AEMO Allowable revenue and forecast capital expenditure (AR6)

July 2022 to June 2025

Presented to WA Electricity Consultative Forum

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AR5 Overview- Opex (preliminary draft)

Current AR5 OPEX spend is forecast to be $5.8m lower (5.8%) at $94.3m

Influencing factors:

- COVID-19 cost savings
- Delays in project completion (PSO, SMST, RoPE Phase 2)

Partly offset by higher labour costs:

- Capex project go-live earlier than anticipated (e.g. GPS, Constraint Management)
- e-terra training effort required under-forecast.
- Overtime coverage due to COVID-19

AR5 Overview- Capex (preliminary draft)

AR5 completed and in-flight CAPEX (including WA DER) is forecast to be $3.4m favourable (4.3%) to the AR5 Determination at $76.9m

- See Appendix for discussion of influencing factors

Note that AR4 actual spend came in at $27.6m, $4.5m (14%) lower than AR4 Determination of $32.1m.

- Reductions mainly from PSO, SMST and RoPE projects that flowed into AR5.

AR6 Overview – 2022-23 to 2024-25

- AEMO recognises that the AR6 proposal represents a material increase in costs that are passed onto market participants and customers. However, we are confident this represents an efficient forecast to enable us to meet our objectives for the period:
    - Maintaining power system security and reliability in an ever challenging environment
    - Continuing to support the planning and delivery of the WA Government's Energy Transformation Strategy
    - Providing support and assistance for stakeholder queries

- During AR6 AEMO will:
    - implement and operate the new real-time energy and essential system services (ESS) market, which will enable more efficient dispatch, co-optimised services, and more competition.
    - support integration of Distributed Energy Resources (DER), keeping the power system secure and enabling DER participation in the market.
    - continue to support and operate the systems and processes required to allow participation in the market.

- AEMO is committed to delivering a functioning market within agreed timeframes and acceptable risk – at an efficient cost.

- The scale of reform to deliver and operationalise is a primary driver of the material increase in WEM fees in AR6.

Timeline

29 October 2021
17 December 2021
8 February 2022
by 31 March 2022
by 31 May 2022
ERA guidelines published
AEMO proposal submission
ERA Issues Paper
ERA Draft Determination
ERA Final Determination
Consultation period
Consultation period

Allowable Revenue overview

- Operating costs (excluding D&A) are forecasted to increase by $33.9 million over the period. This is due to the additional labour resources and IT systems required to operate the new, more sophisticated market, and to manage the system security risks posed by inverter-based generation.

Operational Cost Drivers

Energy Transformation Strategy outcomes	• Increased volume and complexity of activities associated with new market arrangements for RCM commencing 2021; operation of the new real time market from October 2023 and implementation of DER Roadmap actions.
Power system requirements	• New processes and increased power system modelling required to address operational challenges driven by increasing variability and low loads. AEMO must uplift its operational forecasting capabilities to keep pace with changing energy system characteristics and consumer trends. AEMO also requires an increase in control room operators to mitigate succession planning risk.
New obligations	• AEMO has new obligations (also largely driven by the WA Govt's ETS) commencing immediately relating to Network Access Quantity (NAQ) and Reserve Capacity cycle changes, and new obligations regarding Generator Performance Standards (GPS) and constraint modelling.
Ongoing market development	• AEMO has an ongoing obligation to conduct market development and evolution activities, including support for WEM/GSI Rule Proposals and support/implementation of further government policy initiatives. Market Development during AR5 has predominantly been captured under the WEM Reform CAPEX program. In AR6 costs will be increasingly expensed as part of 'business as usual' and therefore OPEX activity.
Operating requirements	• Increase in support function costs associated with growth in systems, processes and data management over the period. For example, the increase in the number of IT applications utilised by AEMO WA requires an uplift in IT resources to support the systems (e.g. transfer of applications from Western Power).

Capital Cost Drivers

- AR6 capex* comprises $50.4 million for finalising and implementing the new market arrangements, $10.7 million to deliver the WA Government's DER Roadmap actions, and $15.4 million to deliver IT lifecycle upgrades, cyber security enhancements, and improved operational capabilities.
- AEMO is focused on ensuring an efficient delivery of scope to achieve the operating timelines required for new obligations.
- AEMO has applied consistent rigor in it's allocation of capital projects to ensure WEM Market Participants are only contributing to projects that support their participation in the WEM through secure, reliable, and robust systems and processes.
- The capex forecast excludes projects that are insufficiently specified at this time, particularly the introduction of five-minute settlement (5MS) and implementing DER aggregator participation.

*Updated to latest capex forecast numbers as at end of Jan'21

Appendix 1
AR5 Capital Expenditure Summary

Project Status	AEMO Proposed	AR5 Final Determination	AR5 Actual/ Forecast	Actual/Forecast Variance to Final Determination	Actual/Forecast Variance to AEMO Proposed
Completed	7,012	6,983	15,138	- 8,155	- 8,126
In flight	82,118	69,238	61,412	7,826	20,706
Pipeline	4,211	2,118	350	1,767	3,861
Accommodation	3,870	2,054	-	2,054	3,870
TOTAL	97,211	80,392	76,900	3,492	20,311

Variance to the Final Determination key influencing factors

- Power System Operations (PSO) required $4.6m additional spend in AR5 due to upgrade to a new EMS version, underestimation of implementation complexities and, WEM specific requirements
- System Management Systems Transition (SMST) - $1.8m additional spend in AR5 due mainly to delayed spending from AR4 and changed sequencing to bring in before the PSO project
- Digital Roadmap – The ERA approved $4.7m of the $13.1m proposed. Digital Program is progressing with revised scope and full AR5 forecast of $3.2m
- WA DER is expected to be $4.4m lower due to reforecast of contingency and to align with partner and EPWA delivery plan.
- The WEM Reform Program is currently $6.9m below AR5 budget with implementation activities starting later than forecast with greater focus on market and regulatory design in AR5

Appendix 2
AR5 Capital Expenditure Detail

Project Status	WEM Projects	AEMO Proposed	AR5 Final Determination	AR5 Actual/ Forecast	Actual/Forecast Variance to Final Determination	Actual/Forecast Variance to AEMO Proposed
Completed	RC_2018_06 (Spinning Reserve Cost Allocation)	129	129	201	-72	-72
Completed	Business Continuity Capability	229	229	90	139	139
Completed	Malaga DC Infrastructure Refresh	-	-	633	-633	-633
Completed	RC_2018_07 Removal of Constrained Off Compensation	-	-	12	-12	-12
Completed	Removal of Resource Plans and Dispatchable Loads Rule Change	-	-	10	-10	-10
Completed	WA Electricity Demand Forecasting	-	-	80	-80	-80
Completed	PSO Project	516	516	5,130	-4,614	-4,614
Completed	POMAX - Oracle Database and Metering Upgrade	997	968	857	111	140
Completed	RoPE (Phase 2)	2,478	2,478	3,069	-591	-591
Completed	System Management System Transition	2,215	2,215	4,051	-1,837	-1,836
Completed	STEM Fortran Replacement	448	448	438	10	10
Completed	WEM Market Modelling – Phase 1	-	-	566	-566	-566
Completed	RC_2014_03 (Admin Improvements to Outage Process)	759	553	-	553	759

Appendix 2
AR5 Capital Expenditure Detail

Project Status	WEM Projects	AEMO Proposed	AR5 Final Determination	AR5 Actual/ Forecast	Actual/Forecast Variance to Final Determination	Actual/Forecast Variance to AEMO Proposed
In flight	Control Room BT Phone Upgrade	-	-	189	-189	-189
In flight	Combined CRM Initiatives	-	-	49	-49	-49
In flight	WA DER Roadmap	18,851	14,600	10,170	4,430	8,681
In flight	WEM Reform Tranche 1 and 2	47,228	47,228	40,903	6,325	6,325
In flight	PASA Process Improvement (ST and MT)	209	-	124	-124	85
In flight	Reserve Capacity Mechanism (RCM) Pricing *	2,750	2,750	2,150	600	600
In flight	Digital Roadmap - AR5 FY20 Approved Projects**	13,080	4,660	5,375	-715	7,705
In flight	Digital Roadmap - Additional FY20 Projects pending review			2,450	-2,450	-2,450
Pipeline	Rule Change Allowance	1,420	-	-	0	1,420
Pipeline	RTNET Upgrades			55		-55
Pipeline	Enhanced Control Room Tools	314	69	-	69	314
Pipeline	Improved Demand and RE Forecasting	89	89	95	-6	-6
Pipeline	Market Operator Interface in the WEM	363	363	-	363	363
Pipeline	BMO Tie-Break	-	-	84	-84	-84
Pipeline	Governance Risk Compliance Audit System	-	-	15	-15	-15
Pipeline	SM Ops Application Remediation	402	179	-	179	402
Pipeline	Life cycle support for H/W & S/W	864	864	101	763	763
Accomodation	Accomodation	3,870	2,054	-	2,054	3,870
	Total (Including WA DER Roadmap)	**97,213**	**80,392**	**76,900**	**3,492**	**20,311**

A number of these projects were partially or not approved in the AR5 Final Determination:

A Expenditure not approved in AR5 period as AEMO does not appear to have considered alternative approaches to managing the low risk audit findings to ensure quality and completeness of forecasts prior to publishing.

B The ERA agrees that AEMO requires a better system to enable controllers to log real time operational events that occur during each shift, and recognises the benefits this new logging tool will have. The ERA views the implementation of the MIAMI logging tool represents both an efficient and least cost solution given AEMO already uses this tool in the National Electricity Market. However the ERA does not approve forecast capital expenditure for the system inertia, Volt/VAr, and system strength tools as the operational needs and benefits of these tools were not clearly identified.

Resources

- Allowable Revenue (AR6) – AEMO proposal
- AR6 Proposal – WA Labour Supporting Information
- AEMO WA IT Roadmap 2022 - 2025
- ERA Issues paper

Questions and discussion