Independent Expert Determination on Claim for Additional Compensation from Directions of 29 August 2018

Draft report

21 December 2018

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Executive Summary

Synergies Economic Consulting (Synergies) was appointed by the Australian Energy Market Operator (AEMO) as an independent expert to determine a claim for additional compensation made under clause 3.12.2 of the NER arising from directions that AEMO issued on 29 August 2018. The claim in question has been submitted by CS Energy in respect of generating units at the Gladstone Power Station, the output of which was affected by the directions[1].

In the case of the two directions in question, a constraint that limits output from the Gladstone Power Station frequently bound in the NEMDE intervention pricing run – and to a much lesser extent in the outturn run. This difference meant that Gladstone Power Station generating units were dispatched at significantly higher levels than AEMO determined would have been the case but for the direction.

AEMO calculated the compensation payable to CS Energy as an *Affected Participant*, in accordance with 3.12.2(c). AEMO's initial notification in respect of the first direction event was that CS Energy must refund to AEMO $283,787.23, which it subsequently adjusted to $280,833.89. This amount reflected the balance of additional revenues that would not have been received and additional costs that would not have been incurred, but for the direction.

CS Energy replied to AEMO's notification of compensation payable 5 October 2018, making a compensation claim of $171,550.72 pursuant to clause 3.12.2(f). CS Energy's initial claim makes clear that it sought additional compensation to account for its SRMC for those periods in which its dispatch was higher as a result of the directions.

In response to detailed communications from Synergies on 21 and 30 November 2018, CS Energy offered additional and broader objections to AEMO's compensation determination on 23 November and 6 December 2018. Whereas CS Energy had originally challenged AEMO's SRMC assumption, in its subsequent communications with Synergies, CS Energy argued that the differences in dispatch were "due to known anomalies in the Intervention Pricing Run". Further, CS Energy asserted its belief that:

> "if the process had been working correctly, the independent processes would have produced the same outcomes for both the Outturn and Intervention Pricing Run for the Gladstone units"

[1] CS Energy is party to the Interconnection and Power Pooling Agreement under which CS Energy is entitled to trade the output of the Gladstone Power Station in excess of the requirements of the Boyne Aluminium Smelter. See CS Energy, 2018, "Wholesale Market" https://www.csenergy.com.au/what-we-do/selling-energy/wholesale-market.

AEMO has used dispatch data generated by a NEMDE pricing run (a modelling run implanting the Intervention Pricing Methodology) to indicate the "what-if" dispatch levels of the Gladstone Power Station. That is, the levels at which the Gladstone units would have operated in the absence of the direction.

AEMO has used these what-if dispatch levels to identify CS Energy as an *Affected Participant* and to quantify the magnitude of the effect of the directions on the dispatch of Gladstone Power Station. While this is both efficient and appropriate as an operational practice, Synergies does not consider that the Rules require these assessments to be made in all instances by reference to the dispatch levels determined in accordance with the Intervention Pricing Methodology.

Synergies believes that in the context of compensation determinations under 3.12.2 of the Rules there is scope to apply other estimates and judgements about what-if dispatch in place of the data generated in accordance with the Intervention Pricing Methodology. For our purposes as an independent expert, Synergies regards a divergence from standard practice as appropriate if there is sufficient evidence that the data generated in accordance with the Intervention Pricing Methodology may not have reasonably reflected what would have happened in the absence of the direction.

We consider that the direction was unlikely to have had any significant effect on GPS's actual dispatch. We give reasons for this view in our determination below. To the extent that the direction did actually affect CS Energy's output, Synergies considers that the effects were unlikely to have been material for the purposes of the Rules. Specifically, the $5,000 minimum threshold imposed by clause 3.12.2(b) is unlikely to have been cleared in any of the trading intervals in question.

Synergies concluded that the original trading amounts received by CS Energy should stand and that the compensation amount determined by AEMO should be reversed. This requires the straight-forward adjustment set out in Table ES1.

Table ES1 Summary of Synergies determination

Parameter	Value
AEMO Determined compensation amount	**-$280,833.89**
Synergies determined compensation amount	**$0**
Adjustment required to AEMO compensation determination	**$280,833.89**

Based on the foregoing, we have determined that the compensation payable pursuant to 3.12.2 as a result of the directions issued on 29 August 2018 is zero. The adjustment required to AEMO's determination of compensation payable is **$280,833.89**. CS Energy has been separately informed of this determination, the reasons for it, and the amount of compensation.

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Figures and Tables

1 Introduction

1.1 Context

Synergies Economic Consulting (Synergies) was appointed by the Australian Energy Market Operator (AEMO) as an independent expert to determine a claim for additional compensation made under clause 3.12.2 of the NER arising from *directions* that AEMO issued on 29 August 2018. The claim in question has been submitted by CS Energy in respect of generating units at the Gladstone Power Station, the output of which may have been affected by the directions[2].

AEMO is required by the NER to use reasonable endeavours to complete all obligations, including final settlement, no later than 150 working days after the end of the AEMO intervention event, given that an independent expert has been appointed (3.12.1(a)(2)). The intervention timetable requires that a draft independent expert determination be delivered no later than 31 December 2018 and a final determination by 20 February 2018. This will allow AEMO to complete the intervention settlement process by the required deadline of 28 March 2019.[3]

Synergies is issuing this draft report on 21 December 2018. The Affected Participant has been notified of our draft determination.

1.2 Structure of this report

In the remainder of this report, we set out the basis for our draft determination of compensation for CS Energy as an affected participant under the NER.

- Section 2 describes the basic details and effects of the directions and summarises AEMO's original compensation determinations.
- Section 3 describes CS Energy's claim.
- Section 4 provides Synergies assessment of the claim, setting out our reasoning for accepting, rejecting or modifying each element.
- Section 5 set out our conclusion as to compensation payable.

[2] CS Energy is party to the Interconnection and Power Pooling Agreement under which CS Energy is entitled to trade the output of the Gladstone Power Station in excess of the requirements of the Boyne Aluminium Smelter. See CS Energy, 2018, "Wholesale Market" https://www.csenergy.com.au/what-we-do/selling-energy/wholesale-market.

[3] AEMO, 2018, Intervention Settlement Timetable- Indicative for all AEMO Intervention Events, https://www.aemo.com.au/-/media/Files/Electricity/NEM/Settlements_and_Payments/Settlements/2018/Intervention-Settlement-Timetable---2018.xlsx.

2 Background

2.1 The Directions

Between 29 and 30 August 2018, AEMO issued directions to South Australian Market Participants to maintain power system security – summarised in Table 1.

Table 2 Summary of the relevant South Australia directions between 29 and 30 August 2018

Direction	Directed Participant	Issue time	Cancellation time	Explanation
Torrens Island A unit 1	AGL SA Generation Pty Ltd	1500 hrs, 29 August 2018	0600 hrs, 30 August 2018	Synchronise and follow dispatch targets from DI ending 2335 hrs 29 August 2018
Torrens Island B unit 1	AGL SA Generation Pty Ltd	1630 hrs, 29 August 2018	1000 hrs, 30 August 2018	Synchronise and follow dispatch targets from DI ending 0035 hrs 30 August 2018

Source: AEMO, 2018, Directions in South Australia between DI ending 1500 hrs on 29 August 2018 and DI ending 1000 hrs on 30 August 2018

Neither of the two directions affected the dispatch instructions of the Gladstone Power Station directly.

2.2 Divergence between outturn and pricing runs

According to AEMO's dispatch operating procedures:[4]

> "If …AEMO applies intervention pricing NEMDE will do an intervention price run after completion of the dispatch or outturn run. The first dispatch run (outturn run) which includes the reserve contract or direction in the form of a constraint is used to determine dispatch targets. The second dispatch run (intervention price or what-if run) is used to determine dispatch prices and does not contain the reserve contract or direction constraint."

Though not stated, the data created by the intervention pricing run is also used to determine the level of dispatch that would have occurred in the absence of the directions. This in turn supports the identification of a generator as an Affected Participant (since it provides a reference point against which to compare actual dispatch) and the calculation of compensation under rule 3.12.2.

Under both the outturn run and the pricing run, NEMDE accounts for the effects of physical limits within the electricity system such as a system normal thermal constraint equation that limits Gladstone Power Station's output (defined as Q>NIL_BI_FB). In

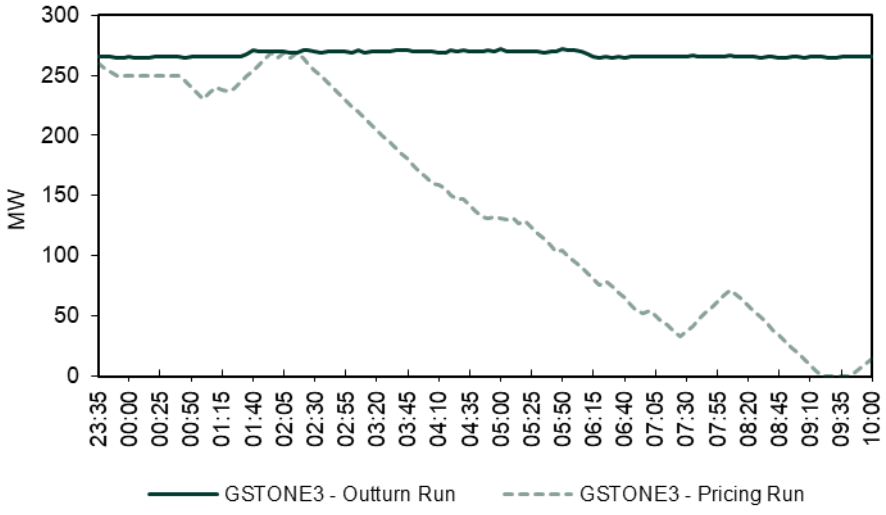
[4] AEMO, 2018, "System Operating Procedure – Dispatch (version 85)" page 18

each of the two modelling runs, NEMDE uses a different basis for calculating Q. In the outturn run, Q is calculated using measured values of generator and interconnector operating points. In the pricing run, Q is set by reference to the what-if values at these operating points from the previous interval. This difference in the input assumptions populating the constraint equation creates the potential for differences to accumulate between a generator's dispatch levels under the outturn and pricing runs.

In the case of the two directions in question, the Q>NIL_BI_FB constraint bound more often in the NEMDE intervention pricing run than was the case in the NEMDE outturn run. The reasons for this modelled difference in any given interval are unclear and may reflect quirks of an extremely complex model rather than true differences in the extent to which the constraint would have bound with or without the direction. The differences binding between the two scenarios were relatively small at first. However, initial divergence in the value of Q between the two runs compounded over subsequent intervals.

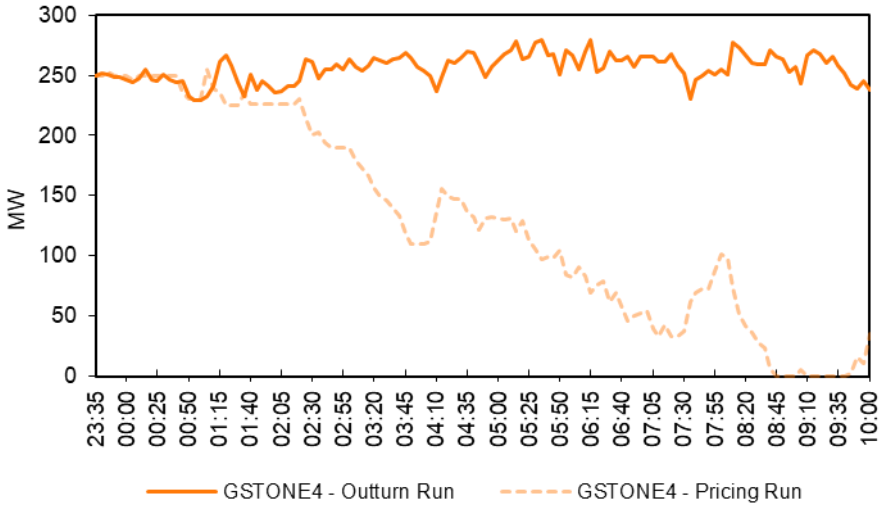
In turn, this meant that some of the Gladstone Power Station generating units were dispatched in accordance with the outturn run at significantly higher levels than the under the pricing run. Indeed, under the pricing run, it appeared that, but for the direction, some of these generating units would have been completely decommitted, rather than operating at significant levels, as they were in practice (see Figure 1 and Figure 2).

Figure 1 Dispatch of the Gladstone Power Station generating unit 3 under outturn and pricing runs



Data source: AEMO

Figure 2 Dispatch of the Gladstone Power Station generating unit 4 under outturn and pricing runs



Data source: AEMO

2.3 Administratively related direction events

AEMO declared four direction events over the period 29 August to 8 September 2018, of which only the first is the subject of this expert determination. On grounds of administrative efficiency, AEMO advised CS Energy of its initial compensation determination in a communication that covers all four direction events. Synergies understands that no claim for additional compensation has been raised by CS Energy in relation to the other three direction events.

2.4 Compensation determined by AEMO

The purpose of the compensation provisions under 3.12.2 is to return the affected participant to the position that it would have been in, had the direction not occurred. In the present instance, AEMO has determined that CS Energy earned revenues (and incurred costs) above the levels it would have, had the direction not occurred. Accordingly, it determined that CS Energy should refund the additional revenues it earned, and be refunded the incremental costs it incurred, as a result of the direction.

AEMO calculated the compensation payable to CS Energy as an Affected Participant, in accordance with 3.12.2(c). AEMO's initial calculation of the compensation payable to CS Energy in respect of the first direction event was -$283,787.23. That is, it advised that CS Energy must refund to AEMO $283,787.23. This amount reflected the balance of additional revenues that would not have been received and additional costs that would not have been incurred, but for the direction.

AEMO subsequently adjusted the total amount of compensation for this direction period (excluding any changes due to CS Energy's claim). The new amount is - $280,833.89 and this is the compensation amount against which we will determine any adjustment to compensation.

AEMO notified CS Energy of the compensation payable in accordance with 3.13.2(c) by email on 26 September 2018 and advised at the same time that no compensation was payable in respect of any of the other three direction events. AEMO subsequently advised CS Energy of its adjustment to the compensation amount.

3 The Claim

CS Energy replied to AEMO's notification of compensation payable 5 October 2018, making a compensation claim of $171,550.72 pursuant to clause 3.12.2(f). CS Energy sought to have AEMO's compensation determination adjusted to account for a higher SRMC than that which AEMO had assumed when calculating the original compensation.

In response to detailed communications from Synergies on 21 and 30 November 2018, CS Energy offered additional and broader objections to AEMO's compensation determination on 23 November and 6 December 2018. Whereas CS Energy had originally challenged AEMO's SRMC assumption, in its subsequent communications with Synergies, CS Energy argued that the differences in dispatch were "due to known anomalies in the Intervention Pricing Run". Further, CS Energy asserted its belief that:

> "if the process had been working correctly, the independent processes would have produced the same outcomes for both the Outturn and Intervention Pricing Run for the Gladstone units"

CS Energy argued that the outcome generated by the above anomalies were perverse, imposed a significant cost on CS Energy and warranted remodelling in a manner consistent with the revised intervention pricing methodology recently recommended by a dedicated market working group[5]. CS Energy expressed confidence that a re-run would result in the Gladstone output in the pricing run being similar to the outcome in the outturn run rather than resulting in differences large enough to imply the de-commitment of Gladstone units.

In short, CS Energy's claim has changed from seeking an adjustment to the SRMC to challenging the what-if dispatch levels on which the entire question of compensation under 3.12.2 rests.

[5] The Intervention Pricing Working Group – see AEMO website https://www.aemo.com.au/Stakeholder-Consultation/Industry-forums-and-working-groups/Other-meetings/Intervention-Pricing-Working-Group

4 Synergies Assessment

4.1 Determining that CS Energy was an Affected Participant

An *Affected Participant* for current purposes is defined in Chapter 10 as a Generator "which was not the subject of the direction, that had its dispatched quantity affected by that direction". AEMO has deemed that Gladstone Power Station's dispatch quantity was affected by the direction based on data that it generated pursuant to the Rules, AEMO's dispatch operating procedures and the intervention pricing methodology.

During intervention pricing intervals (intervals affected by a direction) AEMO is required to initiate intervention pricing (clause 3.9.3), which requires that regional reference prices (RRPs) be set in accordance with a published methodology. To support this, when AEMO applies intervention pricing, NEMDE performs an intervention price run (see earlier discussion in Section 2.2). The dispatch levels determined in the pricing run are combined with bids to calculate a clearing price that reflects the price that would have prevailed had the direction not occurred. The dispatch levels determined in the pricing run have then served the purpose for which they were created (from the perspective of the Intervention Pricing Methodology). However, they then constitute a data artefact that can be used for a different purpose.

AEMO, entirely reasonably in our view, uses the what-if dispatch levels in its assessment of whether a given generator is an *Affected Participant* by comparing these dispatch levels to actual dispatch levels. The test of an *Affected Participant* then simply becomes whether variance is observed between the actual and what-if dispatch levels. AEMO does not explicitly state that it has carried out this test, but it is clearly implied by the fact that it has proceeded to calculate *Affected Participant* compensation under 3.12.2. By this test, CS Energy is an *Affected Participant*, because of differences between actual dispatch data and dispatch levels predicted by a model maintained for the purposes of setting RRPs during intervention pricing intervals.

We can find no other empirical reference point against which to evaluate whether the output of Gladstone Power Station would have been different in the absence of the direction. Yet, there seems to be a reasonable case for believing that dispatch at the Gladstone Power Station would not have been materially different under an alternative scenario in which the direction did not occur (see Section 2.2). That is, it is possible that the differences between pricing and outturn run dispatch levels are a misleading quirk of a complex model and that, absent this quirk, CS Energy would not be regarded as being an *Affected Participant* for the purposes of the direction in question.

4.2 Data used to calculate compensation

To calculate the change in revenues and costs attributable to the direction, AEMO has used the pricing run dispatch data, and compared this with dispatch levels from the outturn run. The difference between these two datasets is the assumed change in output arising from the direction and revenues. The difference in revenues is taken to be the change in dispatch multiplied by the loss adjusted RRP. The difference in costs is taken to be the change in dispatch multiplied by the Gladstone Power Station's SRMC. These values are then combined to estimate the change in net revenues attributable to the direction – that is, the compensation amount.

We characterise the pricing run dispatch data as being a by-product from the intervention pricing determination process. We consider AEMO's use of these data as a general principle is both efficient and appropriate. However, we draw attention to the fact that the data were produced for another purpose (ie the calculation of prices, rather than compensation) because we consider this relevant when evaluating the scope for the exercise of discretion in the context of evaluating compensation.

4.3 Intervention Pricing Methodology is binding

AEMO is bound to follow the steps prescribed in the Intervention Pricing Methodology and can depart from the current Methodology, only once it is changed through the proper processes. The Methodology must be published and (for significant modifications) modified in accordance with the Rules consultation procedures.

AEMO is required under clause 3.9.3(e) to establish and publish a methodology for determining the RRPs to apply during intervention price dispatch intervals. The methodology must allow spot prices to be efficiently determined and published in accordance with 3.13.4. The result of this obligation, the current Intervention Pricing Methodology provides a high-level process specification that is implemented in NEMDE.

We consider that ensuring the operational integrity of NEMDE is a priority of the highest order for AEMO. Requiring that any significant change to the Intervention Pricing Methodology be subject to a proper evaluation and consultation is consistent with this necessity to ensure the system and the market continues to operate. The theoretical correctness of the results NEMDE generates is a second order concern in the context of a market involving settlements worth billions of dollars.

In light of the relevant clauses in the NER and the practical considerations just noted, we consider that AEMO has essentially no practical scope to depart from the Intervention Pricing Methodology. Even if the review of the Intervention Pricing Methodology had

been finalised by the time of the directions (the final determination is dated September 2018, after the direction[6]), AEMO quite reasonably requires time to implement the changes in NEMDE in a manner that minimises the risks of market disruptions.

We stress, however, that the provisions making the Intervention Pricing Methodology binding do so only in relation to the determination of intervention pricing (see clause 3.9.3). Insofar as we can see, this requirement does not extend to the question of how *Affected Participants* are identified and what compensation they should receive.

4.4 Requirements regarding dispatch data for compensation

As we indicate above, AEMO's adherence to the Intervention Pricing Methodology is clearly appropriate. Further its internal practice of using the dispatch data generated by this process is not only efficient, but produces an internally consistent approach to settlement. That is, compensation is determined by reference to both the prices and the quantities that would have prevailed but for a direction.

Notwithstanding the reasonableness of AEMO's approach to calculating compensation, Synergies considers that the independent expert should ask whether an alternative approach that might better advance the national electricity objective is permitted under the Rules.

Considering first what the Rule permit, Synergies believes that there is scope under the Rules for the independent expert to apply an approach to estimating dispatch in the absence of the direction that departs from the Intervention Pricing Methodology as the basis for a) determining whether CS Energy is an *Affected Participant* and b) for quantifying the effect of the direction. In support of this view, we note that:

- There is no explicit step prescribed in Chapter 3 or Chapter 10 that specifies how AEMO is to identify *Affected Participant*s, rather it is implied that this status will be apparent to AEMO.
- The requirements as to determining compensation that AEMO must follow are addressed in subclauses 3.12.2(a)(1) and 3.12.2(j). These explain the general principle of restitution and the matters to consider in evaluating costs and revenues but do not specify how the change in dispatch level is to be calculated
- there is a requirement in 3.12.2(c) for AEMO to advise an *Affected Participant* of the estimated level of dispatch that its generating unit would have been dispatched at

[6] AEMO (2018) Intervention Pricing Methodology Final Report and Determination, September.

had the intervention event not occurred. Again there is no prescription of how this level is to be calculated.

The independent expert machinery, amongst other things, is intended to protect the market against the unintended consequences that occasionally emerge from applying an exceptionally complex set of rules and processes. The fact that the use of the pricing run data is not prescribed leads us to conclude that the independent expert can set this data aside if it considers that a different approach would better serve the national electricity objective.

We turn next to this question of how to best serve that objective.

4.5 Our judgement as to what-if dispatch

In the case of the directions in question, we consider that there is a reasonably strong case that applying the dispatch data from the pricing run gives a misleading view as to the dispatch levels that would have arisen in practice, absent the directions. In practice, the direction seems unlikely to have had any significant effect on Gladstone Power Station's actual dispatch. We base this view on the following considerations.

- While the constraint bound in some intervals under the outturn run it appears that it quickly unbound again without significantly affecting dispatch levels. When considered in light of the enormous geographic and electrical separation between the directed generators (in South Australia) and the Gladstone Power Station (in Central Queensland), the binding of the constraint might reasonably be viewed as a type of modelling noise.
- The procedures underpinning the pricing-run currently allows for small effects to accumulate (as described in Section 2.2).
- The final determination on the Intervention Pricing Methodology resolved to change the calculation approach since the "current calculation of the RHS of feedback constraints in the pricing run can lead to anomalous pricing results."[7] Those pricing anomalies result from anomalous dispatch levels under the pricing run.
- Based on our discussions with both AEMO and CS Energy, we perceive general agreement that the divergent pricing run dispatch levels (relative to actual dispatch) are likely a quirk of an extremely complex model that don't reflect what would have happened in reality.

[7] AEMO (2018) Intervention Pricing Methodology Final Report and Determination, September, page 5.

On the question of whether CS Energy was an *Affected Participant* for the purposes of the 29 August direction, we note that there currently exists no other quantitative reference point besides the pricing run dispatch dataset. That is, AEMO and Synergies have no other basis for answering that question and hence Synergies must assume that CS Energy was an *Affected Participant* in this case.

If we assume that CS Energy is an *Affected Participant* in the formal sense because the direction did result in minor changes in the dispatch level of the Gladstone Power Station, this would not automatically give rise to a need for compensation. Clause 3.12.2(b) limits the payment/recovery of compensation to trading intervals where the adjustment is more than $5,000. If we assume that the average difference between Gladstone Power Station's trading revenue and its SRMC was somewhere in the order of $10/MWh and $50/MWh over the period in question, exceeding the $5,000 threshold would require a difference in output of between 100 and 500 MWh in each trading interval, which translates to a difference in dispatch levels of between 200 and 1000MW for the Gladstone Power Station as a whole, or between 40 and 200MW on average for each of the five generating units in question.

Based on the above, Synergies considers that it is reasonable to believe, in the absence of compelling evidence to the contrary, that the $5,000 threshold is unlikely to have been cleared in any of the trading intervals in question. In other words, even if the directions did affect dispatch levels at the Gladstone Power Station, we consider that the magnitude of the true effect was unlikely to have been material by the standards of the Rules (ie clause 3.12.2(b)).

This leads us to conclude that the original trading amounts paid to CS Energy in accordance with 3.15.6 (ie as part of normal settlement processes) should be allowed to stand without any further compensation required.

4.6 Adjusted compensation

Synergies concluded that the original trading amounts received by CS Energy should stand and that the compensation amount determined by AEMO should be reversed. This requires the straight-forward adjustment set out in Table 3.

Table 3 Summary of Synergies determination

Parameter	Value
AEMO Determined compensation amount	**-$280,833.89**
Synergies determined compensation amount	**$0**
Adjustment required to AEMO compensation determination	**$280,833.89**

Source: AEMO and Synergies analysis

5 Conclusion

Based on the foregoing, we have determined that the compensation payable pursuant to 3.12.2 as a result of the directions issued on 29 August 2018 is zero. The adjustment required to AEMO's determination of compensation payable is **$280,833.89**.

CS Energy has been separately informed of this determination, the reasons for it, and the amount of compensation.