AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Non-market ancillary services (NMAS) cost and quantity report 2019-20

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An Annual Report required by the National Electricity Rules for the National Electricity Market

Important notice

PURPOSE

The purpose of this publication is to provide information about the:

- Quantities and costs of system restart ancillary services (SRAS) and network support and control ancillary services (NSCAS) acquired by AEMO in the National Electricity Market (NEM) for the financial year 2019-20.
- Acquisition of SRAS to meet the system restart standard for each electrical sub-network in the NEM.

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ABBREVIATIONS

Abbreviation	Expanded name
AEMO	Australian Energy Market Operator
NEM	National Electricity Market
NLAS	Network Loading Ancillary Service
NMAS	Non-Market Ancillary Services
NSCAS	Network Support and Control Ancillary Services
NER or Rules	National Electricity Rules
SRAS	System Restart Ancillary Services
SRS	System Restart Standard
TNSP	Transmission Network Service Provider
TOSAS	Transient and Oscillatory Stability Ancillary Service
VCAS	Voltage Control Ancillary Service

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1. Introduction

Ancillary services are essential to the management of power system security in the National Electricity Market (NEM).

AEMO acquires both market and non-market ancillary services under the National Electricity Rules (NER).

- Market ancillary services are acquired through central dispatch and the prices are determined using the dispatch algorithm.
- Non-market ancillary services (NMAS) are acquired under bilateral contracts. There are two types of NMAS that AEMO may acquire in its capacity as market and system operator: System Restart Ancillary Services (SRAS), and Network Support and Control Ancillary Services (NSCAS).

The remainder of this report provides information about the NMAS acquired by AEMO for the 2019-20 financial year.

1.1 System Restart Ancillary Services (SRAS)

SRAS can help restore electricity supply following a large-scale blackout of part or all of the power system. The Reliability Panel[1] is responsible for determining the system restart standard (SRS), which specifies the level of supply restoration for which AEMO is to procure system restart services.

AEMO must use its reasonable endeavours to acquire sufficient SRAS for each defined electrical sub-network to meet the requirements of the SRS.

For the purposes of the matters covered by this report for 2019-20, and estimates for 2020-21, the relevant version of the SRS is the SRS that was determined in December 2016[2] and applicable from 1 July 2018.

For historical data in this report up to and including the 2017-18 financial year – provided for comparative purposes – the relevant version of the SRS is the SRS that was determined in August 2013 and remained in effect until 30 June 2018[3].

1.2 Network Support and Control Ancillary Services (NSCAS)

NSCAS may be procured by Transmission Network Service Providers (TNSPs) to maintain power system security and reliability, and to maintain or increase the power transfer capability of the transmission network to maximise net economic benefits[4]. Such TNSP-procured NSCAS is not the subject of this report.

AEMO, in its role as Market Operator, can also procure NSCAS as a last resort to prevent an adverse impact on power system security and reliability. NSCAS procured by AEMO as Market Operator is reported in Section 3 of this report.

[1] The Reliability Panel is established under the National Electricity Law by the Australian Energy Market Commission (AEMC), and comprises representatives from the AEMC, AEMO, registered participants, and consumers. The Panel's responsibilities are specified in section 38 of the National Electricity Law and clause 8.8.1 of the NER.

[2] Available at https://www.aemc.gov.au/sites/default/files/2018-08/REL0057%20-%20Review%20of%20the%20System%20Restart%20Standard%20-%20Final%20Standard.pdf.

[3] Available at https://www.aemc.gov.au/sites/default/files/content//System-Restart-Standard-Reliability-Panel.PDF.

[4] For more information, see http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Ancillary-services/Network-support-and-control-ancillary-services-procedures-and-guidelines.

1.3 Non-market ancillary services (NMAS) reporting

AEMO is required, under clauses 3.11.10 and 3.13.5 of the National Electricity Rules (NER), to report annually on specified matters relating to the NMAS it has acquired.

This report includes:

- The number of contracted SRAS per NEM region and electrical sub-network for 2019-20 and for 2020-21.
- The total actual annual cost for provision of SRAS in 2019-20, broken down to charges for availability, testing and usage, for each electrical sub-network and each NEM region.
- The total estimated annual cost for provision of SRAS in 2020-21, broken down to charges for availability, testing, and usage, for each electrical sub-network and each NEM region.
- Whether SRAS were acquired to a level that meets the SRS for each electrical sub-network.
- The process followed by AEMO to acquire SRAS, if applicable.
- The quantities and types of NSCAS covered under existing ancillary services agreements.
- The actual costs and quantities of each facility contracted to provide NSCAS under ancillary services agreements.

For more recent actual (weekly) cost data for non-market ancillary services, see the AEMO website[5].

[5] See the Ancillary Services (AS) Payments Summary file at http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Ancillary-Services/Ancillary-Services-Payments-and-Recovery.

2. System Restart Ancillary Services

2.1 SRAS Procurement

AEMO currently has 12 SRAS contracts. Table 1 shows the number of SRAS by region and electrical sub-network.

Table 1 Number of SRAS acquired per region and electrical subnetwork – July 2018 to current

Region	Electrical sub-network	Number of SRAS
Queensland (QLD)	QLD North	2
	QLD South	2
New South Wales (NSW)	NSW	2
Victoria (VIC)	VIC	2
South Australia (SA)	SA	2
Tasmania (TAS)	TAS	2
Total		**12**

2.1.1 The process for acquiring SRAS

AEMO did not acquire any additional SRAS in 2019-20. The services listed in Table 1 are provided under contracts procured (or in one case extended) in 2017-18.

2.1.2 Meeting the SRS in 2019-20

For the 2019-20 year, there was sufficient contracted SRAS to meet the SRS for all electrical sub-networks.

For completeness, AEMO notes that the actual availability of one service was less than the required availability for that service as established by the terms of the relevant contract[6]. Although every SRAS has a contractual availability requirement of 90% or more, in 2019-20 that level was not achieved for one SRAS acquired for South Australia.

2.2 Costs of SRAS

2.2.1 General

The annual cost of SRAS is based on an aggregation of three types of payments to contracted providers:

1. Availability – $ per 30-minute trading interval.
   - The availability cost may vary, as it is paid only when the service is available. For example, it is not paid when plant used by the SRAS is out of service, or when the SRAS fails a test under the contract. For

[6] SRAS are procured to meet a minimum availability, which in turn contribute to meeting the required aggregate reliability for each electrical sub-network as specified by the SRS.

cost estimation purposes, however, AEMO takes a conservative approach, assuming the plant has full availability for the whole year.

2. Testing – fixed amount per successful test.
   - The testing charge, per test, is fixed in SRAS contracts. There are currently two separate requirements for SRAS tests, which means that there may be more than one test per SRAS per year:
     - Post-maintenance test[7]: within 20 business days after a period of maintenance that has the potential to materially affect the performance of the SRAS.
     - Short-notice test[8]: at a date and time nominated by AEMO with no less than five business days' notice.
3. Usage – fixed amount.
   - Paid only if the service is used in the event of a blackout.

2.2.2 2019-20 SRAS costs

Table 2 shows a comparison of the estimated and actual costs for 2019-20.

The difference between the estimated and actual SRAS costs for 2019-20 is attributable to the following:

- Availability costs were less than estimated, due to outages (100% availability is assumed in estimates).
- Testing costs were less than expected, as not all services required a post-maintenance test (outage programs were amended during the year).
- No usage payments were made.

Table 2 Comparison of 2019-20 estimated and actual SRAS costs

Sub-network	Number of SRAS	Estimated Availability ($)	Actual Availability ($)	Estimated Testing ($)	Actual Testing ($)	Estimated Usage ($)	Actual Usage ($)	Estimated Total ($)	Actual Total ($)
QLD North	2	880,489	880,508	489,434	489,434	30,349	0	1,400,272	1,369,942
QLD South	2	3,916,269	3,916,076	894,763	650,046	319,171	0	5,130,203	4,566,122
NSW	2	10,325,179	10,311,337	556,476	278,238	16,112	0	10,897,766	10,589,575
VIC	2	6,942,436	6,935,457	265,997	189,998	30,197	0	7,238,630	7,125,455
SA	2	5,917,395	5,724,391	167,460	199,511	12,727	0	6,097,583	5,923,901
TAS	2	5,686,681	5,686,762	548,714	548,714	1,013	0	6,236,408	6,235,475
Total	**12**	**33,668,449**	**33,454,531**	**2,922,843**	**2,355,940**	**409,569**	**0**	**37,000,862**	**35,810,471**

[7] For more detail see 4.3.2 (b) (i) in the SRAS Guideline: http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Ancillary_Services/SRAS-Guideline-2017.pdf?la=en

[8] For more detail see 4.3.2 (b) (ii) of the SRAS Guideline.

2.2.3 2020-21 estimates

Table 3 shows an estimated cost breakdown for the year 2020-21.

Table 3 Estimated SRAS costs for 2020-21

Sub-network	Number of SRAS	Estimated Availability ($)	Estimated Testing ($)	Estimated Usage ($)	Total Estimated ($)
QLD North	2	899,833	500,158	31,014	1,431,005
QLD South	2	4,001,990	914,368	326,164	5,242,522
NSW	2	10,544,382	568,668	16,465	11,129,515
VIC	2	7,094,661	232,993	30,859	7,358,513
SA	2	6,047,081	171,129	13,006	6,231,217
TAS	2	5,811,143	560,736	1,036	6,372,915
Total	**10**	**30,952,249**	**2,533,843**	**92,379**	**37,765,687**

For the availability cost, the forecast assumes 100% availability for each service. This is conservative, as most SRAS sources will have outages of some duration during a year.

For the testing cost, the forecast assumes 10 short notice tests[9] and 10 post-maintenance tests. The post-maintenance test count was based on the Medium Term Projected Assessment of System Adequacy (MT PASA).

For the usage cost, the forecast assumes an event once every 20 years, therefore a cost probability of 5% has been applied, based on contracted usage charges

Note, AEMO is currently running a tender process for new contracts starting 1 July 2021. The commercial outcome of this process may result in materially different SRAS costs from 1 July 2021.

2.2.4 Historical comparison of SRAS cost

Table 4 shows an historical comparison of SRAS costs over recent years.

The cost differences between the 2013-15 and 2015-18 periods is due to:

- A change in the structure of SRAS regions.
- A new set of contracts with a different commercial outcome.

The cost difference between the 2015-18 to 2018-current periods is due to:

- A new SRS.
- A new set of contracts with a different commercial outcome.

[9] One for each of the 10 SRAS, plus one for an SRAS that includes a back-up power station, which also requires a test.

Table 4 Comparison of SRAS costs from 2013-14 through to estimated costs for 2020-21

Sub-network	Actual 2013-14 ($)	Actual 2014-15 ($)	Actual 2015-16 ($)	Actual 2016-17 ($)	Actual 2017-18 ($)	Actual 2018-19 ($)	Actual 2019-20 ($)	Estimated 2020-21 ($)
QLD North	1,353,428	0	3,054,940	3,240,209	3,330,788	1,328,421	1,369,942	1,431,005
QLD Central	2,670,050	2,505,494	Qld North and Central regions merged					
QLD South	2,417,756	2,508,566	888,240	898,008	917,106	5,106,349	4,566,122	5,242,522
NSW North	12,019,875	11,848,415	New South Wales regions merged					
NSW South	7,364,417	7,580,205						
NSW			7,303,799	6,894,906	6,353,899	10,511,180	10,589,575	11,129,515
VIC North	7,489,905	8,215,237	Victorian regions merged					
VIC Latrobe Valley	6,600,562	6,771,223						
VIC			5,320,851	5,392,461	5,509,010	6,944,780	7,125,455	7,358,513
SA	3,233,916	3,470,570	2,173,957	1,589,134	1,764,049	5,772,405	5,923,901	6,231,217
TAS North	7,025,706	7,232,666	Tasmanian regions merged					
TAS South	3,358,736	3,468,402						
TAS			3,336,148	3,370,867	3,442,597	6,029,789	6,235,475	6,372,915
Totals	**53,534,351**	**53,600,778**	**22,077,936**	**21,385, 585**	**21,317,449**	**35,692,923**	**35,810,471**	**37,765,687**

3. Network Support and Control Ancillary Services

3.1 Types, quantity, and cost of Network Support and Control Ancillary Services (NSCAS)

AEMO's NSCAS Description[10] was amended in September 2020 and the types of NSCAS were revised to two broad categories aligned with the purposes of NSCAS – reliability and security, and market benefits. In its 'last resort' procurement role, AEMO can only acquire NSCAS in the reliability and security category.

In the 2019-20 year, the previous version of the NSCAS Description[11] described three types of NSCAS that could be acquired by AEMO:

1. Network Loading Ancillary Services (NLAS).
1. Transient and Oscillatory Stability Ancillary Services (TOSAS).
2. Voltage Control Ancillary Services (VCAS).

AEMO[12] did not acquire any NSCAS for the financial year 2019-20.

Table 5 summarises the quantities and costs of the NSCAS services over recent years.

[10] Available at: https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2020/ncas/2020-nscas-description-and-quantity-procedure.pdf?la=en

[11] Available at: https://aemo.com.au/-/media/files/pdf/nscas_quantity_procedure.pdf

[12] AEMO in the role of Market Operator is the subject of this report. Any ancillary services procured under other AEMO roles, such as Victorian TNSP, are not the subject of this report.

Table 5 Quantities and cost of NSCAS over the period 2012-13 to 2019-20, and estimated cost 2020-21

Facility	Region	NSCAS	Quantity	Cost 2012-13 ($)	Cost 2013-14 ($)	Cost 2014-15 ($)	Cost 2015-16 ($)	Cost 2016-17 ($)	Cost 2017-18 ($)	Cost 2018-19 ($)	Cost 2019-20 ($)	Estimate 2020-21 ($)
Combined Murray and Yass substations	NSW	VCAS	800 Mvar[A]	0	3,195,62	9,896,698	10,055,572	10,159,498	10,375,519	10,572,619	0	0
Combined Murray & Tumut power stations	NSW	VCAS	1,650 Mvar[B]	23,772,200	41,301,706	134,494	171,797	147,088	3,842,236	0	0	0
Totals				**23,772,200**	**44,497,327**	**10,031,191**	**10,227,368**	**10,306,586**	**14,217,755**	**10,572,619**	**0**	**0**

A. The maximum capacity available from this service.

B. The maximum capacity used at any one time over the years shown.