

Allowable Revenue and Forecast Capital Expenditure for the Australian Energy Market Operator 2016/17 - 2018/19

Final Determination

16 December 2016

Economic Regulation Authority

WESTERN AUSTRALIA

Economic Regulation Authority

4th Floor Albert Facey House
469 Wellington Street, Perth

Mail to:

Perth BC, PO Box 8469
PERTH WA 6849

T: 08 6557 7900

F: 08 6557 7999

E: records@erawa.com.au

W: www.erawa.com.au

National Relay Service TTY: 13 36 77
(to assist people with hearing and voice impairment)

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Determination

1. In September 2016, the Australian Energy Market Operator (**AEMO**) submitted a proposal for AEMO's Allowable Revenue and Forecast Capital Expenditure (**proposal**), for the period 2016/17 to 2018/19 (**AR4**), to the Economic Regulation Authority (**Authority**). The proposal was submitted in accordance with the requirements of clause 2.22A.2 of the Wholesale Electricity Market Rules (**WEM Rules**) and clause 108 of the Gas Services Information Rules (**GSI Rules**).
2. AEMO's proposal is available on the ERA's website.
3. On 27 October 2016, the Authority issued a notice inviting submissions on the proposal and an issues paper to assist interested parties in understanding and making submissions on the proposal. Four submissions were received and are available on the Authority's website.
4. In making its determination, the Authority has taken into account the matters set out in clause 2.22A.11 and 1.20.3 of the WEM Rules and clause 109 of the GSI Rules. The Authority has considered market reform expenditure separately in its review. The Authority's determination of AEMO's allowable revenue and forecast capital expenditure, excluding market reform, is set out in Table 1 below.
5. The Authority's determination has adjusted AEMO's proposed allowable revenue to ensure the costs for functions previously undertaken by the Independent Market Operator, but not transferred to AEMO, have been excluded from AEMO's approved allowable revenue.
6. The Authority has approved AEMO's proposed forecast capital expenditure, excluding expenditure for market reform.

Table 1 Authority determination of AEMO allowable revenue and forecast capital expenditure for AR4- excluding market reform expenditure (\$'000 nominal)

	2016/17	2017/18	2018/19	Total
Allowable Revenue				
Authority Determination				
WEM Market Operations	15,616	13,312	13,555	42,483
System Management	16,665	17,090	14,558	48,313
GSI	1,962	2,097	1,560	5,618
Total approved allowable revenue	34,243	32,498	29,673	96,414
AEMO Proposal				
WEM Market Operations	16,376	13,709	14,679	44,764
System Management	16,665	17,090	14,558	48,313
GSI	2,040	2,150	1,688	5,878
Total proposed allowable revenue	35,081	32,949	30,925	98,955
Difference	(838)	(451)	(1,252)	(2,541)
Forecast capital expenditure				
Authority Determination				
WEM Market Operations	1,779	2,830	1,678	6,287
System Management	4,828	2,769	120	7,717
GSI	229	496	393	1,118
Total approved capital expenditure	6,836	6,095	2,191	15,122
AEMO Proposal				
WEM Market Operations	1,779	2,830	1,678	6,287
System Management	4,828	2,769	120	7,717
GSI	229	496	393	1,118
Total proposed capital expenditure	6,836	6,095	2,191	15,122

Source: ERA

7. AEMO's proposal also included expenditure to implement the systems for the new market design arising from the Electricity Market Review (EMR). AEMO's proposal was based on the high-level market design developed by the EMR and a planned implementation date of 1 July 2018.
8. The WEM Rules include provisions for AEMO to prepare for and facilitate implementation of wholesale electricity market reforms endorsed by the Minister for Energy. This includes the entire reform package set out in the report published by the Public Utilities Office of the Department of Finance entitled "*Final Report: Design*".

Recommendations for Wholesale Energy and Ancillary Service Market Reforms” published in July 2016.¹

9. The WEM Rules require the Authority to make its determination on the basis that the reform package set out in the “*Final Report: Design Recommendations for Wholesale Energy and Ancillary Service Market Reforms*” is implemented by 1 July 2020.
10. AEMO’s proposed expenditure is set out in the table below.

Table 2 AEMO Proposed Market Reform Expenditure (\$’000 nominal)

	2016/17	2017/18	2018/19	Total
Allowable Revenue				
WEM Market Operations	743	2,505	5,957	9,205
System Management	989	1,583	3,611	6,183
Total proposed allowable revenue	1,732	4,088	9,568	15,388
Forecast capital expenditure				
WEM Market Operations	13,782	10,922	539	25,243
System Management	5,083	4,469	1,347	10,899
Total proposed capital expenditure	18,865	15,391	1,886	36,142

11. Following submission of AEMO’s proposal, it became apparent that the legislation to transfer network regulation to the national framework would not be passed during this Parliamentary period. The timelines for implementation and details of the design are currently under review by the EMR.
12. AEMO made a submission to the Authority on 5 December 2016 noting the uncertainties and advising that it had taken measures to “flatten its resources ramp up and defer signing up of significant expenditure”. The Authority agrees this is a prudent approach.
13. AEMO’s submission provided information on the timing of its proposed market reform expenditure. Table 3 below sets out the expenditure AEMO considers it will incur regardless of the timing, or final detail, of the reformed market. Expenditure it considers needs further review, once there is greater clarity on timing and market design details, is shown in the final column. AEMO proposes resubmitting this deferred expenditure for approval at a later date.

¹ This rule change was gazetted on 9 December 2016.

Table 3 AEMO revised proposed Market Reform Expenditure (\$'000 nominal)

	2016/17	2017/18	2018/19	Total	Deferred
Allowable Revenue					
WEM Market Operations	393	232	758	1,384	7,821
System Management	320	331	0	651	5,532
Total proposed allowable revenue	713	563	758	2,035	13,353
Forecast capital expenditure					
WEM Market Operations	4,861	1,743	428	7,031	18,212
System Management	4,954	2,948	0	7,902	2,997
Total proposed capital expenditure	9,814	4,690	428	14,933	21,209

14. In the time available for this decision to be made,² it was not possible for the Authority to review the revised information. The Authority notes there are also some uncertainties in the market design which may be clarified over the next month.
15. Accordingly, the Authority has not approved any of AEMO's proposed Market Reform Expenditure in this determination.
16. The Authority, in consultation with AEMO, the EMR and other market participants will undertake further review of AEMO's revised proposal over the next few months.
17. The reasons for this determination are set out below.

² The Market Rules require the Authority to publish this decision by 16 December 2016.

Reasons for the Determination

Legislative Requirements

18. The Authority is responsible for determining the allowable revenue AEMO can recover for the services it provides. AEMO's services are:³
 - operating the WEM market and system management functions, as set out in the WEM Rules;
 - preparing for and facilitating the implementation of Wholesale Electricity Market Reform;⁴ and
 - operating the Gas Bulletin Board and preparing the Gas Statement of Opportunities as required under the GSI Rules.
19. AEMO submitted its allowable revenue proposal to the ERA in September 2016. This is AEMO's first allowable revenue submission since assuming responsibility for WEM and GSI functions on 30 November 2015. The IMO and System Management previously undertook these functions. This submission replaces previous submissions made by the IMO and System Management in November 2015 and February 2016 respectively.
20. The allowable revenue determined by the Authority forms the basis for AEMO's annual budgets. Market fees, which are charged based on the volume of energy generated or consumed by market participants, are adjusted each year to reflect the annual budget. Annual adjustments arising from differences between forecast and actual expenditure are also made to account for surpluses or deficits in revenues from market fees and system operation fees.
21. AEMO must apply to the Authority to reassess its allowable revenue if its budget proposal is likely to result in revenue over the three-year allowable revenue period being more than 15 per cent greater than the amount determined by the Authority. That is, the annual budget may vary from the allowable revenue determination, provided the total expenditure over the three-year period only varies by up to 15 per cent. Capital expenditure can vary by up to 10 per cent over the three-year period before AEMO is required to apply for a reassessment.

AEMO's Proposal

22. AEMO's total proposed allowable revenue and forecast capital expenditure are set out in Table 4 below.

³ Clauses 2.1A and 2.2 of the WEM Rules and clause 107 of the GSI Rules provide a detailed list of AEMO's functions and services.

⁴ This rule applies until 1 July 2020. Wholesale Electricity Market Reform means any proposed changes to the operation of the WEM or the legislative regime applying to the WEM (including the *Electricity Industry Act*, the WEM Regulations and WEM Rules) that have been endorsed by the Minister, whether or not legislation has been made to implement it. This includes the entire reform package set out in the report published by the Public Utilities Office of the Department of Finance entitled "Final Report: Design Recommendations for Wholesale Energy and Ancillary Service Market Reforms" published in July 2016.

Table 4 AEMO proposed allowable revenue and forecast capital expenditure for AR4 (\$'000 nominal)

	2016/17	2017/18	2018/19	Total
WEM Market Operations Allowable Revenue	17,121	16,214	20,638	53,973
WEM System Management Allowable Revenue	17,652	18,675	18,168	54,495
GSI Allowable Revenue	2,040	2,151	1,687	5,878
Total Allowable Revenue	36,813	37,040	40,493	114,346
WEM Market Operations Forecast Capital Expenditure	15,562	13,752	2,216	31,530
WEM System Management Forecast Capital Expenditure	9,912	7,238	1,467	18,618
GSI Forecast Capital Expenditure	228	496	392	1,116
Total Forecast Capital Expenditure	25,702	21,486	4,075	51,263

Source: AEMO proposal (Tables 1 and 4)

23. AEMO's proposed allowable revenue and forecast capital expenditure includes:

- Business as usual costs (**BAU costs**). These are costs to provide the services in their current form. Outlining these costs separately allows comparisons against previous periods, and the identification of efficiencies or additional costs.
- System management transfer costs. These are the costs of transferring the system management function from Western Power to AEMO. This reflects additional expenditure arising from separating the functions from Western Power and creating an independent market and system operator in the WEM. This includes setting up a security desk in the new AEMO Perth office.
- Market reform projects. These are the planning and establishment costs associated with AEMO's development and implementation of new procedures and systems to comply with the amended WEM requirements being developed by the Electricity Market Review. This includes the Wholesale Settlements and Power System Operations work streams in AEMO's Western Australia Market Reform Program, which will run over the next two to three years.
- New office fitout costs. AEMO will be moving to a new office facility, which is capable of housing all employees and the necessary infrastructure to provide the workspace and environment for it to develop standalone systems and prepare for the new market structures.

24. Table 5 below shows a summary of total allowable revenue and forecast capital expenditure classified under these four categories. The table also includes the total expenditure approved for the previous allowable revenue period (AR3) and actual expenditure during AR3.

Table 5 AEMO proposed allowable revenue and forecast capital expenditure by category for AR4 (\$'000 nominal)

	Approved AR3	Actual AR3	BAU AR4	System Manage- ment Transfer	New Office fitout	Total AR4 excluding market reform	Market Reform
Allowable Revenue							
Market Operations	48,776	47,894	44,768	-	-	44,764	9,205
System Management	39,405	38,914	40,197	8,116	-	48,313	6,183
GSI	6,919	6,059	5,878	-	-	5,878	-
Total	95,100	92,867	90,843	8,116	0	98,955	15,388
Forecast Capital Expenditure							
Market Operations	6,274	6,189	4,786	-	1,502	6,287	25,243
System Management	3,999	961	2,205	3,213	2,299	7,717	10,899
GSI	461	673	917	-	199	1,118	-
Total	10,734	7,823	7,908	3,213	4,000	15,122	36,142

Source: AEMO

25. The proposed BAU costs are lower than those approved for the previous period. However, compliance and rule making functions undertaken by the IMO during AR3 will not be undertaken by AEMO in the AR4 period. The proposed allowable revenue also includes one-off costs for transitioning the system management function from Western Power to AEMO and building new market systems to accommodate the Electricity Market Review reforms.

Approach to assessment

26. The purpose of the Authority's determination of AEMO's allowable revenue and forecast capital expenditure is to ensure that the costs incurred by AEMO are efficient. That is, AEMO's allowable revenue is equal to the costs that would be incurred by a prudent provider acting efficiently and seeking to achieve the lowest practicable and sustainable cost of delivering the services.
27. The Authority has compared AEMO's proposed allowable revenue with costs incurred by the IMO and System Management during AR3, adjusting for functions that did not transfer to AEMO. The assessment of the proposal against costs in AR3 has been applied to costs of a recurrent nature and involved:
- establishing base costs from the actual costs incurred, corrected for any abnormal or non-recurring costs during the periods;
 - identifying and assessing the changes in costs embodied in the allowable revenue proposals that are in the nature of "trend changes", reflecting cost drivers such as an increasing scale of operations and inflation of unit costs; and
 - identifying and assessing the changes in costs embodied in the allowable revenue proposals that are in the nature of "step changes", reflecting changes in the nature of activities being undertaken (such as where new functions or

activities are assumed or removed), or changes in the manner in which activities are undertaken (such as transfers of certain activities from being undertaken in-house to being undertaken by contractors).

28. The Authority has compared AEMO's forecast capital expenditure with capital expenditure approved in AR3. The Authority sought further supporting information for capital projects to ensure the information was sufficient to demonstrate the expenditures were incurred by a prudent provider of services, acting efficiently and seeking to achieve the lowest practicably sustainable cost of delivering those services.
29. The Authority has also:
 - identified and assessed whether recurring expenditure requirements and payments are recovered in the year of the expenditure;
 - assessed whether amounts of depreciation and amortisation included in the allowable revenue have been appropriately determined from capital expenditure;
 - assessed whether the costs incurred by the AEMO for both the performance of functions in connection with the WEM Rules or GSI Rules and the performance of AEMO's other functions have been allocated on a fair and reasonable basis.
30. The Authority engaged Geoff Brown and Associates to provide technical advice and assistance. The report is available on the Authority's website.

Benchmarking

31. Clauses 2.22A.11(c) of the WEM Rules and 109(4) of the GSI Rules require the Authority, where possible, to benchmark AEMO's allowable revenue against the costs of providing similar services in other jurisdictions. In the past, the Authority found there were no directly comparable entities to IMO and System Management in other jurisdictions in terms of scale of operations, the structure of the businesses and the nature of activities.
32. The GSI services are similar to the gas bulletin board and gas statement of opportunities AEMO provides for the eastern states gas markets. AEMO's proposed GSI allowable revenue for 2016/17 of \$2 million compare favourably with its forecast for the eastern states markets for 2016/17 of \$3.2 million.⁵
33. The Authority has compared AEMO's costs for providing services as the market and system operator for the National Electricity Market (**NEM**), and the combined costs of the market operator and system operator for the WEM.⁶

⁵ AEMO Consolidated Final Budget and Fees 2016-17 p. 23
<https://www.aemo.com.au/media/Files/About%20AEMO/Budget%20and%20Fees/2016/AEMO%20Consolidated%20Final%20Budget%20and%20Fees%20201617.pdf>

⁶ Market operator functions were undertaken by the IMO until 30 November 2015 and system management functions were undertaken by Western Power until 30 June 2016. AEMO has been responsible for both functions since those respective dates.

34. Table 6 below provides a comparison of unit costs based on customer load. While the total annual costs (\$ million) of the WEM are less than the NEM, the unit costs (\$/MWh) of the WEM are more expensive than the NEM.
35. There has been little change in the NEM unit costs since 2007/08, while the unit costs of the WEM have varied due to changes in the operation of the market, particularly following introduction of the new balancing market and load following ancillary service market in July 2012.

Table 6 Comparison of unit costs based on customer load

Financial Year	NEM ⁷ \$ million	WEM ⁸ \$ million	NEM GWh	WEM GWh	NEM \$/MWh	WEM \$/MWh
2007/08	69.25	14.73	190,561	16,052	0.36	0.92
2008/09	70.05	14.11	195,514	17,200	0.36	0.82
2009/10	73.71	13.52	189,232	17,239	0.39	0.78
2010/11	76.08	17.94	193,083	17,517	0.39	1.02
2011/12	74.14	20.03	190,639	19,185	0.39	1.04
2012/13	72.03	25.30	181,107	17,706	0.40	1.43
2013/14	67.88	28.38	180,075	18,382	0.38	1.54
2014/15	67.76	29.47	171,606	18,792	0.39	1.57
2015/16	66.84	30.33	178,122	18,866	0.38	1.61

Source:

ERA, Allowable Revenue Determination for the IMO 2013/14 to 2015/16 (for 2007/08 to 2012/13 data)
AEMO, Budget and Fees reports

36. The Electricity Authority manages the New Zealand electricity market. System management functions are outsourced to Transpower (the national transmission company) for around \$38 million⁹ per annum and other market operator functions are outsourced to various parties at an annual cost of around \$11 million. Based on annual energy of around 42,000 GWh, this is approximately \$1.18 per MWh.
37. The Singapore market is around 47,000 GWh per annum. The Energy Market Authority spends around \$66 million¹⁰ per annum, which equates to about \$1.40 per MWh.
38. It is likely the WEM will always be more expensive (on a \$/MWh basis) than larger markets, such as the NEM, that are able to leverage economies of scale.
39. Bluewaters Power's submission notes the difference between the NEM and WEM fees. Bluewaters recommends the Authority should seek to narrow the rate gap to the maximum extent possible by seeking opportunities to further reduce duplication

⁷ Includes general fees and allocated fees as set out in AEMO's annual budgets.

⁸ Includes IMO and System Management prior to AEMO taking on market operator and system management functions.

⁹ Reserve Bank of Australia, Exchange Rates, Units of foreign currency per A\$, 15 December 2016, (1 AUD = 1.0448 NZD), <http://www.rba.gov.au/statistics/frequency/exchange-rates.html>

¹⁰ Reserve Bank of Australia, Exchange Rates, Units of foreign currency per A\$, 15 December 2016, (1 AUD = 1.0665 SGD), <http://www.rba.gov.au/statistics/frequency/exchange-rates.html>

¹¹ The Energy Market Operator is also responsible for industry development and regulation so not directly comparable with AEMO.

of functions (and costs) between the NEM and WEM operations in addition to those already proposed by AEMO.

40. As is discussed further below, AEMO is currently maintaining a stand-alone Western Australian office. It is also facing significant organisational change over the next few years as it consolidates the system management function and prepares for market reform.
41. The Authority agrees with Bluewaters' view that efficiencies could be achieved by reducing duplication of functions and costs between the NEM and WEM operations. Adopting AEMO's system management and market systems to implement the EMR reforms should provide further opportunities for reducing costs in the WEM. However, the Authority recognises it will take time for AEMO to implement these changes, so such efficiencies will fall outside the AR4 period.
42. As is discussed further below, the Authority will undertake further review of market reform expenditure. As part of this review it will seek further information from AEMO of any future efficiencies which can be achieved through merging NEM and WEM operations.

Public submissions

43. As required by clause 2.22A.2(b) of the WEM Rules and clause 108A(3) of the GSI Rules, the Authority undertook public consultation on AEMO's proposal, including publishing an issues paper on 27 October 2016 and inviting public submissions. The closing date for submissions was 11 November 2016. Submissions were received from Synergy, Alinta Energy, Bluewaters Power and NewGen Power.¹² Matters raised in these submissions are discussed in relevant sections of the decision below.
44. Further submissions were received in December from Western Power, APA Group and Moonies Hill Energy. These submissions raised concerns that delays in implementing the new market design, particularly the introduction of a security constrained dispatch engine, affect Western Power's ability to connect new generation. Copies of the submissions are available on the ERA's website.

Allowable Revenue (excluding Market Reform)

45. The table below sets out AEMO's proposal for allowable revenue, excluding costs relating to market reform. A discussion on each item is set out in the following sections.

¹² These submissions are available from the Authority's website. The submissions of Bluewater and NewGen were accepted as late submissions (received on 15 November 2016).

Table 7 AEMO proposed allowable revenue for AR4- excluding market reform (\$'000 nominal)

	2016/17	2017/18	2018/19	Total AR4
Market Operations BAU	16,376	13,709	14,679	44,764
GSI BAU	2,040	2,150	1,688	5,878
System Management BAU	14,646	14,520	11,031	40,197
System Management transfer	2,019	2,570	3,527	8,116
Total System Management	16,665	17,090	14,558	48,313

BAU costs

46. Table 8 shows a breakdown of the BAU costs by category across the AR4 period and against the 2015/16 approved and actual cost.

Table 8 Proposed BAU costs by category for AR4 (\$'000 nominal)

	2015/16 approved	2015/16 actual	2016/17 proposed	2017/18 proposed	2018/19 proposed
Market Operator					
Employee benefits expenses	6,102	6,368	5,168	5,122	5,917
Accommodation	784	726	767	939	735
Supplies and services	4,984	3,992	4,867	5,135	5,425
Borrowing	254	423	154	120	143
Depreciation	4,562	4,416	5,423	2,392	2,459
Total Market Operator BAU	16,686	15,925	16,379	13,709	14,680
GSI					
Employee benefits expenses	794	750	716	712	803
Accommodation	102	96	102	124	97
Supplies and services	727	460	540	550	554
Borrowing	103	68	21	32	25
Depreciation	683	586	661	732	209
Total GSI BAU	2,409	1,960	2,040	2,150	1,688
System Management					
Employee benefits expenses	5,782	6,254	6,009	6,576	5,803
Accommodation	-	-	456	592	489
Supplies and services	3,555	3,846	6,848	5,440	3,887
Borrowing	641	407	-	-	-
Depreciation	3,669	3,673	1,333	1,912	852
Total System Management BAU	13,647	14,180	14,646	14,520	11,031
Total					
Employee benefits expenses	12,768	13,372	11,892	12,410	12,522
Accommodation	886	822	1,325	1,655	1,321
Supplies and services	9,266	8,298	12,254	11,125	9,866
Borrowing	998	898	175	152	168
Depreciation	8,914	8,675	7,416	5,037	3,520
Total BAU	32,742	32,065	33,062	30,379	27,398

Market Operator and GSI BAU

47. To enable a comparison between years, employee benefit expenses, accommodation and supplies and services costs have been converted to real terms in Table 9 below. The corresponding approved expenditure for AR3 is based on an assumed inflation rate of 2.9 per cent for employee benefit expenditure and 2.5 per cent for other expenditure, consistent with the baseline assumptions used by AEMO in preparing its proposal.

Table 9 Proposed BAU costs by category for AR4 (\$'000 nominal and real)

	Total Approved AR3	Total Actual AR3	2016/17 proposed	2017/18 propos ed	2018/19 propos ed	Total proposed AR4
Nominal						
Market Operator						
Employee benefits expenses	17,521	18,281	5,168	5,122	5,917	16,205
Accommodation	2,252	2,119	767	939	735	2,441
Supplies and services	15,000	12,763	4,867	5,135	5,425	15,427
GSI						
Employee benefits expenses	2,352	2,328	716	712	803	2,231
Accommodation	303	276	102	124	97	323
Supplies and services	2,176	1,631	540	550	554	1,644
Real						
Market Operator						
Employee benefits expenses	18,541	19,339	5,167	4,978	5,587	15,732
Accommodation	2,365	2,226	767	916	700	2,383
Supplies and services	15,765	13,431	4,866	5,010	5,164	15,040
GSI						
Employee benefits expenses	2,491	2,466	716	692	758	2,166
Accommodation	318	290	102	121	92	315
Supplies and services	2,287	1,718	540	537	527	1,604

48. AEMO has continued to maintain a single corporate function for its West Australian operations. Cost allocations between the WEM and GSI are consistent with those adopted for AR3. As discussed further below, a share of AEMO's board costs has been allocated to the WEM and GSI.

Employee benefits expenses

49. Actual employee benefit expenses during AR3 were around 4 per higher than the values approved by the Authority for AR3. The IMO restructured its operations during

AR3 and added additional staff.¹³ The approved AR3 costs included rule making and compliance functions which do not apply to AEMO during the AR4 period.

50. AEMO's proposed employee costs for AR4 are lower than the actual and approved expenditure for AR3. The Authority has reviewed detailed salary costings provided by AEMO to support its proposed employee benefits cost. In undertaking its review, the Authority noted a number of costs which it considers should not be included in the BAU employee costs. These include:
 - positions for rule making or compliance, which are no longer functions of AEMO
 - a portion of salary costs for employees working on the market reform.
51. As the organisation structure has changed significantly since the ERA last reviewed allowable revenue, making comparisons with AR3 is difficult. This is compounded by the functions undertaken by AEMO being different from those undertaken by the IMO.
52. To calculate an efficient employee benefits benchmark cost, the Authority has used information from its AR3 determination. Using this information, the Authority identified staff performing rule making or compliance functions.¹⁴ Based on its review, the Authority identified twelve positions which included some element of rule-making or compliance activities. A portion of corporate costs would also apply to these staff.
53. The Authority recognises an element of these positions will still be required by AEMO to monitor compliance and develop rule changes. The Authority considers a reduction of 75 per cent of the salary costs for the positions identified is a reasonable estimate of the reduction in functions and associated corporate costs.
54. The Authority also identified and excluded costs of the IMO board, which were included in employee benefit expenses for AR3. The adjusted employee benefits expenditure has been indexed each year based on AEMO's enterprise agreement of 2.9 per cent per annum.
55. Table 10 below sets out the Authority's determination of the efficient benchmark employee benefit cost, together with the adjustment required to AEMO's proposal.

¹³ The IMO's 2015/16 Operational Plan included 45.7 FTE's compared with the 41.2 positions included in the AR3 approved expenditure.

¹⁴ This included staff in the market development and compliance teams.

Table 10 Authority Determination of employee benefit expenses (\$'000 nominal)

	2015/16 AR3	2015/16 adjusted	2016/17	2017/18	2018/19	Total AR4
Market Operator						
AEMO Proposal			5,167	5,122	5,916	16,205
Authority Determination	6,102	4,767	4,905	5,047	5,194	15,147
Adjustment		(1,335)	(262)	(75)	(722)	(1,058)
GSI						
AEMO Proposal			716	712	803	2231
Authority Determination	750	621	639	658	677	1973
Adjustment		(129)	(77)	(54)	(126)	(258)

Accommodation

56. AEMO is relocating to a new office in September 2017 to enable market operation and system management staff to be in a single location. The new office will include a control room.
57. The proposed accommodation costs are similar to those approved and incurred during AR3. The increase in expenditure during the 2017/18 year is to return the current premises to their initial condition, as required under the lease.
58. The Authority has reviewed the process AEMO undertook to select its new premises. The Authority considers the process and criteria used by AEMO to select the new office to be robust and thorough.
59. The Authority considers AEMO's proposed accommodation costs to be reasonable.

Supplies and services

60. The IMO's actual expenditure for supplies and services during AR3 was 15 per cent lower than the expenditure approved. The Authority has used actual expenditure for 2015/16, which is similar to the actual expenditure for 2014/15, as the starting point to assess efficient expenditure for the AR4 period.
61. In its review of supplies and services costs, the Authority identified AEMO's proposed expenditure included some items attributable to functions which did not transfer to AEMO.¹⁵ AEMO has acknowledged this error.
62. AEMO's proposed expenditure includes a cost allocation to recover a portion of AEMO's board costs. Under the IMO, board costs were included in employee benefit expenses. The AEMO cost allocation is based on the total actual costs reported for 2015-16 of \$1.2 million and allocated between the NEM and WA based on

¹⁵ Consultancy services for rule changes and reviews of ancillary services, relevant level methodology and reliability criteria.

headcount. This resulted in approximately \$100,000 per annum allocated to the WEM market operations and \$12,000 to GSI. This is subject to 2.5 per cent annual cost inflation.

63. The Authority considers the allocation of AEMO board costs to be reasonable. As noted in paragraph 51 above, employee benefit costs have been adjusted to remove the IMO Board costs.
64. The Authority has determined supplies and services costs as set out in Table 11 below. The determination values are based on 2015/16 actual expenditure with the corporate recovery for AEMO's board, plus the addition of one-off items for telecommunications identified by AEMO. The cost has been indexed each year for inflation increases of 2.5 per cent.

Table 11 Authority determination of supplies and services expenditure (\$'000 nominal)

	2016/17	2017/18	2018/19	Total AR4
Market Operator				
AEMO Proposal	4,866	5,135	5,426	15,427
Authority Determination	4,368	4,812	5,024	14,204
Adjustment	(499)	(323)	(401)	(1,223)

Borrowing

65. The proposed borrowing costs for AR4 are lower than AR3 as a result of reductions in outstanding debt.¹⁶ The forecast costs are based on an interest rate of 3.3 per cent.
66. The Authority has reviewed AEMO's calculation of borrowing costs and considers the forecast to be reasonable.

Depreciation

67. Total proposed depreciation for AR4 is \$11.9 million compared with \$14.8 million approved for AR3. The reduction reflects declining asset values¹⁷ offset by accelerated depreciation during AR4, assuming assets are retired when the new market comes into effect.
68. The Authority has reviewed detailed depreciation workings provided by AEMO and is satisfied. Taking account of actual and forecast expenditure and the depreciation rates used, the Authority is satisfied the proposed depreciation forecasts are reasonable.

Summary

69. The table below sets out the Authority's determination of allowable revenue for market operator and GSI BAU costs.

¹⁶ Total approved borrowing costs for AR3 were \$1.5 million compared with total proposed borrowing costs for AR4 of \$0.5 million.

¹⁷ For example, depreciation on the systems implemented for the new balancing market ends in 2017 as the expenditure was capitalised over 5 years from July 2012.

Table 12 Authority Approved Market Operator and GSI BAU costs by category for AR4 (\$'000 nominal)

	2016/17 approved	2017/18 approved	2018/19 approved
Market Operator			
Employee benefits expenses	4,905	5,047	5,194
Accommodation	767	939	735
Supplies and services	4,368	4,812	5,024
Borrowing	154	120	143
Depreciation	5,423	2,392	2,459
Total Market Operator BAU	15,616	13,312	13,555
GSI			
Employee benefits expenses	639	658	677
Accommodation	102	124	97
Supplies and services	539	551	552
Borrowing	21	32	25
Depreciation	661	732	209
Total GSI BAU	1,962	2,097	1,560

System Management BAU and Transfer Costs

70. In addition to BAU costs, AEMO submitted costs for transferring the system management function from Western Power to AEMO. The table below summarises AEMO's proposed BAU and transfer costs for System Management.

Table 13 AEMO proposed System Management BAU and transfer costs by category for AR4 (\$'000 nominal)

	Total AR3	2016/17	2017/18	2018/19	Total AR4
BAU					
Employee benefits expenses	16,790	6,009	6,576	5,803	18,388
Accommodation	926	456	592	489	1,537
Supplies and services	9,142	6,848	5,440	3,887	16,175
Borrowing	2,205	-	-	-	-
Depreciation	10,342	1,333	1,912	852	4,097
Total	39,408	14,646	14,520	11,031	40,197
Transfer costs					
Employee benefits expenses		2,019	1,560	1,658	5,237
Supplies and services		-	737	1,541	2,278
Depreciation		-	273	328	601
Total		2,019	2,570	3,527	8,116
Total System Management					
Employee benefits expenses	16,790	8,028	8,136	7,461	23,625
Accommodation	926	456	592	489	1,537
Supplies and services	9,142	6,848	6,177	5,428	18,453
Borrowing	2,205	-	-	-	-
Depreciation	10,342	1,333	2,185	1,180	4,698
Total	39,408	16,665	17,090	14,558	48,313

71. A comparison of employee benefit expenses, accommodation and supplies and services costs is set out in Table 14 below, expressed in both nominal and real terms.

Table 14 AEMO proposed System Management BAU and transfer costs by category for AR4 (\$'000 nominal and real)

	Total Approved AR3	2016/17 proposed	2017/18 proposed	2018/19 proposed	Total Proposed AR4
Nominal					
BAU					
Employee benefits expenses	16,790	6,009	6,576	5,803	18,388
Accommodation	926	456	592	489	1,537
Supplies and services	9,142	6,848	5,420	3,887	16,154
Transfer costs					
Employee benefits expenses		2,019	1,560	1,658	5,237
Supplies and services		-	737	1,541	2,278
Real					
BAU					
Employee benefits expenses	17,778	6,009	6,391	5,481	17,880
Accommodation	973	456	578	465	1,499
Supplies and services	9,605	6,847	5,288	3,700	15,835
Transfer costs					
Employee benefits expenses		2,109	1,516	1,566	5,191
Supplies and services			719	1,467	2,186

72. Total BAU employee costs are similar to those approved for AR3. However, accommodation costs have increased, reflecting the transfer of the control room from Western Power's control centre in East Perth to a new control room within the Perth CBD.
73. AEMO will continue to operate the system management function from the control room in Western Power premises until September 2017, at which time all Perth staff will move into a single new AEMO Perth office. Provision has been made for the use of Western Power's control room as a back-up control room until June 2018 at an estimated cost of \$0.12 million.
74. The apparent large increase in supplies and service costs is due to the transfer of system management functions from Western Power to AEMO. Depreciation and borrowing costs previously directly incurred by Western Power are now being provided as a service under a commercial agreement and have been included in supplies and services.

75. The apparent large reduction in borrowing costs and depreciation arises due to all borrowing costs and depreciation for Western Power owned assets being included in supplies and service costs.
76. AEMO's proposal includes (separately identified) expenditure to ensure the continuity of service while mitigating risk to AEMO and customers.
77. System management transfer employee benefits expenses include:
- Six additional control room staff to operate a stand-alone security desk (that is, an increase from eight current control staff to 14 control staff).
 - Two additional FTEs for ongoing development and support of operating procedures, IT project management, training, independent security review of network outage requests, and transfer of other activities from Western Power (such as marginal loss factors and generator performance testing). This incorporates synergies from similar functions being undertaken in the NEM and will enable AEMO to fulfil the functions of an independent System Operator.
 - An allowance for the onboarding of new employees and a handover training period to cover System Management employees who do not transfer to AEMO is included. Western Power will provide a secondee service to fill any resource gap until suitable replacements can be recruited and trained.
78. System management transfer supplies and services include:
- An expected payment of \$0.67 million to Western Power for the written down value of System Management assets as at 30 June 2018. No existing Western Power assets are expected to be transferred to AEMO as part of the transfer of functions.
 - Redundant communications links are required between the new AEMO Perth Office, Western Power and the two Perth data centres to support ongoing utilisation of Western Power operational systems by AEMO for management of the southwest-interconnected system. These links are also required for the transfer of operational SCADA controls after the introduction of new market structures in 2018 and will be re-purposed.
79. System management transfer depreciation includes:
- control room fitout costs, which are allocated entirely to the transfer of function costs.
80. The Authority sought technical advice from Geoff Brown and Associates to undertake its assessment of system management BAU and transfer costs. A copy of the report is available on the ERA website.
81. In summary, Geoff Brown and Associates considered the proposed expenditure was reasonable and did not recommend any changes. Specific comments included:
- the increase in the number of control room operators on duty reflects AEMO's lower tolerance for risk than Western Power, though Geoff Brown and Associates does not consider this to be a criticism; and
 - costs have increased due to the separation of operations and maintenance responsibilities for IT systems as a result of system management moving from Western Power to AEMO.

82. Having considered the technical advice, the Authority has accepted AEMO's proposed expenditure for system management BAU and transfer costs.
83. The Authority recognises system management costs are higher in AR4 as a result of the transfer of function from Western Power to AEMO. In some areas it has been necessary to duplicate costs during the transition period. However, ensuring system security is essential to maintain supplies for consumers.
84. As is discussed further below, the Authority will be undertaking further review of market reform expenditure. As part of this review it will ensure it identifies any efficiencies in future system management operations as a result of adopting a fully automated dispatch engine rather, than the current processes which require manual intervention.

Forecast Capital Expenditure (excluding Market Reform)

85. The table below sets out AEMO's proposed forecast capital expenditure.

Table 15 Proposed Forecast Capital Expenditure (\$'000 nominal)

	Total AR3	2016/17	2017/18	2018/19	Total AR4
Market Operator					
BAU-WEMS	6,277	418	888	1,458	4,785
BAU-WA integration and alignment		1,361	440	220	2,021
New office fitout		-	1,502	-	1,502
Total	6,277	1,779	2,830	1,678	6,287
GSI					
BAU-GSI	460	133	117	243	493
BAU- architectural alignment		96	180	150	426
New office fitout			199		
Total	460	229	496	393	1,118
System Management					
BAU	4,000	1,615	470	120	2,205
Transfer costs		3,213			3,213
Office refit			2,299		2,299
Total	4,000	4,828	2,769	120	7,717
Total forecast capital expenditure	10,737	6,836	6,095	2,191	15,122

86. Total proposed expenditure, excluding office refit costs, are similar to the total values approved for AR3. The new office fitout costs will have no net cost as they are offset by a lease incentive payment which will be amortised over the life of the lease.

87. AEMO's proposal was based on an assumption that existing systems would be retired by 1 July 2018. Hence, the proposed BAU expenditure focussed on the minimum requirements for maintaining system security until the assets can be retired.
88. AEMO may need to review its proposed BAU expenditure to reflect any changes in timelines for retirement of the existing systems.
89. In the interim, the Authority has approved the proposed expenditure on the basis that the office refit costs will not increase costs for market participants (as they are offset by AEMO's lease incentive payment) and the remaining expenditure is similar to the level approved for AR3, so will not lead to an increase in costs for market participants.
90. The Authority will review the BAU expenditure, in conjunction with the review of market reform expenditure, if there is any change to the assumed retirement date set out in paragraph 87 above. As part of this review, it will ensure the overall expenditure is based on the most efficient option for maintaining existing systems and introducing new systems.

Market Reform

91. The table below sets out AEMO's proposed expenditure to build and implement the market systems needed to deliver the EMR reforms.

Table 16 AEMO Proposed Market Reform Expenditure (\$'000 nominal)

	2016/17	2017/18	2018/19	Total
Allowable Revenue				
WEM Market Operations	743	2,505	5,957	9,205
System Management	989	1,583	3,611	6,183
Total proposed allowable revenue	1,732	4,088	9,568	15,388
Forecast capital expenditure				
WEM Market Operations	13,782	10,922	539	25,243
System Management	5,083	4,469	1,347	10,899
Total proposed capital expenditure	18,865	15,391	1,886	36,142

92. AEMO's submission assumes that the reformed market, based on the high level design set out in the "*Final Report: Design Recommendations for Wholesale Energy and Ancillary Service Market Reforms*", is implemented on 1 July 2018.
93. Appendix A of AEMO's submission includes project benchmarking information for other large scale market changes including:
- The new balancing market and load following ancillary service market introduced in the WEM in 2012 (\$24 million);
 - Energy Management System upgrade by Western Power in 2016 (\$8.5 million);
 - AEMO Short Term Trading Market in 2008 (\$22 million); and
 - Electric Reliability Council of Texas new market program (US\$510 million).

94. Stakeholder submissions have raised a number of concerns regarding the proposed market reform expenditure. These are summarised below.
95. Synergy:
- “Aligning the WEM with national electricity market (NEM) operations presents advantages in terms of achieving economies of scale and scope. Synergy appreciates the economic benefits of consistency and standardisation across the electricity sector, and is optimistic the systems adopted for WA’s future energy markets will be efficient and sustainable. However, the unique requirements of the WEM, combined with the range of potential solutions available, means care should be taken to ensure all options are fully considered in relation to maximising benefit, and the most prudent solution is selected for the market as a whole.”
- “While at face-value, depending on the objectives, there is logic in adopting established systems and processes in new jurisdictions, the unique requirements of the WEM means existing NEM systems would likely need to be highly customised for the WA market. Synergy considers further evidence is required to understand whether customising AEMO’s existing systems is the most prudent option, or whether adopting new systems (which could potentially be rolled out elsewhere when NEM systems reach end-of-life) may be a more efficient solution for all market participants, including AEMO.”
96. Bluewaters’ submission considers AEMO’s choice of IT technology architecture is not likely to deliver “costs which would be incurred [only] by a prudent provider”.
97. Bluewaters states
- “It is understood that the IT technology architecture currently in place in the WEM is more advance[d] compared to that in the NEM. Hence, it is Bluewaters’ view that this proposed adoption may represent a step backwards in technology. Bluewaters considers it will not be prudent to require market participants to fund this technology downgrade, and to potentially re-upgrade in the future to the technology we currently have.”
98. Bluewaters also notes the proposed technology change, if implemented in the WEM, is likely to:
- “Compromise the reliability of the connectivity between the IT systems of market participants and AEMO. This would increase the market participants’ IT failure risks”; and
 - “Require market participants to increase their IT infrastructure investments to secure connectivity to AEMO’s IT system.”
99. Synergy notes that it will also have significant costs of its own to implement the required participant-side system and process changes for the WEM reforms.
100. Synergy notes the cost of energy market participation in WA is significant and is increasing.
- “Ultimately, all energy market costs are borne by end use energy customers, therefore Synergy is mindful of the need to ensure essential energy market reforms represent prudent costs and the benefits to consumers outweigh the costs.”
101. Synergy’s submission notes AEMO has not presented a “quantitative cost benefit analysis of the proposed market reform solution” or any “detail of alternative options considered”. Synergy also notes AEMO’s stakeholder engagement program regarding the new WEM and retail market systems is still underway. Consequently, Synergy is concerned the forecast capital expenditure and revenue requirement put forward by AEMO is:

“based on a market reform solution that has not yet been fully considered and tested with the market participants that will be expected to adopt it”.

102. Alinta’s submission notes it expects the proposed changes will result in more efficient dispatch of generating plant to meet customer load and ancillary service requirements while ensuring the system remains safe and reliable. It considers improved dispatch efficiencies should translate to reduced wholesale energy costs paid by customers. It notes an increase in fees is, to some extent, understandable as the proposed changes will transition the WEM to a “near real-time, individual facility based, multi-product competitive energy/ancillary service market”.
103. However, Alinta considers that, to ensure any material increases in fees are adequately justified, comparative benchmarking is necessary to determine the costs are appropriate and take full account of merger efficiencies arising from the consolidation of System Management and AEMO.
104. Alinta Energy recommends giving consideration to whether there are:

“options for a more gradual transition of the WEM’s current systems to those of the NEM. A more gradual transition may be more appropriate given the anticipated significant cost impact to current market participants as a result of almost every system in the WEM changing within a relatively short period of time.”
105. Alinta Energy also suggests:

“it may be more appropriate to maintain some of the WEM’s current technology (which it understands is more advanced than that used in the NEM on occasions) rather than incur the costs (to AEMO and market participants) of moving to adopt that of the NEM systems only to have to upgrade systems again in the near term as the NEM moves to upgrade its technology.”
106. Synergy has suggested that:

“Given the limited timeframe for the ERA’s determination on AEMO’s proposal (until 16 December 2016), and given new information will be available in the coming months (both from AEMO’s scheduled market reform stakeholder engagement process and forthcoming government energy policy decisions), the ERA may also wish to consider the possibility of extending the deadline for making its allowable revenue decision to allow all new information to be thoroughly considered.”
107. After the public consultation on AEMO’s allowable revenue closed, it became clear the bills required to transfer network regulation to the national framework would not be passed in this parliamentary period.
108. On 5 December 2016, AEMO provided a supplementary submission to the Authority advising that it was continuing to progress a number of BAU and market reform activities as set out in its original proposal, but had deferred other expenditure until greater clarity was provided.
109. A copy of AEMO’s supplementary submission is available on the ERA’s website. A summary of AEMO’s revised expenditure is set out in Table 17 below. AEMO proposes reviewing the expenditure identified as “deferred” and making a further submission in 2017.

Table 17 AEMO revised proposed Market Reform Expenditure (\$'000 nominal)

	2016/17	2017/18	2018/19	Total	Deferred
Allowable Revenue					
WEM Market Operations	393	232	758	1,384	7,821
System Management	320	331	0	651	5,532
Total proposed allowable revenue	713	563	758	2,035	13,353
Forecast capital expenditure					
WEM Market Operations	4,861	1,743	428	7,031	18,212
System Management	4,954	2,948	0	7,902	2,997
Total proposed capital expenditure	9,814	4,690	428	14,933	21,209

110. In December, the Authority received submissions from Western Power and prospective generators requesting that, despite any delays to EMR reforms, a partial constrained dispatch engine should be introduced by 1 July 2018 to facilitate connection of generators on a constrained basis. Copies of these submissions are available on the ERA's website.
111. The Authority's understanding from AEMO is that significant technical and legal work is required to implement Western Power's proposal in advance of the whole suite of EMR reforms.
112. In any case, funding for processes that do not form part of market operation and AEMO's market operator activities are not within the scope of the Authority's approval of allowable revenue. If the dispatch engine required by Western Power is not used for market operation, it will fall outside the scope of allowable revenue.
113. The purpose of the Authority's determination of AEMO's allowable revenue and forecast capital expenditure is to ensure that the costs incurred by AEMO are efficient. That is, AEMO's allowable revenue is equal to the costs that would be incurred by a prudent provider acting efficiently and seeking to achieve the lowest practicable and sustainable cost of delivering the services. The matters the Authority must take into account in this decision do not include determining the scope of services AEMO must provide or the design of the market.
114. The EMR has estimated the total implementation costs of the reforms across all market participants to be between \$60 million and \$100 million compared with quantifiable efficiency benefits and avoided costs arising from the reforms of between \$190 million and \$375 million in present value terms.¹⁸

¹⁸ Public Utilities Office of the Department of Finance, *Final Report: Design Recommendations for Wholesale Energy and Ancillary Service Market Reforms*, July 2016, p. 2.

115. The EMR has stated the cost of implementing alternative market and dispatch systems would be expected to be at least double the cost of adapting AEMO's existing systems.¹⁹
116. The Authority notes the benchmarking project data provided by AEMO. In particular, the costs for implementing the new WEM balancing market and load following ancillary service market amounted to \$24 million. These costs were based on bespoke IT systems developed by the IMO. The scope of the project was significantly less than the EMR reforms, which require replacement of all market systems for an estimated capital cost of \$36 million.
117. The Authority also notes, as flagged in its decision for AR3, the changes to WEM operations for the balancing and load following ancillary service markets had a significant effect on the core WEM systems as they were not designed for such a dynamic market. It was planned at that time to replace the core market systems in 2016/17, or in the event of a major change to the WEM design.
118. AEMO's proposed solution, based on adapting existing AEMO systems and processes, effectively provides a "free" software system. AEMO has not included any licencing fees for using its proprietary software.
119. The Authority considers AEMO's decision to defer and review market reform expenditure is a prudent approach given the current uncertainties around timing and specific design details. However, there has been insufficient time to adequately review AEMO's revised submission (received on 5 December 2016) by the allowable revenue decision deadline of 16 December 2016.
120. As noted in Synergy's submission:

"deferring the revenue determination to early 2017 should not adversely affect implementation of new market arrangements, as the WEM fees currently being collected for 2016/17 should adequately cover the planned project management and stakeholder consultation required in the short-term."
121. The Authority, in consultation with AEMO, the EMR and other market participants will undertake further review of AEMO's revised proposal over the next few months to enable a proper assessment of the proposed market reform expenditure.
122. The Authority will ensure the matters raised in stakeholder submissions are addressed by AEMO. In particular:
 - future efficiencies which can be expected as a result of adopting AEMO's systems and processes; and
 - reducing the costs for market participants to connect to the new systems and maintaining current functionality as far as possible.

¹⁹ Public Utilities Office of the Department of Finance, *Final Report: Design Recommendations for Wholesale Energy and Ancillary Service Market Reforms*, July 2016, p. 2.