

# Issues paper

Australian Energy Market Operator – Allowable  
Revenue and Forecast Capital Expenditure for  
2016/17 to 2018/19 – Forecast Capital Expenditure  
Adjustment

5 September 2018

**Economic Regulation Authority**

WESTERN AUSTRALIA

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## Invitation to make submissions

Interested parties are invited to make submissions on the Economic Regulation Authority's issues paper by 4:00 pm (WST) Tuesday 16 October 2018 via:

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# 1. Introduction

## 1.1 Purpose of this issues paper

The Economic Regulation Authority has received a submission from the Australian Energy Market Operator (AEMO) requesting approval for an adjusted capital expenditure forecast for its fourth Allowable Revenue period, which covers three years from 1 July 2016 to 30 June 2019.

This issue paper outlines AEMO's proposal and the ERA's assessment process, and is intended to assist interested parties to make submissions on any aspect of the proposal.

The ERA is responsible for determining the allowable revenue and capital expenditure AEMO can recover for the services it provides, including operating the Wholesale Electricity Market (WEM) and system management functions.

## 1.2 Why AEMO has made the submission

On 29 June 2018, the Minister for Energy changed market rule 1.20, conferring additional functions upon AEMO. These are listed in the box below.

1.20.1 The WEM Regulations provide for the Market Rules to confer additional functions on AEMO. Until 1 October 2022, the following additional functions are conferred on AEMO:

- (a) to prepare for Wholesale Electricity Market and Constrained Network Access Reform; and
- (b) to facilitate the implementation of Wholesale Electricity Market and Constrained Network Access Reform (including through transitional measures).

1.20.2 Without limiting AEMO's discretion in performing its functions, AEMO may undertake any of the following activities in carrying out the function conferred on it under clause 1.20.1:

- (a) procuring, developing, testing and otherwise preparing all systems, tools and procedures necessary or convenient for AEMO to continue to provide services and perform its functions and obligations on and from the commencement of Wholesale Electricity Market and Constrained Network Access Reform;
- (b) designing, developing, and consulting about, changes to the legislative regime applying to the Wholesale Electricity Market (including the Electricity Industry Act, the Regulations and these Market Rules) to accommodate Wholesale Electricity Market and Constrained Network Access Reform; and
- (c) project management, governance, planning, change management and stakeholder management activities to facilitate implementation of Wholesale Electricity Market and Constrained Network Access Reform.

At the same time, the Minister wrote to AEMO<sup>1</sup> endorsing a list of activities that AEMO should undertake to comply with the amended market rule 1.20, and recognised that AEMO will incur additional costs to deliver the reform program. In July 2018, AEMO provided the ERA with an estimate of the additional capital expenditure required to 30 June 2019 to deliver these activities, to be approved by the ERA.

The ERA last approved a change to AEMO's allowable revenue in July 2017. Since then, two new market rule changes have been accepted by the independent Rule Change Panel. AEMO's latest submission also includes its estimate of the additional expenditure required to make software and code modifications to implement these market rule changes.

Under the market rules, AEMO can apply for an adjustment to its approved capital expenditure "if the budget for a Financial Year is likely to result in capital expenditure, over the relevant review period, being at least 10% greater than the Forecast Capital Expenditure approved by

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<sup>1</sup> Ministerial correspondence included in Appendix A1 of AEMO's submission.

the Economic Regulation Authority”.<sup>2</sup>

Currently, AEMO’s approved capital expenditure for 2018/19 is \$2.2 million, and \$26.7 million across the fourth Allowable Revenue period (AR4). AEMO’s requested adjustment of \$11.2 million exceeds the 10 per cent threshold set under the market rules.

AEMO’s proposed allowable revenue and forecast capital expenditure for the next review period, from 1 July 2019 to 30 June 2022, was due to be submitted to the ERA by 30 November 2018. However, the Minister has deferred this to 15 March 2019 to allow time for the ERA to make a decision on AEMO’s latest proposal.

### 1.3 AEMO’s approved allowable revenue and forecast capital expenditure for AR4

AEMO’s approved allowable revenue and forecast capital expenditure for the AR4 period is shown in Table 1 below.

**Table 1: Approved allowable revenue and forecast capital expenditure for AR4**

\$'000 (nominal)	2016/17	2017/18	2018/19	Total
Allowable revenue				
WEM market operations	16,225	13,825	14,213	44,263
WEM system management	17,156	17,345	14,885	49,386
Gas information services	1,962	2,097	1,557	5,616
<b>Total allowable revenue</b>	<b>35,343</b>	<b>33,266</b>	<b>30,655</b>	<b>99,264</b>
Forecast capital expenditure				
WEM market operations	6,807	4,832	1,678	13,317
WEM system management	6,626	5,537	120	12,283
Gas information services	229	496	393	1,118
<b>Total forecast capital expenditure</b>	<b>13,662</b>	<b>10,865</b>	<b>2,191</b>	<b>26,718</b>

AEMO has made three previous allowable revenue and forecast capital expenditure submissions to the ERA for AR4. The details of these submissions and the ERA’s approvals are summarised in Appendix 1.

<sup>2</sup> Refer to [WEM Market Rule 2.22A.9](#)

## 2. AEMO's proposal

AEMO's proposal identifies additional forecast capital expenditure for 2018/19, which is the final year of AR4. A summary of how AEMO has allocated this expenditure is outlined below. The full proposal is available on the ERA website.<sup>3</sup>

### Market reform

To help deliver the Government's energy market reforms, AEMO has identified several activities it will need to perform during the remainder of AR4. These are:

- project management
- market and regulatory design
- system, business and process design.<sup>4</sup>

Information on the reform program is available on the Public Utilities Office website<sup>5</sup> and in AEMO's presentation to the latest meeting of the Market Advisory Committee meeting on 8 August 2018.<sup>6</sup>

AEMO has estimated an additional \$5.4 million of capital expenditure for these activities, as follows:

- \$4.3 million to increase its staff numbers<sup>7</sup> to start work on the design and implementation of market reforms. The expenditure is proposed to be allocated equally between system management and market operations.
- \$0.9 million to lease and fit out an additional floor in the Perth Central Park building and procure end-user IT equipment for the additional staff. This expenditure will also be allocated equally between system management and market operations.

### Issue 1

Interested parties are invited to make submissions on the reasonableness of AEMO's estimate of the number and cost of the additional resources required to undertake market reform design and implementation activity in the remainder of the AR4 period.

### Market rule changes

During May 2017, the Rule Change Panel accepted two rule change proposals. These were to reduce prudential exposure<sup>8</sup> in the reserve capacity mechanism and to correct a manifest error<sup>9</sup> relating to the notional wholesale meter. AEMO has identified that an additional

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<sup>3</sup> AEMO 2018, [2016-19 Forecast Capital Adjustment Submission to the ERA](#)

<sup>4</sup> Ibid. pp 20-22

<sup>5</sup> Public Utilities Office 2018, [Industry reforms](#)

<sup>6</sup> Ref MAC mins from Aug 8 meeting ([AEMO presentation](#))

<sup>7</sup> The ERA is seeking clarification on the scale and composition of this increase, compared to current headcount.

<sup>8</sup> The prudential rule change is to ensure sufficient credit support is held by AEMO to cover the amount a market participant would owe in the event of a default. This is market rule change [RC 2017\\_06](#), it was accepted by the Rule Change Panel on 21 May 2018.

<sup>9</sup> The notional wholesale meter rule change is to correct an error in the method for annually setting and monthly adjustment of the Individual Reserve Capacity Requirement for the notional wholesale meter. This is market rule change [RC 2018\\_01](#), it was accepted by the Rule Change Panel on 31 May 2018.

\$3.6 million capital expenditure is required in AR4 to enact these rule changes by their commencement dates, as follows:

- \$3.5 million<sup>10</sup> on software and code modifications to market systems to effect the prudential requirement market rule change by 1 June 2019. This expenditure is allocated to market operations.
- \$0.1 million on software and code modifications to effect the manifest error market rule change by 1 September 2018. This expenditure is allocated to market operations.

## Issue 2

Interested parties are invited to make submissions on the reasonableness of AEMO's proposed capital expenditure to enact the prudential exposure and notional meter rule changes by the required commencement dates.

## IT system projects

In February 2017, the ERA approved an additional \$0.5 million in allowable revenue and \$1.8 million in forecast capital expenditure for AEMO to commence design and build work on three power system operations projects: an energy management system; a demand forecasting system; and a South West Interconnected System power system model. AEMO advised that "additional capex of approximately \$3.04 million would be required to complete the build and development of these systems during the second half of the AR4 period" but did not request approval for this funding at the time.

In its latest submission, AEMO has advised that the demand forecasting system and power system model can be completed using the currently approved funds. Therefore, AEMO has proposed to utilise the previously identified \$3.04 million plus an additional \$0.7 million as follows:

- \$3.7 million to complete the implementation of a stand-alone energy management system (e-terra).<sup>11</sup> This expenditure will be fully allocated to system management.

AEMO has attributed the additional \$0.7 million to increased hardware costs identified during the detailed design phase and increased resource costs due to difficulties in acquiring the specialist skillset and by sourcing external resources to implement the system.<sup>12</sup>

## Issue 3

Interested parties are invited to make submissions on the reasonableness of AEMO's proposed capital expenditure for AR4 to complete implementation of its Energy Management System.

In October 2016, the system management function transferred from Western Power to AEMO. At the time, Western Power and AEMO entered into a service agreement for AEMO to use existing system management IT systems at Western Power, until AEMO could establish its

<sup>10</sup> AEMO expects that it will need further \$1.6 million to complete the necessary software changes, which it will incur in AR5. [AEMO 2018, 2016-19 Forecast Capital Adjustment Submission to the ERA](#), p 23

<sup>11</sup> An energy management system is a tool that ensures the secure and reliable operation of the system. It includes provisions for plant dispatch, automatic generation control, issue of dispatch instructions, collection and monitoring of system control and data acquisition data and analysis and reporting functions.

<sup>12</sup> AEMO 2018, 2016-19 [Forecast Capital Expenditure Adjustment Submission to the ERA](#), pp 25-26

own systems. AEMO expected to design and build its IT systems once the new market design had been identified as part of the previous Government's electricity reform program.

AEMO's service agreement expires on 30 September 2018, but can be extended to March 2019 at the currently negotiated rate. AEMO has proposed to move all remaining system management IT functionality from Western Power to AEMO, as it was "no longer prudent to delay the development of AEMO's in-house systems for a further four years" given the current WEM reforms are not scheduled to be operational until October 2022. AEMO has estimated capital expenditure of:

- \$4.9 million to transfer the core functionality and database structure from existing system management IT systems to AEMO's IT platform so it can modify these systems to accommodate future reforms. The expenditure will be fully allocated to system management.

#### Issue 4

Interested parties are invited to make submissions on the reasonableness of AEMO's proposed:

- a) Timing of the transfer of system management IT functionality to its own IT platform.
- b) Forecast of the capital expenditure required to transfer the IT system functionality to its own IT platform.

In November 2015, AEMO took over responsibility for the WEM from the former Independent Market Operator and inherited IT infrastructure based at the Malaga Data Centre. AEMO has advised that this infrastructure is due to be refreshed or replaced during 2018/19 and has identified a capital expenditure requirement of:

- \$2.0 million to move the market operation systems currently hosted on end-of-life IT infrastructure at the Malaga Data Centre to AEMO's private cloud-based system.<sup>13</sup> The expenditure will be fully allocated to market operations.

As a result of this change, AEMO has identified lower operating costs of \$0.3 million per year from requiring less infrastructure to be maintained at Malaga, and lower power consumption and cooling requirements.

#### Issue 5

Interested parties are invited to make submissions on the reasonableness of AEMO's proposed:

- a) Timing of the transfer of market operation IT systems, currently hosted at the Malaga Data Centre, to its own cloud-based system.
- b) Forecast of the capital expenditure required to transfer the IT systems to its own cloud-based system.

AEMO has estimated that the activities outlined above will require additional capital expenditure of \$19.5 million until the end of AR4. However, AEMO has advised that this can be offset in part by an \$8.3 million underspend from already approved capital expenditure. Therefore, AEMO has proposed additional capital expenditure of \$11.2 million.

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<sup>13</sup> AEMO 2018, 2016-19 [Forecast Capital Expenditure Adjustment Submission to the ERA](#), pp 30-31

AEMO has attributed the underspend<sup>14</sup> to net savings of:

- \$2.2 million in market operations
- \$6.1 million in system management

The approved capital expenditure and the proposed adjustments in 2018/19 (shown in italics) are outlined in Table 2 below.

In its submission to the ERA, AEMO did not seek an increase in its allowable revenue or gas-related expenditure.

If approved in full, this proposal will increase the:

- Total forecast capital expenditure for AR4 from \$26.7 million to \$37.9 million, an increase of 42 per cent.
- Forecast capital expenditure for 2018/19 from \$2.2 million to \$13.4 million.

If approved in full, AEMO has advised that market fees in 2018/19 will remain unchanged, but will result in an increase in market fees of 12 per cent, from the current level, in 2019/20. If the ERA does not approve AEMO's proposal in full, the base for calculating the market fees to apply in 2019/20 will be lower.

#### Issue 6

Interested parties are invited to make submissions on the reasonableness of:

- a) The market reform and rule change activities AEMO has identified as being necessary in the remainder of AR4.
- b) AEMO's forecast capital expenditure proposal for these activities for the remainder of AR4.
- c) The anticipated increase in market fees in 2019/20.

The next allowable revenue period, AR5, runs from 1 July 2019 to 30 June 2022. AEMO will submit its proposed allowable revenue and forecast capital expenditure for AR5 March 2019. The ERA must make its decision on AEMO's AR5 proposal by June 2019. Any allowable revenue and capital expenditure approved by the ERA will result in further increases to market fees on top of the 12 per cent increase anticipated in AEMO's current submission.

<sup>14</sup> AEMO 2018, 2016-19 [Forecast Capital Expenditure Adjustment Submission to the ERA](#), p 19

**Table 2: AEMO allowed and proposed total forecast capital expenditure and allowable revenue (electricity)<sup>15</sup>**

\$'000 (nominal)	2016/17 (approved)	2017/18 (approved)	2018/19 (approved)	AR4 Total (approved)	2018/19 (proposed)	AR4 Total (including proposed)
<b>Forecast capital expenditure (electricity)</b>						
<b>Market operations</b>						
Business as usual	1,779	2,830	1,678	6,287	-	6,287
RCM 3	2,622	987	-	3,609	-	3,609
Capacity auction	-	65	-	65	-	65
Rule changes	-	-	-	-	3,612	3,612
Transferring systems out of the Malaga Data Centre	1,663	58	-	1,721	2,032	3,753
Market development (WEM reform)	743	892	-	1,635	2,138	3,773
Facilities	-	-	-	-	438	438
<b>Total forecast capital expenditure market operations</b>	<b>6,807</b>	<b>4,832</b>	<b>1,678</b>	<b>13,317</b>	<b>8,220</b>	<b>21,537</b>
<b>System management</b>						
Business as usual	905	1,180	120	2,205	-	2,205
System management transfer	3,213	2,299	-	5,512	-	5,512
Power system operations – energy management system	645	1,108	-	1,753	3,740	5,493
Data Centre	1,663	58	-	1,721	-	1,721
System management system transition	-	-	-	-	4,936	4,936
Market development (WEM reform)	200	892	-	1,092	2,138	3,230
Facilities	-	-	-	-	438	438
<b>Total forecast capital expenditure system management</b>	<b>6,626</b>	<b>5,537</b>	<b>120</b>	<b>12,283</b>	<b>11,252</b>	<b>23,535</b>
<b>Total forecast capital expenditure (electricity)</b>	<b>13,433</b>	<b>10,369</b>	<b>1,798</b>	<b>25,600</b>	<b>19,472</b>	<b>45,072</b>
<b>Allowable revenue (electricity)</b>						
Market operations	16,225	13,825	14,213	44,263	-	44,263
System management	17,156	17,345	14,885	49,386	-	49,386
<b>Total approved allowable revenue (electricity)</b>	<b>33,381</b>	<b>31,170</b>	<b>29,098</b>	<b>93,649</b>	<b>-</b>	<b>93,649</b>

<sup>15</sup> This table does not include the savings of \$8.3 million, as identified by the AEMO, and shows therefore the full proposed forecast capital expenditure of \$19.5 million.

## 3. The ERA's review

### 3.1 Market rules governing the review

The ERA is responsible for determining the allowable revenue and capital expenditure AEMO can recover for the services it provides. These services currently include:

- Operating the WEM market and system management functions as set out in the market rules.<sup>16</sup>
- Preparing for and facilitating the implementation of WEM and constrained network access reform.<sup>17</sup>

The ERA's determination forms the basis for AEMO's annual budgets, which AEMO must publish on its website. AEMO's market fees are charged based on the volume of energy generated or consumed by market participants. These fees are adjusted each year to reflect AEMO's annual budget. AEMO also makes annual adjustments to its budget to account for surpluses or deficits in the revenue it collects from market fees and system operation fees that arise from the differences between forecasts and actual expenditure.

The ERA must take the following factors into account in approving allowable revenue and forecast capital expenditure:

- The allowable revenue must be sufficient to cover the forward looking costs of providing the relevant services in accordance with the following principles:
  - Recurring expenditure requirements and payments are recovered in the year of expenditure.
  - Capital expenditure is to be recovered through the depreciation and amortisation of the assets acquired by the capital expenditure in a manner consistent with good accounting principles.
- The allowable revenue and forecast capital expenditure must include only those costs that would be incurred by a prudent provider of the services, acting efficiently, seeking to achieve the lowest practically sustainable cost of delivering the services in accordance with the WEM, while effectively promoting the wholesale market objectives.
- Where possible, the ERA should benchmark the allowable revenue and forecast capital expenditure against the costs of other market operators providing similar services in other jurisdictions.
- Where costs incurred by AEMO relate to both the performance of functions in connection with the WEM rules and the performance of AEMO's other functions, the costs must be allocated on a fair and reasonable basis between:
  - Costs recoverable as part of AEMO's allowable revenue and forecast capital expenditure.
  - Other costs not to be recovered under the WEM rules.

<sup>16</sup> Clauses 2.1A and 2.2 of the WEM Rules provide a detailed list of AEMO's functions and services.

<sup>17</sup> This rule applies until 1 October 2022. WEM and constrained network access reform is defined as any proposed change to the operation of the WEM or related network access arrangements, or the regulatory regime applying to the WEM (including the Electricity Industry Act, the Regulations and these Market Rules), that has been endorsed by the Minister, whether or not legislation has been made to implement it.

## 3.2 Process to be followed by the ERA

To assess AEMO's latest proposal, the ERA will follow a process consistent with that taken in previous proposals.

The ERA will consider AEMO's actual expenditure against already approved allowable revenue and forecast actual expenditure. As part of this exercise, the ERA will assess whether AEMO's market operation and system management costs that may relate to its other functions have been allocated on a fair and reasonable basis. These other functions include in the Western Australian gas market, and work undertaken in Western Australia for AEMO's services to the National Electricity Market and National Gas Market. The ERA would also like to understand whether AEMO anticipates any economies of scale from operating both the WEM and the NEM and, if so, when these economies of scale are likely to be realised.

Some of the capital projects identified by AEMO are to finalise the separation of system management systems from Western Power. As a review of Western Power's access arrangement is under way at present, the ERA will also cross reference system management transfer costs between the two proposals.

The ERA will request additional, more detailed (project level) information from AEMO to assist in its assessment of AEMO's forecast capital expenditure proposal. This will include asking AEMO to explain the estimation, review and governance process it has undertaken to ensure its capital expenditure forecasts are those of "a prudent provider of the services, acting efficiently, seeking to achieve the lowest practically sustainable cost of delivering the services in accordance with the WEM, while effectively promoting the wholesale market objective".

The ERA will assess the reasonableness of the methods and assumptions AEMO has used to estimate the market reform costs, and test key assumptions and costs.

We will seek to assess, against possible alternatives, AEMO's proposal to transfer current market operation and system management functionality from third party or legacy infrastructure or systems to its own IT platforms.

AEMO will be asked to provide further relevant information where proposed capital expenditure in AR4 may influence, or be influenced by, proposed allowable revenue or forecast capital expenditure in the next revenue period.

The ERA will seek expert technical advice to assist in the review and will benchmark the proposed capital expenditure costs where possible.

### Issue 7

Interested parties are invited to make submission on any other issues they consider are relevant to the determination of AEMO's allowable revenue and forecast capital expenditure.

Interested parties are encouraged to make submissions to the issues paper, particularly as part of the market reform costs will now be met directly through market fees.

The ERA will consider submissions received in response to the issues paper and advice from its technical consultant before making its determination.

## Appendix 1 : History of allowable revenue proposals and approvals over AR4 1 July 2016 to 30 June 2019

AEMO's initial AR4 submission in October 2016 included business as usual costs to provide market operation services, system planning services, market administration services and system management services. The submission also included expenditure associated with the previous Government's electricity market reform program.<sup>18</sup>

In December 2016, AEMO made a second submission to the ERA.<sup>19</sup> This identified reform expenditures that "AEMO believes are critical to continue irrespective of the uncertainty of the reform program". This included completing the transfer of system management and associated systems out of Western Power and into a single Perth office; and expenditure associated with changes to the reserve capacity mechanism that had already been written into the WEM rules.

The ERA's determination for AR4 excluded all market reform expenditure, recognising the political uncertainty at the time. The ERA also had insufficient time to consider AEMO's revised submission by the statutory deadline of 16 December 2016.

In February 2017, AEMO submitted a third application for supplementary allowable revenue of \$2.85 million and forecast capital expenditure of \$11.6 million. This was to:

- Implement market rule changes to the reserve capacity mechanism.
- Complete the data centre works and communications links required to support a single AEMO Perth office.
- Undertake design and build work on critical system management IT systems, such as the energy management and forecasting and modelling systems.
- Continue with market reform development work during calendar year 2017, mostly for planning and regulatory design required to meet reform objectives at any revised commencement date.

In its February 2017 submission, AEMO flagged that it would come back with a further in-period adjustment, once there is more clarity on the scope and timing of the market reforms.

In July 2017, the ERA approved AEMO's February submission in full. The history of proposals and approvals to date in AR4 is summarised in Table 3 below.

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<sup>18</sup> AEMO, Sep 2016, [2016-19 Allowable Revenue submission to the ERA](#)

<sup>19</sup> AEMO, Dec 2016, [2016-19 Allowable Revenue submission to the ERA – Supplementary document](#)

**Table 3: History of AEMO proposals and ERA approvals in AR4 (electricity only)**

Item (\$'000s nominal)	AEMO proposal Sep 2016	AEMO proposal Dec 2016	ERA approval Dec 2016	Variance	AEMO proposal Feb 2017	ERA approval Jul 2017
<b>Total allowable revenue</b>	<b>108,463</b>	<b>95,113</b>	<b>90,795</b>	<b>(4,318)</b>	<b>93,648</b>	<b>93,648</b>
Market operations - business as usual	44,766	44,766	42,482	(2,284)	42,482	42,482
System management – business as usual	40,197	40,197	40,197	-	40,197	40,197
System management transfer	8,116	8,116	8,116	-	8,116	8,116
WEM reform	15,388	2,034	0	(2,034)	2,853	2,853
<b>Total forecast capital expenditure</b>	<b>50,146</b>	<b>28,937</b>	<b>14,004</b>	<b>(14,933)</b>	<b>25,600</b>	<b>25,600</b>
Market operations – business as usual	6,287	6,287	6,287	-	6,287	6,287
System management – business as usual	2,205	2,205	2,205	-	2,205	2,205
System management transfer	5,512	5,512	5,512	-	5,512	5,512
WEM reform	36,142	14,933	0	(14,933)	11,596	11,596