AEMC

RULE

Australian Energy Market Commission

RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (NEM SETTLEMENT UNDER LOW, ZERO AND NEGATIVE DEMAND CONDITIONS) RULE 2021

PROPONENT

Australian Energy Market Operator

17 JUNE 2021

INQUIRIES

Australian Energy Market Commission
GPO Box 2603
Sydney NSW 2000

E aemc@aemc.gov.au
T (02) 8296 7800

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ABOUT THE AEMC

The AEMC reports to the Energy Ministers Meeting (formerly the Council of Australian Governments Energy Council). We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the Energy Ministers Meeting.

SUMMARY

1 The Australian Energy Market Commission (AEMC or Commission) has made a rule to enable the national electricity market (NEM) to continue to settle transactions in low, zero or negative demand conditions.

2 The final rule makes amendments to rule 3.15 of the National Electricity Rules (NER) introducing a new clause 3.15.6AA. This clause requires AEMO to substitute into non-energy cost allocation formulas a market customer's average adjusted gross energy (AGE) from the four most recent completed billing periods, in place of that customer's actual AGE when aggregate AGE in a region is below 150 MWh in a trading interval.

3 Background

4 In February 2021, the Commission received two rule change requests that relate to the formulas used to recover non-energy costs from market customers in rule 3.15:

- On 8 February 2021, AEMO submitted the *NEM settlement in low, zero and negative demand conditions* rule change request to amend parts of rule 3.15 of the NER to allow for a substitution of AGE values, when necessary, to create numerators and denominators for non-energy cost allocation formulas that will work in AEMO's settlement systems. AEMO proposed that this substitution should take place when demand fell below 1 MWh in a trading interval.[1]
- On 15 February 2021, Infigen Energy (Infigen) submitted a rule change request to address the potential for distortions in the allocation of costs from non-energy cost formulas, that can occur in low demand circumstances. Infigen proposed placing a floor on a market customer's AGE at zero MWh. This would remove the possibility for a market customer to receive a payment for having a net negative load. Alternatively, Infigen also proposed raising the threshold for when substitution takes place, under AEMO's method, from 1 MWh to 150 MWh.[2]

5 The Commission adopted an expedited process in considering this rule change request as it considered that the proposed rule was an urgent rule. No objections to using this process were received.

6 The Commission received six written submissions to this process, which have been taken into account.

7 The final rule

8 The final rule is a more preferable rule. The Commission has made some drafting changes to the rule suggested by AEMO in order to address the issues noted by Infigen's rule change that also can occur during low net regional demand. In particular, it has included a higher threshold for substitution of 150 MWh instead of the 1 MWh threshold, that was proposed by AEMO. These changes respond to the concerns raised by both AEMO and Infigen, as they will help to address:

1 AEMO, *NEM settlement under zero and negative demand conditions,* rule change request, p. 9.
2 Infigen, *Settlement under low operational demand,* 15 February 2021, p. 12.

- the risks to NEM settlement when net regional demand is less than 1 MWh
- the incidence of market customers being rewarded with payments for having a negative AGE value during a trading interval
- the risk of market customers having to pay a disproportionate amount of non-energy costs when net regional demand is low and market customers have a negative AGE.

9 The rule also makes other minor changes to rule 3.15 to identify which sub-clauses are subject to the new substitution methodology under the proposed clause 3.15.6AA.[3]

10 The rule provides a temporary low cost solution to address the urgent settlement risks and the inequitable payment risks that can take place when net demand is low, until a more permanent solution is progressed, potentially through the *Integrating energy storage solutions into the NEM (Integrating storage)* rule change.

11 Having regard to the issues raised in the rule change and during consultation, the Commission is satisfied that the final rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO) for the following reasons:

- it will remove the settlement risk that exists in low, zero or negative demand circumstances
- it will produce greater certainty for market customers by allowing AEMO to continue to efficiently undertake its prudential responsibilities
- it helps preserve the efficient operation of the NEM, by largely removing the potential market distortions that occur when net regional demand is low
- it helps preserve the efficient operation of the market by substantially reducing the risk that market customers may receive payments for having a negative AGE value.

12 Schedule 1 of the rule commences on 1 September 2021. Schedule 2 of the rule will commence on 1 October 2021, which will align the rule with the introduction of the *Five-minute settlement* rule.

3 This will occur in clauses 3.15.6A, 3.15.8 and 3.15.8A of the NER.

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1 AEMO'S RULE CHANGE REQUEST

1.1 The rule change request

On 8 February 2021, AEMO submitted a rule change request to the Commission in relation to the formulas that are used to calculate how certain non-energy costs are allocated and the interaction between these formulas and the settlement of other markets within the national electricity market (NEM).

AEMO has identified that its settlement systems, as currently configured, cannot function if regional demand in a trading interval, or other cost recovery period, falls below 1 MWh.

AEMO proposed to amend parts of rule 3.15 of the National Electricity Rules (NER).[4] The rule change request included a proposed draft rule.

1.2 Current arrangements

Chapter 3 of the NER sets out the procedures which govern the operation of the market relating to the wholesale trading of electricity and the provision of ancillary services.[5] It also sets out AEMO's responsibility for the operation and administration of the wholesale electricity market, including the following functions:

- registering market participants[6]
- operating and administering the spot markets for electricity and market ancillary services[7]
- managing dispatch[8]
- settling transactions and trades[9]
- prudential monitoring to manage financial risks, such as default risk.[10]

1.2.1 NEM settlement

AEMO is responsible for facilitating the billing and settlement of payments due in respect of all transactions under chapter 3 of the NER, which includes:

- spot market transactions under clause 3.15.6
- reallocation transactions under clause 3.15.11[11]
- some non-energy cost transactions under 3.15.6A, 3.15.8 and 3.15.8A.[12]

AEMO relies on net metering data from connection points so that it can determine fees, allocate cost recoveries and settle transactions. Net metering data is used because under the

4 AEMO, *NEM settlement under low, zero and negative demand conditions,* rule change request, pp. 11-12.
5 See clause 3.1.1 of the NER.
6 See clause 3.2.1 of the NER.
7 See clause 3.2.2 of the NER.
8 See clause 3.2.2 of the NER.
9 See clause 3.2.6 of the NER.
10 See rule 3.3 of the NER.
11 A reallocation is a transaction under which two market participants and AEMO agree to AEMO making matching debits and credits to the position of the market participants. See definition of 'reallocation' in Chapter 10 and clause 3.15.11 of the NER.
12 Additional detail about non-energy costs is included in section 1.2.2 below.

NER the registration categories and the connection point categories represent either 'generation' or 'load', the former generally flowing into the network and the latter taking flow from the network.

The provisions in rule 3.15 also provide formulas to allow AEMO to calculate the amount paid by, or to a market participant, based on its sale or purchase of electricity and its resulting liability for non-energy costs.[13]

1.2.2 Non-energy costs

In the NEM, non-energy costs include payments for market and non-market ancillary services, compensation for directions, market suspension or administered pricing and reserve contract payments.

Low demand circumstances can lead to greater system instability which in turn can increase prices for particular non-energy services, such as frequency control ancillary services (FCAS).

Under the NER, AEMO recovers non-energy costs from market participants based on their registration category and the energy associated with the connection points they have classified in that category.[14]

These registration categories and the associated connection point classifications are set up to represent either 'generation', with flows predominantly into the network, or 'load', with flows predominantly from the network.[15]

1.3 Background

Minimum demand has fallen consistently in South Australia over the last ten years and in 2019 and 2020 this has seen record levels of minimum demand.[16]

South Australia is likely to be the first in the world to reach zero operational demand.[17]

This decline has coincided with consistent growth in rooftop solar capacity, which has seen peak rooftop solar generation in South Australia grow from 648 MW in December 2017, to 775 MW in December 2018, to 928 MW in December 2019 and finally to 1152 MW in December 2020, or between 20 and 24 per cent year-on-year during the period.[18]

By December 2020 solar rooftop capacity was growing by around 30 MW per month.[19]

13 Clause 3.15.6A of the NER.

14 AEMO, *NEM settlement under zero and negative demand conditions,* rule change request, p. 3.

15 AEMO, *NEM settlement under zero and negative demand conditions,* rule change request, p. 3.

16 Australian Energy Regulator (AER), *Wholesale markets quarterly: Q3 2019*, November 2019 p. 11; AER, *Wholesale markets quarterly: Q3 2020,* November 2020, p. 16 ; AER, *Wholesale markets quarterly: Q4 2020,* February 2021, p.10.
AER relies on native demand, which includes scheduled and semi-scheduled generation, non-scheduled wind and solar generation, non-scheduled non wind and solar, exempt generation and imported generation.

17 AEMO, *Minimum operational demand thresholds in South Australia*, May 2020, p. 3.

18 See AER, *Wholesale markets quarterly: Q4 2020*, February 2021, p. 11.

19 AEMO, *Minimum demand in South Australia,* fact sheet, 2021, p. 1.

1.4 Rationale for the rule change request

Some of AEMO's most recent sensitivity studies indicate that net regional demand will reach zero MWh in South Australia in spring 2021.[20]

The consequences for NEM settlement and prudential operations are so significant that AEMO considers it essential for market system changes to be implemented by September 2021.[21]

To prepare for a potential zero or negative demand trading interval and, to ensure that settlement can continue, AEMO must change its systems to ensure that AGE values remain more than 1 MWh, in these cost allocation formulas.

AEMO requested the AEMC initiate this rule change proposal as an urgent rule under section 96 of the NEL.

According to AEMO, if a rule that facilitates settlement in zero or negative demand conditions is not made and implemented before an incidence of those conditions, it could lead to:

- significant disruption to NEM energy and non-energy settlement.
- the potential for significant market participant margin calls and even prudential defaults should this disruption coincide with high pricing events.
- AEMO having to choose between either not paying non-energy costs, in breach of the NER, or being left with no avenue to recover them.[22]

In addition, the risk of operational demand falling below 1 MWh for a trading period is likely to be heightened by the introduction of five-minute settlement on 1 October 2021.[23]

This is because non-energy costs, such as FCAS, have their costs settled on a five-minute basis already, but the apportionment of these costs between market customers is completed following the aggregation of demand and costs for a full 30-minute trading interval.

When a trading interval becomes five minutes, demand will no longer be aggregated in this way, and this creates a greater risk that a trading interval will be a negative value.[24]

1.5 Solution proposed in the rule change request

The solution proposed by AEMO in its rule change request is to allow it to substitute AGE values when net regional demand is less than 1 MWh, to create numerators and denominators for non-energy cost recovery formulas that will work in AEMO's settlement systems. This will be an automated process.[25]

The value for substitution for each market customer would be the average of that market customer's AGE amounts in the last four billing periods.[26] It will then substitute the aggregate

20 AEMO, *Minimum demand in South Australia,* fact sheet, 2021, p. 3.

21 AEMO, *Minimum demand in South Australia,* fact sheet, 2021, p. 3.

22 AEMO, *NEM settlement under zero and negative demand conditions,* rule change request, p. 4.

23 The introduction of the *Five-minute settlement rule* will align the dispatch and settlement and the trading interval at five minutes.

24 AEMO, *Settlements guide to ancillary services and payment and recovery,* February 2020, p. 9.

25 AEMO, *NEM settlement in zero and negative demand conditions,* rule change request, p. 9.

26 Chapter 10 of the NER defines a *billing period* as the period of 7 days commencing at the start of the trading interval ending 12.30 am Sunday.

AGE for a region with the sum of the substituted market customer average AGEs in the affected NEM region.[27]

The proposed rule has been designed to be a targeted, low impact, short-term and inexpensive solution. For these reasons its design is simple. To reduce its burden and unintended consequences, it includes a:

- reduced scope, excluding Reliability and emergency reserve trader (RERT) costs and compensation for administered price cap or floor events, to minimise implementation costs, because these non-energy costs are highly unlikely to be incurred during minimum demand periods.[28]
- review mechanism to allow the demand substitution reference period (four most recent complete billing periods) to be replaced with a more representative AGE value, if requested by a market customer or recognised by AEMO.[29]

1.6 The rule making process

On 22 April 2021, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request.[30] A consultation paper identifying specific issues for consultation was also published. Submissions closed on 20 May 2021. The Commission received six submissions as part of this consultation.

AEMO requested that the rule change request be considered an urgent rule change request and, as a result, be assessed under an expedited rule change process.

The Commission accepted that the rule change request was a request for an urgent rule as defined in s. 96 of the NEL. Accordingly, the Commission commenced an expedited rule change process, subject to any written requests not to do so. The closing date for receipt of written requests was 6 May 2021. No objections to an expedited rule change process were received. Accordingly, the rule change request was considered under an expedited process.[31]

The Commission considered all issues raised by stakeholders in submissions and feedback provided at bilateral meetings. Issues raised in submissions are discussed and responded to throughout this final rule determination. Issues that are not addressed in the body of this document are set out and addressed in appendix A.

27 AEMO, *NEM settlement in zero and negative demand conditions,* rule change request, p. 9.

28 AEMO, *NEM settlement in zero and negative demand conditions,* rule change request, p. 9.

29 AEMO, *NEM settlement in zero and negative demand conditions,* rule change request, p. 12. To be reviewed substitution must have occurred in at least five billing periods.

30 This notice was published under s. 95 of the NEL.

31 Section 96 of the NEL.

2 FINAL RULE DETERMINATION

This chapter includes:

- the Commission's final rule determination
- the rule making test for changes to the NER
- the assessment framework for considering the rule change request
- a summary of reasons for the final rule
- implementation of the final rule.

2.1 The Commission's final rule determination

Having considered views expressed by stakeholders in submissions and meetings and undertaken further analysis, the Commission has determined to make a final rule that enables the NEM to continue to settle transactions in low, zero or negative demand conditions.

It will also reduce the potential for market customers to receive inequitable payments for having a negative net regional demand during a trading interval and the potential for market customers with net positive regional demand to be required to pay a disproportionate amount of non-energy costs.

Key features of the more preferable rule

The more preferable final rule made by the Commission is published with this final determination. The key features of the more preferable final rule are:

- when aggregate AGE, or a similar aggregate term,[32] in the non-energy cost formulas goes below 150 MWh for a trading interval, AEMO will substitute values in place of each market customers' AGE, or a similar term, in the relevant NEM region.[33]
- the AGE, or a similar term, as explained in appendix D, will be substituted for each customer's average value for the last four completed billing periods prior to the start of the relevant recovery period
- the final rule does not include RERT costs and compensation for administered price cap or floor events, because these non-energy costs are highly unlikely to be incurred during periods of minimum demand
- the substitution mechanism must be reviewed by AEMO if there has been substitution in at least 5 billing periods and AEMO or a market customer considers the existing demand substitution period is not suitable
- from 1 October 2021, with the introduction of the Five-minute settlement rule, the trigger threshold for substitution will be reduced to 25 MWh in a trading interval. This is because

32 Similar aggregate term means ATCE, RATCE or ΣE. Additional detail about these terms is provided in appendix D.

33 Similar terms are TCE and E. Additional detail about these terms is provided in appendix D.

a trading interval will be reduced to 5 minutes and the substitution trigger threshold must be adjusted to reflect this.[34]

In addition, the rule inserts a note at the end of clauses 3.15.6A(c8); (c9); (e); (h); (i); 3.15.8(f), (g); 3.15.8A(b); (g), 3.15.18(b); (f) to recognise that values within these clauses are now subject to substitution according to the terms of clause 3.15.6AA.

The final rule is a more preferable rule because it is similar in design to AEMO's proposed rule, but it includes a trigger for the substitution of values at a threshold of 150 MWh rather than 1 MWh.

The Commission's reasons for making this final rule determination are set out in section 2.4. More details of the more preferable rule are also set out in chapter 3 of this final determination. The Commission considered all issues raised by stakeholders in submissions, which are discussed and responded to throughout this final rule determination.

Further information on the legal requirements for making this final rule determination are set out in appendix B.

2.2 Rule making test

2.2.1 Achieving the NEO

Under the NEL the Commission may only make a rule, if it is satisfied that the rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO).[35] This is the decision-making framework that the Commission must apply.

The NEO is:[36]

> to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.

2.2.2 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO.

In this instance, the Commission has made a more preferable rule. The reasons are summarised below in section 2.4.

34 AEMC, *Five-minute settlement*, final determination, 28 November 2017, p. i.
35 Section 88 of the NEL.
36 Section 7 of the NEL.

2.2.3 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
  - the national electricity system, and
  - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

As the rule relates to parts of the NER that currently do not apply in the Northern Territory, the Commission has not assessed the rule against the additional elements required by the Northern Territory legislation.[37]

2.3 Assessment framework

In assessing the rule change request against the NEO the Commission has considered the following principles:

- **Effective and proportionate risk management:** does the proposed solution enable the market operator to appropriately manage against foreseeable risks?
- **Minimises uncertainty and market changes:** does the proposed solution minimise uncertainty for market participants and AEMO to manage risks?
- **Minimises regulatory and administrative burden:** is the cost of implementing the proposed solution proportional to the importance of the issue to be resolved?
- **Administrative certainty**: does the proposed solution facilitate effective administrative processes and provide administrative certainty for market participants?

2.4 Summary of reasons

Having regard to the issues raised in the rule change request and during consultation, the Commission is satisfied that the more preferable final rule will, or is likely to, better contribute to the achievement of the NEO for the following reasons:

- it will substantially remove the settlement risk that exists in low, zero or negative demand circumstances
- it will produce greater certainty for market customers by allowing AEMO to continue to efficiently undertake its prudential responsibilities

37 From 1 July 2016, the NER, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NER have been adopted in the NT. (See the AEMC website for the version of the NER that applies in the NT.)

- it helps preserve the efficient operation of the NEM, by largely removing the potential market distortions that occur when net regional demand is low
- it helps preserve the efficient operation of the market by substantially reducing the risk that market customers may receive payments for having a negative AGE value.

The rule is a proportionate response to the risks faced by AEMO and market customers. By providing a temporary, low cost solution to the settlement risks raised by AEMO, which can be implemented within the urgent time frame, the Commission has ensured that AEMO can prevent the risks to its settlement and prudential systems. Addressing these settlement and prudential risks should also assist in preserving market integrity and certainty.

Additionally, the Commission has reduced the risk and uncertainty market customers faced due to inequitable payments and disproportionate payments risks.

Finally, because the rule is simple and targeted with a narrow scope and involves only one rule change, it can be implemented as soon as possible and allow market customers and AEMO to progress any system changes as soon as possible, preserving administrative certainty.

2.5 Implementation of the final rule

The main operative provisions in schedule 1 of the final rule, which amends rule 3.15 of the NER, will commence on 1 September 2021. The Commission has relied on a load of 150 MWh for a trading interval under Schedule 1 as this is broadly similar to the record minimum demand conditions of 300 MW in a trading interval that was experienced by South Australia in 2020. This is because a 300 MW load consuming over 30 minutes uses the equivalent amount of electricity to a 150 MW load consuming over 1 hour.

2.5.1 Aligning the rule with five minute settlement

Schedule 2 of the rule will commence on 1 October 2021. This amends clause 3.15.6AA(b)(2) to align the rule with the introduction of five minute settlement.

This additional amendment is necessary because the *Five-minute settlement* rule will change the length of a trading interval from 30 minutes to five minutes.[38] At this time the clause will need to amend the threshold for triggering substitution from 150 MWh to 25 MWh.

This is necessary to adjust for the changing time base under which AGE is measured. To maintain a 300 MW load over the five-minute interval, the threshold will have to be reduced to 25 MWh as this represents the 300 MW over a five-minute trading interval.[39]

38 AEMC, *Five-minute settlement*, final determination, 28 November 2017, p. i.

39 Five minutes is equal to a twelfth of one hour and 25 MWh is 300 MW x 1/12.

3 SUBSTITUTION METHODOLOGY WITH A 150 MWH THRESHOLD

3.1 AEMO's view

As explained in section 1.5, to address the settlement risks recognised in AEMO's rule change request, AEMO proposed to implement a change to rule 3.15 of the NER that would allow it to substitute AGE values into non-energy cost allocation formulas when AGE values fall below a threshold level of 1 MWh during a trading interval.[40]

The substitution methodology

When this threshold for substitution is reached, AEMO proposed that AGE values should be substituted with the average AGE amounts in the last four complete billing periods for each market customer.[41] The aggregate AGE value would be the sum of all market customers' substituted AGE values.

3.1.1 Infigen's alternative threshold for substitution

As an alternative to its proposed market flooring solution, which is explained in more detail in appendix C of this determination, Infigen suggested pairing AEMO's proposed substitution methodology with a higher threshold for substitution of 150 MWh.[42]

In its view, this would reduce the risk that a market customer's AGE will be a negative value. This means:

- It is unlikely that a market customer would receive payment for having negative net flows.[43]
- It reduces the risk that in low net regional demand situations those market customers with positive net loads are required to potentially pay a disproportionate share of non-energy costs, despite native demand remaining constant.[44]
- AEMO would be able to continue to settle the NEM if net regional demand is less than 1 MWh during a trading interval.

3.2 Stakeholder view's

The imminent risk

The majority of submissions recognised the imminent settlement risk raised by AEMO and acknowledged that action needed to be taken to address the problem.[45]

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40 AEMO, *NEM settlement in zero and negative demand conditions*, rule change request, p. 9.
AEMO's proposal set this threshold value at 1 MWh, the Commission is making a rule with a threshold value of 150 MWh.

41 AEMO, *NEM settlement in zero and negative demand conditions*, rule change request, p. 9.

42 Infigen, *Settlement under low operational demand*, rule change request, p. 13.

43 Infigen, *Settlement under low operational demand,* rule change request, p. 12.

44 native demand in a region is demand that is met by local scheduled, semi-scheduled, non-scheduled, and exempt generation, and by generation imports to the region, excluding the demand of local scheduled loads. AEMO, *Demand terms in the EMMS data model,* June 2019, p. 9.

45 Submissions to consultation paper: AGL, p. 1; ENGIE, p. 1; SA Water, p. 4; Neoen, p. 1; Origin, p. 1.

The substitution methodology

Whilst stakeholders generally agreed that changes were required to address the settlement risks noted by AEMO, there was disagreement about whether AEMO's proposed solution was the best mechanism.

AGL, ENGIE, and Origin explicitly supported AEMO's substitution methodology.[46]

Even though SA Water acknowledged the settlement risks raised by AEMO and the need for a short-term solution, it noted that it still preferred a final solution with a long lead time, rather than a stop gap measure. SA Water suggested that a solution should allow market participants to respond to actual market signals, rather than relying on historical averages.[47]

Stakeholder views on the threshold

Stakeholders held divergent views on what the threshold value should be.

Some stakeholders were strongly in favour of a higher threshold. The South Australian Chamber of Mines and Energy (SACOME) observed that a higher threshold would allocate costs more fairly among market participants, while it was concerned applying AEMO's draft rule risked higher prices.[48]

Similarly, ENGIE saw increasing the threshold in AEMO's proposed solution to 150 MWh per trading interval as an appropriate short-term solution to limit potential distortions.[49]

Origin indicated that a higher threshold increased the likelihood of market intervention[50], while AGL noted that it was concerned that using a different threshold (150 MWh) would require extensive coding, testing and implementation.[51] However, the Commission notes that AEMO has confirmed that it can implement a higher threshold within sufficient time.

Neoen stated that AEMO's solution still resulted in inequitable wealth transfers between market participants.[52]

3.3 Analysis

In conducting its analysis, the Commission considered several matters:

- the need to implement an urgent solution to address the imminent problem identified
- AEMO's implementation constraints
- the longer term solutions that may be provided by the implementation of *Integrating storage* and *Global settlements and market reconciliation (Global settlement)* rule changes.

46 Submissions to consultation paper: AGL, p. 1; ENGIE, p. 1; Origin, p. 1.
47 SA Water, *submission to consultation paper,* 20 May 2021, p. 4.
48 SACOME, *submission to consultation paper,* 20 May 2021, p. 2.
49 ENGIE, *submission to consultation paper,* 20 May 2021, p. 1.
50 Origin, *submission to consultation paper*, 20 May 2021, p. 1.
51 AGL, *submission to consultation paper,* 21 May 2021, p. 1.
52 Neoen, *Submission to consultation paper,* 20 May 2021, p. 1.

- the fact that the Commission had previously noted, in its consultation paper, that it was willing to consider a different threshold.[53]

Imminent risks from non-settlement

Given the settlement risks raised by AEMO are likely to be non-remote by spring 2021, an urgent and proportionate response is required. Failing to take action risks:

- significant disruption to NEM energy and non-energy settlement
- significant disruption to AEMO's capacity to undertake its prudential management responsibilities
- broader damage to market integrity and the reputation of the market operator.[54]

Limited time and capability to implement solutions

AEMO has noted that it currently has limited time and capability to implement changes to its systems before spring 2021 and in its *EMMS Technical Specification — October 2021,* released in May 2021,[55] AEMO noted that it had commenced implementation of the 1 MWh threshold concurrently with AEMC's rule change consultation.[56] The Commission understands that AEMO can implement this rule change by 1 September 2021.

Beyond this urgent rule, AEMO is already committed to implementing other major projects during spring 2021, including:

- Five-minute settlement: 1 October 2021
- Wholesale demand response mechanism: 24 October 2021
- Reducing customer switching times: 1 October 2021.[57]

Given the significant scale of these projects, the Commission recognises that AEMO has limited capacity to implement additional rule changes before summer 2021-22.[58]

Long-term comprehensive solution

The *Integrating storage* rule change (if made) and the implementation of the *Global settlement* rule change will, combined, provide a long-term solution to the problems identified in AEMO's rule change by allocating costs based on gross energy flows, rather than net energy flows.[59]

Willingness to consider alternative thresholds

Finally, while the Commission, has focused on creating a solution that responded to the settlement risks and the inequitable payments that can occur in low net demand

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53 AEMC, *NEM settlement under zero and negative demand conditions*, consultation paper, 22 April 2021, p. 25.

54 AEMO, *NEM settlement under low, zero and negative demand conditions,* rule change request, pp. 4; 9; 13.

55 AEMO's Electricity Market Management System (EMMS) describes the technical changes required to AEMO's participant systems for the relevant month. It provides guidance about the changes to market systems. The *EMMS Technical Specification — October 2021* provides detail about the implementation of the Wholesale Demand Response rule change.

56 AEMO, *EMMS Technical specification — October 2021,* 1 May 2021, p. 10.

57 AEMO, *Regulatory roadmap v.4.*, 18 March 2021.

58 AEMO, *Regulatory roadmap v.4.*, 18 March 2021.

59 AEMC, *Integrating energy storage systems in the NEM,* options paper, December 2020, p. 19.
Global settlement will ensure that AEMO has gross data on energy flows. See AEMC, *Global settlement and market reconciliation,* final determination, 6 December 2018.

circumstances, it did note that if stakeholders demonstrated substantial consensus about what the threshold for triggering substitution should be, it would consider addressing an alternative threshold through AEMO's rule change.[60]

3.3.1 Addressing the key risks noted by AEMO and Infigen

By implementing AEMO's substitution methodology with a threshold of 150 MWh:

1. non-energy costs will continue to be settled.
2. AEMO will be able to calculate non-energy costs if net regional demand is zero MWh.[61]
3. broader settlement will continue.[62]
4. prudential assessment processes will remain effective.[63]

Furthermore, because substitution takes places at a higher threshold it will mitigate against the risks presented by Infigen, reducing the risk that:

- market customers with net negative loads will receive payments[64]
- the remaining market customers with net positive loads will be required to pay a higher share of the costs, despite native demand remaining constant.[65]

The Commission notes that the 150 MWh threshold is broadly similar to the 300 MW record minimum demand conditions experienced in South Australia in October 2020.[66]

The Commission acknowledges that the risk of over-recovery will remain and some customers may still receive payments but analysis notes that the potential prevalence and magnitude of these will be diminished.

3.3.2 Minimising regulatory and administrative burden

In making the rule, the Commission has given particular regard to the need for a proportional response.

While the problems of low operational demand recognised by AEMO and Infigen are likely to occur more frequently in the future, the solution is only a temporary one. Given this, it is critical that it does not create any unreasonable burden on market customers and AEMO. This approach was acknowledged by most stakeholders.[67]

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60 AEMC, *NEM settlement under low zero and negative demand conditions*, consultation paper, 22 April 2021, p. 25.

61 Under the current arrangements, if aggregate AGE is exactly zero MWh during a trading interval, AEMO will not be able to calculate, via its automated systems or manually, non-energy costs because there will be a zero denominator, which will mean AEMO is unable to attend to its settlement responsibilities under chapter 3 of the NER.

62 If a non-energy cost recovery amount cannot be allocated, the calculation will fail and AEMO's automated settlement runs will stop working. Because AEMO's settlement is an integrated process, this will impact the settlement of all transactions, including energy and reallocations.
See AEMO, *NEM settlement in zero and negative demand conditions*, rule change request, p. 8.

63 AEMO's prudential processes will cease to operate effectively, because they rely on settlement data to determine maximum credit limits, corresponding amounts of credit support and to determine when margin calls need to be made. See AEMO, *NEM settlement in zero and negative demand conditions*, rule change request, p. 8.

64 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 4.

65 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 4.

66 AEMO, *Operational management of low demand in South Australia,* 22 October 2020, p. 1.
A megawatt hour (MWh) is a measure of electrical energy over time. A trading interval under the NEM is equal to 30 minutes, therefore over 1 hour this amounts to using 300 MW x 0.5 hours = 150 MWh.

67 Submissions to consultation paper: AGL, p. 1; ENGIE, p. 1; Neoen, p. 1; SACOME, p. 2.

The Commission considers the more preferable rule is a proportionate response for the following key reasons:

- it can be implemented by 1 September 2021
- it is targeted and has a minimal scope as it does not include RERT costs and compensation for administered price cap or floor events. This is because these non-energy costs are highly unlikely to be incurred during periods of minimum demand[68]
- the consultation has not revealed any unreasonable additional costs on market participants or AEMO
- the *Integrating storage* rule change will (if made) provide a long-term solution.[69]

SA Water noted it preferred a solution with a long lead-time that implemented a final, well-designed solution rather than a stop-gap measure.[70]

However, in the present circumstances, the Commission emphasises that a temporary solution is urgently needed.

3.3.3 Minimising distortion and promoting market integrity

The Commission recognises that, despite the urgency of this rule, it is important that the solution limits market distortion as much as possible and protects market integrity. The final rule achieves this because:

- the use of four billing periods for substitution protects against the potential for greater distortion that could exist under both longer and shorter substitution periods and there is a mechanism to call for a review of the substitution period if it is found to be unrepresentative
- the 150 MWh threshold is likely to be rarely triggered
- not making a rule and allowing settlement to fail is not an outcome consistent with the NEO.

Distortion from substituting values

Some stakeholders commented in their submissions that AEMO's substitution methodology caused market distortion because it involved substituting historical values into cost recovery formulas.[71]

The Commission acknowledges that by substituting real figures with historical values there is potential to distort the market and that this may disadvantage those market participants that have already implemented strategies to respond to market price signals.[72]

68 AEMO, *NEM settlement in zero and negative demand conditions*, rule change request, p. 9.

69 AEMC, *Integrating energy storage systems in the NEM,* options paper, December 2020, p. 19.

70 SA Water, *submission to consultation paper,* p. 4.

71 Submissions to consultation paper: Origin, p. 1; SA Water, p. 4.

72 In its submission SA Water noted it has taken active steps to manage its demand and to schedule electricity consumption at times when generation is abundant and prices are low. See SA Water, *submission to consultation paper,* 20 May 2021, pp. 1; 4.

However, it is worth noting that in settling on a demand substitution reference period of four billing periods, AEMO was informed by its own consultation process, undertaken at the end of 2020.

AEMO ultimately settled on four complete billing periods because a longer period risked distorting a market customer's demand due to customer churn and seasonal differences, while a shorter period risked being distorted by one-off unusual events.[73]

As a safeguard to protect against unintended distortionary consequences, the rule also allows for the substitution period to be reviewed, where either AEMO or a market customer believes that it does not yield a representative AGE value for the relevant recovery periods.[74]

As such, while the risk of market distortion remains because of this substitution, the Commission considers that the potential distortion is reduced by the substitution methodology, while the review mechanism alleviates the risk of any unintended consequences.

The likelihood of triggering

Additionally, it is worth noting that the substitution mechanism is unlikely to be triggered often. As explained in section 3.3.1, the 150 MWh threshold for substitution is broadly equivalent to the 300 MW record minimum demand event that was experienced in South Australia in 2020.[75]

AEMO's most recent modelling suggests that net regional demand is likely to continue to decline in 2021 and 2022 and it possibly will be negative during a trading interval in spring 2021.[76]

Despite this, it is unlikely that this will be triggered frequently in the near term, although there is increasing risk as more rooftop solar enters the NEM. This is because minimum demand requires a confluence of conditions, typically this will take place:

- during spring or early summer
- on a public holiday or a weekend day, as demand is typically lower on these days
- during mild, clear weather conditions, with high generation output from rooftop solar.[77]

The Commission notes that it is unlikely that this combination of conditions will occur regularly.

For example, according to the AER, between September and December 2020, in South Australia, daily minimum demand was less than 400 MW on only seven out 122 days. Furthermore, while this is low demand by historical standards, this still would not have triggered the substitution of values.[78]

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73 AEMO, *Settlement under zero and negative demand conditions,* consultation outcomes, February 2021, p. 4.

74 Clause 3.15.6AA(d) of the NER. To be reviewed substitution must have occured in at least five billing periods.

75 AEMO, *Operational management of low demand in South Australia,* 22 October 2020, p. 1.

76 AEMO, *Operational management of low demand in South Australia,* 22 October 2020, p. 1.

77 AEMO, *Operational management of low demand in South Australia,* 22 October 2020, p. 1.

78 AER, *Wholesale market quarterly -- Q3 2020,* 12 November 2020, p.16; AER, *Wholesale markets quarterly — Q4 2020*, 18 February 2021, p. 10.

As such, while the substitution can cause market distortion it is unlikely that the substitution of values will take place often.

Distortion arising from not making a rule change

Finally, the potential distortion that may be caused by the proposed solution needs to be considered in relation to the alternative of not making a rule change.

Failing to settle the NEM would lead to short-term market disruption and in the longer term would significantly undermine market integrity.

The Commission recognises that whilst some risk of market distortion brought about by the solution will remain, it has been minimised, and still remains preferable to not making a rule.

3.4 Conclusions

Taking into consideration feedback provided by stakeholders through submissions and further analysis carried out by the AEMC, the Commission has made a more preferable rule which will implement the solution broadly as suggested by AEMO.

AEMO's rule change request and Infigen's rule change request recognised related issues, that require an urgent short-term solution until a longer-term solution is implemented.[79]

Pairing AEMO's substitution methodology with the threshold for substitution of 150 MWh, as proposed by Infigen, is a proportionate response to address the urgent settlement risks raised by AEMO.

It is also an effective way to limit the downside impacts of inequitable cost recovery and over procurement of non-energy costs in low net regional demand conditions noted by Infigen.

Additionally, it is a low burden solution that provides certainty for market participants and AEMO.

The final rule does not include RERT costs and compensation for administered price cap or floor events. This is because these non-energy costs are unlikely to be incurred during periods of minimum demand.

The final rule

The rule amends the NER to include a new clause 3.15.6AA that amongst other things, defines the substitution methodology and sets out the conditions for when substitution will occur, that is when aggregate AGE or a similar term is less than or equal to 150 MWh.

In addition, the rule inserts a note at the end of clauses 3.15.6A(c8); (c9); (e); (h); (i); 3.15.8(f), (g); 3.15.8A(b); (g), 3.15.18(b); (f) to recognise that values within these clauses are now subject to substitution according to the terms of clause 3.15.6AA.

79 AEMO, NEM settlement under zero and negative conditions, rule change request, 8 February 2021. Infigen, *NEM settlement under low operational demand,* rule change request, 22 February 2021.

Finally, the rule adds the definition of customer energy in Chapter 10 of the NER. The rule also italicises references to 'customer energy' in the definitions of 'TCE' and 'RATCE'. [80] Additional detail about which non-energy cost formulas are affected by the rule change and how the substitution of values takes place under the rule can be found in appendix D.

Commencement

Schedule 1 of the rule will commence on 1 September 2021.

Schedule 2 of the rule changes the applicable value in clause 3.15.6AA(b)(2) from 150 MWh to 25 MWh, following the commencement of the *National Electricity Amendment (Five-Minute Settlement) Rule 2017 No.15.* This rule is scheduled to commence on 1 October 2021.

This is necessary in order to adjust for the changing time base under which AGE is measured. To maintain a 300MW load over the five-minute interval, the threshold will have to be reduced to 25 MWh as this represents the 300 MW load consuming over a five-minute trading interval.[81]

This additional change is necessary because, under the *Five-minute settlement* rule, trading intervals will be aligned with dispatch intervals at five minutes.[82] The change will ensure that substitution triggering threshold reflects the five-minute trading interval value rather than the current 30-minute trading interval value.

80 TCE refers to the customer energy for the relevant market customer in the region for the trading interval, it is used in non-energy cost allocation formulas for ancillary services under clause 3.15.6A, funding of compensation for directions under clause 3.15.8. RATCE refers to the aggregate of the customer energy figures for all market customers in that region for the trading interval. It also is used in non-energy cost allocation formulas for ancillary services under 3.15.6A and funding for directions under clause 3.15.8.

81 Five minutes is equal to a twelfth of one hour and 25 MWh is 300 MW x 1/12.

82 AEMC, *Five-minute settlement,* final determination, 28 November 2017, p. i.

ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AGE	Adjusted gross energy
Commission	See AEMC
FCAS	Frequency control ancillary service
MCE	Ministerial Council on Energy
MWh	Megawatt hour
NEL	National Electricity Law
NEM	National electricity market
NEO	National electricity objective
NER	National Electricity Rules
RERT	Reliability and reserve trader
SACOME	South Australian Chamber of Mines and Energy

A SUMMARY OF OTHER ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the first round of consultation on this rule change request and the AEMC's response to each issue. If an issue raised in a submission has been discussed in the main body of this document, it has not been included in this table.

Table A.1: Summary of other issues raised in submissions

STAKEHOLDER	ISSUE	AEMC RESPONSE
Neoen, p. 1.	Neoen noted that using net metering was not appropriate for the recovery of FCAS costs, market charges or non-market services. It suggested an alternative to Infigen's suggestion which would involve estimating behind-the-meter production and back calculating the underlying consumption.	The AEMC has previously been made aware of estimating behind-the-meter production to back calculate underlying consumption as a means of allocating non-energy costs. The complexity required to accurately measure this underlying consumption makes this option infeasible given the timeline required for a solution before spring 2021.
SACOME, p. 4.	SACOME member companies continue to raise concerns about how AEMO's intervention in the NEM continue to increase their energy costs. SACOME noted that the secure operation of the NEM and energy costs are not mutually exclusive but interlinked.	The Commission notes that this is beyond the scope of AEMO's rule change.

B LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this final rule determination.

B.1 Final rule determination

In accordance with s. 102 of the NEL the Commission has made this final rule determination in relation to the rule proposed by AEMO.

The Commission's reasons for making this final rule determination are set out in chapter 3.

A copy of the more preferable final rule is attached to and published with this final rule determination. Its key features are described in chapter 2.

B.2 Power to make the rule

The Commission is satisfied that the more preferable final rule falls within the subject matter about which the Commission may make rules. The more preferable final rule falls within s. 34 of the NEL as it relates to the operation of the national electricity market.

B.3 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule
- the rule change request
- submissions received during first round consultation
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.[83]

B.4 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the ministerial forum of the Energy Ministers (formerly the COAG Energy Council) that new or existing provisions of the NER be classified as civil penalty provisions.

The Commission's more preferable rule amends clause 3.15.8(b) of the NER. This clause is currently classified as civil penalty provisions under Schedule 1 of the National Electricity (South Australia) Regulations.

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83 Under s. 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council was formerly called the COAG Energy Council but is now called the Energy Ministers Meeting.

The Commission considers that clause 3.15.8(b) should continue to be classified as a civil penalty provision and therefore does not propose to recommend any change to its classification to the ministerial forum of the Energy Ministers.

B.5 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the ministerial forum of the Energy Ministers that new or existing provisions of the NER be classified as conduct provisions.

The more preferable final rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the ministerial forum of the Energy Ministers that any of the proposed amendments made by the more preferable final rule be classified as conduct provisions.

C INFIGEN'S RULE CHANGE

Infigen's rule change request *NEM settlement under low operation demand* was also initiated on 22 April 2021, with the release of a consultation paper. It was submitted to the AEMC on 15 February 2021.[84]

C.1 Infigen's related concerns

As noted in chapter 1, non-energy costs include payment for market and non-market ancillary services, compensation for directions, market suspension or administered pricing and reserve contract payments.

Low demand circumstances can lead to a need for particular non-energy services, such as FCAS, as low demand circumstances can lead to greater system instability. These costs are then allocated and recovered from market customer's according to their net demand.

Infigen's request focused on the potential for low operational demand to distort the allocation of costs that arise from these non-energy cost formulas. When operational demand reduces in a region, the remaining market customers with a net load pay a higher share of non-energy costs, despite native demand[85] remaining constant.[86]

Infigen further observed that as operational demand approaches 1 MWh, there would be an increase in the number of net exporting market customers and a reduction in the number of net importing market customers.

This leads to a point where:

- customers with net negative loads receive payments, despite these net exporters not providing services to the NEM that would require the recovery of non-energy costs from market customers, while they also do not contribute to the non-energy costs that should be recovered from market customers.[87]
- the remaining market customers with positive net loads are required to pay more than 100 percent of the total service charges, to fund these additional payments.[88]

Figure C.1 below provides a simplified example of how a market customer can be required to pay more than 100 percent of total service costs under scenario 4.

84 Infigen, *Settlement under low operational demand*, rule change request, 15 February 2021.

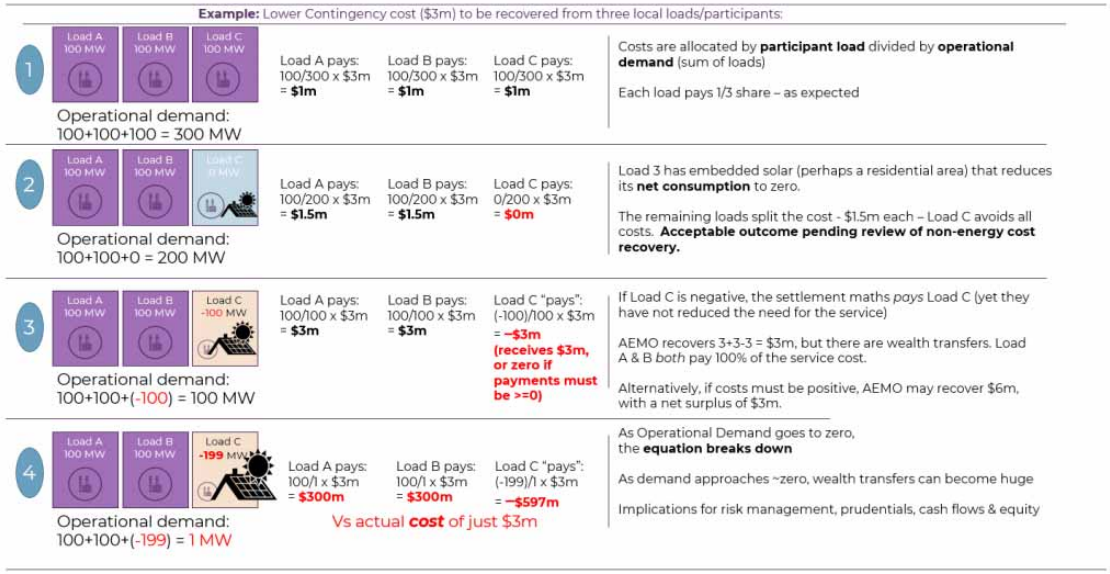
85 Native demand in a region is demand that is met by local scheduled, semi-scheduled, non-scheduled, and exempt generation, and by generation imports to the region, excluding the demand of local scheduled loads. AEMO, *Demand terms in EMMS data model*, June 2019, p. 9.

86 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 4.
The Infigen rule change and the associated consultation paper discuss declining operational demand. AEMO's rule change request uses both regional demand and operational demand.

87 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 6.

88 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 6.

Figure C.1: Infigen's simplified example of cost recovery with three local loads/participants



Source: Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 5.

Infigen notes that the extra amounts recovered are paid to the net exporting loads. This is despite net exporters not providing services to the NEM that would require the recovery of non-energy costs from market customers and also not contributing to their share of the non-energy costs that should be recovered from market customers.[89]

Infigen also suggests that as non-energy costs rise to very high levels, this issue could have potential impacts and drive behaviour that was not contemplated, including:

- Costs rising to what Infigen describes as significant but spurious level where there will be disproportionate effects on particular classes of market customers (large industrial customers).[90]
- The potential for cascading defaults as retailers are unable to meet their settlement obligations to AEMO, potentially further reducing competition in the South Australian retail market.[91]
- Driving customers to disconnect in a manner that may lead to security and reliability risks.[92]

89 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 6.

90 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 8.

91 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 8.

92 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 8. Infigen notes that because high non-energy costs are likely to be in excess of the *Value of customer reliability* the remaining customers with positive loads will have strong incentives to reduce consumption, through load shedding. It notes that as most loads are non-scheduled, this shedding will not be communicated to AEMO ahead of time, and load may drop off suddenly and dramatically. When this happens, operational demand will further decrease, creating even sharper incentives for loads to disconnect and potentially greater load shedding.

C.2 Infigen's proposed solution

To address both its own issue and AEMO's settlement issue, Infigen suggested that instead of preventing aggregate AGEs from becoming negative (i.e. the denominator in the equation in the cost recovery formula being negative), the rules should be amended so that the market customer's AGE, the numerator of the equation, is substituted in the cost recovery formula for zero MWh, in circumstances where the market customer's net flows are negative.

By substituting in this way Infigen's solution ensures that a market customer's AGE (the numerator in the equation) is the greater of zero or the market customer's AGE.[93]

In doing this, Infigen's proposed solution prevents a market customer's AGE from being a negative value in the non-energy cost formula. The additional consequences of this, for the cost recovery formulas, are as follows:

- A market customer cannot have a negative AGE for a trading interval, which prevents that customer from receiving payment for their negative net flows.[94]
- While this does mean that regional demand can still fall below 1 MWh, this can only occur when all market customers in a region have a load that is net negative or zero. Infigen notes that this is very unlikely for at least the next 12-24 months.[95]
- AEMO does not recover any share of market costs from customers who reach the zero MWh floor.

C.3 Infigen's alternative solutions

Infigen also suggested a number of possible alternative solutions:[96]

- setting the threshold for substitution in AEMO's rule change at 150 MWh
- applying a settlement cap such that individual recoverable costs can not exceed the total recoverable costs
- redistributing excess recovered costs back to market customers who have been required to overpay as a result of non-energy costs being over-recovered
- using multiple trading intervals for recovery rather than a single trading interval.

The Commission has chosen to implement the 150 MWh threshold for substitution suggested by Infigen through this rule change.

C.4 Infigen's rule change process

The Commission initiated a standard rule change process on Infigen's proposal, by releasing a consultation paper on 22 April 2021. Submissions closed on 20 May 2021 and the Commission received five submissions as part of this consultation.

93 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 12.
94 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 12.
95 Infigen, *Settlement under low operational demand,* rule change request, 15 February 2021, p. 12.
96 Infigen, *Settlement under low operational demand,* Rule change request, 15 February 2021, p. 13.

Draft determination

On 17 June 2021, the Commission made a draft determination to not make a rule in the Infigen's process because, in its view, Infigen's proposed flooring mechanism did not contribute to the NEO for the following reasons:[97]

- The threshold of 150 MWh, as suggested by Infigen, allows the continued settlement of the NEM in low operational demand scenarios. This is because the aggregate AGE of the region, which is the denominator in the cost recovery formulas, will no longer be able to fall below 1 MWh during a trading interval.
- Having only one solution that addresses both Infigen's and AEMO's rule changes allows for an efficient administrative implementation for both AEMO and the required market customers. An additional rule made within this draft determination, with the assumption that it would be made final, would be published as a final determination on 26 August 2021. Given the spring 2021 deadline for forecast low operational demand events the Commission considers this would be insufficient time for market customers to implement the mechanism.
- Implementing a second interim solution in addition to the 150 MWh threshold solution at an additional cost and for limited benefits is not considered effective or proportionate.
- AEMO can implement the threshold approach by spring 2021 allowing it to be in place for the forecast low or negative operational demand conditions.

The Commission recognises the materiality of the issues identified by Infigen and the need for a solution before the current forecast of low operational demand conditions in September 2021. However, the Commission considers any additional rule made above that already made in the AEMO rule change final determination would have limited benefits.

Further reasoning and analysis can be found in the Commission's draft determination on the Infigen's rule change.

Submissions on the draft determination are due on 29 July 2021 and a final determination will be published on 26 August 2021.

More information about the project can be found at http://www.aemc.gov.au/rule-changes/settlement-under-low-operational-demand

97 AEMC, *NEM settlement under low operational demand*, draft determination, p. 3.

D INABILITY TO SETTLE THE NEM

AEMO's systems cannot calculate when net regional demand is less than 1 MWh, during a trading interval, where non-energy costs are to be recovered. The following table explains this.

Table D.1: **Additional details on non-energy cost formulas and settlement**

ADDITIONAL DETAILS
Non-energy cost formulas
Non-energy costs formulas rely on numerators and denominators that include the term 'adjusted gross energy' and similar terms such as TCE or E • **TCE** means the customer energy for the market customer for the trading interval in that region, in respect of particular Ancillary services transactions under either clause 3.15.6A; the funding of directions under clause 3.15.8; or the funding of compensation for market suspension pricing schedule periods under clause 3.15.8A; • **E** means the sum of the market customer's AGE amounts at each connection point for which the relevant market customer is financially responsible in a region, determined in accordance with clauses 3.15.4 and 3.15.5 in respect of the relevant intervention price trading interval, or that occur during a market suspension pricing schedule period, for funding for compensation for directions under clause 3.15.8 and funding for compensation for market suspension pricing schedule periods under clause 3.15.8A of the NER.
How non-energy costs function
• AGE is measured as the flow of electricity at a participant's connection point, in the relevant category for recovery, either as load or generation. If a connection point both generates and consumes energy, then the AGE for a trading interval is the difference between this produced and consumed energy at the connection point.
Consequences of the denominators falling below 1 MWh
If the aggregate AGE, or a similar term (which means either $ATCE_R$, RATCE, ΣE), which is the sum of AGEs for all customers in a region, falls below one MWh for a trading interval, the non-energy cost recovery formulas in rule 3.15 cannot be solved by AEMO's market settlement systems. If aggregate AGE were to occur during a trading interval in which non-energy costs are incurred and need to be recovered from market customers, AEMO would be unable to recover these costs. **$ATCE_R$** which is either: • in relation to ancillary services, under clause 3.15.6A(e) of the NER, is the aggregate of the customer energy figures for all market customers for the trading interval in that region ATCE, in relation to ancillary services under clause 3.15.6A(h) of the NER, the aggregate of the customer energy figures for all market customers for the trading

ADDITIONAL DETAILS

interval in the region; or

- the aggregate of the customer energy figures for all Market customers, for whom the trading amount is not calculated in accordance with the formula in subparagraph(1) of 3.15.6A(i), for the trading interval for the region or regions relevant to that regulating raise service or regulating lower service; in relation to funding for compensation for directions under clause 3.15.8;

RATCE which is either:

- in relation to ancillary services under clause 3.15.6A of the NER, the aggregate of the customer energy figures for all market customers in that region for that trading interval; or
- in relation to directions under 3.15.8 of the NER, the aggregate of the customer energy for all market customers in that region of the relevant trading interval for the period of the direction.

ΣE which is either:

- in respect of compensation for directions under clause 3.15.8 means, the sum of all market customers' adjusted gross energy amounts at each connection point for which the relevant market customer is financially responsible in a region, determined in accordance with clauses 3.15.4 and 3.15.5 in respect of the relevant intervention price trading intervals, excluding any loads in respect of which the market customer submitted a dispatch bid for the relevant intervention price trading interval in that region; or
- in respect of compensation for market suspension pricing schedule periods under clause 3.15.8A, the sum of all market customers' adjusted gross energy amounts at each connection point for which the market customer is financially responsible in a region, determined in accordance with clauses 3.15.4 and 3.15.5, in respect of the trading intervals that occur during a market suspension pricing schedule period.

Broader consequences of failing to settle non-energy costs

- Once a recovery amount cannot be allocated by AEMO's systems, AEMO's automated settlement runs will stop working, impacting the settlement of all transactions, including energy and reallocations.
- This will also impact AEMO's ability to manage prudential assessment processes, which rely on settlement data to determine the maximum credit limit of each market participant, as well as credit support and margin call requirements

Source: AEMO, *NEM settlement under zero and negative demand conditions,* rule change request, p. 9; Rule 3.15 of the NER.