Jemena Electricity Networks (Vic) Ltd

2021-26 Electricity Distribution Price Review Regulatory Proposal

Attachment 07-09

Advanced Metering Infrastructure

Jemena
bringing energy to life

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Glossary

AER	Australian Energy Regulator
Capex	Capital expenditure
Current regulatory period	The regulatory control period covering 1 January 2016 to 31 December 2020
Intervening period	The regulatory control period covering 1 January 2021 to 30 June 2021
Metering coordinator	The Metering Coordinator is a registered participant role within the National Electricity Market, with the overall responsibility for metering services at a customer's connection point within a distribution or transmission system
Next regulatory period	The regulatory control period covering 1 July 2021 to 30 June 2026
Opex	Operating expenditure
Previous regulatory period	The regulatory control period covering 1 January 2011 to 31 December 2015
Regulatory proposal	2021-26 regulatory proposal
RIN response	Our response to information sought by the AER in the Regulatory Information Notice served 4 October 2019
Smart metering services	Type 5 and 6 (including smart meters) services

Abbreviations

ACS	Alternative Control Service
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
ARR	Annual Revenue Requirements
BIS	BIS Oxford Economics
CEG	Competition Economics Group
CY	Calendar Year
DELWP	Department of Environment, Land, Water and Planning
EBBS	Efficient Benefit Sharing Scheme
DER	Distributed Energy Resources
DNSPs	Distribution Network Service Providers
EDC	Electricity Distribution Code
ESC	Essential Service Commission
FY	Financial year
HY21	Half year Jan to June 2021
IS-U	SAP Industry Specific – Utilities module
IT	Information technology
MAB	Metering Asset Base
NER	National Electricity Rules
NMS	Network Management System
OIC	Order In Council
PTRM	Post-tax Revenue Model
RFM	Roll-forward Model
SCS	Standard Control Services

Overview

This attachment to our 2021-26 regulatory proposal (**regulatory proposal**) sets out our forecast costs, required revenues and prices for our advanced metering infrastructure (**AMI**) used in the provision of type 5 and 6 (including smart meters) services (**smart metering services**) where the Distribution Network Service Provider (**DNSP**) remains responsible.

This document provides additional information on our historical and forecast AMI operating and capital expenditure, how we have developed our expenditure forecasts, and the resulting revenue requirement and smart metering service prices for the regulatory control period covering 1 July 2021 to 30 June 2026 (**next regulatory period**).

This attachment is structured as follows:

- Section 1 provides a brief history of AMI or 'smart meters' and the benefits delivered to date, how we plan to leverage AMI further to develop a smart, robust and efficient network, and the outcomes of our current period expenditure relative to allowances
- Section 2 sets out our proposed revenue requirements for smart metering services in the for the next regulatory period, and how they were determined, including our operating expenditure forecast
- Section 3 explains our metering asset base for the next regulatory period
- Section 4 explains our capital expenditure forecast for the next regulatory period
- Section 5 demonstrates the efficiency and prudence of our expenditure forecasts
- Section 6 presents our proposed form of price control for smart metering services
- Section 7 outlines our proposed indicative prices for smart metering services for the next regulatory period.

This document provides the calculation of key inputs into the price control mechanism for smart metering services – including our annual revenue requirements and real price movements (x-factors) for each year of the next regulatory period – and shows how these inputs are used to calculate prices. It therefore provides a demonstration of how the control mechanism is applied to determine prices for smart metering services.

Unless otherwise stated, all financial numbers in this document are presented in real June 2021 dollars (i.e. dollars as at 30 June 2021).

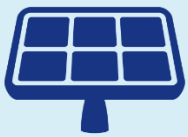
What smart metering services mean to our customers

Our smart meters are a vital gateway to our electricity distribution network for our customers. They provide:

- the data our customers need to understand their usage
- allow two-way energy flows into and out of the electricity distribution network for customers who have solar PV systems
- allow for intelligent control of energy devices
- allow us to see our customers' energy supply status to better manage the quality of service we provide, and restore supply when interruptions do occur (e.g. due to storms or third party hits to our network).

The customer services and network management capabilities that our AMI systems enable were of critical importance to our People's Panel. This capability was recognised in many of their 25 recommendations to us, as Table OV–1 explains.

Table OV–1: People's Panel recommendations that rely on AMI capabilities

Recommendation	Relationship to smart metering services
1  Improve the information available to customers and the ease of access to smart meter data. This should be through: a. Improving Jemena's portal b. Adding additional services such as apps for smart phones.	In our regulatory proposal, we have proposed capital expenditure on IT systems to enable us to improve the availability and accessibility of information for our customers, mainly residential and small-medium business customers. This includes better integrating our systems to provide more options for customers in choosing how they interact with us and more personalised information for customers. Our plans to provide more transparent information and faster resolution of queries include providing live updates around planned outages, more detailed information about unplanned outages and consistency in customer information used in interactions with customer service representatives. Our proposed expenditure for the next regulatory period will allow us to provide the smart meter data access our customers want.
3  Investigate how customers could be provided with personal usage and bill information for different pricing structures.	In our regulatory proposal, we have proposed capital expenditure on IT systems to enable us to improve the availability and accessibility of information for our customers, mainly residential and small-medium business customers. This includes better integrating our systems to provide customers more information on pricing structures and personal usage. The smart meter data our AMI systems collect will facilitate this initiative.
4  Enable increased feed-in of solar (and other renewables) into the grid, by improving the performance of the grid through new technologies.	A key feature of our regulatory proposal is our Future Grid program.[1] In it we outline the activities we plan to undertake, which includes a number of activities that enable distributed energy resources (**DER**). Our enabling DER activities rely on accurate and timely AMI data to better understand and increase the hosting capacity of our distribution network.

[1] See Attachment 05-04.

Recommendation	Relationship to smart metering services
6  Invest in smart technology across the grid to ensure network equipment is not upgraded too early.	In our Future Grid program, we outline the activities we plan which encompass a range of network and non-network capital expenditures as well as operating expenditure. Our program includes a number of "Optimised Asset Investment" activities, through which we propose to use real-time condition monitoring of network assets and other activities to improve network utilisation further. These activities—specifically use of real-time monitoring—rely on accurate and timely AMI data to optimise future asset investment decisions.
12  Note that the Panel believes that the Monthly Maximum demand pricing structure is the best for customers, so long as customers can opt out	Peak demand will be affected by how customers use the network—for example, growth in air conditioners and uptake of electric vehicles over the long term is expected to impact peak demand. Tariff design is an important element in managing this impact. It would not be possible to introduce time-of-use and maximum demand pricing without the interval data provided by our smart metering services. In other states and territories, not all customers can access such prices and therefore miss out on the ability to save money by managing how much energy they use at peak times.
13  Note the Panel's recommendation that Jemena continue to explore using rebates to encourage customers to respond during times of need (for example hot days)	Jemena will look to build a robust case for a large scale rebate program for small customers by leveraging the learnings of recent rebate trials. Our ability to reward customers who respond relies on us being able to measure when and by how much they have met. This capability is the core capability of our AMI meters and system.

As part of our broader engagement on this regulatory proposal, we published a draft plan for consultation in January 2019 and undertook a deep dive session with several stakeholders. We received specific feedback in response to our draft plan, with Appendix A listing this feedback and our responses.

Our 2021-2026 smart metering service charges will be the lowest they have ever been

Over the regulatory control period covering 1 January 2016 to 31 December 2020 (**current regulatory period**), we managed to find savings to underspend both our operating and our capital expenditure allowances. We are passing on these savings to our customers in the next regulatory period, during which our forecast operating expenditure will be lower than our current period's allowance.

Figure OV–1 shows trends in our meter charges (in real terms) over three regulatory periods. Our proposed indicative smart metering service charges for the next regulatory period are the lowest they have ever been due to a lower rate of return and depreciation as the metering asset base continues to depreciate.

Figure OV–1: Meter charges per annum ($ June 2021)

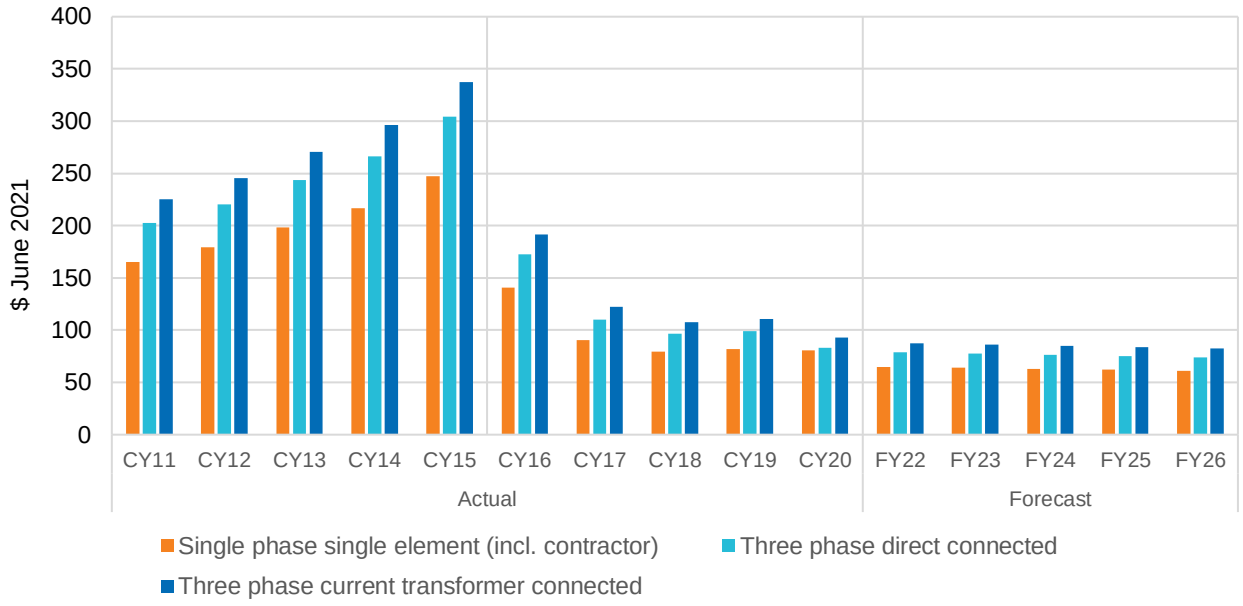
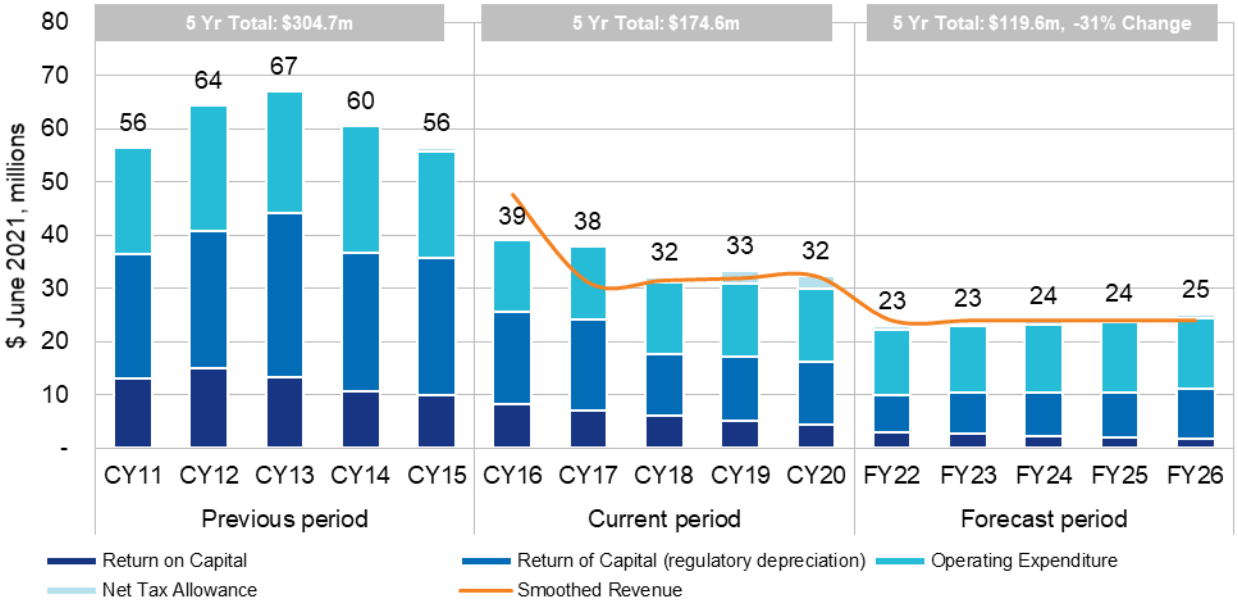


Figure OV-2 shows what drove down our revenue requirements for each period.

Figure OV–2: Trend in metering revenue over time ($ June 2021, millions)



Change from a calendar year to a financial year

On 12 April 2019, the Victorian Minister for Energy, Environment and Climate Change (**Minister**) wrote to the Victorian DNSP and the Australian Energy Regulator (**AER**), announcing a policy to change the regulatory control period to align with a financial year (**FY**) end, rather than calendar year (**CY**), with the change to take effect from

1 July 2021. The change to the regulatory cycle was proposed to occur by providing a six-month extension to the current regulatory period.

This change impacts the regulatory determination process applicable to Victorian DNSPs and the AER as a result of the 6-month gap (from 1 January 2021 to 30 June 2021) between the end of the current regulatory period and the commencement of the next regulatory period (**intervening period**).

To give effect to the revised timings for the next Victorian regulatory reset, JEN has submitted a separate proposal for the intervening period. For details on our proposal for the intervening period, see JEN's regulatory proposal for the intervening period.[2]

This attachment forms part of the JEN's 2021-26 regulatory proposal for the next regulatory period.

List of smart metering service attachments

To support the smart metering service proposal outlined in this document, we rely on several supporting materials; we list these in Table OV–2.

Table OV–2: List of smart metering service attachments

Attachment	Name	Author
07-24	ACS Metering PTRM FY22-26	JEN
07-25	ACS Metering RFM CY16-HY21	JEN
07-26	ACS Metering Opex Model FY22-26	JEN
07-28	ACS Metering RFM CY16-CY20	JEN
07-34	ACS Metering Capex Forecast Model	JEN
05-11	Capex model	JEN
05-03	Demand forecasts report	ACIL Allen Consulting
05-07	Real labour rate escalation report	BIS Oxford Economics
06-03	Debt raising transaction costs report	CEG

[2] JEN, *A proposal for setting electricity distribution service prices, 1 January 2021 to 30 June 2021*.

1. Advanced metering infrastructure in Victoria

1.1 A brief history

In 2008, the Victorian Government, mandated electricity distribution businesses to roll out AMI or 'smart meters', to all Victorian residential and small business electricity customers consuming up to 160 MWh of electricity per annum. The mandate set out in a November 2008 Order in Council (**OIC**), made under the Electricity Industry Act 2000 (Vic), required electricity distribution businesses to roll out AMI in accordance with prescribed metering standards[3] service levels and time frame. The rollout commenced in 2009 and was completed by the end of 2015.

Prices for smart metering services were regulated by the Australian Energy Regulator (**AER**) under the OIC until the end of 2015. For the current regulatory period—when regulation of these services transitioned to the National Electricity Rules (**NER**)—the AER classified smart metering services as alternative control prices (**ACS**) and applied a revenue cap form of price control.

For the next regulatory period, the AER will continue to regulate smart metering services under the NER using the same regulated service classification as it did in the current regulatory period.[4]

1.2 Benefits delivered by AMI

The smart meters we deploy have a range of functions, including recording consumption in 30-minute intervals,[5] remote meter reading, remote connection and disconnection, as well as technology that connects new smart appliances to the meter to facilitate home energy management.

Our smart meters facilitate the innovative design of the electricity distribution network and retail tariffs. Customers can access their energy consumption data via our Electricity Outlook portal and see how much electricity they are using and when they are using it. They can use their consumption information to compare retail market offers.

AMI also enables us to develop and apply smart technologies to the operation of and investment in the electricity network. It gives us data and real-time insight into the operation of network assets, which helps us to improve the efficiency and reliability of the electricity distribution network. For example, AMI significantly enhances the way we:

- forecast demand and the load on the electricity distribution network and allows us to target our capital spending more effectively, which helps to keep power affordable
- respond to supply outages through automated outage notifications
- reduce hazards—through remote identification of poor connections—and detect if a customer has a faulty meter or overhead service that needs replacing.

We plan to leverage AMI further to develop the smart, robust and efficient network we will require to meet ever-changing customer needs, for example to:

- enable demand management services, which will encourage peak demand management—slowing the growth in the network—and improve the efficiency of the network

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3 *Victorian Minimum Advanced Metering Infrastructure (AMI) Functionality Specification* v1.2; and *Victorian Minimum AMI Service Levels Specification.*

4 AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, p. 43.

5 Meters capable of recording electricity usage in five-minutes interval have been installed in JEN's network since December 2018, as required by the NER rule change (Rule 11.103.4).

- increase hosting capacity to facilitate connection of DER and peer-to-peer trading.[6]

We are also working with retailers and other market innovators to help facilitate the products and services they wish to provide to customers. We are also assisting the Victorian Department of Environment, Land, Water and Planning (**DELWP**) to develop their smart grid strategy and the Essential Service Commission (**ESC**) of Victoria as it undertakes a review of the Electricity Distribution Code (**EDC**)[7] to see how electricity distribution businesses can improve transparency and accessibility of AMI information—for example, publication of outage events promptly on the website.

1.3 Deferral of metering competition

The Australian Energy Market Commission (**AEMC**) determined in November 2015 that competition in metering and related services will commence nationally on 26 November 2017 in National Electricity Market (**NEM**) jurisdictions[8]. This NEM-wide decision covered the jurisdictions that had not completed state-mandated AMI rollouts of the kind delivered in Victoria (that is, Queensland, South Australia, New South Wales, the Australian Capital Territory and Tasmania).

Following the AEMC rule change, the Victorian Government deferred metering competition in Victoria through an Order In Council requiring Victorian electricity distribution businesses to continue to remain responsible for smart metering services for all small customers residential and small business customers consuming up to 160 MWh of electricity per annum[9].

As the final decision on the electricity distribution price reset determination for the current period was made in May 2016—and the decision by the Victorian Government to *not* introduce metering competition came after this—the AER's distribution determination for JEN's current regulatory period did not provide any capital expenditure allowance for new and replacement meters beyond November 2017. Consequently, JEN was unfunded in the current regulatory period for capital expenditure for the meters we installed between November 2017 and the end of the current regulatory period. In deferring the metering competition, the DELWP advised[10] JEN:

> "*that Victoria is in a unique position as we are the only state to have completed a rollout of smart meters. Deferral of metering competition will allow the Government to monitor the implementation of metering competition in other jurisdictions in order to consider whether there would be merit in adopting competition in Victoria in the future. Many of the potential benefits of metering competition - such as innovative retail products and services for electricity consumers - can be realised under Victoria's current framework.*

The advice further noted:

> *"It is proposed that a review be undertaken prior to 1 January 2021 to determine whether metering competition should be introduced in Victoria. The review will examine the benefits to Victorian electricity users of switching to the national regime, the impact of competition in metering services on particular customer groups, how potential barriers to distributor access to metering data can be addressed and the experience of other jurisdictions in implementing metering competition*".

At the time of making this submission, the Victorian electricity distribution businesses continue to hold the obligation to provide smart metering services to the mass market and, therefore, this proposal has been developed based on the assumption that this obligation is retained through to the end of the next regulatory period.

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6 See Attachment 05-04

7 ESC, *Electricity Distribution Code Review, Issues Paper*, 13 August 2019.

8 Australian Energy Market Commission, *Rule Determination, National Electricity Amendment (Expanding competition in metering and related services) Rule*, 26 November 2015.

9 *AMI (Obligations to Install Meters) Order* means the Advanced Metering Infrastructure (Obligations to Install Meters) Order 2017 made on 10 October 2017 under sections 15A and 46D of the Electricity Industry Act 2000 and published in the Government Gazette S342 on that day as amended from time to time.

10 Email from DELWP's Executive Director, Energy Policy and Program, 16 March 2017.

Why distribution businesses providing smart metering makes sense

Victoria has been successful in maintaining the lowest network charges in the NEM, in no small part due to the foresight of the Victorian Government to mandate electricity distribution business led smart meter roll out over a decade ago. This strategy has enabled our customers that we serve to access the benefits of this smart energy technology.

Other parts of the NEM have moved forward with installing smart meters on a new and replacement plus ad-hoc installation basis using a multi-provider model under the AEMC's 'Power of Choice' reforms. Some influential stakeholders and consumer groups have stated that this approach has been a failure.[11] In addition to the lack of broad deployment, high upfront costs and undisclosed costs, a fundamental problem the rest of the country is seeing is impediments to customers accessing their data—something that JEN provides to all our customers for free using our portal.

In 2020 the AEMC will be conducting a review of these reforms and revisiting whether the approach has delivered on its aspirations compared to the electricity distribution business-led approach Victoria has successfully implemented.

A report[12] by Dieter Helm—a specialist adviser to the UK Government on energy markets—has identified two critical findings with regards to smart meter programs that contradict the current trends in Australia, these are:

1. that the rationale for wholesale/retail benefits is diminishing and the benefits are more likely to come from demand management and related products and other network benefits. "The role of the wholesale market declines in importance" (p. 68) and quoted in numerous other areas within the report.
2. a market lead rollout of smart meters results in "haphazard, patchy and high-cost" program and with costs at "higher levels" than what a network business could provide (p. 63).

These findings are consistent with our views that benefits are coming from network-related activities as we have, and continue to, innovate in the smart metering services we provide.

1.4 Regulated smart metering services

Since Victorian electricity DNSP's will continue to be the sole providers of type 5 (interval), type 6 (accumulation) and smart meters and have the role of metering coordinator, metering provider, and metering data provider for AMI meters, the AER has proposed to classify smart metering services as ACS in Victoria for the next regulatory period. The AER's approach is consistent with the classification in the 2016-20 service classification determination[13].

Our smart metering services include:

- installation, operation, maintenance, and replacement of type 5 and 6 metering installations (including smart meters)
- collection of meter data, processing and storage of meter data, and provision of access to meter data for type 5 and 6 metering installations (including smart meters).

Regulated meter provision and meter data provision services for type 5, 6 and smart meters are currently provided as a bundled service, and we propose to continue charging this way in the next regulatory period.

11 Sangeetha Chandrashekeran, Gavin Dufty and Martin Gill (In the Conversation and ABC news), *Smart electricity meters are here, but consumers are failing to reap the benefits*, February 2018.

12 Dieter Helm, *Cost of Energy Review*, 25 October, 2017.

13 AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, p. 43.

1.5 Our actual expenditure in the current regulatory period

1.5.1 Current regulatory period AMI operating expenditure

For the current regulatory period, JEN underspent its operating expenditure allowance approved by the AER in its distribution determination for the current regulatory period. JEN's underspend is shown in Table 1–1.

Table 1–1: Actual operating expenditure compared against allowance ($ June 2021, millions)

AMI operating expenditure	CY16	CY17	CY18	CY19	CY20	Total
Allowed operating expenditure	13.3	14.0	13.6	13.7	13.8	**68.4**
Actual operating expenditure	11.8	14.1	12.9	11.6	11.6	**62.0**
Difference	**1.5**	**-0.1**	**0.7**	**2.1**	**2.2**	**6.4**

1.5.2 Current regulatory period AMI capital expenditure

We were underfunded in the current regulatory period for capital expenditure relative to the allowance we would have received if the AER had known the actual number of meters we would be required to install over the period. This is due to the Victorian Government deferring meter competition, which was scheduled to commence 1 December 2017. Consequently, JEN had to fund the capital expenditure for AMI meters for new connections until the end of December 2020.

Table 1–2 shows we expect to spend within our allowance over the entire period by $0.6M.

Table 1–2: Actual capital expenditure compared against allowance ($ June 2021, millions)

AMI capital expenditure	CY16	CY17	CY18	CY19	CY20	Total
Allowed capital expenditure	3.3	2.9	1.0	1.1	4.4	**12.6**
Actual capital expenditure	1.5	0.4	3.3	3.8	3.0	**12.0**
Difference	**1.8**	**2.5**	**-2.3**	**-2.7**	**1.4**	**0.6**

AMI transition charges

The AMI transition charges—set out in the Victorian Government's AMI OIC—required the AER to make an AMI transition charges determination.[14] The AMI transition charge provides an approved amount of pricing true-up for differences between a distributor's recoverable AMI costs and the revenues it has received up to 31 December 2015. These charges were to follow on after the completion of the AMI rollout period, which ran from 1 January 2009 to 31 December 2015.

In December 2016, the AER made a final decision on our AMI transition charges application. The AER determined that JEN return an amount $7.67M (real 2018 dollars) to customers over the CY18-CY20 period, which lowered customers' metering bills by $22.53M (real 2018 dollars) over the three years.

[14] *Victorian Advanced Metering Infrastructure Cost Recovery Order In Council*. Since the Order was initially made, it has been amended several times. This final decision applies the latest version of the Order made 15 June 2016.

2. Revenue requirement for smart metering services

JEN proposes to apply a revenue cap form of control to annual metering charges consistent with the approach outlined in the final Framework and Approach (**F&A**)[15]. Under this form of control, our smart metering revenues are capped each year of the next regulatory period. Under the revenue cap, our annual metering charge revenue is adjusted to true-up any under or over recovery of actual revenue collected relative to a forecast.

The revenue cap pricing formula we propose to apply is consistent with the formula set out in the final F&A[16] for smart metering services. We outline the formula in Attachment 07-07.

To forecast our annual revenue requirements for the provision of smart metering services for each regulatory year of the next regulatory period, we used the Post-Tax Revenue Model (**PTRM**).

2.1 How we determine the annual requirements for smart metering services

We use a building block approach to determine our annual revenue requirements (**ARR**) for the provision of smart metering services. Our proposed ARR is the sum of:

- return on capital (also known as the return on assets), which represents the benchmark financing costs of investing in our AMI comprising of smart meters, the communication network and related IT systems. The return on capital for a given year is calculated by multiplying the rate of return by our forecast metering asset base (**MAB**) at the start of that year
- regulatory depreciation (also known as the return of capital), which represents the payback of our investment on our metering system
- operating expenditure allowance, which represents the estimated prudent and efficient costs of operating and maintaining our metering system
- corporate income tax allowance, which represents the estimated cost of corporate income tax for a benchmark firm providing electricity distribution services.

Table 2–1 details our unsmoothed and smoothed ARR for the next regulatory period. We prepared this forecast using the metering PTRM, which is included in Attachment 07-24.

[15] AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, pp. 89–93.

[16] AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, pp. 89–93.

Table 2–1: Annual revenue requirements for smart metering services ($ June 2021, millions)

	FY22	FY23	FY24	FY25	FY26	Total
Return on capital	2.8	2.6	2.3	2.0	1.7	**11.4**
Regulatory depreciation	7.1	7.7	8.1	8.5	9.3	**40.8**
Operating expenditure (including debt raising costs)	12.3	12.5	12.8	13.0	13.3	**63.9**
Revenue adjustments	-	-	-	-	-	**-**
Cost of corporate income tax	0.7	0.6	0.7	0.8	0.8	**3.5**
Annual revenue requirements (unsmoothed)	22.8	23.4	23.9	24.3	25.1	**119.6**
Annual revenue requirements (smoothed)	**23.9**	**23.9**	**23.9**	**23.9**	**23.9**	**119.5**

Source: Attachment 07-24 ACS Metering PTRM FY22-26.

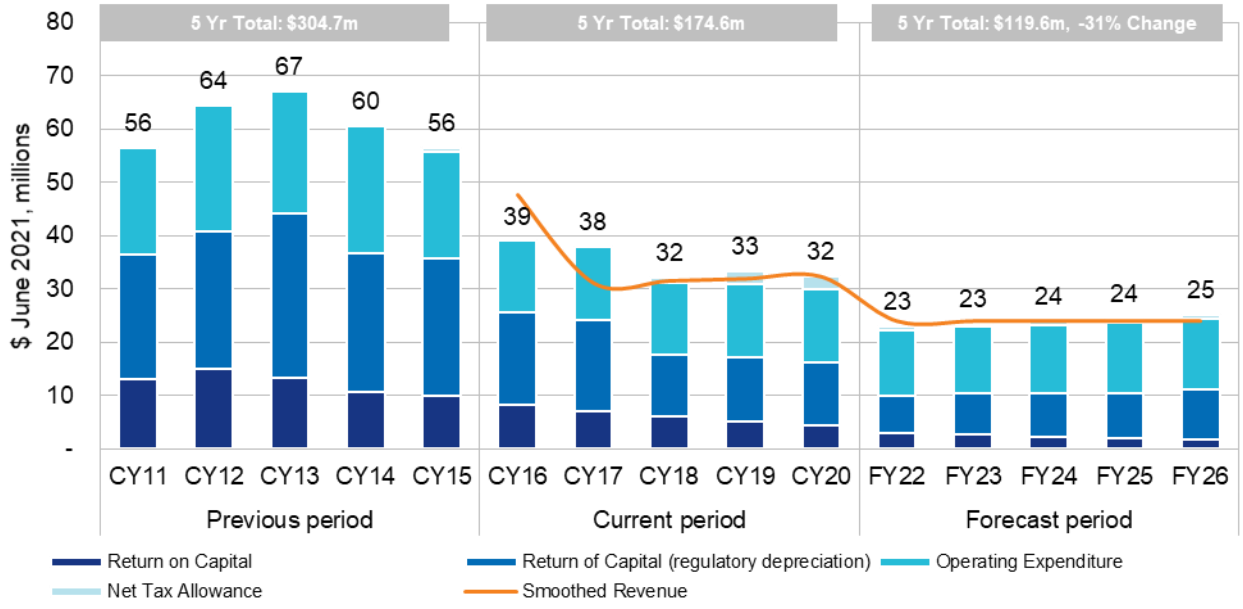
Figure 2–1 shows our revenue requirements for each period and the trend in our metering revenue over our the 2011-15 regulatory period (**previous regulatory period**), current regulatory period and next regulatory period. This figure shows that there has been a steady decrease in our metering revenue over the three regulatory periods, and illustrates the drivers of this.

Our proposed revenue requirement for the current regulatory period is significantly lower than in the previous period due to:

- lower operating expenditure as the meters are remotely read (instead of manually) and minimal periodic inspection and testing was required as 98 per cent of meters were still new
- lower return on capital and depreciation as the metering asset base becomes smaller.

The forecast revenue requirement for the next regulatory period is lower than the current regulatory period—again due to lower return on capital and depreciation as assets in our MAB continue to depreciate.

Figure 2–1: Trend in metering revenue over time ($ June 2021, millions)



Below we discuss each revenue building block which contributes to our ARR.

2.2 Return on capital

The forecast return on capital represents the cost of financing our investments in AMI, and it varies with the rate of return and the size of our MAB. To determine the forecast return on capital building block, we adopted the same approach as for rate of return for our Standard Control Services (**SCS**), which is described in Attachment 07-02. The return on capital shown in Table 2–1 will be updated each year annually to reflect changes in return on debt.

2.3 Regulatory depreciation

Depreciation represents the use or consumption of an asset over its service life. Including regulatory depreciation in our metering annual revenue requirement enables us to recover our investment in AMI over time in accordance with the economic lives of the assets. This approach allows us to fund the purchase of new and replacement assets so that we can continue to provide our metering services in the future.

For the MAB, the F&A considers actual depreciation—that is based on actual capital expenditure—is the most appropriate approach for rolling forward the MAB to the commencement of the 2026-31 regulatory control period.[17]

The AER's approach in the PTRM for the calculation of regulatory depreciation for the current regulatory period is to apply the straight-line depreciation.[18] It involves using the forecast indexation on the MAB and then dividing the amount by the weighted average remaining asset lives.

We have maintained the same asset classes for the next regulatory period as used in the current regulatory period, except for incorporating the recommendations of the AER in its regulatory tax review final decision.[19] Specifically, we have added two asset classes for inhouse software and buildings. We have estimated the economics lives for inhouse software and buildings in accordance with the standard lives applied to those same categories in recent AER draft decisions.[20]

As per the AER's preference, the standard asset life for equity raising costs is calculated for each regulatory period based on the weighted average life associated with the forecast capital expenditure profile. Table 2–2 shows the current and proposed standard lives.

Table 2–2: Current and proposed standard lives (years)

MAB Asset Class	Standard Life – Current Period	Standard Life – Next Period
Accumulation Meters	n/a	n/a
Manually read interval meters	n/a	n/a
Remotely read interval meters & transformers	15.0	15.0
IT	7.0	7.0
Communications	7.0	7.0
Other	7.0	7.0
In-house software (Standard life tax Depreciation)	n/a	5.0
Buildings (Standard life tax Deprecation)	n/a	40.0
Equity raising costs	12.6	11.2

17 AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, p 93.

18 AER, *Final Decision Jemena – PTRM Metering & Exit fees – May 2016.*

19 AER, *Final report – Review of Regulatory Tax Approach*, 17 December 2018.

20 AER, *SA Power Networks 2020-25 Draft Decision, Attachment 4 – Regulatory Depreciation*, October 2019; AER, *Ergon Energy 2020-25 Draft Decision, Attachment 4 – Regulatory Depreciation*, October 2019; AER, *Energex 2020-25 Draft Decision, Attachment 4 – Regulatory Depreciation*, October 2019.

Our AMI depreciation for the next regulatory period, which is shown in Table 2–1 is the sum of the depreciation on:

- existing assets in our opening MAB at the start of the regulatory control period based on their remaining asset lives
- forecast capital expenditure over the regulatory control period based on their standard asset lives.

2.4 Forecast operating expenditure

Forecast metering operating expenditure reflects the costs we expect to incur in operating and maintaining our metering and related information systems and administering our metering obligations in accordance with regulatory requirements for the provision of regulated smart metering services.

We have forecast the operating expenditure that we would incur in the next regulatory period to:

- maintain our existing smart metering installations—expenditure related to alteration, testing, and refurbishment
- operate and maintain our AMI communication network and information systems—expenditure associated with metering data services that involve the collection, processing, storage and delivery of metering data to the NEM in accordance with our regulatory obligations
- meet our market and regulatory obligations.

2.4.1 Operating expenditure forecasting methods

We used two methods to develop our forecast operating expenditure, which are:

1. The base, step and trend method[21] for operation and maintenance of smart meters, AMI communication network, and operating the related information technology.[22] This method uses a base year that reflects efficient and recurrent operating expenditure and adjusts this to account for future changes in our circumstances and operating environment (changes in output and other cost inputs) over the next regulatory period. To forecast the AMI operating expenditure for the next regulatory period, we:
    a) propose CY19 as the base year since it is based on our latest forecast and excludes any impact of our transformation program. In the revised proposal, we will use the audited AMI operating expenditure in CY19, which will form the basis for our forecast operating expenditure over the next regulatory period.[23]
    b) establish our efficient base year operating expenditure by adjusting the operating expenditure for forecast inflation.
    c) trend the adjusted base year costs forward by escalating or de-escalating the forecast to reflect changes in key cost inputs including, real price growth and output growth.
        i) for price growth—we applied the benchmark labour proportion of 59.7 per cent of total operating expenditure consistent with standard control service operating expenditure. The labour escalator we applied to labour reflects the average of forecasts by BIS Oxford Economics and Deloitte Access

[21] This is the AER's preferred method of forecasting operating expenditure. For example, see AER, *Better Regulation, Explanatory Statement Expenditure Forecast Assessment Guideline*, November 2013, section 5.3.1 and AER, *Access arrangement final decision, Envestra Ltd 2013–17, Part 1*, March 2013, chapter 7.

[22] AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, p. 91.

[23] The election of CY19 as the base year for smart metering services is different to the approach we are adopting for SCS. In the case of SCS we are adopting CY18 as the operating expenditure base year because the transformation program operating expenditure that occurred in 2019 did not apply to smart metering services, and therefore it is still appropriate to select the penultimate year of the current regulatory period to be the operating expenditure base year for smart metering services. See Attachment 06-01 for a more detailed explanation selecting the SCS operating expenditure base year.

Economics of wage-price indices for the utilities sector. A report from BIS Oxford Economics explaining their forecast is provided as Attachment 05-07 to our regulatory proposal.

ii) for output growth—we scaled the AMI operating expenditure based on customer numbers because it is the best measure of changes in metering service output and thus a driver of operating expenditure costs.

d) did not include any productivity improvement

e) did not include any step changes in operating expenditure not captured by the base year expenditure or trend escalation, to reflect other expected events or programs over the next regulatory period, such as changes to regulatory obligations, or our operating environment.

2. We use specific year-on-year method for debt raising costs where the use of the 'base, step and trend' method is not representative of future costs. We estimated the incremental forecast costs for each year of the next regulatory period within the PTRM using the benchmark debt raising cost.[24]

Table 2–3 summarises our forecast operating expenditure for smart metering services over the next regulatory period. The calculations of these costs are detailed in the metering operating expenditure model, Attachment 07-26.

Table 2–3: Forecast operating expenditure for metering services ($ June 2021, millions)

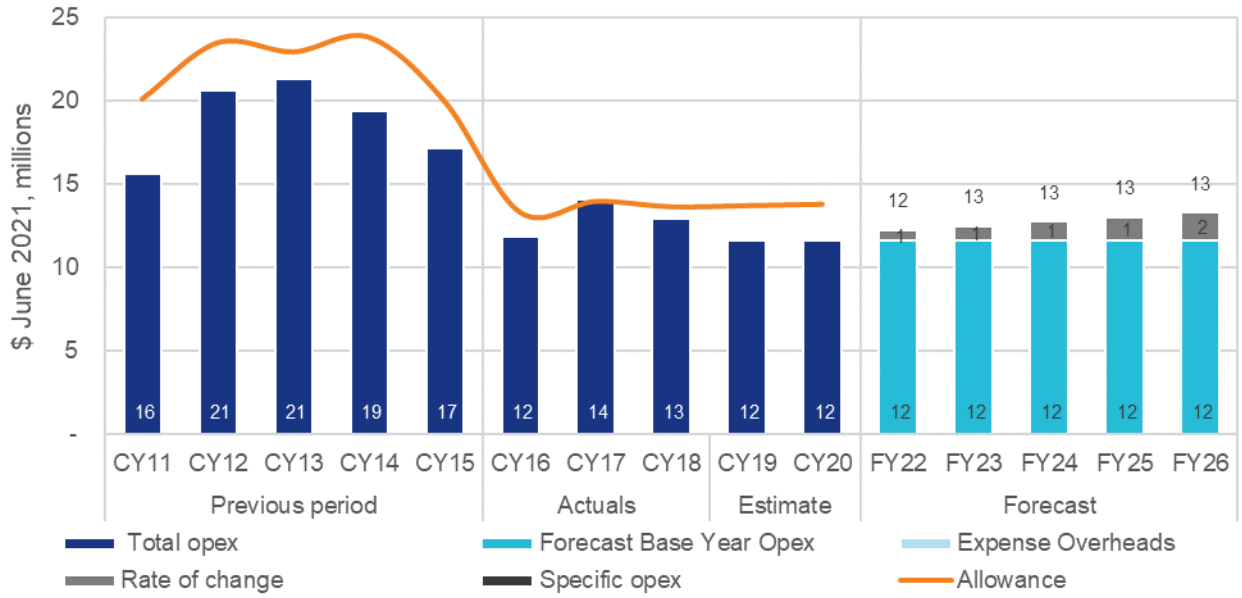
Metering services operating expenditure	FY22	FY23	FY24	FY25	FY26	Total
Base year total operating expenditure (excluding debt raising costs)	11.6	11.6	11.6	11.6	11.6	**57.9**
Price growth	0.2	0.2	0.3	0.4	0.5	**1.6**
Output growth	0.5	0.7	0.8	1.0	1.2	**4.2**
Productivity growth	0.0	0.0	0.0	0.0	0.0	**0.0**
Step changes	0.0	0.0	0.0	0.0	0.0	**0.0**
Debt raising costs	0.0	0.0	0.0	0.0	0.0	**0.1**
Operating expenditure (including debt raising costs)	**12.3**	**12.5**	**12.8**	**13.0**	**13.3**	**63.9**

Source: Attachment 07-26.

The figure below shows the metering operating expenditure trend over three regulatory periods.

[24] See Attachment 06-03.

Figure 2–2: Trend in metering operating expenditure 2011 and 2026 ($ June 2021, millions)



2.5 Cost of corporate income tax

Our proposed approach to the calculation of corporate income tax allowance for smart metering services is the same as that for SCS and takes into account the AER's tax review final decision.[25] The corporate income tax allowance for smart metering services is calculated using four components:

- pre-tax revenues – any factor that changes our revenues will change these pre-tax revenues
- tax expenses, including tax depreciation, interest and operating expenditure
- the statutory corporate tax rate, which is set at 30 per cent
- gamma, which is the expected proportion of company tax that is returned to investors through the utilisation of imputation credits.

Net taxable income is derived from pre-tax revenues less tax expenses. Applying the statutory corporate tax rate to net taxable income leads to forecast tax payable. The forecast tax costs are then adjusted to remove the estimated value of imputation credits (gamma) created by paying tax to set the allowance for corporate income tax.

We have forecast our corporate income tax allowance using the AER's PTRM. Table 2–4 details the calculation of our estimated corporate income tax.

[25] AER, *Final report – Review of Regulatory Tax Approach*, 17 December 2018.

Table 2–4: Estimated corporate income tax ($ June 2021, millions)

Corporate income tax	FY22	FY23	FY24	FY25	FY26	Total
Tax payable	1.6	1.4	1.7	1.9	2.0	**8.5**
Less value of imputation credits	-0.9	-0.8	-1.0	-1.1	-1.1	**-5.0**
Estimated corporate income tax	**0.7**	**0.6**	**0.7**	**0.8**	**0.8**	**3.5**

Source: Attachment 07-24.

3. Metering asset base

The value of the AMI asset base we use in providing our smart metering services is known as the metering asset base (**MAB**). The MAB represents the as yet unrecovered capital expenditure that we have incurred to provide smart metering services to our customers consuming less than 160 MWh per annum.[26] Our MAB changes from year to year by:

- adding indexation
- adding metering capital expenditure
- deducting straight-line depreciation
- deducting proceeds from asset disposals.

The MAB is used to calculate two elements of our ARR for the provision of smart metering services, these are:

- return on capital—this is calculated by multiplying the opening MAB and the rate of return for a given year. It reflects the financing costs on our investments in the MAB
- regulatory depreciation—this reflects the payback of our investments in the MAB.

The MAB is also used to determine the debt raising cost allowance in the forecast operating expenditure forecast.

3.1 Opening metering asset base as at 1 July 2021

We have used the AER's Roll-Forward Model (**RFM**)[27] to roll-forward our MAB for smart metering services of our current regulatory period and the intervening period. This approach to rolling forward the MAB is consistent with the approach used by the AER in its decision for this service in the previous regulatory period and consistent with the approach taken within SCS to accommodate the intervening period.

Table 3–1 details the outcomes of our MAB roll-forward calculation.

Table 3–1: Opening MAB as at 1 July 2021 ($ June 2021, millions)

	CY16	CY17	CY18	CY19	CY20	HY21	FY22
Opening MAB	125.6	108.4	90.1	79.2	70.7	62.5	
plus capital expenditure	1.5	0.4	3.3	3.9	3.0	2.2	
less straight-line depreciation	-18.7	-18.8	-14.2	-12.5	-11.1	-4.4	
Closing MAB	108.4	90.1	79.2	70.7	62.5	60.3	
Opening MAB as at 1 July 2021							**60.3**

Source: *Attachment 07-25 Metering RFM CY16-HY21*.

[26] AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*, p. 45.

[27] See Attachment 07-01, section 1.1 of this regulatory proposal for details on the guidance we received from the AER relating to intervening period and the models we adopted correspondingly on both SCS and ACS Metering

Below we provide a brief explanation of the components in Table 3–1:[28]

- The opening value of the MAB for 2016 is based on the closing 2015 value from the AER's final decision on the AMI transition charges application. We take this approach because the true-up in the estimate MAB at the end of 2015 is resolved through the AER's transition charges decision[29]
- The forecast closing MAB on 30 June 2021 is our forecast opening MAB on 1 July 2021, which is $60.3M[30]
- The indexation is based on actual inflation, except for the intervening period where forecast inflation is used
- The capital expenditure used in the roll forward model is our actual for CY16 to CY18 and our forecast for CY19, CY20, and the intervening period to which we add financing costs. In our revised regulatory proposal, we will replace our forecast capital expenditure for CY19 with our actual CY19 capital expenditure
- The straight-line depreciation is based on our actual capital expenditure in the current regulatory period.

In the current regulatory period, we expect to underspend the AER's metering capital expenditure allowance despite the fact that we were underfunded due to the Victorian Government deferring meter competition, which was scheduled to commence on 1 December 2017.

3.2 Forecast MAB in the next regulatory period

We have taken the opening MAB as at 1 July 2021 and rolled it forward for each regulatory year of the next regulatory period using the AER's PTRM. This approach involves:

- adding forecast indexation
- adding forecast capital expenditure
- depreciation
- deducting proceeds from asset disposals.[31]

Table 3–2 details the calculation of our forecast opening and closing MAB for the next regulatory period.

Table 3–2: Forecast MAB ($ June 2021, millions)

	FY22	FY23	FY24	FY25	FY26
Opening MAB	60.3	58.2	53.7	48.2	44.5
Inflation on opening MAB	1.4	1.4	1.3	1.1	1.1
plus capital expenditure	5.1	3.6	3.3	5.6	5.8
less straight-line depreciation	-8.7	-9.5	-10.0	-10.5	-11.5
Closing RAB	**58.2**	**53.7**	**48.2**	**44.5**	**39.9**

Source: *Attachment 07-24*.

28 Details of the MAB amounts can be found in Attachment 07-25.

29 AER, *Final Decision, Advanced metering infrastructure, Transition Charges Applications*, December 2016.

30 See Attachment 07-25.

31 JEN does not have any proceeds from the disposal of meters.

4. Our smart metering capital expenditure

Metering capital expenditure relates to augmentation and replacement of JEN's AMI assets. AMI assets comprise of meters, a proprietary communication network which includes a head-end network management system (**NMS**) and related back-end IT systems.

Key drivers of smart metering services capital expenditure

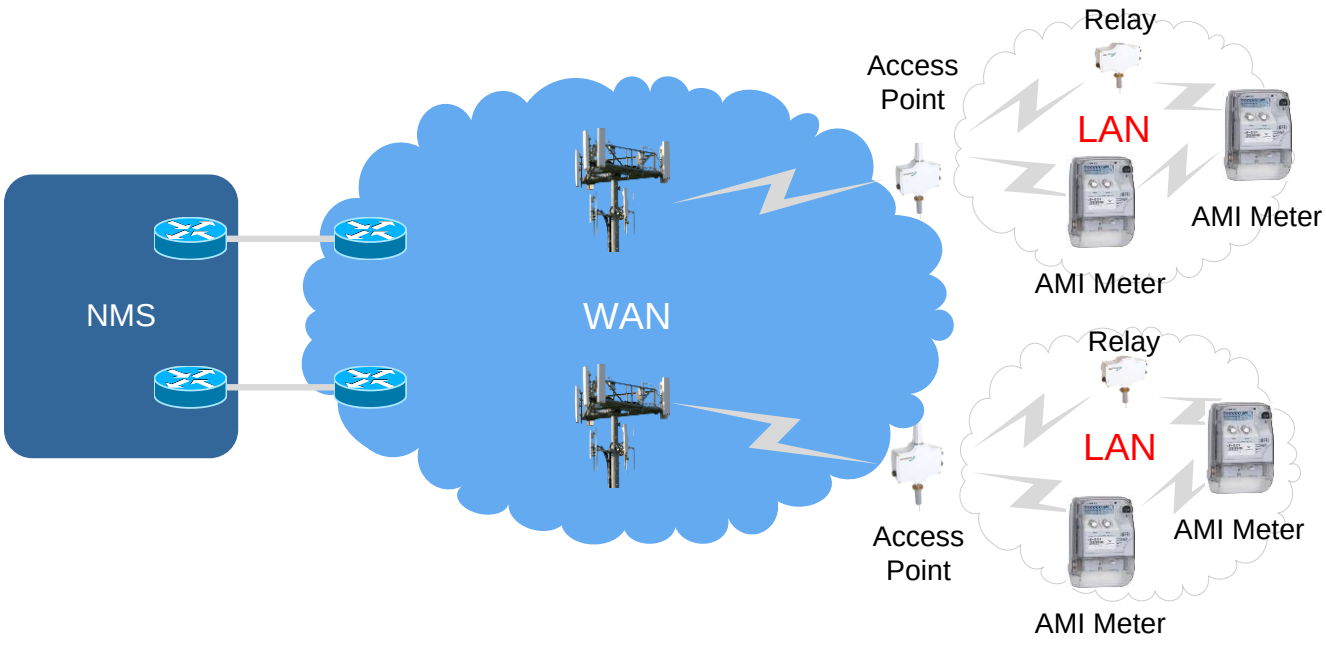
The key drivers of smart metering services capital expenditure are new residential and small business connections, the age profile of existing metering assets, including AMI communication network, up-keep of the NMS and regulatory changes. We describe these drivers in detail in section 4.2.

An overview of the AMI communication network

Figure 4–1 shows the various components that make up the AMI communication network.

The AMI communication network comprises equipment including access points, relays and antennas, which collects meter data from the meters and send it the NMS. The NMS supervises the meter communications network and ensures the data collection meets the service levels defined in the Victorian AMI service level specification.[32]

Figure 4–1: AMI communication network



4.1 How we forecast metering capital expenditure needs

AMI meters and current transformers

To forecast the capital expenditure for AMI meters, we first forecast the gross meter volumes we require for the next regulatory period by applying the historical trends of supply abolishment to ACIL Allen Consulting's forecast

[32] *Victorian Minimum Advanced Metering Infrastructure (AMI) Functionality Specification* v1.2; and *Victorian Minimum AMI Service Levels Specification.*

customer growth rate.[33] We then adjust the forecast gross meter volumes for alterations (meter exchange), replacements and meters refurbished or written-off. These volumes are then multiplied by the unit cost of AMI meter, which was established through JEN's competitive tender process in 2018.

AMI communication network

The capital expenditure forecast for the AMI communication network is based on the forecast volumes of communication components required to meet the growth of new customer connections, technical obsolescence,[34] replacement communication equipment as they approach the end of their technical life and anticipated equipment failures.

For each replacement communication equipment type we adopt a different approach to end-of-life management to maximise the economic value:

- access points and relays are replaced at the end of their technical life
- batteries have a five-year life and are run to failure.

We multiply the forecast volumes of the communication network components by unit rates which are based on the prices of the components procured from Itron and the labour cost of our internal workforce.

Lifecycle and upgrade of NMS

We have assigned 100 per cent of the capital expenditure for the lifecycle management of the NMS to our smart metering services expenditure forecast, including meter firmware releases, communications firmware release, as well as ongoing investment in the technology test lab to support production, development and testing of metering technology environments.

Our smart metering services capital expenditure forecast also includes a portion of the capital expenditure to upgrade the NMS so that it is capable of collecting five-minute interval meter data for settlement in the NEM.[35] The capital expenditure for the upgrade of NMS relative to other AMI capital expenditures is shown in Table 4–1 and Table 4–3.

Equity raising costs

Equity raising costs are calculated using the AER's PTRM model once all inputs have been included. Network overheads and corporate overheads are assumed to be zero for ACS metering next period for two reasons. From 1 January 2021, capitalised corporate overheads will be expensed in line with the Cost Allocation Methodology[36] approved by the AER in May 2019.[37] ACS metering activities do not attract network overheads.

Table 4–1 sets out our proposed forecast smart metering services capital expenditure for the next regulatory period. It represents the prudent and efficient costs required to provide ongoing smart metering services to our customers.

33 See Attachment 05-03

34 Our telecommunication carrier service provider has advised JEN that their 3G network will be progressively retired during the next regulatory period.

35 AEMC, *National Electricity Amendment (Five Minute Settlement) Rule 2017*, 28 November 2017.

36 JEN, *Cost Allocation Methodology*, 29 March, 2019.

37 AER, *Final Decision, Jemena Electricity Networks (Vic) Ltd Revised Cost Allocation*, May 2019.

Table 4–1: Smart metering services capital expenditure ($ June 2021, millions)

Smart metering services capital expenditure	FY22	FY23	FY24	FY25	FY26	Total
AMI meters and current transformers	2.5	2.5	2.5	2.5	2.6	**12.5**
AMI communications network	1.3	0.9	0.5	0.5	0.5	**3.7**
Lifecycle management of NMS (1)	0.0	0.0	0.0	2.0	2.0	**4.1**
Upgrade of the NMS to meet five-minute settlement requirements (2)	1.0	0.0	0.0	0.0	0.0	**1.0**
Equity raising costs	0.2	0.0	0.0	0.0	0.0	**0.2**
Network overheads	0.0	0.0	0.0	0.0	0.0	0.0
Total metering capital expenditure	**5.0**	**3.4**	**3.0**	**5.1**	**5.1**	**21.5**

Source: Attachment 05-11 and Attachment 07-24.

(1) Refer to Table 4–3 below

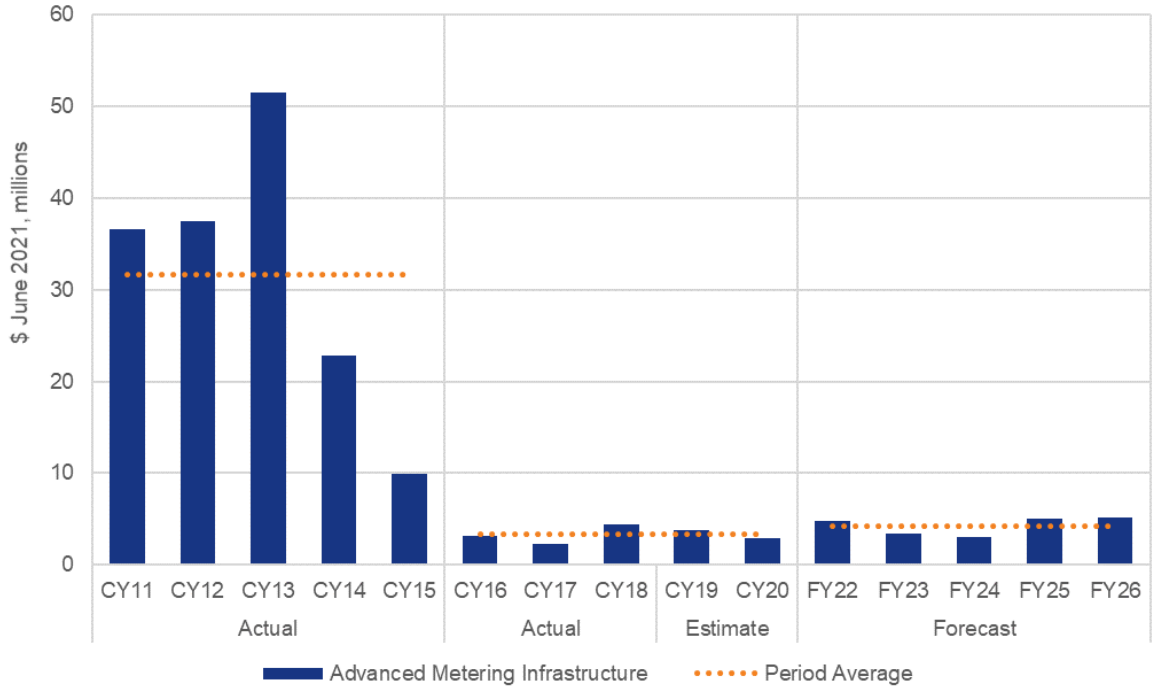
(2) Refer to Table 4–4 below.

Figure 4–2 shows the actual and forecast metering capital expenditure over the previous, current and next regulatory period. The reasons for the variations between periods are due to:

- The very high capital expenditure in the previous regulatory period was due to the rollout of the AMI, which we completed in 2015
- The capital expenditure in the current regulatory period is very low compared to the previous regulatory period because the communication network and related IT systems were newly installed in the previous regulatory period and being relatively new, did not need a lot of investment. The relatively small capital expenditure for the current regulatory period is mostly attributed to activities driven by new connections[38]
- The forecast capital expenditure for the next regulatory period is higher compared to the current period due to the conversion of 3G access points to 4G, NMS lifecycle management, and upgrade of the NMS for collecting five-minute interval meter data.

[38] Customers do not pay for the capital cost of smart meters when new connections are installed. The capital cost of meters (including current transformers) are recovered through the smart metering charge.

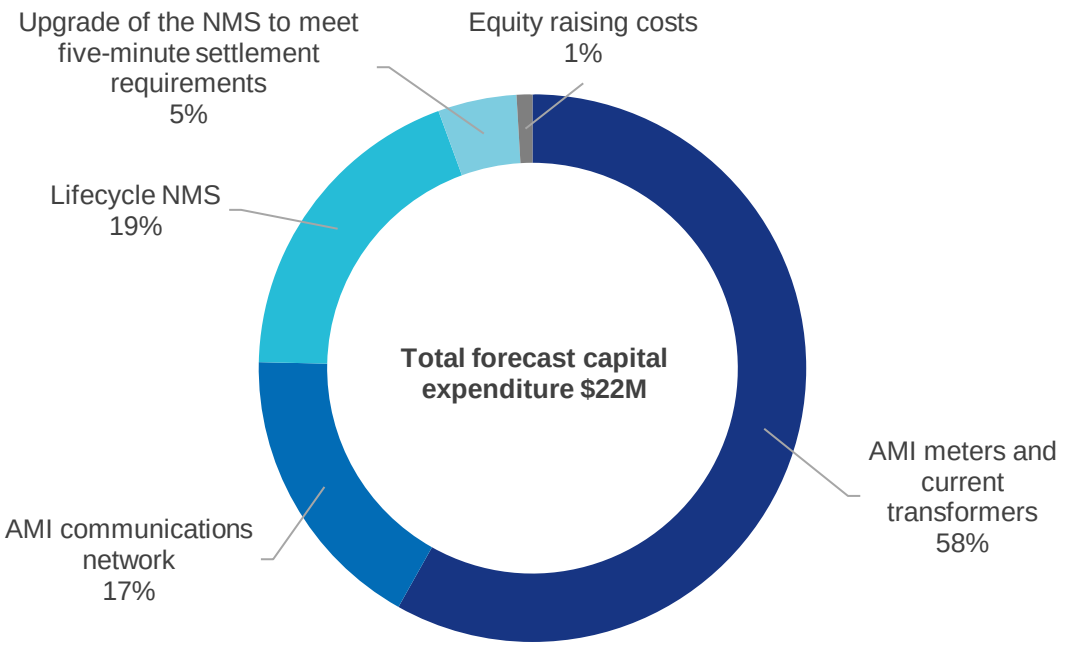
Figure 4–2: Advanced metering infrastructure capital expenditure ($ June 2021, millions)



4.2 Key drivers of smart metering capital expenditure

Figure 4–3 shows the percentage of the various capital expenditure components that comprise smart metering services capital expenditure.

Figure 4–3: Percent of capital expenditure by category



4.2.1 Meter purchase

The purchase of new meters for new residential and small business connections[39] is the primary driver of our smart metering services capital expenditure.

The volume of new meters is lower than the number of new connections because meters removed from the operation are often reused for new connections, following refurbishment. The reuse of meters only takes place when the residual value of a meter[40] is assessed to be higher than the cost of the meter refurbishment.

Based on the current contracted prices for meters and refurbishment:

- single-phase AMI meters removed from operation with a life of more than five years are not redeployed
- multi-phase AMI meters removed from operation with a life of more than eight years are not redeployed.

4.2.2 Meter lifecycle replacement

The state-wide smart-meter rollout in Victoria over the previous regulatory period renewed the majority (~98 per cent) of legacy accumulation and interval meters. Since most of the smart meters were deployed around 2011-2013 and are still within the 15 years of their technical life, we do not expect that AMI meter family end-of-life failures will occur during the next regulatory period. Therefore, we have not forecast any meter lifecycle expenditure.

39 Connection supplying customers who use less than 160 MWh per annum.

40 Estimated by straight-line depreciation.

JEN implements a condition-based asset replacement approach, where meters are replaced only when their performances deteriorate beyond the standards defined in the NER and AEMO metrology procedures; we consider this to be the "technical life". This approach is optimal because it minimises asset investment while meeting NER requirements.

As part of this approach, meters are tested and inspected in accordance with NER requirements. We expect some meters to be replaced, but they will be limited to random failures caused by premature meter component failure, network fault or environmental influence such as water ingress.

4.2.3 Augmentation of AMI communication network

Augmentation of the AMI communication network includes additions of antennas, relays, access points and dedicated poles to which the AMI communication components are attached.

We have forecast capital expenditure for the augmentation of our AMI communication network to support the forecast growth of new connections over the next regulatory period. Another driver for the augmentation is the amendments to the NER requiring metering coordinators to collect and deliver five-minute interval meter data for NEM settlement.[41]

4.2.4 AMI communication network lifecycle replacement

AMI communication network equipment requires periodic lifecycle renewal of batteries in the access points and relay equipment to ensure capacity, performance and reliability are maintained during the next regulatory period. Our lifecycle forecasts allow for risk-based replacements of AMI assets through the period.

We have forecast capital expenditure to replace the 3G access points with 4G because our telecommunication carrier service provider has advised JEN that their 3G network will be progressively retired during the next regulatory period. Consequently, we have planned for the replacement of the access points in 2021 and 2022. Table 4–1 shows the corresponding higher capital expenditure for this activity.

An access point or relay uses batteries so they can continue to operate during a power outage. These batteries have a service life of five years but are only replaced on failure, which is more cost-effective than batch replacement at the end of their service life. Accordingly, we have forecast replacement of battery packs in the access points and relays.

Details of the AMI communication network capital expenditure are set out in Table 4–2.

Table 4–2: AMI communication system capital expenditure (un-escalated) ($ June 2021, millions)

AMI communication network capital expenditure	FY22	FY23	FY24	FY25	FY26	Total
Antenna	0.0	0.0	0.0	0.0	0.0	**0.1**
Dedicated Poles	0.2	0.2	0.2	0.2	0.2	**1.1**
Access Points	0.7	0.5	0.2	0.2	0.2	**1.7**
Relays	0.0	0.0	0.0	0.0	0.0	**0.1**
Battery Packs	0.1	0.1	0.1	0.1	0.1	**0.4**
Project management – AP replacement from 3G to 4G	0.2	0.1	0.0	0.0	0.0	**0.2**
Total AMI network management system capital expenditure (un-escalated)	**1.3**	**0.9**	**0.5**	**0.5**	**0.5**	**3.7**

Source: Attachment 07-34.

[41] The five-minute rule change came into force in December 2018.

One hundred per cent of the capital expenditure for the lifecycle management of the NMS is allocated to smart metering services.

4.2.5 Network management system upgrade

In November 2017, the AEMC made a final rule to change the settlement period for the electricity spot price from thirty minutes to five minutes, aligning operational dispatch and financial settlement at five-minute intervals. The change takes place in stages and starts in 2021.[42] In addition to this change, in December 2018, the AEMC made a final rule that requires a move from a boundary load settlement to a global settlement framework for the demand side of the wholesale electricity market.[43]

To ensure we comply with these new requirements, we must make changes to our IT systems and associated business processes which relate to the provision of data to the wholesale electricity market for settlement. Given their similar context, and to ensure we comply with these new obligations as efficiently as possible, we are progressing changes for both the Five Minute Settlement and Global Settlement as a single project.

Broadly, our systems must be modified or augmented to provide them with the ability to process and interpret five-minute interval data, provide an uplift in infrastructure capacity to send and receive an increased number of transactions, and increased data storage and AMI network capacity. This change will ensure JEN can provide and manage five-minute data no earlier than 1 July 2021 and no later than 1 December 2022.[44] It also ensures JEN can bill on receipt of five-minute meter data from Type 1, 2, 3 and wholesale 4 meters, as well as generate and publish Type 7 meter data in five-minute intervals from 1 July 2021.

We are using a multi-stage delivery approach to implement the five-minute settlement obligations to minimise delivery risk and the cost of implementation.

- In 2018, JEN completed a competitive tender process to select a high quality and cost-effective technology provider. As part of this process, we tested and proved our AMI meters are capable of meeting the five-minute settlement requirements.
- In 2019, JEN actively participated in industry working groups and provided input through discussions and our response to AEMO consultation papers to finalise and publish the new B2B and MSATS Metrology procedures for five-minute settlement.
- Throughout 2020 and through to 2022, JEN will execute a significant IT upgrade of the meter management systems, including the NMS to ensure operational, functional and system readiness for five-minute settlements. This includes the ability to process and interpret five-minute interval data, an uplift in infrastructure capacity to send and receive an increased number of transactions, increase of data storage and AMI network capacity. For further details on the IT upgrade, see the *Business Case – 5-Minute Settlement Market Rule* in our RIN Response.

A portion of the IT capital expenditure for the upgrade of the IT systems including the upgrade of the NMS is allocated to ACS and the balance to SCS based on what capital expenditure we would prudently spend on our SCS IT systems if we were not performing a metering coordinator role (refer to *Business Case – 5-Minute Settlement Market Rule* for the cost allocations).[45]

[42] AEMC, *National Electricity Amendment (Five Minute Settlement) Rule 2017*, 28 November 2017.

[43] AEMC, *Rule determination, national electricity amendment (global settlement and market reconciliation) rule 2018*, 6 December 2018.

[44] NER cl. 11.103.5.

[45] Attachment 05-01 describes JEN's forecast SCS capital expenditure for the next regulatory period.

Table 4–3 shows the capital expenditure for the upgrade of the NMS relative to other IT projects related to the Five Minute Settlement and Global Settlement rule changes.

Table 4–3: NMS Five-Minute Settlement and Global Settlement IT projects ($ June 2021, millions)

Project name	Project ID	FY22	FY23	FY24	FY25	FY26
5-Minute Meter Reading & Global Settlement Phase 3	ITEH01	0.6	0.0	0.0	0.0	0.0
5-Minute Meter Reading & Global Settlement Phase 4	ITEH06	0.4	0.0	0.0	0.0	0.0
Total		**1.0**	**0.0**	**0.0**	**0.0**	**0.0**

4.2.6 Lifecycle management of network management systems

The stability of our metering systems is fundamental in allowing us to continue delivering safe and efficient metering services to customers, from knowing what to bill customers to provide insights on their electricity usage.

JEN collects meter data from AMI meters via the AMI communication network, and the data enters our back-end IT system via the UIQ SilverSprings head-end product known as NMS. We then use a suite of Itron products—collectively called the Meter Data Management systems—to validate the metering data in accordance with AEMO's metrology procedures and deliver it to the NEM. The meter data management systems pass the data on to SAP IS-U to process the data for billing of network charges. These systems, including the NMS, all have a finite expected useful life and will eventually require upgrading, in line with the roadmap for the system, to ensure they can continue to provide services as expected by our customers.

JEN's IT applications are subject to regular review to assess whether they remain fit for purpose as evaluated against a range of criteria including performance, security, cost-effectiveness, serviceability, end-of-life timeframes and overall risk. Our reviews indicate elements of these systems are reaching an unacceptable level of support risk at various times during the next regulatory period. We also make decisions to replace these systems by taking into account the optimum time for an upgrade or replacement based on historical performance and serviceability of the components and interdependent systems and processes.[46]

Table 4–4 shows the capital expenditure for the cycle management of NMS.

Table 4–4: Lifecycle management of NMS ($ June 2021, millions)

Project name	Project ID	FY22	FY23	FY24	FY25	FY26	Total
SSN UIQ Migration (New Itron Platform)	ITEF20	0.0	0.0	0.0	2.0	2.0	4.0
Total		**0.0**	**0.0**	**0.0**	**2.0**	**2.0**	**4.0**

[46] JEN's approach to making prudent and efficient IT investment decisions is described in our RIN Response -- *Technology Plan*.

5. Our AMI expenditure is efficient

Our incentives to minimise the cost base of our smart metering service are the strongest of all our incentives due to the persistent and credible threat of competition for the provision of these services.

On 26 November 2015, the AEMC made a final rule decision under its Power of Choice reforms to open up competition in smart metering services. As noted in section 1.3, we entered the current regulatory period expecting that from December 2017 we would need to provide our smart metering services in direct competition with retailers, metering providers and other network providers from across the country. That drove us to propose lower operating and capital expenditure than we had incurred previously and to strive to outperform the allowances, which we did.

We now enter the next regulatory period knowing that metering competition in Victoria is again being considered. Our preference is that when our customers can choose their smart metering service provider, they will choose us. For these reasons we have proposed our lowest smart metering operating expenditure to date and have minimised our capital expenditure through extensive market testing, and we will continue to provide our customers free access to their smart meter data through our AMI portal.

5.1 Capital expenditure

The key drivers of our metering capital expenditure are the procurement of AMI meters for new connections followed by augmentation and replacement activities our AMI communication network.

We believe our capital expenditure for procurement of AMI meters is efficient because:

- forecast of AMI meter volumes for new connections are based on ACIL Allen Consulting's forecast customer growth rate. The independence and expertise of ACIL Allen Consulting ensures transparency, robustness of our volume forecasts
- AMI meters are procured through open market tender processes
- meter installation costs for new connections and alterations are funded through relevant fixed-fee ACS charges and therefore not included in the shared AMI capital expenditure forecast
- meters removed can be reused for new connections after refurbishment when it is economically efficient to do so
- we have not made any forecast for life cycle replacement of the first tranche of meters coming to the end of their expected 15-year life in the next regulatory period.

Our forecast volume of access points required each year in the next regulatory period is mainly driven by 3G to 4G conversion and augmentation of our AMI communication network to accommodate the larger volume of meter data due to five-minute settlement rule—both of which are certain activities.

For the period up to the end of 2017, we were able to utilise existing power poles to attach access points and relays to support the AMI communication network in new residential and commercial subdivision developments built close to the periphery of our overhead distribution network. Since the access points and relays have limited radio frequency coverage and new subdivision developments—which are underground—are expanding further away from our overhead distribution network, we have been installing dedicated poles to attach the access points and relays.

We also anticipate that the five-minute settlement will be more pronounced in these areas due to newly installed meters having the capability of recording five-minute intervals.[47] This dynamic will result in larger volumes of data sent through the communication network and will require additional poles and access points. Installing an access point in an established subdivision is cost-intensive, involving standing of dedicated poles, excavation and

[47] Meters installed prior to 1 December 2018 are grandfathered from the five-minute interval data requirement.

reinstatement of road and footpath pavements for electricity supply to the access points and relays from nearby electricity service pits.

The cost of installing the NMS equipment is developed using a bottom-up cost build-up based on projects undertaken in 2018.[48]

Refer to our ACS Metering Capex model in Attachment 07-34 for details of the cost build-up calculations.

5.2 Operating expenditure

Table 5–1 shows that we are on course to efficiently lower our operating expenditure over the current period as we continue to learn more about operating the AMI system and data management, and find ways to maintain our metering service levels while lowering the costs that are passed onto our customers.

Table 5–1: Metering operating expenditure ($ June 2021, millions)

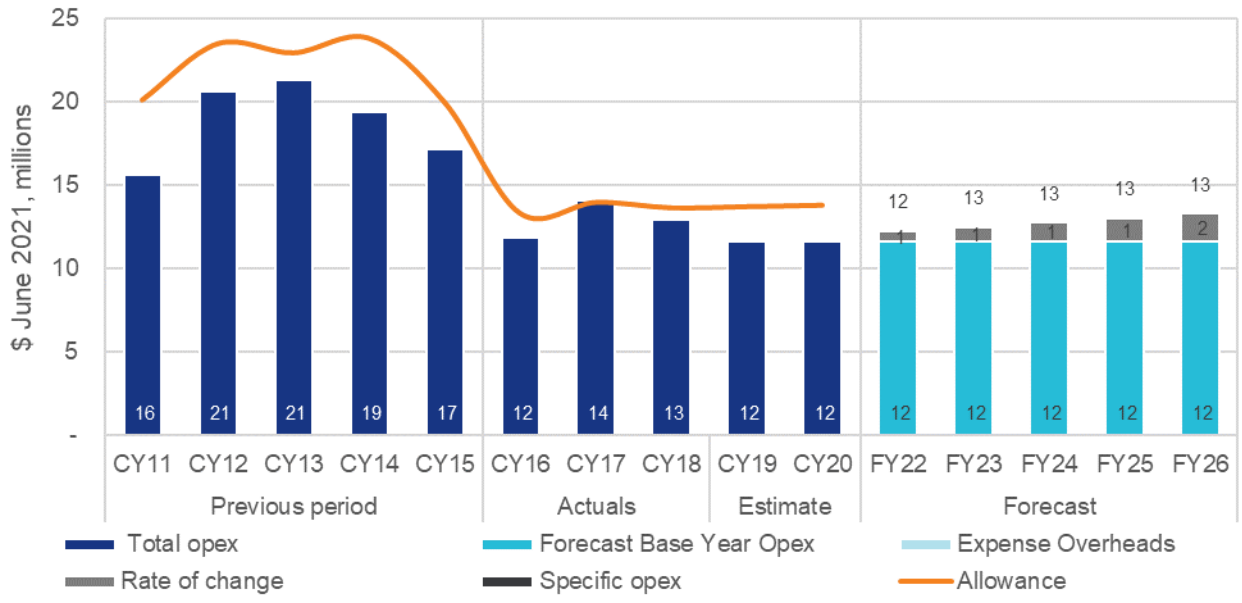
Metering operating expenditure	CY16	CY17	CY18	CY19	CY20	Total
AER allowance	13.3	14.0	13.6	13.7	13.8	**68.4**
Actual	11.8	14.1	12.9	11.6	11.6	**62.0**
Variance	**-1.5**	**0.1**	**-0.7**	**-2.1**	**-2.2**	**-6.4**

Source: Attachment 07-26.

(1) CY19-CY20 values are estimates

The AER set an efficient allowance for the regulatory periods and by spending less, we have demonstrated that we are efficiently lowering our operating expenditure. Figure 5–1 shows that we have lowered our operating expenditure over successive regulatory periods as we continue to learn more about operating the AMI system and data management, and find ways to maintain our metering service levels while lowering the costs that are passed onto our customers.

Figure 5–1: Trend in metering operating expenditure from CY11 to FY26 ($ June 2021, millions)



[48] Iton Networked Solutions (formerly known as Silver Springs Networks) is the sole supplier of our NMS equipment.

6. Form of price control for annual metering charge

6.1 Revenue cap for smart metering services

JEN proposes to apply a revenue cap form of control to annual metering charges consistent with the final F&A.[49] Under this form of price control, our annual AMI revenue is capped for each year of the next regulatory control period and any under or over recovery of actual revenue collected in a regulatory year being trued-up—along with time value of money adjustment—in subsequent regulatory years.

The revenue cap pricing formula[50] we propose to apply is consistent with the formula set out in the final F&A[51] for type 5, 6 and smart metering services. We outline the revenue cap pricing formula we propose in section Attachment 07-07.

6.2 Revenue path

We considered our revenue path following significant customer feedback on this topic. In one of our Peoples Panel sessions,[52] we specifically asked about the profile that electricity prices should take from year to year. The overwhelming response was that price should remain stable over time. Although we have no control over price stability for other cost components in the electricity supply chain, we have committed to a flat revenue path for smart metering services as a part of our regulatory proposal to reduce distribution network bill volatility.

We consider this revenue path meets our customers' preferences for:

- affordability—by delivering an initial revenue decrease of 17.53 per cent[53] in FY22
- steady network charges—through a flat revenue path.

As demonstrated in Table 6–1 our forecast smoothed and unsmoothed revenue over the next regulatory period has the same net present value (**NPV**) demonstrating that our building block proposal does not over-compensate us because of smoothing.

The smoothed revenue profile is calculated using the AER's PTRM (by making smoothed revenues equal to required (i.e. unsmothered) revenues in net present value terms), and is summarised in the table below.

Table 6–1: Proposed Standard Control Services revenue and revenue path ($ June 2021, millions)

	FY22	FY23	FY 24	FY 25	FY 26	NPV
Unsmoothed revenue requirement	22.8	23.4	23.9	24.3	25.1	**111.8**
Smoothed revenue requirement	23.9	23.9	23.9	23.9	23.9	**111.8**
Revenue path change (% pa) (1)	**-17.53%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**N/A**

(1) Relative to CY20 revenue.

49 AER, *Final framework and approach for the Victorian electricity distributors, Regulatory control period commencing 1 January 2021*, January 202019, pp. 89–93.

50 NER, cl. 6.8.2(c)(3).

51 AER, *Final framework and approach AusNet Services, CitiPower, Jemena, Powercor and United Energy, Regulatory control period commencing 1 January 2021*,pp. 89–93.

52 See Attachment 02-04 , section 3.1.

53 Compared to CY20 revenue.

7. Pricing

7.1 Smart metering prices

JEN proposes to continue setting prices with its four metering charge types for the next regulatory period. The charge types are consistent with the previous regulatory period and the current regulatory period. The benefit of continuing with the four charge types is that IT billing systems do not have to be changed and retailers and customers are familiar with the four charge types. Moreover, there has not been any new information that warrants changing to an alternative approach.

To determine smart metering prices we apply the price control formulae as set out in Attachment 07-07. In essence, we have applied the revenue cap formula and inputs set out in the previous sections to calculate metering charges for the next regulatory period. The key inputs—as described in price control formula and calculated using the metering PTRM[54]—are:

- the smoothed annual revenue requirement for the first regulatory year of the next regulatory period
- the real price movement in the annual revenue requirement (x-factors) for setting prices in the remaining regulatory years of the next regulatory period.

In Table 7–1, we outline JEN's proposed indicative metering charges for the next regulatory period when following the above approach.

Table 7–1: Proposed indicative metering charges per meter, per year ($ June 2021, dollars)

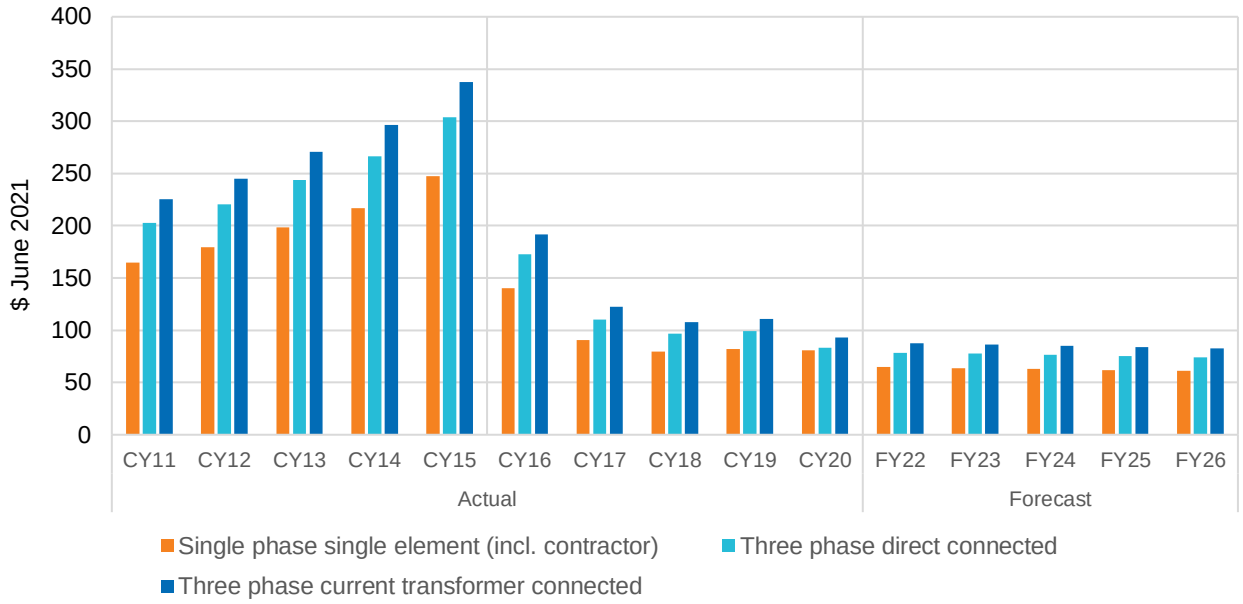
AMI meter charges (<160 MWh per annum per meter)	FY22	FY23	FY24	FY25	FY26
Single-phase non-off peak per meter per annum	64.85	63.90	62.98	62.06	61.21
Single-phase off-peak per meter per annum	64.85	63.90	62.98	62.06	61.21
Multi-phase direct connect per meter per annum	78.62	77.48	76.36	75.24	74.21
Multi-phase CT per meter per annum	87.68	86.41	85.16	83.91	82.76

These prices are indicative only, and actual prices may vary because of a number of factors, including under or over collection of revenue from year to year, or some tariff rebalancing. Prices will be submitted to the AER for their consideration as a part of the annual pricing approval process.

As Figure 7–1 shows, our proposed indicative smart metering service charges for the next regulatory period are the lowest they have ever been due to lower return on capital and depreciation as the metering asset base continue to depreciate.

[54] See Attachment 07-25

Figure 7–1: Meter charges per annum ($ June 2021)



Appendix A
Customer feedback

Jemena
bringing energy to life

A1. Customer Feedback

As part of our broader engagement on this regulatory proposal, we published a draft plan for consultation in January 2019 and undertook a deep dive session with several stakeholders. Table A1-1 details the feedback we received from our customers on our metering infrastructure and services.

Table A1–1: Customer feedback on our draft plan

Who	Chapter	Topic	Feedback	Our Response
Jemena's Customer Council	Capital Expenditure	Distributed energy resources	We were asked to provide additional information regarding plans to connect more solar to the grid while maintaining safety and reliability. The potential for inverters frequently 'tripping' due to high voltage levels on the network was of concern and a suggestion of setting higher inverter standards and fixing substation transformer issues was made.	Our Regulatory Proposal details our plans for modifying the grid and our systems to enable customers to connect more distributed energy resources (**DER**), such as rooftop solar systems. Our proposed Future Grid program details these plans for improving our connection processes, working with customers and installers to standardise solar inverter settings, upgrading low-voltage assets to increase the amount of power the grid can receive from customers (commonly referred to as 'hosting capacity') and providing commercial and residential DER customers with an option of having dynamic export limits. Smart meters enable remote monitoring of voltage at the supply point and are key to managing 'tripping' due to high voltage levels under our Future Grid program.
People's Panel		Distributed energy resources	Our People's Panel suggested the provision of additional information to customers on the connection of solar generation to the electricity network and smart capabilities would strengthen our plan to provide incentives for households to invest in renewable energy.	We actively share the recommendations and views expressed by the People's Panel with regulators, rule makers and the wider industry to highlight the changing and growing desire of the community to have an energy system that supports an increasingly renewable future. Additionally, our Future Grid proposal will help ensure that more solar PV exports can be accommodated by the grid, ensuring that a greater number of customers have access to feed-in tariffs (thus providing an incentive for customers to invest in renewable generation).

Who	Chapter	Topic	Feedback	Our Response
Jemena's Customer Council		Customer experience	Our Customer Council asked how our plans to enhance customer experience, provide energy data and enhance security would be implemented, monitored and shared with customers.	We are keen to maintain contact with our customers through the People's Panel and have sought permission to continue to work with them to facilitate continuous input and feedback to our customer experience improvements, with AMI data being a key enabler of these improvements. We have also tried to learn from other organisations with excellent reputations for customer service and customer experience.
Jemena's Customer Council	Revenue Recovery	Pricing	Questions regarding the impact of smart metering on prices were raised by our Customer Council. They felt that customers had been paying for the AMI for a long time and that it was essential to understand how long that would continue and where JEN was placed in taking advantage of the benefits of AMI data compared with our peers.	Each business has a different program of work, so it is difficult to compare, but we believe we are broadly in line with other distribution businesses concerning developments in use of AMI data and subsequent benefits to customers. Benefits include reducing the cost of reading meters as well as lower retail price offers and faster retail transfers. The Victorian Government is identifying additional opportunities with distribution business input.