each credible option
- Describe the methodologies used in quantifying each class of cost and market benefit
- Explain way Essential Energy has determined that a set of classes of market benefits or costs do not apply to the credible options
- Present the result of a net present value analysis of each credible option, including an explanation of results, and
- Identify the proposed preferred option.

This FPAR follows the DPAR released on 16th February 2022. Parties on the Demand Side Engagement Register were notified on 17th February 2022. This FPAR represents the final stage of the formal consultation process set out in the NER in relation to the application of the RIT-D.

1.2 Submissions received on the DPAR

The DPAR called for submissions from parties by 30th March 2022. However, no submissions were received on the DPAR.

Party making the submission	Details	Essential Energy's response
N/A		

1.3 Contact Details

Any submissions or queries relating to the Final Project Assessment Report are to be sent to: RegInvestment@essentialenergy.com.au

2 Background

An MSM installation consists of a master meter that measures total, or aggregated, power consumption at premises where downstream meters exist. Meters installed downstream from a master meter are referred to as subtractive meters, as they measure a subset of power already measured by the master meter.

At the commencement of the Power of Choice program in 2017 there were 13,402 MSM sites located over a large geographic area across regional and rural New South Wales. The number of sites continues to reduce due to customer initiated works, e.g. installation of solar generation, and commencement of the reactive rectification program for faulty MSM installations.

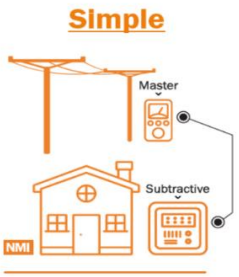
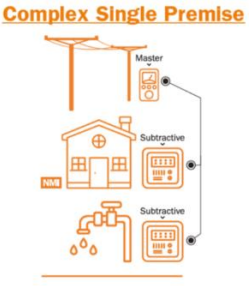
MSM arrangements have not been installed by Essential Energy (or its predecessor organisations) for more than 20 years. This type of installation was typically used to measure consumption of controlled load hot water systems, shearing sheds and bore pumps.

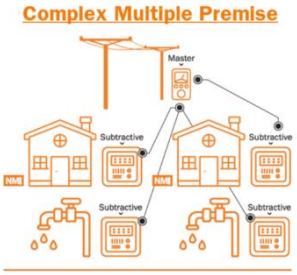
MSM configurations are not technically compliant with AEMO's Metrology Procedures or the NER.

Complex multiple premise arrangements with one master meter servicing multiple NMIs are not compliant with the NER, which requires each connection point to have only one NMI and one FRMP. In addition to this, the published meter data for all MSM sites is not compliant with the NER or the AEMO metrology procedure Part A, as the meter data published to the market does not match the actual master meter reading and cannot be reconciled directly to the metering installation.

Essential Energy has developed three classification levels of MSM installations, depending on the metering installation complexity, as detailed in Table 1 below.

Table 2 Current Essential Energy MSM Sites (July 2020)

Configuration Type	Description	Typical Installation
Simple configuration **(8,699 premises)**	• One Master Meter • One Subtractive Meter • One NMI • One FRMP	
Complex Single Premises configuration **(2,457 premises)**	• Either more than one Master Meter, or • More than one Subtractive Meter, or • More than one of each • One NMI	

Configuration Type	Description	Typical Installation
Complex Multiple Premises configuration **(757 premises)**	• Either more than one Master Meter, or • More than one Subtractive Meter, or • More than one of each • Two or more NMIs • One or more FRMP	

3 Identified Need

3.1 Description of the Identified Need

The identified need is to rectify MSM sites to achieve compliance with regulatory requirements.

MSM installations require rectification because:

- The NER requires a connection point to have one metering installation, one NMI and one FRMP. Complex Multiple Premise MSM arrangements, where one master meter is servicing multiple NMIs, are not consistent with these requirements, specifically Clauses 7.2.1(a), 7.8.1(a), 7.8.2(d) and 3.15.3(a) of the NER.
- The billing process employed for all MSM installations is inconsistent with clause 7.9.3 of the NER and clause 12.5(c) of AEMO Metrology Procedure Part A because of data published to the market. Whilst the data published is correct, it does not match the actual master meter reading, and cannot be reconciled back to the metering installation. The reason for this is that, to avoid double billing, Essential Energy subtracts the energy recorded on subtractive meters from the Master Meter before sending data to the market.

4 Credible Options Assessed

4.1 Assessment of Network Solutions

As set out in section 4, there are no credible non-network options. Additionally, there is no feasible 'do nothing' option, as this would result in Essential Energy not complying with its legislative obligations and potentially incurring substantial penalties.

Rectification of the MSM sites will be completed to ensure compliance with AER requirements. This involves consolidation of metering to the main switch point or more complex installation of sub-circuits or alteration of the distribution network. The following general activities will occur during the program and for each site.

1. Detailed planning and project management activities to ensure the program is set up for success and managed well throughout the life of the program;
2. Communication with the relevant customer, throughout the duration of MSM rectification activities at each site, and depending on the complexity of the site, communication with multiple customers;
3. Site preparation activities including
    a. Customer outage coordination;
    b. Undertaking detailed site inspection at each MSM installation;
        i. Based on the detailed site inspections and given the high number of possible variations involved, additional and specific parts / stores may be required.
    c. Undertaking detailed individual site rectification technical design development activities, which may involve design activities that span over several properties or easements.
4. Investigating wiring configurations "behind the meter" on a site by site basis and rectifying wiring in line with individual site complexity;
    a. Expected on-site work duration range: 2 hours (simple sites) to 5 days (complex sites)
    b. The level of complexity at each site is not known until each site is investigated in detail;
    c. The wiring process can be relatively simple in line with standard meter changes or extremely complex, requiring complete rewiring of metering arrangements across the site, which may be kilometres apart on some remote sites and across multiple retailers.
5. Engaging with impacted retailers to coordinate relevant MSM rectification activities;
6. Engaging with the relevant metering coordinators for each site to coordinate relevant rectification activities;
7. Leading ongoing collaboration with stakeholders throughout the rectification plan.

Essential Energy identified five credible network options. They mainly vary in the timing of delivery and the resources they use.

The options were formulated based on the following key constraints:

1. The availability of specialist resources to undertake the rectification plan - given the large number of sites that need to have the wiring corrected, and the specialist skills that will be required to complete this type of work;
2. The logistical implication associated with the rectification plan in terms of geographic coverage and the time needed to undertake the work;
3. The need to complete the rectification plan in the most efficient way;
4. No funding is allowed for in Essential Energy's 2019-24 AER determination to rectify MSM installations.

Table 2 describes the options that were considered. Table 3 Network Options

Option	Description	Result
1	Arrange for the rectification of all MSM sites in one regulatory period 2019-24 - outsourced delivery	• Higher cost option than using internal resources. • Significant financial consequences for Essential Energy as no funding is allowed for in the AER 2019-24 determination. • Likely that external resources will need further training. • Control risk due to extent of resourcing
2	Arrange for the rectification of all MSM in one year - outsourced delivery	• Best outcome for timely compliance. • Higher cost option than using internal resources. • Significant financial consequences for Essential Energy as no funding is allowed for in the AER 2019-24 determination. • Likely that external resources will need further training. • Unlikely to be achievable in the short timeframe due to the preparatory work required. • Potential for insufficient customer communications.
3	Arrange for the rectification of all MSM over two regulatory periods 2019-29 – internal delivery	• Lower cost option than using external resources. • Reduced financial consequences for Essential Energy as, although no funding is allowed for in the AER 2019-24 determination, there is the potential for recovery of some costs in the 2024-29 determination. • Trained resources with coverage in remote locations. • Increased administrative costs due to longer rectification period. • Delays compliance until 2029.
4	Undertake the rectification work reactively when the MSM fails – expected to be completed over five regulatory periods 2019-2044 – internal delivery	• Best outcome for cost management. • Trained resources and best outcome for work scheduling. • Non-compliance until 2044 is unlikely to be acceptable.
5	Arrange for the rectification of all MSM sites before end of FY29 – blended approach (internal and outsourced delivery)	• Provides greater resource flexibility to prioritise high-risk work and respond to critical incidents without affecting program delivery timescales. • Provides a potential opportunity (dependent upon market availability and other criteria) to phase the MSM program. • By using a blended approach, Essential Energy can use its resources to best effect in these works and in its recovery response to COVID-19 and bushfires impacted programs. • Allows the proactive program to be efficiently completed using contract resources while maintaining control over rectification timeframes using internal resources for failed sites. • Provides a potential opportunity to stimulate NSW regional economies through the engagement of external resources in these areas.

4.2 Qualitative Options Analysis

Options 2 and 4 are considered infeasible as a result of their duration. Option 2 would require 100% external resourcing the extent to which is likely to exceed total available contractors and be prohibitively costly. Option 4 would not result in completion until 2044, - which is unlikely to be acceptable to regulators or customers.

4.2.1 Option 2: Outsourced proactive option over one year.

Essential Energy does not have the internal resources to complete the rectification work in one year, and therefore would need to rely extensively on external contractors. Based on four quotes Essential Energy received from outsourced contractors, we are of the view that resourcing solely on this basis would be significantly more expensive than the use of internal resources or a blend of internal and external resources. Resourcing in some remote areas may prove difficult to source and this will result in greater expense for travel and accommodation; and due to the complexity of the MSM wiring this option is likely to require additional training of external contractors, as well as additional supervision, which further increases costs.

It is also unlikely, even with external resourcing, that the rectification work can be completed in 12 months. Detailed planning and project management activities must be done to ensure the program is set up for success and managed well throughout the life of the program. There is the need to communicate with the relevant customer, throughout the duration of MSM rectification activities at each site, and depending on the complexity of the site, communication would be with multiple customers. Site preparation activities would include: customer outage coordination, undertaking detailed site inspection activities at each MSM installation, investigating wiring configurations 'behind the meter' on a site by site basis and rectifying wiring in line with individual site complexity, engaging with impacted retailers to coordinate relevant MSM rectification activities, engaging with the relevant metering coordinator for each site to coordinate relevant rectification activities, and leading ongoing collaboration with stakeholders throughout the rectification plan.

The time needed to complete most of the above steps cannot be reduced by external resourcing. The complexity at each site is unknown until each site is investigated in detail, the wring process can be relatively simple or extremely complex, requiring complete rewiring of metering arrangements across the site, which may be kilometres apart on some remote sites and across multiple retailers; given the high number of possible variations involved, additional and specific parts/stores may be required. This further increases the chance of not completing the rectification plan on time.

Although this option would result in more timely compliance and extensive use of external resourcing would also alleviate work effort from internal resources to allow them to focus on business-as-usual activities, the most material market benefit from this option is the same as the others compliance with the regulation. This option is therefore discounted because it achieves the same result, but is more costly and uncertain.

4.2.2 Option 4 – Rectification at time of failure

Option 4: undertake the rectification work reactively when MSM sites fail, with expected completion over five regulatory periods, in 2044. This option is discounted because it achieves regulatory compliance unacceptably late.

5 Market Benefit Assessment Methodology

The purpose of the RIT-D is to identify the option that maximises the present value of net market benefits to all those who produce, consume and transport electricity in the National Electricity Market (NEM).

5.1 Classes of Market Benefits Considered and Quantified

Market benefits are deemed to have been considered in the development of regulation and therefore outside the scope of quantification.

5.2 Classes of Market Benefits not Expected to be Material

The RIT-D requires that Essential Energy considers whether each credible option could deliver relevant classes of market benefits as set out in clause 5.17.1(c)(4) of the NER. The AER's application guideline further explains the quantification of market benefits is optional for reliability corrective action (AER 2018 guideline page 34).

Given the above provisions, we note that:

- The MSM rectification work qualifies as a reliability corrective action as the identified need is driven by Clauses 7.2.1(a), 7.8.1(a),7.8.2(d), 7.9.3, 12.5.(c) and 3.15.3(a) of the NER.
- The credible options considered ensures compliance with the minimum standard required for reliability corrective action.
- Our assessment is that the market benefits listed in clause 5.17.1(c)(4) will not affect the selection of the preferred option, and therefore it is not necessary to quantify them.

In the table below, we discuss each of the market benefits listed in clause 5.17.1(c)(4).

Table 4 Market Benefits

Class of Market Benefits	Analysis
Changes in voluntary load curtailment.	The objective of this project is to address compliance with regulation. It is not expected to lead to changes in voluntary or involuntary load curtailment.
Changes in involuntary load shedding and customer interruptions caused by network outages, using a reasonable forecast of the value of electricity to customers.	As noted above, the purpose of this project is to maintain compliance with regulation, rather than affect involuntary load shedding.
Changes in costs for parties, other than the RIT-D proponent, due to differences in a. The timing of new plant; b. Capital costs; and The operating and maintenance costs.	There is no impact on other parties.
Differences in the timing of expenditure.	This project will not result in changes in the timing of other expenditure.
Changes in load transfer capacity and the capacity of Embedded Generators to take up load.	This project will not impact on the capacity of Embedded Generators to take up load.

Class of Market Benefits	Analysis
Any additional option value (where this value has not already been included in the other classes of market benefits) gained or foregone from implementing the credible option with respect to the likely future investment needs of the NEM.	This project will not impact the option value in respect to likely future investment needs of the NEM.
Changes in electrical energy losses.	This project will not result in changes to electrical energy losses.
Any other class of market benefit determined to be relevant by the AER.	We do not consider any other class of market benefit as relevant to the selection of the preferred option.

In our assessment, the market benefits listed in the table above are not relevant to the selection of the preferred option. As such, it is not necessary to set out the methodologies used to quantify the market benefits as required by clause 5.17.4(j)(7) of the NER.

The approach adopted in this FPAR is therefore to select the most prudent and efficient method to achieve compliance with the NER. Essential Energy has a responsibility to ensure that higher risk work such as fault and emergency takes precedence over lower risk projects such as MSM rectification work. It is also worth noting that Essential Energy resources may also need to be diverted to other electricity networks during times of major events such as storms and bushfires. A prudent and efficient method would not prejudice Essential Energy's flexibility to deal with unforeseen events, while keeping the rectification cost as low as possible.

The principal benefit from the proposed investment is the protection of customers against overbilling. This category of benefit is not listed in clause 5.17.1(c)(4). Furthermore, the inclusion of this benefit would not affect the selection of the preferred option as it would be the same for all credible options.

6 Detailed Economic Assessment

6.1 Methodology

The RIT-D requires Essential Energy to identify the credible option that maximises the present value of net economic benefit to all who produce, consume, and transport electricity in the NEM.

Accordingly, a base case Net Present Value / Cost (NPV / C) comparison of the alternative development options has been undertaken. A sensitivity analysis was then conducted on this base case to establish the option that remained the lowest cost option in the scenarios considered.

6.2 Key Variables and Assumptions

Variable	Value
Discount Factor	5.33% with sensitivities at ±2%
Escalation factor	2.5%
External Contractor Rates	Average of quotes received for 3 MSM configurations. Sensitivities at ±2.5* standard deviation of quotes. Contracts are to be issued for duration of program and therefore not subject to change

6.3 Net Present Value / Cost Results

The calculation of the NPC for each credible option is set out in the table below.

Option	Description	Capex	Opex	Total	NPC
1	1 regulatory period, external	$18.31M	$28.49M	$46.80M	$34.51M
2	1 year	$18.31M	$27.01M	$45.32M	$35.37M
3	2 regulatory period internal	$21.21M	$22.51M	$43.72M	$30.90M
4	Reactive to failure 2044 estimate	$19.73M	$26.47M	$46.19M	$26.38M
5	2 regulatory periods internal / external	$19.76M	$25.45M	$45.21M	$31.54M

As no market benefits have been identified, all options have a negative PV, or a net present cost.

The RIT-D requires the preferred option to be the credible option that maximises the present value of the net economic benefit to all those who produce, consume and transport electricity in the NEM. In addition, clause 5.17.1(b) of the NER states that where the identified need is for reliability corrective action, a preferred option may have a negative net economic benefit (a cost). Given Essential Energy's obligation to maintain compliance with the regulations, Option 5 satisfies the RIT-D despite the negative PV . [1]

6.4 Selection of Preferred Option

Essential Energy's preferred option is Option 5, rectifying all MSM sites with a mix of internal and external resourcing in two regulatory periods. The estimated net present cost of this option inclusive of interest, risk, contingencies and overheads is $31.54 million. The estimated project delivery timeframe has design commencing in 2022 and works completed by June 2029.

Option 1 is technically and commercially feasible, however, completing the rectification plan in a period shorter than 10 years would be more costly, and harder to deliver on time.

Option 1 will also create significant resource strain for Essential Energy. The quantification of the required MSM program had not been undertaken at the time Essential Energy developed its regulatory proposal for the 2019-24 regulatory period, and therefore Essential Energy's approved regulatory allowances for 2019-24 do not include funding to complete this program. The regulatory allowances provide a funding envelope for Essential Energy to operate and maintain its network. Essential Energy's current expenditure suggests that other programs of work may need to be partially or fully deferred to allow the accommodation of new programs. Additionally, expectations of internal resource utilisation and availability of external contractors suggests potential limitations which will be alleviated by completing the work over a longer period. Essential Energy prioritises work based on a monetisation risk framework, for example, defects with severe safety risks in highly populated areas would be completed before defects with low safety risks in sparsely populated areas.

The impact of the 2019-20 bushfire events exacerbates the resource strain. Essential Energy's resource demand model (RDM), which is updated regularly with the most recent statement of work indicates that, even without the bushfire events, a total of 1.97 million hours of work is required while only 1.93 million hours are available using the current staffing resources (without overtime). As shown in the table below, there is a 37,185 hours shortfall of resource hours.

Table 5 Internal Resource Utilisation 2021

Operational Area	Available Hours	Demand	Variance
Central	158,992	167,523	(8,531)
Coastal	211,407	205,732	5,675
Macquarie	251,592	242,241	9,351
Mid North Coast	270,810	277,708	(6,898)
Murray	120,554	116,042	4,512
North Western	136,279	140,247	(3,968)
Northern Tablelands	232,373	253,934	(21,561)
Ranges	150,256	185,856	(35,600)
Riverina Slopes	190,441	181,683	8,758
South Eastern	209,660	198,583	11,077
Grand Total	**1,932,362.72**	**1,969,548.09**	**(37,185)**

The bushfire events of 2019-20 had significant impact on resource hours. As shown in the table below, without overtime, 82,000 hours have been required, and including overtime, 168,000 resource hours have been required throughout Essential Energy's bushfire response. This is reflective of the need to restore power

[1] Note: p 52 of the guideline: "under the RIT-D, the preferred option is the credible option that maximises the net economic benefit to all those who produce, consume and transport electricity in the NEM." ➔ although it does not say for regulatory compliance work the preferred option is the one with the least NPC, it would be helpful if the costs of not being able to respond to emergency are quantified and show that option 5 is the one with least cost.

quickly and that while significant resources were mobilised to impacted areas, crew levels were maintained in home depots to ensure sufficient fault and emergency coverage.

With the increased overtime requirement, significant annual leave balances have built up. These deferred annual leave requirements, combined with the significant hours of overtime already performed by staff, and additional restoration work yet to occur, will place further pressure on the already constrained resource available hours.

Table 6 Internal Resourcing Bushfire Response 2019-2020

Operational Area	Base resource hours	Overtime hours
Central	4,836	6,936
Coastal	7,774	7,968
Inspection Programs	3,276	2,051
Macquarie	5,245	5,766
Mid North Coast	16,072	14,258
Murray	5,256	4,175
North Western	1,020	1,050
Northern Tablelands	5,284	4,346
Ranges	9,608	7,222
Riverina Slopes	11,961	14,552
South Eastern	11,745	17,427
Totals	**82,077**	**85,751**
Grand total	**167,828**	

The bushfire events required re-prioritisation of work. The following table shows the resource demand for FY21 without taking into account the impact of the bushfire. As is shown, there is greater work requirements in FY21 than in FY20. The RDM for FY21 will also be impacted by the reprioritisation of work in FY20 due to the bushfires.

Table 7 Internal Resourcing Excluding Bushfire Response 2021

Operational Area	Available Hours	Demand	Variance
Central	158,992	174,742	(15,750)
Coastal	211,407	213,701	(2,294)
Macquarie	251,592	272,178	(20,586)
Mid North Coast	270,810	282,370	(11,559)
Murray	120,554	122,486	(1,932)
North Western	136,279	149,513	(13,234)
Northern Tablelands	232,373	289,184	(56,811)
Ranges	150,256	193,319	(43,063)
Riverina Slopes	190,441	203,245	(12,804)
South Eastern	209,660	212,980	(3,320)
Grand Total	**1,932,363**	**2,113,717**	**(181,355)**

External contractors are limited in the tasks they can perform, due to restrictions of those authorised to work on Essential Energy's network. Due to the remoteness of some MSM sites, at times Essential Energy may be the closest, and therefore most cost effective, resource to allocate the work to (i.e. inspection). These factors combined means that Essential Energy has to complete certain components of the work, necessitating a blended delivery model.

Financial consequences for Essential Energy would also result as no funding is allowed for in the AER 2019-24 determination. All else being equal, Essential Energy will operate above its regulatory allowance which leads to suboptimal financial performance in each regulatory year and potential incentive scheme penalties in the following regulatory period. This is also reflected in the higher NPC.

Option 3 is also a credible option, however, is likely to place an undue burden on Essential Energy's internal resourcing. Essential Energy undertook analysis and found that the organisation does not have the internal capacity to complete the work any shorter than in 10 years, while maintaining the currently agreed AER program of work safely and within regulatory allowances. This is mainly due to the fact that individual site inspections and subsequent design can take from 1 to 16 hours to complete depending on complexity; wiring rectification on all MSM on Essential Energy's network is labour and time intensive due to remote rural locations and varying configurations including multiple masters and subtractive meters; there is a high risk of additional time and effort expected as asbestos is likely to be found at a large number of installations and additional work needs to be completed.

The strain on Essential Energy's internal resources would hamper its ability to respond to emergent events such as natural disasters.

If Essential Energy was required to increase internal resources, it is likely the additional resources will be stranded at the conclusion of the program leading to additional costs for customers through either higher cost of short-term contract labour or redundancy expense for labour employed greater than 12 months.

Consequently, Option 5, which involves the rectification of MSM over two regulatory periods using both internal and external resources is considered the most suitable option. It meets requirements of the identified need in the most cost efficient and operationally prudent manner.

6.5 Preferred Network Option

The preferred option is Option 5: arrange for the rectification of all MSM sites in two regulatory periods, with a blend of internal and external resourcing. A 10- year blend approach rectification plan is preferred primarily due to the complexity and remote location of MSMs as well as the planning, stakeholder coordination and experienced resourcing required to complete rectification work with minimal disruption to customers in a cost-effective manner.

7 Compliance Statement

This FPAR complies with the requirements of NER section 5.17.4(j) as demonstrated below:

Table 8 Compliance

Requirement	Report Section
(1) a description of the identified need for investment;	3.1
(2) the assumptions used in identifying the identified need (including, in the case of proposed reliability corrective action, why the RIT-D proponent considers reliability corrective action is necessary;	3.1
(3) if applicable, a summary of, and commentary on, the submissions received on the NNOR;	NA
(4) a description of each credible option assessed	4
(5) where a *Distribution Network Service Provider* has quantified market benefits in accordance with clause 5.17.1(d), a quantification of each applicable market benefit of each credible option	5
(6) a quantification of each applicable cost for each credible option, including a breakdown of operating and capital expenditure	6
(7) a detailed description of the methodologies used in quantifying each class of costs or market benefit	6.1
(8) where relevant, the reasons why the RIT-D proponent has determined that a class or classes of market benefits or costs do not apply to a credible option	5
(9) the results of a NPV analysis of each credible option and accompanying explanatory statements regarding the results	6.3
(10) the identification of the proposed preferred option	6.5
(11) for the proposed preferred option, the RIT-D proponent must provide: **(i) details of the technical characteristics;** **(ii) the estimated construction timetable and commissioning date (where relevant);** **(ii) the indicative capital and operating costs (where relevant);** **(iv) a statement and accompanying analysis that the proposed preferred option satisfied the RIT-D; and** **(v) if the proposed preferred option is for reliability corrective action and that option has a proponent, the name of the proponent**	6.5
(12) contact details for a suitably qualified staff member of the RIT-D proponent to whom queries on the final report may be directed.	1.3
5.17.4(r): A summary of any submissions received on the DPAR and the RIT-D proponents response to each such submission	1.2