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Regulatory Submission for period 2021/22 to 2025/26

JEMENA - REVIEW OF PROPOSED FUTURE GRID AND CYBER SECURITY OPEX STEP CHANGES

Report prepared for:

AUSTRALIAN ENERGY REGULATOR

August 2020

This report has been prepared to assist the Australian Energy Regulator (AER) with its determination of the appropriate revenues to be applied to the prescribed distribution services of Jemena from 1st July 2021 to 30th June 2026. The AER's determination is conducted in accordance with its responsibilities under the National Electricity Rules (NER). This report covers a particular and limited scope as defined by the AER and should not be read as a comprehensive assessment of proposed expenditure that has been conducted making use of all available assessment methods.

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Except where specifically noted, this report was prepared based on information provided to EMCa prior to 31st July 2020 and any information provided after this time may not have been taken into account.

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ABBREVIATIONS

Term	Definition
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AESCSF	Australian Energy Sector Cyber Security Framework
CAT	Critical Assessment Tool
DER	Distributed Energy Resources
EDC	Electricity Distribution Code
IT	Information Technology
LV	Low Voltage
MIL	Maturity Indicator Levels
NER	National Electricity Rules
OT	Operational Technology
PQ	Power Quality
PV	Photovoltaic (solar)
RCP	Regulatory Control Period
SP	Security Profile

1 INTRODUCTION

1.1 Scope

1. The AER has asked for EMCa's advice on two proposed aspects of Jemena's Regulatory Proposal for the period 2021/22 to 2025/26:
   - Future Grid (solar enablement) opex step change; and
   - Cybersecurity opex step change.

1.2 Our approach

2. Our approach involved:
   - Reviewing those aspects of Jemena's Regulatory Proposal and associated supporting documents in which it proposes the opex step changes;
   - Meeting with Jemena by video-conference, in conjunction with AER staff, on 27th May 2020; and
   - Reviewing follow-up information provided by Jemena in response to Information Requests.

1.3 Presentation of expenditure amounts:

3. Expenditure is presented in this report in $2021 real terms, unless stated otherwise. In some cases, we have converted to this basis from information provided by the business in other terms.
4. Jemena has proposed expenditure allowances which it has real-cost escalated in aggregate. However, project and program-level information presented by Jemena (such as in the project models and business cases) has generally not had escalation applied. Accordingly, in this report, we have presented expenditure information in non-escalated terms to preserve comparability with the source data. We have footnoted any graphs and tables that comprise non-escalated expenditure.
5. While we have endeavoured to reconcile expenditure amounts presented in this report to source information, in some cases there may be discrepancies in source information and minor differences due to rounding. Any such discrepancies do not affect our findings.

2 JEMENA'S PROPOSED FUTURE GRID OPEX STEP CHANGE

Jemena's solar PV penetration is forecast to grow from 10% to 28% by 2025/26. With increased solar penetration, there is an expected increase in over-voltage issues at the LV level that will to some extent constrain customers' solar energy exports to the grid.

Jemena proposes a $3.8m opex step change for its Future Grid solar enablement program to reduce the extent to which over-voltage occurs in the LV network.

We consider that Jemena has not sufficiently demonstrated that: (i) its proposed expenditure for LV asset inspection is cost-efficient; (ii) its proposed expenditure for preparatory work packages complies with the NER opex criteria; and (iii) it has an obligation to incur additional opex to adjust non-compliant customer inverter settings.

Accordingly, we consider that Jemena has not justified its proposed opex step change as being prudent and efficient.

2.1 Introduction

7. Jemena Electricity Networks (Vic) Pty Ltd's (**Jemena**) proposes a 'Future Grid' program for the next RCP which comprises 'a set of least-regrets initiatives in response to changes we know will continue to occur in our energy market over the coming decades, particularly as the customer take-up of distributed energy resources (DER) continues to accelerate.'[1] The majority of the proposed expenditure is capital expenditure, which is not within the scope of our assessment. However, we have considered Jemena's justification of its Future Grid program to inform our assessment of the operating expenditure component.

2.2 Jemena's proposed Future Grid program

2.2.1 Jemena's proposed expenditure for the next RCP

8. Jemena proposes incurring $3.8m opex, together with capital expenditure, over the next RCP to *'maximise the opportunities available from increasing customers' DER exports and optimising the utilisation of existing network assets.'*[2]

9. There are three components to the Future Grid program, each of which has a capex and an opex component: [3]

- Developing an LV Network Model – several projects are designed to improve Jemena's visibility and understanding of its network's DER hosting capacity:
  - improve data capture processes to capture DER information;
  - implement LV network modelling tools;
  - trial LV network monitoring; and
  - implement a new DER website and connection portal.

[1] Jemena – Att 06-05 Operating expenditure step changes – Confidential – 24 Feb 20, page 11

[2] Jemena - Att 05-04 Future Grid investment proposal - 20200131 – Public, page 24

[3] Jemena – Att 06-05 Operating expenditure step changes, page 12

- Enabling dynamic DER export control – includes installing LV network monitoring devices to:
  - enable dynamic export limits; and
  - enable new distribution management system modules in Jemena's SCADA system to allow for the control and management of DER.
- Increasing DER hosting capacity – includes:
  - upgrading or modifying existing customer PV generation inverters to allow for voltage regulation;
  - installing LV voltage regulation devices[4] to mitigate power quality impacts from increased DER penetration; and
  - augmenting LV network assets.

10. Table 2.1 below shows Jemena's proposed opex profile over the next RCP, with the step change forecast to occur from FY22 onwards. Jemena advises that the '…*timing is driven by the need for this operating expenditure to support the implementation of other activities (for which our proposal includes forecast capital expenditure) within our Future Grid program.'* [5]

Table 2.1: Jemena's proposed Future Grid program - opex step change - $million, June 2021

Component	FY22	FR23	FY24	FY25	FY26	Total
Low voltage network asset inspection	0.17	0.17	0.17	0.17	0.17	**0.9**
Enabling DER portfolio preparatory work	0.21	0.21	0.22	0.22	0.22	**1.1**
Increasing hosting capacity by modifying customers' DER inverter settings	0.36	0.36	0.36	0.36	0.36	**1.8**
Future Grid operating expenditure step change total	**0.75**	**0.75**	**0.75**	**0.76**	**0.76**	**3.8**

Source: Jemena – Att 06-05 Operating Expenditure step changes – Confidential – 24 Feb 20, p12

2.2.2 Jemena's justification for its DER program

Distributed solar penetration and implications for LV distribution networks

11. Jemena's solar PV penetration is currently 10% and it forecasts that this will grow to 28% by 2025/26.[6]

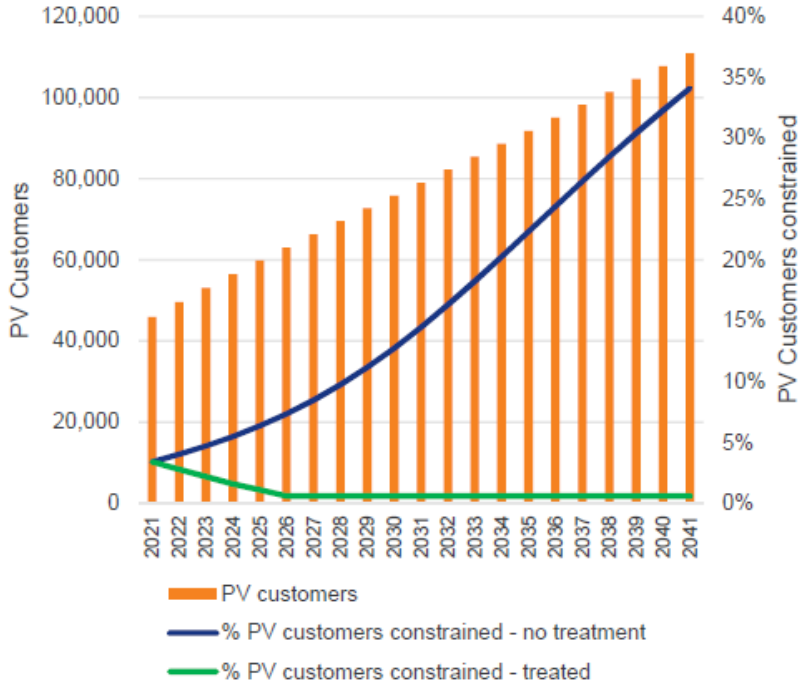
12. Increased distributed generation such as from rooftop solar has the effect of raising the voltage at the LV level. Customer solar system inverters which are compliant with AS4777 are set to trip when voltage exceeds set thresholds to avoid over-voltage supply in the LV system to which its connected. Jemena's forecast of constraints over time is shown in Figure 2.1 below.

4 In-line voltage regulators, static Var compensators, and Var-controlled devices

5 Jemena – Att 06-05 Operating expenditure step changes, page 12

6 Jemena – 2021-26 Regulatory Proposal – Overview – 31 January 202, page 38

Figure 2.1: Jemena's forecast PV generating customers and constraints (central case scenario)



Source: EMCa - Jemena onsite meeting - Future grid opex step change (DRAFT), slide 7

13. Jemena's proposed solar enablement program is intended to reduce the extent to which over-voltage occurs and therefore the extent to which exported solar from customers' systems is constrained.

Jemena's strategy for enabling DER

14. Jemena advises that it manages DER issues reactively, as shown in the process diagram in Figure 2.2 below. Our understanding is that if a power quality (PQ) issue relates to voltage excursions beyond the Electricity Distribution Code (EDC) requirements,[7] it applies one or more of the following remedial actions: (i) manual distribution substation tap change; (ii) review and revise zone substation voltage settings; and/or as a last resort (iii) augment the distribution substation, typically by increasing its capacity.

Figure 2.2: Jemena's existing approach to DER enablement – 'building reactively'

Source: EMCa - Jemena onsite meeting - Future grid opex step change (DRAFT), slide 6

15. Jemena advises that this reactive approach to building hosting capacity is the least economically effective approach of the three options it has considered. Its counterfactual is to increasingly constrain customer DER exports to meet EDC requirements, which it argues is the outcome of lack of visibility of its LV network.[8] Jemena's two other options are:[9]

- building-out all constraints proactively (i.e., with network solutions); and

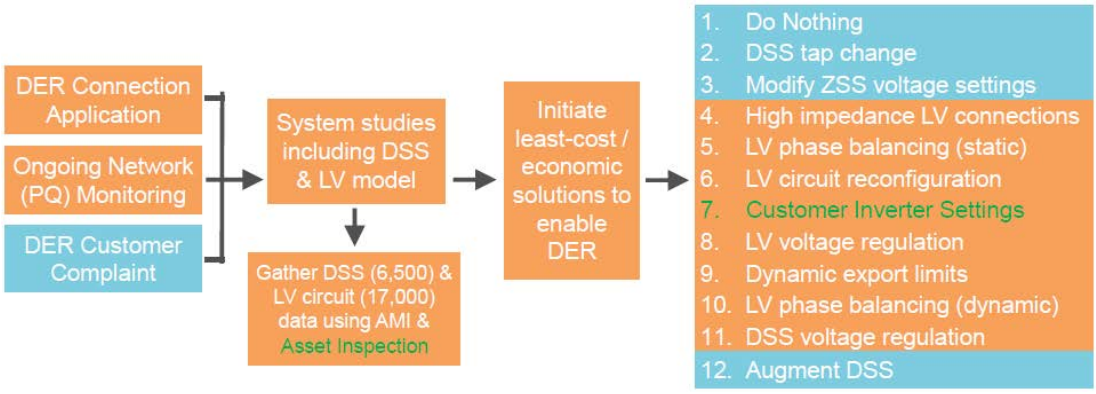
7 +10% (253v) to -6% (216V) steady state, Victorian Electricity Distribution Code, Version 9A, clause 4.2.2, Table 2 Standard Voltage Variations

8 In this counterfactual, PV generation exports from additional installations are constrained after an assumed 30% penetration threshold is reached at the distribution substation level.

9 Jemena, Att 05-04 Future Grid Investment Proposal

- building smart – its recommended approach, illustrated in Figure 2.3 below, which also highlights (in green) two of the three opex requirements.

Figure 2.3: Jemena's proposed approach to DER enablement – 'building smart'



Source: EMCa - Jemena onsite meeting - Future grid opex step change (DRAFT), slide 6

2.2.3 Jemena's opex-related initiatives

Low voltage network asset inspection[10]

16. The forecast $0.8m over the next RCP is to employ an additional full-time asset inspector to gather LV network configuration, LV asset data and LV customer connection arrangements and to enter the information into Jemena's asset and customer and network management systems. Jemena advises that:
    - the information will enable development of its proposed low voltage (LV) network model;
    - it has limited visibility of its LV network; and
    - it has limited ability to control individual assets within the LV network.
17. Jemena's position is that. with increasing DER penetration, lack of visibility can present a barrier to optimising its LV network planning, design and operations.

Enabling DER portfolio preparatory work packages[11]

18. Opex is required in advance of capital works to increase network hosting capacity to:
    - develop the data architecture for the LV network model;
    - develop a method to calculate the hosting capacity of various network assets;
    - develop a model utilising AMI data to optimise the planning, operation and maintenance of network assets;
    - develop an 'Increase Hosting Capacity Solution' model to determine the optimal mix of technical solutions; and
    - revise the customer connections process for DER '*to provide customers with the option of dynamic hosting capacity limits in cases where it is not economically feasible to remove an export constraint.*'

Increasing hosting capacity by modifying customers' DER inverter settings[12]

19. Jemena proposes 700 x $500 incentive payments per year to incentivise customers in specific locations to update their inverter settings to enable both volt-var and volt-watt response mode settings.

10 Jemena – Att 06-05 Operating expenditure step changes, p14

11 Jemena – Att 06-05 Operating expenditure step changes, p14

12 Jemena – Att 06-05 Operating expenditure step changes, p14

2.3 Our assessment

2.3.1 Context

20. The AER has asked EMCa to provide advice in relation to the opex components of Jemena's DER program and not regarding the capex components. Our assessment is independent of the AER's findings in relation to its findings for the capex components.

2.3.2 Low voltage network asset inspection

Jemena's requirement for some additional LV network information is reasonable

21. Our understanding from discussions with Jemena at our workshop[13] is that it anticipates that the extra asset inspector will be required to fill in an approximate 20% knowledge gap of relevant LV network information (i.e., that cannot be derived from other sources). It therefore estimates that the data for the 'full network model' will be able to be captured within 10 years (i.e., 10 person years).[14]

22. It seems plausible to us that there may be inadequate LV network data in some cases to facilitate LV network modelling and planning to overcome potential or actual hosting capacity constraints. However, it is not clear from the information provided what Jemena means by a 'full network model'. Typically, network modelling is based on reasonable assumptions as there are diminishing returns in having accurate data for every individual network element. We would expect the diminishing returns to apply for the purpose of PV connections and PV export management.

Jemena has not provided compelling evidence to support the need for an extra inspector

23. Jemena has not provided evidence that it has adequately considered alternatives to an additional full-time inspector. For example, using existing asset inspectors to collect specific missing or unconfirmed data would appear to be a more efficient means of collecting necessary data and may be able to be completed well within the nominated 10-year period.

24. We asked Jemena about this option at the on-site meeting. Jemena advised that because it is a 100% operationally efficient organisation, it is unable to extend its routine asset inspection practices to undertake this additional work. We have not seen evidence to support this claim.

2.3.3 Preparatory work packages

Some preparatory work may be required, but it does not appear to be recurrent opex

25. Jemena has described activities to support its DER enablement program that appear to be discrete, one-off activities rather than a continuous set of activities which would satisfy the NER requirements for an opex step-change. Furthermore, it is not clear to us why Jemena requires consulting services to the extent identified in addition to in-house resources.

26. At the on-site meeting we asked Jemena to clarify why it considered the expenditure to be on-going. Our understanding from the discussion is that Jemena's forecast is based on the assumption that every year a new DER-related issue will arise that will require similar types of work – for example, to manage customer batteries and electric vehicles.

Jemena has not provided compelling evidence that it considered credible alternatives

27. From the information provided, we do not see evidence of Jemena considering a credible number of alternatives to hiring a consultant to undertake the five parcels of work on a recurrent basis. For example, assuming that some or all of the work is not undertaken as

13 27 May 2020

14 EMCa - Jemena onsite meeting - Future grid opex step change (DRAFT), slide 8

part of the DER enablement capex program (i.e., capitalising consultancy expense), options include:

- knowledge transfer to help build internal capability – this would reduce the reliance on consultants and, in our experience, would likely be a more efficient medium to long term approach; and
- staging the development of new architecture, methods, models, and processes over the next RCP - building on the work in the first year and recognising the impact of the experience curve as a means of reducing the overall cost in the next RCP.

2.3.4 DER inverter settings

Enabling volt-var and volt-watt response mode settings is likely to improve hosting capacity

28. We concur with Jemena's claim that volt-var / volt-watt control is a 'simplistic form of dynamic export limit' that will: (i) *'…enable more customers supplied from the same assets to connect DER',* and (ii) *'…allow for the better management of supply point voltages experienced by customers without DER, reducing the likelihood of damage to their appliances caused by over-voltages.'* [15]

29. However, based on the information provided in its response to an Information Request, Jemena appears to be planning to encourage customers with compatible inverters to adjust their inverter settings after implementing measures such as changing the DSS tap position, modifying the zone substation voltage settings, removing high impedance LV joints and/or undertaking LV network phase balancing.[16]

30. In our view, all relevant customers should be encouraged to have their inverter settings adjusted as an early measure. As discussed below, this does not mean that we endorse Jemena's incentive scheme.

Jemena has not demonstrated the efficiency of its proposed incentive scheme

31. Jemena advises that more than 35,000 solar inverters were installed prior to 1 December 2019, after which all inverters were required to be installed with the voltage regulation settings enabled. Of these, 13,135 PV systems were installed by Jemena's customers between 1 January 2016 and 30 November 2019[17] which Jemena advises '*should be compliant with the 2015 version of the AS4777 inverter standard – meaning that these inverters' settings should be capable of being modified to comply with our current PQ setting requirements.'*[18]

32. Jemena has assumed (i) 100% of the 13,135 systems are non-compliant with Jemena's current PQ setting requirements, (ii) 80% of the 13,135 systems should be capable of being set with volt-var and volt-watt response mode settings, (iii) the life of the inverters is, on average, 20 years, and (iv) customers will act on the incentive scheme at an even rate over the 15 year period or 700 p.a.[19]

33. Whilst we consider Jemena's forecasting methodology to be overly simplistic, we are more concerned with the proposition that it is incumbent on the DNSP to pay target customers $500 to encourage them to set their inverter systems in accordance with AS4777 given that:

- there are clear advantages to those customers to change their settings to maximise their individual PV system export capacity;
- the cost of the incentive scheme would effectively be a wealth transfer to those customers (i.e., at the expense of all other customers); and

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15 Jemena's response to IR-027, page 4

16 *Ibid,* page 4

17 Prior to 1 Jan 2016 systems are assumed not to be able to comply with AS4777; inverters systems installed after 30 Nov 2019 are required to comply with the volt-var and var-watt response mode settings

18 Jemena response to IR027, page 5

19 (80% x 13,135)/15 = 700 per Jemena's response to IR-027, page 5

- there are alternatives to the proposed scheme, for example:
  - a letter from Jemena to relevant customers advising of their non-compliance and the benefits of correctly setting their inverter and a time limit for taking corrective action, noting that the customer may be able to recover any costs from the installer; and
  - the inverter settings could be reset as part of a service call at little or no incremental costs to the relevant customer.

2.4 Implications for proposed Future Grid opex step change

34. Based on the information available to us at the time of preparing this report, we consider that Jemena has not sufficiently demonstrated that its proposed opex step change for its Future Grid program is prudent and efficient.

LV asset Inspection

35. We consider that there is likely to be a more cost-efficient means of acquiring the necessary LV network data to enable Jemena's proposed LV network model, using existing resources, rather than employing an additional asset inspector.

Preparatory work packages

36. In our view, the proposed work does not comply with the NER opex criteria because Jemena has not demonstrated satisfactorily that: (i) it is a recurrent opex activity; and (ii) it is the most efficient means of achieving the stated objectives.

DER inverter settings

37. In our opinion, Jemena has not demonstrated that it has an obligation to incur the proposed additional opex to adjust non-compliant customer inverter settings. We consider that Jemena could implement alternatives to the proposed scheme that are likely to be more efficient and cost-effective. Moreover, Jemena can require any customer with a non-compliant inverter system to rectify the non-compliance at the customer's own cost.

3 JEMENA'S PROPOSED CYBER SECURITY OPEX STEP CHANGE

Jemena plans to achieve a cyber-security level of MIL2/SP-2. This is appropriate for the 'Moderately Critical' nature of an electricity distribution business.

Jemena proposes to recover its allocated cyber security cost of $2.9m through an opex step change. Jemena has structured its proposed expenditure to achieve benchmarks set out in the AESCF, [redacted]

We consider that there is sufficient evidence to underpin a continued focus by Jemena to improve its cyber security resilience. Whilst achieving MIL2/SP-2 is not currently a regulatory obligation, it is likely to represent the actions of a prudent operator to address escalating cyber security risks.

We consider that the option selected is appropriate and that the quantum of Jemena's proposed cyber security expenditure is reasonable. Accordingly, we consider that the proposed opex step change is reasonable.

3.1 Introduction

38. Jemena proposes to continue to invest in systems to identify, protect, detect, respond and recover from cyber-attacks. Jemena has submitted information to support recurrent and non-recurrent investments in new capabilities.

3.2 Jemena's proposed cyber security program

3.2.1 Overview of proposed program

Jemena's cyber security program covers its electricity and gas utility service businesses

39. Jemena's utility services business is comprised of a distribution electricity network service provider (Jemena Electricity Network) and a gas distribution pipeline network (Jemena Gas Network), several gas transmission pipelines and a range of other infrastructure services businesses.[20] The assessment in this section involves the allocation of proposed cyber security expenditure in the next RCP to Jemena Electricity Network ('Jemena').

Jemena has structured its proposed expenditure on achieving benchmarks set in the AESCF

40. In reviewing Jemena cyber security program and, in particular, its proposed opex step change, reference is made to the Australian Energy Sector Cyber Security Framework (AESCSF). This framework has been applied by Jemena as a basis for cyber security maturity assessment (or resilience to cyber threats).

41. The development of the AESCSF was led by the Australian Energy Market Operator (AEMO) in conjunction with industry and government stakeholders.[21] It provides a self-assessment framework for measuring cyber security maturity according to three gradings of

[20] JEN - RIN - Support - IT Investment Brief - Cyber Security Enhancements - 20200131 – Public, page 1

[21] Australian Cyber Security Centre (ACSC), Critical Infrastructure Centre (CIC), and the Cyber Security Industry Working Group (CSIWG); the latter includes representatives from Australian energy organisations

Maturity Indicator Levels (MIL): MIL 1, MIL 2, MIL 3, with the latter being the highest level. The AESCSF comprises 11 domains, 28 objectives, 240 practices and 42 anti-patterns.

42. It is common for the electricity utilities to self-assess (with or without external advice) its progress, including partial progress, towards achieving any of the three MILs. For example, MIL 1.5 as referenced would be indicative of achieving 100% of the MIL 1 level and 50% of the practices and anti-patterns represented by the MIL 2 level.

43. In the latest version of the AESCSF framework (version 2019-8), Security Profile (SP) levels 1-3 have been introduced. Our understanding is that the 'MIL2/SP-2' and 'MIL3/SP-3' levels represent the equivalent of cyber security maturity. We refer to the MIL2/SP-2 level in our review of Jemena's supporting documentation.

3.2.2 Jemena's proposed opex step change

44. Jemena has proposed 18 non-recurrent cyber security projects in the next RCP as follows:[22]

- 4 non-recurrent 'maintain' projects to maintain current capabilities:
  - the projects are required to retain existing capabilities; and
  - Jemena is either planning to move to a new product or shift an existing system to a cloud solution rather than perform in-place lifecycle upgrades.
- 14 other non-recurrent 'compliance' projects to comply with obligations.

45. These projects are deployed to ensure that Jemena's cybersecurity capabilities keep up with the increasing capabilities of cyber attackers. The table below shows the proposed opex step change which Jemena advises is necessary to implement, configure and monitor the new defences.[23]

Table 3.1: Jemena's proposed 2021-2026 cyber security opex step change - $m, real 2021

Opex step change	FY22	FY23	FY24	FY25	FY26	Total
Cyber security spend	1.8	1.8	1.8	1.8	1.8	**9.1**
Apportionment attributed to Jemena[24]	0.6	0.6	0.6	0.6	0.6	**2.9**

Source: Jemena – Att 06-05 Operating expenditure step changes – Confidential, p23

3.2.3 Jemena's justification for its cyber security opex step change

Increasing threat profile and AEMO guidance

46. Jemena observes an increase in cyber-threats to its electricity network. To ensure that it continues to protect its customers, staff and data against evolving cyber risks, Jemena proposes to increase its investment in cybersecurity controls.

47. Based on the AESCSF standards, Jemena's Distribution network is categorised as 'Moderately Critical' per the Critical Assessment Tool (CAT) and 'should achieve' SP-2 level of security, which is comparable with MIL 2 standards.[25]

48. Jemena advises that:[26]

- meeting the MIL2/SP-2 standard is a prudent approach to ensuring the security of supply and is in keeping with the AESCSF; and

22 Jemena - RIN - Support - IT Investment Brief - Cyber Security Enhancements - 20200131 – Public, pages 2-4

23 Jemena - RIN - Support - IT Investment Brief - Cyber Security Enhancements - 20200131 – Public, page 5

24 Jemena attributes 35% of IT costs to Jemena Distribution

25 AESCSF, version 2019-8, Table 1

26 Jemena – Att 06-05 Operating expenditure step changes – Confidential, page 22

- [redacted]

Jemena's strategy for achieving and sustaining MIL2/SP-2

49. [redacted]

50. In addition to the 'do nothing' option (which incurs no opex step change), Jemena has, '*with expert research from Gartner,*' considered three options for achieving a response time for security issues [redacted] [28]
    - Option 1 - strengthen internal capability;
    - Option 2 – outsourced; and
    - Option 3 - hybrid sourcing with automation.

51. The five-year opex for each option is shown in the table below. Option 3 is Jemena's recommended option because it '*combines the best value with the highest ability to successfully reduce incident response times to two hours or lower.*'[29]

Table 3.2: Jemena Cybersecurity opex step change – options comparison - $m, real 2021

Component	Option 1	Option 2	Option 3
External Cyber Security Monitoring and Detection Service		8.0	3.0
Security Operation Automation and Orchestration Service			0.9
End Point Detection and Response Service			1.4
Network Analysis and Anomaly Detection Service			1.5
Additional staff for Operational Technology	11.5	1.6	2.0
TOTAL opex step change for next RCP	**11.5**	**9.6**	**8.8**

Source: Jemena – Att 06-05 Operating expenditure changes – Confidential, Tables 6-3, 6-4, 6-5, pages 24-26

3.3 Our assessment

Jemena will spend more than forecast on cybersecurity in the current RCP

52. Jemena advises that due to the 'growing external threat environment', it has spent more on uplifting its cyber security capabilities, although it categorises this as compliance expenditure.[30] It has provided numerous references to support its position.[31]

53. Jemena's position is consistent with advice from AEMO regarding the threat from cyber security to the energy sector and the increasing trend of expenditure on cyber security risk mitigation:

27 Based on a blog by CrowdStrike, Jemena – Att 06-05 Operating expenditure step changes – Confidential, page 22

28 Jemena – Att 06-05 Operating expenditure step changes – Confidential, page 23

29 Jemena – Att 06-05 Operating expenditure changes – Confidential, page 24

30 Jemena - Attachment 05-02 - Historical capital expenditure report - 31 January 2020, page 11

31 Responses to AER IR010

'Protecting the Australian energy sector against increasingly sophisticated cyber threats is a matter of national importance - not only to ensure the security and reliability of electricity supply, but also for economic stability and national security. Addressing this challenge is a core element of appropriately responding to the Finkel Review recommendation 2.10;[32] *and*

The magnitude of the threats faced by Australian businesses and families has increased. They will become more acute as our society and economy become increasingly connected. As the threat evolves, so too must our response.'[33]

54. As recently as 19 June 2020, the Australian Prime Minister announced that there had been a cyber attack by a "*sophisticated state-based actor… targeting Australian organisations across a range of sectors, including all levels of government, industry, political organisations, education, health, essential service providers, and operators of other critical infrastructure."*[34]

55. In short, we consider that there is sufficient evidence to underpin continuing focus by Jemena (and other Australian electricity utilities) on improving its cyber security resilience in the face of evolving cyber threats.

Achieving MIL2/SP-2 is not currently a compliance obligation, but is likely to be prudent

56. Jemena has referred to the AEMO and AESCSF frameworks for guidance on the appropriate risk appetite. These frameworks enable participants to undertake assessments of their own cyber security capability and maturity and use the results to inform and prioritise investment to improve cyber security posture. AEMO's framework is based on one of the most popular global frameworks (NIST cyber security framework).

57. As Jemena states, application of the AEMO framework for a DNSP results in a proposed level of MIL2/SP-2. As far as we can ascertain, this is not currently a regulatory obligation nor is the self-assessment process itself a mandatory requirement.[35] Whilst achieving MIL2/SP-2 is not currently a regulatory obligation, it is likely to represent the actions of a prudent operator to address escalating cyber security threats and to be cognisant of the AEMO's guidance.

There is evidence that Jemena is not currently at AESCSF MIL2/SP-2 despite cyber security activities in the current RCP

58. Jemena has provided information in response to IR010 which provides adequate evidence that its self-assessed maturity level was and remains less than MIL2/SP-2.

59. Given its intention to achieve MIL2/SP-2, we asked Jemena to explain why it appears to be waiting until the next RCP to address the capability gap.[36] In its response, Jemena confirmed that Jemena has begun implementing many initiatives as part of its cyber security program, '*mostly throughout the first three quarters of 2019*' that are part of normal business activities. However, it advised that beyond the incremental improvements, it is taking a staged approach to improving cyber security capabilities and would not achieve MIL2/SP-2 until CY22. Based on its further descriptions of the planned capex and opex-related initiatives, we are satisfied that additional opex is likely to be incurred.

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32 AEMO Australian Energy Sector Cyber Security Framework (AESCSF) Overview, website

33 Australian Cyber Security Centre website, Critical Infrastructure

34 https://www.abc.net.au/news/2020-06-19/foreign-cyber-hack-targets-australian-government-and-business/12372470

35 AEMO Australian Energy Sector Cyber Security Framework (AESCSF) Framework and 2019 Self-Assessment Program Overview, Version 2019

36 AER Information Request IR027

Jemena has selected the appropriate option for achieving MIL2/SP-2

60. Jemena presented four options (including doing nothing) to support its achievement [redacted]
It has undertaken quantitative and qualitative assessment criteria as follows:

- Jemena has undertaken a cost-benefit analysis of Options 1-3 and for four cyber threat scenarios (Base, Optimistic, Moderate and Pessimistic) which indicates that, with the exception of the Optimistic scenario, the investment in any of the three scenarios is strongly positive. The highest net benefit is for Option 3 – however, the difference between the options is relatively small;[37] and
- Jemena considered five qualitative criteria,[38] with Option 3 rated 'High' (the maximum) on all dimensions, which was not matched by any of the other options.

61. We consider that the options considered are credible and that Jemena's selected option is likely to be the most prudent approach based on: (i) the information presented by Jemena; (ii) our experience; and (iii) evidence that it is the superior option, both qualitatively and quantitatively.

The quantum of Jemena's cyber security program costs is reasonable

62. Jemena advises that the basis for the cost estimates for the five components of its approach [redacted] estimates provided by vendors and the Hays Salary Guide 2019 for cyber-security staff. We consider this to be a reasonable cost estimating approach.

63. Jemena advised at our on-site meeting that it had 160 OT and IT staff. We asked why it could not resource the additional two OT staff for cyber security coverage from within its existing staffing level. In summary, Jemena advised at the on-site and later in writing that:[39]

- cyber-security is a specialised field, requiring new systems, processes, and skills within the organisation; and
- Jemena does not have the capacity within the existing resource base to undertake additional cyber security activities.

64. We are satisfied with this response.

3.4 Implications for proposed cyber security opex step change

65. We are satisfied that:

- There is an escalating threat from cyber attacks and that it is prudent for Jemena to improve its cyber security posture;
- AEMO's guidance is that DNSP's are 'Moderately Critical' infrastructure organisations and that the MIL2/SP-2 maturity level and the accompanying AESCSF framework provide a reasonable basis for gap assessment;
- A prudent DNSP should identify and implement its cyber security improvement initiatives despite the current absence of a regulatory obligation;
- Option 3 - hybrid sourcing with automation, is the appropriate approach for identifying the costs involved in achieving MIL2/SP-2; and

66. We therefore consider that the proposed opex step change is reasonable.

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37 Jemena – IR010 – Attachment k1 – Jemena – HILP Model – 20200423 - Confidential

38 Including its option assessment summarised in Table 6-2, Jemena – Att 06-05 Operating expenditure step changes – Confidential, page 24

39 Response to AER Information Request IR027

67. We have not reviewed Jemena's cost allocation methodology, which results in 35% of the total cost of Option 3 being allocated to Jemena Electricity Networks.