



**Additional compensation claims arising
from AEMO directions during billing weeks
5 to 8, 2022
DRAFT DETERMINATION**

An independent expert report for AEMO

8 June 2022

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1 Introduction

Synergies Economic Consulting (Synergies) was appointed by the Australian Energy Market Operator (AEMO) as an independent expert to determine additional compensation claims for a *directed participant* under clause 3.15.7B of the National Electricity Rules (NER) in relation to billing weeks 5 to 8 in 2022.

AEMO is required by the NER to use reasonable endeavours to complete all obligations, including final settlement, no later than 30 weeks after the end of the Direction(s). For the *directions* relating to billing weeks 5 to 8, the intervention timetable requires that a draft independent expert determination be delivered no later than 8 June 2022 and a final determination by 8 August 2022. This will allow AEMO to complete the intervention settlement process by the required deadline of 25 August 2022, 1 September 2022, 8 September 2022, and 15 September 2022 for *directions* occurring during billing weeks 5 to 8.

In accordance with the Intervention Settlement Timetable, Synergies is issuing this draft determination on 8 June 2022.

1.1 Structure of the report

In the remainder of this report, we set out the basis for our draft determination regarding additional compensation claims resulting from these directions under the NER, as follows:

- Section 2 summarises the circumstances of the *directions* and the additional compensation claim provisions of clause 3.15.7B relevant to the Claim;
- Section 3 provides details of the *directions* made and initial compensation amount determined;
- Section 4 provides an overview of the additional compensation amount claimed by the directed participant as a result of the *directions*;
- Sections 5 provides our analysis of the reasonableness of the additional compensation amount under the Claim; and
- Section 6 provides our draft determination.

2 Claims under clause 3.15.7B

This section summarises the circumstances of the *directions* and sets out the additional compensation claim provisions of clause 3.15.7B relevant to the Claims.

2.1 Basis of the *directions*

Section 116 of the NEL and clause 4.8.9 of the NER establish that AEMO may direct a *Registered Participant* to take relevant actions to maintain or restore the security or reliability of the power system.

During billing weeks 5 to 8 in 2022, AEMO issued several *directions* (refer to **Error! Reference source not found.** below) to a South Australian *market participant* to maintain the system in a secure operating state. In response, this *market participant* modified the operations of their generating units.

As a result of the operational responses to the *directions*, the *directed participant* incurred costs and is entitled to compensation under clause 3.15.7 of the NER, which sets out compensation based upon:

- the amount of the relevant market service which the *directed participant* has been enabled to provide in response to the *direction*; and
- the 90th percentile price of the relevant market service over the preceding 12 months.

In line with the Intervention Settlement Timetable, AEMO calculated *directed participant* compensation and notified the *directed participant* of the compensation payable under clause 3.15.7.

In addition to the additional compensation claims set out in the tables below, other claims were also made due to the *directions*. However, they were not assessed as part of this determination as any claims under \$20,000 are not required to be assessed by an independent expert under clause 3.12.2(1)(2) of the NER.

2.1.1 Managing system strength

Following changes to the NER in 2017¹, the South Australian region faces system strength issues (i.e., adequate fault currents) that are being and/or will be principally managed by:

¹ AEMC (2017) *National Electricity Amendment (Managing power system fault levels) Rule 2017*, 19 September.

- AEMO identifying fault level shortfalls at critical nodes in the network;
- Transmission Network Service Providers (TNSPs) performing the role of system strength service provider, with responsibility to procure system strength services, including from scheduled generators, to address fault level shortfalls as determined by AEMO; and
- AEMO directing specific scheduled generators to synchronise or remain online where necessary to ensure adequate system strength is maintained.

While these arrangements may in time prove sufficient to ensure system strength requirements are met in the future, the process of TNSPs procuring system strength services remains ongoing². In the meantime, AEMO has been ensuring adequate fault levels are maintained by applying operational procedures regarding permissible combinations of generators. Where the optimal supply solution determined by the NEM dispatch engine (NEMDE) is inconsistent with these permissible combinations, AEMO overrides the solution and directs specific generators to take actions to ensure the permissible combination of generators is operating.

2.2 Clause 3.15.7 of NER

AEMO must compensate each *directed participant* for the provision of energy or market ancillary services pursuant to a *direction* to be determined in accordance with the following formula:

$$DCP = AMP * DQ$$

Where:

- DCP is the amount of compensation the *directed participant* is entitled to receive.³
- AMP is the price below which are 90% of the spot prices or ancillary service prices (as the case may be) for the relevant service provided by Scheduled Generators, Semi-Scheduled Generators, Scheduled Network Service Providers or Market Customers in the region to which the direction relates, for the 12 months immediately preceding the trading day in which the *direction* was issued.

DQ is either:

² For instance, in South Australia, ElectraNet installed two synchronous condensers at Davenport substation and two at Robertstown substation, all operational from October 2021. See <https://www.electranet.com.au/strength-reliability-boost-to-south-australias-electricity-network/>

³ DCP is calculated in accordance with NER Clause 3.15.7(c).

- (a) the difference between the total adjusted gross energy delivered or consumed by the *directed participant* and the total adjusted gross energy that would have been delivered or consumed by the *directed participant* had the *direction* not been issued; or
- (b) the amount of the relevant market ancillary service which the *directed participant* has been enabled to provide in response to the *direction*.

2.3 Clause 3.15.7B(a) of NER

A *directed participant* that is entitled to compensation under clause 3.15.7 and 3.15.7A of the NER may make a claim for additional compensation under clause 3.15.7B, which confines compensation (under clause 3.15.7B (a)) to:

1. the aggregate of the loss of revenue and additional net direct costs incurred by the *directed participant* in respect of a scheduled generating unit, semi-scheduled generating unit or scheduled network services, as the case may be, as a result of the provision of the service under direction; less
2. the amount notified to that *directed participant* pursuant to clause 3.15.7(c) or clause 3.15.7A(f); less
3. the aggregate amount the *directed participant* is entitled to receive in accordance with clause 3.15.6(c) for the provision of a service rendered as a result of the direction.

In broad terms, clause 3.15.7B (a) entitles a *directed participant* to claim additional compensation to cover loss of revenue and net direct costs minus *trading amounts* for *energy* and *market ancillary services* and minus any compensation for directed services that has already been determined by AEMO.

The *directed participant* in this case has made a claim for compensation for additional net direct costs pursuant to clause 3.15.7B (a)(1) arising from its response to *directions* issued during billing weeks 5 to 8 in 2022.

3 The directions and initial compensation

3.1 The Claim *directions*

AEMO issued the following *directions* commencing 29 January and ending 26 February 2022.

Table 1 AEMO's *directions* to the Claimant

Directed unit	Event Number	Issued date/time	Effective date/time	End date/time	Reason
Unit 1	69-1	29/01/2022 16:00	30/01/2022 00:30	30/01/2022 13:10	System strength
Unit 2	69-2	28/01/2022 16:00	30/01/2022 02:00	30/01/2022 13:10	System strength
Unit 1	70-1	31/01/2022 16:00	01/02/2022 08:30	01/02/2022 18:30	System strength
Unit 3	70-2	31/01/2022 16:00	01/02/2022 09:00	02/02/2022 17:00	System strength
Unit 1	70-3	01/02/2022 15:30	02/02/2022 01:30	03/02/2022 17:30	System strength
Unit 2	70-4	02/02/2022 15:10	03/02/2022 08:00	03/02/2022 17:30	System strength
Unit 1	71-1	03/02/2022 17:00	03/02/2022 18:00	06/02/2022 16:15	System strength
Unit 2	71-3	04/02/2022 16:30	05/02/2022 07:30	05/02/2022 15:30	System strength
Unit 2	71-4	05/02/2022 15:30	06/02/2022 01:00	06/02/2022 15:00	System strength
Unit 2	72-1	06/02/2022 15:00	07/02/2022 08:00	07/02/2022 13:00	System strength
Unit 1	72-2	06/02/2022 15:00	07/02/2022 08:00	07/02/2022 13:00	System strength
Unit 2	73-1	09/02/2022 17:00	10/02/2022 09:30	10/02/2022 17:00	System strength
Unit 1	73-2	09/02/2022 17:00	10/02/2022 10:00	10/02/2022 16:00	System strength
Unit 2	74-1	10/02/2022 15:00	11/02/2022 07:00	11/02/2022 17:30	System strength
Unit 1	74-2	10/02/2022 15:00	11/02/2022 07:30	11/02/2022 17:30	System strength
Unit 1	75-1	11/02/2022 15:00	12/02/2022 07:00	12/02/2022 15:30	System strength
Unit 2	75-2	11/02/2022 16:00	11/02/2022 18:30	12/02/2022 15:30	System strength
Unit 3	76-1	12/02/2022 16:30	13/02/2022 02:30	13/02/2022 12:00	System strength
Unit 1	77-2	17/02/2022 15:50	18/02/2022 08:30	18/02/2022 14:20	System strength
Unit 2	78-1	18/02/2022 17:00	19/02/2022 07:30	19/02/2022 17:00	System strength
Unit 1	78-2	18/02/2022 17:00	19/02/2022 08:00	19/02/2022 16:00	System strength
Unit 2	79-1	19/02/2022 17:00	20/02/2022 10:00	20/02/2022 17:30	System strength
Unit 1	79-2	19/02/2022 17:00	20/02/2022 09:00	20/02/2022 16:30	System strength
Unit 2	80-1	20/02/2022 17:00	21/02/2022 09:30	21/02/2022 17:00	System strength
Unit 1	80-2	20/02/2022 17:00	21/02/2022 08:30	21/02/2022 16:00	System strength
Unit 2	81-1	21/02/2022 16:00	22/02/2022 01:00	22/02/2022 16:30	System strength
Unit 1	81-2	21/02/2022 16:00	22/02/2022 07:30	22/02/2022 15:30	System strength
Unit 2	82-1	22/02/2022 17:00	23/02/2022 07:30	23/02/2022 14:30	System strength
Unit 2	83-1	24/02/2022 15:00	24/02/2022 23:00	26/02/2022 16:15	System strength
Unit 1	83-2	24/02/2022 15:00	25/02/2022 00:00	26/02/2022 14:30	System strength

Source: AEMO

3.1.1 Initial compensation

In accordance with the above NER provisions, AEMO calculated settlement compensation for the above *directions* as summarised in Table 2.

Table 2 AEMO's settlement compensation amounts

Directed unit	Event number	Issued date/time	Compensation entitlement (DCP)	Retained trading amounts (RTA)	Initial settlement compensation (DCP – RTA)
Unit 1	69-1	29/01/2022 16:00	\$51,151	\$68,499	-\$17,348
Unit 2	69-2	28/01/2022 16:00	\$45,687	\$65,486	-\$19,799
Unit 1	70-1	31/01/2022 16:00	\$41,067	-\$9,059	\$50,126
Unit 3	70-2	31/01/2022 16:00	\$140,089	-\$19,939	\$160,028
Unit 1	70-3	01/02/2022 15:30	\$181,711	\$7,630	\$174,082
Unit 2	70-4	02/02/2022 15:10	\$47,535	-\$14,150	\$61,685
Unit 1	71-1	03/02/2022 17:00	\$301,050	\$64,254	\$236,796
Unit 2	71-3	04/02/2022 16:30	\$34,795	-\$5,490	\$40,285
Unit 2	71-4	05/02/2022 15:30	\$56,576	-\$220	\$56,796
Unit 2	72-1	06/02/2022 15:00	\$20,035	\$3,615	\$16,420
Unit 1	72-2	06/02/2022 15:00	\$20,635	\$3,826	\$16,808
Unit 2	73-1	09/02/2022 17:00	\$31,887	-\$2,316	\$34,203
Unit 1	73-2	09/02/2022 17:00	\$24,101	-\$3,247	\$27,348
Unit 2	74-1	10/02/2022 15:00	\$42,986	-\$14,663	\$57,650
Unit 1	74-2	10/02/2022 15:00	\$41,016	-\$14,525	\$55,541
Unit 1	75-1	11/02/2022 15:00	\$34,534	-\$2,302	\$36,836
Unit 2	75-2	11/02/2022 16:00	\$98,872	\$25,154	\$73,718
Unit 3	76-1	12/02/2022 16:30	\$37,743	\$1,929	\$35,813
Unit 1	77-2	17/02/2022 15:50	\$24,081	-\$1,202	\$25,282
Unit 2	78-1	18/02/2022 17:00	\$40,439	\$7,028	\$33,410
Unit 1	78-2	18/02/2022 17:00	\$32,930	\$5,389	\$27,541
Unit 2	79-1	19/02/2022 17:00	\$33,212	-\$6,566	\$39,778
Unit 1	79-2	19/02/2022 17:00	\$31,997	-\$6,516	\$38,513
Unit 2	80-1	20/02/2022 17:00	\$32,682	-\$1,781	\$34,464
Unit 1	80-2	20/02/2022 17:00	\$30,724	-\$2,284	\$33,008
Unit 2	81-1	21/02/2022 16:00	\$73,105	\$16,826	\$56,279
Unit 1	81-2	21/02/2022 16:00	\$33,067	-\$3,241	\$36,308
Unit 2	82-1	22/02/2022 17:00	\$35,971	\$20,048	\$15,923
Unit 2	83-1	24/02/2022 15:00	\$175,073	\$39,419	\$135,654
Unit 1	83-2	24/02/2022 15:00	\$158,158	\$35,787	\$122,371

Source: AEMO

The amount of compensation a *directed participant* is entitled to receive (DCP) is calculated in accordance with Clause 3.15.7(c) of the NER. The Retained Trading

Amount (RTA) is calculated in accordance with Clause 3.15.6(b) for the additional energy produced, which would have been included in the settlement amount indicated in the Preliminary Billing statement. Since invoices are issued weekly and the intervention period spanned four billing weeks, the compensation calculations for all units are presented for each relevant billing week.

Initial settlement compensation is determined as DCP minus RTA and included in the Final Billing statement.

4 Claims for additional compensation

This section analyses the reasonableness of the Claim and sets out Synergies' draft position on each component of claimed costs.

4.1 Additional compensation in respect of the Claim

The Claimant has submitted the following claims for additional compensation for the *directions* received during billing weeks 5 to 8 in 2022.

Table 3 Summary of additional compensation claim estimates for the Claim

Directed unit	Event number	Direction date/time	Gas fuel cost (1)	FCAS (2)	Start cost (3)	Variable operating & maintenance (4)	Cost of Direction (COD) (1+2+3+4)	Compensation entitlement (DCP)	Add. comp amount (COD – DCP)
Unit 1	69-1	29/01/2022 16:00	\$84,851	\$23	\$17,665	\$1,526	\$104,066	\$51,151	\$52,915
Unit 2	69-2	28/01/2022 16:00	\$74,457	\$23	\$0	\$1,355	\$75,834	\$45,687	\$30,148
Unit 1	70-1	31/01/2022 16:00	\$62,959	\$23	\$17,011	\$1,213	\$81,207	\$41,067	\$40,140
Unit 3	70-2	31/01/2022 16:00	\$211,377	\$94	\$10,823	\$3,882	\$226,175	\$140,089	\$86,086
Unit 1	70-3	01/02/2022 15:30	\$270,571	\$102	\$16,696	\$4,852	\$292,221	\$181,711	\$110,510
Unit 2	70-4	02/02/2022 15:10	\$55,880	\$13	\$19,845	\$1,152	\$76,891	\$47,535	\$29,356
Unit 1	71-1	03/02/2022 17:00	\$457,401	\$206	\$0	\$8,522	\$466,129	\$301,050	\$165,079
Unit 2	71-3	04/02/2022 16:30	\$48,061	\$31	\$13,597	\$970	\$62,659	\$34,795	\$27,865
Unit 2	71-4	05/02/2022 15:30	\$85,164	\$63	\$16,869	\$1,698	\$103,795	\$56,576	\$47,219

Directed unit	Event number	Direction date/time	Gas fuel cost (1)	FCAS (2)	Start cost (3)	Variable operating & maintenance (4)	Cost of Direction (COD) (1+2+3+4)	Compensation entitlement (DCP)	Add. comp amount (COD – DCP)
Unit 2	72-1	06/02/2022 15:00	\$30,299	\$7	\$13,713	\$607	\$44,624	\$20,035	\$24,589
Unit 1	72-2	06/02/2022 15:00	\$31,898	\$7	\$13,739	\$607	\$46,250	\$20,635	\$25,615
Unit 2	73-1	09/02/2022 17:00	\$47,290	\$27	\$0	\$910	\$48,227	\$31,887	\$16,340
Unit 1	73-2	09/02/2022 17:00	\$37,097	\$23	\$13,589	\$728	\$51,437	\$24,101	\$27,336
Unit 2	74-1	10/02/2022 15:00	\$64,775	\$25	\$13,462	\$1,274	\$79,536	\$42,986	\$36,550
Unit 1	74-2	10/02/2022 15:00	\$62,227	\$23	\$13,486	\$1,213	\$76,949	\$41,016	\$35,933
Unit 1	75-1	11/02/2022 15:00	\$53,286	\$31	\$13,614	\$1,031	\$67,962	\$34,534	\$33,428
Unit 2	75-2	11/02/2022 16:00	\$143,360	\$56	\$0	\$2,547	\$145,964	\$98,872	\$47,092
Unit 3	76-1	12/02/2022 16:30	\$57,025	\$39	\$27,889	\$1,152	\$86,105	\$37,743	\$48,362
Unit 1	77-2	17/02/2022 15:50	\$37,470	\$18	\$13,542	\$708	\$51,738	\$24,081	\$27,657
Unit 2	78-1	18/02/2022 17:00	\$59,214	\$53	\$13,704	\$1,152	\$74,124	\$40,439	\$33,685
Unit 1	78-2	18/02/2022 17:00	\$49,666	\$44	\$13,542	\$970	\$64,223	\$32,930	\$31,292
Unit 2	79-1	19/02/2022 17:00	\$48,089	\$39	\$0	\$910	\$49,038	\$33,212	\$15,826
Unit 1	79-2	19/02/2022 17:00	\$47,602	\$36	\$13,691	\$910	\$62,239	\$31,997	\$30,242
Unit 2	80-1	20/02/2022 17:00	\$47,755	\$29	\$0	\$910	\$48,693	\$32,682	\$16,011

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Directed unit	Event number	Direction date/time	Gas fuel cost (1)	FCAS (2)	Start cost (3)	Variable operating & maintenance (4)	Cost of Direction (COD) (1+2+3+4)	Compensation entitlement (DCP)	Add. comp amount (COD – DCP)
Unit 1	80-2	20/02/2022 17:00	\$46,347	\$29	\$13,758	\$910	\$61,044	\$30,724	\$30,320
Unit 2	81-1	21/02/2022 16:00	\$105,238	\$116	\$0	\$1,880	\$107,234	\$73,105	\$34,129
Unit 1	81-2	21/02/2022 16:00	\$49,610	\$61	\$13,897	\$970	\$64,539	\$33,067	\$31,472
Unit 2	82-1	22/02/2022 17:00	\$50,731	\$45	\$14,122	\$849	\$65,747	\$35,971	\$29,776
Unit 2	83-1	24/02/2022 15:00	\$257,068	\$246	\$13,730	\$5,004	\$276,048	\$175,073	\$100,975
Unit 1	83-2	24/02/2022 15:00	\$241,121	\$226	\$20,263	\$4,670	\$266,281	\$158,158	\$108,122
Total additional compensation claimed			\$2,917,889	\$1,757	\$352,248	\$55,084	\$3,326,978	\$1,952,909	\$1,374,069

Source: The Claimant.

5 Synergies' assessment regarding the Claim

This section analyses the reasonableness of the Claim and sets out Synergies' draft position on each component of claimed costs.

5.1 Gas cost

The following method was applied by the Claimant to calculate the additional gas fuel costs for each of the *directions*:

- The volume of gas used by the directed unit during the *direction* was calculated by taking the directed megawatts of electrical production by that unit (supported by dispatch data) and applying the relevant heat rate⁴ to convert to gigajoules per hour;
 - this provides the gas consumed by the directed unit per hour (divided by twelve to derive per trading interval consumption).
- The gas used was sourced from one gas supply contract with the corresponding price applied to gas transported through two different pipelines (Moomba to Adelaide Pipeline System and SEA Gas Pipeline).⁵
 - Explanation for the approach taken to sourcing gas to meet these *directions* was provided by the Claimant and as such, has been accepted.
 - The gas supply contract price was supported by a copy of the confidential invoice from the relevant gas producer.

Converting the directed megawatts to gas gigajoules using an appropriate relevant heat rate for the direct unit provides an accurate calculation of gas consumed. However, there was a minor calculation error in the application of the heat rate formula, whereby the brackets and the unit-conversion factor in the Excel formula were slightly misplaced. These were amended by Synergies and have caused a very minor difference in the allowed gas fuel costs.

Based on the evidence provided and the method applied, Synergies accepts the gas fuel cost claimed due to the *directions* in this draft determination.

5.2 Variable operating and maintenance (VOM) costs

The Claimant's method to calculate the VOM costs was as follows:

⁴ Heat rate is one measure of the efficiency of electrical generators/powers that convert a fuel into heat and into electricity. The heat rate is the amount of energy used by an electrical generator/power plant to generate one kilowatt hour (kWh) of electricity.

⁵ The Claimant is not claiming additional gas transportation costs in relation to these *directions*.

- A per 5-minute interval VOM cost was calculated based on a historical VOM cost estimate, which was then adjusted for inflation by using an annual inflation rate of 2.5%.
- The VOM rate was applied to every interval that each generating unit was operating under AEMO's *direction*.
- Then, the 5-minute interval VOM costs were summed across the period for which each generating unit was operating under *direction*.

The VOM costs identified by the Claimant relate to the operating and maintenance costs driven by the hours of operation of the plant. VOM costs can only be considered avoidable costs (i.e., costs incurred due to the *directions*) if there is clear evidence that the generating units would have been off-line but for the *directions*.

The need for the *directions* arose from AEMO's consideration of forecasts of plant dispatch based on forecast demand and the prices that generation was being bid in future periods. As per previous similar determinations, Synergies is satisfied that the directed generating units would not have been in operation during the directed periods but for the *directions*.

We accept the VOM costs claimed for all units have been reasonably substantiated for this draft determination, including with supporting documentation.

5.3 Start Costs

Start costs were claimed for most of the directions in this claim.

The Claimant's method for calculating the start costs is as follows:

- The Claimant identified the start as following a period off-line of 36 hours duration.
- The Claimant then took a historical estimate of the cost of a 'cold' start and adjusted the estimate for inflation by using an approximate annual inflation rate of 2.5%.
- To derive the final start cost, the cost of electricity for internal loads (priced at the average market price over the start-up period) was added to the cost of gas fuel to heat the generator (using the same \$/GJ price as that which was claimed for the gas fuel costs).

The costs were supported by confidential data provided by the Claimant.

Synergies accepts the start cost estimates in this claim for additional compensation.

5.4 Frequency Control Ancillary Services (FCAS)

The Claimant's method to calculate the additional costs incurred due to its increased Frequency Control Ancillary Service (FCAS) Raise liabilities⁶ is as follows:

- The Claimant first determined the total liability of the power station in respect of contingency FCAS Raise services for the relevant period during the gas day of the *direction*.
- The Claimant then determined the contribution of the directed units to the total power station output during the relevant period.
- Next, the generating unit's proportional share of power station output was multiplied by the power station's total FCAS Raise liability for each relevant interval on the gas day.
- Finally, this value was summed for the period.

The Claimant has previously shown workings and detailed FCAS cost assumptions for the power station provided by AEMO. Synergies has verified this data by reviewing the calculations and FCAS Raise unit costs provided by AEMO and as such, accepts the FCAS costs claimed for this draft determination.

5.5 Claim results

The Claimant's additional costs to comply with the *directions* are as claimed and, on this basis, the Claimant is entitled to additional compensation of **\$1,374,069**.

⁶ The costs recovered from the Claimant in respect of contingency raise costs, allocated in accordance with the FCAS causer pays formulation.

6 Conclusion

In this draft determination, the Claimant's additional costs to comply with the *directions* have been accepted as claimed and it is entitled to additional compensation of **\$1,374,069**.

The *directed participant* has been informed of the draft determination outcome, our reasons, and the amount of additional compensation accepted.