

Australian Energy Market Operator in-period funding submission for implementation of the Distributed Energy Resources Roadmap – Draft findings report

9 November 2020

Economic Regulation Authority

WESTERN AUSTRALIA

D221403

Economic Regulation Authority

Level 4, Albert Facey House

469 Wellington Street, Perth WA 6000

Telephone 08 6557 7900

Email info@erawa.com.au

Website www.erawa.com.au

This document can also be made available in alternative formats on request.

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Executive summary

In June 2020, the Minister for Energy placed new obligations on the Australian Energy Market Operator to implement part of the State Government's Distributed Energy Resources Roadmap. The roadmap is a plan and series of actions to integrate electricity generated from rooftop solar systems into the wholesale electricity market and also ensure the ongoing stability of the electricity network.

On 25 September 2020, the Australian Energy Market Operator (AEMO) submitted its proposal to the Economic Regulation Authority for additional forecast capital expenditure of \$18.9 million to cover Distributed Energy Resources (DER) roadmap activities. AEMO can recover approved expenditure from market participants through market fees. These costs are eventually passed through to consumers.

AEMO's submission represents a substantial increase in funding: a 29 per cent increase on AEMO's approved capital expenditure and a 39 per cent increase above approved capital expenditure for Wholesale Electricity Market (WEM) reform in the current funding period. The funding request is also similar to AEMO's budget of \$20 million for DER implementation in the National Electricity Market (NEM) in 2020/21.¹ The proposed DER funding would add a further 5.4 percentage points onto the 13.8 per cent increase in average WEM market fees over the three years from 1 July 2022 to 30 June 2025.²

Transitional market rules enable AEMO to recover the cost of its new obligations to support WEM reform activities. The same transitional rules require the ERA to review the efficiency of AEMO's proposed WEM reform costs but not whether a project proposed by AEMO is a prudent means to deliver WEM reform.³ The State Government's DER roadmap is part of the current suite of reforms, and so the transitional funding approval arrangements extend to AEMO's proposed DER projects. The ERA's role is to determine whether AEMO's expenditure estimates for DER activities are consistent with costs proposed by a prudent provider of the services, acting efficiently and "seeking to achieve the lowest practicably sustainable cost of delivering the services."⁴

In June 2020, further changes to the transitional market rules affect the ERA's determination by allowing two requests for additional information from AEMO during the process and establishing that the time the ERA has to make a determination is 45 business days. The ERA must also not take into account any funding already approved for AR5 when making its determination on DER funding.

This report does not consider all aspects of AEMO's submission. If the ERA had waited until all the additional information requested from AEMO had been received, then there would have been insufficient time within the 45 day period to also consult with stakeholders. This draft report focusses on estimated labour costs and the application of previous regulatory decisions to AEMO's proposed property and contingency costs. The ERA invites feedback on all aspects of AEMO's submission and on the points raised in this report and will consider stakeholder feedback when making its final determination.

¹ AEMO, 2020, *2020-21 Final Budget and Fees*, pp. 24-25 ([online](#))

² ERA, 2019, *Australian Energy Market Operator Allowable Revenue and Forecast Expenditure 2019/20 to 2021/2022*, p.47 ([online](#))

³ Wholesale Electricity Market Rules (WA), 7 August 2020, Rule 1.20 ([online](#))

⁴ *Ibid*, Rule 2.22A.11(b)

Observations and initial views

Labour costs

AEMO's total labour cost estimate to deliver the DER roadmap actions is \$14.4 million, or 77 per cent of the total funding estimate. Just under \$9 million is for internal labour while \$5.4 million is for external labour such as consultants and technical specialists. To estimate the total internal labour costs, AEMO calculated five unit labour day rates, allocated each position to a unit day rate and then multiplied the unit rate by the estimated number of days required for each position over the AR5 period. AEMO's submission did not contain sufficient detail to enable the ERA to determine whether the approach meets the funding approval requirements in the market rules. The ERA has requested additional information from AEMO and will use this to make its final determination.

Nearly 60 per cent of the internal positions are allocated to the three highest unit day rates. The ERA compared base salary rates for each unit day rate proposed by AEMO and found they were approximately 25 per cent higher than publicly available market rates for equivalent positions. Applying market-based unit rates to AEMO's new contract hires would reduce internal labour costs by approximately \$1.7 million.

AEMO has identified 78 individual positions needed to work on DER roadmap activities until July 2022. This is equivalent to approximately 20 full time internal staff plus 14 full time consultants. This compares to the 30 staff that were identified as working on WEM reform projects over AR5 and will be in addition to the 125 personnel AEMO was expected to have by the end of the AR5 period. The ERA has requested that AEMO provides more information to justify the number of positions identified as necessary for DER activities and how it has estimated the number of days required from each position. The ERA will consider this information in its final determination.

Capitalisation of costs and future intellectual property

AEMO has chosen to capitalise the forecast DER expenditure to be written down in the next funding period. In additional information provided to the ERA, AEMO identified the creation of intangible assets, such as intellectual property, through DER activities, that will bring AEMO future economic benefit. AEMO provided the example of "the use of intellectual property in a production process may reduce future production costs rather than increase future revenues."⁵

The ERA has some reservations about whether all of the DER activities can or should be capitalised. Unless AEMO can demonstrate how the future value of these intangible assets will be quantified and realised in the National Electricity Market and the WEM, the ERA's initial view is to treat some or all of the costs as operational expenditure.

Property costs

AEMO has applied a fixed property charge to each full time equivalent hour identified in the submission to cover rent, floorspace, utilities and consumables. The ERA approved additional accommodation costs in its AR5 final determination because AEMO demonstrated that additional accommodation would be required and how it had been costed.⁶ In the current submission, AEMO has not demonstrated that it has applied its own accommodation strategy of exploring alternatives to increasing the floorspace required. This is pertinent as AEMO continues to roster staff to work from home as part of its response to the COVID-19 pandemic.

⁵ From commercial in confidence information provided to the ERA.

⁶ ERA, 2019, *Australian Energy Market Operator Allowable Revenue and Forecast Capital Expenditure 2019/20 to 2021/2022 - Final Determination*, pp.26-27, ([online](#))

AEMO has provided insufficient information to support this charge and the ERA's initial view is to not approve the \$0.4 million identified by AEMO as property costs in the final determination.

Project contingency

Consistent with its approach in the AR5 funding submission, AEMO has applied a risk-based approach to project contingency. AEMO calculated a risk-based contingency for each DER action that ranged from 5 per cent to 22 per cent. In total, the accumulated project contingency adds \$2.4 million or 15 per cent to AEMO's total DER forecast capital expenditure.

The ERA deliberated on project contingency in its final AR5 determination and supported a risk-based approach to calculating project contingency. However, the \$2.4 million contingency allowance AEMO has proposed can be accommodated within the 10 per cent of capital expenditure that it is allowed to incur above the level of forecast capital expenditure approved by the ERA. Consequently, the ERA's initial view is to not approve any additional forecast capital expenditure for project contingency.

The ERA's observations and initial views above could lower the forecast capital expenditure for implementing DER roadmap actions by approximately \$4.5 million.

Prior to making its final determination, the ERA will consider the quantity of labour AEMO has identified as necessary to deliver the DER roadmap actions, the proposed external labour unit costs, proposed hardware and software costs, and proposed travel and financing costs. The ERA encourages stakeholders to consider the information in AEMO's DER funding submission and the initial views in this draft findings report when making submissions. The ERA will consider stakeholder feedback in its final determination.

1. Introduction

The ERA is responsible for determining the allowable revenue and forecast capital expenditure AEMO can recover through fees charged to market participants.⁷

AEMO estimates its funding requirements every three years. In May 2019, the ERA approved AEMO's funding for the fifth allowable revenue period from 1 July 2019 to 30 June 2022 (AR5).⁸ For AEMO's activities in the WEM, the ERA approved:

- \$99.8 million allowable revenue
- \$65.8 million forecast capital expenditure.⁹

On 4 April 2020, the Minister for Energy released the DER roadmap that identifies 32 actions needed to integrate DER into the South West Interconnected System (SWIS).¹⁰ The roadmap gives AEMO responsibility for delivering some of these actions within AR5.

On 1 July 2020, the Minister for Energy amended market rule 1.20, to recognise the additional obligations that the roadmap conferred on AEMO. These obligations were not anticipated early in 2019 when AEMO proposed, and the ERA determined, AEMO's funding for AR5.

The amendments to market rule 1.20 enable AEMO to make an in-period funding submission to the ERA for additional funding to cover the new DER roadmap obligations.¹¹ The amendments to market rule 1.20 also impose conditions around the ERA's approval of AEMO's proposed DER funding.¹² These conditions are outlined in section 3.

1.1 Funding approval process and timeline

On 25 September 2020, the ERA received a submission from AEMO seeking approval for \$18.9 million additional forecast capital expenditure in AR5 for its DER roadmap functions. On 29 September 2020, the ERA published AEMO's submission and a notice explaining the process the ERA would take to review the proposal.

This draft report outlines the ERA's initial findings on AEMO's proposal and provides an indicative level of approved funding for AEMO's DER activities if the ERA applied its initial findings in the final determination. The ERA is seeking feedback from interested parties on its draft findings report and will take into account stakeholder feedback when making its final determination.

The ERA will continue to analyse AEMO's proposal and any variation in the funding amounts noted in the draft findings report and final determination will be explained in the final determination paper.

The ERA's timeline for reviewing and determining AEMO's funding is fixed at 45 business days as shown in Table 1:.

⁷ Wholesale Electricity Market Rules (WA), 7 August 2020, Rule 2.22A.11

⁸ ERA, 2019, *Australian Energy Market Operator Allowable Revenue and Forecast Capital Expenditure 2019/20 to 2021/22 – Final determination*, ([online](#))

⁹ *Ibid*, p. v.

¹⁰ Energy Policy WA, 2020, Government publications – DER Roadmap ([online](#))

¹¹ Wholesale Electricity Market Rules (WA), 7 August 2020, Rule 1.20A

¹² *Ibid*, Rule 1.20A

Table 1: ERA review timeline

Date	Action	Timeline count
25 September	AEMO submitted its DER funding proposal	-
29 September	The ERA published the proposal with a notice	Day 1 – clock starts to Day 7
8 October	The ERA sent its first set of questions to AEMO	Clock stopped
15 October	AEMO provided its response to the questions	-
16 October	The ERA's review continues	Day 8 – clock starts again to Day 17
22 October	The ERA sent its second set of questions to AEMO	Clock stopped
9 November*	AEMO provides its response to the questions	-
	The ERA publishes its draft findings report	
10 November	The ERA's review continues	Day 18 – clock starts again
20 November	Consultation closes	Day 26
17 December*	Deadline for the ERA to publish its final determination	Day 45*

*Note: * These are expected dates, they will be confirmed once the ERA receives AEMO's response to the second set of questions.*

Given the limited timeframe, the consultation period is two weeks and closes on 20 November 2020. Requests for additional time to make submissions will not be accommodated as the ERA must publish its final determination on AEMO's submission by 17 December.

2. AEMO's DER funding submission

AEMO's DER funding submission requests \$18.9 million to cover its new obligations to implement parts of the DER roadmap in AR5. AEMO advised that the DER activities include some additional allowable revenue expenditure. However, AEMO has indicated that it can accommodate this within the allowable revenue already approved for AR5.

2.1 Expenditure by workstream

The additional forecast capital expenditure is allocated across four workstreams, all supported by shared program support resources. AEMO has applied an allowance for project contingency to each of the four workstreams and the program support expenditure. The allocation by workstream over each year of AR5 is shown in Table 2 below.

Table 2: Estimated forecast capital expenditure costs by workstream (\$ million)

Workstream	2019/20	2020/21	2021/22	Contingency	AR5 total	%
DER register	0.122	0.924	-	0.230	1.277	6.8
DER participation	-	0.658	1.347	0.200	2.205	11.7
Technology integration	-	1.112	1.900	0.265	3.277	17.4
DER orchestration	-	5.826	2.078	1.580	9.486	50.3
Program support	0.247	1.176	1.059	0.124	2.606	13.8
Total	0.369	9.696	6.384	2.401	18.851	100

Note: ERA analysis of AEMO data

A short description of each of the four workstreams and project support is provided below.

2.1.1 DER register

In its proposal, AEMO states that to be able to “effectively manage the power system as DER penetration levels increase, a reliable database of installed DER equipment must be established for the SWIS.”¹³ AEMO has already begun project planning to establish and deliver the register in January 2021. AEMO has an operational DER register in the NEM and “will draw heavily on the experience and technology applied in the NEM DER register.”¹⁴

2.1.2 DER participation

AEMO stated that its “effort in this workstream is to design market arrangements and support the establishment of rules and regulatory arrangements to enable DER aggregators to participate in the WEM.”¹⁵ AEMO has separately costed its involvement in six DER roadmap actions that are collated, along with separate DER implementation planning costs, into the total costs for this workstream. The DER implementation planning costs of \$0.9 million will be

¹³ AEMO, 2020, *Adjustment to 2019-22 Forecast Capital Expenditure – DER Roadmap Implementation Costs*, p. 29. ([online](#))

¹⁴ *Ibid*, p. 30.

¹⁵ *Ibid*, p. 39.

informed by the DER orchestration pilot. The DER implementation planning workstream includes just under \$0.5 million in resource costs that are allocated to:

- Providing expert advice on EPWA's proposed initial and detailed legislative and regulatory arrangements for DER Orchestration.
- Engaging with EPWA consultation processes on detailed legislative and regulatory requirements, including with written and direct consultation with EPWA.
- Supporting the implementation of EPWA's legislative and regulatory arrangements as required by EPWA.¹⁶

2.1.3 Technology integration

AEMO described the technology integration workstream as covering “the critical actions required to ensure system security as more and more DER connects to the grid.”¹⁷ Over half of the \$3.3 million forecast capital cost for this workstream is focussed on DER inverters, which convert direct current generated by solar rooftop panels into alternating current for use by the household and export to the network. This includes establishing equipment to collect data to understand how DER inverters perform in practice and develop communications to allow the remote control of inverters in the SWIS.

AEMO described the remaining costs in this workstream as having an operational focus. This includes assessing how DER can reduce the load on the system and whether there are any implications for under frequency load shedding scheme settings. This is the emergency mechanism that disconnects sections of the network when the frequency of supply drops below a given level.

Under black start conditions, AEMO is concerned that demand fluctuations resulting from distributed solar generation may disrupt efforts to restart the system. The smaller the region, the greater the effect of changes in cloud cover.

AEMO also plans to use DER and load models originally developed in the NEM to inform the creation of similar models in the WEM. AEMO will use these to model the effect of DER systems on demand, particularly when the security of the electricity system is at risk.¹⁸

2.1.4 DER orchestration

AEMO described this workstream as “a ‘virtual power plant’ pilot project to demonstrate technical capability of DER and the aggregation of DER to participate in the market, alongside the provision of network support services (or ‘alternative options services’) to Western Power.”¹⁹ The pilot program involves recruiting customers with rooftop solar to participate in the pilot, determining how to aggregate and control these DER resources, and identifying what services the aggregated DER can provide and how their performance in delivering services will be measured. Also included in the project is the design of the IT platforms to integrate aggregated DER into existing market operation and settlement systems. The pilot project will run from January 2021 to December 2022.

DER orchestration funding makes up half of AEMO's total in-period funding request. In its submission, AEMO stated that the DER orchestration workstream was linked to the DER participation workstream and it was “therefore crucial both workstreams are appropriately

¹⁶ Ibid, p. 40.

¹⁷ Ibid, p. 25.

¹⁸ Ibid, p. 29.

¹⁹ Ibid, p. 31.

resourced, coordinated and delivered within the strict timeframes prescribed by the WA State Government.”²⁰ Forecast capital expenditure for both workstreams is \$11.7 million, or 62 per cent of the total funding request.

2.1.5 Program support

AEMO has included \$2.6 million in its submission to cover resource costs of providing support to the DER workstreams. This includes “planning and oversight, legal support, communications and stakeholder management and project support services.”²¹

2.2 Expenditure by cost category

AEMO presented the categorisation of costs in its funding submission using the same breakdown as in AR5. Costs have been grouped by cost category in Table 3.

Table 3: Estimated forecast capital expenditure by cost category (\$ million)

Cost category	2019/20	2020/21	2021/22	AR5 total	%
Internal labour	0.124	4.131	4.727	8.982	47.6
External labour	0.235	4.456	0.699	5.390	28.6
Hardware	-	0.200	-	0.200	1.1
Software	-	0.525	0.357	0.882	4.7
Travel	-	0.024	0.046	0.070	0.4
Property costs	0.010	0.247	0.170	0.428	2.3
Financing costs	-	0.113	0.386	0.499	2.6
Contingency	0.039	1.604	0.757	2.401	12.7
Total	0.409	11.301	7.142	18.851	100

Note: Totals may not add due to rounding

Overall, 76 per cent of the total forecast capital expenditure, \$14.4 million, is on staffing:

- 62 per cent, or \$9.0 million, is on internal staff, including existing WEM staff, existing NEM staff, and new contract positions in the WEM.
- 38 per cent, or \$5.4 million, is on external contractors and consultants.

2.2.1 AEMO’s approach to estimating costs

AEMO stated that it started by identifying the personnel requirement for each workstream and then, for each role, estimated the number of days required. AEMO then costed existing staff

²⁰ Ibid, p. 25.

²¹ Ibid, p. 25.

and internal contract personnel using a five-tier unit rate system. The five unit rates were derived from the labour costs of 1,100 existing AEMO roles.²²

AEMO has identified 23 external contractor positions to work on DER roadmap actions. AEMO stated that it approached five separate vendors to request estimated rates for given roles and then used this information as one of the factors upon which it based estimated costs for external contractors.

A further 55 positions are a combination of:

- 22 new internal staff that will be employed on contract in the WEM.
- Nine existing WEM staff that will be seconded onto DER activities and their positions backfilled.
- 24 NEM employees who will work on DER activities, recording their time and allocating those costs, again based on the five-tier system, to the WEM.

For each action included in the workstreams, AEMO undertook a risk assessment and from this calculated a project contingency. The higher the anticipated risk, the higher the contingency for the action. Contingencies ranged from 5 per cent to 22 per cent for individual actions. The overall contingency amount included for the funding proposal is 15 per cent.

AEMO has applied a fixed charge to each full time equivalent (FTE) hour to cover occupancy costs:

Occupancy costs include rental, floor space, utilities and consumables, all of which are subject to incremental increase or decrease as the number of AEMO employees using AEMO resources varies. It is likely that additional floor space will be required to accommodate the new WEM resources necessary to deliver the DER Roadmap. This cost would be absorbed within the occupancy charge.²³

AEMO proposed financing its forecast capital expenditure using an existing debt facility. This approach to project financing is consistent with its approach in AR5, which the ERA supported.²⁴ AEMO uses an in-house consolidated borrowing facility to finance projects.

AEMO provided the ERA with commercial-in-confidence information to illustrate where it had sought to benchmark forecast capital expenditure against similar projects undertaken elsewhere.

AEMO noted that it:

Has sought to achieve the lowest practicably sustainable cost of delivering the work, and that the capex forecast reflects this. Cost estimates are based on market-tested rates and historical costs of a similar nature. Detailed bottom up build and top down challenge has been applied, with scrutiny from the Investment Committee, AEMO's Executive and Board in particular.²⁵

²² From confidential information provided to the ERA

²³ AEMO, 2020, *Adjustment to 2019-2022 Forecast Capital Expenditure – DER Roadmap Implementation Costs*, p. 22 ([online](#)).

²⁴ ERA, 2019, *Australian Energy Market Operator Allowable Revenue and Forecast Capital Expenditure 2019/20 to 2021/2022 - Final Determination*, p. 28. ([online](#))

²⁵ AEMO, 2020, *Adjustment to 2019-22 Forecast Capital Expenditure – DER Roadmap Implementation Costs*, p. 10. ([online](#))

2.3 Effect on market fees

In the ERA's final determination for AR5, market fees were estimated to increase by an average of 4.2 per cent year on year compared to AR4.²⁶

In its submission, AEMO calculated that, assuming its in-period proposal was fully funded, the effect of the additional capital expenditure in AR5 would be a further increase of 0.2 per cent in 2020/21 and 0.5 per cent in 2021/22.

AEMO's AR5 funding submission stated that "most of the capex incurred during the AR5 period will not commence depreciation and amortisation until the AR6 period."²⁷ As part of its AR5 submission AEMO undertook some high-level modelling of AR6 fees. This modelling indicated that average market fees in AR6 would increase by 13.8 per cent over the AR6 period.²⁸

AEMO's current funding submission identifies that the additional capital expenditure for DER roadmap activities, if funded in full, would increase market fees in AR6 on average by a further 5.4 per cent. Combined with the existing reform program, this increase over the AR6 period is 19.2 per cent higher than average fees during the AR5 period.²⁹

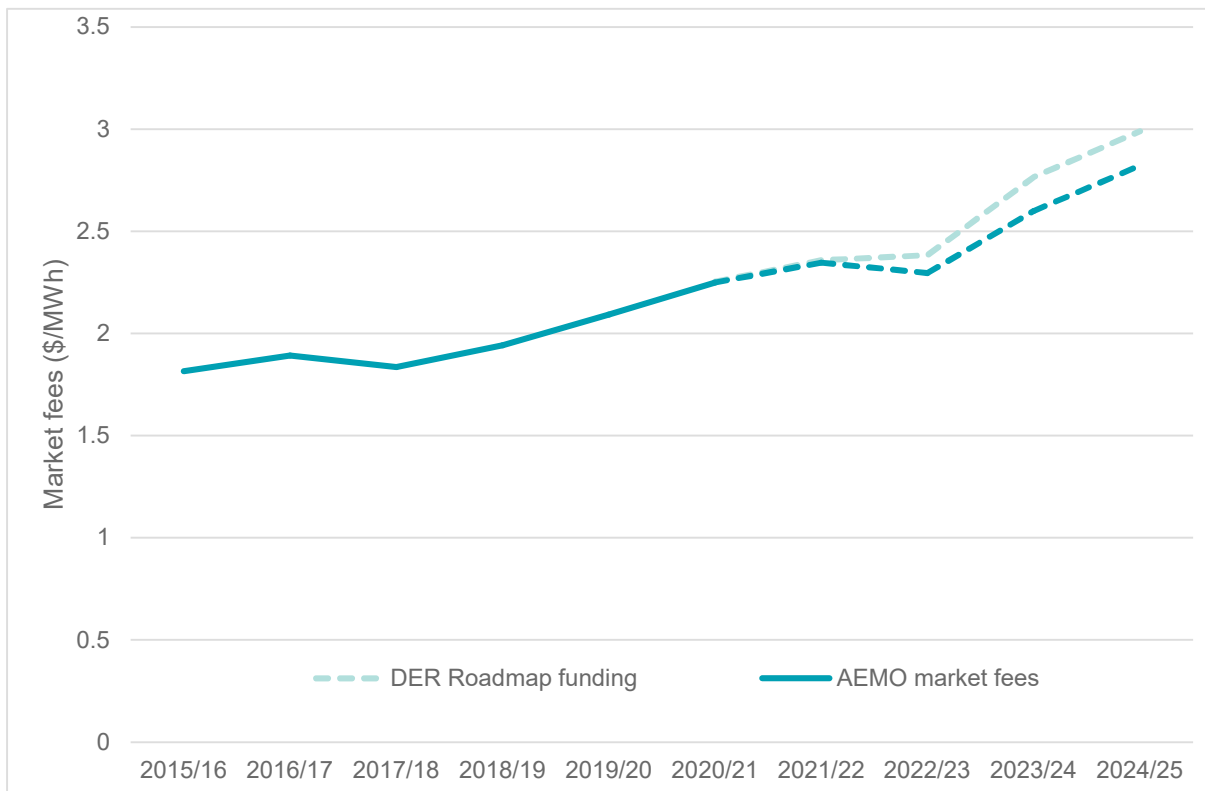
²⁶ ERA, 2020, *Australian Energy Market Operator Allowable Revenue and Forecast Capital Expenditure 2019/20 to 2021/2022 - Final Determination*, p. 45. ([online](#))

²⁷ AEMO, 2019, *2019-22 allowable revenue and forecast capital expenditure submission to the Economic Regulation Authority*, p. 44. ([online](#)) AR6 is the next allowable revenue funding period and runs from 1 July 2022 to 30 June 2025.

²⁸ Ibid.

²⁹ AEMO, 2020, *Adjustment to 2019-22 Forecast Capital Expenditure – DER Roadmap Implementation Costs*, p. 47. ([online](#))

Figure 1: WEM market fees with DER roadmap funding



Source: ERA analysis

3. The ERA's obligations under the market rules

The WEM rules identify the ERA's obligations when approving sufficient funding to cover AEMO's obligations in the WEM. On 29 June 2018, the ERA's funding approval obligations and discretion changed with amendments to transitional market rules regarding the approval of funding for AEMO's new market reform obligations. Two years later on 30 June 2020, the ERA's obligations changed again when the transitional market rules were further amended around approving funding for AEMO's new DER Roadmap obligations.

Following the changes made to the market rules in June 2018, the ERA clarified its obligations around approving funding for WEM reform activities prior to its final determination of AEMO's allowable revenue and forecast capital expenditure funding for AR5. This clarification confirmed that the ERA had no discretion to:

- Determine whether a proposed WEM reform project or activity was prudent.³⁰
- Approve part of AEMO's proposed WEM funding request.³¹

As AEMO's functions to implement the DER roadmap are an extension of its WEM reform activities, the points above also apply. When approving AEMO's proposed DER funding submission, the ERA has no scope to determine whether proposed DER workstreams or projects are a prudent means of delivering the Minister's DER roadmap. Also, the ERA must approve funding for the remainder, not part, of the AR5 period.

The ERA does have to ensure any DER funding approved is efficient. When approving allowable revenue and forecast capital expenditure, the ERA must take the following into account:

- (a) The allowable revenue must be sufficient to cover the forward looking costs of providing the services described in clause 2.22A.1 and performing AEMO's functions and obligations under these Market Rules in accordance with the following principles-
 - (i) Recurring expenditure requirements and payments are recovered in the year of expenditure
 - (ii) Capital expenditure is to be recovered through the depreciation and amortisation of the assets acquired by the capital expenditures in a manner that is consistent with generally accepted accounting principles; and
 - (iii) Notwithstanding clauses 2.22A.11(a)(i) and 2.22A.11(a)(ii), expenditure incurred, and amortisation charged, in relation to any Declared Market Project are to be recovered over the period determined for the Declared Market Project.
- (b) The Allowable Revenue and Forecast Capital Expenditure must include only costs which would be incurred by a prudent provider of the services described in clause 2.22A.1, acting efficiently, seeking to achieve the lowest practicably sustainable cost of delivering the services described in clause 2.22A.1 in accordance with these Market Rules, while effectively promoting the Wholesale Market Objectives.
- (c) Where possible the Economic Regulation Authority should benchmark the Allowable Revenue and Forecast Capital Expenditure against the costs of providing similar services in other jurisdictions; and

³⁰ Under usual funding approval obligations, market rule 2.22A.11, the ERA can determine if a proposed project is a prudent means for AEMO to deliver its business as usual market operation and system management services in the WEM. This is out of scope under transitional market rule 1.20.

³¹ The ERA's AR5 draft determination suggested delaying approving funding for IT WEM reform projects until more robust costings for these large-scale market IT systems had been developed. The ERA reviewed its obligations under transitional rule 1.20 and determined that this was not an option for the AR5 final determination.

- (d) Where costs incurred by AEMO relate to both the performance of functions in connection with the Market Rules, and the performance of AEMO's other functions, the costs must be allocated on a fair and reasonable basis between-
- (i) Costs recoverable as part of AEMO's Allowable Revenue and Forecast Capital Expenditure; and
 - (ii) Other costs not to be recovered under the Market Rules.³²

The changes made to the market rules in June 2020 further prescribe the decision-making process of the ERA when approving funding to cover AEMO's DER activities.

The ERA can make two requests to AEMO for additional information the ERA requires to assess and make a determination on AEMO's submission. AEMO is obliged to comply with these requests. These requirements are described in market rules 1.20A.2 to market rule 1.20A.4 as follows:

Within 15 Business Days of the day on which an application under clause 1.20A.1 is received, the Economic Regulation Authority may give notice to AEMO requesting any additional information the Economic Regulation Authority reasonably requires to assess and determine AEMO's application.³³

The Economic Regulation Authority may, within 10 Business days of the day it receives AEMO's response to a notice issues under clause 1.20A.2, give notice to AEMO requesting any further additional information the Economic Regulation Authority reasonably requires to assess and determine AEMO's application.³⁴

AEMO must comply with any request made by the Economic Regulation Authority under clauses 1.20A.2 and 1.20A.3.³⁵

The ERA's review of AEMO's submission must be completed within 45 business days, extended by the number of business days AEMO takes to return information requested by the ERA. This is explained in market rules 1.20A.5 and 1.20A.6:

Subject to clause 1.20A.6, the Economic Regulation Authority must assess an application made under this section 1.20A and determine any adjustment to AEMO's Allowable Revenue and Forecast Capital Expenditure within 24 Business Days of the date AEMO's application is received.³⁶

The 45 Business Day period referred to in clause 1.20A.5 is to be extended by the following additional Business Days-

- (a) The day on which any request for additional information is made by the Economic Regulation Authority under clauses 1.20A.3 and 1.20A.3;
- (b) The period of time subsequently taken by AEMO to respond to such a request; and
- (c) The day on which the Economic Regulation Authority receives AEMO's response.³⁷

The ERA cannot consider funding already approved for AR5. This is a departure from the usual review and determination process undertaken when AEMO makes a request for additional funding within a funding period.³⁸ In such determinations, the ERA has discretion to review AEMO's expenditure against budget and reallocate unused but approved funding to

³² Wholesale Electricity Market Rules (WA), 7 August 2020, Rule 2.22A.11 ([online](#))

³³ Ibid, Rule 1.20A.2

³⁴ Ibid, Rule 1.20A.3

³⁵ Ibid, Rule 1.20A.4

³⁶ Ibid, Rule 1.20A.5

³⁷ Ibid, Rule 1.20A.6

³⁸ Ibid, Rule 2.22A.8 and 2.22A.9

other activities. This discretion has been removed when approving funding to cover DER implementation costs as described in market rule 1.20A.7 (d) below:

When determining and approving an adjustment to AEMO's Allowable Revenue and Forecast Capital Expenditure under this section 1.20A, the Economic Regulation Authority-

- (a) Must take into account the matters in clauses 2.22A.11(a) to 2.22A.11(d);
- (b) Must have regard to information provided by AEMO in its application and to any information provided in accordance with clauses 1.20A.2 and 1.20A.4;
- (c) May have regard to such other information as the Economic Regulation Authority reasonably considers necessary or desirable to inform the Economic Regulation Authority's assessment of AEMO's application;
- (d) Must not have regard to or take into account the Allowable Revenue and Forecast Capital Expenditure already approved by the Economic Regulation Authority for the Review Period 1 July 2019 to 1 July 2022; and
- (e) Must determine and approve an adjustment on the basis that-
 - (i) Any Wholesale Electricity Market Reform and Constrained Network Access Reform relating to the introduction of a distribution system operator or distribution market operator will not be completed before 1 July 2022 but will require a substantial commitment of resources by AEMO during the Review Period ending on that date; and
 - (ii) All other Wholesale Electricity Market Reform and Constrained Network Access Reform will be implemented before 1 October 2022.³⁹

Clause (c) above enables the ERA to have regard to other information in assessing AEMO's application. The ERA has used this clause to:

- Take advice from a technical consultant on aspects of AEMO's submission.
- Publish this draft report to gather stakeholder feedback on:
 - AEMO's proposal
 - the ERA's initial findings from reviewing AEMO's proposal.

The ERA will consider stakeholder feedback received in response to the draft findings report and additional information obtained from AEMO in making its final determination.

³⁹ Ibid, Rule 1.20A.7

4. The ERA's observations and initial views

AEMO has requested \$18.9 million forecast capital expenditure to cover the estimated costs of its new DER implementation actions over the remaining 20 months of the AR5 period.

The additional \$18.9 million is an increase of 25 per cent above the \$68.5 million WEM forecast capital expenditure previously approved for AR5 and a 39 per cent increase in the \$48.5 million forecast capital expenditure previously approved for WEM reform activities in AR5.⁴⁰

The funding request is a significant increase to AEMO's budget. To ensure the material components of the funding request are available for stakeholder consultation in the time available, the ERA has concentrated on four aspects of AEMO's submission in this draft findings report. These are unit labour rates, property costs, project contingency and the capitalisation of project costs. The ERA has chosen these areas because:

- At 77 per cent, labour costs constitute most of AEMO's submission.
- The ERA can compare previous regulatory decisions to proposed property and contingency costs.
- The ERA will consider how the intangible assets created through the DER activities may provide benefit outside Western Australia and whether part of the cost should be met by the NEM.

As part of its final determination, the ERA will review whether the wide range of personnel are all needed and the quantity of time allocated by each individual to DER roadmap activities. For example, AEMO's submission did not indicate that it would backfill the 24 NEM staff that are identified to work on DER activities. These staff are already fully funded in the NEM and the ERA will consider how AEMO has ensured that only the incremental costs of these staff are allocated to the WEM.

Each of the areas of focus in the draft report are discussed below.

4.1 Internal labour costs

More than three quarters of AEMO's funding submission is for labour. AEMO has identified the number and type of different personnel required, estimated the number of days required from each individual for each DER action and then applied a unit day rate to calculate the cost of each resource.

In the draft findings report, the ERA has concentrated on reviewing and reporting on AEMO's proposed unit labour costs.

In its submission, AEMO allocated all the required internal labour positions, for existing staff and new contract hires, across five pay grades, or tiers. Each tier has a unit rate which is an average of the total remuneration for the positions in that tier. As AEMO is yet to provide information on how these unit rates were calculated, the ERA has been unable to assess whether the unit rates are reasonable and consistent with a prudent service provider, acting

⁴⁰ ERA, 2019, *Australian Energy Market Operator Allowable Revenue and Forecast Capital Expenditure 2019/20 to 2021/2022 -Final Determination*, p. 39, ([online](#))

efficiently and seeking to achieve the lowest practicably sustainable cost of delivering DER actions.⁴¹

In the absence of labour cost details from AEMO, the ERA calculated a base salary for each tier to compare AEMO's positions with equivalent positions in the private and public sectors.⁴² Examples of the comparisons, focused on tiers 2, 3 and 4, are below and in Appendix 2. More than 70 per cent of internal positions are allocated to tier 2 and 3, while over half are tier 3 and above.

Table 4: Distribution of AEMO's internal staff across the five unit rate tiers

Tier	Number of positions	%
Tier 1	5	9
Tier 2	18	33
Tier 3	22	40
Tier 4	9	16
Tier 5	1	2
Total	55	100

Source: ERA analysis of AEMO commercial in confidence data

Note: Tier 5 is the highest pay grade

4.1.1 Comparison with staff costs in the private sector

To compare AEMO's proposed staff costs with the market rates for similar positions in the private sector, the ERA compared a sample of job titles within each tier with publicly available data for similarly named positions.⁴³ These include comparable positions within state-owned trading enterprises such as Western Power, Synergy and Horizon Power as well as broader market cost data compiled by the Hay Group.⁴⁴

The ERA undertook its market rate comparison on the basis of position title as AEMO has not yet provided competency and grading levels that would allow a more extensive comparison with market rates. When conducting this analysis, the ERA assumes that the competencies required are comparable between positions with similar job titles. Some examples are provided below.

- AEMO allocated the change management analyst positions to tier 2. On base salary, AEMO's rates were between 19 per cent and 28 per cent higher than market rates for a comparable change manager in the Information Communication and Technology (ICT) sector.
- AEMO allocated its analyst positions to tier 2. A search on security analyst positions in current employment websites indicated an annual salary range of \$80,000 to \$150,000

⁴¹ Under market rule 1.20A.2, the ERA sent a request for additional information on total employee costs to AEMO on 8 October 2020.

⁴² The ERA considered comparable market rates for position titles identified by Hays Group validated with positions advertised on Seek, for Western Power, Horizon Power, Synergy, and public sector IT positions. These were then aggregated into the same tiers to derive a comparable market rate equivalent.

⁴³ Hays, 2020, *FY 2020/21 Salary Guide* ([online](#)), Seek.com.au ([online](#)), accessed 29 October 2020.

⁴⁴ Hays, 2020, *FY 2020/21 Salary Guide* ([online](#))

with most positions weighted towards the lower end of this range. Hays 2020 salary survey indicates median salaries of \$107,000 a year for Perth, and \$122,000 a year for Melbourne⁴⁵. Robert Walters 2020 Salary Survey indicated median annual salary for a security analyst in Melbourne to be \$123,000 and \$109,000 in Perth.⁴⁶ These market rates are eight to 20 per cent lower than AEMO's estimated base salary cost for this type of position.

- AEMO allocated its Solutions Architect to tier 4. A market-based search for solutions architect positions indicated annual salaries ranged from \$130,000 to \$200,000. Positions at the upper end of the salary range tended to be lead level positions and the packages included bonuses making it difficult to identify base salaries. Hays survey indicated a median annual salary of \$160,000 for Melbourne and \$140,000 for Perth.⁴⁷ Robert Walters indicated an annual median salary of approximately \$150,000 for both Perth and Melbourne.⁴⁸ Market rates for this position are between 30 per cent and 40 per cent lower than AEMO's estimated base salary cost for this type of position.

All of AEMO's unit labour rates, excluding on costs such as payroll tax, long service leave and performance incentives, are higher than the average market labour rates as shown in Table 5. On average across all positions AEMO's base salary rates exceeded the indicative market rate by 26 per cent.⁴⁹

Table 5: Percentage by which AEMO base salary rates are higher than equivalent market base salary rates

AEMO labour cost tier	AEMO base salary rate % above market rate
Tier 1 – Analyst and administrative roles	31
Tier 2 – Senior level roles	19
Tier 3 – Principal and Lead roles	25
Tier 4 – Manager and specialist roles	44

Source: ERA analysis of AEMO submission and public data on market rates

Two thirds of AEMO's internal labour costs, approximately \$6 million, is for 22 new contract hires in the WEM. Of these, 16 positions will be hired for more than one year over the remainder of the AR5 period. AEMO has confirmed that the new hire positions will have contracts terminated after the work has been completed.

AEMO has used its five tier unit labour rates to estimate the cost of contract staff positions. However, AEMO's five tier labour rates are calculated based on existing staff costs and include allowances for performance rewards and long service leave. The ERA considers that a prudent service provider seeking the lowest practicable sustainable costs would not apply AEMO's unit day rates, including performance incentives of up to 15 per cent, and long-service

⁴⁵ Hays, 2020, FY 2020/21 Salary Guide – Australia and New Zealand, pp83-89

⁴⁶ Robert Walters, 2020, Salary Survey 2020 – Australia and New Zealand, pp98-103

⁴⁷ Hays, 2020, FY 2020/21 Salary Guide – Australia and New Zealand, pp83-89

⁴⁸ Robert Walters, 2020, Salary Survey 2020 – Australia and New Zealand, pp98-103

⁴⁹ Excluding the tier 5 Group Manager for which limited information was provided

leave of 2.7 per cent above salary and superannuation to new contract hires, particularly when market rates for comparable positions are substantially lower.⁵⁰

In the absence of information to assess AEMO's proposed labour costs, the ERA has recalculated AEMO's total internal labour costs to deliver DER activities using publicly available market-based rates. This calculation suggests that AEMO's estimated internal resources are costed at \$2.4 million above market rates.

The ERA cannot apply market rates to existing staff as this would be inconsistent with AEMO's Enterprise Bargaining Agreement. Therefore, the ERA's initial view is to apply market rates only to new contract hires. This would reduce internal staff costs by \$1.7 million.

4.1.2 Comparison with staff costs in the public sector

The Public Sector CSA Agreement 2019 sets the salaries for 30,767 State Government employees in general division, executive and specified callings roles.⁵¹

In its tier 2 salary rate AEMO's submission identifies positions titles such as Analyst - Senior Regulatory Affairs, Data Management Analyst, Senior Engineer, IT Database Administrator and Project Manager. AEMO's tier 2 salary rate is equivalent to a level 8 in the public sector, usually a manager or assistant director. For example, the level 8 position Manager ICT Strategy and Governance in the Department of Health:

Is responsible for managing the team in the development and coordination of complex, strategic ICT special projects, with particular focus on supporting the effective and robust governance, planning, decision-making and delivery of ICT across the WA health system and implementing the WA Health Digital Strategy 2020-2030.⁵²

AEMO's tier 3 salary is on par with a Class 1 executive, such as an Executive Director, while AEMO's tier 4 salary is almost 10 per cent above the top level in the Agreement, for a Class 4 executive.⁵³

Tier 3 positions include: Senior Project Manager, IT Cloud Engineer, Solutions Designer and DER Market Principal. As an example of a Class 1 position, the Director Data and Information Systems in the Department of Health would be responsible for 53 staff and expected to:

- Lead the management and implementation of health information systems and associated strategies that support the planning, commissioning of health services, and the performance management, monitoring and reporting of Health Service Providers.
- Provide leadership and direction on data systems & cloud technologies, collections and registries, web application development, data management and linkage techniques and approaches, business intelligence & data science tools, reporting systems and data repositories to support timely provision of meaningful information across all knowledge domains.⁵⁴

⁵⁰ Fair Work Commission website, AEMO Agreement class 4.1(b), pp. 16 and 28 ([online](#)), accessed 29 October 2020. AEMO's enterprise bargaining agreement has provisions for a "performance reward" of up to 15 per cent of the base salary and superannuation subject to corporate performance and employees meeting the minimum employment performance requirements of their role.

⁵¹ As at June 2019, the Public Sector CSA Agreement covered 30,767 employees and 27,399 Full Time Equivalent employees, ([online](#))

⁵² Advertised ([online](#))

⁵³ WA Public Sector CSA Agreement 2019. Schedules 2 and 3 ([online](#))

⁵⁴ Advertised ([online](#))

Most staff proposed by AEMO at the tier three level would be expected to have a high level of management responsibility and/or be expected to have substantial technical expertise and experience to be employed at an equivalent base salary in the Western Australian Government sector.⁵⁵

The Public Sector CSA Agreement also allows for professionals to be remunerated on the basis of their qualification and experience without necessarily taking on the management tasks expected of a level 8 or Class 1. Specified callings positions require a specific qualification and experience, such as legal or engineering degrees.⁵⁶

AEMO's tier 4 salary is higher than level 10, the highest rate available for specified callings positions in the public sector. As an example, level 6 specified calling positions would be chief engineers, general counsel for a large department, or specialists in the health sector. The ERA understands that no staff have been employed as specified callings on the basis of their ICT qualifications or experience.

Staff employed in similarly named roles on major State Government ICT programs, depending on their level of experience and the complexity of the project, are typically employed in levels 5 to 8 under the Public Sector CSA Agreement 2019. The equivalent position titles in AEMO's DER program would be remunerated at rates significantly above the public sector levels. For example, an IT test manager in the public sector is usually a level 6 (with a base salary of \$102,966 to \$113,590), while at AEMO, the same position title is listed as tier 4 with a base salary nearly 100 per cent above the top of the public sector range.

Appendix 2 provides more detail on position titles, the relevant tier and base salaries.

4.2 Property costs

AEMO has included property costs as part of a fixed occupancy charge per FTE hour applied to all internal and external staff and contractors. Although AEMO has explained that the property cost charge includes "rental, floorspace, utilities and consumables", these have not been separately identified in the single charge. AEMO indicated that additional floor space would be required at its office to accommodate additional staff working on the DER roadmap actions but did not indicate when or how much additional floorspace would be required.

In its AR5 final determination, the ERA noted that:

AEMO's accommodation strategy now includes options such as requiring consultants to work from their own premises and hot desking to minimise the need for additional office space. This demonstrates that AEMO has sought to restrict its accommodation costs.⁵⁷

AEMO did not provide information confirming that it had applied this strategy when setting the accommodation element in its property charge. The option of hot-desking may no longer be appropriate given health and safety arrangements adopted by most organisations to protect staff through the COVID-19 pandemic. However, the ERA understands that AEMO continues to encourage staff, including contractors, to work part of their time from home. Given the extended nature of these arrangements and that AEMO has continued to work on WEM

⁵⁵ The leadership capabilities required for all levels are available [here](#)

⁵⁶ Officers with relevant tertiary qualifications or equivalent determined by Labour Relations. Clause 12 Public Service Award [here](#)

⁵⁷ ERA, 2019, *Australian Energy Market Operator Allowable Revenue and Forecast Capital Expenditure 2019/20 to 2021/2022 – Final Determination*, pp. 26-27 ([online](#))

reforms while working from home, an option may be to enable some new contract staff to work on this basis. This would limit the need for additional floor space.

The ERA considers that AEMO has not provided sufficient evidence to justify this property cost and the ERA's initial view is to not approve the proposed \$0.4 million property cost.

4.3 Project contingency

AEMO undertook a risk assessment of each DER roadmap action and from this calculated a project contingency. There were two categories of risk assessment:

- the risk that resource costs would vary from the forecast
- the risk that the cost of hardware, software and licences would vary from the forecast.

AEMO identified changes in the mix of internal and external resources, changes in the complexity or the scope of the project and any other feasible risk such as exchange rate risk.

The ERA supports AEMO maintaining a risk-based approach to determining project costs consistent with the approach approved by the ERA in AR5.

In its final determination for AR5, the ERA made the following observations:

- Historically, AEMO's actual expenditure has been below the approved level of allowable revenue and forecast capital expenditure. There may be several reasons for this such as poor cost estimation, good cost management, projects being cancelled or projects being deferred.
- Some of the project risks identified, such as exchange rate risk could work in AEMO's favour.
- There is no demonstrated feedback loop between AEMO's actual experience of managing project risk, utilising project contingency and its estimation of contingency for new projects.⁵⁸

The 15 per cent project contingency AEMO has calculated for DER actions appears high, given the nature of the proposed expenditure. The ERA does not support AEMO's project contingency estimates because:

- There are 24 internal NEM staff identified to work on DER roadmap actions. AEMO's submission did not indicate whether these NEM positions will not be backfilled and the risk of these staff not being available appears minimal.⁵⁹ Therefore it is not necessary to include changes in resource risk in the calculated project contingency.
- There are nine existing WEM staff that will be transferred to work on DER roadmap actions. AEMO has indicated these positions will be backfilled. The contingency amounts approved by the ERA in AR5 included an allowance for changes in staffing mix that will already apply to the backfill positions for these nine staff and does not need to be approved again in this funding submission.
- In its final AR5 determination, the ERA dismissed exchange rate risk as requiring a contingency as the only component of the funding submission that would possibly have exposure to any exchange rate risk would be the hardware and software. The total value

⁵⁸ Ibid, p. 32

⁵⁹ AEMO, 2020, *Adjustment to 2019-22 Forecast Capital Expenditure – DER Roadmap Implementation Costs*, p. 21, ([online](#))

of this component is just over a million dollars so any exchange risk would be small. AEMO's annual report states that on occasion AEMO enters into foreign currency contracts to minimise currency risk. Using low cost hedging products such as foreign currency options or forward exchange contracts would fix the price of any foreign currency purchases and eliminate any exchange rate risk.

There may be some residual project risk, for example an unexpected change in the scope or complexity of a project, such that specialist, higher cost resources are required or different IT platform requirements are needed.⁶⁰

The DER roadmap actions with the highest project contingences identified by AEMO are:

- The DER register (action 15 in AEMO's submission) with a project contingency of 22 per cent, or \$0.2 million.
 - AEMO stated that the DER register project contingency was a combination of the project requiring some software development to enable the DER register to interface with WEM IT systems and the risk of a project extension and the necessary retention of the project team.⁶¹
- The DER orchestration pilot (actions 22 and 23 in AEMO's submission) with a project contingency of 20 per cent or \$1.6 million.
 - AEMO applied the 20 per cent contingency to the DER orchestration pilot because "platform/software development" was required.⁶² Given that AEMO intends to use off the shelf software to deliver the pilot, this attracts a lower contingency than the 30 per cent starting point AEMO typically uses for assessing contingency for an IT project.

Combined, these project contingencies are \$1.8 million, which can be accommodated within the 10 per cent above forecast capital expenditure, that AEMO is able to spend before it needs to apply to the ERA for a budget uplift.

On this basis, the ERA's initial view is to not approve proposed funding of \$2.4 million to cover project contingency in the final determination.

4.4 Capitalisation policy, intangible assets and future benefit

In May 2020, AEMO provided estimated cost information as part of Energy Policy WA's DER consultation paper. These costs are compared with the current proposal in Table 6 below.

⁶⁰ Ibid, p. 45.

⁶¹ Ibid, p. 46.

⁶² Ibid, p. 47.

Table 6: AEMO's cost estimates for DER in May and September 2020

Project	DER cost estimate in May 2020 ⁶³		DER cost estimate in September 2020 ⁶⁴		Variance	
	Operating costs	Capital costs	Operating costs	Capital costs	Operating costs	Capital costs
Technology integration	2.7	0.5	0	3.8	(2.7)	3.3
DER participation	2.1	3.3	0	2.6	(2.1)	(0.7)
DER orchestration	0.1	3.5	0	11.0	(0.1)	7.5
DER register	0	0.9	0	1.5	0	0.6
Total	4.9	8.2	0	18.9	(4.9)	10.7

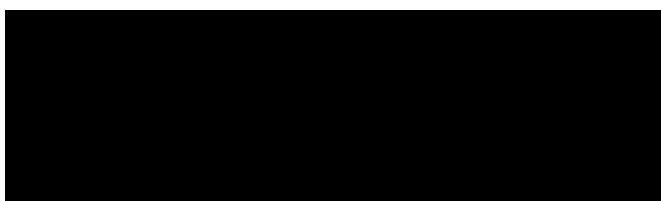
Source: ERA analysis of AEMO data

In May 2020, AEMO's initial estimate of its DER implementation costs was \$13.1 million in total, 37 per cent was identified as forecast operating expenditure and 63 per cent was forecast capital expenditure. In its September submission, AEMO's total DER implementation costs had risen to \$18.9 million and AEMO had chosen to capitalise some of its expenditure on DER activities in line with the Australian Accounting Standards Board (AASB) 138 – Intangible Assets.⁶⁵

In additional information provided to the ERA, AEMO noted that the DER project would deliver:

New and enhanced capabilities developed, systems, protocols, procedures and technical specifications/prototypes built (and more) in order to incorporate DER into the power system. These can be considered either intellectual property (IP) or actual technology assets created.

AEMO acknowledged that intellectual property developed through DER activities is an intangible asset, which is controlled by AEMO and from which future economic benefits are expected to flow to AEMO. The intellectual property can be separated and shared with or sold to third parties if desired. In confidential information provided to the ERA, AEMO has identified the future benefit of the intangible assets will be realised as:



Many of the actions outlined in the DER Roadmap lead anticipated national work programs. Examples include the work on inverter standards and communications as well as the virtual power plant pilot (Project Symphony).

⁶³ Energy Transformation Taskforce, 2020, *DER Roadmap Implementation Rule Change – Industry Consultation Paper* (4 May 2020), pp. 9 and 13 ([online](#))

⁶⁴ AEMO, 2020, *Adjustment to 2019-22 Forecast Capital Expenditure – DER Roadmap Implementation Costs*, p. 3. ([online](#))

⁶⁵ Australian Accounting Standards Board, 2020, AASB 138 – Intangible Assets ([online](#)) accessed 29 October 2020.

The benefit of linking or harmonising systems and knowledge between the NEM and the WEM is the value of intellectual property that can be spread and recovered across both markets and a wider cost base. It is reasonable for AEMO to use the intellectual property gained from conducting WEM-based DER activities in the NEM. If some of the benefit from AEMO's involvement in the DER roadmap actions is to be transferred out of the state and used in other Australian jurisdictions, then these jurisdictions could bear some of the costs incurred in acquiring the intellectual property. Electricity customers in the SWIS should not be funding benefits that are realised by NEM customers. However, AEMO's proposal did not discuss how the value from the intangible assets created through DER activities would be captured, commercialised, or transferred in the interest of market participants.

Of the 55 internal staff working on DER activities, 16 per cent are existing WEM staff. The 40 per cent who are contract staff will leave after the DER work is complete and the remaining 44 per cent of NEM staff, will return to work in the NEM once DER activities are completed. This effectively transfers the knowledge and experience gained in the DER roadmap activities and the intellectual property from the WEM to the NEM. For this reason, the ERA considers that AEMO should reconsider how much of the costs for NEM employees involved in DER roadmap actions should be allocated to the WEM.

The ERA has concerns about whether all of the DER activities can or should be capitalised. Unless AEMO can demonstrate how and where the future value of these intangible assets will be realised, the ERA's initial view is to treat some or all of the costs as operational expenditure.

4.5 Effect of ERA's findings on DER forecast capital expenditure

The ERA has included its findings and analysis on unit labour rates, property costs and contingency and used these figures to recalculate AEMO's forecast capital expenditure on DER roadmap activities. If the ERA assumes all DER costs are capitalised and the ERA's initial views were to be implemented in the final determination, the ERA would approve approximately \$14.4 million in forecast capital expenditure for AEMO's DER activities. This is a reduction of approximately \$4.5 million on AEMO's proposal.

This information is provided in Table 7 by cost category and in Table 8 by workstream.

Table 7: Draft report calculation of DER forecast capital expenditure compared to AEMO's proposal by cost category for DER activities in AR5

Cost category	AEMO proposed (\$ million)	ERA draft finding (\$ million)	Variance (%)
Internal labour	9.0	7.3	(18)
External labour*	5.4	5.4	-
Hardware*	0.2	0.2	-
Software*	0.9	0.9	-
Travel*	0.1	0.1	-
Property	0.4	0	(100)
Financing*	0.5	0.5	-
Contingency	2.4	0	(100)
Total	18.9	14.4	(24)

Source: ERA analysis

Note: Items marked * have not been considered in the draft report but will be considered in the final determination.

In the draft findings report, forecast capital expenditure reduces to approximately \$14.4 million. This is \$4.5 million, or 24 per cent, lower than the \$18.9 million forecast capital expenditure AEMO proposed in its submission.

The ERA has also recalculated the expenditure by workstream to reflect the findings in the draft report. This is shown in Table 8 for comparison against AEMO's submission.

Table 8: Draft report calculation of DER forecast capital expenditure compared to AEMO's proposal by workstream for DER activities in AR5 (\$ million)

Workstream	AEMO proposed	ERA draft findings	Variance (%)
DER register	1.3	0.9	(25)
DER participation	2.2	1.6	(28)
Technology Integration	3.3	2.3	(30)
DER orchestration	9.5	7.3	(23)
Program support	2.6	2.2	(16)
Total	18.9	14.4	(24)

Source: ERA analysis

The ERA will consider stakeholder feedback on the draft report along with the remaining elements of AEMO's submission in the final determination. These include:

- How AEMO has determined the quantity and type of resources required to deliver the DER roadmap action.

- Proposed external consultant and contractor unit labour costs
- Proposed financing and travel costs
- Proposed hardware and software costs.

Appendix 1 History of allowable revenue and forecast capital expenditure proposals and approvals AR3-AR5

Table A1: Comparison of proposed and approved funding over the last three funding approval periods

\$'000s (nominal)	AR3 - 1 July 2013 – 30 June 2016			AR4 – 1 July 2016 – 30 June 2019			AR5 – 1 July 2019 – 30 June 2022					
	IMO proposed	ERA approved	Variance (%)	AEMO proposed	ERA approved	Variance (%)	AEMO proposed	ERA approved	Variance (%)	AEMO revised proposed	ERA revised approved	Variance
Total allowable revenue	91,800	88,182	(3.9)	114,344	99,265	(13.2)	104,241	105,895	1.6	-	-	-
Independent Market Operator/Market operator	48,776	48,776	-	53,972	44,263	(18.0)	42,764	44,795	4.7	-	-	-
System management	43,024	39,403	(8.4)	54,494	49,386	(9.4)	55,584	55,033	(0.99)	-	-	-
GSI	6,919	6,919	-	5,878	5,619	(4.4)	5,893	6,067	3.0	-	-	-
Total forecast capital expenditure	12,006	10,734	(10.6)	51,264	33,232	(35.2)	78,477	66,324	(15.5)	85,175	80,677 (draft)	(5) (draft)
Independent Market Operator/Market operator	6,274	6,274	-	31,530	16,091	(49.0)	38,637	34,469	(10.8)	-	-	-
System management	5,271	3,999	(24.1)	18,616	16,023	(13.9)	38,566	31,322	(18.8)	-	-	-
GSI	461	461	-	1,118	1,118	-	1,274	533	(58.2)	-	-	-

Appendix 2 Salary comparison

Table A2: Comparison of AEMO's proposed base salaries with equivalent positions in the public and private sectors

Examples	Position type	Tier 1	Tier 2	Tier 3	Tier 4
AEMO average base salary	Commercial in Confidence				
WA Public Sector General Agreement 2019 ⁶⁶ Base salary June 2020	Specified Callings ⁶⁷	L4 \$125,885	L5 \$142,046	L6 \$162,164 L7 \$183,637	L9 \$202,794 L10 \$212,375
	General division	L7 \$119,725	L8 \$135,296	L9 \$154,689	
	Executive			Class 1 \$175,438 Class 2 \$184,588	Class 3 \$193,725 Class 4 \$202,869
Western Australian CEO base salary examples (July 2019) ⁶⁸	WA Police Service: Assistant Commissioners				\$212,337
	Worksafe Commissioner				\$200,000
	Chief Information Officer				\$220,000
Western Power ⁶⁹	Professional Workstream: Grades and base pay at September 2019	Engineering 8.1 \$130,596 Network and Systems Controller 8.1 to 8.2 \$134,443 to \$139,099	Engineering 8.2 to 10.1 \$135,118 to \$161,411 Others 8.2 to 10.2 \$131,025 to \$163,041	Engineering 10.2 \$168,157	
Synergy ⁷⁰	Total fixed remuneration at February 2019 (includes super, excludes allowances, performance bonus)		Grade 8 \$132,559		
AEMO ⁷¹	Schedule A. Classifications and remuneration rates for 2020 (excludes super and allowances)	275 to 301 points: \$120,011 to \$129,693	307 to 323 points: \$131,930 to \$137,925	404 to 432 points: \$168,416 to \$180,040	

⁶⁶ WA Public Sector CSA Agreement 2019. Schedules 2 and 3 ([online](#))

⁶⁷ Officers with relevant tertiary qualifications or equivalent determined by Labour Relations Clause 12 Public Service Award [here](#)

⁶⁸ Determination of the Salaries and Allowances Tribunal – Special Division 2 July 2019. Salary excludes vehicle (notional value \$20,300) and super ([online](#))

⁶⁹ Western Power and Australian Services Union Enterprise Agreement 2017. 13 December 2017 ([online](#))

⁷⁰ Synergy Perth Enterprise Agreement 2018. 28 February 2019 ([online](#))

⁷¹ AEMO Enterprise Agreement 2018. 31 October 2018 ([online](#))

Digital Transformation Agency ⁷²	Base rates on commencement (excludes super and allowances)	EL 2.3 \$138,669	EL 2.4 \$143,038 EL 2.5 \$146,104		
Australian Public Service ⁷³	Median base salaries 2019 (excludes bonuses and super)	EL 1 \$115,005	EL 2 \$142,556		SES 1 \$202,910
Western Australian Local Government ⁷⁴	CEOs: Total Reward Package (includes base salary, leave loading, all allowances and superannuation)		Band 4 \$128,226 to \$200,192 Examples: Shires of Morawa and Peppermint Grove	Band 3 \$157,920 to \$259,278 Examples: Shires of Halls Creek and Kalamunda	Band 2 \$206,500 to \$319,752 Examples: Shires of Broome and Esperance

⁷² Australian Government Digital Transformation Agency Enterprise Agreement 2018-2021 ([online](#))

⁷³ Australian Public Service Commission, Remuneration Report 2019, Chapter 3, Base Salary ([online](#))

⁷⁴ Local Government Chief Executive Officers and Elected Members Determination No 1 of 2020. 8 April 2020. ([online](#))

Table A3: State Government indicative ICT roles and level and AEMO position tier grading

Position title in State Government ICT programs ⁷⁵	Public Sector Agreement, general division level ⁷⁶	Public Sector Agreement, general division salary range ⁷⁷	Position title by AEMO employment tier	AEMO employment tier base salary
IT test manager	6	\$102,966 to \$113,590	4	████████
Tester	4, 5 or 6	\$80,452 to \$113,590	2	████████
Project managers	6, 7 or 8	\$102,966 to \$146,609	2	████████
Program Manager	8	\$146,609	3	████████
Developers	5, 6 or 7	\$89,047 to \$128,033	2, 3, and 4	████████████████
Solutions architects	6 or 7	\$102,966 to \$128,033	4	████████
Enterprise Architects	7	\$119,725 to \$128,033	4	████████
ICT Administrators	5 or 6	\$89,047 to \$113,590	2	████████
Cloud engineers	5, 6 or 7	\$89,047 to \$128,033	3	████████
Data management analysts	5, 6 or 7	\$89,047 to \$128,033	2	████████
Business Analyst	6 or 7	\$102,966 to \$128,033	2	████████
Digital Transformation Manager	6 or 7	\$102,966 to \$128,033	3	████████
Data Scientist	6, 7 or 8	\$102,966 to \$146,609	2	████████
Data Analyst	5, 6 or 7	\$89,047 to \$128,033	2	████████

Source: ERA analysis

⁷⁵ Based on positions advertised on the WA Government Jobs Board and on information shared informally by State Government agencies.

⁷⁶ WA Public Sector General Agreement 2019. Schedule 2 ([online](#))

⁷⁷ WA Public Sector General Agreement 2019. Schedule 2 ([online](#))