

Australian Energy Market Commission

RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (WHOLESALE DEMAND RESPONSE MECHANISM) RULE 2020

NATIONAL ENERGY RETAIL AMENDMENT (WHOLESALE DEMAND RESPONSE MECHANISM) RULE 2020

PROPONENTS

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INQUIRIES

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ABOUT THE AEMC

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

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SUMMARY

- 1 This final determination sets out a series of changes to the National Electricity Rules (NER) to facilitate wholesale demand response in the national electricity market (NEM), principally through implementing a wholesale demand response mechanism. This represents a significant reform for the NEM. Under this final rule, consumers would be able to sell demand response in the wholesale market either directly or through specialist aggregators for the first time.
- 2 This rule represents an important reform for the NEM. It introduces a low-cost mechanism for transparently engaging the demand side in central dispatch. Since the NEM commenced, the demand side has rarely participated in central dispatch. However, under this mechanism, consumers would be able to actively participate in central dispatch and be rewarded for the value they provide to the system. In addition, this mechanism would capture the benefits of greater demand side participation and share these benefits with all consumers. This final rule allows for new technologies, particularly those brought about by increased digitalisation to be valued within the market framework. This is an important step on a path toward a more two-sided market.
- 3 This mechanism also provides for more flexible capacity in the wholesale market. Wholesale demand response will be able to compete with peaking generation in times of tight supply and demand balance.
- 4 This mechanism also represents a design that seeks to minimise the impact of implementation. It has been designed such that retailers would not need to change their billing systems, which is complex and costly. It has also been designed to minimise the costs incurred by AEMO. This has resulted in a mechanism that enables greater demand side participation at low cost.
- 5 The opportunity to introduce a wholesale demand response mechanism arises because there is growing interest across industry in participating in wholesale demand response, as highlighted by the three rule change requests received by the Commission. This rule provides those consumers with greater opportunities to participate in the wholesale market in a manner that values their response while also improving reliability. Wholesale demand response will also contribute to improving reliability and security in the NEM.
- 6 The implementation date for the final rule is 24 October 2021, which means a wholesale demand response mechanism will be operational ahead of summer, which is historically the period in which peak demand is highest and in which a wholesale demand response mechanism may be most useful.

What is wholesale demand response?

- 7 Demand side participation is an umbrella term for the actions a consumer can take regarding their energy consumption, responding to a wide range of incentives. It also indicates that the demand side participates and is influential in clearing the market, as opposed to having a passive role.

8 In electricity markets, active demand side participation promotes efficient consumption of electricity. Having more consumers participate in the market and respond to market price signals means consumption will better reflect consumer preferences. In the long-run, a greater level of demand side participation will improve the efficiency of the dispatch process by delivering the lowest combination of resources to achieve the supply-demand balance.

9 Demand response is a subset of demand side participation. There are different types of demand response: wholesale (for example, responding to changes in the wholesale price), emergency (for example, participating in the RERT), network (for example, using demand response to delay or remove the need for network augmentation) and ancillary services (for example, load changing to manage frequency). While the equipment that provides these different types of demand response is often the same, the services provided are distinct.

Rationale for the wholesale demand response mechanism

10 The rule change requests that are the subject of this final determination seek to facilitate wholesale demand response in the NEM.

11 Providing wholesale demand response in the NEM has been difficult to date because consumers need to be technically equipped to respond (for example, with advanced metering and control over consumption), as well as needing a 'signal' to respond to. Most consumers elect to not respond to wholesale prices themselves, and instead a retailer typically manages the risk on their behalf.

12 There have been a number of trials and state government funded schemes which are encouraging wholesale demand response. In addition, a number of retailers and third party service providers either utilise demand response or enable consumers to do so themselves with offerings which sit outside trials.

13 The role of consumers, and importantly the technology to enable consumer participation, is changing. Technology has evolved and become cheaper, such that more consumers want to participate directly in the wholesale market and are equipped to do so. There is capability and significant interest now to accommodate consumers who want to engage and participate.

14 As the sector continues to transform, there is increasing variability, not only on the supply side (with more weather-dependent, renewable generation), but also on the demand side. Increases in intermittent generation and the uptake of batteries and electric vehicles will make forecasting the demand side increasingly challenging, without more information being provided by the demand side.

15 The Commission considers that there need to be changes in the wholesale market to provide greater scope for consumers to participate in wholesale demand response. A mechanism to facilitate wholesale demand response will unlock underutilised demand response and provide more opportunities for consumers to participate in the wholesale market by offering their demand reductions in as a supply resource.

16 A wholesale demand response mechanism allows consumers to bid their willingness to consume electricity at different prices into the wholesale market. This is effectively what a

two-sided market would facilitate: a wholesale electricity market informed by both quantity and price information from the supply and demand sides of the market. While a two-sided market may have broader scope, particularly in relation to the level of market participation, the implementation and use of the mechanism will inform market design choices in the development of a two-sided market.

17 This mechanism will facilitate additional demand response that is expected to assist with managing tight supply-demand conditions. However, this demand response will constitute an increase in the demand response already being facilitated under the current arrangements.

Mechanism focuses on large customers

18 The wholesale demand response mechanism is designed to allow meaningful volumes of demand-side participation in dispatch and associated system operation benefits at minimal cost and in the near term. This means the design, which requires consumer loads to be controllable for the purposes of scheduling and predictable for the purposes of baselines, is most suited to large customers and unlikely to suit participation by small customers. Small customers also want to participate in demand response, and technological changes are increasingly creating options for them to do so. There are a number of opportunities emerging under the current arrangements for these consumers to participate in demand response. However, extending this mechanism to cater for small customers would:¹

- significantly increase complexity of the systems changes needed to introduce the mechanism which would in turn, significantly increase the implementation costs and time needed to implement the mechanism
- provide limited additional benefits as small customer demand response is not suited to participating in central dispatch in the short to medium term
- require the development of baselines for individual small customers which is difficult to do accurately.

19 Therefore, the Commission's final rule determination is to not make a retail rule, as retail rule changes would only be required if the mechanism extended to small customers.

20 Small customers will increasingly provide valuable demand response. There is a growing number of opportunities for small customers in this regard, either participating through retailer-led demand response programs or providing emergency reserves through the reliability and emergency reserve trader. The value to individual consumers and to consumers collectively of more small customer demand response will grow as digitalisation becomes more prominent. A two-sided market would result in consumers benefiting from increasing opportunities to provide demand response services.

21 The Commission also has a work program assessing how consumer protections should be applied to new energy products and services; in particular, how consumer protections should evolve as consumers are increasingly able to control their import and export of energy and manage their energy requirements. Demand response is one way in which increased

1 More detail on the challenges associated with extending the mechanism to include small customers are presented in chapter 5 of this determination.

consumer participation can occur. It will be important to make sure the appropriate energy specific consumer protections are in place as more small customers engage in demand response.

A two-sided market is the enduring solution

- 22 The Commission notes there is significant stakeholder interest in promoting demand response opportunities for residential customers, and facilitating small customer demand side participation would benefit consumers and the NEM. In seeking to engage small customer demand side participation and share the benefits with all consumers, care needs to be taken in selecting the right framework. The Commission considers that the best approach is to develop a two-sided market, which is more suited to small customer involvement.
- 23 The Commission considers that moving to a two-sided market will assist the NEM in effectively evolving and transitioning to the future power sector, and that will provide enduring consumer benefits. A two-sided market is characterised by the active participation of the supply and demand side in dispatch and price setting. Moving to a two-sided market should enable the transition to a reliable and secure future NEM that is characterised by increased variable supply and more flexible, price responsive demand.
- 24 With these expanded opportunities, a move to a two-sided market will be essential. The growing number of consumers equipped to actively participate in the market will eventually lead to the market outgrowing this particular wholesale demand response mechanism.
- 25 The wholesale demand response mechanism will eventually be outgrown by the market because it is reliant on the use of centrally determined baselines. If the move to a two-sided market is made, this reform should replace the wholesale demand response mechanism. The wholesale demand response mechanism under the final rule relies on setting a baseline quantity against which the value of demand response would be calculated and paid. However, the counter-factual level of demand that would have occurred without a demand response mechanism can not be known accurately. This means there is necessarily some imprecision in the baseline process. If the baseline is set too high, consumers will pay more than they need to. If it is too low, then there would not be enough incentive to encourage demand response in the market.
- 26 On 14 November 2019, the Commission published a paper on the impacts of digitalisation on the NEM.² This paper sets out some thinking on digitalisation and the potential to move to a two-sided market. The Commission invited stakeholders to draw on the paper when they engage in the ESB's 2025 market design work.³ The ESB (which includes the AEMC) was tasked with providing COAG Energy Council with advice on a two-sided market at the Energy Council meeting on 20 March 2020. The ESB published a paper titled 'Moving to a two-sided market'.⁴ This paper set out a high-level overview of what a two-sided market could look like

2 AEMC, *How digitalisation is changing the NEM - The potential to move to two-sided market*, 14 November 2019, available at: <https://www.aemc.gov.au/sites/default/files/2019-11/How%20digitalisation%20is%20changing%20the%20NEM.pdf>

3 For more information, see <http://www.coagenergycouncil.gov.au/publications/post-2025-market-design-issues-paper-%E2%80%93-september-2019>.

4 This paper is available on the COAG Energy Council's website: <http://www.coagenergycouncil.gov.au/post-2025/two-sided-markets>

and its key foundations. It also outlines how both supply and demand should participate to get the most efficient market outcomes and greatest benefits for consumers. Submissions to this paper were due on 18 May 2020.

Overview of the final rule

- 27 The Commission has determined to make a more preferable electricity rule.⁵ The wholesale demand response mechanism will:
- promote greater demand side transparency and assist with power system reliability
 - promote the ability for consumers who participate in the mechanism to change their level of consumption in response to the wholesale electricity price
 - increase the level of consumer choice in relation to wholesale demand response
 - minimise the impacts of any distortions introduced under the mechanism, particularly to the wholesale market as well as retailers' hedging and positions in the contract market
 - reduce the extent of upfront costs imposed on AEMO and the market, specifically retailers, compared to the mechanisms proposed in the rule change requests and in the first draft rule.
- 28 The rule makes a number of changes to the NER to introduce a wholesale demand response mechanism. The rule:
- introduces a new market participant category, a demand response service provider (DRSP)
 - places obligations on DRSPs that, as much as practicable, replicate those applied to scheduled participants, for example, similar information provision and scheduling obligations
 - sets out a process for having baseline methodologies determined and applied to wholesale demand response units
 - provides for DRSPs to be settled in the wholesale market for the wholesale demand response they have provided at the prevailing spot price
 - sets out consequential changes to other aspects of the NER, including changes to RERT provisions
 - makes additional changes to related aspects of the NER, such as the demand side participation information provisions, to improve the integration of the demand side
 - sets out implementation timeframes for the mechanism.
- 29 The process of a customer providing demand response through the mechanism is highlighted below.

⁵ This final rule is a more preferable rule than the proposals set out to the Commission in the rule change requests. The Commission considers this final rule is a more preferable approach in terms of contribution to the NEO.

Figure 1: Process under final rule



Changes from the second draft rule

30

A limited number of changes have been made between the second draft rule and the final rule. The key changes are:

- changing the **reimbursement rate** to reflect peak-period demand weighted wholesale prices. This reimbursement rate is likely to more closely reflect the wholesale component of the retail tariff for loads that are able to provide demand response during periods of high wholesale prices.
- changes to the **dispatch model**. Under the final rule, AEMO will issue a dispatch instruction to DRSPs with a specified level of baseline deviation, that is, an instruction to provide an amount of demand response away from the baseline.
- a **cap in settlement** such that a single load cannot be settled for demand response exceeding its maximum responsive component. This would limit the DRSP being settled for demand response arising from changes in the underlying load that were not predicted by the baseline.

Implementation date

31

Under the final rule, the mechanism will be implemented on 24 October 2021, as was proposed in the second draft rule.

32

A number of stakeholders highlighted concerns with bringing forward the implementation date (from the July 2022 date proposed in the first draft rule) in light of the impacts of COVID-19 and the *Delayed implementation of five minute and global settlement* rule change request.⁶ Equally, a number of stakeholders highlighted the importance of proceeding to introduce this mechanism at the earliest possible date to allow consumers to benefit from more wholesale demand response as soon as possible. The Commission has considered these arguments and decided to retain the implementation date of 24 October 2021 because:⁷

- the majority of the systems changes needed to implement the mechanism reside with AEMO. AEMO has indicated that it can make these changes by 24 October 2021.

⁶ For more information, see: <https://www.aemc.gov.au/rule-changes/delayed-implementation-five-minute-and-global-settlement>

⁷ More information on the rationale for the implementation date of the mechanism is set out in chapter 6 of this determination.

- the interlinkage between the systems changes that retailers may need to make for five minute settlement and global settlement, and the wholesale demand response mechanism, are relatively minor. As such, the Commission considers it unlikely that if there was a delayed implementation of five minute settlement and global settlement this would have a material impact on the costs for retailers of implementing this mechanism.
- the Commission considers retailers are able to manage the implementation of the wholesale demand response mechanism without making systems changes and can instead rely on operational or commercial solutions to the extent this is more cost effective. Therefore, if there is a delay to the implementation of five minute and global settlement, retailers would likely be able to manage the implementation of this mechanism operationally until the commencement of five minute and global settlement, and make any desired systems changes at the same time.

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1 THE RULE CHANGE REQUESTS

1.1 The rule change requests

The Australian Energy Market Commission (AEMC or Commission) received three requests to make a rule regarding demand response in the wholesale electricity market.

- On 31 August 2018, the Total Environment Centre (TEC), the Australia Institute (TAI) and the Public Interest Advocacy Centre (PIAC) submitted a rule change request to the Commission to make an electricity rule, along with consequential retail rules, to introduce a wholesale demand response mechanism. This mechanism would allow third parties (i.e. those who are not the financially responsible market participant (FRMP), usually a retailer, for a consumer) to offer demand response into the wholesale electricity market in a transparent, scheduled manner.⁸
- On 18 October 2018, the Australian Energy Council (AEC) submitted a second, related rule change request to the Commission, to make an electricity rule to introduce an obligation for retailers to negotiate in good faith with third parties looking to provide wholesale demand response through a wholesale demand response register. These third parties would also be scheduled in the wholesale market.⁹
- On 30 October 2018, the South Australian Government submitted a third, related rule change request to the Commission. As with the first rule change request, this proposal seeks to make electricity and retail rules that would allow third parties to offer wholesale demand response into the wholesale market. The rule change request also proposed the introduction of a transitional market for wholesale demand response, a separate wholesale demand response market.¹⁰

1.2 Rationale for the rule change requests

The three rule change requests identified the requirement that third party demand response providers either be registered as a retailer or have a commercial relationship with a retailer to provide wholesale demand response as creating challenges for the integration of demand response in the NEM.¹¹

PIAC, TEC and TAI considered that there are commercial barriers to developing the required partnerships between retailers and demand response providers, with this contributing to a sub-optimal level of wholesale demand response in the NEM in comparison to other energy markets.¹²

8 This rule change request is available on the AEMC website under project code ERC0247/RRC0023. See: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>.

9 This rule change request is available on the AEMC website under project code ERC0248/RRC0025. See: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-register-mechanism>.

10 This rule change request is available on the AEMC website under project code ERC0250/RRC0027. See: <https://www.aemc.gov.au/rule-changes/mechanisms-wholesale-demand-response>.

11 PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, p. 7; AEC, *Wholesale demand response register mechanism - rule change request*, p. 1; South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 3.

12 PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, p. 7.

The AEC suggested that a key concern of demand response providers is that their investments (for example, in equipment to facilitate demand response) are at risk of becoming stranded should their customers change retailers, as a subsequent retailer may decide not to continue with the previous retailer's existing demand response arrangement.¹³

The South Australian Government raised the related issue that if a retailer does not offer demand response products, or provide a direct signal of the wholesale price to customers, its customers have no incentive to change their energy consumption.¹⁴ Further, the South Australian Government noted that the lack of a mechanism for portfolio demand response, and the fact that consumers may not have the capacity to manage their demand at all times, limits consumers' ability to take advantage of demand response offerings.¹⁵

1.3

Solution proposed in the rule change requests

1.3.1

Wholesale demand response mechanism

To address the issues identified their rule change requests, PIAC, TEC and TAI and the South Australian Government proposed changes to introduce a wholesale demand response mechanism in the NEM and create a new category of market participant in the NEM: the demand response service provider (DRSP).¹⁶

This proposal involves transferring the value of wholesale demand response from the existing FRMP (i.e. the retailer) to a DRSP, who may be the customer or a third party service provider engaged by the customer. The model proposed by the rule proponents has the following features:¹⁷

- DRSPs could submit demand response bids into the wholesale market.
- Demand response offers would be scheduled in a manner similar to bids submitted by generators.
- The DRSP would be exposed to the spot price for the difference between a baseline level of consumption estimated to have occurred were it not for the demand response, and the actual level of consumption. The FRMP would be settled in the wholesale market at the spot price for the baseline level of consumption. This would allow the value of the wholesale demand response to accrue to the DRSP without the involvement of the retailer.
- The DRSP would earn the spot price from the wholesale market for the reduction in energy demand by its participating customers and would pay customers for the value of their demand reduction based on agreed commercial arrangements.
- All retail energy customers would be free to participate in this mechanism.

¹³ AEC, *Wholesale demand response register mechanism - rule change request*, p. 1.

¹⁴ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 2.

¹⁵ Ibid, p. 3.

¹⁶ PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, p. 3; South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 4.

¹⁷ PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, p. 9; South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 4.

The rule change requests from PIAC, TEC and TAI and the South Australian Government did not include drafting for a proposed rule.

1.3.2 Wholesale demand response register

To address the issues identified in its rule change request, the AEC proposed NER changes to create a framework within which parties can negotiate agreements to facilitate wholesale demand response in the NEM. The key features of the proposal include:¹⁸

- the creation of a new category of market participant, the Demand Response Aggregator (DRA), which would apply to parties that control demand response and behind-the-meter generation at a connection point (the DRA could also be the FRMP at the connection point)
- requiring AEMO to maintain a register of the demand-side capabilities of registered DRAs
- where a customer who is already participating in demand response changes FRMP, the new FRMP would be required to accept the previous FRMP's DRA arrangements or negotiate changes to DRAs and associated agreements in good faith
- where a customer who is already participating in demand response intends to change demand response arrangements and has provided written notice of this intention to their FRMP, the FRMP would be required to negotiate changes to DRAs and associated agreements in good faith
- where a customer who is not participating in demand response intends to enter into a demand response arrangement and has provided written notice of this intention to their FRMP, the FRMP would be required to negotiate in good faith with prospective DRAs
- loads registered with a DRA may either be continuously classified as scheduled loads, or alternatively could remain "dormant" until such time as the DRAs intended the loads to be active in the market or a Lack of Reserve Notice is issued by AEMO.

The rule change request from the AEC did not include drafting for a proposed rule.

1.3.3 Separate wholesale demand response market

The South Australian Government also proposed the creation of an additional market, designed specifically for demand response and which operates separately from the wholesale electricity market. It is proposed to be introduced as a transitional measure prior to the implementation of a wholesale demand response mechanism (if applicable) to enable the benefits of the mechanism to be realised sooner.¹⁹ However, the Commission noted in the consultation paper that it was proposing to treat this as an alternative mechanism to the proposed wholesale demand response mechanism discussed above.

This market would be operated by AEMO and would be co-optimised with the existing spot market to ensure demand can be met in the most cost-efficient way. Retailers would be responsible for costs associated with the market, which they would be able to spread across their customers.

¹⁸ AEC, *Wholesale demand response register mechanism - rule change request*, p. 2.

¹⁹ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 7.

This new market would require the use of baselines to measure demand response activities of customers. That is, in order to determine the quantity of wholesale demand response being offered into the separate market, a baseline for participating consumers would be needed.

As it would be a separate market to the spot market, it would not require changes to existing settlement processes in the spot market.

The rule change request from the South Australian Government did not include drafting for a proposed rule to implement this additional market.

1.4 Relevant background

In July 2018, the Commission published the final report for its *Reliability frameworks review*.²⁰ In the final report, the Commission made a series of complementary recommendations aimed at supporting increased demand side integration into the wholesale market.²¹ These recommendations did not aim to lock in a particular type of demand side participation, but instead left it open for different types of demand side participation to be provided in the wholesale market in the future. This recognises that new technologies and new business models evolve over time. The recommendations included that demand response providers should be able to be recognised on equal footing with generators in the wholesale market and so be able to more readily offer wholesale demand response in a transparent manner to the Australian Energy Market Operator (AEMO).²² This is the subject of this final rule determination, following the submission of the three rule change requests discussed above.

1.5 The rule making process

Commencement

The Commission commenced six rule change projects, two in respect of each rule change request.

- In respect of the rule change request from the Public Interest Advocacy Centre, the Total Environment Centre and the Australia Institute, the Commission commenced a rule change project titled *Wholesale demand response mechanism* (ERC0247). The Commission also opened a consequential rule change project under the retail rules, *Wholesale demand response mechanism - retail* (RRC0023).
- In respect of the rule change request from the Australian Energy Council, the Commission commenced a rule change project titled *Wholesale demand response register mechanism* (ERC0248). The Commission also opened a consequential rule change project under the retail rules, *Wholesale demand response register mechanism - retail* (RRC0025).
- In respect of the rule change requests from the South Australian Government, the Commission commenced a rule change project titled *Mechanisms for wholesale demand*

²⁰ AEMC, *Reliability frameworks review - final report*, July 2018.

²¹ These recommendations are discussed in more detail in chapter 4.

²² AEMC, *Reliability frameworks review - final report*, July 2018, p. 45.

response (ERC0250). The Commission also commenced a related rule change project under the retail rules, *Mechanisms for wholesale demand response - retail* (RRC0027).

Consultation paper

On 15 November 2018, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change requests.²³ A consultation paper identifying specific issues for consultation was also published. Submissions closed on 21 December 2018.

The Commission received 37 submissions as part of the first round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions were discussed and responded to in the draft determination published in July 2019.

First extension of time

On 7 February 2019, the Commission extended the period of time for making the draft determination for each of the three rule change requests to 18 July 2019 under section 107 of the National Electricity Law (NEL) and section 266 of the National Electricity Retail Law (NERL). The Commission considered this extension to be necessary due to the complexity of the issues raised in the three rule change requests and in stakeholders' submissions to the consultation paper. Several stakeholders also requested that additional time be allowed for consideration of these issues and further consultation. The extension was therefore intended to allow the Commission to undertake additional stakeholder consultation and incorporate outcomes from proposed trials related to wholesale demand response.²⁴

Workshop and technical working groups

The Commission held a stakeholder workshop on 5 March 2019 in Melbourne to discuss the rule change requests. The workshop agenda and slides from the workshop are available on the project page.²⁵

The Commission also formed a technical working group of experts from industry, demand response providers and consumer groups. The Commission convened five technical working group meetings:

- on 22 March 2019
- on 15 April 2019
- on 27 May 2019
- on 11 October 2019
- on 8 April 2020.

Discussion notes from these technical working group meetings are available on the project page.

²³ This notice was published under s.95 of the National Electricity Law (NEL) and s.251 of the National Energy Retail Law (NERL).

²⁴ Due to the revised publication date for the draft determination, the Commission also extended the time for making the final determination for each of the three rule change requests to 14 November 2019 under section 107 of the NEL and section 266 of the NERL.

²⁵ The project page is available here: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

First draft determination

On 18 July 2019, the Commission published two consolidation notices:²⁶

- The first notice related to the consolidation of ERC0247, ERC0248 and ERC0250. The three electricity rule change requests are consolidated under ERC0247 and named *Wholesale demand response mechanism*.
- The second notice related to the consolidation of RRC0023, RRC0025 and RRC0027. These three retail rule change requests are consolidated under RRC0023 and named *Wholesale demand response mechanism - retail*.

On 18 July 2019, the Commission published a draft determination and more preferable draft electricity rule under s. 91A of the NEL. It also determined not to make a draft national energy retail rule.

The Commission received 40 submissions as part of the second round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to in the second draft determination published in March 2020.

Public hearing

Following the publication of the first draft determination:

- The AEMC received two requests, from ENGIE and SIMEC Energy, to hold a pre-final rule determination hearing in relation to the first draft determination. The hearing was held on 6 August 2019.²⁷
- The Commission also held two stakeholder consultation workshops on the first draft determination on 16 August and 22 August 2019.²⁸

Further extensions of time

On 10 October 2019, the Commission extended the period of time for making the final determination for the rule change requests to 5 December 2019 under s. 107 of the NEL and s. 266 of the NERL. The Commission considered this extension was necessary due to complexity and the volume of issues raised by stakeholders in submissions in relation to how the rule is put in place in the regulatory framework.

On 5 December 2019, the Commission extended the time for making a final determination until 11 June 2020 under section 107 of the NEL and section 266 of the NERL. This extension followed the provision of supplementary information by AEMO on the systems changes and costs associated with implementing the proposed mechanism. The Commission considered this extension was necessary to allow for further consideration of how the mechanism may be designed to reduce implementation costs and timeframes and, to the extent possible, avoid costly system changes that may become redundant in the transition to a two-sided

²⁶ These notices were published under section 93(1)(a) of the NEL and section 248 of the NERL.

²⁷ A transcript of the hearing, and associated materials, are available at: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>.

²⁸ The discussion notes and agendas for both workshops can be found at: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

market. The extended timeframe for making a final determination was also intended to allow time for the Commission to consult with stakeholders on the proposed changes from the first draft determination set out in this second draft determination.

Second draft determination

On 12 March 2020, the Commission published a second draft determination and a second more preferable draft electricity rule under s. 91A of the NEL. It also determined not to make a draft national energy retail rule.

The Commission received 26 submissions as part of the third round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this final determination. Issues that are not addressed in the body of this document are set out and addressed in appendix I of this determination.

1.6 Structure of final determination

The remainder of this determination is structured as follows:

- Chapter 2: the final rule determination, including the Commission's assessment framework and summary of reasons
- Chapter 3: overview of the mechanism set out in the final rule
- Chapter 4: the Commission's approach to small customers and the development of a two-sided market
- Chapter 5: the implementation timing of the final rule
- Chapter 6: context for this final rule determination
- Appendix A: legal requirements for making the final rule and determination
- Appendix B: table summarising changes between the final rule and the second draft rule published in March 2020
- Appendix C: the registration process introduced under the final rule for a new participant category, a demand response service provider
- Appendix D: how demand response service providers will be integrated with central dispatch
- Appendix E: the information provision requirements placed on demand response service providers
- Appendix F: the process for determining baselines under the final rule
- Appendix G: the settlement model introduced in the final rule
- Appendix H: the consequential and complementary changes which are proposed alongside the introduction of the mechanism
- Appendix I: summary of other issues raised in stakeholder submissions on the second draft determination.

2 FINAL RULE DETERMINATION

2.1 The Commission's final rule determination

The Commission's final rule determination is to make a more preferable electricity rule. The more preferable rule:

- introduces a new participant category, a DRSP, who will be allowed to classify loads for the purpose of providing wholesale demand response through the wholesale demand response mechanism
- requires DRSPs to participate in central dispatch, including following dispatch instructions in the wholesale market
- places obligations on DRSPs that, as far as practicable, replicate those applied to other scheduled participants
- sets out a process for having baseline methodologies determined and applied to wholesale demand response units
- provides for DRSPs to be settled in the wholesale market for the wholesale demand response they have provided
- sets out consequential changes to other aspects of the NER, including changes to RERT provisions
- makes additional changes to related aspects of the NER, such as the DSP portal, to improve the integration of the demand side
- sets out implementation provisions for this rule, including requiring AEMO and the AER to prepare new guidelines and update existing guidelines to take into account the amending rule.

A summary of the final rule is provided in chapter 3. More detail on the various aspects of the final rule is also provided in the appendices.

The Commission's reasons for making this final rule determination are set out in section 2.4 and section 2.5.

The Commission has determined to not make a retail rule in respect of the rule change requests.²⁹ This is because:

- the mechanism set out in this final determination would be costly to extend to small customers
- small customers would be unlikely to capture any value from being able to participate in the mechanism
- the Commission was not able to satisfy itself that a rule including small customers would be likely to contribute to the achievement of the national energy retail objective (NERO), due to the difficulty in adequately addressing the application of energy-specific consumer protections to arrangements between small customers and DRSPs under these rule

²⁹ The relevant retail project code is RRC0023, in relation to the consolidated retail rule change requests from PIAC, TEC and TAI, the AEC, and the South Australian Government.

change requests, given that a holistic review is required which may conclude that changes to the NERL are necessary³⁰

- the Commission considers that progressing regulatory reforms that facilitate the transition towards a two-sided market is the best approach to allow small customers to more actively participate in the market.

Because the mechanism will not be extended to include small customers, the retail rules do not need to be changed to accommodate this participation. The reasons for not including small customers in the mechanism are outlined in section 2.5 and covered in more detail in chapter 5.

This chapter outlines:

- the rule making test for changes to the NER and NERR
- the assessment framework for considering the rule change requests
- how the more preferable electricity rule is likely to contribute to the achievement of the national electricity objective
- why a retail rule is not likely to contribute to the achievement of the national energy retail objective
- the Commission's consideration in deciding to make a uniform rule in accordance with the Northern Territory legislation adopting the NEL.³¹

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

2.2 Rule making tests

2.2.1 Contributing to the achievement of the NEO

The rule change requests covered by this final determination relate to both the NER and the NERR. As such, in making a final determination, the Commission must follow the decision making framework under the NEL and NERL respectively.

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).³² This is the decision making framework that the Commission must apply.

The NEO is:³³

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:

30 The Commission has commenced the Consumer protections in an evolving market review, which is considering (among other issues) the consumer protections which should apply to the provision of new energy products and services, including demand response. The Commission published two issues papers for this review in December 2019. These papers are available at <https://www.aemc.gov.au/market-reviews-advice/consumer-protections-evolving-market>.

31 *National Electricity (Northern Territory) (National Uniform Legislation) Act 2015*, referred to here as the NT Act.

32 Section 88 of the NEL.

33 Section 7 of the NEL.

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.

Under the Northern Territory legislation adopting the NEL, the Commission must regard the reference in the NEO to the "national electricity system" as a reference to whichever of the following the Commission considers appropriate in the circumstances having regard to the nature, scope or operation of the proposed rule:³⁴

- (a) the national electricity system
- (b) one or more, or all, of the local electricity systems³⁵
- (c) all of the electricity systems referred to above.

For the rule change requests considered in this final determination, the Commission has determined that the reference to the national electricity system in the NEO is (c), the national electricity system and the local electricity systems (noting that the rule will not have effect in relation to the local electricity systems).

2.2.2 **Contributing to the achievement of the NERO**

Under the NERL, 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 energy retail objective (NERO).³⁶ This is the decision making framework that the Commission must apply.

The NERO is:³⁷

to promote efficient investment in, and efficient operation and use of, energy services for the long term interests of consumers of energy with respect to price, quality, safety, reliability and security of supply of energy.

Under the NERL, the Commission must also, where relevant, satisfy itself that the rule is "compatible with the development and application of consumer protections for small customers, including (but not limited to) protections relating to hardship customers" (the "consumer protections test").³⁸

³⁴ Section 14A of the NT Act, inserting section 88(2a) into the NEL as it applies in the Northern Territory.

³⁵ These are specified Northern Territory systems, defined in schedule 2 of the NT Act.

³⁶ Section 236(1) of the NERL.

³⁷ Section 13 of the NERL.

³⁸ Section 236(2)(b) of the NERL.

Where the consumer protections test is relevant in the making of a rule, the Commission must be satisfied that both the NERO test and the consumer protections test have been met.³⁹ If the Commission is satisfied that one test, but not the other, has been met, the rule cannot be made.

There may be some overlap in the application of the two tests. For example, a rule that provides a new protection for small customers may also, but will not necessarily, promote the NERO.

2.2.3 Making a more preferable final rule

Under s. 91A of the NEL and s. 244 of the NERL, 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 or the NERO (respectively).

In this instance, the Commission has made a more preferable electricity rule. The reasons are set out below.

2.2.4 Rule making in relation to the Northern Territory

The NER, as amended from time to time, apply in the Northern Territory, subject to derogations set out in regulations made under the Northern Territory legislation adopting the NEL.⁴⁰ Under those regulations, only certain parts of the NER have been adopted in the Northern Territory.⁴¹

As the Commission has determined to make a more preferable electricity rule which relates to parts of the NER that apply in the Northern Territory,⁴² the Commission is required to consider whether to make a uniform or differential final rule under Northern Territory legislation.

Under the NT Act, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a differential rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule.⁴³ A differential rule is a rule that:

- varies in its terms 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

³⁹ That is, the legal tests set out in sections 236(1) and (2)(b) of the NERL.

⁴⁰ The regulations under the NT Act are the National Electricity (Northern Territory) (National Uniform Legislation) (Modifications) Regulations.

⁴¹ The version of the NER that applies in the Northern Territory is available on the AEMC website.

⁴² While the key provisions of the final rule amend chapters 2-4 of the NER, which do not apply in the Northern Territory, other parts of the NER amended by the final rule do apply in the Northern Territory. However, these changes will not affect Northern Territory local electricity systems.

⁴³ Section 14B of Schedule 1 to the NT Act, inserting section 88AA into the NEL as it applies in the Northern Territory.

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.

A uniform rule is a rule that does not vary in its terms between the national electricity system and the local electricity systems, and has effect with respect to all of those systems.⁴⁴

The Commission has determined to make a uniform rule as it does not consider that a differential rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule.

2.3 Assessment framework

The Commission has assessed the rule change requests against an assessment framework focussed on a consideration of consumers and the promotion of their interests in the long term. This assessment framework incorporates feedback provided to the Commission from submissions to the consultation paper and first and second draft determinations, as well as through its technical working group meetings.

Wholesale demand response relies on consumers changing their consumption (or generation) of energy in response to a signal to do so. Consumers can respond to these signals and choose to consume or generate less or more compared to what they otherwise would have done. For example, consumers can consume less or shift consumption at a particular time in order to reduce their exposure to high spot prices, or to help market participants manage their positions in the contract market. The mechanisms set out in the rule change requests provide potential ways to promote wholesale demand response, but other options exist.

An active demand-side of the market, characterised by the presence of demand side participation, can promote efficient consumption of electricity. Where load is able to effectively respond to prices as signalled by the spot market, it would be an efficient outcome for it to choose its level of consumption based on its willingness to pay for consuming electricity compared to the cost of supplying that electricity.

Demand side participation can be more efficient than dispatching generation. Economic inefficiency results when electricity is consumed despite the cost of supplying it exceeding the value gained by its consumption. By having the demand side respond to high spot prices by reducing consumption, wholesale demand response can provide a more cost-effective option for meeting peak demand than using peaking generation. Enabling greater demand side participation in the wholesale electricity market is also a recognition of the fact that in some situations the opportunity cost of demand reductions may be lower than the opportunity cost of generation.

In other words, by changing their load patterns in response to a signal relating to wholesale prices, consumers are able to make the trade-off between the costs of consuming electricity and the costs of reducing their electricity consumption (and so, for example, not being able to produce widgets or heat their home). This benefits the consumer by promoting

⁴⁴ Section 14 of Schedule 1 to the NT Act, inserting the definitions of "differential Rule" and "uniform Rule" into section 87 of the NEL as it applies in the Northern Territory.

consumption of electricity at an efficient price. It also benefits the market (and hence consumers) by reducing the costs of providing for power system reliability.

In assessing the rule change requests against the NEO and the NERO, the Commission has considered the following principles:

- promoting competition and consumer choice
- resilience of the framework
- not distorting efficient market outcomes
- reliability and transparency
- appropriate risk allocation
- administrative and implementation costs
- appropriate consumer protections
- robustness to climate change mitigation and adaptation risks.

2.3.1 Competition and consumer choice

Where feasible, providing for consumer choice in the provision of services generally leads to more efficient operational and investment decisions. Competitive markets which enable consumers to choose also tend to be more flexible to changing conditions because they provide incentives for participants to innovate and minimise costs over time.

Competition is a process by which inefficient costs are discouraged. It lowers the combination of supply-side and demand-side resources at any given moment in time, as well as through time. Alternatively described, competition provides incentives for market participants to provide services at levels that consumers value (including with regard to the level of reliability), given the price.

Competitive markets also provide a mechanism for collating information from participants and providing signals to inform future actions. Competitive markets therefore encourage efficient decision-making on the basis of this information.

Competition, where feasible, should therefore promote the efficient levels of electricity consumption and generation.

2.3.2 Resilient framework

Regulatory arrangements must be flexible to changing market conditions. They should not be implemented to address issues specific to a particular time period or jurisdiction, or the prevailing technology or business model of the day. Regulatory frameworks should support the right mix of resources over time, encompassing technological developments and changes in consumer behaviour. Markets with resilient designs are characterised by:

- innovation, because business models are able to emerge without being unnecessarily restricted by regulatory frameworks and because participants face incentives to provide services in a least cost manner
- low barriers to entry and exit, because regulatory frameworks provide consistent signals for undertaking investment decisions.

Regulatory stability for market participants can be maintained where changes to the regulatory frameworks are made in a transparent manner.

2.3.3 **Non-distortionary**

Efficient electricity markets are characterised by:

- efficient allocation of electricity services to market participants who value them the most, typically through price signals that reflect underlying costs
- provision of, and investment in, electricity services at lowest possible cost through employing the least-cost combination of inputs
- the ability of the market to readily adapt to changing supply and demand conditions over the long-term.

When making changes to the regulatory framework to facilitate demand response in the wholesale market, the Commission bears in mind that these changes should not distort efficient market outcomes. That is, any regulatory changes should not detract from the ability of the NEM to provide for the least cost combination of supply-side and demand-side options at any point in time. A distortionary change to regulatory frameworks would detract from the efficiency of the current market frameworks.

2.3.4 **Reliability and transparency**

Market participants make investment and operational decisions based on market signals in the spot and contract markets. Prices in these markets provide signals for generators and consumers to invest in assets, and produce and consume electricity, as well as providing information about the balance of supply and demand across different places and times. Providing greater amounts of information to market participants will improve their ability to make efficient decisions in both operational and investment time frames on both the supply and demand side of the market.

To provide more information to the rest of the market, wholesale demand response should be provided in a way that is transparent to the rest of the market. In addition to improving efficient decision-making in the wholesale market, for demand response to contribute to reliability outcomes it is important that wholesale demand response is transparent to the system operator.

2.3.5 **Risk allocation**

Risk allocation and the accountability for investment and operational decisions should rest with those parties best placed to manage them. Placing inappropriate risks on consumers, who may not be best placed to manage these risks, is likely to result in higher prices if these risks cannot be managed and reduced over time.

Conversely, placing risks with market participants (who may be better placed to manage them) will only result in higher prices being passed on to consumers where competition permits. Solutions that allocate risks to market participants, such as commercial businesses, who are better able to manage them are preferred, where practicable.

2.3.6 **Administrative and implementation costs**

Changes to regulatory frameworks come with associated costs. These costs include both those imposed to implement the change and the ongoing costs associated with the change. These costs result from necessary changes to information technology systems, billing arrangements and other market process. Generally costs should be attributed to the party who is best able to reduce the extent of the costs over time. However, where costs are imposed in implementation and cannot be mitigated through market mechanisms, these costs should be minimised relative to the benefits of the regulatory changes.

The Commission has considered the implementation efficiency of the proposals set out in the rule change requests, the approach set out in the first and second draft determinations and the approach set out in this final determination. This is necessary to reduce the risk that the implementation and ongoing costs, ultimately borne by consumers, exceed the benefits of introducing a mechanism.

2.3.7 **Appropriate consumer protections**

A competitive retail market should be backed by a strong consumer protection framework for those that need it most. This framework should facilitate consumers accessing the benefits of competitive markets on fair and reasonable terms, while maintaining the right to access energy as an essential service.

The energy-specific consumer protections were developed in the context of regulating traditional services and the Australian energy retail market being opened up to competition. At the heart of this framework is the principle that consumers have a right to access energy (as an essential service) on fair and reasonable terms.

In addition, in light of the new technologies, innovation in products and services, and changes in consumer preferences, consideration should be given to the appropriate application of consumer protections to new energy services. Changes to the rules that impact on the level of consumer protections should not expose consumers to additional risks.

Customers participating in wholesale demand response through an energy service provider or aggregator may be exposed to potential risks as a result of not being covered by consumer protections in the NERL and NERR in respect of these services.

2.3.8 **Commission decision-making and climate change risks**

Climate change manifests through two broad types of risk:

- how the physical world is changing or likely to change as a result of climate change (adaptation risk)
- how policy makers, consumers and investors are responding, or are likely to respond, to the risks presented by climate change (mitigation risk).

The Commission makes its decisions on changes to the NER and NERR with reference to the NEO and the NERO, as discussed above. These objectives do not specifically require the Commission to have regard to the long-term interests of consumers with respect to climate change or the environment. Instead, the NEO and NERO direct the Commission to consider

the achievement of economic efficiency in the long-term interests of consumers with respect to specified matters, being the price, quality, safety, reliability and security of the supply of electricity and energy services.

However, in making its decisions under the NEL and NERL in respect of the wholesale demand response rule change requests, the Commission also has regard to relevant factors that can affect the specific matters identified in the NEO and the NERO. This includes considering whether its decisions are robust to any impacts of climate change mitigation or adaptation risks on the price, quality, safety, reliability and security of supply of electricity and energy services.

2.4 Summary of reasons - more preferable final electricity rule

The more preferable final electricity rule made by the Commission is attached to and published with this final rule determination. The key features of this final rule are outlined at the start of this chapter.

Further detail on the final rule can be found in chapter 3 of this determination.

The Commission's determination to make a final rule introducing a wholesale demand response mechanism at this time reflects the facts that:

- Technologies have evolved such that more consumers want to and can participate directly in the wholesale market. The rule change requests received by the Commission, and the subject of this final determination, highlight a growing interest across industry for the wholesale market to accommodate consumers who are able to engage in the wholesale market. Barriers have limited the opportunities for consumers to participate in wholesale demand response to date.
- Wholesale demand response may contribute to promoting reliability and security in a more affordable way than peaking generation.
- Certain elements of the wholesale demand response mechanism would provide opportunities to gain valuable experience with processes that will be useful if there is a transition to a two-sided market, including increased demand side participation in the scheduling arrangements used in the wholesale market.

2.4.1 Assessment of the final rule against the assessment criteria

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

- **Promoting reliability and transparency:**
 - The mechanism introduced under the final rule will promote greater demand side transparency and assist with reliability. Under the final rule, wholesale demand response units will need to be scheduled to participate in the wholesale market. This will increase the capacity of resources that can be relied upon to be dispatched in order to promote reliable outcomes for consumers. This may allow DRSPs to be dispatched ahead of more expensive peaking generation and reduce wholesale

electricity prices. This should lead to reduced need for peaking capacity. By participating transparently, DRSPs will also contribute to the ability of other market participants to make informed operational decisions, since participants will be able to incorporate information about wholesale demand response participating through the mechanism into their operational and investment decisions.

- The final rule requires these parties to be scheduled i.e. make offers to provide wholesale demand response and receive and comply with dispatch targets. Without the obligations associated with scheduling, the wholesale demand response would be less certain and would not be able to be relied upon by AEMO for reliability purposes.
- Under the final rule, DRSPs will also be required to provide relevant information through pre-dispatch, the short-term projected assessment of system adequacy (ST-PASA) and the demand side participation (DSP) portal. This will provide a greater level of information to AEMO and the market over various timeframes, which will further promote more efficient operational and investment decisions by AEMO and market participants.
- The final rule also increases the transparency and reporting relating to the DSP portal.
- **Promoting efficient utilisation of electricity services:**
 - The final rule promotes the ability for consumers who participate in the mechanism to change their level of consumption (or export of generation) in response to the wholesale electricity price. This will occur through their reduced consumption or increased generation competing directly with the supply-side, and so the supply-side should be more competitive, with this reflected in the wholesale price.
 - Demand response sold through the mechanism can avoid more expensive generation being dispatched when the supply-demand balance is tight, leading to an efficient clearing of the spot market.
 - Wholesale demand response has the effect of reducing demand in high priced periods. Over the short term, this would have the benefit of suppressing high wholesale spot prices and reducing the total costs of supplying consumers' demand for electricity.
 - In the long term, this should lead to the least-cost combination of resources to meet demand. This will reduce the costs that are recovered from all consumers.
- **Promoting consumer choice and competition:**
 - The mechanism introduced under the final rule will increase the level of consumer choice in relation to providing wholesale demand response and accessing service providers to assist with providing wholesale demand response. By increasing the ability for consumers to provide wholesale demand response through the mechanism, it should have the effect of increasing the level of competition among providers of wholesale demand response services to customers. As a result, consumers should receive greater value for providing a given level of wholesale demand response under the final rule when compared to the current arrangements.

- Under the final rule, wholesale demand response provided through the mechanism directly competes with scheduled generation, increasing competition in the wholesale market.
- **Minimising the extent of any distortionary impacts:**
 - The final rule seeks to minimise the impacts of any distortions introduced under the mechanism, particularly to the wholesale market and retailers' hedging and positions in the contract market. The Commission acknowledges the potential for distortionary impacts and costs being imposed on the market through the introduction of centrally determined baselines. The final rule seeks to address these impacts in the following ways:
 - The final rule requires AEMO to determine the appropriate baseline methodology metrics through stakeholder consultation. These metrics will constitute the appropriate thresholds for baselines applied to wholesale demand response units. A wholesale demand response unit will need to demonstrate compliance with these metrics when classifying load as a wholesale demand response unit initially and over time, in order to continue participating in central dispatch. As a result, any wholesale demand response unit unable to comply with the metrics (and by inference, unable to be accurately baselined) will not be able to participate in dispatch and settlement under the mechanism. This will reduce the exposure of other market participants to inaccurate baselines.
 - The final rule allows for these metrics to be made more rigorous as baseline methodologies improve over time. The final rule allows new baseline methodologies to be developed through consultation between stakeholders and AEMO.
 - The Commission notes that risks relating to centrally determined baselines cannot be entirely avoided under the wholesale demand response mechanism. Baselines will be impossible to accurately determine for some consumers, and particularly difficult for variable loads. This is one of the reasons the mechanism is not suited to small customers participating - these customers typically provide demand response through highly variable and controllable devices. As noted in chapter 5, the Commission considers a longer term solution for capturing the benefits of wholesale demand response will be to move toward a two-sided market which would not rely on centrally determined baselines. The COAG Energy Council requested the Energy Security Board (which includes the Commission) to provide advice on this priority for the COAG Energy Council. The ESB published a paper providing a high-level overview of what a two-sided market could look like and its key foundations. It also outlined how both supply and demand could participate to get the greatest benefits.⁴⁵
 - The final rule also seeks to reduce the risks for retailers by providing for a retailer to be informed when a customer for which it is the FRMP has an arrangement with a

⁴⁵ This paper is available on the COAG Energy Council's website: <http://www.coagenergycouncil.gov.au/post-2025/two-sided-markets>

DRSP, and the baseline methodology being used for that customer. This will assist the retailer in managing its exposure to the wholesale market. In addition, it will provide the retailer with information to be able to adjust its arrangement with that customer (if necessary) to account for any change in risk profile introduced by virtue of that customer providing wholesale demand response. The final rule also requires a notification to be provided to the FRMP when a consumer has been dispatched to provide wholesale demand response. This should allow the relevant retailer to make any necessary operational adjustments to manage its wholesale market exposure.

- The final rule also requires a DRSP to pay a retailer, using a pre-determined reimbursement rate, for the amount of demand response provided by their shared customer (covering the amount of energy the customer would have otherwise purchased from the retailer if it had not provided demand response, and for which the retailer remains liable in the wholesale market). This should result in the retailer's hedging position being largely unaffected and the retailer not being exposed to costs that it is unable to manage. By providing for this adjustment in settlements, the final rule will minimise the extent of any changes in relation to contract market positions and the associated costs of maintaining these hedging positions.
- **Minimising the extent of any upfront costs:**
 - The dispatch and settlement model introduced under the final rule seeks to reduce the extent of upfront costs imposed on AEMO and the market, specifically retailers.
 - By allowing retailers to continue to bill their consumers for actual consumption (as opposed to the baseline level of consumption), the final rule minimises the extent of the changes required to retailer billing systems. This will result in materially reduced upfront costs for retailers when compared to the proposals set out in the rule change requests from PIAC, TEC and TAI, and from the South Australian Government.
 - The final rule will require a number of changes to AEMO systems. In developing the rule, the Commission has sought to reduce the extent of these upfront system change costs by minimising the extent to which AEMO will be required to adjust existing systems. In addition, the proposed implementation time frames are intended to strike the appropriate balance between introducing the mechanism in a timely manner, and providing AEMO with sufficient time to manage upfront costs. In submissions to the second draft determination, a number of stakeholders suggested it may be appropriate to delay the implementation of the wholesale demand response mechanism due to the impacts of COVID-19 and the potential outcomes of the *Delayed implementation of five minute and global settlement* rule change request. The Commission has considered these submissions and concluded that it remains appropriate to introduce the mechanism on 24 October 2021. This is because:⁴⁶
 - The majority of the systems changes needed to implement the mechanism reside with AEMO. AEMO has indicated that it can make these changes by 24 October 2021.

⁴⁶ More detail on these reasons are provided in chapter 6 of this determination.

- The interlinkage between the systems changes that retailers may need to make for five minute settlement and global settlement, and the wholesale demand response mechanism, are likely to be relatively minor. As such, the Commission considers it unlikely that there would be a material impact on costs for retailers even if the implementation of five minute settlement and global settlement were delayed.
- Retailers are able to manage the implementation of the wholesale demand response mechanism without making systems changes and instead relying on operational or commercial solutions, to the extent this is more cost effective. Thus, if there is a delay to the implementation of five minute and global settlement, retailers would have an option to manage the implementation of the demand response rule operationally until the commencement of five minute and global settlement, and make any desired systems changes coincidentally.
- The final rule has excluded DRSPs from some processes that other scheduled participants engage in, to reduce the extent of AEMO's upfront costs, including:
 - not including DRSPs in the systems and processes for FCAS cost recovery and affected participant compensation
 - not requiring DRSPs to submit information to AEMO for the purposes of MT PASA, instead utilising the existing DSP portal.
- The aim of minimising the upfront costs of the final rule has also informed the Commission's decision to focus on facilitating wholesale demand response from large customers as discussed in chapter 5.
- **Robust to climate mitigation and adaptation risk**
 - The Commission considers that the final rule is robust to the impacts of climate change mitigation and adaptation risks on the price, reliability and security of supply of electricity.
 - **Adaptation and reliability and security of supply:** One of the key modelled impacts of anthropogenic climate change is an increase in the frequency and severity of extreme weather events.⁴⁷ Extreme weather is likely to impact the power system by increasing the extent to which generation and network assets may be damaged or unable to provide generation or network services, and by driving uncertainty around generation availability from an increasingly weather dependent generation fleet. Together, these impacts may affect the reliability and security of supply of electricity. As discussed above, the Commission considers the wholesale demand response mechanism will assist in the reliability of the NEM by incentivising additional sources of transparent, scheduled peaking capacity that may be able to operate when other

⁴⁷ See: Seneviratne, S.I., N. Nicholls, D. Easterling, C.M. Goodess, S. Kanae, J. Kossin, Y. Luo, J. Marengo, K. McInnes, M. Rahimi, M. Reichstein, A. Sorteberg, C. Vera, and X. Zhang, 2012: Changes in climate extremes and their impacts on the natural physical environment. In: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. *A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC)*. Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 109-230.

forms of capacity are limited or unavailable, and therefore considers the mechanism is robust to adaptation risks to system reliability.

- **Mitigation and reliability and security of supply:** Among the various economy wide measures that may be used to mitigate the impacts of climate change, the rollout of variable renewable generation is the primary measure adopted in the NEM power system. The Commission considers that the wholesale demand response mechanism is robust to risks to reliability and security of supply arising from this shift in the generation fleet, for the reasons discussed above.
- **Adaptation and the price of electricity in the short term:** Climate change impacts, in the form of extreme weather events, may affect the wholesale price of electricity at the time of the event by affecting both supply and demand. The Commission considers that the wholesale demand response mechanism is robust to these impacts as it incentivises demand reduction as an alternative to dispatchable generation during high-price periods, that may operate to limit or suppress price spikes.
- **Mitigation and the price of electricity in the longer term:** As noted above, a key form of climate change mitigation measure adopted in the NEM is the increased use of variable renewable generation. This is increasing the need for dispatchable sources of supply, which are currently relatively costly. By incentivising demand reductions that may compete with existing forms of dispatchable supply, such as gas peaking plants and energy storage, the Commission considers that the wholesale demand response mechanism may operate to moderate the price of electricity over the longer term, and is therefore robust to this impact of mitigation risks on the NEM.

2.4.2 Model of wholesale demand response mechanism

The Commission has considered the potential impact of the wholesale demand response mechanism on the efficient utilisation of electricity services (that is, using electricity when more is gained by that use than the costs of providing that electricity) in relation to the potential implementation costs, as part of its overall assessment of whether this mechanism is likely to contribute to achieving the NEO. As discussed below, this model does not try to assess all of the benefits that could be derived from the introduction of a wholesale demand response mechanism.

This analysis indicates that it is reasonable to expect the mechanism will produce benefits (in the form of reduced wholesale market prices and lower cost dispatch) greater than its implementation costs.

This analysis has been used to inform the Commission's decision-making in addition to the qualitative assessment of the mechanism as set out above.

Assumed inelasticity of demand causes inefficiency

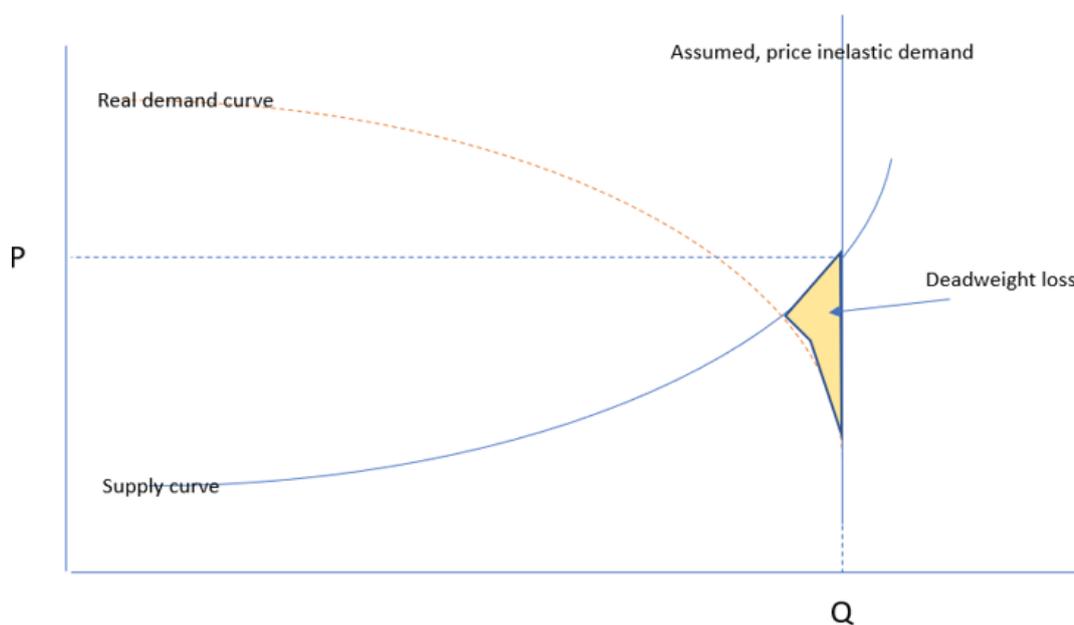
Under the current arrangements and wholesale market design, electricity load is largely non-scheduled and AEMO's dispatch engine assumes it is inelastic to changes in price. This means that at high prices, the implied marginal willingness to pay for electricity for some consumers will be overstated. As a result, during periods when the demand supply balance is tight, the

dispatch engine may set a price and quantity that is above the 'optimal' price and quantity where social benefit is maximised. This also means some consumers would be using electricity where the price in the wholesale market exceeds the price at which they would provide demand response.

Figure 2.1 below illustrates the inefficiency that is created by the assumed inelastic demand.⁴⁸ In this diagram the real demand curve represents the true marginal willingness to pay for electricity. The real demand curve departs from the inelastic demand line assumed by the dispatch engine as the price increases. This creates a wedge between the efficient outcome (where the real demand curve and supply curve intersect) and the outcome from the dispatch engine at the price, P , and quantity, Q . The wedge, labelled 'deadweight loss', represents the welfare loss to society created by the inelasticity of the assumed demand curve. This welfare loss means consumers are generally paying more for electricity than they would like to pay.

⁴⁸ This is a standard approach for representing wholesale electricity markets in microeconomics. For an explanation of the approach see Chapter 4 of *The Economics of Electricity Markets* by Biggar and Hesamzadeh (2014).

Figure 2.1: Deadweight loss resulting from assumed, price inelastic demand



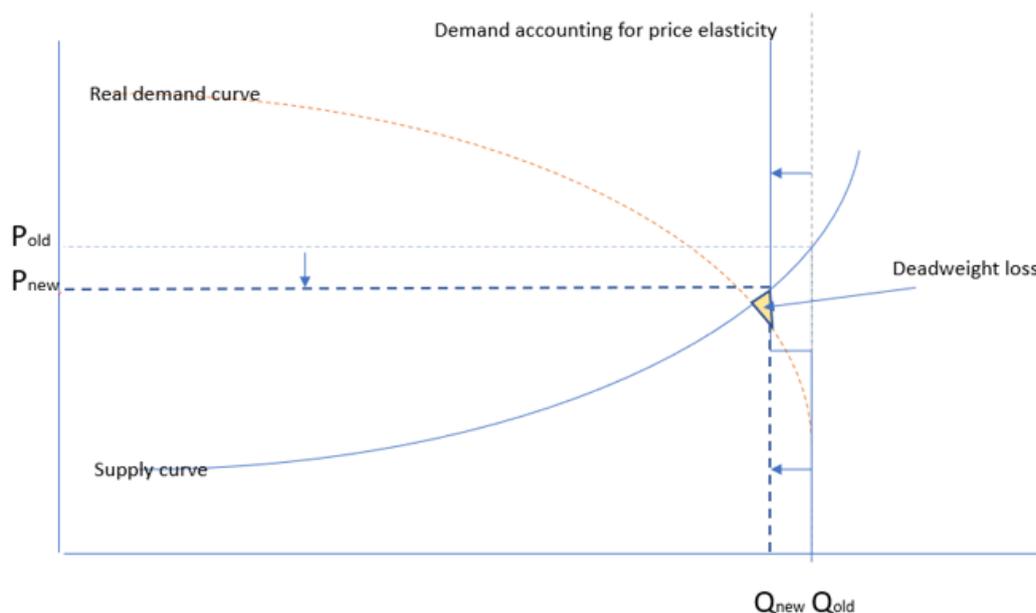
Source: AEMC

The wholesale demand response mechanism seeks to reduce this loss by allowing the preferences of large consumers to be reflected in the demand curve. That is, it allows these consumers to indicate the price at which they would provide demand response, and reflects this transparently to the rest of the market.

Figure 2.2 shows how the mechanism should result in a more efficient outcome with a smaller deadweight loss.⁴⁹

⁴⁹ Note that this ignores the costs of the mechanism, as well as any other benefits of it. The potential costs are considered below.

Figure 2.2: Reduced deadweight loss when reflecting consumer preferences



Source: AEMC

If the price rises above the demand reduction bid in by the DRSP, the demand is effectively reduced, illustrated as a leftward shift in the upper section of the demand curve. This results in a demand curve that more closely reflects the underlying preferences of consumers represented by the real demand curve. The resulting price and quantity set by the dispatch engine are lower, and the deadweight loss is smaller representing an efficiency gain relative to the status quo.

Estimating the relationship between demand response and efficiency

The Commission has undertaken some basic quantitative modelling to estimate the efficiency gain described above for different levels of additional wholesale demand response enabled by the wholesale demand response mechanism (that is, in addition to any wholesale demand response that exists outside of the mechanism). This modelling depends on simplifying assumptions and as such should only be used as a heuristic for considering the relationship

between the size of demand response, the size of the price reduction due to demand response, and the resulting increase in efficiency (decrease in deadweight loss).

Modelling assumptions

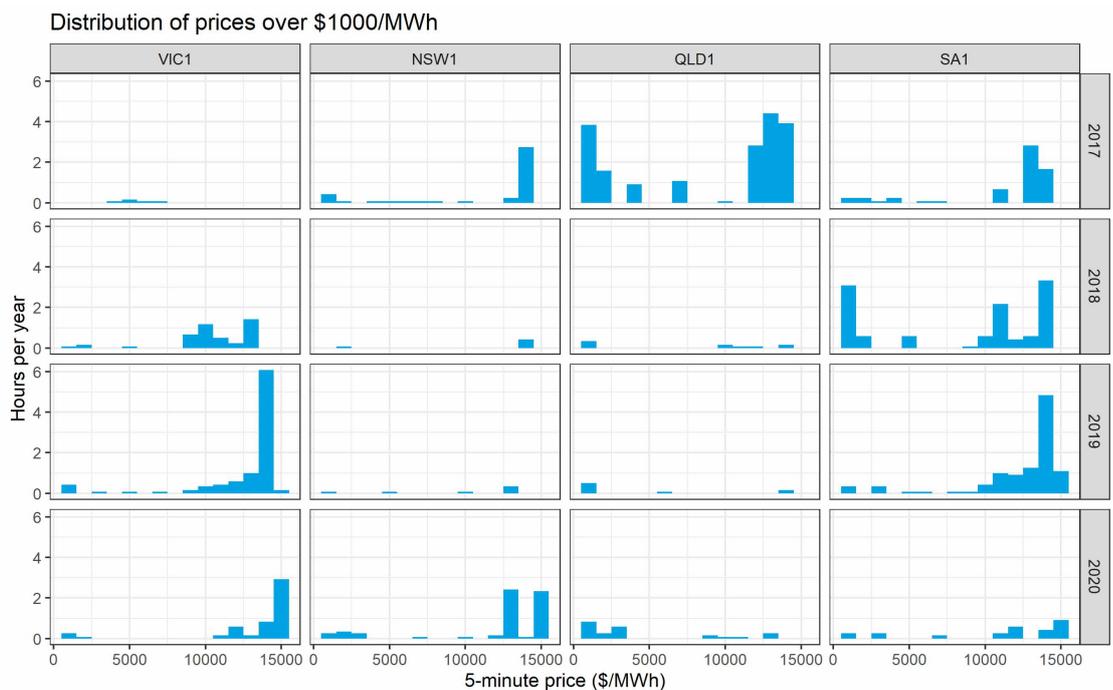
As pricing in the NEM is done on a regional basis the model assumes a hypothetical region that represents the entire NEM. As a result, the demand and price reductions required for a given efficiency gain are for all regions collectively.

The model assesses the impact of the mechanism over five years and assumes that there are eight hours of high prices per year (96 dispatch intervals) where demand reductions are dispatched through the mechanism. We have assumed five years as an estimate of the period that the mechanism may be in place before a possible transition to a two-sided market design. The assumption of 8 hours is considered to be a conservative (low) estimate of the duration of high priced events across the NEM per year.

Figure 2.3 shows the number of dispatch intervals exceeding \$1,000/MWh in Victoria, New South Wales, Queensland and South Australia.

An analysis of 5-minute wholesale prices shows that since 2017 there has been more than eight hours of high priced intervals (over \$1,000/MWh) per year across the NEM.

Figure 2.3: High priced dispatch intervals



Source: AEMC analysis.

Note: The numbers for 2020 are the number of high priced events for the year to 26/5/2020.

Total implementation costs are assumed to be \$23-33 million. This includes the AEMO cost estimate of \$13-17 million⁵⁰ and an allowance of \$10-16 million in retailer and DRSP costs based on discussions with market participants over the past 12 months. For simplicity, all dollar values are nominal assuming a zero discount rate.

Modelling results

Figure 2.4 shows the model results for the above assumptions. Any point in this chart represents the efficiency gains (reduction in deadweight loss) for a level of additional wholesale demand response facilitated through the mechanism, and price reduction.

The wholesale demand response would be occurring for eight hours across the NEM each year over five years.

The price reduction represents the difference between the price that would have been paid in the wholesale market absent the demand response and the actual price that the price responsive consumers would pay to consume electricity. For example, if a consumer valued electricity at \$4,000/MWh and provided demand response while the wholesale price reached \$9,000/MWh, this would represent a \$5,000/MWh price reduction.

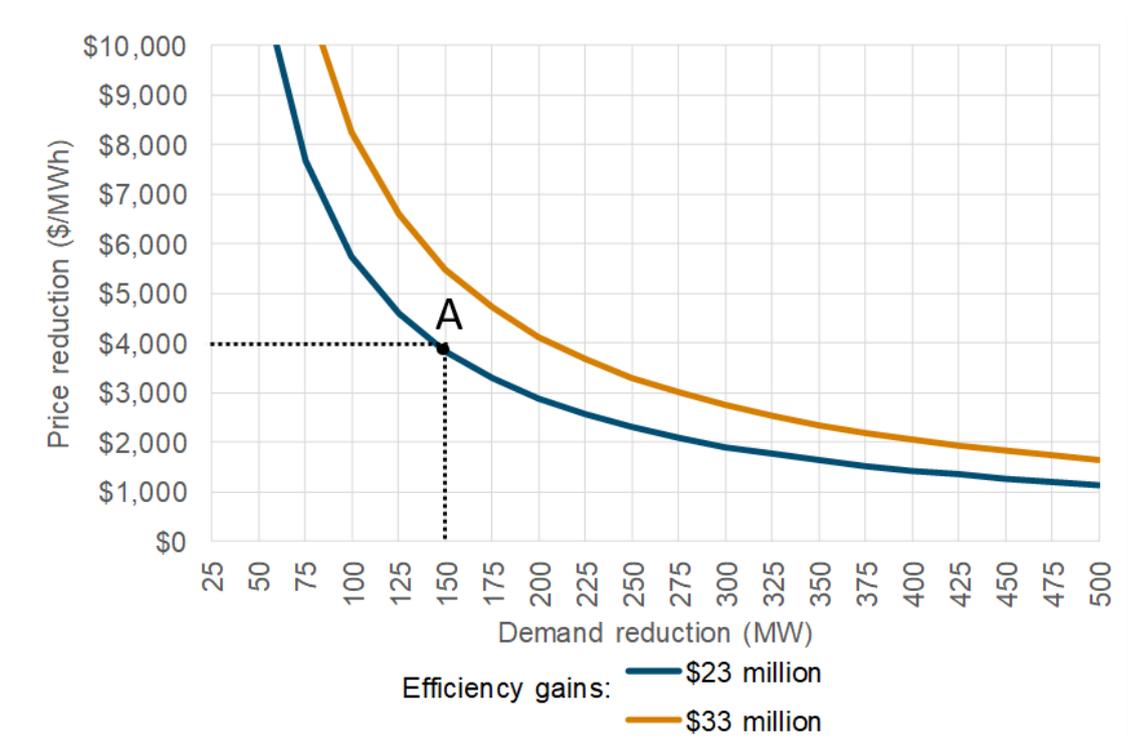
In Figure 2.4, the blue line indicates the different combinations of demand reductions and price reductions that would provide an efficiency gain of \$23 million, that is, to offset the implementation costs of the mechanism if the costs are at lower end of the range. This curve is created by dividing implementation costs per high priced dispatch interval by the amount of demand reduction enabled per high priced dispatch interval. The curve denotes the required size of the price reduction enabled by the wholesale demand response mechanism such that the efficiency gains are equal to the implementation costs.

For example, point A indicates if the wholesale demand response mechanism enables 150 MW of additional demand response that results in a price reduction of \$4,000/MWh for eight hours per year over five years, an efficiency gain of \$23 million can be achieved. The orange line represents an efficiency gain of \$33 million, the upper end of the implementation cost range discussed above.

Efficiency gains are increasing with the size of the price reduction, and the size of the demand response. That is, the greater the amount of additional demand response facilitated or the greater the reduction in price, the greater the efficiency gain from the mechanism.

⁵⁰ AEMO, *Wholesale demand response - high level design*, p. 4. Available at: <https://www.aemo.com.au/initiatives/submissions/Wholesale-Demand-Response-Mechanism-High-level-Design>

Figure 2.4: Modelling results



Source: AEMC.

Any points above and to the right of the curve represent efficiency gains in excess of estimated implementation costs. Taking the upper end of the cost range (\$33 million) as an example, the model shows that if the wholesale demand response mechanism can deliver demand and price reductions above the orange curve, say 200 MW demand reduction across the NEM and \$5,000/MWh price reduction in the wholesale price per dispatch interval, the efficiency gains enabled by the mechanism would exceed the implementation costs.

Given the prevalence of high priced dispatch intervals (as shown in Figure 2.3) and the feedback to the Commission on the potential amount of demand response that could be provided through the mechanism,⁵¹ the Commission considers it reasonable to assume that there will be enough demand response to high prices to at least offset the implementation costs (if they are within the assumed range).

Benefits and costs not covered in the model

⁵¹ The feedback on the potential uptake of demand response through the mechanism has been informed by discussions with, and submissions from, consumers, consumer representatives and prospective DRSPs.

A number of benefits and costs that may arise from the introduction of a wholesale demand response mechanism have not been included in the model above, including:

- Benefits associated with increasing the transparency of demand side participation in the wholesale market. The benefits assessed in this model are derived only from a more efficient demand side utilisation of electricity. Making this demand response transparent to the rest of the market informs market participants and the market operator and can drive more efficient unit commitment decisions.
- Increased competition for the provision of wholesale demand response from retailers. The introduction of the wholesale demand response mechanism is expected to place greater competitive pressure on retailers to offer demand response products to consumers in competition with DRSPs. This would lead to more price responsive demand being facilitated outside the mechanism.
- If a two-sided market is implemented, the extent to which costs accounted for in the model are costs that would be incurred in the transition to the two-sided market (that is, costs that could be attributed to that transition rather than to the demand response mechanism).
- The model does not include the ongoing costs to AEMO of operating the mechanism, or the ongoing costs to retailers/DRSPs for participating in this mechanism. While the Commission does not have access to detailed information on these costs, it is expected that these costs would be relatively small and would therefore not fundamentally change the outcome of the analysis.

Conclusion

Noting the limitations inherent in models trying to quantitatively assess the impacts of introducing a wholesale demand response mechanism into the NEM, the Commission considers this demonstrates that under a reasonable set of assumptions, the efficiency gains enabled by this mechanism should exceed the implementation costs, promoting the long-term interests of consumers.

2.4.3

More preferable final rule

The Commission considers the final rule is likely to better contribute to the achievement of the NEO than the proposals set out in the proponents' rule change requests.

Rule change request from PIAC, TEC and TAI - wholesale demand response mechanism

A number of the basic elements of the mechanism under the final rule are based on the model proposed by PIAC, TEC and TAI. However, a key practical implication of the model proposed by PIAC, TEC and TAI would be that retailers would be required to charge their individual customers at their baseline level of consumption, rather than their actual level of consumption. This would require all retailers to make costly, complex and time-consuming changes their existing retail billing systems. The Commission considers that the final rule better contributes to the NEO for the following reasons:

- Under the final rule, retailers would be able to continue to bill customers based on actual consumption, thereby significantly reducing the changes required to retailer billing systems and the associated implementation costs relating to the proposed settlement model.
- The final incorporates a number of changes from PIAC, TEC and TAI's rule change request which are expected to significantly reduce the overall implementation costs associated with the mechanism and allow it to be implemented prior to the summer of 2021-22.

Rule change request from AEC - demand response register

The AEC's rule change request proposed an extension of the current arrangements for wholesale demand response. However, the Commission considers the final rule better contributes to the NEO for the following reasons:

- In the register proposal, substantial scope is provided to the retailer to determine whether a demand response arrangement is consistent with its business model. This would provide little certainty to the demand response aggregator or consumer that its demand response arrangement would be maintained following a change of retailer.
- Good faith negotiation is unlikely to be accessible for most consumers looking to participate in wholesale demand response. The Commission considers that there would be significant information asymmetry between the retailer and the consumer such that there would be little avenue for a consumer to challenge a retailer.
- In contrast, under the final rule, a change of retailer would not affect a consumer's demand response arrangements with a DRSP, promoting competition and consumer choice.

Rule change request from South Australian Government - separate market for demand response

The Commission also considers the final rule is likely to better contribute to the achievement of the NEO than the proposal for a separate market for wholesale demand response set out in the South Australian Government's rule change request. The Commission considers the final rule better contributes to the NEO for the following reasons:

- The proposal set out by the South Australian Government would have involved the costs of wholesale demand response being recovered in a smeared manner. Retailers have limited ability to manage such costs, as they are very difficult to incorporate into their hedging strategies. This would have resulted in increased costs being imposed on consumers. The final rule sets up a settlement model that allows participants to manage their costs, minimising the extent of any distortionary costs, while also minimising administrative costs.
- The proposal set out by the South Australian Government was considered by the proponent to be advantageous compared to the other proposals as it did not impact on retailer billing systems and consequently, would not require as much time to implement. The final rule also avoids making any changes to retailer billing systems. In addition, both the South Australian Government proposal and the final rule would require changes to

AEMO's systems. The final rule would be able to be implemented as quickly as the South Australian Government proposal.

2.5 Summary of reasons - no retail rule

Having regard to the issues raised in the rule change requests and during consultation, the Commission has decided not to make a retail rule. The Commission is not satisfied that a retail rule relating to wholesale demand response will, or is likely to, contribute to the achievement of the NERO for the following reasons:

- **It is unlikely that the mechanism would be suited to participation of large numbers of small customers**
 - Baselines have not been demonstrated to work well for small customers. In order to allow a third party to sell wholesale demand response, a counterfactual is used to determine the quantum of response provided. The quality of a baseline is directly related to how predictable a load is. If a load is very predictable, the baseline can be treated as being more certain. As loads become more unpredictable, it becomes harder to reasonably predict what the consumer would have done had they not provided wholesale demand response. Large commercial and industrial loads are often more predictable. This is because they operate large processes, often on fixed timetables and fixed hours. However, the loads small customers are likely to use to provide demand response are highly variable. This makes it very difficult to determine baselines accurately. As such, it is unlikely that small customer loads would be able to meet AEMO's baseline methodology metrics, meaning they would be unable to participate in the mechanism.
 - Behavioural demand response, a form of demand response often used for small customers, is not suited to being scheduled. Behavioural demand response involves eliciting some amount of demand response from consumers on request, rather than using automated control systems. Often it involves the consumer being provided with the option of participating in demand response on the day. Consumers that are not providing demand response through a controllable device may instead provide behavioural demand response. While these programs provide customers with the opportunity to provide wholesale demand response, they often mean the party calling for the demand response is unsure how much will be provided. As such, behavioural demand response programs are not suited to being scheduled. Indeed, any requirements to meet scheduling obligations would likely make them untenable. Given the demand response provided through the mechanism is required to be scheduled (for the reasons discussed above), and the unsuitability of behavioural demand response for scheduling, behavioural demand response would not be able to participate in the mechanism.
- **Baselines may encourage inefficient behaviour by small customers**
 - Centrally determined baselines may, depending on the methodology used, encourage inefficient outcomes from discretionary resources such as those typically used by small customers providing demand response. By paying customers to reduce

consumption relative to a centrally determined counterfactual that is based on usage in immediately preceding intervals, customers are encouraged to consume more in peak periods in anticipation of high spot prices. This is likely to have a greater impact with small customers as most small customer devices that would be available to provide demand response (i.e. pool pumps, batteries etc.) would be able to shift consumption times without inconveniencing the consumer. On the other hand, large customer loads are likely to be less discretionary and less able to be consistently moved to particular times of day for the purposes of inflating the baseline.

- **The costs of including small customers would likely outweigh the benefits**
 - After undertaking extensive consultation, the Commission understands that including small customers in the mechanism would result in significantly higher implementation costs for AEMO and market participants.
 - By focussing on large customers, a significant amount of wholesale demand response can be facilitated while minimising the systems changes required by AEMO and market participants.
 - In addition, small customers are not expected to be able to provide material amounts of wholesale demand response through the mechanism. For the reasons listed above, the forms of demand response typically used by small customers are unlikely to meet the requirements to be able to participate in the mechanism. As such, extending the mechanism to include small customers would impose higher costs on the market and deliver unclear benefit. These costs would inevitably be required to be recovered from consumers.
- **The energy-specific consumer protections framework does not currently extend to demand response provided through third parties**
 - Energy consumers are protected by energy specific provisions under the National Energy Retail Law and associated rules, which relate to the supply of energy by distributors and the sale of energy by retailers to customers.
 - Under the current arrangements, these specific protections would apply to customers of retailers that are providing wholesale demand response through that retailer. For example, through the programs described in chapter 4.
 - However, these protections would not apply to the relationship between customers and DRSPs given that the service provided by DRSPs to customers is not a sale or supply of energy. The NERL would not require a DRSP to be an authorised retailer (and nor would a DRSP be a distributor).
- **The retail rule change request would not allow for consumer protections for small customers to be addressed holistically:**
 - It is important that there is proper consideration of the appropriate consumer protections that should be extended to consumers participating in wholesale demand response, as well as other non-traditional energy services and products.
 - Given the close linkages between the NERL and the NERR, it is not possible to consider one in isolation of the other. It is likely that any change to the application of the relevant consumer protections will require changes to the NERL as well as to the

NERR. Changes to the NERL require the approval of the COAG Energy Council and could not be made through these rule change requests.

- **The Commission has started a holistic review of consumer protections:**
 - There has been significant market evolution in recent years in relation to non-traditional energy services and products. The nature and application of the energy-specific consumer protections have not been adapted to these changes. This applies to wholesale demand response as well – as noted above customers providing wholesale demand response through an entity who is not a retailer would not be covered by the retail law or rules in respect of the services provided by that entity.
 - Our 2019 *Retail competition review*⁵² recognised that there is a need to analyse and update the retail law and rules to remove barriers to innovation and extend consumer protections to new models of essential service supply.
 - On 12 December 2019, the Commission published an issues papers on the review of consumer protections. This paper discussed how the market's evolution raises some regulatory issues related to new energy products and services, including demand response, and whether there is a need for potential changes to the application of energy specific consumer protections.
 - A final report on the Commission's analysis of the consumer protections framework for energy markets will be published along with the annual retail competition review report in June 2020. This will include recommendations on changes to the NERL and NERR to make sure that consumer protections for new energy products and services and the traditional sale of energy remain appropriate in an evolving market. The COAG Energy Council will need to consider and approve these recommendations before any changes to the law can be made.

Changes to the retail rules are not required because small customers are not participating in the mechanism. Accordingly, the Commission has determined not to make a retail rule.

52 See: <https://www.aemc.gov.au/market-reviews-advice/2019-retail-energy-competition-review>

3 OVERVIEW OF THE FINAL RULE

This chapter provides an overview of the final rule, including the wholesale demand response mechanism and other changes introduced under the second draft rule or recommended in the second draft determination.

The Commission has determined to not make a retail rule in respect of the rule change requests. The Commission has determined that the wholesale demand response mechanism introduced under this final rule is not suited to small customer participation. Chapter 5 of this determination sets out why the Commission does not think small customers are suited to the mechanism and alternative options for small customers accessing wholesale demand response. Because only large customers are able to participate in the mechanism, there isn't a need to change the retail rules. The Commission's reasons for not making a retail rule are set out further in chapter 2.

3.1 Wholesale demand response mechanism

3.1.1 Participant category and registration

The final rule introduces a new market participant category: a demand response service provider (DRSP). Registering as a DRSP would be the first step for those seeking to participate in the wholesale demand response mechanism. This will be the only participant class that is able to sell wholesale demand response through the wholesale demand response mechanism. If a retailer wanted to provide wholesale demand response through the mechanism, it would need to register as a DRSP.

A DRSP will need to register as such with AEMO and obtain AEMO's consent to classify loads as wholesale demand response units.

Registration and classification are important steps in the process of facilitating more wholesale demand response through the mechanism. These steps provide for:

- the obligations that a DRSP is required to comply with in order to be approved as a provider of wholesale demand response
- an opportunity to assess the suitability of loads to participate in the mechanism, including technical characteristics such as the ability for its baseline to be determined accurately and the maximum quantity of wholesale demand response that can be provided by the load (the maximum responsive component).

Under the final rule:

- The DRSP registration category will be combined with the existing registration category for market ancillary service providers (MASP).⁵³
- To be eligible for registration as a DRSP, a person must obtain the approval of AEMO to classify a load as an ancillary service load or a wholesale demand response unit.⁵⁴

⁵³ Clause 2.3AA of the final rule. Entities currently registered as a MASP will have their registration category automatically renamed as a DRSP registration.

⁵⁴ Clause 2.3AA.1(b) of the final rule.

- A load can only be classified as both an ancillary service load and a wholesale demand response unit by the same demand response service provider or market customer (as the case may be).⁵⁵
- The application for classification must identify the qualifying load and specify the proposed baseline methodology for the load.
- A load can be a qualifying load if:⁵⁶
 - the load comprises a single connection point (including an on-market child connection point, or a parent connection point in respect of all its off-market child connection points)
 - the load is neither a small customer load nor a scheduled load
 - the DRSP has the consent of the relevant customer and has arrangements to provide wholesale demand response with that load
 - the appropriate metering is installed.
- AEMO must approve the classification of a qualifying load as a wholesale demand response unit if AEMO is reasonably satisfied that:⁵⁷
 - the load is a qualifying load
 - the qualifying load can provide wholesale demand response in accordance with the NER and can provide an amount at least equal to the maximum responsive component proposed by the DRSP.
 - the DRSP has adequate communications and telemetry and has provided the bid and offer validation data required under schedule 3.1 of the final rule.
 - a baseline methodology can be applied to the load that produces a baseline satisfying the baseline methodology metrics
 - the load satisfies each other requirement in AEMO's wholesale demand response guidelines for classification.
- AEMO may determine appropriate requirements for telemetry and communications equipment.⁵⁸ AEMO has advised that a qualifying load that has a demand responsive capacity of 5 MW or more would likely be required to use SCADA. If an aggregated wholesale demand response unit includes such a qualifying load, all other loads within the wholesale demand response unit would also be required to use SCADA (regardless of their size).
- AEMO will be allowed to determine an upper limit on the amount of non-visible demand response (i.e. demand responsive loads not using SCADA) that can participate in the mechanism in each region.⁵⁹ Once this threshold has been reached, AEMO could impose additional or alternative telemetry requirements on any loads seeking to be classified as

55 Clause 2.3.5(e1) of the final rule.

56 Clause 2.3.6(m)(1) and clause 2.3.6(f) of the final rule.

57 Clause 2.3.6(e) of the final rule.

58 Clause 3.10.1(a)(2) of the final rule.

59 Clause 3.10.1(c) of the final rule.

wholesale demand response units in that region. This could include a requirement that they use SCADA.⁶⁰

- DRSPs can apply to aggregate two or more wholesale demand response units such that they are treated as one for the purposes of central dispatch.⁶¹
- AEMO must approve aggregation if:⁶²
 - the aggregated wholesale demand response units are connected within a single region and have the same DRSP
 - power system security is not materially affected by the proposed aggregation
 - appropriate control systems exist
 - any other requirements set out in AEMO's wholesale demand response guidelines have been satisfied.
- AEMO may specify conditions when approving aggregation, including setting the maximum responsive component of the aggregated units.⁶³
- AEMO must develop a guideline that outlines the above requirements for classification of a load, as well as any others AEMO considers necessary for classifying a load as a wholesale demand response unit, or for aggregation for participation in central dispatch.⁶⁴

This aspect of the final rule is discussed further in appendix C of this determination.

3.1.2 Dispatch and pre-dispatch

Under the final rule, DRSPs would participate in central dispatch in a transparent, scheduled manner. DRSPs are treated similarly to other scheduled participants, i.e. a DRSP would submit dispatch bids and when cleared by NEMDE, receive dispatch instructions to provide wholesale demand response to a specified level. DRSPs are also able to set the wholesale market price. Consequently, DRSPs have obligations and incentives consistent with the obligations imposed on scheduled generators, including compliance with dispatch instructions. These obligations and incentives are key to maintaining the integrity of the central dispatch and price setting process.

The general principle that DRSPs should be treated in a similar manner to scheduled participants guides the Commission's approach to how DRSPs should participate in these processes. However, in some instances these obligations have been modified to better suit the nature of DRSPs and wholesale demand response and to allow existing systems and processes to be utilised by AEMO. Without scheduling, the availability of demand response is less certain and this would substantially reduce the reliability benefits associated with the mechanism.

Under the final rule:

60 Ibid.

61 Clause 3.8.3(a2) of the final rule.

62 Clause 3.8.3(b2) of the final rule.

63 Clauses 3.8.3(b3) and (b4) of the final rule.

64 Clause 3.10.1(a) of the final rule.

- DRSPs is required to submit the available capacity of its wholesale demand response unit to provide wholesale demand response for all dispatch intervals.⁶⁵ For a wholesale demand response unit, available capacity would be determined taking into account the following principles:
 - Available capacity would be capped at the maximum responsive component of the wholesale demand response unit.⁶⁶
 - Available capacity would be required to be specified as zero when the wholesale demand response unit is not baseline compliant at the time the available capacity is submitted or is, or is likely to be, spot price exposed in the trading interval the available capacity relates to.⁶⁷
 - Wholesale demand response would only be available when it is the result of wholesale demand response activity and there would be no change in flow at another connection point that offsets the quantity provided.⁶⁸ A DRSP is responsible for making sure these requirements are met in relation to the quantities of demand response it bids into the market.⁶⁹
- DRSPs would be required to submit dispatch bids for all dispatch intervals for the purposes of providing information for pre-dispatch. If a DRSP does not intend to provide demand response for a particular interval, the DRSP may bid available capacity of zero.
- A DRSP would submit dispatch bids for wholesale demand response for the available capacity of the wholesale demand response unit (i.e. dispatch bids to provide varying levels of wholesale demand response).
- A DRSP would be required to submit dispatch bid in price and quantity pairs in whole MW increments.⁷⁰
- A DRSP's dispatch bid must specify:⁷¹
 - price bands and the corresponding prices at which the DRSP would provide wholesale demand response
 - ramp up and ramp down rates.
- A DRSP's bid will be included in dispatch in every dispatch interval, as the wholesale demand response unit will be either:
 - not dispatched to provide wholesale demand response or
 - provide wholesale demand response by deviating from its baseline by reducing consumption, increasing export or moving from consumption to export.⁷²

65 Clause 3.7.3(e) and clause 3.8.4(f) of the final rule.

66 Clause 3.8.2A(b) of the final rule.

67 Clauses 3.8.2A(c) and (d) of the final rule.

68 Definition of *wholesale demand response* in Chapter 10 of the final rule.

69 Clause 3.8.22A(a2) of the final rule.

70 Clause 3.8.7B of the final rule.

71 Ibid.

72 Clause 3.8.7B(g) of the final rule.

- When cleared to provide wholesale demand response, the DRSP's dispatch instruction would be to provide a specified level of deviation from the baseline of the wholesale demand response unit.⁷³ A DRSP is required to comply with its dispatch instructions.⁷⁴
- DRSPs have obligations consistent with those of other Market Participants to ensure their wholesale demand response units can comply with dispatch bids, tell AEMO about changes to the availability of wholesale demand response units and install devices used by AEMO for the dispatch process.⁷⁵
- DRSPs must not submit dispatch offers to provide wholesale demand response which:
 - encompass loads that are not compliant with the baseline methodology metrics at the time the offer is submitted⁷⁶
 - encompass loads that are spot price exposed in the trading interval⁷⁷
 - would have been undertaken anyway, even in the absence of a dispatch instruction or is offset by increased consumption at another connection point.⁷⁸
- AEMO assesses conformance with dispatch instructions and may limit the participation of a non-conforming wholesale demand response unit in dispatch.⁷⁹ For wholesale demand response units, conformance assessment will take place after dispatch.⁸⁰
- The AER enforces compliance with dispatch instructions and the rules about declaring the available capacity of wholesale demand response units and the provision of genuine demand response. The AER will have access to information to identify non-compliance with dispatch instructions, and DRSPs would be required to maintain information and records to facilitate the assessment of other provisions in accordance with guidelines made by the AER.⁸¹

Figure 3.1 provides an illustration of how DRSPs would be scheduled under the final rule. In this example:

- the maximum demand responsive component of the wholesale demand response unit is 70 MW - this is the maximum amount of wholesale demand response the DRSP could provide for that wholesale demand response unit
- the DRSP is dispatched to provide wholesale demand response of 60 MW in dispatch intervals 2 and 3.
- it is assumed that the market clearing price exceeds the price at which the DRSP offers to provide this reduction (i.e. the DRSP is cleared and receives a dispatch instruction to provide wholesale demand response).

⁷³ Clause 4.9.2B(a) of the final rule.

⁷⁴ Clause 4.9.8(a) of the NER.

⁷⁵ Clauses 4.9.8(f), 4.9.9E and 4.11.1(c1) of the final rule.

⁷⁶ Clause 3.8.2A(a) of the final rule.

⁷⁷ Clause 3.8.2A(c) of the final rule.

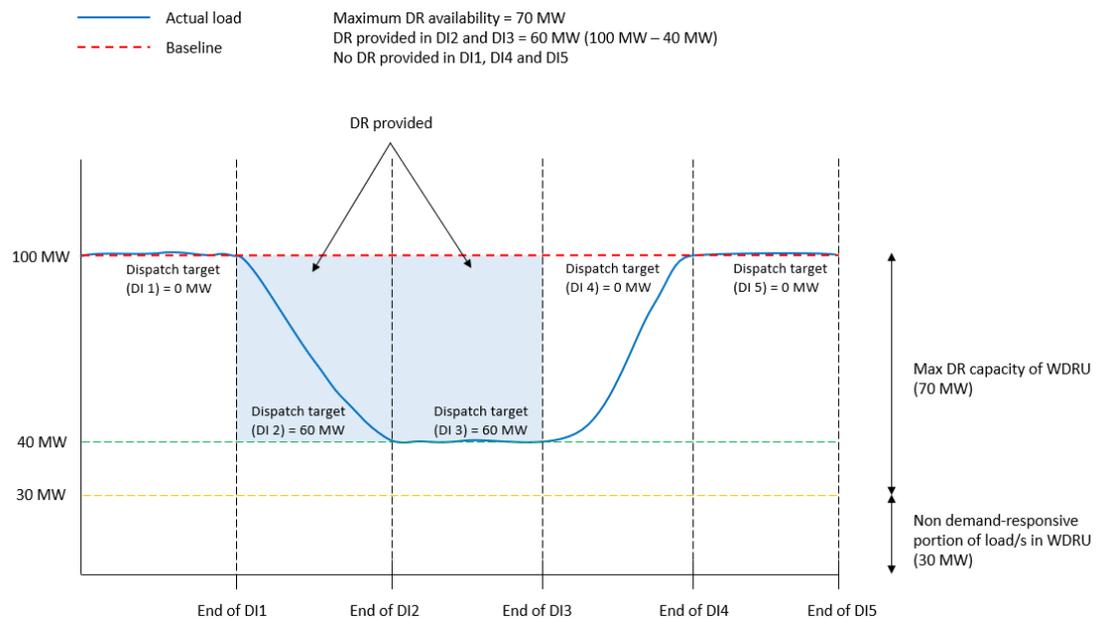
⁷⁸ Clause 3.8.2A(b) of the final rule.

⁷⁹ Clauses 3.8.23A(c) and 3.8.2A(e) of the final rule.

⁸⁰ Clause 3.8.23A of the final rule.

⁸¹ Clauses 3.8.2A(g), (h) and (i) of the final rule.

Figure 3.1: Scheduling of DRSPs under the final rule



Source: AEMC.

This aspect of the final rule is discussed further in appendix D.

3.1.3 Information provision

Increasing the transparency of wholesale demand response in the NEM was identified as one of the key benefits of this rule change by the rule proponents. Increased transparency contributes to the efficient operation and management of the wholesale electricity market by providing more information to the system operator and participants, so that investment and operational decisions can be better informed. This will also allow AEMO to better forecast demand and supply, as well as power flows across the system.

To facilitate this, the Commission considers that DRSPs should generally be subject to the same information provision requirements as existing scheduled generators, unless a particular requirement is not appropriate or necessary to apply to DRSPs.

Each DRSP will be required to provide the following information to AEMO:

- short term PASA inputs applying to the DRSP's wholesale demand response units, including available capacity for each trading interval under expected market conditions, PASA availability for each trading interval and projected daily wholesale demand response capability for wholesale demand response constrained⁸²

⁸² Clause 3.7.3(e) of the final rule.

- any information required for publication by AEMO in the *Electricity Statement of Opportunities* (ESOO)⁸³
- information required to be submitted through AEMO's DSP portal.⁸⁴

AEMO is required to publish information obtained through the short-term PASA,⁸⁵ the ESOO⁸⁶ and the demand side participation portal.⁸⁷

DRSPs will not be subject to the information provisions requirements applying to generators in respect of medium-term PASA or the Energy Adequacy Assessment Projection (EAAP).

This aspect of the final rule is set out in appendix E.

3.1.4

Determination of baselines

The final rule sets up a process for determining a baseline for wholesale demand response that participates in the wholesale demand response mechanism.

Baselines are an estimate of the counter-factual level of consumption that would have occurred were it not for the demand response.⁸⁸ They are necessary to allow demand response providers to sell demand response directly into the wholesale market – because the quantity of demand response sold (and paid for) is determined as the difference between the baseline and actual levels of consumption.

The framework in the final rule captures the benefits of having a central body determining the initial series of baseline methodologies while also allowing for improvements to be made over time.

Under the final rule, AEMO is required to:

- develop a guideline, in consultation with stakeholders, which sets out:⁸⁹
 - information about the process for development of baseline methodologies by AEMO and how proposals for new baseline methodologies may be made
 - the process for a DRSP to apply to AEMO for approval to apply a baseline methodology determined by AEMO and associated baseline settings to its wholesale demand response unit
- develop one or more baseline methodologies in accordance with the guideline and publish the methodologies and related settings in a register⁹⁰
- determine:⁹¹

83 Clause 3.13.3A of the final rule.

84 Clause 3.7D(b) of the final rule.

85 Clause 3.7.3(a) of the NER.

86 Clause 3.13.3A(a) of the NER.

87 Clause 3.7D(c) of the final rule.

88 Definition of baseline in Chapter 10 of the final rule. When the wholesale demand response unit is not being dispatched to provide wholesale demand response, the baseline is a forecast. Baseline accuracy compares the forecast with actual consumption or export.

89 Clause 3.10.1(a)(4)-(5) of the final rule.

90 Clause 3.10.3 of the final rule.

91 Clause 3.10.2 of the final rule.

- the baseline methodology metrics which set the thresholds for an acceptable baseline methodology
- arrangements for regular and systematic testing of baselines' compliance with the baseline methodology metrics
- monitor and report on the baseline methodologies used under the demand response mechanism.⁹²

DRSPs must:

- demonstrate that the baseline methodology and baseline settings it proposes to apply to a load will produce a baseline capable of complying with the baseline methodology metrics in order to classify that load as a wholesale demand response unit⁹³
- establish and implement measures in accordance with good electricity industry practice to identify when its wholesale demand response unit is not baseline compliant or is spot price exposed.⁹⁴

This aspect of the final rule is discussed further in appendix F.

3.1.5

Settlement and cost recovery

There are several ways in which DRSPs could be compensated for reducing demand under a wholesale demand response mechanism involving centralised settlement. The approach taken to settlement and cost recovery can have a significant impact on the extent of the costs associated with changes to retailers' and AEMO's systems to accommodate the mechanism, which are ultimately borne by consumers.

Accordingly, the Commission has sought to develop a settlement model which is cost-effective for consumers and market participants. In particular, the settlement model applying under the final rule will:

- allow retailers to continue to bill customers based on actual consumption, thereby significantly reducing the changes required to retailer billing systems and the associated implementation costs
- reduce the scope of the changes required to AEMO's settlement systems
- avoid imposing unmanageable or unhedgeable risks on retailers, leading to increased costs for consumers.

Where a customer undertakes wholesale demand response, the financial flows under the settlement model applying under the final rule (and under the DRSP's contract with the customer) would be as follows:

- The customer will be charged by the retailer for its actual consumption of electricity at the customer's retail rate

⁹² Clause 3.10.6 of the final rule.

⁹³ Clause 2.3.6(e)(3) of the final rule.

⁹⁴ Clause 3.8.2A(f) of the final rule.

- The retailer will be charged by AEMO for the customer's baseline level of consumption in the wholesale market, at the spot price.⁹⁵
- The DRSP will receive a payment from AEMO for the quantity of demand response provided by the customer (i.e. the customer's baseline level of consumption minus its actual consumption) at the wholesale price⁹⁶
- The payment to the DRSP will be capped at the maximum responsive component for each wholesale demand response unit. This cap means DRSPs will not be settled for any demand response provided in excess of the maximum capacity the DRSP has nominated.
- The DRSP will share a proportion of this payment with the customer in accordance with the terms agreed between those parties
- In order for the retailer to recover a portion of the cost it incurs by hedging for the customer's baseline level of consumption in the wholesale market but only being paid by the customer for metered energy, the DRSP will pay to the retailer (via AEMO) an amount equal to the quantity of demand response provided by the customer (i.e. the customer's baseline level of consumption minus its actual consumption) multiplied by a predetermined reimbursement rate⁹⁷
- This payment will also be capped at the maximum responsive component for each wholesale demand response unit.
- The reimbursement rate will be calculated by AEMO on a quarterly basis and will be based on the peak period load weighted average spot market prices over the previous 12 months.⁹⁸ This is a change from the reimbursement rate in the second draft determination. The final rule uses a reimbursement rate based on wholesale prices in the "peak load profile" period specified in the contract specification Australian Peak Load Electricity Futures Contract in the ASX 24 Operating Rules of the Australian Securities Exchange. This reimbursement rate better reflects the wholesale cost component of the retail tariff for the loads most likely to participate in wholesale demand response.

The financial flows described above are illustrated in Figure 3.2.

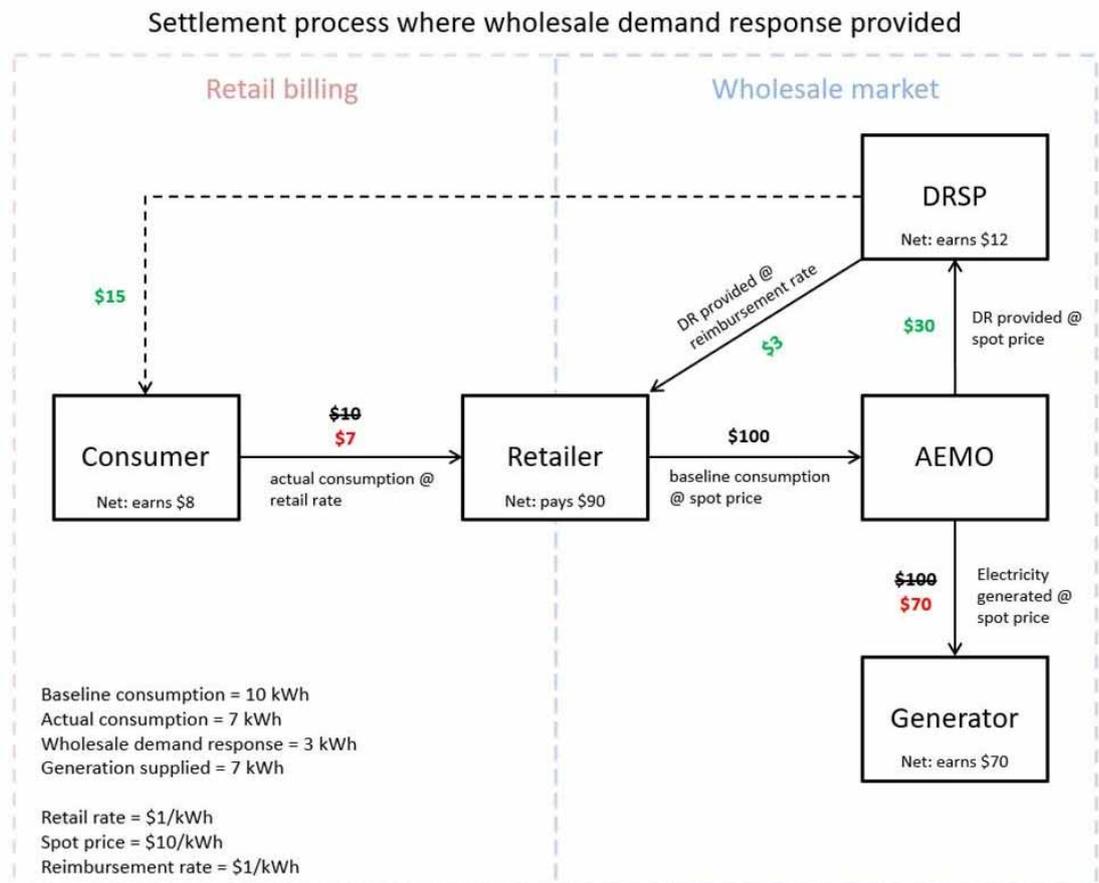
95 The actual consumption is included in the trading amount calculated clause 3.15.6 of the NER. The balance is included in the trading amount calculated under clause 3.15.6B(c) of the final rule.

96 Clause 3.15.6B(a) of the final rule.

97 Clause 3.15.6B(b) and 3.15.6B(c) of the final rule.

98 Clauses 3.15.6B(e) and (f) of the final rule.

Figure 3.2: Settlement model under the final rule - worked example



Note: Under the final rule, the flow 'DR provided at reimbursement rate' goes from DRSP to AEMO and then from AEMO to Retailer.

This aspect of the final rule is discussed further in appendix G.

3.2 Other changes - demand side participation portal

Under the final rule:

- AEMO is obliged to:
 - publish annual reports (without disclosing any confidential information) setting out a range of information about retailer-led, DRSP-led and network-led wholesale demand response, based on the data submitted to the Demand Side Participation (DSP) Portal⁹⁹

⁹⁹ Clause 3.7D(c) of the final rule.

- review the Demand Side Participation Information Guidelines as necessary to reflect the amending rule¹⁰⁰
- Registered Participants are required to submit a report in the DSP Portal even where they have no demand response arrangements with customers.¹⁰¹

3.3 Implementation

The substantive parts of the rule implementing the wholesale demand response mechanism would commence on 24 October 2021. This approach attempts to balance the benefits of the mechanism with the ability of AEMO and market participants to manage the transitional requirements and interactions with other regulatory reforms.

The following specific aspects of the final rule will commence before 24 October 2021:

- Schedule 2 of the final rule, which includes the changes to the obligations on AEMO and market participants other than DRSPs with respect to the Demand Side Participation (DSP) Portal discussed in appendix H, will commence on 31 March 2021. This is intended to ensure that these changes take effect when the DSP Portal opens for submissions on 31 March 2021.
- Schedule 6 of the final rule, which sets out the transitional rules relating to the establishment of the wholesale demand response mechanism, will commence on 18 June 2020. The transitional rules relate primarily to the development or amendment of guidelines and procedures by AEMO and the AER, allowing those entities to commence that process soon after the rule is made. Key guidelines and procedures are required to be in place by 24 June 2021 (four months before the mechanism starts), in order to allow entities to apply to AEMO for registration as DRSPs, and to seek classification of loads as wholesale demand response units, from that date.¹⁰² This will allow DRSPs to prepare to commence trading wholesale demand response from 24 October 2021.

The commencement dates for the various components of the final rule are set out in Table 3.1.

Table 3.1: Commencement timeframes under the final rule

SCHEDULE OF AMENDING RULE	PARTS OF THE NER COVERED BY SCHEDULE	COMMENCEMENT DATE OF SCHEDULE
1	Chapter 2 - Registered participants and registration	24 October 2021
2	Rule 3.7D - Demand side participation	31 March 2021

¹⁰⁰ Clause 11.125.7(a) of the final rule.

¹⁰¹ This would be a "no activity" report. Clause 3.7D(b)(2) of the final rule.

¹⁰² Clauses 11.120.2-7 of the final rule.

SCHEDULE OF AMENDING RULE	PARTS OF THE NER COVERED BY SCHEDULE	COMMENCEMENT DATE OF SCHEDULE
	information	
3	Chapter 3 - Market rules	24 October 2021
4	Chapter 4 - Power system security Chapter 4A - Retailer Reliability Obligation Chapter 7 - Metering	24 October 2021
5	Chapter 10 - Glossary	24 October 2021
6	Chapter 11 - Savings and transitional rules	18 June 2020

4 CONTEXT

Energy markets are changing. A range of new products and services are emerging that are redefining the way in which electricity is supplied to consumers, how consumers engage with the market and how and when electricity is used. Consumers can benefit from the evolving market arrangements and through their choices provide important signals to businesses throughout the energy system.

An active demand-side, characterised by the active participation of consumers, promotes efficient outcomes in the wholesale market. The supply side of the market provides a product or service at a price, and the demand side (i.e. consumers) responds to the price/value of the product or service being offered. Where load can effectively respond to prices, it can choose its level of consumption based on its willingness to pay for consuming electricity compared to the cost of that electricity. This has benefits to the individual consumer and to the system as a whole.

Wholesale demand response will play an increasingly important role in the future of the national electricity market (NEM), notably as an alternative to peaking generation. There is a need for flexible and dispatchable resources on both the supply and demand side to accommodate the increasing penetration of variable generation and changing consumer preferences and to promote efficient outcomes in the wholesale market. It is anticipated that a more active demand-side means that consumers will play an increasingly important role in helping to match supply and demand in the NEM. Demand response can be more cost-effective for both the consumer and the power system than building new generation and network capacity.

This development is being driven by technological advancements allowing the demand side to become more dynamic. Historically, high upfront costs and technical limitations associated with the equipment needed to facilitate demand response (e.g. advanced metering, monitoring and communications equipment) posed a barrier to many consumers, particularly small customers, undertaking demand response. However, declines in the costs of these technologies in recent times, as well as the emergence of new technologies and platforms, are making it cheaper and easier for consumers to provide demand response in a manner that is cost-effective and convenient to them.

These technology changes, along with the increasing recognition of the utility of demand response, are driving the emergence of new programs and product offerings which increase consumers' access to demand response and help to assess the capabilities and potential contribution of demand response in the NEM in different contexts. The variability of spot prices in the NEM and the potential for high prices during peak demand periods, which is a market-design characteristic intended to provide appropriate investment and operational signals for generators, also provides an incentive for consumers that are exposed to the spot price to reduce their consumption (or increase their generation) during these periods. However, most consumers do not currently receive these price signals under their retail electricity contracts. Instead, their retailer manages these risks for them and sells energy to

the consumer, often at a fixed wholesale price. These rule change requests focus on ways to increase signals and incentives for consumers to engage in demand response.

This chapter explores some of the existing programs and trials relating to demand response which are currently in development or under way in the NEM, as well as relevant products already being offered by retailers. These products and programs illustrate that there is a range of different ways consumers can provide demand response, including through participation in the Reliability and Emergency Reserve Trader (RERT), residential virtual power plants (VPPs), aggregation of loads to provide market ancillary services, direct spot price pass-through contracts and other retail and network tariff structures that incentivise demand reductions at certain times.

The wholesale demand response mechanism will provide an additional avenue for large customers to undertake demand response. However, this is only one type of demand response that will occur in the wholesale market. Other types of demand response are currently being trialled, including through products and programs that will allow small customers to become more active demand-side participants. As technologies continue to emerge and become cheaper, and consumer awareness of demand response grows, customers will continue to experiment with different ways of providing demand response, including those that sit outside of the wholesale demand response mechanism. The Commission considers that the wholesale demand response mechanism will be complementary to existing demand response programs, as well as to the development of new programs, as it will provide an important source of learnings and will facilitate the development of new technologies and skills among market participants.

4.1 What is demand response?

4.1.1 Categories of demand response

Demand response refers to consumers of electricity changing their level of consumption in response to short-term signals.

There are different types of demand response: wholesale, emergency, network and ancillary services, as shown in the table below. While the equipment that provides these different types of demand response is often the same, the services provided are distinct. There are also clear interactions between these different types of demand response. For example, there are interactions between wholesale and emergency demand response.

The Australian Competition and Consumer Commission (ACCC) highlighted these interactions in its *Retail Electricity Pricing Inquiry*, noting that there are coordination issues to consider when it comes to demand response participating in different markets (e.g. high spot prices, which may incentivise wholesale demand response, may not occur at the same time as localised network issues).¹⁰³ It should also be noted that emergency demand response typically sits outside of the wholesale market.

¹⁰³ ACCC, *Restoring electricity affordability and Australia's competitive advantage, Retail Electricity Pricing Inquiry—Final Report*, June 2018, available at: <https://www.accc.gov.au/publications/restoring-electricity-affordability-australias-competitive-advantage>.

Table 4.1: Categories of demand response

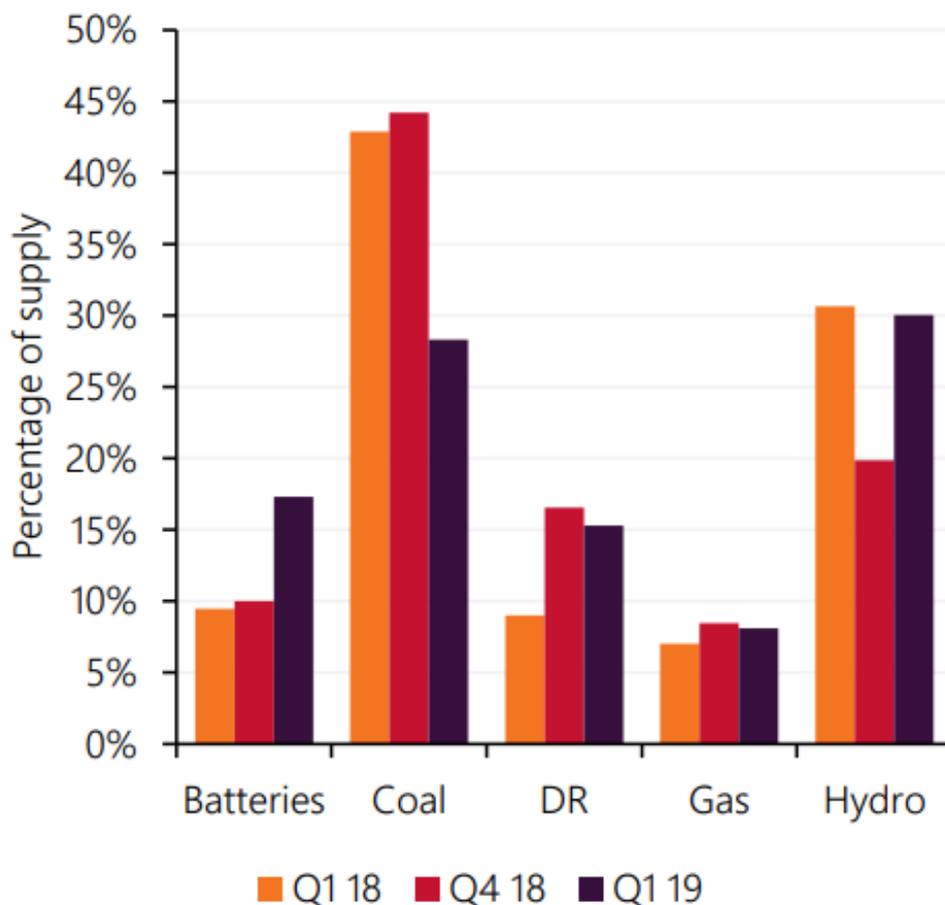
TYPE	DESCRIPTION	CURRENT STATUS
Wholesale demand response	Demand response used to change the quantity of electricity bought in the wholesale market, which could be used to manage spot price exposure, or to help market participants manage their positions in the contract market.	Due to the lack of transparency around how much wholesale demand response is currently being utilised, it is difficult to draw firm conclusions about how much demand response is occurring in the NEM, or whether this level is efficient. Wholesale demand response is the subject of the rule change requests addressed in this determination.
Ancillary service demand response	Demand response employed for providing ancillary services. For example, responding quickly to brief, unexpected imbalances in supply and demand by participating in the frequency control ancillary service (FCAS) markets.	Large energy users have used demand response to provide FCAS. Market ancillary service providers (MASPs) can offer customers' loads into FCAS markets. Currently, there are three MASPs using demand response to provide FCAS.
Emergency demand response	Demand response employed by the system operator during supply emergencies, with the service being centrally dispatched or controlled to avoid involuntary load shedding. This is generally provided by out-of-market reserves.	Demand response can – and currently is – participating in the Reliability and Emergency Reserve Trader (RERT). The Commission understands demand response loads currently participate as unscheduled reserves.
Network demand response	Demand response employed to help a network business to provide network services to consumers	The existing regulatory framework provides a number of incentives and obligations for non-network options (including demand response) to be adopted by a network service provider where it is efficient to do so.

The ability of MASPs to offer demand response into FCAS markets was established by the National Electricity Amendment (Demand Response Mechanism and Ancillary Services Unbundling) Rule 2016 No.10. These changes commenced on 1 July 2017. A MASP is not required to be a customer's retailer to offer such demand response services, but must satisfy certain registration requirements and deliver FCAS services in accordance with AEMO's specifications just as any other market participant is required to do. Box 1 details the impacts this rule change has had on FCAS markets in the NEM.

BOX 1: IMPACT OF DEMAND RESPONSE ON FCAS MARKETS

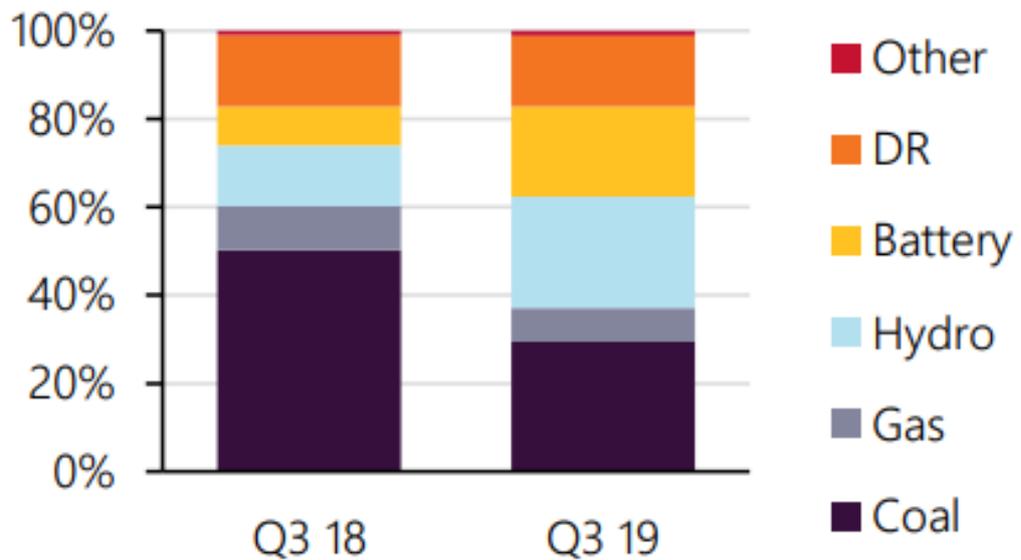
The establishment of the MASP participant category and the introduction of demand response into FCAS markets has resulted in increased competition for the provision of such services. This is highlighted by data published by AEMO. Figure 4.1 shows that the share of demand response in the supply of FCAS increased from around 9% in Q1 2018 to 15% in Q1 2019. Data published in AEMO's *Quarterly Energy Dynamics* for Q3 2019 shows that this share has since increased to just under 20%, as illustrated in Figure 4.2.

Figure 4.1: FCAS supply mix, Q1 2018 to Q1 2019



Source: AEMO, *Source: Quarterly Energy Dynamics - Q1 2019* Source: , p. 20. Available at: Source: https://www.aemo.com.au/-/media/Files/Media_Centre/2019/QED-Q1-2019.pdf Source: .

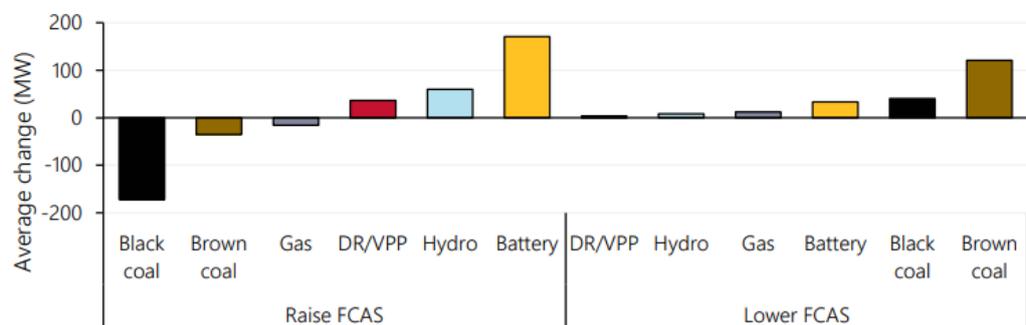
Figure 4.2: FCAS supply mix, Q3 2018 to Q 3 2019



Source: AEMO, *Source: Quarterly Energy Dynamics - Q3 2019*Source: , p. 20. Available at: Source: https://www.aemo.com.au/-/media/Files/Media_Centre/2019/QED-Q3-2019.pdfSource: .

The most recent data for Q4 2019 shows that the amount of FCAS provided by demand response and VPPs increased by 36.6 MW between Q4 2018 and Q4 2019, as illustrated in Figure 4.3.

Figure 4.3: Change in FCAS supply - Q4 2019 versus Q4 2018



Source: AEMO, *Source: Quarterly Energy Dynamics - Q4 2019*Source: , p. 22. Available at: Source: <https://aemo.com.au/-/media/files/major-publications/qed/2019/qed-q4-2019.pdf?la=en&hash=A46E0A510AE9F127B0A991B312C54460>Source: .

This data suggests that as the share of FCAS provided by demand response, batteries and hydro generators increases, the share provided by coal-fired generators decreases.

Demand response has also shown the potential to reduce FCAS costs. AEMO noted that in Q2 2019, reduced contingency raise costs were a function of a 107% increase in the supply of FCAS from a range of MASPs offering demand response at comparatively low prices.¹

Note: 1. AEMO, *Note: Quarterly Energy Dynamics - Q2 2019*, p. 18.

An active demand-side, characterised by the presence of demand response, promotes efficient consumption of electricity. Consumers would be able to trade off consumption against price signals from across the power system. In practice, benefits from an active demand side would include consumers:

- electing to avoid consumption during local network peaks and defer investment in capital intensive networks
- adjusting consumption during scarcity to maintain the supply-demand balance, often at a lower cost than doing so with expensive peaking generation
- providing the least cost resource for maintaining the power system within its secure limits, e.g. by responding to and correcting frequency deviations
- providing a low cost, controllable resource to correct the supply demand balance in place of involuntary load shedding.

Where consumers are able to effectively respond to prices, it would be an efficient outcome for consumers to choose their level of consumption based on the range of different services they can access or provide.

The AEMC commissioned The Brattle Group to update a previous report on demand response in other international jurisdictions, which was published in 2015 relation to the *Demand response mechanism and ancillary services unbundling* rule change,¹⁰⁴ to help inform the AEMC's assessment of the three rule change requests addressed in this determination. The Brattle Group's findings are summarised in Box 2 and the full updated report is available on the AEMC website.

BOX 2: THE BRATTLE GROUP REPORT ON DEMAND RESPONSE IN OTHER JURISDICTIONS

The AEMC asked The Brattle Group to assess the same six jurisdictions that were covered in the previous report and provide an update on relevant developments. These were: PJM interconnection, ISO – New England, Ontario, Alberta, Singapore and Electricity Reliability Council of Texas (ERCOT).

These markets can be considered to be a cross-section of different types of market design. Some have capacity payments for generation and demand response in addition to the wholesale energy market; whereas others only reward participants through the wholesale energy market. There are also differences in terms of the volatility of wholesale market outcomes, and size and type of generation mix. The report provides more detail on the characteristics and design of the energy markets in each of these jurisdictions.

The Brattle Group was asked to look specifically for changes and developments in relation to wholesale demand response since the time The Brattle Group last reviewed these

¹⁰⁴ The Brattle Group, *International Review of Demand Response Mechanisms*, October 2015. Available at: <https://www.aemc.gov.au/rule-changes/demand-response-mechanism>.

jurisdictions. In particular, The Brattle Group was asked to look at how wholesale demand response is facilitated in a transparent and schedulable manner.

The key findings from The Brattle Group report were:

- As the electricity industry transforms toward intermittent generation sources, wholesale demand response will become increasingly important for balancing the system.
- Since its previous report in 2015, there do not appear to have been significant increases in the amount of demand response quantities that are registered in those jurisdictions that either provide wholesale demand response, or ancillary services. Further, some jurisdictions had shown decreases in the quantities of registered demand response.
- In some jurisdictions, the rules that govern participation of demand response in the wholesale market have been changed in order to make demand response able to be dispatched and so relied on by the system operator, in order for this to assist with reliability. Necessarily, this has generally reduced the amount of demand response that can be offered and provided in these wholesale market since not all demand response can meet these characteristics. For example, to better support reliability PJM now requires demand response providers to be available all year round, rather than just at particular times of the year, which has reduced the number of available providers.
- In jurisdictions where demand response providers receive upfront availability payments, there tend to be higher levels of demand response being made offered for use in the wholesale market. However these resources were infrequently dispatched in the wholesale energy market, because prices were not as volatile and so often did not reach levels where the demand response would be economic to dispatch.
- In jurisdictions where demand response providers don't receive an upfront availability payment, most wholesale demand response occurs through loads simply responding to the wholesale price. However, since this is not clearly integrated in the wholesale market, the demand response that occurs is not transparent to the rest of the market and so it is difficult to quantitatively assess how much there is.

The Brattle Group also looked at proposals being considered by the European Union. The report found that the proposed European legislative framework calls for demand response aggregators to be able to contract with customers directly without needing to go through or have an arrangement with the retailer. This legislative framework is yet to be developed. The proposal would require aggregators to compensate retailers if they imposed costs on the retailers.

Source: The Brattle Group, *International Review of Demand Response Mechanisms in Wholesale Markets*, June 2019. Available at: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>.

4.1.2

Types of wholesale demand response

The rule change requests - the subject of this final determination - seek to facilitate wholesale demand response in the NEM. There is a range of ways wholesale demand response can be incentivised and facilitated. A number of examples are set out in Table 4.2.

Table 4.2: Types of wholesale demand response

DESCRIPTION	CONSUMER IMPACTS	IMPACTS ON MARKET PARTICIPANTS	PARTIES INVOLVED
<p>Interruptible supply contracts based on consumers shedding interruptible loads (e.g. facility shifting production to periods outside high spot prices, or at night).</p> <p>Arrangements can be through either:</p> <ul style="list-style-type: none"> • availability payments, which electricity consumers receive for nominating a demand response resource that they can commit • dispatch payments, which electricity consumers receive if they actually shed load in response to a request. 	<p>Potential cost savings for businesses. Some costs to businesses for implementation of technology and infrastructure.</p>	<p>Retailers - provides an alternative to hedge against high wholesale spot prices</p> <p>Network service providers (NSPs) - may provide a mechanism to defer network augmentations, reduce load at risk, or improve supply quality and reliability</p>	<p>Large commercial and industrial energy users</p> <p>Retailers</p> <p>NSPs</p> <p>Specialist third party demand response aggregators</p>
<p>Direct load control of appliances such as hot water, air conditioners and pool pumps – typically through contracts with consumers to enable cycling/shut down on short notice</p>	<p>Potential cost savings for businesses and residential consumers</p>	<p>Costs for NSPs to establish programs</p> <p>NSPs may also have some network augmentations savings</p>	<p>Commercial and residential consumers</p> <p>NSPs</p>
<p>Price based approaches utilising different tariff arrangements:</p> <ul style="list-style-type: none"> • time of use - cost-reflective pricing in which the day is divided into time bands and different prices are charged during each 	<p>Timely energy consumption information</p> <p>Price signals for customers which would allow them to more effectively manage their peak electricity usage and reduce costs</p>	<p>NSPs - potential for deferring network capital expenditure for peak demand period capacity</p> <p>Retailers - benefits for</p>	<p>Currently technology enabled in large commercial and industrial businesses</p> <p>Some small to medium business and residential</p>

DESCRIPTION	CONSUMER IMPACTS	IMPACTS ON MARKET PARTICIPANTS	PARTIES INVOLVED
<p>time band (i.e. peak, off-peak and shoulder).</p> <ul style="list-style-type: none"> seasonal time of use - aim to better reflect the differing seasonal costs of electricity supply, and therefore to apply a different TOU price schedule at different times of year. dynamic peak price - seek to more closely mirror supply and demand conditions where for a few hours each year the cost of electricity supply is highly skewed from the average. peak-time rebates - alternative form of dynamic peak pricing where customers are paid a rebate for reducing energy use during specific dispatch events. 		<p>competition and innovative product and service options</p> <p>Some cost impacts -IT systems and customer management</p>	<p>consumers</p> <p>Retailers</p> <p>NSPs</p>
<p>Allowing third parties to bid demand reductions into the wholesale market under a wholesale demand response mechanism of the kind set out in this determination.</p>	<p>Potential for participating consumers to earn money by selling their demand response</p> <p>Reduced peak wholesale prices due to increased competition between demand response and generation</p>	<p>Specialist third party demand response aggregators - direct access to the wholesale market</p> <p>Retailers - hedging strategies and potential systems changes</p> <p>NSPs - may have some</p>	<p>Large commercial and industrial energy users</p> <p>Specialist third party demand response aggregators</p>

DESCRIPTION	CONSUMER IMPACTS	IMPACTS ON MARKET PARTICIPANTS	PARTIES INVOLVED
		network augmentations savings Cost impacts for AEMO, including IT systems changes, which will impact market participant fees	

4.2 Existing demand response trial initiatives in the NEM

This section sets out a number of trials and incentive programs aiming to facilitate the integration of demand response in the NEM which are currently under way or have recently been completed.

4.2.1 ARENA/AEMO demand response RERT trials

In May 2017, the Australian Renewable Energy Agency (ARENA) and AEMO partnered to trial demand response services using the RERT (i.e. emergency demand response) arrangements in the NEM.¹⁰⁵ The trial is scheduled to run for three years, from 1 December 2017 to 30 November 2020. The objectives of this initiative include:¹⁰⁶

- demonstrating that demand response is an effective source of reserve capacity for maintaining reliability of the electricity grid during contingency events and that demand response resources can be rapidly developed for deployment from summer 2017/18
- providing an evidence base to inform the merits and design of a new market or other mechanism for demand response to assist with grid reliability and security, allowing for greater uptake of renewable energy
- improving the commercial and technical readiness of demand response providers and technologies, in particular to help demonstrate and commercialise the use of demand response for grid security and reliability.

Ten pilot projects, representing a broad range of technical and commercial solutions, were awarded funding under the initiative to manage electricity supply during extreme demand peaks. The trial has contracted for 143 MW of demand response in 2017-18, 190 MW in 2018-19 and 203 MW in 2019-20, across New South Wales,¹⁰⁷ Victoria and South Australia.¹⁰⁸

Further details on the programs funded under this program are set out in Table 4.3.

¹⁰⁵ The RERT is a function conferred on AEMO under the NEM. Under the RERT, AEMO can enter into reserve contracts so it can call upon resources not available to the market if needed to ensure reliability of supply meets the reliability standard, and to maintain power system security.

¹⁰⁶ ARENA, *Demand Response RERT Trial: Year 1 Report*, March 2019. Available at: <https://arena.gov.au/assets/2019/03/demand-response-rert-trial-year-1-report.pdf>.

¹⁰⁷ Funding for the procurement of reserves in New South Wales was provided by the New South Wales Government through the AEMO/ARENA tender process.

¹⁰⁸ AEMO, Summer 2017-18 operation review, p. 31.

Table 4.3: Overview of projects funded as part of the ARENA demand response RERT trial

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
Retailers			
AGL	<p>Peak Energy Rewards Program: Residential demand response</p> <p>AGL offered customers a sign-up incentive of \$50, as well as \$2 per kWh reduction as compared to their baseline consumption. Over the four events that AGL ran during year 1 of the program, the average incentive earned by customers was \$12. The average for the top 10 per cent of participating customers was \$43, while for the bottom 10 per cent it was \$2.</p> <p>In December 2019, AGL extended the program into Victoria with over 11,000 customers signing up. More than 8,000 NSW customers are involved in the program in 2020. AGL also plans to expand the program into other states prior to summer 2020-21.</p> <p>Peak Energy Rewards Managed For You: Residential demand response</p> <p>Following the launch of Peak Energy Rewards, AGL launched a subsequent program – Peak Energy Rewards Managed For You – giving customers the option of having their own device, such as an air conditioner, remotely triggered during a demand response event. In exchange for allowing AGL to control these devices, customers are paid a financial incentive. Incentives under this program were significantly higher, with a \$300 sign up incentive and a flat \$30 payment per event.</p>	18	20

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
	<p>The Managed For You program was initially launched in February 2018 with air conditioner control, involving retro-fitting air conditioners with a Demand Response Enabling Device (DRED). The program was expanded to electric vehicles in March 2018 using smart charging stations. While AGL initially had 123 enrolments in the air conditioner program, only 58 were subsequently confirmed and 45 successfully proceeded to final installation (primarily due to incompatibility with Australian Standard AS 4755 rendering customers' assets incompatible with DREDs).</p> <p>Commercial and industrial demand response</p> <p>AGL contracted commercial and industrial customers to provide 10 MW of demand response from 1 December 2017, increasing to 17 MW in January 2018. These customers were offered both an availability fee and a dispatch fee as incentives to participate. Customers across 34 sites included data centres (1 site), telecommunications (3 sites), shopping centres (11 sites), manufacturing and recycling plants (4 sites), water utility pumping stations and treatment plants (15 sites) and a university campus (1 site).</p>		
EnergyAustralia	<p>EnergyAustralia's demand response portfolio draws on initiatives across all customer segments.</p> <p>The portfolio employs the following approaches:</p> <p>Mass Market (MM) Behavioural Demand Response: Residential demand response</p> <p>Residential customers receive incentives under the PowerResponse</p>	38	49

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
	<p>program if they reduce their consumption in response to an SMS notification.</p> <p>MM Circuit Level Control Device campaign: Residential demand response</p> <p>Residential customers install innovative, high quality circuit-level monitoring and remote-control capable devices at their premises and can receive incentives if they allow EnergyAustralia to switch off appliances such as air-conditioners, pool pumps or other loads at the circuit level after a series of notifications.</p> <p>Battery storage group control</p> <p>This activity involved developing group control capability to aggregate a large proportion of battery storage devices. For a financial incentive, customers allow EnergyAustralia to remotely charge and/or discharge their battery into the grid after a series of notification steps.</p> <p>On site generation</p> <p>A group of EnergyAustralia customers have linked their assets to a virtual power plant (VPP) platform to allow for remote control and orchestration of their distributed energy resources (DER). The VPP includes a range of generators which can be called upon when needed and business activities can be curtailed or shifted when advance notice is given.</p> <p>Commercial and industrial customers</p>		

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
	<p>EnergyAustralia has collaborated with a number of major customers and a VPP provider to trial a range of capabilities at certain sites which are managed simultaneously to provide load reduction during events. This includes pre-cooling/heating at large sites, and curtailing low temperature freezers under managed conditions.</p> <p>Large scale industrial load curtailment</p> <p>Several of EnergyAustralia’s largest customers have participated in and provided demand response through curtailment of a core business activity. Each has gone through a process of change management to ensure their availability fits within requirements of notification and activation times while still being able to manage core business activities.</p>		
Flow Power	<p>Energy Under Control: Commercial and industrial demand response</p> <p>Flow Power is working with commercial and industrial customers to provide strategic demand response. Participating customers will install technology which allows a “controller” to remotely reduce their load when an event is triggered by AEMO. Customers must pay for the installation of the controller and receive payments for both availability and activation under the program.</p>	5	20
Powershop	<p>Curb Your Power: Residential demand response</p> <p>This is an opt-in program where customers are notified to curtail their electricity usage during times of peak demand. The program is entirely voluntary and certain customers are excluded from participation (e.g. vulnerable customers). The program currently has 10,364 customers.</p>	5	5

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
	Residential customers receive a \$10 power credit if they hit their 'curb target'. The power credit can be used by customers to purchase electricity with Powershop. The curb target for a residential customer is a 10% reduction from their baseline or a reduction of 1 kWh every hour of the Event. This is also the minimum curb target for small business customers, however these customers can earn more credits if they meet higher load reduction thresholds.		
Demand response aggregators			
Enel X	<p>Advancing Renewables Program: Commercial and industrial demand response</p> <p>Enel X has developed a 20 MW reserve in NSW and a 30 MW reserve in Victoria, as part of its contracts for the trial. The portfolio comprises commercial and industrial energy users who are capable of implementing load curtailment within 10 minutes of receiving dispatch instructions from Enel X indicating that a demand response event is commencing.</p> <p>Enel X has installed its own metering technology at customer sites for purposes of monitoring customer facility demand and facilitating demand response. Additionally, a portion of the sites have been equipped with control equipment that allows Enel X to remotely initiate a load reduction.</p> <p>Participating customers were paid both availability payments and energy payments. Payment terms were negotiated on a case-by-case basis, depending on their individual operational requirements, size of</p>	50	50

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
	loads, cost of reducing load, magnitude and complexity of required on-site technology and controls work, opportunity cost of other energy management strategies, and other commercial considerations.		
Zen Ecosystems	<p>Zen Ecosystems (ZE) ran multiple DR events in summer 2018. ZE’s goal was to target small to medium-sized loads (typically HVAC, refrigeration and lighting) at scale, using the ZenHQ cloud platform to deliver DR signals manually or automatically. ZenHQ is a centralised energy control system for multi-site businesses which combines smart, connected thermostats and lighting controls with cloud software to view and manage those devices.</p> <p>The incentive used by Zen in its initial <i>Save the Grid</i> program was based on intention. When Zen notified participating customers of an event, they asked whether the customer intended to participate and reduce their energy consumption. If the customer answered in the affirmative, they were given 2 movie tickets.</p> <p>The <i>Save the Grid</i> program was the forerunner to the much larger <i>Help the Grid</i> program that was marketed by the RACV and attracted about 1,400 participants. The only incentive in that program was an entry into a draw for a chance to win a weekend at an RACV resort on the Surf Coast.</p>	5	15
Industrial customer			
Intercast & Forge	Intercast & Forge is a foundry in South Australia which provided load curtailment on its own upon notification from AEMO, without an aggregator as intermediary. The business has installed sophisticated	10	10

PROPONENT	PROGRAM DESCRIPTION	MW CONTRACTED	
		YEAR 1	YEAR 3
	energy systems that allows it to provide dispatchable demand response by powering down furnaces during peak events.		
Distribution network service provider			
United Energy	<p>Demand Response Service</p> <p>United Energy delivers demand response services through the use of remote-controlled voltage reduction at its 47 zone substations. This service uses an existing fleet of smart meters deployed across the distribution network to provide time-lagged customer voltage data from all connected smart meters to enable reductions in voltage while maintaining voltage compliance during the demand response event. United Energy's first test of its demand response reserve capability achieved approximately 15-20 MW of demand response.</p>	12	30

Source: The information set out in this table is drawn from reports published by ARENA and the participants in the demand response RERT trials, including ARENA's *Demand Response RERT Trial Year 1 Report* published in March 2019 and the knowledge sharing reports published by the proponents.

In March 2019, ARENA published a report on the outcomes of the first year of the trial program.¹⁰⁹ The report notes that, while the performance by individual participants was varied, overall the combined portfolio delivered more demand response than was contracted for across the year. Early results also indicate that the success of the trial continued to build in the second year, with an increase in the combined contracted capacity from 143 MW to 187 MW and a number of lessons learnt from year one already being applied by the proponents with positive outcomes.

Some of the key learnings arising out of the trial to date include:¹¹⁰

- Challenges with the baseline methodology used in the trial were noted early in Period 1 of the program.¹¹¹ ARENA has commissioned a separate study on the applicability of this methodology to specific types of loads that had been recruited for this program, but had not previously been used in RERT applications.
- A number of the proponents noted that the very tight timeframes for year 1 of the trial, while unavoidable, posed a significant challenge, specifically for recruitment. However, this is not anticipated to be a recurring issue for the program moving forward.
- Proponents that were not the retailer of the customers within their portfolios reported several issues regarding access to metering data.
- EnergyAustralia noted that revisions to metering data from the market can be made several months after an event, and this has the potential to materially change the level of performance achieved by an aggregator and that of individual customers within the aggregator's portfolio.

The program has also provided valuable insights into engaging with and managing participating customers, the drivers of customer participation in demand response events, challenges created by technology issues and approaches to manage the risk of under-delivery of demand response. So, while the trial has focussed on facilitating emergency demand response, it has provided useful insights and learnings for wholesale demand response. Further, given the participants received funding to make customers demand response ready, it is expected that some of these would participate in wholesale demand response in the future.

4.2.2

Virtual power plant demonstrations

AEMO is collaborating with ARENA, the AEMC, the AER and members of the Distributed Energy Integration Program (DEIP) to establish VPP demonstrations. A VPP broadly refers to an aggregation of resources coordinated using software and communications technology to deliver services that have traditionally been performed by a conventional power plant. VPPs can deliver multiple services to increase the potential 'value stack' delivered to consumers,

¹⁰⁹ ARENA, *Demand Response RERT Trial Year 1 Report*, March 2019.

¹¹⁰ Ibid, p. 16.

¹¹¹ The program uses the "10 of 10" baseline methodology used by the California Independent System Operator (CAISO). This methodology uses an average of the previous 10 'like days' (i.e. not weekends, public holidays or event days) to create a baseline profile of consumption for a customer.

including by participating in markets for both energy and frequency control ancillary services (FCAS), as well as entering into network support agreements with NSPs. Currently, VPP value stacking in the NEM is in the very early stages of development.

AEMO has established a framework to allow VPPs to demonstrate their capability to deliver services in energy and FCAS markets. By trialling VPP operations while their aggregated fleets remain of a small scale (less than 5-10 MW per VPP operator), the VPP demonstrations aim to inform the effective integration of VPPs into the NEM as they reach a larger scale.

AEMO published a consultation paper seeking stakeholder feedback on the demonstrations program in November 2018.¹¹² AEMO secured funding from ARENA for the program in April 2019. In July 2019 AEMO published the technical specifications for participants in the demonstrations and opened registrations for participation. AEMO's final design for the demonstrations accommodates three different models for participation:¹¹³

1. **Retailer engages with VPP coordinator:** A retailer and a separate VPP coordinator (who is not required to be a registered participant in the NEM) may jointly participate in the trial in respect of connection points where the retailer is the financially responsible market participant (FRMP). This arrangement will require the retailer and the separate VPP operator to enter into a commercial agreement, and the retailer will participate as the Market Customer in contingency FCAS markets and be exposed to energy market prices.
2. **Retailer is also the VPP coordinator:** A retailer, who is also the VPP coordinator, can participate as a Market Customer with respect to multiple connection points at which it is the FRMP.
3. **VPP coordinator as MASP:** A VPP coordinator who is registered as a MASP may participate in the trial in contingency FCAS markets only.

The VPP Demonstrations aim to:

- provide an understanding of whether VPPs can reliably control and coordinate a portfolio of resources to stack value streams relating to FCAS, energy, and possible network support services
- develop systems that provide AEMO with operational visibility of VPPs to understand their impact on power system security, local power quality, and how they interact with the market
- provide insights on how to improve consumers' experience of VPPs in future
- provide insights as to what cyber security measures VPPs currently implement, and whether VPP cyber security capabilities should be augmented in future

112 AEMO, *NEM Virtual Power Plant (VPP) Demonstrations Program – Consultation paper*, November 2018. Available at: <https://www.aemo.com.au/-/media/Files/Electricity/NEM/DER/2018/NEM-VPP-Demonstrations-program.pdf>.

113 AEMO, *NEM Virtual Power Plant (VPP) Demonstrations Program: Final Design*, July 2019. Available at: https://www.aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/NEM-VPP-Demonstrations_Final-Design.pdf.

- allow the Commission and AEMO to make informed changes to the regulatory frameworks, systems and processes required to facilitate the smooth integration of VPPs in the NEM.

In March 2020, AEMO published a report outlining the following learnings to date from the VPP demonstrations:¹¹⁴

- **Operational capability for market participation:** The data received so far indicates that VPPs can effectively respond to power system events and price signals. This includes responding to frequency excursions beyond the normal operating range (49.85-50.15 Hz) and pre-charging (or discharging) to cater for future high (or low) price events, respectively.
- **Value stream realisation:** Energy Locals, as the market participant for the South Australia VPP, has been able to earn revenues by participating in the six contingency FCAS markets. Total revenue over the first four months of their involvement (from 13 September 2019 to 12 January 2020) was \$225,000.
- **Early assessment of regulatory arrangements:** The VPP Demonstrations identified a number of regulatory arrangements to be considered for amendment, including:
 - the classification of load
 - streamlining data as a service for intending participants
 - Small Generator Aggregators (SGA) providing FCAS
 - faster contingency FCAS
 - VPPs participating in regulation FCAS
 - future market services that are designed to recognise that DER and VPPs could deliver those services.
- **Technology development:** AEMO started developing a new application programming interface (API) management platform with the launch of the VPP Demonstrations. All four APIs are published on the new platform and are publicly accessible via the internet.

The Commission notes that Solar Quotes provides information on existing VPP programs to small customers to help them compare the details and potential benefits of these programs when deciding whether to participate in a VPP.¹¹⁵

4.2.3

State government programs

Most jurisdictions in the NEM have established, or are developing, programs to incentivise the uptake of technology that will enable residential and business customers to participate in demand response programs.

South Australia

¹¹⁴ AEMO, *AEMO Virtual Power Plant Demonstration: Knowledge Sharing Report #1*, March 2020. Available at: <https://aemo.com.au/-/media/files/electricity/nem/der/2019/vpp-demonstrations/aemo-knowledge-sharing-stage-1-report.pdf?la=en>.

¹¹⁵ See: <https://www.solarquotes.com.au/battery-storage/vpp-comparison/>.

In February 2018, the South Australian Government announced plans to establish a 250 MW VPP in partnership with Tesla by creating a network of 50,000 homes fitted with smart meters, rooftop solar panels and battery storage systems.¹¹⁶ The first stages of the trial involve installing these technologies in 1,100 SA Housing Trust properties. The first 100 of these systems had been installed as at July 2018. Once these installations are complete, Tesla will test the ability of the systems to operate together to reduce demand during peak periods, thereby reducing electricity bills for participating households. If the initial phase of the trial is successful and other key criteria for the initiative are met, the full program may be rolled out to a further 24,000 public housing properties and 25,000 private properties.

The South Australian Government has also announced an \$11 million trial scheme which will seek to incentivise energy consumers to utilise new technologies to change their consumption behaviour, particularly during periods of peak demand.¹¹⁷ Under the scheme, South Australian businesses will be provided grants of up to \$2.5 million to implement innovative demand response ideas. Applications for grants under this program closed on 21 December 2018.

The following projects have been announced as receiving funding under this program:

- Embertec has been awarded \$584,049 to implement a project involving efficient targeting and automated control of residential air conditioning loads.
- Amber Electric has been awarded \$800,000 to implement a project involving [automating the demand response of residential loads in response to wholesale prices](#) in partnership with Symbiot Technology.
- Enel X has been awarded \$2,000,000 to implement a project involving the use of [commercial customers' existing backup generators to provide demand response](#).
- SA Power Networks has been awarded \$975,000 to implement a project involving advanced voltage control in partnership with the CSIRO and Future Grid.
- The University of Adelaide has been awarded \$675,000 to implement a project involving the use of digitised tri-generation and nanogrids for demand management.
- Flow Power has been awarded \$1,067,697 to implement the Building Intelligent Demand Response project.
- GreenSync Pty Ltd has been awarded \$2,432,900 to implement the deX SA Marketplace Project.

New South Wales

The NSW Government is currently developing its *Empowering Homes* program.¹¹⁸ Under this program, the NSW Government will support the installation of up to 300,000 solar-battery systems across the state, over 10 years. The program will be providing interest-free loans to

¹¹⁶ For more information, see: <https://virtualpowerplant.sa.gov.au/>.

¹¹⁷ For more information, see: http://www.energymining.sa.gov.au/energy_and_technical_regulation/energy_resources_and_supply/south_australian_demand_management_trials_program.

¹¹⁸ For more information, see: <https://energy.nsw.gov.au/renewables/clean-energy-initiatives/empowering-homes>

NSW residents to install solar and battery systems. A pilot of the program will be undertaken in the Hunter region and will run for up to 12 months.

In November 2019, the NSW Government released the NSW Electricity Strategy.¹¹⁹ Part of this strategy involves the setting of an Energy Security Target for NSW, which would identify the level of supply needed to meet customer demand, plus an appropriate reserve margin. Under the strategy, the NSW Government may consider actions that deliver investments needed to avoid a breach of the EST in the event of an anticipated capacity shortfall, including demand response measures.

Australian Capital Territory

Under the \$25 million *Next Generation Energy Storage* program, the ACT Government is supporting the roll out of up to 36 megawatts of smart battery storage systems in up to 5,000 eligible ACT homes and businesses. The program is delivered through a range of battery storage providers, which were selected by the ACT Government after a competitive selection process. Around 1,100 systems have been supported under the program to date.¹²⁰

Queensland

The Queensland Government had a concessions program in place under which households and small businesses could apply for interest-free loans or grants to purchase a battery system or a combined solar and battery system up until 30 June 2019. Assistance packages were available offering grants of \$3,000 and interest-free loans of up to \$6,000, repayable within 10 years. 3,650 assistance packages were available across both the loans and grants for battery systems and the loans and grants for combined solar and battery systems.¹²¹

Victoria

Under its *Solar Homes Program*, the Victorian government offers a range of rebates on residential solar PV and battery systems. In 2019-20 the government will offer 1,000 rebates of up to \$4,838 for solar battery systems. These rebates will be available to people in designated suburbs who have already installed solar panels, but have not already accessed a solar rebate.¹²²

4.3 Availability of retail demand response products in the NEM

In addition to the above programs, some consumers are already able to access retail electricity products which allow them to provide wholesale demand response. A number of retailers and third party service providers either utilise demand response or enable consumers to do so themselves with offerings which sit outside the trials noted above. These are examples of the different types of wholesale demand response referred to in section 4.1.2.

¹¹⁹ NSW Government, *NSW Electricity Strategy*, November 2019. Available at: <https://energy.nsw.gov.au/government-and-regulation/electricity-strategy>.

¹²⁰ For more information, see <https://www.environment.act.gov.au/energy/cleaner-energy/next-generation-renewables>.

¹²¹ For more information, see <https://www.qld.gov.au/community/cost-of-living-support/concessions/energy-concessions/solar-battery-rebate/about-the-program>.

¹²² For more information, see <https://www.solar.vic.gov.au/Solar-rebates/Solar-batteries>.

Some retailers that are currently facilitating wholesale demand response are highlighted in Box 3. A number of these product offerings have emerged quite recently in the NEM. The Commission notes that several third parties, such as Tesla, Reposit Power, Powerpal and Ohmie HOME, currently offer services to residential customers to help them manage their energy usage and utilise their household load and appliances to engage in demand response through retailers.

BOX 3: EXISTING WHOLESALE DEMAND RESPONSE PRODUCTS OFFERED BY RETAILERS

ERM Power

ERM Power is an electricity retailer and generator that operates across the NEM. ERM Power is an energy retailer for commercial and industrial customers. As a part of its energy retailing, ERM Power develops bespoke demand response contracts with its customers. These commercially-negotiated contracts include arrangements that:

- pass through spot prices and help the customer anticipate and minimise exposure to price spikes, or
- involve ERM Power calling upon these customers to reduce consumption to help manage ERM Power's exposure to the wholesale electricity price.

Flow Power

Flow Power is an electricity retailer that operates in all regions of the NEM. Flow Power emerged from a company that offered energy management services (specialising in demand management) to medium and large energy users. It has since opted to register as a retailer and connect customers to the wholesale market. Flow Power's retail contracts pass on wholesale price signals to its customers, and it helps those customers manage consumption in a way that reduces costs. Flow Power's customers are typically medium to large energy users who are able to change consumption in response to wholesale spot prices. These customers can either do this manually or install a device that allows Flow Power to remotely adjust demand.

Amber Electric

Amber Electric is a new entrant electricity retailer. It participates in the NEM through the retail license platform offered by Energy Locals. Amber initially launched in Sydney in mid-2018 and has subsequently expanded to South Australia. Amber offers spot price pass through contracts to customers and charges a flat fee of \$10 per month. The company offers a portal through which customers can monitor real-time wholesale prices and forecast prices and adjust their usage accordingly. Amber intends to start offering retail contracts in Victoria, Queensland, ACT and the rest of NSW in the near future. Amber has also recently commenced a VPP pilot project in partnership with SwitchDin to offer smart energy management systems to ten Amber customers who have pre-existing household batteries to allow them to automatically respond to wholesale prices.

Stanwell

Stanwell's retail business, Stanwell Energy, offers demand response products to all its customers and has a number of existing customers with demand response products incorporated in their contracts. These represent customers with load requirements of around 10 to 100 MW that are willing and able to make available a fraction of their total load for demand response. Stanwell Energy's demand response products typically involve an availability payment as well as remuneration if the load is activated to provide demand response. Stanwell Energy calculates the customer's baseline, which is used to calculate the applicable payments. Stanwell Energy activates these contracts when there is a market benefit in doing so, and so the market naturally sets the value and timing of these resources. Customers are typically not obliged under their contracts to participate if called to activate at a time that would adversely affect their operations.

Powerclub

Powerclub is a new entrant retailer which offers retail contracts in New South Wales, Queensland, South Australia, ACT and Victoria. Powerclub offers spot price pass through contracts to customers and charges an annual membership fee of \$39 for residential consumers. The company's product includes a feature called Powerbank, which customers can deposit funds into to act as a 'buffer' to smooth out fluctuations in the wholesale price. Powerclub also has a different corporate structure to most retailers - customers that join become a part owner of the company and gain access to voting rights and distribution of profits.

Pooled Energy

Pooled Energy is a specialist electricity retailer which offers pool automation systems that optimise the operation of a customer's pool pump in response to wholesale electricity prices. Pooled Energy directly controls these devices to reduce customers' energy costs. The company has installed its systems in 1,400 swimming pools across Australia. Pooled Energy has plans to expand its product offering to include monitoring and control of air conditioners.

AGL Energy

AGL Energy is currently accepting registrations from customers with battery storage systems to participate in a VPP as an add-on to their existing electricity plan. AGL will "actively manage" participating customers' battery up to 30 times a year to either supply the customer's load, charge the battery or hold its state of charge steady. Customers can receive a \$45 quarterly credit and a one-off \$100 sign-up credit towards their electricity bill over the first 12 months.

Recent consumer surveys undertaken by Energy Consumers Australia (ECA) and The Australia Institute (TAI) provide some insights into consumers' interest in participating in demand response. ECA's *Energy Consumer Sentiment Survey* published in June 2019 found that, when asking residential and small business consumers whether they would be prepared

to reduce their energy use during periods of very high demand, a high proportion of respondents (between 43 per cent and 60 per cent depending on the jurisdiction) said that they would be willing to do so without requiring a financial incentive.¹²³ Approximately one in four consumers said that they would only reduce their consumption with a financial incentive.¹²⁴

The Australia Institute also conducted a survey of consumers in 2017 which indicated that 81 per cent of respondents were either somewhat interested or very interested in receiving payments for conserving energy for short periods during peak demand.¹²⁵

The AER also considered the levels of wholesale demand response in the NEM in its 2018 *Wholesale electricity market performance report*.¹²⁶ While the AER noted that its enquiries with participants indicated that the uptake of demand response products had decreased recently, this was partly due to demand for those in-market products being crowded out by the "out-of-market" Reliability and Emergency Reserve Trader (RERT).¹²⁷ Market participants indicated to the AER that the higher priced RERT mechanism is redirecting customers from existing demand response agreements, rather than creating an incentive for new capacity and security services, or new demand response contracts.¹²⁸ The AER also noted that it intends to monitor the effect of proposed changes to integrate more demand response into the market and participants' reactions to any such developments, as well as the impact of AEMO's RERT management on market driven demand side participation.¹²⁹

In 2018, PIAC conducted a research project involving consumers contacting 23 retailers in NSW through a range of mediums to ask if they offered demand response programs for individual customers. Of the retailers contacted, only one retailer that currently serves less than 0.01% of NSW residential electricity customers offered a demand response product.¹³⁰

4.4 Previous rule changes relating to demand response

4.4.1 Demand side participation portal

In 2015, the Commission made a rule requiring registered participants to provide information about demand side participation to AEMO through AEMO's Demand Side Participation (DSP) Portal.¹³¹ The DSP rule sought to improve AEMO's visibility of demand side participation in the NEM and allow this information to be incorporated into its demand forecasts. However, this information is not currently transparent to the market. As such, it is of limited use in

123 ECA, *Energy Consumer Sentiment Survey June 2019*, p. 23. Available at: <https://energyconsumersaustralia.com.au/wp-content/uploads/Energy-Consumer-Sentiment-Survey-Report-June-2019.pdf>.

124 Ibid.

125 TAI, *Polling - Demand Response*, September 2017. Available at: <http://www.tai.org.au/sites/default/files/Polling%20Brief%20-%20Sept%202017%20-%20Demand%20Response%20FINAL.pdf>.

126 AER, *Wholesale electricity market performance report - December 2018*, Available at: <https://www.aer.gov.au/wholesale-markets/market-performance/aer-wholesale-electricity-market-performance-report-2018>.

127 Ibid, p. 35.

128 Ibid, p. 61.

129 Ibid, p. 65.

130 PIAC, submission to consultation paper, p. 6.

131 AEMC, National Electricity Amendment (Improving demand side participation information provided to AEMO by registered participants) Rule 2015 No. 4, available at: <https://www.aemc.gov.au/rule-changes/improving-demand-side-participation-information-pr>.

assessing the levels of wholesale demand response which currently exist in the NEM. The final demand response rule proposes changes to increase the transparency and utility of the information submitted to the DSP Portal. These changes are discussed in detail in appendix H.

Since the publication of the first draft determination in July 2019, AEMO has published the *Demand side participation forecast and methodology* report (DSP report),¹³² which sets out AEMO's approach to forecasting demand side participation and the extent to which, in general terms, demand side participation information submitted to the DSP Portal has informed AEMO's development or use of load forecasts in exercising its functions under the NER. The DSP report identifies the "program groups" which were used in 2019 to estimate the quantities of demand side participation in the NEM, which included RERT providers, individual industrial loads, customers on network event programs, customers involved in programs relating to connections with network-controlled load and customers included in other programs that could incentivise demand side participation, such as market-exposed connections and demand reduction contracts. The DSP report also includes information on AEMO's approach to estimating the prices at which demand response would be triggered, the calculation of baselines and the probability of customers responding to price events.

The below table from the DSP report sets out statistics relating to each category of demand response program determined by AEMO based on information submitted to the DSP Portal, including the type of demand side participation, the number of distinct connections, the reported sum of potential demand response in MW and the number of programs in that category. This data suggests that nearly 3,572 MW of potential demand response exists in the NEM. However, AEMO notes that this includes demand response potential which has been excluded from AEMO's calculations and further analysis is required to assess the robustness of this estimate.

AEMO is in the process of consulting on its DSP forecast methodology and is scheduled to publish a draft determination in Q2 2020.¹³³

¹³² AEMO, *Demand side participation forecast and methodology*, August 2019. Available at: https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEM_ESOO/2019/Demand-Side-Participation-Forecast-Methodology-2019.pdf.

¹³³ For more information, see <https://aemo.com.au/en/consultations/current-and-closed-consultations/demand-side-participation-forecast-methodology-consultation>.

Figure 4.4: Summary of information submitted to the DSP Portal in 2019

Category	DSP type	Distinct number of connections	Reported sum of potential response (MW)	Number of programs
Connections on network event tariffs	Load reduction	2,593	Not reported	1
Connections on retail time-of-use tariffs	< not specified >	1,173,980	Not reported	30
Connections on retail time-of-use tariffs	Embedded generation	15	1.8	1
Connections with energy storage	< not specified >	10,054	Not reported	9
Connections with energy storage	Energy storage	112,155	0.2	2 out of 4
Connections with network-controlled load	< not specified >	0	Not reported	3
Connections with network-controlled load	Embedded generation	6	11.0	1
Connections with network-controlled load	Load reduction	2,545,004	2,624.0	57 out of 58*
Market exposed connections	< not specified >	964	Not reported	19
Market exposed connections	Embedded generation	20	36.9	4 out of 4
Market exposed connections	Load reduction; embedded generation	258	109	1
Other	< not specified >	35	49.2	3 out of 4
Other	Embedded generation	39	95.8	16
Other	Energy storage	758	4.5	2
Other	Energy storage; embedded generation	0	4.0	1
Other	Load reduction	71,705	605.5	17 out of 21
Other	Load reduction; embedded generation	2	30.0	1

Source: AEMO, *Demand side participation forecast and methodology*, August 2019, p. 19.

4.4.2 Demand management incentives for networks

The AEMC also made a rule in 2015 to help balance the incentives on distribution businesses to make efficient decisions in relation to network expenditure, including investment in demand management.¹³⁴ The rule amended the arrangements in the NER to provide greater

¹³⁴ AEMC, National Electricity Amendment (Demand Management Incentive Scheme) Rule 2015 No. 8. Available at: <https://www.aemc.gov.au/rule-changes/demand-management-embedded-generation-connection->.

clarity to the AER and stakeholders in respect of how a demand management incentive scheme should be designed and applied. Two mechanisms were established under the new framework:

- Demand management incentive scheme (DMIS) - the objective of the incentive scheme is to provide distribution businesses with an incentive to undertake efficient expenditure on relevant non-network options relating to demand management. The scheme rewards distribution businesses for implementing relevant non-network options that deliver net cost savings to retail customers.
- Demand management innovation allowance (DMIA) - the objective of the innovation allowance is to provide distribution businesses with funding for research and development in demand management projects that have the potential to reduce long term network costs. The allowance funds innovative projects that have the potential to deliver ongoing reductions in demand or peak demand.

The Commission received a rule change request from Energy Networks Australia in March 2019 seeking to require the AER to develop a DMIS and DMIA for transmission networks. The Commission published a final rule in relation to this rule change request in December 2019, which applies the DMIA to transmission networks. However, the final rule does not apply the DMIS to transmission networks as the Commission is not satisfied that the benefits of doing so would outweigh the upfront costs to consumers.¹³⁵

¹³⁵ AEMC, National Electricity Amendment (Demand management incentive scheme and innovation allowance for TNSPs) Rule 2019 No. 10. Available at: <https://www.aemc.gov.au/rule-changes/demand-management-incentive-scheme-and-innovation-allowance-tnsps>.

5 SMALL CUSTOMERS AND THE TWO-SIDED MARKET

This final determination establishes a mechanism that provides more opportunities for consumers to capture the value of responding to wholesale prices, compared to the current arrangements. In order for the mechanism to result in wholesale demand response that can be relied on by the system operator, and so provide reliability related benefits, as well as to minimise risks imposed on the market, the mechanism features a number of elements including scheduling obligations and centrally determined baselines. This mechanism is also a solution that can exist within the market at the moment, given current levels of technology.

The wholesale demand response mechanism set out in this determination involves a number of new processes. As with any new regulatory change introduced into the NEM, there are associated implementation and operational costs. In developing this mechanism, the Commission has made a number of decisions to balance the extent of these costs against the expected benefits. One of these decisions is to focus on the participation of large customers in the mechanism.¹³⁶

The mechanism in the final rule better meets the assessment framework and is likely to better contribute to the achievement of the NEO, compared to the mechanisms proposed in the rule change requests and the mechanism set out in the first draft determination. It is the mechanism that best enables existing large customers that currently do not see direct wholesale prices to provide wholesale demand response through having a relationship with a third party, in a way that can be introduced in the short-term.

However, as technology and consumer preferences evolve, how consumers interact with and participate in the wholesale market will continue to change. The solutions that enable demand response from large customers do not necessarily work for small customers, particularly in light of digitalisation and technological development. The wholesale demand response mechanism should not be thought of as a silver bullet, nor an enduring solution for enabling demand side participation. Instead, alternative options that provide small customers and the market with the greatest value over the longer term should be explored.

The Commission has carefully considered the application of the mechanism to small customers. The checks and balances in the mechanism that provide benefits to the market and reduce any associated risks to participants are likely to also make the mechanism very challenging for small customer participation. Instead of reducing these checks and balances and potentially compromising the integrity of the mechanism, the Commission recommends considering alternative avenues for small customers to participate in the market.

The Commission understands that representatives of consumers from across the NEM have noted that small customers wish to participate and offer wholesale demand response. While the Commission agrees that consumer preferences include being more active in the electricity market, there have been rapid developments in the opportunities available for small

¹³⁶ Each jurisdiction has a specific consumption threshold that defines a small customer for legislative and regulatory purposes. The maximum annual consumption thresholds are: South Australia — Electricity 160MWh, Gas 1TJ; Australian Capital Territory — Electricity 100MWh, Gas 1TJ; New South Wales — Electricity 100MWh, Gas — 1TJ; Victoria — Electricity 40MWh, Gas 1TJ; Tasmania — Electricity 150MWh, Gas 10TJ; Queensland — Electricity 100MWh, Gas 1TJ.

customers to participate in wholesale demand response separately from this mechanism, as discussed in chapter 4. In addition, the mechanism introduced in the final rule is not well suited to small customers, and to allow small customers in the mechanism would impose significant additional costs. These additional costs would be likely to outweigh the benefits of small customers being included.

Noting the significant stakeholder interest in promoting demand response opportunities for residential customers, and facilitating small customer demand side participation in NEM, care needs to be taken in selecting the right framework. The Commission considers that the best approach is to develop a two-sided market, which is more suited to small customer involvement.

The rest of this chapter sets out:

- a summary of stakeholder comments on small customer participation
- the reasons why this mechanism is not well suited to small customers
- the opportunity presented by focussing on large customers
- why a different approach is needed for small customers.

5.1 Stakeholder comments

A number of stakeholders commented on the participation of small customers in the wholesale demand response mechanism in response to the position set out in the second draft determination.

Small customers

The second draft rule set out a framework that enabled large customers to participate in wholesale demand response through the mechanism. It prohibited the participation of small customers. A number of stakeholders commented on this prohibition in submissions to the second draft determination.

A number of stakeholders supported the prohibition on small customers participating in the mechanism:¹³⁷

- **ERM Power** supported the focus on large customers as it felt there are a range of consumer protections that need to be fully understood before small consumers participate in the mechanism. Further, there were a series of other potential interactions that could have inadvertently led to creating barriers to entry for new retailers who use load-following hedges.
- **Energy Queensland** agreed that inclusion of small customers would add unnecessary costs and complexity to the mechanism, and these costs would outweigh the benefits to customers and the market.

¹³⁷ Submissions to second draft determination: ERM Power, p. 5; Energy Queensland, p. 3; Australian Energy Council, p. 2; ENGIE, p. 3; Momentum Energy, p. 1; Snowy Hydro, p. 2.

- **AEC** believed that the costs of developing a robust framework and its associated systems would outweigh the benefits from having smaller customers providing demand response through this mechanism, as opposed to the conventional retailer approach.
- **ENGIE** supported the decision to exclude small customers for the time being is also understandable. ENGIE noted that small customers with controllable devices such as batteries can still indirectly access wholesale market benefits through virtual power plant arrangements, such as ENGIE's virtual power plant in South Australia.
- **Momentum Energy** was supportive of the decision to limit the scope of the mechanism to the market segment more readily able to participate, large customers. It considered this posed less risk for retailers, allows for faster implementation, and provides the market an opportunity to assess the uptake of this facility, prior to the development of a two-sided market for all customers.
- **Snowy Hydro** considered the focus on large customers appropriate. Snowy Hydro felt retailers would be required to enact significant system changes for small customers to participate in this scheme, the cost of which would be ultimately borne by consumers.

Other stakeholders considered the focus on large customers misplaced, wanted small customers included in the mechanism or sought clarity on how small customer demand response was being considered.

- **CS Energy** noted by focusing on large customers, was less likely to incentivise demand response additional to what is currently provided in the market. In these cases, CS Energy considered retailers can provide greater incentives to customers as they procure demand response not just for the price differential at peak times but to hedge against their portfolios.¹³⁸
- In its submission, the **South Australian Government** highlighted an appetite for demand response services at a household level and, currently, a limited number of retailer offers for these services exist. It considered that AEMC and AEMO should continue to work on how small customers could be included in the mechanism and, at minimum, suggest this matter should be formally reviewed after one year of operation of the new mechanism.¹³⁹
- **PIAC** raised concern that transferring responsibility for household inclusion in demand response to the two-sided energy market reform process will unnecessarily delay household participation and the realisation of its associated benefits. PIAC noted that household demand drives high energy prices and evidence shows many households are eager and able to participate in demand response. PIAC considered excluding them from the mechanism would reduce its effectiveness and prevents them from accessing its full benefits.¹⁴⁰

138 CS Energy, submission to second draft determination, p. 4.

139 South Australian Government, submission to second draft determination, p. 2.

140 PIAC, submission to second draft determination, p. 2.

- The **Energy Efficiency Council** strongly encouraged the AEMC and AEMO to start investigating methods for smaller consumers to participate in the wholesale demand response mechanism.¹⁴¹
- The **Major Energy Users** considered excluding small end users from the mechanism unacceptable and suggested the AEMC needs to investigate more deeply whether the involvement, in some form, of smaller end users could be brought forward, such as allowing aggregators to collate demand response from a number of small end users.¹⁴²

Two sided market

The second draft determination suggested that two-sided market would be a market framework that could enable small customers to participate in wholesale demand response. A number of stakeholders commented on this prohibition in submissions to the second draft determination.

- **Infigen Energy** considered the transition to a fully two-sided market should be achieved as quickly as possible, with a focus on design mechanisms that avoid the need to use inefficient, external baselines. It considered it to be credible that this transition could be implemented ahead of the ESB's nominal 2025 timeframe.¹⁴³
- **ENGIE** suggested the proposed transition to a two-sided market as an enduring solution highlights the transitional nature of the DRM which reduces the benefits the mechanism may deliver without any commensurate cost reduction. ENGIE also considered it important to signal to stakeholders by reconfirming in the final determination that a genuine two-sided market is a superior approach and that in the long-run the wholesale demand response mechanism will be superseded. This would help stakeholders to understand that they should not predicate their business models or investments on this specific mechanism, but rather on the ability to be able to deliver dynamic and price-responsive demand in the longer-term.¹⁴⁴
- **EEC** strongly recommended that market bodies and governments continue to pursue a range of practical reforms to encourage demand response, including demand response by households, rather than solely focus on the development of a two-sided market. The EEC noted that while a two-sided market is a theoretically appealing concept, it is very early in its development and it is still far from clear whether a two-sided market will be practical or effective.¹⁴⁵
- **CS Energy** noted that the draft determination stated that the mechanism was the first step towards the two-sided market under consideration and leverages this context in presenting the benefits of the rule change. However, CS Energy noted the publicly available information on the two-sided market work is scant. Without an understanding

141 EEC, submission to second draft determination, p. 2.

142 Major Energy Users, submission to second draft determination, p. 3.

143 Infigen Energy, submission to second draft determination, p. 2.

144 ENGIE, submission to second draft determination, p. 3.

145 Energy Efficiency Council, submission to second draft determination, p. 2.

of, and more importantly consultation on the two-sided market framework, it is difficult to assess the veracity of the mechanism in this context.¹⁴⁶

- While it did not have a clear indication as to what the two-sided market will look like at this stage, **ERM Power** considered that this is a reasonable approach to ensure that implementation costs are kept low and there is time to learn from the early stages of operation and how baselines function in real-world scenarios. Pending the outcomes of the Energy Security Board's post-2025 NEM Review and the design of things such as the two-sided market, the retail market for small customers may well continue to innovate and evolve to create a greater variety of demand response products available to small consumers. ERM Power considered the AEMC right to not prejudge the results of the ESB's work.¹⁴⁷

5.2 Challenges for small customer participation in the mechanism

There are three primary reasons why the mechanism in the final rule would present challenges in relation to the participation of small customers:

- the form of demand response typically used with small customers, behavioural demand response, is not suited to being scheduled
- centrally determined baselines have not been demonstrated to work well for small customers
- there is a risk that relying on centrally determined baselines for small customers will lead to distortionary behaviour.

Importantly, if it were costless to include small customer participation in the mechanism, these challenges would not be a reason to exclude them - this would mean a mechanism could be designed such that if a particular small customer met the criteria, they could participate in the mechanism. However, there are likely to be significant costs associated with extending the mechanism to these customers. Retailers have estimated that their costs would be significantly higher if small customers were to be included. In addition, it would materially increase costs for AEMO as significant systems changes would be needed to account for the processing of an order of magnitude greater number of customers. Therefore, including small customers in the mechanism would likely not provide new opportunities to a significant number of small customers, but would impose systems costs on the market as a whole, which would flow through to energy consumers collectively.

For these reasons (discussed further below) the Commission has determined that only large customers are able to participate in the mechanism set out under the final rule.

5.2.1 Behavioural demand response is not suited to scheduling

Being scheduled in the wholesale market comes with a number of obligations. These include being required to provide information to the market ahead of real time, submit dispatch

¹⁴⁶ CS Energy, submission to second draft determination, p. 3.

¹⁴⁷ ERM Power, submission to second draft determination, p. 5.

offers every five minutes and making a commitment to meet dispatch targets. Scheduled participation is integral to the functioning of the wholesale market, in particular AEMO's ability to manage reliability and security. Scheduled participants allow for price discovery to occur and by providing information ahead of real time, allow other market participants to make more informed unit commitment decisions.

Scheduling can be onerous and is not suited to all types of wholesale market participants. Traditionally, most energy consumers have been non-scheduled. Under the current arrangements, there is little incentive for a load to become scheduled. Typically, being scheduled has an associated cost and, from the perspective of an individual load, negligible benefit. On top of this, most consumers cannot practically comply with being scheduled. The associated obligations are difficult to comply with, particularly as energy is often just an input into a consumer process.

Wholesale demand response provided through the mechanism is required to be scheduled, as this provides the most value to the market as a whole. However, this means that some types of demand response are not suited to participation in the mechanism. One example is behavioural demand response, which is the most common type of demand response that small customers engage in.

Behavioural demand response involves eliciting some amount of demand response from consumers on request, without having direct controls on consumers' loads. Often it involves the consumer being provided with the option of participating in demand response on the day. An example is the Powershop demand response program where customers can decide to participate and receive a credit if they provide a reduction. Behavioural demand response programs represent the majority of the offers available to small customers at the moment, including three of the mass market demand response solutions being provided through the AEMO-ARENA RERT trial.¹⁴⁸

While these programs provide customers with the opportunity to provide wholesale demand response, they often mean the party calling for the demand response is unsure how much will be provided. As such, behavioural demand response programs are not suited to being scheduled. Indeed, any requirements to meet scheduling obligations would likely make them untenable.

Given the importance of scheduling the demand response provided through the mechanism, and the unsuitability of behavioural demand response for scheduling, behavioural demand response would not be suited to participation in the mechanism.

The alternative to behavioural demand response is having demand response provided through devices that can be remotely controlled by the DRSP, such as pool pumps and batteries. However, as noted below, the more controllable these discretionary devices are, the more difficult it is to determine an accurate baseline for them.

¹⁴⁸ More information on this trial is included in chapter 4.

5.2.2 Centrally determined baselines do not work well for distributed controllable devices

Baselines for measuring demand response have been used in a number of jurisdictions and a number of applications. In the consultation paper for this rule change, the Commission set out that, in order to have a view on how much response was provided, the counterfactual level has to be estimated. The Commission also set out that baselines are inevitably wrong to some extent and this should be minimised where possible.

It is a feature of the wholesale demand response mechanism to have these counterfactual baselines determined by AEMO. In order to allow a third party to sell wholesale demand response, this counterfactual is used to determine the quantum of response provided.

The quality of a baseline is directly related to how predictable a load is. If a load is very predictable, the baseline can be treated as being more certain. As loads become more unpredictable, it becomes harder to reasonably predict what the consumer would have done had they not provided wholesale demand response.

Large commercial and industrial customer loads are often relatively predictable. This is because they operate large processes, often on fixed timetables and fixed hours. These parameters can change, but it does mean these types of consumers are better suited to baselines.

There are large loads that are not suited to having a baseline determined. For example, large pumps are highly controllable and can run at any time of day. Because these loads can and regularly do change the times they use electricity, it becomes very difficult to meaningfully predict the timing of their energy consumption. This point was noted in ARENA's findings in relation to baselines used in the ARENA-AEMO demand response RERT trial.¹⁴⁹

A number of devices that small customers would be expected to use to provide wholesale demand response are also highly variable in the timing of their electricity consumption, for example:

- pool pumps
- household batteries
- electric vehicles.

Because these loads can be easily adjusted to consume at different times of day they are difficult to accurately baseline. For example, the charging regime of an electric vehicle will be highly dependent on a number of variables relating to the use of that vehicle. This makes developing accurate baselines for electric vehicles very difficult.

In its submission to the first draft determination, AEMO, who would be responsible for determining consumer baselines, noted:¹⁵⁰

the baselining approach in the draft mechanism is not well suited to measurement of

¹⁴⁹ Oakley Greenwood, *Baselining the ARENA-AEMO Demand Response RERT Trial*, September 2019, p. 1.

¹⁵⁰ AEMO, submission to first draft determination, p. 6.

smaller energy volumes and small consumer loads. Due to the behavioural nature of small consumers' responses, and the technical characteristics of the load profile of households, it is difficult to establish predictable baselines and verifiable demand responses of individual small consumer loads. This difficulty has been evident during the first year of the joint AEMO-ARENA demand response trial.

Devices that can consume energy at variable times, particularly those that are expected to enable small customers to participate in demand response, are not suited to having their electricity consumption centrally predicted.

The report by Oakley Greenwood on the baselines used in the AEMO-ARENA RERT trial found that none of the baseline methodologies tested on *aggregated* residential NMIs resulted in baselines with 'good' accuracy in more than 40 per cent of the simulated events. By contrast, all of the methodologies produced an 'acceptable' level of accuracy in at least 70 per cent of the simulated events. The results are provided below.

Table 5.1: Portfolios of residential customer baselines

BASILINE METHODOLOGY	'GOOD ACCURACY'	'ACCEPTABLE ACCURACY'
10 of 10	27%	70%
Maximum temperature	37%	76%
Average temperature	33%	83%
Day of week & maximum temperature	40%	77%
Day of week & average temperature	23%	80%

Source: Oakley Greenwood, *Baselining the ARENA-AEMO Demand Response RERT Trial*, prepared for ARENA, September 2019, pp. 14-16.

Note: This table presents the percentage of simulated event days with 'good' and 'acceptable' accuracy for weather-sensitive residential loads in VIC using different baseline methods. More information on the baseline methodologies can be found in the Oakley Greenwood report.

Note: Good accuracy was defined as having a Relative Root Mean Square of the Errors (RRMSE) of < 10%. Acceptable accuracy was defined as having RRMSE < 20%.

In addition, Oakley Greenwood found that none of the baseline approaches that were tested were found to produce good or acceptably accurate baselines for the residential PV segment in any of the simulated events. Oakley Greenwood concluded that the results of this analysis suggest the '10 of 10' baseline methodology currently used in the RERT may be adequate for certain types of loads, particularly those of larger commercial and industrial customers whose energy consumption is relatively similar from day to day and not particularly weather sensitive.¹⁵¹

In order for small customer baselines to be accommodated under the rule, AEMO would need to set very broad baseline methodology metrics. In essence, this would mean allowing participation of loads that have inaccurate or biased baselines. This would in turn have the effect of reducing the efficacy of the mechanism and imposing risks on the market more broadly. Consequently, the Commission does not consider it appropriate to have the baseline methodology metrics broadened to allow for highly variable loads and devices to participate.

Small customer loads can be aggregated together and the inherent variability among those loads can be balanced out. This makes aggregated small customer loads easier to predict than individual small customer loads. However, the settlement model set out in this determination relies on baselines being determined at individual NMIs. As such, the benefits of developing baselines to apply to a portfolio of small customers would not be realised under this mechanism.

5.2.3

Certain baseline methodologies may lead to distorted small customer behaviour

Introducing centrally determined baselines for small customer demand response may also introduce the risk of driving inefficient behaviour, depending on the baseline methodology. Because much of the small customer demand response would be delivered through smart devices that can vary consumption times without affecting customers, it is possible that paying for a reduction from a baseline would encourage consumers to shift consumption to peak periods, the opposite of the intention of the mechanism. This is discussed in .

BOX 4: DISTORTIONARY CONSUMER BEHAVIOUR

If small customers were being paid to reduce consumption relative to a baseline weighted towards recent consumption patterns, it is possible it would encourage consumption during peak periods.

Imagine a DRSP that signed up a number of customers with pool pumps that normally clean pools in the middle of the day. Also imagine that these customers all had flat retail tariffs.

¹⁵¹ Oakley Greenwood, *Baselining the ARENA-AEMO Demand Response RERT Trial*, prepared for ARENA, September 2019, pp. 14-16.

Because the customers do not mind what time the pool pumps are operated (both in terms of impact on the pool and because the retail rate is flat), the DRSP is given full control in exchange for the best possible return in the wholesale market. The DRSP would be encouraged to move the consumption of the pool pumps out of the middle of the day and into peak periods. The DRSP would do so because it is more likely that there are going to be high wholesale prices in the peak, from which the DRSP (and customer) can profit if the pool pump is operating in the peak and can be turned off to provide demand response, provided the baseline indicates the customer usually consumes at this time.

What has actually occurred is that:

- the pool pumps are no longer being operated during the day when solar output is its greatest
- the pool pumps consume electricity in the evening which increases system demand in the wholesale market and pushes up wholesale prices at this time
- when the wholesale price gets high enough, the pool pumps will be turned off and will consume overnight or in the middle of the day.

In the end, all consumers are being paid to turn off pool pumps that would have never been on in that peak period in the first place.

This behaviour arises because these loads are highly controllable and can be changed without a material impact on the customer (unlike larger commercial loads), and because the baseline methodology does not include an adjustment to account for this behaviour.

A key point to note is that all of these devices are well suited to providing wholesale demand response - they can be highly controllable and changes to consumption times do not have significant impacts on the customer. Indeed, there are retailers using pool pumps, batteries and electric vehicles to provide wholesale demand response. However, a mechanism that pays for demand response relative to a centrally determined baseline that is based on recent consumption patterns may encourage inefficient usage of these devices.

5.3 The opportunity presented by large customers

Presently, the commercial and industrial sector is the biggest provider of wholesale demand response. These customers represent both latent demand side flexibility and existing demand side flexibility that can be better utilised. Across a relatively small number of customers, a significant portion of the NEM's electricity demand is consumed.

This means that the systems designed to enable demand response from these customers can be designed at lower cost than systems covering customers of all types. By focussing on large customers, the Commission considers the mechanism can deliver the greatest amount of additional wholesale demand response at a reasonable cost.

If these systems are required to account for a greater number of customers, the complexity and costs significantly increase. We understand that if small customers were able to participate in the mechanism, this would significantly increase costs for the market operator and retailers.

The additional implementation costs imposed would be incurred regardless of whether small customers were actually able to participate in the mechanism. These costs would be imposed on AEMO and retailers and eventually recovered from all consumers. Consequently, the Commission would need to anticipate there would be enough wholesale demand response enabled through the mechanism to offset these costs. However, given the challenges outlined above the Commission considers it is unlikely that small customers would be able to provide material amounts of wholesale demand response through the mechanism sufficient to offset the additional costs associated with extending the mechanism to small customers.

5.4 A different approach is needed for small distributed energy resources

Digitalisation in the energy sector involves a power system and market that efficiently utilises digital technologies to make it easier to choose and control how, when and where power is generated, delivered and used, including to empower customers to optimise their energy use within their homes and businesses. Digitalisation is increasing in the NEM. There are two key policy questions related to digitalisation, namely:

- How can the regulatory framework make sure consumers are able to capture the full value of digitalisation and distributed energy resources?
- How can the regulatory framework adapt so that all consumers can share in these benefits?

Further consideration should be given to the regulatory framework that would best achieve the above.

In its submission to the first draft determination, AEMO noted that small customers engaging with the market may be better suited to approaches other than a wholesale demand response mechanism, such as more straightforward incentive and arbitrage arrangements, including via the Small Generation Aggregator connection point or accessing network tariffs designed to incentivise similar behaviour to that which is targeted by the mechanism.¹⁵²

An option that could collectively provide more value for small customer demand response is for the NEM to progress towards a two-sided market

¹⁵² AEMO, submission to first draft determination, p. 7.

On 14 November 2019, the Commission published a paper on the impacts of digitalisation on the NEM.¹⁵³ This paper sets out some thinking on digitalisation and the potential to move to a two-sided market. This paper also noted:

- Consumers are already starting to benefit from increased digitalisation in the energy sector.
- Increasing digitalisation will facilitate more advanced engagement in energy markets through increased remote communication, control and automation of consumer devices.
- There is an opportunity to establish a fit-for-purpose framework ahead of the fundamental, consumer-led changes that will follow increased digitalisation. The sector should be considering changes to the market framework now in anticipation of these changes.

The effect of digitalisation is likely most pronounced among small customers. These are the customers who have previously had limited ability to engage and dynamically adjust their consumption. The customers benefiting from digitalisation may also be well suited to providing demand response. However, for the reasons noted earlier in this chapter, these customers would not be well accommodated through the wholesale demand response mechanism set out in the determination and the Commission considers a two-sided market would provide a better avenue for small customers to provide demand response.

The Commission and AEMO are leading further work being undertaken by the ESB to assess how regulatory reforms can best facilitate the transition to a two-sided market, with specific reference to the benefits to small customers.

The ESB published a paper titled 'Moving to a two-sided market' in March 2020.¹⁵⁴ This paper set out a high-level overview of what a two-sided market could look like and its key foundations. It also outlined how both supply and demand could participate to get the greatest benefits. Submissions to this paper were due on 18 May 2020. The ESB will provide an update on the post 2025 work program, including the two-sided market work, in August 2020.

153 AEMC, *How digitalisation is changing the NEM - The potential to move to two-sided market*, 14 November 2019, available at: <https://www.aemc.gov.au/sites/default/files/2019-11/How%20digitalisation%20is%20changing%20the%20NEM.pdf>

154 This paper is available on the COAG Energy Council's website: <http://www.coagenergycouncil.gov.au/post-2025/two-sided-markets>

6 IMPLEMENTATION TIMING

This chapter discusses the timing for implementing the mechanism under the final rule; namely, commencing the wholesale demand response mechanism on 24 October 2021.

6.1 Background

Under the first draft rule, the mechanism would have commenced on 1 July 2022. This implementation date was based on advice from AEMO and feedback from stakeholders about the scope of the systems changes that would have been required to accommodate the mechanism as proposed in the first draft rule, and having regard to other regulatory reforms such as five minute settlement and global settlement.

The commencement date for the mechanism under the second draft rule was 24 October 2021. AEMO advised that the changes to the design of the mechanism made between the first and second draft (and retained in the final rule) would reduce the time and resources needed to update AEMO's systems to accommodate the mechanism. As such, the date from which customers can participate in the mechanism was brought forward. The earlier implementation date under the second draft rule would also allow the mechanism to be implemented prior to the 2021-22 summer. As such, wholesale demand response provided through the mechanism would be able to assist with the management of reliability events which may occur over that peak summer period.

This approach balanced bringing forward the benefits of the mechanism with the ability of AEMO and market participants to manage the transitional requirements and interactions with other regulatory reforms.

6.2 Stakeholder comments

A number of stakeholders, particularly consumer representatives, supported the earlier implementation date:¹⁵⁵

- **PIAC** strongly opposed any delay in the implementation of the wholesale demand response mechanism beyond the proposed date of 2021.
- **The Australia Institute** submitted that the mechanism has been made very simple for retailers and felt there should be not be significant IT or other burdens on retailers imposed by the introduction of the mechanism. The Australia Institute considered it beneficial to bring forward the implementation date from July 2022 to 24 October 2021.
- **EUAA** highlighted that a number of EUAA member companies have expressed frustration that the implementation of this rule change has been delayed to this point and would be extremely disappointed if further delays occurred under the auspices of COVID-19. EUAA saw this rule change as highly complementary to a recent COAG Energy Council decision to move ahead with two-sided and day ahead market development.

¹⁵⁵ Submissions to second draft determination: PIAC, p. 1; Energy Efficiency Council, p. 1; Tesla, p. 1; Major Energy Users, p. 2; The Australia Institute, p. 1; Energy Users Association of Australia, p. 1; AEMO, p. 4; Joint submission on behalf of consumer groups and businesses, p. 2; Enel X, p. 1.

- **Enel X** agreed with the market bodies' conclusions that despite the impact of COVID-19, the wholesale demand response mechanism is a reform with relatively low costs to industry and important benefits to customers that should be implemented in October 2021.
- **AEMO** supported the introduction of the wholesale demand response mechanism prior to five minute settlement (if it is delayed), though acknowledges this may add some complexity to rule drafting and implementation, specifically in the areas of settlement and baselines. AEMO is keen to support the AEMC and industry stakeholders to design the necessary transitional rules and processes.
- The joint submission from a number of consumer groups and other businesses submitted that, as consumer, community and industry representatives, they considered any delay in the introduction of wholesale demand response would have considerable costs and downsides, and would be neither necessary nor in line with the long-term interests of consumers. Wholesale demand response is a priority reform made essential by reliability and security risks that have become more critical in recent years.

Conversely, a number of stakeholders raised concern with the implementation date of the mechanism in the second draft rule:¹⁵⁶

- **AEC** suggested that the implementation of the mechanism should be delayed even further, to ensure that system changes and preparations do not conflict with, or cause unwelcome resource constraints for, the implementation of Five Minute Settlement and Global Settlement. It was stated that leaving the Wholesale Demand Response implementation at the accelerated time of 24th October 2021 is even more problematic, since it would require retailers' systems to be amended twice, once for 30 minute settlement and later for 5 minute settlement, effectively duplicating implementation costs.
- **Energy Queensland** considered that the AEMC has not adequately justified the need for such urgency and, in light of current and emerging challenges in the energy market and the broader economy, Energy Queensland questions the appropriateness of bringing forward implementation of the mechanism.
- **ERM Power** noted the high degree of uncertainty and risk in the economy as a result of COVID-19, and strongly urged the AEMC to keep an open mind as to the start date of the WDRM. There are already significant challenges becoming evident in managing and upgrading IT systems remotely, as well as remote sales staff and limited access to sites for installing control or metering equipment. Further, pressing ahead at such a time of high risk and uncertainty could mean that the full range of benefits may not be achieved as expected.
- **AGL** submitted that the AEMC should consider whether additional costs will be incurred as a result of the proposed delay in five minute settlement and in turn whether these additional costs out-weight the likely benefit of implementing the DRM prior to five minute settlement. This is particularly relevant if the uptake of DR is predicated by the

¹⁵⁶ Submissions to second draft determination: Australian Energy Council, p. 2; Energy Queensland, p. 4; ERM Power, p. 2; AGL, p. 3; AusNet Services, pp. 3-4; EnergyAustralia, pp. 3-4, Origin Energy, p. 2; Momentum Energy, p. 3; Snowy Hydro, p. 3; Infigen Energy, p. 1.

sharper price signals provided through five minute settlement. We would support the AEMC avoiding unnecessary implementation of elements of the DRM reforms which could become quickly redundant or require modification very soon after commencement.

- **AusNet Services** noted that changes to their systems interfacing with AEMO and retailers that would be necessary to support the addition of a new market participant category and associated meter data delivery and CATS/B2B functionality are not trivial. DNSPs and MDP would need to: register the wholesale demand response service providers for the purpose of the provision of metering and other data; update their register on receipt of CATS transactions from AEMO; and potentially transact site specific B2B transactions in support of these site registrations. The introduction of a new market participant category, supporting CATS/B2B and meter data frameworks mean these functions would need to be reassessed, additional requirements to be considered and new commercial agreements established with our vendors and business partners for the new scope. AusNet Services recommended that the AEMC consider a delay of one year in the implementation date of the mechanism to ensure the programs are able to continue and be delivered as planned.
- **EnergyAustralia** noted that under the second draft rule, retailers will still be required to make changes to a number of systems and processes. For example, those used for management and performance reporting, pricing, load forecasting, settlement and reconciliation and interactions with MSATS. Due to the cost imposition, resourcing requirements and low level of urgency, we believe the delivery date should be reassessed, allowing this reform to be introduced under a more favourable economic and operating environment. EnergyAustralia would not support concurrent implementation as we believe this would lead to unnecessary competition for resources and testing environments.
- **Origin Energy** asked for further consideration of the rationale for introducing the mechanism at this time. As identified by the AEMC, the proposed mechanism is not expected to be enduring and more fundamental changes to the NEM framework may be needed to better facilitate demand side participation in the wholesale market. It is also not clear the mechanism will deliver any material benefits for consumers in the near term, given the introduction of a Strategic Reserve and enablement of multi-year Reliability and Emergency Reserve Trader (RERT) contracting in Victoria will likely cannibalise the level of WDR that may have emerged. Origin considers the proposed commencement date should be extended to 24 October 2022 in the event AEMO's rule change proposal to delay the commencement of five-minute settlement by 12 months is progressed. This would ensure AEMO and market participants are not required to successively update their systems to accommodate wholesale demand response under current and future market settlement arrangements.
- **Momentum Energy** believed that implementation should be deferred until such time as the market is no longer suffering the effects of COVID-19.
- **Snowy Hydro** submitted that retailers would be required under early implementation to make changes to develop systems twice for 30 minutes and then for 5 minutes after the 5 minute settlement rule is implemented if the implementation of five minute settlement

is delayed. Snowy Hydro's initial submission to the consultation highlighted the costs associated with implementation of such a mechanism, if it proceeds, needs to be following the implementation of 5 minute settlement and not before.

- **Infigen Energy** submitted that due to the significant disruption to our customers as a result of the CoVID-19 economic restrictions, it believed that introduction of non-urgent new schemes and policies should be deferred. This rule change represents a significant shift in how customers interact with the market, and will in some cases create new complexity and uncertainty. Customers will be forced to evaluate and act on decisions that may include new capital expenditure, and sufficient time must be allowed for this to avoid inefficient investments. Similarly, AEMO, retailers, and DRSPs will all need to invest in new systems and processes at a time when resources are already stretched thin. We further note that wholesale prices are trading at very low levels and volatility in the spot market is subdued, reducing any urgency to implement the mechanism earlier.

6.3 Analysis and conclusions

The Commission has decided to retain the implementation date of the mechanism as 24 October 2021. This section sets out:

- the rationale for this implementation date
- the interaction between this rule change and five-minute settlement and global settlement
- the impact of COVID-19.

6.3.1 Rationale for implementation date

The wholesale demand response mechanism set out in this determination has been designed such that the majority of systems changes needed to implement it sit with AEMO. There will be other changes that market participants can make (such as operational or commercial changes) to improve their ability to manage any potential costs or challenges arising under the mechanism, without significant system changes.

The changes made between the first and second draft rules brought forward the implementation date from July 2022 to 24 October 2021. AEMO advised that the changes to the design of the mechanism between drafts would reduce the time and resources needed to update AEMO's systems to accommodate the mechanism. By reducing the costs and complexity of the mechanism for AEMO to implement, the implementation date was brought forward, allowing wholesale demand response to be provided through the mechanism earlier and the benefits of the mechanism to be accessed earlier. This implementation date has been retained for the final rule.

The earlier implementation date allows the mechanism to be implemented prior to the 2021-22 summer. As such, wholesale demand response provided through the mechanism would be able to assist with the management of reliability events which may occur over that peak summer period. Some aspects of the final rule which relate to specific processes or matters unrelated to the implementation of the mechanism, such as changes to the DSP portal, would commence prior to the commencement of the mechanism.

The final rule also contains transitional clauses, which would commence shortly after the final rule is made and facilitate the introduction of a mechanism in such a way that participants can prepare effectively for this.

6.3.2

Interaction with five minute and global settlement

In submissions to the second draft determination noted above, a number of stakeholders suggested it may be appropriate to delay the implementation of the wholesale demand response mechanism due to the *Delayed implementation of five minute and global settlement* rule change request.

The implementation of five minute settlement requires significant effort from network service providers, generators, retailers, meter providers, metering data providers and AEMO, who must all complete their readiness activities within a common time frame. AEMO's rule change proposal suggests that the deferred commencement of 5MS prioritises the short-term safety, reliability and security of supply of electricity and the national electricity system, and the financial resilience of the energy industry due to the constraints and risks posed by COVID-19, over the potential for immediate economic benefits of 5MS.¹⁵⁷

The Commission has considered these submissions and concluded that it remains appropriate to introduce the wholesale demand response mechanism on 24 October 2021.

This is because, even if the *Delayed implementation of five minute and global settlement* rule change were to be made:¹⁵⁸

- The majority of the systems changes needed to implement the mechanism reside with AEMO. AEMO has indicated that it can make these changes by 24 October 2021.¹⁵⁹ As such, the Commission is confident that the changes necessary for the mechanism to be operational can be implemented by the implementation date.
- The interlinkage between the systems changes that retailers may need to make for five minute settlement and global settlement, and the wholesale demand response mechanism, are understood to be relatively minor. The Commission understands that the systems retailers may need to change to accommodate the demand response mechanism primarily relate to:
 - reading and processing standing data. After the commencement of the mechanism, this will include standing data flagging that a DRSP is associated with a NMI. The systems being changed for 5MS should not significantly overlap with the systems for reading and processing standing data.
 - reconciling settlement. The settlement mechanism for the wholesale demand response mechanism is separable from the existing settlement process. Therefore, if retailers decide to implement processes for reconciliation, these processes would likely need to be bespoke. These reconciliation systems would be able to be designed

¹⁵⁷ AEMO, *Delayed implementation of five minute and global settlement - rule change request*, p. 4. Available at: <https://www.aemc.gov.au/rule-changes/delayed-implementation-five-minute-and-global-settlement>

¹⁵⁸ Noting that, as of the date of publishing this final determination, the Commission has not made a determination in relation to the *Delayed implementation of five minute and global settlement* rule change request.

¹⁵⁹ AEMO, submission to second draft determination, p. 4.

to work in a five minute settlement environment. However, if the implementation of five minute settlement was delayed, these systems should be able to be easily designed to operate under 30 minute settlement. As such, retailers should be able to develop reconciliation systems that can operate under both 30 minute settlement periods and five minute settlement periods.

- managing wholesale market exposure. When a retailer's customer participates in wholesale demand response, it is exposed at the baseline level in the wholesale market. Retailers may implement processes to manage this exposure. Again, these processes are likely to be new. These systems are not directly linked to five-minute or 30 minute settlement. These systems can be designed to operate under five-minute settlement with minor changes to also operate effectively under 30 minute settlement.
- As such, the Commission considers it unlikely that a delayed implementation of five minute settlement and global settlement would have a material impact on the costs for retailers in relation to the changes needed to accommodate or manage the introduction of a wholesale demand response mechanism.
- Further, retailers are able to manage the implementation of the wholesale demand response mechanism without making systems changes and instead relying on operational or commercial solutions to the extent this is more cost effective. Thus, if there is a delay to the implementation of five minute and global settlement, retailers could choose to either make the systems changes or to manage the implementation operationally until the commencement of five minute and global settlement, and then make any systems changes coincidentally.

6.3.3 Impact of COVID-19

A number of stakeholders also suggested it may be appropriate to delay the implementation of the wholesale demand response mechanism due to the impacts of COVID-19 (regardless of any delay to five minute settlement and global settlement).

The impact of COVID-19 on the energy industry are complex and broadly relate to the:

- ability of people to attend their places of employment
- ability of people to work (either remotely or at their usual workplace)
- availability of healthy people to perform routine or specialist tasks
- ability of energy industry participants to continue to meet financial commitments as a result of significant revenue uncertainty.

The Commission does not consider the impacts of COVID-19 to be significant enough to justify a delay to the wholesale demand response mechanism. This is because the framework introduced under the final rule places most of the systems changes with AEMO. AEMO has noted in its submission to the second draft determination that it would prefer to proceed with implementation on 24 October 2021. Further, representatives of a number of large customers highlighted in submissions to the second draft determination their support for the earlier implementation date. These large customers are best placed to understand the direct impact

on their processes and ability to participate in the wholesale demand response mechanism by October 2021.

ABBREVIATIONS

ACL	Australian Consumer Law
AEC	Australian Energy Council
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
APC	Administered price cap
ARENA Commission	Australian Renewable Energy Agency see AEMC
CPT	cumulative price threshold
DER	distributed energy resources
DRSP	Demand Response Service Provider
ECA	Energy Consumers Australia
EMMS	Electricity Market Management Systems
ESOO	Electricity Statement of Opportunities
FCAS	Frequency Control Ancillary Services
MASP	Market Ancillary Service Provider
MCE	Ministerial Council on Energy
MDP	Metering Data Provider
MSATS	Market Settlement and Transfer System
MW	megawatt
NEL	National Electricity Law
NEM	national electricity market
NEMDE	national electricity market dispatch engine
NEO	national electricity objective
NER	National Electricity Rules
NERL	National Energy Retail Law
NERO	national energy retail objective
NERR	National Energy Retail Rules
NMI	national metering identifier
NSP	network service provider
PASA	projected assessment of system adequacy
PIAC	Public Interest Advocacy Centre
RERT	Reliability and Emergency Reserve Trader
RSSR	reliability standard and settings review
TAI	The Australia Institute
TEC	Total Environment Centre
VPP	virtual power plant

A LEGAL REQUIREMENTS UNDER THE NEL AND NERL

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

A.1 Final rule determination

In accordance with ss. 102 and 102A of the NEL and s. 259 of the NERL the Commission has made this final rule determination in relation to the rules proposed by the Public Interest Advocacy Centre, Total Environment Centre and the Australia Institute, by the Australian Energy Council, and by the South Australian Government.

The Commission's reasons for making this final rule determination are set out in chapter 2 of this determination.

A copy of the more preferable final electricity rule is attached to and published with this final rule determination. Its key features are described in chapter 3.

A.2 Power to make the final rule

The Commission is satisfied that the more preferable final electricity rule falls within the subject matter about which the Commission may make rules. The final rule falls within s. 34 of the NEL as it relates to regulating the operation of the national electricity market and to regulating the activities of persons (including registered participants) participating in the national electricity market (NEL ss. 34(1)(a)(i) and (iii)).

A.3 Commission's considerations

In assessing the rule change requests the Commission considered:

- its powers under the NEL and NERL to make the final rule
- the rule change requests
- feedback provided at public forums on 5 March 2019, 16 August 2019 and 22 August 2019
- feedback provided at the public hearing on 6 August 2019¹⁶⁰
- feedback provided at the technical working group meetings¹⁶¹
- submissions received during the first, second, and third rounds of consultation¹⁶²
- advice provided by AEMO on the technical systems changes required to implement the wholesale demand response mechanism and the estimated costs of those changes

¹⁶⁰ A transcript of this hearing is available on the project page: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

¹⁶¹ Summaries of these meetings are available on the project page <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>.

¹⁶² These submissions can be accessed on the project page: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

- the Commission’s analysis as to the ways in which the proposed rules will or are likely to contribute to the NEO and NERO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for the rule change requests.¹⁶³

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO’s declared network functions.¹⁶⁴ The more preferable final rule is compatible with AEMO’s declared network functions because it does not affect those functions.

A.4 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may, jointly with the AER, recommend to the COAG Energy Council that new or existing provisions of the NER be classified as civil penalty provisions.

A.4.1 Amendments to existing provisions

The Commission’s more preferable final rule amends rule 3.7D(b) of the NER, regarding reporting by registered participants of demand side participation information. This rule is not currently classified as a civil penalty provision. However, the Commission considers that this rule should be classified as a civil penalty provision to promote compliance with this obligation, given the importance to the market of obtaining demand side participation information and the relative difficulty to date in obtaining this information. The AER has indicated that it approves of this recommendation.

The Commission’s more preferable final rule amends the clauses of the NER listed below. These rules are currently classified as civil penalty provisions under Schedule 1 of the National Electricity (South Australia) Regulations. The Commission considers that these rules should continue to be classified as civil penalty provisions and therefore does not propose to recommend any change to their classification to the COAG Energy Council. The AER has indicated that it approves of this recommendation.

Table A.1: Amendments to existing civil penalty provisions

CLAUSE	SUBJECT OF CLAUSE AND CHANGE
Clause 2.3.5(g)(1)	Requirement that Market Ancillary Service Provider and Market Customer comply with any terms and conditions imposed by AEMO as part of approval of classification of a load as an ancillary service load pursuant to clause 2.3.5(f). The clause is amended to replace Market Ancillary Service

¹⁶³ Under s. 33 of the NEL and s. 225 of the NERL 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 is now called the COAG Energy Council.

¹⁶⁴ Section 91(8) of the NEL.

CLAUSE	SUBJECT OF CLAUSE AND CHANGE
	Provider with DRSP.
Clause 2.3.5(g)(2)	Requirement that Market Ancillary Service Provider and Market Customer ensure that market ancillary services provided using the relevant ancillary services load are provided in accordance with the co-ordinated central dispatch process operated by AEMO under the provisions of Chapter 3 and in accordance with the market ancillary service specification. The clause is amended to replace Market Ancillary Service Provider with DRSP.
Clause 2.3.5(g)(4)	Requirement that Market Ancillary Service Provider or Market Customer that submits a market ancillary service offer in respect of the relevant ancillary service load comply with the dispatch instructions from AEMO in accordance with the Rules. The clause is amended to replace Market Ancillary Service Provider with DRSP.
Clause 2.3.5(h)	Requirement that Market Ancillary Service Provider or Market Customer with an ancillary service load only sell the market ancillary services produced using that ancillary service load through the spot market in accordance with the provisions of Chapter 3. The clause is amended to replace Market Ancillary Service Provider with DRSP.
Clause 3.7.3(e)	Requirement that certain short term PASA inputs be submitted by each relevant Scheduled Generator or Market Participant in accordance with the timetable and represent current intentions and best estimates. The clause is amended so that the certain short term PASA inputs include available capacity of each wholesale demand response unit, PASA availability of each wholesale demand response unit and projected daily wholesale demand response availability for units that are wholesale demand response constrained.
Clause 3.8.4(a)	Requirement that Scheduled Generator and Market Participant notify AEMO of available capacity of certain scheduled units. The clause is amended so that the certain scheduled units include wholesale demand response units.
Clause 3.8.4(b)	Requirement that subsequent changes may only be made to the information provided under clause 3.8.4(c), (d) and (e) in accordance with clause 3.8.22. The clause is amended to include clause 3.8.4(f), which is a new clause (discussed in new rules to be classified as CPPs, below).
Clause 3.8.19(a)	Requirement that Scheduled Generator or Market Participant notify AEMO: <ul style="list-style-type: none"> • if it reasonably expects one or more of its particular scheduled units or loads is unable to operate in accordance with dispatch instructions in any trading interval; • that such particular scheduled units or load is inflexible in that trading interval; and • a fixed loading level at which it is to be operated in that trading interval.

CLAUSE	SUBJECT OF CLAUSE AND CHANGE
	The clause is amended to include wholesale demand response units.
Clause 3.8.19(b)(1)	Requirement that where a Scheduled Generator, Semi-Scheduled Generator or Market Participant advises AEMO that a unit, service or load is inflexible that a brief, verifiable and specific reason is provided. The clause is amended to include wholesale demand response units.
Clause 3.8.20(g)	Requirement that Scheduled Generator, Scheduled Network Service Provider and Market Customer ensure it is able to dispatch the relevant plant as required under the pre-dispatch schedule. The clause is amended to include DRSPs.
Clause 3.9.7(a)	Requirement that a scheduled generating unit comply with dispatch instructions when constrained on due to a network constraint. The clause is amended to extend to wholesale demand response units.
Clause 3.13.3(b)	Requirement that Scheduled Generators, Semi-Scheduled Generators and Market Participants provide AEMO with the bid and offer validation data relevant to their scheduled loads, scheduled network services, and generating units in accordance with schedule 3.1. The clause is amended to include wholesale demand response units.
Clause 3.13.3(b1)	Requirement that Scheduled Generators, Semi-Scheduled Generators and Market Participants which have aggregated certain loads, services or units in accordance with clause 3.8.3 must provide AEMO with certain information. The clause is amended to include wholesale demand response units and to require that AEMO is provided with the number of individual wholesale demand response units that have been aggregated in accordance with clause 3.8.3.

A.4.2

New provisions the Commission proposes to recommend be classified as civil penalty provisions

The Commission's more preferable final rule includes the addition of the rules set out in the following table into the NER.

The Commission considers that these new provisions should be classified as civil penalty provisions for consistency with similar provisions (currently classified as civil penalty provisions) that apply to other types of registered participants, and to promote compliance with these new obligations so that the new mechanism operates effectively. The AER has indicated that it approves of this recommendation.

Table A.2: New provisions proposed to be recommended as civil penalty provisions

CLAUSE	SUBJECT OF NEW CLAUSE
Clause 2.3.6(h)	Requirement that DRSP comply with any terms and conditions imposed by AEMO as part of approval of classification of a load as a wholesale demand response unit pursuant to clause 2.3.6(g).
Clause 2.3.6(i)	Requirement that if DRSP submits a dispatch bid in respect of a wholesale demand response unit, the DRSP must comply with dispatch instructions from AEMO in accordance with the Rules.
Clause 2.3.6(k)	Requirement that DRSP notify AEMO if a load the DRSP has classified as a wholesale demand response unit ceases to be a qualifying load as soon as reasonably practicable and in any event no later than 10 business days after becoming aware that the load ceases to be a qualifying load.
Clause 3.8.2A(a)	Requirement that a DRSP submit a dispatch bid in respect of its wholesale demand response unit or aggregated wholesale demand response units for each trading day.
Clause 3.8.2A(b)	Requirement that when providing available capacity to AEMO in accordance with the Rules, a DRSP must cap the available capacity of its wholesale demand response unit to the maximum responsive component of the wholesale demand response unit, or (where wholesale demand response units have been aggregated) the maximum responsive component of the aggregated wholesale demand response units.
Clause 3.8.2A(c)	Requirement to provide available capacity of zero if a DRSP is aware (whether by reason of the DRSP's own knowledge or a notification from AEMO) at the time it provides the available capacity that the wholesale demand response unit is baseline non-compliant or (where demand response units have been aggregated), any of the aggregated wholesale demand response units are baseline non-compliant.
Clause 3.8.2(d)	Requirement to provide available capacity of zero for a trading interval if the wholesale demand response unit will be, or is likely to be, spot price exposed in the trading interval or (where wholesale demand response units have been aggregated) any of the aggregated wholesale demand response units will be, or is likely to be, spot price exposed in the trading interval.
Clause 3.8.2(e)	Requirement that if AEMO has given a notice in relation to a non-conforming wholesale demand response unit under clause 3.8.23A(e) limiting the available capacity of the non-conforming wholesale demand response unit or aggregated wholesale demand response units to a maximum figure determined by AEMO, from the time the notice takes effect and for so long as the notice remains in place, the DRSP must provide to AEMO an available capacity for the wholesale demand response unit or aggregated wholesale demand response units in accordance with the notice.

CLAUSE	SUBJECT OF NEW CLAUSE
Clause 3.8.2A(f)	Requirement that DRSP establish and implement measures in accordance with good electricity industry practice to identify any wholesale demand response unit of the DRSP that is not baseline compliant or is spot price exposed in respect of a trading interval.
Clause 3.8.2A(i)	Requirement that DRSP retain the information specified in the wholesale demand response participation guidelines in the manner, and for the period, specified in the guidelines.
Clause 3.8.4(f)	Requirement that DRSP inform AEMO, two days ahead of each trading day, of a MW capacity profile and an up ramp rate and a down ramp rate for wholesale demand response units.
Clause 4.9.2B(d)	Requirement that DRSP, with respect to wholesale demand response units in relation to which a dispatch bid has been submitted for a particular trading interval, ensure that appropriate personnel or electronic facilities are available at all times to receive and immediately act upon dispatch instructions issued by AEMO to the DRSP.
Clause 4.9.8(f)	Requirement that DRSP ensure that each of its wholesale demand response units is at all times able to comply with its latest dispatch bid.
Clause 4.9.9E	Requirement that DRSP must, without delay, notify AEMO of any event which has changed or is likely to change the availability of any of the DRSP's wholesale demand response units, as soon as the DRSP becomes aware of the event.
Clause 4.11.1(c1)	Requirement that DRSP must in respect of its wholesale demand response units arrange the installation and maintenance of all remote control equipment and remote monitoring equipment in accordance with the standards and protocols determined and advised by AEMO for use in the relevant control centre.

In addition, the Commission has inserted a new clause 3.8.22A(a2), which provides that for the purposes of the requirement in clause 3.8.22A(a) that a dispatch bid not be false, misleading or likely to mislead, the making of a dispatch bid by a DRSP is deemed to represent to other Market Participants through the pre-dispatch schedules published by AEMO that the available capacity the subject of the dispatch bid will, if dispatched, result in a deviation from the baseline for the unit that is the result of wholesale demand response activity (that is, additional) and is not the result of load shifting. A consequential change to clause 3.8.22A(e) has also been made.

The whole of clause 3.8.22A is currently classified as a rebidding civil penalty provision. The Commission proposes to recommend that the new clause 3.8.22A(a2) also be classified as a rebidding civil penalty provision, for consistency with the other paragraphs of this clause. The AER has indicated that it approves this recommendation.

A.5 Conduct provisions

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

The Commission's more preferable final rule includes the addition of clause 3.8.2A(d), which requires a DRSP to submit available capacity of zero for a wholesale demand response unit in relation to a trading interval if the wholesale demand response unit will be, or is likely to be, spot price exposed in the trading interval or, where two or more wholesale demand response units have been aggregated, any one of the wholesale demand response units will be, or is likely to be, spot price exposed in the trading interval.

Under spot pass price through retail arrangements, a retailer passes the wholesale costs and associated risks through to the customer. If a DRSP breaches clause 3.8.2A(d), the relevant retailer may suffer losses given the likely disparity between the reimbursement rate and the spot price. The retailer would be liable for the baseline quantity in the wholesale market and would remain exposed to these wholesale costs and associated risks, which would be inconsistent with the risk management approach retailers take in spot price pass through arrangements.

The Commission considers that this new clause 3.8.2A(d) should be classified as a conduct provision to allow a retailer that suffers loss or damage as a result of a DRSP breaching this clause to recover the amount of loss or damage by action in court, pursuant to section 61B of the NEL.

A.6 Review of operation of final rule

The more preferable final rule requires the Commission to conduct a formal review of the operation of the rule. Clause 3.10.7 in the final rule requires the Commission, by the third anniversary of the commencement of that clause, to:

- conduct a review of the arrangements for the provision of wholesale demand response under the rules, in accordance with the rules consultation procedures
- publish a report of its findings and recommendations.

The Commission could decide to complete the review before the three-year deadline if the quantity of demand response facilitated through the mechanism in the early years exceeds expectations.

The review would be required to consider the costs, benefits and effectiveness of the arrangements having regard to:

- the impact of the arrangements on the spot price
- the accuracy of baseline methodologies
- market and technological developments
- any other matters relating to wholesale demand response which the Commission considers relevant.

These other matters could include, for example:

- the reimbursement rate
- the exclusion of DRSPs from cost recovery for FCAS
- the exclusion of DRSPs from being required to provide information for the purposes of MT-PASA.

B TABLE OF CHANGES BETWEEN SECOND DRAFT RULE AND FINAL RULE

This table provides a summary and explanation of the amendments between the first draft rule and second draft rule.

Table B.1: Summary of amendments from second draft rule to final rule

REFER- ENCE	SUMMARY OF AMENDMENT
Chapter 2	
2.3.6(e)(6)	New subparagraph (e)(6) requires the bid validation data under schedule 3.1 to be provided to AEMO before it will consent to classification of a load as a WDRU. This is consistent with requirements elsewhere in Chapter 2, for example under clause 2.2.2, relating to classification of a scheduled generating unit.
2.3B (was 2.3AA)	To simplify the rule numbering scheme, in the final rule, rule 2.3AA has been deleted in its entirety and replaced with new rule 2.3B, to follow rule 2.3A.
2.3B.1(c)	A drafting correction in paragraph (c) (paragraph (d) in the second draft rule) changes the reference to wholesale demand response units from the singular to the plural.
Chapter 3	
3.8.2A(a)	Clause 3.8.2A(a) has been amended to explain that where units are aggregated, the available capacity must be submitted for the aggregated unit. The same principle applied in the second draft rule due to the definition of 'wholesale demand response unit' but in the final rule, the principle has been stated in the clause itself so that consistent drafting can be used throughout clause 3.8.2A.
3.8.2A(b)	<p>Clause 3.10.1 in the second draft rule provided for AEMO to make guidelines about nominating the available capacity of a wholesale demand response unit.</p> <p>Due to changes in the dispatch model, the guidelines are not required and have been removed from the final rule. As a consequence, the requirement to comply with the guidelines has been removed from paragraph (b) in this clause.</p> <p>Chapter 10 of the second draft rule specified that the available capacity of a wholesale demand response unit was capped at its maximum responsive component. To bring all the rules about the available capacity of a wholesale demand response unit together, this requirement has been moved to clause 3.8.2A(b).</p> <p>The second draft rule referred to a DRSP 'determining' the available capacity of a</p>

REFER- ENCE	SUMMARY OF AMENDMENT
	wholesale demand response unit. The clause has been amended to refer to the DRSP providing the information to AEMO for the purposes of the Rules, to include all circumstances in which the DRSP nominates or otherwise notifies available capacity to AEMO.
3.8.2A(c)	<p>In the second draft rule, the obligation in paragraph (c) to declare available capacity of zero when the wholesale demand response unit is not baseline compliant applied on a trading interval basis. In the final rule, this has been amended so that the obligation applies when the DRSP is aware that the wholesale demand response unit is baseline non-compliant (or any of the wholesale demand response units is baseline non-compliant, in the case of aggregated wholesale demand response units).</p> <p>The new term 'baseline non-compliant' is defined in clause 3.10.4.</p>
3.8.2A(d)	<p>Consistent with the second draft rule, paragraph (d) requires a DRSP to declare available capacity of zero when a wholesale demand response unit is spot price exposed (or any of the wholesale demand response units is spot price exposed, in the case of aggregated wholesale demand response units). This obligation applies on a trading interval basis. As the availability declarations are made before the trading interval, the paragraph has been amended so that it applies where the wholesale demand response unit "will be or is likely to be" spot price exposed in the trading interval.</p>
3.8.2A(e)	<p>As in the second draft rule, under the final rule the provisions dealing with dispatch non-conformance by a wholesale demand response unit will allow AEMO to give a notice specifying a level of available capacity for the wholesale demand response unit while the non-conformance issue is resolved. Clause 3.8.2A(e) requires the DRSP to comply with the notice. Changes from the second draft to final rule update the cross reference to the non-conformance clause (3.8.23A) and clarify the drafting.</p>
3.8.2A(f)	<p>Consequential changes to paragraph (f) reflect the changes to paragraphs (c) and (d).</p>
3.8.2A(i)	<p>A consequential change to paragraph (i) aligns the drafting with the rest of the clause.</p>
3.8.2A(j)	<p>A new paragraph explains what is meant by 'aggregated wholesale demand response units' in clause 3.8.2A. In most of Chapter 3, a reference to a 'wholesale demand response unit' is a reference to the aggregated units where applicable, due to the definition of 'wholesale demand response unit' in Chapter 10. However clause 3.8.2A deals separately with single wholesale demand response units and aggregated wholesale demand response units and so it is carved out in the Chapter 10 definition and dealt with expressly in this clause.</p>
3.8.3(b3)	<p>This paragraph allows AEMO to approve aggregation of wholesale demand</p>

REFER- ENCE	SUMMARY OF AMENDMENT
	<p>response units subject to terms and conditions. The final rule indicates that this may include setting a maximum responsive component for the aggregated wholesale demand response unit.</p> <p>In the definition of 'demand responsive component' in Chapter 10, the default position is for the demand responsive component for aggregated units to be the sum of the individual values.</p>
3.8.3(f1)	<p>A drafting change clarifies that paragraph (f1) only applies in relation to aggregation of wholesale demand response units (not ancillary service loads).</p>
3.8.7B(e)	<p>In the final rule, provision has been included to adjust the prices in wholesale demand response dispatch bids so they apply at the regional reference node. The adjustment accounts for losses and a similar approach is applied to dispatch bids for scheduled loads under clause 3.8.7(f).</p> <p>Where the wholesale demand response unit is not aggregated, the loss factor applicable to the connection point specific will be used. Where the wholesale demand response unit is aggregated, it is not possible to calculate the loss factors accurately and so an average loss factor of 1 will be applied.</p>
3.8.7B(f)	<p>Paragraph (f) requires the bid prices to be within the bounds of the market price floor and market price cap. In the final rule, as a consequence of the change to paragraph (e) the rule has been amended to allow for the adjustment for losses that will occur under paragraph (e).</p>
3.8.7(g)	<p>This paragraph explains that a dispatch offer is an offer to reduce consumption, increase export or reduce consumption and increase export. In the final rule, "at the connection point" has been added to clarify that consumption and export are measured at the connection point and not by reference to the consumption of the facility sitting behind the connection point. Consumption behind the connection point may not change, for example if the facility has its own behind the meter generation or storage capability.</p>
3.8.21(n)	<p>In response to stakeholder feedback on the second draft rule, the final rule specifies that AEMO must give a notice of dispatch to the FRMP as soon as practicable after dispatch. A drafting amendment has been made to clarify that the notice is only required when the wholesale demand response unit is dispatched to provide wholesale demand response. This clarification was included as a wholesale demand response unit will receive dispatch signals of zero at other times.</p>
3.8.22A(a2)	<p>This paragraph sets out the representation made by a DRSP through its dispatch bid for a wholesale demand response unit, to the effect that the wholesale demand response would not otherwise have occurred and is not offset by an increase in consumption at another connection point. For the final rule, changes have been made to correct and clarify the drafting.</p>

REFER- ENCE	SUMMARY OF AMENDMENT
3.8.23	<p>In the second draft rule, changes to this clause were proposed to deal with dispatch non-conformance by wholesale demand response units. In the final rule, this issue is addressed in new clause 3.8.23A and the changes to clause 3.8.23 in the second draft rule have been reversed.</p>
3.8.23A	<p>This new clause deals with dispatch non-conformance by wholesale demand response units. The provisions have been moved to a separate clause as conformance by wholesale demand response units will be monitored after dispatch and not in real time, as occurs for generation.</p> <p>Paragraph (b) confirms that if a wholesale demand response unit that set the spot price is later found to be non-conforming, or was known to be non-conforming when dispatched, the spot price will not be recalculated.</p> <p>Paragraphs (c) and (e)-(f) set out the measures to be taken by AEMO and the DRSP when a wholesale demand response unit is found to be non-conforming. As for the second draft rule, these may include a change to the maximum responsive component of the wholesale demand response unit and a limit on available capacity declarations until the reasons for the non-conformance are remedied. The second draft rule also provided for changes to plant parameters but this has been removed in the final rule.</p> <p>Paragraph (d) explains when the wholesale demand response unit ceases to be non-conforming.</p> <p>Paragraph (g) provides for AEMO to give a report to the AER where there is ongoing non-conformance.</p> <p>Paragraph (h) sets out some of the matters AEMO may have regard to when making assessments under the clause and provides for AEMO to give its assessment and relevant information to the AER.</p>
3.9.7	<p>In the second draft Rule, amendments from the first draft rule to extend the clause to wholesale demand response units as well as generating units were reversed, reflecting the change to the dispatch model.</p> <p>Following discussion with AEMO, the Commission understands that wholesale demand response units may be constrained on under the final dispatch model and so for the final rule this clause has again been extended to wholesale demand response units.</p>
3.10.1(a)	<p>Amendments to the content of the wholesale demand response guidelines have been made to require the guidelines to explain how to access information about the maximum responsive component of the wholesale demand response unit and its baseline methodology and baseline settings. The second draft Rule provided for these to be included in MSATS but the Commission understands from discussions with AEMO that other processes may be used. The guidelines will</p>

REFER- ENCE	SUMMARY OF AMENDMENT
	provide the information when a decision is made.
3.10.1(b)	<p>This paragraph sets out the matters AEMO must have regard to when developing or amending the wholesale demand response guidelines. In the second draft rule, the principles applied when AEMO was determining requirements for classification of a load as a wholesale demand response unit and the methodology for determination of a regional threshold under paragraph (c).</p> <p>In the final rule, paragraph (b) has been extended to apply to all matters covered by the guidelines.</p>
3.10.2(h) and (i)	<p>Paragraphs (h) and (i) deal with AEMO and the DRSP providing information to the other when a wholesale demand response unit fails to satisfy the baseline compliance standard, which is set out in 3.10.4(a). For the final rule, changes have been made as a consequence of changes to clause 3.10.4.</p>
3.10.3	<p>Baseline methodologies, with the approved baseline settings, will be used by AEMO, the DRSP, retailers and possibly also the customer at the connection point to calculate the baseline for a wholesale demand response unit. It is important for the operation of the demand response mechanism that when using the same set of metering data to calculate a baseline, the same result can be calculated by all these users.</p> <p>As the result of feedback during consultation, this has been included as a principle to be taken into account by AEMO when developing baseline methodologies. Consequential changes have been made to the paragraph numbering.</p>
3.10.4(a) , (b) and (c)	<p>Under clause 3.8.2A(b), a DRSP providing available capacity for a wholesale demand response unit under the Rules must specify available capacity of zero if it is aware at the time that the wholesale demand response unit is baseline non-compliant. Clause 3.10.4 defines when a wholesale demand response unit is baseline non-compliant.</p> <p>Following feedback from stakeholders on the second draft rule, the clause has been reworked to clarify the drafting. In the final rule:</p> <ul style="list-style-type: none"> • under paragraph (a), a wholesale demand response unit satisfies the 'baseline compliance standard' if the approved baseline methodology, when applied to the wholesale demand response unit using the approved baseline settings, produces a baseline that satisfies the baseline methodology metrics; and • under paragraph (b), if a wholesale demand response unit does not satisfy the baseline compliance standard, it is 'baseline non-compliant' and it remains baseline non-compliant until the DRSP demonstrates that it satisfies the baseline compliance standard. <p>Despite the change in drafting, the broad principles governing baseline</p>

REFER- ENCE	SUMMARY OF AMENDMENT
	compliance in the final rule are not intended to change.
3.10.4(e)	In the final rule, references to the 'load' in paragraph (e) have been replaced with references to the 'wholesale demand response unit'.
3.10.5(a)	Following feedback on the second draft rule, a drafting change has been made to paragraph (a) with a corresponding change to the definition of baseline in Chapter 10. The changes clarify that paragraph (a) specifies how a baseline is calculated for all purposes under the Rules.
3.10.6(a)	A drafting correction in paragraph (a) clarifies that AEMO's report is to be published within six months after the end of the financial year.
3.10.6(b) (3)	A consequential change to paragraph (b)(3) uses the new term 'baseline non-compliant'. The amendment also removes the reference to wholesale demand response units being ineligible for dispatch as the final rule is not framed in terms of ineligibility; rather, it requires available capacity to be zero when a wholesale demand response unit is baseline non-compliant.
3.10.7(a)	Under the final rule, the AEMC has been given flexibility to conduct its review of the demand response mechanism before the third anniversary of the rule taking effect if it wishes to do so.
3.14.5A(f 1)	Under the final rule, consistent with the second draft rule, compensation may be payable to a Market Suspension Compensation Claimant in relation to wholesale demand response. Following stakeholder feedback, the Commission has amended paragraph (f1) to provide more guidance in the Rules about the benchmark value for wholesale demand response units. One of the benchmark values used for scheduled generators will be used, as determined by AEMO and specified in the market suspension compensation methodology.
3.14.5A(h)(2A)	This new subparagraph requires AEMO to specify in the market suspension compensation methodology its approach to selecting the class of scheduled generator to be used when calculating the benchmark value under clause 3.14.5A(f1). Consequential changes have been made to subparagraph (h)(1).
3.14.5A(j)	Consequential changes to paragraph (j) reflect the change in approach to determining the benchmark value for wholesale demand response units.
3.15.6B(a), (b), (d) and (e)	In the final rule, the settlement quantity for a dispatched wholesale demand response unit has been capped at the maximum responsive component of the wholesale demand response unit. The cap is applied in the calculation of the trading amount for the DRSP (paragraph (a)) and for the FRMP (paragraph (b)). Paragraph (e) converts the maximum responsive component (a MW value) to a MWh value to be used in settlement. A consequential change has been made to paragraph (d) to be clear that the

REFER- ENCE	SUMMARY OF AMENDMENT
	baseline value used for the calculation of the baseline settlement quantity is in MWh.
3.15.6B(c))	A trading amount is only calculated for a wholesale demand response unit for a trading interval if it has been dispatched to provide wholesale demand response in the trading interval; refer to the opening words of clauses 3.15.6B(a) and (b). In the second draft rule, clause 3.15.6B(c) also set this out in full due to the dispatch model then proposed. In the final rule the drafting has been simplified to use the term 'dispatched wholesale demand response unit'.
3.15.6B((f) and (g) was 3.15.6B(e) and (f))	Under the final rule, the wholesale demand regional reimbursement rate will be calculated using the peak period spot prices only. The peak periods will be those during the period of the 'peak load profile' specified in the contract specification Australian Peak Load Electricity Futures Contract in the ASX 24 Operating Rules of the Australian Securities Exchange as amended from time to time. If the specification ceases to be in effect, AEMO will determine an equivalent peak period. Under the specification, the peak load profile covers the period between 7:00 am and 10:00 pm Monday to Friday AEST excluding public holidays and any other days determined by the ASX 24 Market Operator.
3.15.9(b)	To correct a drafting oversight in the second draft rule, a reference to wholesale demand response units has been included in paragraph (b)(2)(ii).
3.15.10(a))	To correct a drafting oversight in the second draft rule, a reference to DRSPs has been included in paragraph (a).
3.20.7(c)	For completeness, a reference to wholesale demand response units has been included in paragraph (c).
Chapter 4	
4.9.2B(a) and (b)	Following stakeholder feedback on the second draft Rule, changes to this paragraph clarify the content of a dispatch instruction given to a DRSP for its wholesale demand response unit. The dispatch instruction will specify the level or schedule of baseline deviation to be achieved by the wholesale demand response unit. The reference to the 'level or schedule' of baseline deviation is consistent with the description of dispatch instructions for scheduled generating units in clause 4.9.2(a)(2). The final rule also refers to the level or schedule of 'baseline deviation' (and not 'wholesale demand response'). The provision of 'wholesale demand response' has four main components: <ul style="list-style-type: none"> • there is a baseline deviation • the baseline deviation occurs in response to a dispatch instruction

REFER- ENCE	SUMMARY OF AMENDMENT
	<ul style="list-style-type: none"> the baseline deviation is the result of wholesale demand response activity the baseline deviation does not have a related baseline deviation offset. <p>For the final rule it is intended that dispatch instruction compliance assessment for the purposes of clause 4.9.8(a) should only consider whether the nominated baseline deviation has been achieved and should not require an assessment of the other three elements of the definition. The amendment to clause 4.9.2B(a) is intended to allow the AER to use the metered consumption (or export) and the baseline. If the wholesale demand response unit has complied with its dispatch instruction, the difference should reflect the level or schedule of baseline deviation nominated in the dispatch instruction.</p> <p>The question of whether the baseline deviation occurs in response to a dispatch instruction or is the result of baseline non-compliance is assessed indirectly through the baseline assessment framework established by rule 3.10. The remaining two components (the baseline deviation must be the result of wholesale demand response activity and there must not be a related baseline deviation offset) are dealt with by the representation made by the DRSP under clause 3.8.22A(a2). Assessment of compliance with this representation is supported by the arrangements under clauses 3.8.2A(g), (h) and (i).</p>
4.9.2B(c)	The final rule clarifies that a dispatch instruction to provide wholesale demand response cannot be a negative value and must not be more than the available capacity of the wholesale demand response unit (or aggregated wholesale demand response units).
4.9.2B(e) (was (d))	Drafting changes in the final rule reflect that the instruction is given to the DRSP not the wholesale demand response unit.
4.9.3(a)	In the final rule, the reference to 'load' has been change to 'scheduled load' to avoid possible confusion with dispatch instructions given for wholesale demand response units. This change reflects the existing definition of 'dispatch bid' which refers only to bids given in relation to scheduled loads.
4.9.5(a2)	To be consistent with clauses 4.9.2B(a) and (b), for the final rule, references to the loading level or level of wholesale demand response have been replaced with references to the baseline deviation.
Chapter 7	
7.15.5	A drafting correction has been made to new clause 7.15.5(f)(5).
Chapter 10	
available capacity	In the second draft rule, a new paragraph was added to provide for the available capacity of a wholesale demand response unit to be capped at the maximum responsive component and to be limited or reduced to zero where required under clauses 3.8.2A(b) to (d) or clause 3.8.23(c)(6).

REFER- ENCE	SUMMARY OF AMENDMENT
	In the final rule, these matters are dealt with as obligations of the DRSP under clause 3.8.2A. Consequential changes have been made to the definition.
baseline	In the final rule, a cross reference to clause 3.10.5 has been included to specify that the calculation of the baseline is performed in accordance with that clause.
baseline compliance standard	In the final rule, the term 'baseline compliant' has been replaced with the term 'baseline compliance standard' to reflect the revised approach in clause 3.10.4.
baseline data	Clause 7.15.6 provides for baseline data to be provided to DRSPs and retailers. In the final rule, the baseline data includes the value of the maximum responsive component of a wholesale demand response unit. In the second draft rule, this information was included in the information to be provided through MSATS. The Commission understands from discussions with AEMO that other systems may be used to provide this information. Clause 3.10.1(a)(7) in the final rule requires the wholesale demand response guidelines to explain how the baseline methodology, baseline settings and the maximum responsive component of a wholesale demand response unit will be made available.
baseline deviation offset	In the final rule, a reference to the baseline deviation has been added in the opening words to align with the terms of the representation in clause 3.8.22A(a2).
baseline non- compliant	This new definition cross references the definition in clause 3.10.4(b).
constrained on	In the final rule, a new paragraph explains what 'constrained on' means in relation to a wholesale demand response unit. This is a consequential change resulting from the amendments to clause 3.9.7.
dispatched load	To avoid uncertainty about whether dispatched wholesale demand response falls in the scope of this definition, the definition has been amended to exclude it expressly.
dispatched wholesale demand response unit	Drafting changes to the definition have been made for the final rule to clarify the definition. The definition is used to identify which wholesale demand response units are included in settlement.
loading level	In the draft rule, the term 'loading level' was used to specify the level of wholesale demand response to be provided by a wholesale demand response unit. For the final rule, this is no longer required due to the changes to the

REFER- ENCE	SUMMARY OF AMENDMENT
	definition of 'dispatch instruction' in clause 4.9.2B. The definition of 'loading level' has been aligned with the approach to 'loading level' for generating units to refer to the level of baseline deviation.
market settleme nt and transfer solution procedur es	This definition has been amended to remove reference to the maximum responsive component of a wholesale demand response unit and the baseline methodology and baseline settings applicable to the unit. This information may be provided through different systems, as noted above in relation to the definition of baseline data.
spot price exposed	A drafting correction has been made for the final rule. As for the second draft rule, a wholesale demand response unit is not intended to be spot price exposed within the meaning of this definition merely because forecasts of spot price are taken into account in setting a retail supply rate or because the retailer pays the market at spot price.
wholesal e demand regional reimburs ement rate	The cross reference has been amended as a consequence of renumbering in Chapter 3.
wholesal e demand response	Drafting changes in paragraphs (a), (b) and (c) of the definition align it more closely with the explanation of how the bid is to be interpreted in dispatch in clause 3.8.7B(g). A reference to the connection point has also been added to clarify that the consumption and export are measured at the connection point and not at the facility behind the connection point.
wholesal e demand response activity	For the final rule, drafting changes have been made to the definition for clarification.
wholesal e demand response unit	Paragraph (b) explains when the term refers to two or more units that have been aggregated for dispatch purposes. The clause references have been updated for the final rule.
Chapter 11	
Whole	The numbering has changed to rule 11.125.

REFER- ENCE	SUMMARY OF AMENDMENT
rule	
11.125.1	A new definition has been added for new clause 11.125.10.
11.125.5(b)	A new paragraph gives AEMO 40 business days to consider applications for aggregation of wholesale demand response units, for the first 3 months after the effective date.
11.125.6(a)	Reference to the procedures used for the medium term PASA have been removed as this process does not apply in relation to wholesale demand response units under the final rule.
11.125.6(b)	A new transitional rule allows AEMO to change the term 'Market Ancillary Service Provider' to 'Demand Response Service Provider' in procedures and other instruments made by AEMO under the Rules without going through consultation, if that is the only change needed.
11.125.10	A new transitional rule delays publication of AEMO's report about wholesale demand response under new clause 3.10.6 until the demand response mechanism has been in operation for at least a full calendar year.

C PARTICIPANT CATEGORY AND REGISTRATION

The final rule establishes a new participant category - a DRSP. This participant would be able to engage in offering wholesale demand response into the wholesale market through the wholesale demand response mechanism. It would be able to do so without also being the FRMP for the load providing that demand response.

The DRSP would be consolidated with the existing market ancillary service provider (MASP) category. This means that the DRSP could also choose to offer frequency ancillary services as well, if it wishes to and the load has been classified appropriately.

Registering as a DRSP will be the first step for those seeking to participate in the wholesale demand response mechanism.

This appendix provides detail on the DRSP participant category and registration process established under the final rule. It sets out:

- a background to registration categories, including related categories
- a summary of relevant stakeholder comments
- the Commission's analysis and conclusions.

C.1 Overview

The final rule introduces a new distinct service to be provided in the wholesale market: wholesale demand response. To enable the provision of this service, a new market participant category and registration and classification processes is established.

A DRSP is the only participant class that is able to sell demand response through the wholesale demand response mechanism. If retailers wish to provide wholesale demand response through the mechanism, they will need to separately register as DRSPs.

A DRSP will need to register as such with AEMO and classify loads as wholesale demand response units.

Registration and classification provide for:

- attaching the obligations that a DRSP is required to comply with in order to be approved as a provider of wholesale demand response
- an opportunity to assess the suitability of loads to participate in the mechanism, including technical characteristics and the applicability of baselines.

The final rule includes a process for assessing the eligibility of loads to participate in the wholesale demand response mechanism. This is necessary because these participants are scheduled and the wholesale demand response units may comprise portfolios of physically separate loads, which have not been accommodated in central dispatch to date.

Under the current rules, all scheduled wholesale market participants are scheduled generators, loads or storage facilities (which are also scheduled loads).¹⁶⁵ These parties must demonstrate compliance with a range of technical performance standards prior to the finalisation of their connection agreement. This provides AEMO with greater certainty regarding the technical characteristics of these participants. AEMO does not have the same certainty of technical performance with regard to aggregated portfolios comprised of resources connecting under less prescriptive connection arrangements. Without a demand response unit classification regime such as the one in the final rule, AEMO would have limited opportunities to assess whether these aggregated loads would impact on the security or reliability of the power system, particularly when responding simultaneously.

To address this, the final rule introduces a process to classify wholesale demand response units. This allows AEMO to assess the technical suitability of each load seeking to provide wholesale demand response. It also allows AEMO to assess whether the load is likely to be able to meet the requirements of the baseline methodology metrics, using the baseline methodology nominated by the DRSP from the methodologies developed by AEMO.

There is an existing MASP category that allows the parties registered in this category to classify load to participate in ancillary services markets. Under the final rule, the MASP registration category is subsumed into the DRSP category. This means there is a single registration category that allows persons to classify loads as wholesale demand response units and/or ancillary services loads, provided they meet the requirements set out in the NER and by AEMO. This is similar to how a generator is treated, where it registers as a generator, and then chooses to participate in the wholesale energy market, frequency control ancillary services market, or both.

C.2 Proponents' views

All of the rule change proponents proposed the introduction of a new participant category. These views are set out below.

C.2.1 PIAC, TEC and TAI

In their rule change request, PIAC, TEC and TAI proposed the introduction of a new category of market participant, a DRSP. PIAC, TEC and TAI proposed that the NER be amended to:¹⁶⁶

- Allow DRSPs to register as market participants to provide demand response services and ancillary services to the wholesale market
- Allow for load to be classified as 'demand response load' by a DRSP
- Provide for obligations with which this class of market participant must comply
- Provide for payment and calculation of market fees for DRSPs.

¹⁶⁵ MASPs share some of the characteristics of scheduled participants e.g. submitting bids to AEMO for enablement. However, MASPs are not scheduled for energy in the wholesale market.

¹⁶⁶ PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, p. 9.

PIAC, TEC and TAI noted that there may be implications of the above that the Commission should consider applying to the existing MASP market participant category.¹⁶⁷

C.2.2 AEC

In its rule change request, the AEC proposed that a new registration category would be introduced, a demand response aggregator (DRA). The AEC proposed that the NER would be amended to:¹⁶⁸

- allow DRAs to register
- establish a technical relationship between the DRA and AEMO in regards to obligations relating to information provision and scheduling.

The AEC noted that as its proposal would not introduce a settlement relationship between the DRA and AEMO, there would be no need to place prudential requirements on the DRA.

C.2.3 South Australian Government

The South Australian Government's proposal included the introduction of a DRSP market participant category. Under the South Australian Government's proposal:¹⁶⁹

- the DRSP would need to demonstrate its intention to classify load as demand response load within a reasonable period of time
- the DRSP would also need to demonstrate its ability to comply with the relevant provisions in the NER.

The South Australian Government also noted that, where a new meter is required, the DRSP could be required to coordinate with the metering coordinator to arrange for the new meter.¹⁷⁰

C.3 Stakeholder comments

In submissions to the second draft determination, stakeholders provided feedback on the proposed registration and classification process.

General comments

- **Energy Queensland** strongly recommended that relevant clauses of Chapters 5 and 5A should be reviewed to ensure they cover DRSPs' scheduled demand and WDRUs, by recognising that existing customers may participate in wholesale demand response. In Energy Queensland's view, WDRUs should be treated on the same basis as generation and therefore constitute a connection alteration by the participating customer.¹⁷¹

167 Ibid.

168 AEC, *Wholesale demand response register mechanism - rule change request*, p. 1

169 South Australian Government, *Mechanisms for wholesale demand response - rule change request*, pp. 4-5.

170 Ibid, p. 5.

171 Energy Queensland, submission to second draft determination, p. 6.

- **EnergyAustralia** requested clarity around whether the non-registered component of a qualifying load is permitted to engage in non-mechanism related demand response activities, such as retailer-led demand response.¹⁷²
-
- **Snowy Hydro** submitted that the non-demand responsive load which is not separately metered should have fixed metering or a fixed number otherwise it is meaningless as it will be lost in the variability. Snowy Hydro noted that if a load decreases total output, this example would allow DRSPs to change the non-demand responsive loads which would mean if they didn't meet their target they could easily change the non-demand responsive.¹⁷³
- **Momentum Energy** queried the creation and implementation of an additional market participant, given the wholesale demand response mechanism is now limited to large customers.¹⁷⁴

Telemetry requirements

- **Energy Queensland** sought more detail on the determination of regional limits for non-SCADA wholesale demand response units. It noted that AEMO requires scheduled generators (and 5 MW batteries) to have SCADA telemetry. Energy Queensland considers that the wholesale demand response mechanism should be consistent with other NEM requirements.¹⁷⁵
- **Tesla** suggested an alternative approach where AEMO starts with a light touch metering approach and has designated review points on the efficacy of the metering (given ex-post compliance approach).¹⁷⁶
- **Tesla** also noted that the current process for gaining pattern approval for new meters is cumbersome and time-consuming, and the process should be reviewed to focus more on outcomes and meeting all requirements of the NER chapter 7.¹⁷⁷
- The **Australian Energy Council** supported AEMO imposing limitations on the capacity of non-SCADA demand response which is able to participate in each region.¹⁷⁸
- **AGL** supported ongoing measures for AEMO to assess how non-visible demand response may affect risks to the system. As demand response capacity becomes more prevalent, AGL felt it important that the market value of the mechanism is not outweighed by detrimental effects on the system that in turn lead to greater uncertainty in system requirements.¹⁷⁹
- **EEC** strongly recommended reducing telemetry requirements for demand response participants to 60 seconds. The EEC suggested level of precision in four-second data is

172 EnergyAustralia, submission to second draft determination, p. 8.

173 Snowy Hydro, submission to second draft determination, p. 8.

174 Momentum Energy, submission to second draft determination, p. 3.

175 Energy Queensland, submission to second draft determination, p. 7.

176 Tesla, submission to second draft determination, p. 2.

177 Ibid, p. 3.

178 AEC, submission to second draft determination, p. 2.

179 AGL, submission to second draft determination, p. 2.

far higher than is either necessary or required in well-established overseas demand response markets, and will significantly and unnecessarily increase the cost of participating in the DRM.¹⁸⁰

- **Major Energy Users** raised concern regarding requirements for greater than 5MW loads in the mechanism to have SCADA in order to monitor the response provided. The MEU considered that the imposition of these requirements is excessive and will deter many potential WDR providers through the costs involved.¹⁸¹
- **ENGIE** supported the Commission's proposal that AEMO be empowered to put a limit on the quantum of non-SCADA demand response in each region.
- **Enel X's** submission noted:¹⁸²
 - Implementing a threshold at which more onerous telemetry requirements are imposed will penalise customers who are willing to provide demand response but enter the market later. Under the proposal, even the smallest wholesale demand response unit will require more onerous telemetry, which may far outweigh the benefits of entering the market. This would create a two tiered market and may ultimately prevent many potential customers from participating, simply because of bad timing.
 - If the threshold was set too low, the threshold could represent an unreasonable and unnecessary cap on the participation of demand response in the wholesale market.
 - there are a variety of telemetry options that could provide AEMO with the information in a time frame that would still provide AEMO with sufficient certainty to operate the system in a safe, secure and reliable way.

Prudential requirements for DRSPs

- **AEMO** considered allowing for negative settlement could lead to a 'high risk, low probability' settlement events, which may require AEMO to develop bespoke prudential requirements for registering DRSPs. AEMO recommended not allowing for negative settlement for an aggregated WDRU.¹⁸³
- **CS Energy** submitted that the conscious decision to not impose prudential frameworks on DRSPs was a gross misallocation of risk.¹⁸⁴

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180 EEC, submission to second draft determination, p. 2.

181 MEU, submission to second draft determination, p. 2.

182 Enel X, submission to second draft determination, pp. 3-4.

183 AEMO, submission to second draft determination, p. 2.

184 CS Energy, submission to second draft determination, p. 6.

BOX 5: FINAL RULE - REGISTRATION AS A DRSP AND CLASSIFICATION OF LOADS AS WHOLESALE DEMAND RESPONSE UNITS

Registration is the process by which an entity is admitted by AEMO into the NEM to allow it to participate in the market. DRSPs will be required to be registered in order to provide wholesale demand response in the wholesale market, in accordance with the final rule.

The final rule:

- introduces a registration process for DRSPs
- introduces a classification process for determining the eligibility of loads to participate in wholesale demand response through the mechanism
- combines the new participant category, DRSP, with an existing participant category, MASP.

There have been no material changes between the second draft rule and final rule in relation to registration and classification requirements.

Benefits of the final rule

The registration process under the final rule allows entities (which may include, but importantly are not limited to, retailers) to register as DRSPs for the purposes of providing wholesale demand response. By combining the DRSP and MASP categories, it also reduces the overlap between related registration categories and does not increase the number of registration categories.

The final rule introduces a wholesale demand response unit classification step following registration of a DRSP. This allows AEMO to assess the technical suitability of each load seeking to provide wholesale demand response.

C.4.1

Interaction with other registration categories

Under the final rule, the DRSP participant category is combined with the MASP participant category into a single category.¹⁸⁵ Following registration, a DRSP would be able to classify loads as:¹⁸⁶

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wholesale demand response units for the purposes of providing wholesale demand response, and/or

- ancillary service loads for the purposes of providing market ancillary services.

The final rule combines the two into a single participant category in recognition of the extent of overlap between the entities likely to wish to provide both types of services. By combining the registration categories, it removes unnecessary duplication of process. However, as there are different requirements placed on loads participating in the wholesale demand response mechanism and those providing market ancillary services, there would be different

¹⁸⁵ The transitional arrangements under the final rule transfer the registration of existing MASPs to this new participant category. These existing MASPs would not need to re-register. See clause 11.125.9 of the final rule.

¹⁸⁶ Clause 2.3B of the final rule.

classification processes for the loads used to provide each service. That is, a DRSP will need to separately satisfy AEMO that a load is capable of meeting the requirements for participating in the wholesale market through the demand response mechanism *and* providing market ancillary services (where the same load is intended to be used to provide both services; alternatively, a load could be classified for one of these services only).

The final rule does not directly accommodate the co-optimisation in the dispatch engine for a DRSP providing FCAS and wholesale demand response. While a DRSP may be offering both services with the same loads, it is possible that different loads will be participating in FCAS and wholesale demand response at the same time. As such, it would not be appropriate to co-optimize the services provided from two resources. Instead, a DRSP would need to manage offering FCAS and wholesale demand response with the same load in the same dispatch interval and bid accordingly. For this reason, if a load is being used to offer both wholesale demand response and FCAS, the MASP and the DRSP must be one and the same as this entity must be able to control and co-optimize the bids for both services.

The distinction between these services is reflected in the ongoing obligations set out in the final rule, e.g. some obligations apply to DRSPs where they are providing market ancillary services; and other obligations apply to DRSPs where they are participating in the wholesale market. The Commission has not made substantive changes to the obligations applying to MASPs. Instead, the same obligations are preserved, but apply to DRSPs acting in their capacity of providing market ancillary services.

While stakeholders have suggested there is an intersection between the DRSP category and the small generation aggregator participant category, the Commission considers that these frameworks are sufficiently distinct that there would be little benefit arising from their consolidation.¹⁸⁷ The primary distinction is that being a small generation aggregator at a connection point means being the FRMP at that connection point, whereas a DRSP does not need to be the FRMP. The Commission expects that there will be participants that register as both a DRSP and a small generation aggregator.

While the DRSP will interact with customers at different NMIs, it will not be the FRMP. Each NMI that has a DRSP associated with it will still need to have a FRMP, typically a retailer. The DRSP and the FRMP will not have a direct relationship; however, the FRMP would be notified when a NMI for which it is responsible has a DRSP allocated to it. This would allow the FRMP to make any necessary changes to systems or hedging arrangements to accommodate a customer with a DRSP.

C.4.2

Registration process

Registration is the process by which an organisation is admitted by AEMO into the NEM to allow it to participate in the market. DRSPs are required to be registered in order to provide wholesale demand response in the wholesale market, under the final rule.

This would allow the DRSP to undertake its two primary functions:

¹⁸⁷ This is consistent with the recommendations made in the Commission's *Frequency control frameworks review* final report, where it was noted that these frameworks suit typically different aggregations.

- indicate loads that are able to provide demand response or ancillary services to the market
- provide wholesale demand response and ancillary services from those loads and to be paid accordingly.

To be eligible for registration as a DRSP, the final rule requires that the person seeking registration obtains the approval of AEMO to classify a load as an ancillary service load or as a wholesale demand response unit.¹⁸⁸

The classification process is discussed below. Upon classification, end-users' NMIs would be tagged as being involved in the provision of the relevant service(s).

While it is not expected that a DRSP would be regularly indebted to the market, under the final rule AEMO would be able to set prudential requirements for DRSPs where it considers this necessary. For example, the possibility of the DRSP's load consuming above the baseline may necessitate the DRSP meeting prudential requirements. This is consistent with AEMO's current role in determining the credit requirements and prudential settings for market participants.¹⁸⁹

AEMO raised in its submission on the second draft determination possible changes to the design of the mechanism that would remove the prospect of negative settlement, which would have the effect of removing the need for prudential requirements.¹⁹⁰ The Commission notes that, while removing the need for AEMO to develop prudential requirements would reduce costs, we consider maintaining the prospect of negative settlement is important. Retaining negative settlement means DRSPs are exposed to the overs and unders of baseline inaccuracy and the ability of the DRSP to provide demand response relative to a baseline. This should balance the settlement outcomes experienced by DRSPs and retailers.

C.4.3

Classification of qualifying loads as wholesale demand response units

The final rule allows DRSPs to apply to AEMO to classify qualifying loads as wholesale demand response units. The classification process is intended to make sure that the loads participating in the mechanism are appropriate in terms of customer type and technical capability. This process was refined in the second draft rule based on detailed consultation with AEMO, with the aim being to have a classification process that is straightforward for AEMO to implement and for DRSPs to engage in.

To be considered a qualifying load:¹⁹¹

- **It must exist at a single connection point:** each wholesale demand response unit must have its own connection point. This is important for determining baselines and settling the wholesale demand response provided. However, in relation to embedded networks, a parent connection point can be a wholesale demand response load in respect

¹⁸⁸ Clause 2.3B.1(b) of the final rule.

¹⁸⁹ See clause 2.4.2(a) and rule 3.3 of the NER, to which DRSPs would be subject as Market Participants.

¹⁹⁰ AEMO, submission to second draft determination, p. 1.

¹⁹¹ Clause 2.3.6(m) of the final rule.

of all of its associated child connection points that are not on-market. A child connection point can be a qualifying load only if it is on-market.

- **It cannot be a small customer or a scheduled load:** under the final rule, only large customers are able to participate in the mechanism. Loads that are already scheduled are already participating in the central dispatch process and can respond to wholesale prices. The reasoning for not including small customers is set out in chapters 2 and 4 of this determination.
- **The DRSP needs to have the consent of the relevant customer and arrangements in place to provide wholesale demand response.**
- **The appropriate metering is installed:** each load must have a type 1, 2, 3 or 4 meter for the purpose of the recording time varying load data. This data is needed for the purposes of settlement and baseline determination.

When a DRSP makes an application to AEMO to classify a qualifying load as a wholesale demand response unit, it must:¹⁹²

- identify the qualifying load
- specify the proposed maximum responsive component of that load
- specify the baseline methodology and baseline settings that it proposes will apply.

The final rule places an obligation on AEMO to develop a guideline that provides details on the above technical requirements, as well as any others AEMO considered relevant for classifying load as wholesale demand response units, having regard to the need not to distort the operation of the market and the need to maximise the effectiveness of wholesale demand response at the least cost to end use consumers of electricity.¹⁹³ The Commission considers that this will allow AEMO to apply requirements that would prevent load shifting within a site, for example.¹⁹⁴

Under the final rule, AEMO must approve the classification of a load as a wholesale demand response unit if it is reasonably satisfied that:¹⁹⁵

- the load is a qualifying load (discussed above)
- the load can provide wholesale demand response in accordance with the NER
- the load is capable of providing a quantity of wholesale demand response at least equal to the maximum responsive component
- the DRSP has adequate communications and telemetry in place to support the issuing of dispatch instructions
- when a baseline methodology is applied to the load (using the relevant baseline settings and historical metering data), it:
 - produces a baseline that satisfies the baseline methodology metrics, and

¹⁹² Clause 2.3.6(b) of the final rule.

¹⁹³ Clause 3.10.1 of the final rule.

¹⁹⁴ In addition, the final rule provides that baseline deviation offsets (such as load shifting within a site) would not constitute wholesale demand response. See clause 3.8.22A(a2)(2) and chapter 10, definitions of "baseline deviation offsets" and "wholesale demand response", in the final rule.

¹⁹⁵ Clause 2.3.6(e) of the final rule.

- can apply to that load having regard to any other criteria outlined in the wholesale demand response guidelines produced by AEMO
- the DRSP has submitted bid and offer validation data required under schedule 3.1 of the NER
- the load satisfies each other requirement in the wholesale demand response guidelines for classification as a wholesale demand response unit.

A DRSP must also immediately notify AEMO if a load classified as a wholesale demand response unit ceases to be a qualifying load.¹⁹⁶

There is no restriction on a load registered with a DRSP also engaging in other forms of demand response with other market participants. A consumer would also be able to have demand response arrangements with DNSPs and retailers, noting that a load that is spot price exposed in an interval is not able to participate in the mechanism, and that an activity only constitutes wholesale demand response for the purpose of the mechanism if it is additional to any demand response the load would have provided due to other incentives.¹⁹⁷

Single DRSP per NMI

In order to preserve the integrity of the baseline methodology, there would only be one DRSP allocated to a NMI at any one time. This means that, without a customer's consent to cease its arrangement with one DRSP and commence a new arrangement with another DRSP, a DRSP would not be able to classify a load as a demand response load where that load already has an allocated DRSP.¹⁹⁸ The customer consent and transfer process would occur through contracts between DRSPs and customers.

C.4.4

Telemetry requirements

AEMO has advised that a lack of visibility of loads participating in the mechanism could create potentially significant risk and uncertainty for AEMO's operation of the power system, particularly if there are large amounts of load responding to wholesale prices through the mechanism. To address this, AEMO has proposed that any load with a maximum responsive component of 5 MW or above would be required to provide SCADA (or an approved equivalent) for the maximum responsive component.¹⁹⁹ This will make sure that changes in these larger loads are visible to AEMO in real time, thereby allowing fluctuations in these loads in response to wholesale prices to be managed more effectively when operating the wholesale market. The final rule does not directly address this proposed requirement, as this would be dealt with through the telemetry requirements to be developed by AEMO. The Commission understands that loads with maximum responsive components of less than 5 MW would not be automatically required to provide SCADA (subject to the threshold

¹⁹⁶ Clause 2.3.6(k) of the final rule.

¹⁹⁷ In the final rule, see clauses 3.8.2A(d) and 3.8.22A(a2)(1) and the definitions of "wholesale demand response" and "wholesale demand response activity" in chapter 10.

¹⁹⁸ This is provided for through clause 2.3.6(m)(1)(v) of the final rule.

¹⁹⁹ AEMO, *Wholesale demand response: High level design*, p. 25. Available at: <https://www.aemo.com.au/initiatives/submissions/Wholesale-Demand-Response-Mechanism-High-level-Design>.

discussed below). However, the Commission notes that under the final rule, AEMO is responsible for determining the appropriate telemetry standards.²⁰⁰

Given the potential risks associated with having large amounts of non-visible load participating in the mechanism, AEMO has also advised that it requires the ability to set a limit on the total amount of demand responsive load without SCADA that can participate in each region, if necessary to address system security risks. The Commission considers that it is appropriate for these risks to be addressed in the final rule, to the extent practicable to do so. The final rule therefore allows AEMO to set an upper limit on the amount of non-visible demand response (i.e. demand responsive loads not using SCADA) that can participate in the mechanism in each region.²⁰¹ Once this threshold has been reached, AEMO could impose additional or alternative telemetry requirements on any loads seeking to be classified as wholesale demand response units in that region, including a requirement that they use SCADA (or an approved equivalent). Once this threshold is reached, the wholesale demand response connected under the lower standard of telemetry would not need to meet the additional telemetry standard.²⁰²

AEMO would be required to consult with market participants when determining the methodology used to determine this threshold.²⁰³ The Commission expects that this methodology would clearly and robustly specify the process AEMO would use to determine the threshold. In addition, the final rule sets out a number of principles AEMO must have regard to when setting the threshold.²⁰⁴ AEMO must also publish and update information each month on the progress towards reaching the threshold in each region so that this information is transparent to participants.²⁰⁵ There would be no limit on the amount of demand responsive load using SCADA which could participate in each region.

This means that, under the final rule, there will be a transparent threshold up to which wholesale demand response units would not be required to have additional or alternative telemetry (ie SCADA or equivalent). This will allow AEMO and DRSPs to trial new approaches while also preserving the secure operation of the power system. If AEMO finds telemetry approaches that are less onerous than SCADA to be effective, this could justify increasing or removing the regional thresholds for wholesale demand response units without the additional telemetry.

C.4.5

Aggregation of wholesale demand response units

A DRSP is able to apply to AEMO to aggregate units for the purpose of participating in central dispatch in a similar manner to aggregation applications for generating units or ancillary services loads (noting that, even if aggregated for dispatch, settlement will occur on an individual unit basis).²⁰⁶

²⁰⁰ Clauses 2.3.6(e)(4) and 3.10.1(a)(2) of the final rule.

²⁰¹ Clause 3.10.1(c) of the final rule.

²⁰² Clause 3.10.1(c) of the final rule.

²⁰³ Clauses 3.10.1(a)(3) and (e) of the final rule.

²⁰⁴ Clause 3.10.1(b) of the final rule.

²⁰⁵ Clause 3.10.1(d) of the final rule.

²⁰⁶ Clause 3.8.3 of the final rule.

The Commission considers the benefits of DRSPs being allowed to offer wholesale demand response in the wholesale market are related to the level of transparency and certainty provided by the wholesale demand response units acting in a scheduled manner.

Aggregation of wholesale demand response units would allow for multiple units to be bid into central dispatch together. These units would be treated individually for the purposes of settlement. Under the final rule, the aggregation would be treated as having a loss factor of 1 for the purposes of dispatch.²⁰⁷ This is necessary because the individual loads in the aggregation would have different loss factors and developing an aggregated loss factor would be highly complex and dynamic depending on which loads were dispatched. Individual loss factors will be applied in settlement.

The Commission understands that AEMO's proposed telemetry requirements would allow multiple loads to be aggregated in a wholesale demand unit with a total responsive component of more than 5 MW without requiring SCADA. However, AEMO has advised that due to technical system limitations, a single wholesale demand response unit could not accommodate some loads using SCADA and some not using SCADA. This would mean that if a DRSP seeks to aggregate an individual load that is greater than 5 MW (and would therefore require SCADA) with other loads, those other loads would also be required to use SCADA regardless of their demand responsive capacity. Alternatively, the DRSP could choose not to aggregate a load that has SCADA with loads that do not have SCADA (and would otherwise not need it).

²⁰⁷ Clause 3.8.7B(e) of the final rule.

D INTEGRATION WITH CENTRAL DISPATCH

D.1 Overview

This appendix sets out how wholesale demand response facilitated through the mechanism will participate in central dispatch and pre-dispatch. Participation in these processes means that these parties can be scheduled, providing AEMO with greater certainty that the wholesale demand response will be available.

Under the final rule, DRSPs will participate in central dispatch in a transparent, scheduled manner. DRSPs are treated in a similar manner to other scheduled participants, i.e. DRSP will submit dispatch offers and when cleared by NEMDE, receive dispatch targets to provide wholesale demand response. DRSPs will also be able to set the wholesale market price.

The principle that DRSPs should be treated in a similar manner to scheduled participants has guided the Commission's approach to how DRSPs should participate in central dispatch. However, it is worth noting that in some instances, the obligations have been modified to better suit the nature of DRSPs and wholesale demand response.

As the market moves toward a more two-sided market, the demand side will have an increasing prominent role in central dispatch. However, in doing so, consideration should be given to the differences between large, centralised generators that make up typical scheduled participants, and less controllable and more decentralised demand side participants. Through the scheduling approach for DRSPs in this final rule, there will be opportunities to explore the implications of involving more of the market in central dispatch.

Under the final rule, DRSPs will be dispatched based on the physical capability of the wholesale demand response units to provide wholesale demand response. Settlement for wholesale demand response will be based on a subsequent assessment of how much wholesale demand response was provided, with reference to the baseline.

This appendix sets out:

- background information on the wholesale market, the dispatch process and the pre-dispatch process
- the proponents' views
- the relevant stakeholder comments
- the Commission's analysis and conclusions.

D.2 Background

D.2.1 The wholesale market

The NEM's spot market is a gross pool design with mandatory participation. Generators sell, and market customers buy, all of their electricity through the spot market, which matches supply and demand (near) instantaneously, including an allowance for a sufficient quantity of reserves.

Scheduled and semi-scheduled generators and loads offer and bid into the market dispatch engine, operated by AEMO. Once these offers and bids are received, AEMO then forecasts

the expected consumer demand for electricity in each region for each 5-minute dispatch interval. The dispatch engine seeks to optimise outcomes by attempting to maximise the value of trade given the physical limitations of the power system. These physical limits are known as "constraints" which, for example, restrict how much electricity can flow over a particular piece of equipment i.e. keeping it within its technical limits.

Scheduled participants currently provide information that feeds into a number of processes ahead of real time. This information assists AEMO to operate the power system in a safe, secure and reliable manner and helps market participants form expectations about future price outcomes to guide operational decisions.

In addition, scheduling participants provide the market operator with greater certainty that this capacity will be available. Scheduled participants need to have the capacity to receive and respond to dispatch instructions. This provides the market operator with certainty that this capacity will be delivered to the market. This certainty is in turn crucial for accounting for this capacity in the reliability framework.

D.2.2 Dispatch and pre-dispatch

Dispatch

The dispatch process is fundamental to the operation of the NEM. It is the process by which supply and demand are matched and the market is cleared. The dispatch process operates through NEMDE. The NEMDE runs a security constrained optimisation to find the least-cost way to match the supply and demand sides of the NEM within its technical limits.

The dispatch process is key for scheduled participants to recover revenue and run equipment under economic conditions. Scheduled participants (both loads and generators) submit price-quantity pairs into AEMO. This allows participants to nominate the wholesale price at which they would like to generate or consume.

Scheduled participants in dispatch actively participate in the price setting process. The offer price associated with the marginal unit of supply will become the price on which the market is cleared.

Pre-dispatch

Pre-dispatch is a key information provision process for market participants. It informs market participants of expected market conditions. It also helps the market operator in assessing expected market conditions and managing security and reliability.

Pre-dispatch takes participant bids and offers, and AEMO's demand forecasts. AEMO will then provide the market with a forecast of load and expected prices which will in turn assist participants in making operational decisions. This cycle iterates in the approach to real time and participants continue to adjust their position on the basis of this more up-to-date information.

D.2.3 Scheduled loads under the current arrangements

The current arrangements allow for the demand side to participate as scheduled load in the wholesale market. AEMO's dispatch processes are already set up to accommodate this functionality.

A market customer can request that AEMO classify any of its market loads as a scheduled load.²⁰⁸

The choice of being scheduled or non-scheduled lies with the market customer. It is only if a customer decides, in respect of its load, to become a scheduled load that the customer will participate in AEMO's central dispatch process.

To date, with the exception of a few pumped storage facilities and large-scale batteries,²⁰⁹ no market customers have elected to classify load as scheduled load.

Under the current arrangements, there is little incentive for a load to become scheduled. Typically, being scheduled has an associated cost and, from the perspective of an individual load, negligible benefit. From the perspective of the broader market, having more loads scheduled provide benefits. However, under the current arrangements, due to the lack of scheduling incentives or obligations to be scheduled, the demand side participates passively in the wholesale market.

D.3 Proponent's views

This section sets out the proponents' views regarding dispatch as set out in the respective rule change requests.

D.3.1 PIAC, TEC and TAI

In their rule change request, PIAC, TEC and TAI proposed that demand response offers would be scheduled, in order to create consistency with how generators are treated in the wholesale market. The proponents noted that wholesale demand response under the mechanism would only be allowed on a scheduled basis.²¹⁰

The proponents noted:²¹¹

- that there will need to be some consideration of the exact form of scheduling that is most appropriate for offers of flexibility from aggregated demand-side resources, as their characteristics are quite different from those of conventional generators.
- scheduling obligations for small volumes of wholesale demand response may be limited to advanced notification of the start of a DR event rather than price-based central dispatch.

208 Clause 2.3.4(d) of the NER.

209 Large-scale storage facilities must register both as scheduled generators and scheduled loads under AEMO's interim guidance for storage facilities.

210 PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, pp. 9, 14.

211 *Ibid*, p. 15.

D.3.2 AEC

In the AEC's proposal, it set out two suggested treatments for curtailed loads' interaction with the spot market, each with purported advantages and disadvantages:²¹²

1. loads registered with a DRA must be classified as scheduled loads, which obliges them to continuously provide short and long-term availability information to AEMO, and to bid and rebid their behaviours to the same level of transparency as scheduled generators.
2. loads registered with a DRA could be dormant until such time as the DRAs intended the loads to be active in the market, or a Lack of Reserve Notice is issued by AEMO. Should either of these conditions occur, then DRAs would be required to participate in the spot market as a scheduled load for the relevant period, thereby only suffering the compliance burden for the critical period.

The AEC suggested that the compliance burden of Option 2 would not be markedly less than Option 1, since a DRA would be obliged to have the systems and processes in place to participate in the market regardless. The Energy Council also expected the requirements for scheduled loads to be naturally improved and expanded as a result of the proposed rule, and this would be an additional benefit of the rule.

D.3.3 South Australian Government

In its proposal, the South Australian Government noted:²¹³

- it considered that DRSPs would be dispatched in the same manner as a scheduled generator. If its offer to reduce demand is cleared through the wholesale market, it would be dispatched to reduce consumption by the amount it is cleared for.
- The consequences of not meeting dispatch would be consistent with the dispatch targets for scheduled generators. Compliance with dispatch would be assessed by the AER and the DRSP may be required to pay costs such as FCAS causer pays.
- Depending on the nature of the load, it would have ramp rate constraints.

D.4 Stakeholder comments

A number of stakeholders commented on the role for demand response in central dispatch in submissions to the second draft determination.

General comments

- **Energy Queensland** was interested to better understand how this dispatch of aggregated wholesale demand response units will work in practice where these units are located across multiple regions. It was also Energy Queensland's view that wholesale demand response units should be subject to network constraints.²¹⁴
- **Tesla** noted that the dispatch of DRSPs is a good opportunity for AEMO to explore alternative approaches for scheduling and receiving signals, than that used for scheduled

²¹² AEC, *Wholesale demand response register mechanism - rule change request*, p. 3.

²¹³ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 3.

²¹⁴ Energy Queensland, submission to second draft determination, p. 6.

generation. This could also build on the work being undertaken through the AEMO VPP Demonstrations Trial and could consider using APIs or other alternatives.²¹⁵

- **Snowy Hydro** believed that DRSPs should have a number of obligations and incentives consistent with the obligations imposed on scheduled generators. These included compliance with dispatch targets, bidding and rebidding obligations and incurring FCAS contribution factors deviating from dispatch targets, as these obligations are vital for maintaining the integrity of the central dispatch and price setting process.²¹⁶

Dispatch

- **Enel X** welcomed AEMO's recognition that "loads cannot necessarily be treated the same as generation" and that "that further considerations of load inflexibility profiles (such as minimum notification times, and capability to execute smaller MW step changes) may be required".²¹⁷
- **CS Energy** submitted that the dispatch requirement to consume at full capacity should be assessed for conformance to be consistent across all participants. If there are no effective penalties for non-compliance on DRSPs, CS Energy felt that the risk to the retailer increased, and there is little clarity in the second draft rule if or how retailers may be compensated.²¹⁸
- **Major Energy Users** considered there remained significant complexity in the second draft decision, apparently with a view that wholesale demand response needs to be treated as if it was the core product of the provider (as applies for generators) rather than as an adjunct to their primary activities.²¹⁹
- **AEMO** recommended the rules specify that a loss factor of 1 is to be used for dispatch and pricing where multiple WDRUs are aggregated.²²⁰ AEMO also recommended further collaboration between AEMO and the AEMC to determine if a reduction model is feasible.²²¹
- **EnergyAustralia** noted that while the second draft rule outlined clear consequences for baseline non-conformance (deregistration), it is less clear on dispatch non-conformance. Consistent deviations from targets will further deteriorate, not improve, issues AEMO has well-documented in relation to system stability and control. We therefore consider it unusual that AEMO would recommend changes that remove incentives on DRSPs to minimise system deviations.²²²

FCAS cost recovery and causer pays

- **CS Energy** considered DRSPs should be bound to the same FCAS recovery as market participants regardless of whether they also chose to provide FCAS. Controllable load that

²¹⁵ Tesla, submission to second draft determination, p. 3.

²¹⁶ Snowy Hydro, submission second draft determination, p. 6.

²¹⁷ Enel X, submission to second draft determination, p. 6.

²¹⁸ CS Energy, submission to second draft determination, p. 7.

²¹⁹ Major Energy Users, submission to second draft determination, p. 2.

²²⁰ AEMO, submission to second draft determination, p. 3.

²²¹ Ibid.

²²² EnergyAustralia, submission to second draft determination, p. 5.

would be eligible to participate can be greater than 100 MW discrediting the argument that there would be minimal impact on contingency FCAS. It also considered it unclear whether DRSPs that also provide FCAS will still be excluded from FCAS recovery.²²³

- **Tesla** supported removing FCAS cost recovery and enabling exports.²²⁴
- **AGL** noted that, whilst it understood the reasons for exempting DRSPs from the FCAS causer pays framework, the exemption should in turn place a stronger onus on AEMO to ensure the wholesale demand response units conform with dispatch instructions as is required for other scheduled generators.²²⁵
- **ENGIE** considered it inconsistent to exempt DRSPs from FCAS cost recovery on the basis that it is difficult to calculate a precisely cost-reflective share of such costs when the Commission is so relaxed about the methodology for calculating the retailer reimbursement rate.²²⁶
- **Energy Queensland** considered DRSPs should also be liable for frequency control ancillary services and consistent registration thresholds.²²⁷
- **EnergyAustralia** noted that DRSPs will contribute to the need for FCAS but, under the draft rules, would be exempt from cost recovery. This raises questions around sufficient incentives on DRSPs to minimise deleterious impacts on the system, and ensuring a level-playing field between participants.²²⁸ EnergyAustralia also:
 - supported the AEMC's decision that AEMO should regularly assess the impact of DRSPs' dispatch on system security. The threshold for acceptable deviations should be published and AEMO should report against this on a quarterly basis to identify the appropriate time at which to review the allocation of FCAS costs.
 - considered that in the interim period, AEMO and the AEMC should consider alternative arrangements to allocate some of these costs to DRSPs and provide incentives to improve performance. This could be an alternative financial incentive framework and separate cost recovery scheme, that incentivises support for the system. There could be requirements on those WDRUs with SCADA and 4-second telemetry to be included in cost recovery.
- **AEC** suggested compliance with dispatch targets and causer pays exposure as applies to other scheduled participants, should be applicable to wholesale demand response units as well.²²⁹
- **Snowy Hydro** noted that if the DRSP registration category is combined with the MASP category, therefore being able to provide ancillary service, then there is no reason for the category to not be subject to causer pays.²³⁰

223 CS Energy, submission to second draft determination, p. 6.

224 Tesla, submission to second draft determination, p. 1.

225 AGL, submission to second draft determination, p. 2.

226 ENGIE, submission to second draft determination, p. 2.

227 Energy Queensland, submission to second draft determination, p. 6.

228 EnergyAustralia, submission to second draft determination, p. 5.

229 AEC, submission to second draft determination, p. 2.

230 Snowy Hydro, submission to second draft determination, p. 7.

Notification to retailers

- **EnergyAustralia** suggested that the notification to retailers of wholesale demand response dispatch should be as close as practicable to real-time notification coincident with sending dispatch instruction to the respective wholesale demand response unit.²³¹
- **Snowy Hydro** believed that the information for retailers is enhanced by requiring additional information about customers that have an arrangement with a DRSP in order to adjust their hedging strategy for those customers if required in real-time.²³²
- **AEMO's** submission noted that the notification provided to the FRMP should only be provided where a wholesale demand response unit is dispatched to provide wholesale demand response.²³³

Information to DNSPs

- **Mondo** considered wholesale demand response mechanism information could support:
 - Network planning and forecasting
 - The design of local demand response programs and network tariffs
 - The operational management of networks
 - The identification of local demand response resources.
- **Ausgrid's** submission noted:²³⁴
 - it is important distributors have access to information pertaining to demand response activities (such as the WDRM and Demand Side Participation Information (DSPI)) to enable efficient planning and operation of the electricity network. Ausgrid expressed surprise that despite agreeing with this need the AEMC has chosen not to include this provision in the second draft rule.
 - The AEMC's reference to the DER Register as another source of information already catered for under the regulatory framework fails to recognise the potential scale of the impact from large customer demand response in comparison to distributed energy resources.
 - While Ausgrid appreciated the AEMC's desire to reduce the complexity and cost of the WDRM, Ausgrid did not agree sharing this information [about when a customer has an arrangement with a DRSP] with the DNSP of that customer would significantly add to the complexity of the solution to be implemented. Ausgrid considered sharing this information with DNSPs would ultimately translate into an improved service to our customers as it would allow Ausgrid to ensure that the network and operations are capable of accommodating these arrangements and flag any issues with proponents ahead of time.
 - Ausgrid believed that the rule change should allow access to DSPI at the NMI level for registered participants with an interest in that NMI, including distributors. The DER

²³¹ EnergyAustralia, submission to second draft determination, p. 8.

²³² Snowy Hydro, submission to second draft determination, p. 10.

²³³ AEMO, submission to second draft determination, p. 6.

²³⁴ Ausgrid, submission to second draft determination, pp. 1 -

Register does not capture flexible commercial and industrial load, despite this clearly being a promising growth area for demand response. As there is already wide consensus on the need for DNSPs to have access to this information, the rule change is an opportune time to include these basic provisions.

- To maintain a high level of forecast accuracy distributors will require historical information about the dispatch of wholesale demand response. This data is required for two purposes: (i) network forecasting for operations and investment planning, and (ii) network pricing.
- Ausgrid require access to data by NMI as network forecasting and planning is done at the local spatial level and aggregate data does not provide the detail needed to accurately forecast future demand. Ausgrid considered that by not having this information means DNSPs will be:
 - unable to correctly interpret historic load curves and potentially underestimate the underlying load growth in an area
 - more likely to miscalculate the load available for load shedding or under-frequency events.
- As well as operating the network and planning investments, distributors would need detailed historical data to ensure the wholesale demand response mechanism outcomes are included in load forecasts for pricing purposes. Under revenue cap regulation avoided Distribution Use of System (DUOS) charges associated with demand response will be recovered in subsequent years, so it is important that DNSPs have access to demand response data by NMI to appropriately adjust forecasts to reflect the reduction in customer demand. This will minimise the potential for price volatility caused by inaccurate energy forecasts.
- As we increasingly depend on this flexibility to operate the distribution network and to support system security it will become paramount that we have visibility of the demand response activities on our network. In addition to this, without access to demand response information, there is the risk that Lack of Reserve (LOR) events to support system stability will be misinformed and lead to inefficient outcomes for customers.
- **AusNet's** submission raised the following points:²³⁵
 - both DNSPs, and TNSPs require visibility on the location and activity of demand response (where relevant to their networks). If the network does not have visibility of a large customer's intention to reduce demand, in a particular dispatch interval, this could impact planned load shedding activities in the event this is required. It is likely to impact distribution level voltage and controlled load switching and the switching of transmission assets. It is not clear why this information cannot be shared with networks.
 - Rather than relying on market parties to sell information, AusNet considered it would be better if the benefits paid to the wholesale demand response service providers

235 AusNet Services, submission to second draft determination, p. 2.

through the wholesale demand response mechanism included the value of promptly sharing bid information with networks. The cost of providing transparent data should be incorporated in the incentive provided through the wholesale demand response mechanism.

- In its submission, the **ENA** noted that both DNSPs and TNSPs require visibility of the location and activity of demand response (where relevant to their networks). If the network does not at least have visibility of a large customer's intention to reduce demand in a particular dispatch interval, this could impact planned load shedding activities in the event this is required. This lack of visibility will introduce new coordination issues and is likely to impact distribution level voltage and controlled load switching and the switching of transmission assets resulting in increased reliability problems for both networks and customers. It is not clear from the determination why this information cannot be shared with networks.²³⁶

Other

- **AEMO** noted that the second draft rule would require AEMO to declare a wholesale demand response unit as non-conforming in dispatch timeframes and exclude it from setting the spot price. These actions are not consistent with a post-event assessment. AEMO recommended removing WDRUs from clause 3.8.23(a) and drafting a new rule for ex-post dispatch conformance assessments for WDRUs.²³⁷
- **AEMO** also noted that, if applicable, an inflexibility profile for a wholesale demand response unit would apply when it is dispatched from its maximum availability. However, the second draft rule required the inflexibility profile to be used when dispatching from 0 MW.²³⁸
- **Enel X** noted that it was not clear from the second draft rule whether a DRSP may elect to declare an available capacity of zero for reasons other than those set out in the second draft rule or AEMO's guidelines or what any penalty would be for doing so may be if it were not permitted.²³⁹

D.5 Commission's analysis and conclusions

BOX 6: INTEGRATION WITH CENTRAL DISPATCH UNDER THE FINAL RULE

The final rule sets out:

- a process for wholesale demand response units to participate in central dispatch.
- a process for wholesale demand response units to be aggregated for the purpose of central dispatch

²³⁶ ENA, submission to second draft determination, p. 2.

²³⁷ AEMO, submission to second draft determination, p. 7.

²³⁸ Ibid, p. 6.

²³⁹ Enel X, submission to second draft determination, p. 5.

- the obligations that apply to DRSPs as scheduled participants, including obligations to comply with dispatch instructions
- a process through which the DRSP would be scheduled only in periods where it is available for dispatch
- how DRSPs would participate in the pre-dispatch process
- other changes to the NER necessary to accommodate the integration of DRSPs into pre-dispatch and dispatch.

Under the final rule, DRSPs will be dispatched based on the physical capability of the wholesale demand response units to provide wholesale demand response. Settlement for wholesale demand response (as set out in appendix G) will be based on a subsequent assessment of how much wholesale demand response was provided, with reference to the baseline.

Benefits of the final rule

The final rule will facilitate the transparent participation of DRSPs in the wholesale market. In the short term, this will allow DRSPs to be dispatched instead of more expensive peaking generation. By participating transparently, DRSPs will also contribute to the ability of other market participants to make informed operational decisions. It will also assist AEMO in its operation of the market and, importantly, enable demand response to be relied upon by the system operator so it can contribute to power system reliability.

It will also be an opportunity to explore how participation in central dispatch can be extended to a larger number of participants. This may be useful in a longer-term transition to a two-sided market which can be informed by lessons learned in the scheduling and dispatch of demand response through this mechanism.

Changes from second draft rule

There are changes between the second draft rule and final rule that reduce the costs associated with the implementation of the mechanism, reduce the complexity associated with integration and provide AEMO with greater flexibility with regards to how DRSPs are treated by AEMO in dispatch. These changes include:

- Changes to the arrangements for declaring available capacity. Under the final rule, a DRSP can declare available capacity of zero if it does not wish to provide wholesale demand response.
- Changes to the way AEMO issues dispatch instructions to DRSPs. Under the final rule, AEMO will issue a dispatch instruction to DRSPs with a specified level of baseline deviation i.e. an instruction to provide an amount of demand response away from the baseline.
- Changes to the conformance process for wholesale demand response units. The final rule makes it clear that AEMO can assess conformance after real time dispatch.

- Changes to the way dispatch instructions are formulated for wholesale demand response units. The final rule makes it clear that a dispatch instruction refers only to the required baseline deviation. Compliance with the other requirements that define genuine wholesale demand response are assessed separately.
- When providing a notification to the FRMP, the final rule clarifies that this must be provided as soon as practicable after dispatch, and only when the wholesale demand response unit is dispatched to provide wholesale demand response.

This section is structured as follows:

- Benefits of greater transparency in the wholesale market
- An overview of DRSPs participating in central dispatch
- Aggregation of wholesale demand response units
- Telemetry requirements for wholesale demand response units
- DRSP obligations when participating in central dispatch
- AEMO's operation of central dispatch
- Conformance in central dispatch
- DRSP participation in pre-dispatch
- AEMO's operation of pre-dispatch
- Separation of dispatch and settlement
- Clause 4.8.9 directions for DRSPs
- Information provided to other market participants about dispatch of wholesale demand response.

D.5.1

Benefits of transparency in the wholesale market

The NEM wholesale market relies on participants submitting information regarding their intentions in advance of real time. The types of participant that are obligated to provide this information to the market are typically scheduled generators and scheduled loads.

Scheduling participants has two main benefits:

- By being cleared through the dispatch engine, scheduled participants' bids and offers are accounted for in determining the price and quantity of electricity cleared.
- Through submitting their bids and offer in advance of real time, scheduled participants provide greater amounts of information to other market participants. Providing greater amounts of information to these market participants will improve their ability to make efficient decisions in operational and investment timeframes on both the supply and demand side of the market.

In addition, scheduling participants provides the market operator with greater certainty that this capacity will be available. Scheduled participants need to have the capacity to receive and respond to dispatch instructions and must comply with them. This provides the market

operator with certainty that the dispatched capacity will be delivered to the market. This certainty is in turn crucial for accounting for this capacity in the reliability framework.

As the demand side of the market becomes increasingly capable of making dynamic consumption decisions, it will be important to increase the information flows from these demand side participants to the rest of the market. Scheduling is one way of eliciting this information from the demand side. The participation of the demand side in central dispatch is also being explored in the Energy Security Board's consideration of the two-sided markets.

The Commission considers it key to the development of the wholesale market to encourage demand side participants to engage in the wholesale market transparently. This includes providing information into both dispatch and pre-dispatch. This is particularly the case for price responsive demand side participants.

As such, the final rule sets out a process by which DRSPs can participate in the wholesale market as scheduled participants.

D.5.2

Overview of DRSPs participating in central dispatch

Under the final rule, the Commission has sought consistency of treatment between scheduled wholesale demand response units and other scheduled participants in central dispatch to the extent it is practicable to do so, taking into consideration the systems changes and associated costs required to facilitate this. The Commission considers the value of wholesale demand response facilitated through the mechanism is greater if it occurs transparently and with certainty. Transparency will improve the functioning of the wholesale market and contribute to power system reliability.

In principle, the final rule treats DRSPs similarly to scheduled generators through settlement and dispatch. In some instances these obligations have been modified to better account for the technical characteristics of DRSPs and wholesale demand response. As such, the final rule seeks to accommodate the practical challenges with requiring DRSPs to meet these obligations while still achieving the reliability benefits associated with the mechanism.

Under the final rule, DRSPs would be responsible for declaring the available capacity of its wholesale demand response units. The DRSP would need to make dispatch offers for this available capacity in every dispatch interval, reflecting the available wholesale demand response at the market price at which it would respond. The available capacity of a wholesale demand response unit will be capped at the maximum responsive component, providing AEMO with greater certainty that if dispatched, the wholesale demand response will be delivered to the system.

The table below provides an overview of how DRSPs will participate in dispatch under the final rule, highlighting which obligations apply depending on difference circumstances.

Table D.1: Scheduling related obligations under different circumstances

CONDITION	DRSP HAS NO AVAILABLE CAPACITY	DRSP IS NOT CLEARED TO PROVIDE WHOLESALE DEMAND RESPONSE	DRSP IS CLEARED TO PROVIDE WHOLESALE DEMAND RESPONSE
Must participate in pre-dispatch	Yes	Yes	Yes
Will receive a dispatch instruction from AEMO to provide wholesale demand response	No	No	Yes
Must provide wholesale demand response in accordance with the dispatch instruction	No	No	Yes
Wholesale demand response is settled at the spot price	No	No	Yes

D.5.3

Aggregation of wholesale demand response units

The final rule allows for DRSPs to aggregate wholesale demand response units for the purpose of participation in central dispatch with AEMO's approval.²⁴⁰ Aggregation of wholesale demand response units will enable loads with individual capacity below the 1 MW dispatch threshold to offer wholesale demand response into central dispatch and may also simplify the dispatch process for DRSPs and AEMO by allowing DRSPs to make a single dispatch offer for multiple wholesale demand response units.

Under the final rule, AEMO must approve applications for aggregation if:

- aggregated wholesale demand response units are connected within a single region of the NEM
- power system security will not be materially affected by the proposed aggregation
- each other requirement for aggregation in the wholesale demand response guidelines must have been satisfied in respect of the proposed aggregation.

If AEMO approves an application for aggregation made under paragraph, AEMO may include specification of circumstances in which aggregated wholesale demand response units would need to be disaggregated or the maximum responsive component of the aggregated

²⁴⁰ Clause 3.8.3(b2) of the final rule.

wholesale demand response unit.²⁴¹ This will allow AEMO to address concerns regarding potential adverse impacts arising from large aggregations of wholesale demand response units. It would also allow AEMO to require a DRSP to disaggregate groups of wholesale demand response units, for example if they are not being effectively accounted for in network constraints.

D.5.4 Telemetry requirements for DRSPs

Large scheduled generators have SCADA links to AEMO. This provides AEMO with real time information relating to the output of those units. This communication equipment has been in place for a long period of time. In addition, while a SCADA link is expensive, it is relatively cheap compared to the cost of an individual generating unit.

This is not the case for most loads. With the exception of a some large loads, most consumers do not have SCADA links.

The information provided by AEMO to participants through SCADA is integral to the functioning of dispatch and to demand forecasting. However the final rule does not require installing SCADA links for all wholesale demand response units. Not only is installing these links expensive, it would be exceptionally expensive if required for most small wholesale demand response units.

Under the final rule, AEMO will determine the telemetry and communications standards for wholesale demand response units and set these out in its guideline.²⁴²

To enable the greatest amount of demand response to be provided through the mechanism without posing operational challenges to AEMO or undue costs on DRSPs, AEMO will be able to accommodate:

- wholesale demand response units up to an aggregate capacity limit in each region determined by AEMO that would not require SCADA links and so would be subject to lower telemetry standards
- all SCADA connected loads looking to participate in wholesale demand response through the mechanism.

Through the final rule, AEMO would be required to publicly set out:²⁴³

- how much demand response under lower telemetry standards could be registered in each region
- how much demand response under these standards has already been registered in each region.

²⁴¹ Clause 3.8.3(b3) of the final rule.

²⁴² The Commission notes that this issue is being considered in AEMO's VPP demonstrations. More information is available here: <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/DER-program/Virtual-Power-Plant-Demonstrations>

²⁴³ Clause 3.10.1 of the final rule.

Above that limit AEMO could specify additional or alternative telemetry and communications requirements for wholesale demand response units.²⁴⁴

Under the final rule, AEMO is required to set the limit for wholesale demand response with a lower telemetry standard having regard to the need not to distort the operation of the market, the need to maximise the effectiveness of wholesale demand response at the least cost to end use consumers of electricity and any other matter determined by AEMO acting reasonably, which it will be required to set out in the wholesale demand response guidelines.²⁴⁵

This approach enables consumers who do not have SCADA connections to participate through the mechanism. Equally, it enables AEMO to manage risks to power system security that may result from reduced visibility of wholesale demand response units that do not have SCADA connections.

If additional wholesale demand response units were classified after the threshold was reached, these additional units would need the higher telemetry standards. The units that had connected under the lower standard would continue to be able to use this lower standard telemetry.

D.5.5

DRSP participation in dispatch

This section sets out in detail how DRSPs will participate in central dispatch under the final rule.

DRSP wholesale demand response bids

Under the final rule, DRSPs would be required to declare the available capacity of their wholesale demand response units and make dispatch bids for that available capacity. The available capacity will reflect the portion of the wholesale demand response unit the DRSP is able to control and adjust through central dispatch since the available capacity offered by the DRSP to AEMO must be equal to, or less than the maximum responsive component of the wholesale demand response unit or where applicable, of the aggregated wholesale demand response units.²⁴⁶

If the DRSP has available capacity but does not wish to provide wholesale demand response, it may decide to make its available capacity zero.

In making a dispatch bid for its available capacity, the DRSP must take into account only its capacity to provide wholesale demand response as the result of wholesale demand response activity and where that is not offset by a change to the load at another connection point.²⁴⁷ The DRSP must declare available capacity of zero if the wholesale demand response unit is

²⁴⁴ Clause 3.10.1(c) of the final rule.

²⁴⁵ Ibid.

²⁴⁶ Clause 3.8.2A(b) of the final rule.

²⁴⁷ Clause 3.8.22A(a2) of the final rule.

not baseline compliant at the time or is spot price exposed for the trading interval.²⁴⁸ If the wholesale demand response unit is declared non-conforming due to failure to comply with dispatch instructions, AEMO may set a limit on the available capacity for the wholesale demand response unit (which may be zero) which the DRSP must comply with.²⁴⁹

For central dispatch, DRSPs will make dispatch bids for wholesale demand response units. DRSPs will submit dispatch offers in price and quantity pairs. These price - quantity pairs will need to be in whole MW increments, consistent with dispatch offers from other wholesale market participants.

In up to ten bands, these dispatch offers will specify:²⁵⁰

- price bands and the corresponding prices at which the DRSP would provide wholesale demand response
- up and down ramp rates.

A dispatch bid represents the wholesale demand response unit either reducing consumption, exporting electricity or shifting from consumption to exporting.²⁵¹

Dispatch bids and dispatch instructions

When a DRSP makes a dispatch bid, it will submit this bid to AEMO. The DRSP's bid would reflect its willingness to adjust its consumption or export electricity at different prices. For example, if a DRSP controlled 10MW, it could make a dispatch bid for 10MW of wholesale demand response at a price of \$10,000/MWh. This would mean that if the market price cleared below \$10,000/MWh, the DRSP would not receive a dispatch instruction to provide wholesale demand response.

Alternatively, if the market price cleared at \$14,000/MWh, the DRSP would receive a dispatch target to provide 10 MW of demand response.

The Commission understands from AEMO that when the DRSP is not being dispatched to provide wholesale demand response, it will still receive a signal from AEMO's control centre. This is not a dispatch instruction for the purposes of the rules.²⁵²

DRSP is dispatched to provide wholesale demand response

When a DRSP makes a dispatch bid that is cleared by AEMO, it will receive a dispatch instruction to provide a deviation from its baseline.²⁵³ The dispatch instruction will account for

248 Clause 3.8.2A(c) and (d) of the final rule.

249 Clause 3.8.2A(e) and clause 3.8.23A(e) of the final rule.

250 See clause 3.8.7B of the final rule.

251 Clause 3.8.7B(g) of the final rule.

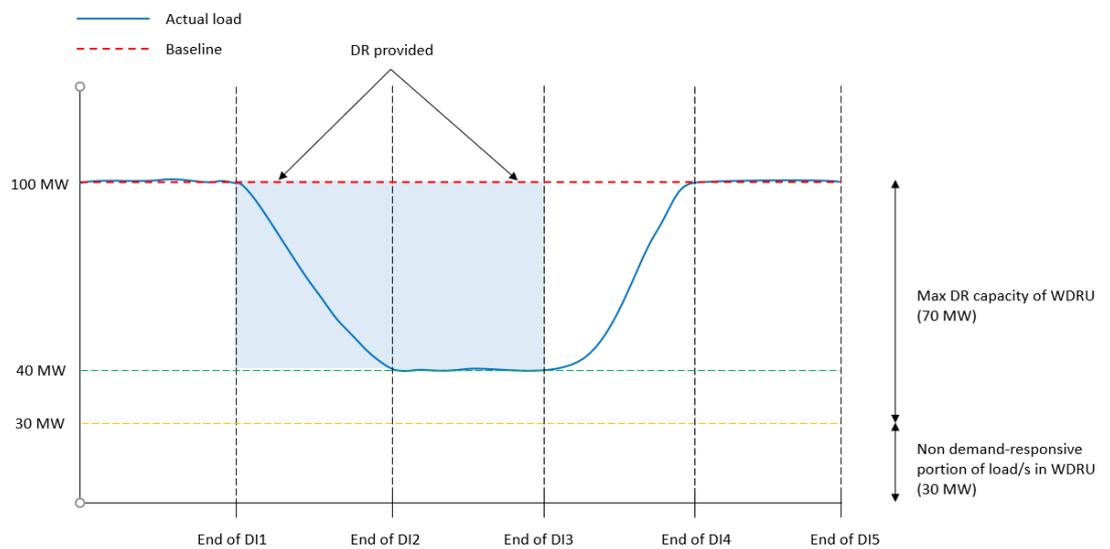
252 Clause 4.9.2B(a) of the final rule defines dispatch instructions for wholesale demand response units.

253 Clause 4.9.2B(a) and (b) of the final rule.

any ramp rate limitations on the scheduled wholesale demand response unit.²⁵⁴ The DRSP will be obligated to comply with this dispatch instruction.

In subsequent dispatch intervals where the DRSP continues to provide wholesale demand response, it would continue to make dispatch bids to AEMO and receive new dispatch targets. This is demonstrated in the figures below.

Figure D.1: Providing wholesale demand response



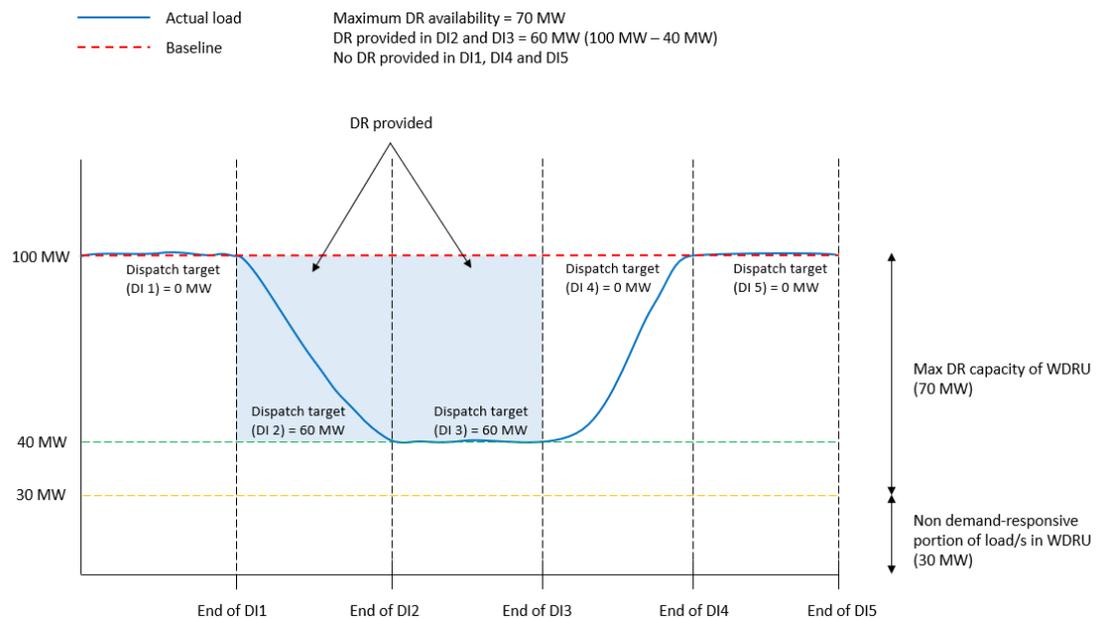
Source: AEMC.

The graph below shows the above example but adds in numbers to provide additional clarity. In this example:

- In dispatch intervals 1, 4 and 5, the DRSP is not dispatched to provide wholesale demand response.
- In dispatch intervals 2 and 3, the DRSP received a dispatch instruction to provide wholesale demand response.

²⁵⁴ Clause 3.8.2A(d) of the final rule.

Figure D.2: Providing wholesale demand response with numbers added



Source: AEMC

D.5.6

AEMO's operation of dispatch

AEMO operates the dispatch process to provide for the least-cost combination of supply and demand. The dispatch process does so by issuing dispatch instructions taking into account the technical limitations of the power system.

Under the final rule, AEMO will be required to account for the participation of DRSPs when operating dispatch. DRSPs will compete with other scheduled participants the wholesale market. Scheduled wholesale demand response units will be treated equivalently to other scheduled participants by NEMDE.

The process set up under the final rule seeks to minimise impacts on the existing central dispatch process by maintaining consistency between wholesale demand response units and those that apply to other scheduled participants. The most notable difference is the greater flexibility afforded to DRSPs regarding participation in dispatch. DRSPs only declare available capacity up to the demand responsive component of the wholesale demand response unit. This would allow the DRSP to have greater certainty when submitting its dispatch bids regarding the availability of response. AEMO will continue to develop demand forecasts for loads that are not scheduled (either through DRSPs or as scheduled loads), including the non-responsive component of the wholesale demand response units.

D.5.7 Conformance with dispatch targets

The final rule sets out a process for assessing conformance of wholesale demand response units with dispatch targets.

The assessment of conformance with dispatch targets is necessarily different to the process for scheduled participants with SCADA connections as wholesale demand response units will not necessarily be providing AEMO with real time visibility of output, which is provided by scheduled generators to AEMO through SCADA connections.

Owing to these differences, the final rule sets out a separate process for AEMO to take action if it identifies a wholesale demand response unit is failing to conform with dispatch targets.²⁵⁵ The rule recognises that the assessment may take place after dispatch using metering data, data from SCADA if available and other information.

The final rule also specifies that the dispatch instruction given to a DRSP for a wholesale demand response unit refers to the level or schedule of 'baseline deviation' (and not 'wholesale demand response').²⁵⁶ This distinction is relevant for compliance purposes as the provision of 'wholesale demand response' has four main components:

- there is a baseline deviation
- the baseline deviation occurs in response to a dispatch instruction
- the baseline deviation is the result of wholesale demand response activity
- the baseline deviation does not have a related baseline deviation offset.

Under the final rule, dispatch instruction compliance assessment need only consider whether the nominated baseline deviation has been achieved.²⁵⁷ For example, this could occur by comparing metered consumption (or export) with the baseline. If the wholesale demand response unit has complied with its dispatch instruction, the difference should reflect the level or schedule of baseline deviation nominated in the dispatch instruction.²⁵⁸

Whether the baseline deviation occurs in response to a dispatch instruction or is the result of baseline non-compliance is assessed indirectly through the baseline assessment framework.²⁵⁹

The remaining two components (the baseline deviation must be the result of wholesale demand response activity and there must not be a related baseline deviation offset) are dealt with by the representation made by the DRSP when it submits its dispatch bid.²⁶⁰

255 Clause 3.8.23A of the final rule.

256 Clause 4.9.8(a) of the final rule.

257 Clause 4.9.8(a) of the final rule.

258 Clause 4.9.2B(a) of the final rule.

259 Rule 3.10 of the final rule.

260 Clause 3.8.22A(a2) of the final rule. Assessment of compliance with this representation is supported by the arrangements in clauses 3.8.2A(g), (h) and (i) of the final rule.

D.5.8 DRSP participation in pre-dispatch

Regardless of whether availability may be zero, DRSPs will need to submit information for the purposes of pre-dispatch and information about availability and ramp rate two days ahead.²⁶¹ This information will inform AEMO's pre-dispatch forecasts.

AEMO's operation of pre-dispatch would be adjusted to account for the additional capacity provided by scheduled wholesale demand response units over the pre-dispatch timeframes.

The Commission notes that, as a scheduled participant, DRSP bids should be reflected in pre-dispatch. Transparency about the expected level of demand response in pre-dispatch timeframes will be important for other market participants and AEMO making operational decisions.

D.5.9 Settlement

Under the final rule, the quantity of wholesale demand response provided will be assessed by comparing metered consumption (or export) against the baseline, which reflects a counterfactual level of demand of the wholesale demand response unit as a whole. The dispatch instruction also relates to a deviation from the baseline based on the available capacity of the wholesale demand response unit.

In practice the two figures (the quantity dispatched and the quantity settled) should be very similar provided that the DRSP is following its dispatch instructions and the baseline is accurate.

The quantity settled will also be capped by the maximum responsive component of the wholesale demand response unit. Baseline deviation in excess of that quantity is taken not to satisfy the requirement for wholesale demand response to be a baseline deviation that occurs in response to a dispatch instruction.

D.5.10 FCAS cost recovery

FCAS cost recovery operates differently depending on the service.

- For regulation FCAS, scheduled participants have contribution factors determined by looking at how they follow their dispatch instructions. This requires telemetry that provides AEMO with high granularity information. For the participants who don't have this telemetry (typically consumers), it is recovered on a nominal basis of load consumed.
- For contingency FCAS, the raise costs are apportioned amongst generators and the lower costs are apportioned amongst loads.

Under the final rule, DRSPs would not be subject to FCAS cost recovery processes. Based on advice from AEMO and discussions with stakeholders about the complexity associated with incorporating DRSPs into FCAS cost recovery, the Commission has retained the draft position as it considers that the costs of doing so would outweigh the associated benefits. In addition, AEMO has other tools under the final rule to incentivise DRSPs to comply with dispatch

²⁶¹ Clause 3.8.3(f) of the final rule.

targets and manage non-compliance. The reasons for excluding DRSPs from FCAS cost recovery are discussed further below.

The exclusion of DRSPs from FCAS cost recovery will be examined in the AEMC's review of the operation of the wholesale demand response mechanism.

Regulation FCAS costs

Under the first draft rule, contribution factors would have been determined for DRSPs in the dispatch intervals in which they were instructed to provide wholesale demand response and these would have been used to determine the contribution DRSPs would make to regulation FCAS costs.

However, the determination of contribution factors for scheduled participants relies on four second data conveyed via SCADA systems.²⁶² The final rule does not specify the granularity with which DRSPs must provide data to AEMO. The reasons for this are discussed in appendix d.5.4. Consequently, the current method for determining contribution factors is unlikely to be workable for DRSPs.

AEMO have also noted that including DRSPs in causer pays would require significant changes to the causer pays process. In its submission to the first draft determination, AEMO noted that adding causer pays to the settlement arrangements will add cost and complexity to AEMO's settlements system implementation. This is because AEMO would expect to receive data from DRSPs in a different granularity to the information it receives from other market participants.

Given it is unclear how much demand response would be provided through the mechanism, and what the impact of this demand response would be on power system frequency, the final rule does not require contribution factors to be determined for DRSPs.

The Commission notes that if there are significant quantities of wholesale demand response being provided by DRSPs in the future, it will be necessary to revisit the application of causer pays.

A number of stakeholder raised concern regarding the exclusion of DRSPs from causer pays. However, including DRSPs in the causer pays mechanism would have high implementation costs with an unclear level of benefits. As such, the Commission intends to review FCAS cost recovery from DRSPs in its review of the mechanism.

Contingency raise costs

Broadly, contingency raise costs are recovered from supply and contingency lower costs are recovered from customers.

Under the final rule, DRSPs will be not required to pay contingency raise costs.

In its submission to the first draft determination, and in subsequent discussions with the AEMC, AEMO has suggested that there is a low likelihood of a wholesale demand response

²⁶² AEMO's causer pays procedure is available here: <https://www.aemo.com.au/Stakeholder-Consultation/Consultations/Causer-Pays-Procedure-Consultation>

unit resulting in a low frequency event (and hence triggering the need to use contingency raise FCAS). As such, these costs should not be recovered from these loads.

The Commission agrees that wholesale demand response units are unlikely to cause low frequency events. AEMO has also advised that excluding DRSPs from the recovery of contingency raise costs will reduce the implementation costs of the mechanism, as this will allow the settlement process for DRSPs to be undertaken separately from settlement for other market participants, thereby reducing the scope of the changes required to AEMO's systems. Given that the benefits of including DRSPs in the recovery of contingency raise costs are considered to be relatively minor, the Commission has determined to exclude DRSPs from this process under the final rule. In addition, the Commission notes that the consumers comprising a wholesale demand response unit already indirectly pay for contingency FCAS costs through their retailer who would be a Market Customer. Therefore, having DRSPs pay for contingency FCAS costs could result in an over-allocation of FCAS contingency costs to customers participating in demand response.

D.5.11 **Clause 4.8.9 directions for DRSPs**

Under the final rule, DRSPs will not be able to be directed under clause 4.8.9 of the NER. The Commission considers that the provisions relating to directions do not provide a DRSP with reasonable grounds to not respond to a direction. For example, if the DRSP had not capacity to provide a response, the NER would not necessarily accommodate this as a reason for not responding to a direction.

The Commission notes that under the final rule, AEMO is able to issue a direction under clause 4.8.9 of the NER to a DRSP in respect of ancillary services load. This is consistent with the arrangements for directing MASPs.

AEMO is also able to issue a clause 4.8.9 instruction to a DRSP in respect of its wholesale demand response unit.

D.5.12 **Information provision to participants in real time**

More information would be provided to retailers

Under the final rule, retailers would have access to information about which NMIs had a relationship with a DRSP and which baseline methodology was being used for that NMI. However, there would be no real time information on whether a DRSP was being dispatched, or what the baseline at that point in time would be.

In submissions to the second draft determination, a number of retailers sought greater levels of information to assist them in managing their exposure in the wholesale market at the baseline level. That is, to be able to know their real time liability in the wholesale market, as well as being able to manage this by adjusting their contracting position, when demand response is being provided by their customers.

The Commission agrees that retailers face uncertainty regarding their wholesale market exposure when their customers are participating in wholesale demand response through the mechanism. This uncertainty will be difficult to manage without more information.

However, it is also noted that in the times where demand response is likely to be provided through the mechanism, there is likely to be a strong incentive on the retailer to minimise its net buying position in the wholesale market. That is, a retailer should be incentivised to increase output of any generation assets or undertake its own demand response.

As such, knowing the baseline in real time, while it would provide the retailer with more information, may not result in a retailer undertaking different actions. In addition, AEMO will not determine baselines in real time as it only uses baselines for settlement ex-post. Having AEMO determine baselines in real time would result in significantly higher implementation costs.

To address the above, the final rule provides retailers with a greater level of information without providing them with the actual baselines used in real time. Retailers will know which NMIs (for which they are the FRMP) are being dispatched to provide wholesale demand response. AEMO is required to provide this information to the FRMP.²⁶³ By being provided with this information, retailers should be better able to manage their exposure in the wholesale market.

The final rule also made clear that this notification should be provided to retailers as close to dispatch as practicable, and only when the wholesale demand response unit has been instructed to provide a response.

Final rule does not provide more information to network service providers

A number of network service providers submitted that DNSPs should be provided with more information regarding the provision of demand response in their networks. It was noted that the provision of wholesale demand response could impact on the ability for DNSPs to meet their network service obligations.

The Commission understands that NSPs would like access to this information to:

- operate their network such that they meet their network service obligations
- effectively plan their network accounting for the potential for wholesale demand response to impact on the timing and magnitude of factors such as peak demand.

The Commission agrees that it is important for DNSPs to have sufficient information to allow them to provide network services. DNSPs are likely to need more information about the timing, location and capacity of demand side participation. This information will be necessary to manage the planning and operation of these networks.

However, the Commission does not consider the following should be provided through the mechanism to assist with the operation of distribution networks:

- the notification to the FRMP: under the final rule, this notification is provided to a FRMP when a NMI that it is responsible for, is dispatched to provide wholesale demand response. This notification does not specify the quantum of demand response to be provided. Therefore, this notification does not indicate when a specific NMI will respond

²⁶³ Clause 3.8.21(n) of the final rule.

or whether another NMI in the same aggregation will be responsible for providing the response.

- historical information on the amount of wholesale demand response provided: this information on the specific location of where wholesale demand response was provided is not made available to market participants.

The final rule provides DNSPs with information on which NMIs are engaging in wholesale demand response. DNSPs also have access to metering data for the NMIs on its network. The Commission considers this would allow a DNSP to assess which customers on its network are providing demand response and their consumption profiles. This can assist DNSP decisions in planning their network to account for wholesale demand response provided through the mechanism.

DNSPs also have options available to them to manage operational challenges associated with the provision of wholesale demand response. This includes any commercial agreements with the large customers connected to their networks. DNSPs can enter into commercial arrangements with these large demand responsive customers to help the DNSP in the provision of their network services.

Until it becomes apparent how much wholesale demand response is provided through the mechanism, it is not clear whether additional information regarding its dispatch would meaningfully improve DNSPs ability to operate their networks. Also, given the significant development of wholesale demand response offers outside the mechanism, the Commission considers information provision to DNSPs regarding demand side participation should be considered more broadly. For example, customers who have elected to take spot price exposure are strongly incentivised to change consumption in response to wholesale prices.

Over time, the Commission considers the wholesale market should move towards a two-sided market. This two-sided market would likely mean greater amounts of information are provided to the market. The development of a two-sided market should consider the appropriate avenues for providing DNSPs with the appropriate information to manage their networks.

The Commission notes that there is a broader issue regarding the information that DNSPs will need to plan and operate their networks with greater uptake of DER and digitalisation and this should be considered holistically.

E INFORMATION TO BE PROVIDED BY DRSPS

E.1 Overview

This appendix discusses the requirements regarding the information DRSPs must provide to AEMO for the purposes of AEMO's information processes and forecasting. Information provision requirements relating to other types of demand response (i.e. non-mechanism wholesale demand response) for which information must be provided to the Demand Side Participation (DSP) portal are discussed in appendix H.

Increasing the transparency of wholesale demand response in the NEM was identified as one of the key benefits of this rule change by the rule proponents. Increased transparency contributes to the efficient operation and management of the wholesale electricity market by providing more information to the system operator and participants, so that investment and operational decisions can be better informed. This would also allow AEMO to better forecast demand and supply, as well as power flows across the system.

To facilitate this, the Commission considers that DRSPs should generally be subject to the same information provision requirements as existing market participants, unless a particular requirement is not appropriate or necessary to apply to DRSPs.

The remainder of this appendix outlines:

- information provision requirements under the NER
- stakeholders' views on the information provision requirements for DRSPs set out in the second draft rule
- the Commission's analysis and conclusions relating to information provision under the final rule.

E.2 Background

Provision of information by market participants and AEMO is critical to reliability outcomes in the NEM, as it allows market participants, the system operator, regulators and policy-makers to make better-informed decisions. The role of forecasts is particularly important. Forecasts provide market participants and AEMO with the best information available at any given moment in time to inform decisions they need to make in the present.

Some forecasting is done by AEMO, while some is done by participants themselves. AEMO provides a range of forecasts to the market of metrics such as demand, supply and price, which cover a range of time frames. These are based on its own analysis, as well as information provided by participants as inputs to its processes.

Participants, including generators, retailers and network businesses, also do their own forecasting, based on their own view of the future and their market position. The outcomes from participant forecasting activities feed into their investment and operational decisions, as well as the information that they provide continually to AEMO for its forecasting purposes.

Some of AEMO's key publications and information processes, which are informed by information provided to it by market participants, include:

- Pre-dispatch schedules – forecasts 30-minute pre-dispatch data by region to the end of the next market day, which is updated half hourly and also includes a 5-minute pre-dispatch which forecasts one hour ahead.
- Projected Assessment of System Adequacy (PASA) – projects whether there will be a balance of supply and demand for different forward intervals:
 - The short-term PASA forecasts the supply-demand balance for six days following the next trading day. This report is published every two hours and provides information for each half-hour within the reporting period.
 - The medium-term PASA forecasts the supply-demand balance for the next two years.²⁶⁴ This report is published weekly and provides information for each day within the reporting period.
- Energy Adequacy Assessment Projection (EAAP) – provides information on the impact of potential energy constraints, particularly those relating to inputs to production (for example, water shortages or constraints on fuel supply) or energy availability. This report is published annually.
- Electricity Statement of Opportunities (ESOO) – projects whether there will be adequate supply of electricity over a ten year-period based on existing and committed generation capacity. This report is published annually.

The purpose of these forms of supplementary information is to inform the market of prevailing and expected conditions, and when reserves may be running low, entice a market response, if possible. For example, if the ESOO identifies a potential shortage of generation in a location in, say, five years' time, the expectation is that revealing this information to the market will prompt new investment to alleviate that problem. In a similar vein, AEMO's first step when publishing a low reserve condition or lack of reserve notice is to seek a market response, for example, ideally, generators will come online in anticipation of the high spot prices that are likely to prevail during the identified period.

Market participants are also required to provide demand side participation information to AEMO in accordance with the demand side participation information guidelines. This information is recorded by AEMO in its DSP Portal. Changes made by the final rule to strengthen the role of the DSP Portal in increasing the transparency of demand response in the NEM are discussed further in appendix H.

E.3 Stakeholder comments

A number of stakeholders commented in submissions to the second draft determination on the provision of information to AEMO by DRSPs participating in a wholesale demand response mechanism.

Relevant stakeholder comments included the following:

²⁶⁴ In February 2020 the AEMC published a final rule in response to a rule change request from ERM Power in relation to the MT PASA forecast period. The final rule extends the period for which information on generator availability is provided under MT PASA from two years to three years. The final determination and final rule are available at <https://www.aemc.gov.au/rule-changes/improving-transparency-and-extending-duration-mt-pasa>.

- A number of stakeholders objected to the proposal that DRSPs not be required to provide information to AEMO for the purposes of MT PASA, citing the objective of seeking to treat DRSPs in the same way as scheduled generators.²⁶⁵ Some stakeholders suggested that AEMO should be required to include an estimate of how much wholesale demand response will be available in MT PASA, so that all market participants can factor that into their own plans and forecasts.²⁶⁶
- CS Energy suggested that DRSPs should be subject to similar information provision obligations as generators in relation to the EAAP, as large loads often depend on externalities such as supply chain costs and fuel costs.²⁶⁷ CS Energy also submitted that utilising information about wholesale demand response from the Demand Side Participation Portal is not adequate when participants rely on information in PASA to make decisions.²⁶⁸
- Enel X sought assurance that DRSPs would not be penalised if there were legitimate reasons for any information provided for the purpose of the ESOO turning out to be incorrect.²⁶⁹ Enel X also requested clarity on whether a DRSP's inputs to this process would relate to existing, contracted capacity only, or is expected to also include the DRSP's projections of the amount of additional demand response capacity it expects to contract with over the forecast period.²⁷⁰
- Origin Energy noted that it is supportive of ensuring DRSPs are required to provide information relating to the availability of wholesale demand response over timeframes beyond ST PASA.²⁷¹ Origin also expressed support for requiring AEMO to publish:
 - information relating to the volumes and types of demand response reported through the DSP Portal; and
 - an annual report relating specifically to DRSP-led wholesale demand response.

E.4 Commission's analysis and conclusions

BOX 7: INFORMATION PROVISION UNDER THE FINAL RULE

The final rule:

- requires DRSPs to provide information relating to the availability of wholesale demand response over various timeframes to AEMO for the purposes of pre-dispatch, the DSP portal, ESOO and ST PASA, in accordance with the existing requirements imposed on market participants

265 Submissions to second draft determination: AEC, p. 2; CS Energy, p. 7; Energy Queensland, p. 8; ENGIE, p. 2; Infigen Energy, p. 2.

266 Submissions to second draft determination: ENGIE, p. 2; ERM Power, p. 3.

267 CS Energy, submission to second draft determination, p. 7.

268 Ibid, p. 9.

269 Enel X, submission to second draft determination, p. 6.

270 Ibid, p. 6.

271 Origin Energy, submission to the second draft determination, p. 1.

- does not require DRSPs to provide information to AEMO as an input to the EAAP, as the information currently provided by generators for this purpose is not considered to be relevant to wholesale demand response
- does not require DRSPs to provide information to AEMO as an input to MT PASA, as the information DRSPs would be able to provide for this purpose would be of limited utility and would involve additional implementation costs for AEMO and market participants.

There are no material changes between the second draft rule and the final rule in relation to information provided by DRSPs.

Benefits of the final rule

Requiring DRSPs to provide the relevant information to AEMO will increase the transparency of the level and availability of wholesale demand response in the NEM. AEMO can utilise this information to develop more accurate forecasts of the demand-supply balance, which would result in more efficient operational and investment decisions by AEMO and market participants.

The Commission considers that, as a general principle, the existing information provision requirements currently imposed on other scheduled participants should also apply to DRSPs to the extent possible. The Commission acknowledges that some stakeholders have queried the utility of requiring DRSPs to provide certain information to AEMO. Extending these obligations to DRSPs is consistent with the market design principles in the NER which aim to increase the level of market transparency in the interests of achieving a very high degree of market efficiency and to avoid the special treatment of any particular technology.²⁷² Nevertheless, it is appropriate that these requirements be modified as necessary to account for the differences in the characteristics and operations of DRSPs as compared to other market participants.

AEMO's information processes and the inputs currently associated with them are summarised in Table E.1. This table is not an exhaustive list of all the information published by AEMO but highlights the main variables and outputs for each process and document.

²⁷² NER clause 3.1.4(a).

Table E.1: AEMO's information processes under existing framework

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
Forecast timeframe	Ten years NER clause 3.13.3A(a)	Two years NER rule 3.7C(b)(1)	Two years, extended to three years for generator availability NER clause 3.7.2(a)	Six days NER clause 3.7.3(b)	One day NER clauses 3.13.4(e), 3.8.20(a) Note: AEMO also publishes a five-minute pre-dispatch schedule
Frequency of publication	Annually (by 31 August) NER clause 3.13.3A(a)	At least annually NER rules 3.7C(b)(2) and 3.7C(d) Note: clause 3.9.3D(b1) requires the Reliability Standard Implementation Guidelines (RSIG) to set out the factors AEMO will consider in determining whether it has an obligation to publish an EAAP under rule 3.7C(d)(2)	Weekly NER clauses 3.7.2(a) and 3.13.4(a)	Two-hourly Note: clause 3.7.3(a) requires publication at least daily, but AEMO publishes it every two hours	30 minutes Note: clause 3.8.20(a) requires a pre-dispatch schedule covering each trading interval
Resolution of forecast	Annually	30-minute traces	Daily NER clause 3.7.2(a)	30 minutes Note: NER clause	30 minutes Note: NER clause

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
				3.13.4(c) requires publication of outputs of ST PASA for each trading interval	3.8.20(b) requires the pre-dispatch process to have a resolution of one trading interval
Purpose	Provides technical and market data that informs the decision-making processes of existing and potential market participants, as they assess opportunities in the NEM over a 10-year outlook period. NER clause 3.13.3A(a)(9)	Provides analysis to market participants and other interested persons that quantifies the impact of energy constraints on energy availability over the 24-month period, such as water storages during drought conditions or constraints on fuel supply for thermal generation, or supply adequacy in the NEM. NER rule 3.7C(a)	Provides analysis of power system security and reliability of supply prospects to inform participants and enable them to make decisions about supply, demand and transmission network outages in respect of periods up to three years in advance. NER clause 3.7.1(b)	Provides analysis of power system security and reliability of supply prospects to inform participants and enable them to make decisions about supply, demand and transmission network outages in respect of a six day half-hourly reserve outlook. NER clause 3.7.1(b)	Provides projections of the prices and generation dispatch based on market participants' bids and offers, and AEMO forecasts of demand and other system conditions. NER clause 3.13.4(f)
Information provided by participants under current framework <i>(italicised text indicates that this is a NER requirement)</i>	Participant surveys. Capacity based on evidence of project status (existing, committed etc) <i>Participants must provide required</i>	<i>Generator must provide updated Generator Energy Limitation Framework (GELF) if there has been a material change that impacts the energy</i>	<i>Generators must provide information regarding unit availability for each day and weekly energy constraints to AEMO in accordance with the</i>	<i>Participants must update AEMO of any changes in generator availability in relation to the ST PASA as soon as they occur.</i> NER clause 3.7.3(e)	A generator must not make a dispatch offer that is false, misleading or likely to mislead. This includes if it: 1) does not have a

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
	<p><i>information to AEMO as soon as practicable after participant becomes aware of a material change to any information required for publication by AEMO.</i></p> <p>NER clause 3.13.3A(f)</p>	<p><i>constraints associated with that GELF.</i></p> <p>NER rule 3.7C(i)</p>	<p><i>timetable published by AEMO.</i></p> <p>Generators must update AEMO of any changes in generator availability in relation to the MT PASA as soon as they occur. This will be based on planned / actual outage profile.</p> <p>NER clause 3.7.2(d)</p>	<p>Participants will monitor and update near term availability and capability based on latest plant and weather conditions.</p>	<p>genuine intention to honour the offer, or</p> <p>2) does not have a reasonable basis to make it.</p> <p>NER clauses 3.8.22A(a) and (b)</p> <p>Re-bidding is required when the participant becomes aware of changes to the basis of the offer.</p> <p>NER clause 3.8.22A(d)</p> <p>Participants must ensure that they are able to dispatch relevant plant required under the schedule.</p> <p>NER clause 3.8.20(g)</p>

Table E.2 sets out how the existing information provision requirements imposed on market participants will apply to DRSPs under the final rule. AEMO will also be required to publish the relevant information in accordance with existing processes and timeframes in the NER. This is reflected in the final rule.

Table E.2: Application of existing information processes to DRSPs under final rule

ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
Requirements applying to DRSPs under final rule				
<p>DRSPs would be subject to the same information provision requirement as generators.</p> <p>This is a high-level obligation and it is reasonable to expect that DRSPs will be able to comply with this requirement.</p> <p>DRSPs would be required to provide the information requested by AEMO, which may include current contracted capacity of demand response and/or projected future capacity.</p> <p>DRSPs' obligations with respect to this information would be consistent with those of generators, namely to ensure the information:</p> <ul style="list-style-type: none"> • is not false or misleading • is prepared in accordance with good electricity industry 	<p>The existing requirement on scheduled generators to submit GELF declarations to AEMO does not apply to DRSPs under the final rule.</p> <p>The purpose of these declarations is to support the calculation of energy restricted business scenarios relating primarily to water shortages and other restrictions on fuel supply for large generators.¹</p> <p>This is not considered to be relevant to demand response, as loads generally do not face the same fuel input constraints as traditional generators. Where loads</p>	<p>The existing requirement on scheduled generators to submit information to AEMO for the purposes of MT PASA does not apply to DRSPs under the final rule.</p> <p>The Commission understands that it would be difficult to forecast the availability of a load or groups of load to provide demand response over a multi-year timeframe with a high degree of accuracy.²</p> <p>In addition, AEMO has submitted that this information would be of limited utility for the purposes of its demand forecasts.</p> <p>AEMO has also advised that requiring DRSPs to</p>	<p>DRSPs are subject to the same information provision requirement as generators.</p> <p>It is expected that DRSPs will be able to forecast their demand response availability over the relevant timeframe with a reasonable degree of accuracy.</p> <p>The Commission understands that AEMO is currently considering broader changes to ST PASA procedures and systems in</p>	<p>Refer to appendix D for details on scheduling requirements.</p>

ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
<p>practice</p> <ul style="list-style-type: none"> represents their current intentions and best estimates. 	<p>do depend on fuel or other supply chain inputs, constraints on these inputs would not necessarily directly impact on the load's ability to provide wholesale demand response.</p>	<p>participate in MT PASA would involve substantial systems changes and associated implementation costs.</p> <p>The Commission considers that it would still be useful for this information to be captured in some form in a cost-effective manner. Accordingly, the final rule requires DRSPs to submit information on wholesale demand response over longer timeframes through the DSP Portal. This is discussed further in appendix h.</p>	<p>response to a range of changes in the market. As discussed in appendix e.3, AEMO has indicated that any such changes to ST PASA will include modifications to accommodate information provided by DRSPs.</p> <p>Given that wholesale demand response will be treated similarly to scheduled loads for the purposes of dispatch under the final rule, the Commission considers that AEMO's existing</p>	

ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
			<p>obligations to publish information relating to load forecasts (adjusted to make allowance for scheduled loads and wholesale demand response) for the purposes of ST PASA would sufficiently capture information on wholesale demand response. As such, the final rule does not include specific ST PASA reporting requirements relating to wholesale demand response.</p> <p>However, the Commission expects that information published by AEMO</p>	

ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
			for the purposes of ST PASA would sufficiently distinguish between wholesale demand response and scheduled loads in order to provide clarity to participants on the levels of wholesale demand response participating in the market over the period covered by ST PASA.	
Do the information provision requirements applying to DRSPs differ from those for generators?				
No – the requirements applying to DRSPs will be the same in principle as those currently imposed on generators. ³	Yes – the requirements currently imposed on generators do not apply to DRSPs under the final rule for the reasons discussed above.	Yes – the requirements currently imposed on generators do not apply to DRSPs under the final rule for the reasons discussed above.	No – the requirements applying to DRSPs will be the same in principle as those currently imposed on generators. ⁴ Although DRSPs have to provide similar information	Refer to appendix D for details on scheduling requirements.

ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
			<p>as generators in ST PASA, AEMO is not required to report that information in the same way as it reports generator information for the reasons discussed above.</p> <p>AEMO's ST PASA Process Description will also require amendment to clarify the specific processes which will apply to DRSPs.</p> <p>Equivalents to relevant terms such as "energy constrained scheduled generating unit" have been developed for demand response.⁵</p>	

Rule determination

Wholesale demand response mechanism
11 June 2020

1. AEMO, *Guide to Generator Energy Limitation Framework (GELF) Declarations: Energy Adequacy Assessment Projection (EAAP)*, May 2014. Available at: http://www.aemo.com.au/-/media/Files/PDF/Guide_to_GELF_Declarations_2014_July.pdf.
2. The Commission's final determination on the rule change request submitted by ERM Power in relation to MT PASA, published on 20 February 2020, imposes a requirement that MT PASA inputs meet the standards of ST PASA (i.e. that information provided to AEMO must represent the market participant's 'current intentions and best estimates'). Available at: <https://www.aemc.gov.au/rule-changes/improving-transparency-and-extending-duration-mt-pasa>.
3. Clause 3.13.3A of the final rule.
4. Clause 3.7.3 of the final rule.
5. Chapter 10 of the final rule - see new definitions of "wholesale demand response unit" and "wholesale demand response constraint".

F DETERMINATION OF BASELINES

F.1 Overview

The final rule sets up a process for determining a baseline for wholesale demand response that participates in the wholesale demand response mechanism.

Baselines are an estimate of the counter-factual level of consumption that would have occurred were it not for the demand response. They are necessary to allow demand response providers to sell demand response directly into the wholesale market – because the quantity of demand response sold (and paid for) is determined as the difference between the baseline and actual levels of consumption.

In summary the final rule:

- requires AEMO, in consultation with stakeholders, to develop wholesale demand response guidelines. These guidelines will set out, among other things:
 - information about the process for development of baseline methodologies, including how proposals for new baseline methodologies may be made
 - the process for a DRSP to apply to AEMO for approval to apply a baseline methodology to a wholesale demand response unit (a step in the classification of a load as a wholesale demand response unit)
- requires AEMO to develop arrangements for the regular testing of baselines to assess baseline compliance
- requires AEMO to monitor and report on the baseline methodologies used under the demand response mechanism.

DRSPs would be required to demonstrate compliance with the requirements set out in AEMO's guidelines in relation to baseline methodologies in order to classify loads as wholesale demand response units. DRSPs would also need to be able to demonstrate compliance on an ongoing basis.

The framework captures the benefits of having a central body determining the baseline while also allowing for innovative approaches to be developed over time but in such a way that minimises costs.

This appendix provides more detail on the role for baselines in the demand response mechanism. It sets out:

- an overview of baselines in the final rule
- background on the role for baselines in a wholesale demand response mechanism
- a summary of relevant views from the proponents
- a summary of relevant stakeholder comments
- the Commission's analysis and conclusions.

F.2 Background

This section provides more information on why the final rule sets up a framework for centrally determining baselines.

F.2.1 What are baselines?

A baseline is an estimate of expected behaviour that would otherwise have occurred were it not for some event. It is similar to a forecast in many ways. The key difference between a baseline and a forecast is that a baseline attempts to isolate and discount the effect of a particular variable. A forecast of consumption would try to account for the variation in load over the forecast period. When setting a baseline for demand response, it is trying to show 'what would demand have been in the absence of any demand response to a particular signal.'

For most consumers, determining a baseline for demand response would mean trying to assess what their consumption would be under their existing retail contracts in the absence of a signal to change their consumption.

Baselines are typically calculated by looking at historical consumption and using that to predict future consumption. Different weightings are given to different historic time periods. For example, some methodologies place more weighting on the level of consumption closer to the time when wholesale demand response has been dispatched, and so when the baseline will be calculated.

For wholesale demand response, at a high-level there can be considered to be four different approaches to setting and settling the baseline. The approaches are differentiated by two factors:

1. whether they are set by a central body or by agreement between the buyer and seller of the demand response
2. whether they are settled through the centralised market settlements or settled outside the market.

These are set out in the table below.

Table F.1: Four approaches to setting and applying baselines

	CENTRALISED SETTLEMENT	DECENTRALISED SETTLEMENT
Centrally set baseline methodologies	Centralised wholesale demand response mechanisms. Baselines of this nature are introduced under the final rule.	The baseline methodology would be centrally determined. The price paid for the demand response would be settled out of the market.
Decentrally set baselines	Centrally administered settlement, with the	There would be no central approach to determining or settling

	CENTRALISED SETTLEMENT	DECENTRALISED SETTLEMENT
	methodology for the baseline agreed between two participants.	baselines. This is how out of market wholesale demand response currently occurs.

F.2.2

What makes a good baseline?

A 'good' baseline has a number of qualities or attributes:

- Accurate under a range of conditions
- Does not display a consistent error or bias
- Not susceptible to manipulation
- Adaptable to changes in consumer characteristics.

When developing a baseline methodology, the aim is to deliver baselines characterised by the above qualities.

Below, each of these characteristics of baselines are discussed in more detail.

Accuracy

The accuracy of a baseline refers to how well it is able to predict the counter-factual level of consumption. This relates to any single instance of demand response, and the average over time. An accurate baseline would have little or no difference from the actual consumption when demand response is not being provided.

This section discusses challenges associated with:

- Setting an accurate baseline
- Measuring the accuracy of a baseline

It also discusses issues that arise if the baseline is inaccurate.

Challenges with setting an accurate baseline

The challenges with setting an accurate baseline are similar to the challenges with forecasting. A baseline needs to account for a wide range of variables that might influence consumption decisions, including but not limited to:

- the day of the week
- the air temperature
- any seasonal variations
- changes in operational patterns, such as the installation of new machines
- increased night time operation due to increased production schedules
- availability of other resources including staff or raw materials for making widgets.

Since there are many factors that may influence consumption, inevitably the consumer is likely to be best placed to know the baseline. However, any party (including the consumer)

trying to estimate the baseline will not know precisely what the level of consumption would be in the absence of demand response. Estimating the baseline would be easier when a party shares incentives with the consumers, such as an aggregator representing the consumer, as aligned incentives can help with overcoming information asymmetry.

Models of a customer's behaviour, based on that consumer's previous behaviour and/or the behaviour of similar consumers, can attempt to explain the variation in consumption of electricity and predict future consumption. However, in much the same manner that forecasts will never be perfect, these models will never be able to fully account for fluctuations in consumption.

Challenges with measuring the accuracy of a baseline

Because a baseline is not observed but rather is a counter-factual, it cannot be directly quantitatively measured for accuracy when the demand response occurs. This is unlike a forecast, which can be directly compared to actual consumption over the forecast period.

Instead, baseline methodologies can be tested to see whether they produce accurate results at those times when demand response does *not* happen, by comparing the baseline against the consumer's actual historic consumption or the actual historic consumption of a similar consumer or group of consumers with no demand response arrangements.

This makes it difficult for any party to retrospectively assess whether demand response was appropriately quantified or not.

Consequences of inaccurate baselines

When a baseline is "wrong" (i.e. it does not reflect what the consumer's electricity use would have been in the absence of demand response), it means that the quantity of demand response that was accounted for will be wrong. If the baseline is too high, the amount of demand response will be overestimated. If the baseline is too low, the amount of demand response will be underestimated. As a result, either too much or too little value relating to demand response will be transferred from the buyer to the seller of demand response. This will result in the DRSP either being paid for more demand response than was provided, or being underpaid for the quantity provided.

In a single instance, if the baseline is wrong, the demand response will either be over or undervalued. However, if the baseline is correct *on average* when wholesale demand response is being dispatched,²⁷³ over time, then the fair value for the demand response should be exchanged between the retailer and the demand response provider. If it is correct on average, the over- and under-valuation of the demand response should cancel out over time.

So, while in the short-term, the value attributed to demand response through settlements may be incorrect, the distortionary impacts should be at least partially mitigated in the medium-term if the average error in the baseline is zero. This effect is demonstrated when using baselines for aggregated portfolios.

²⁷³ That is, the average amount that the baseline methodology over or under-estimates the demand response quantity

Bias

Bias refers to whether the baseline is consistently too high, or too low. This could be the case, for example, if the baseline methodology did not account for temperature and the baseline was typically utilised on days with elevated temperatures.

When the baseline is biased, it results in either the buyer or seller of demand response being overcharged or underpaid. It is important that there is confidence that a baseline methodology is consistent and unbiased - to the extent that it has a systemic bias, there are likely to be winners and losers. Under a centrally settled baseline, this would result in distortionary costs being imposed on the market.

The distortionary costs arising under a biased, centrally settled baseline would be imposed on the party suffering the bias which will subsequently result in broader inefficiencies. Either the demand response provider will be consistently undervalued and consequently, will not provide demand response under all circumstances where it would be efficient. Alternatively, the retailer will be consistently over-charged for demand response that did not in reality occur. These costs will need to be recovered from the retailer's consumers and represent a cost to the retailer (and ultimately consumers).

Participant influence over baseline

A tendency for a baseline to be either too high or too low may also be the result of the buyer or seller of the demand response having the ability to influence the setting of the baseline in a manner which is not economically efficient for consumers as a whole.

When participating in a wholesale demand response mechanism, participants would be economically incentivised to maximise the amount earned through the arrangement or mechanism. Under the mechanism, the customer and the DRSP both have influence over the baseline since this is determined based on the actions of the consumer. Increasing the baseline provides an opportunity for a demand response provider to increase the quantity of demand response it is credited for without necessarily physically undertaking that demand response. Similarly, decreasing the baseline provides an opportunity for a buyer of demand response (i.e. a retailer) to pay for less demand response than was provided. This could occur if:

- The seller or buyer of the demand response has the ability to artificially inflate/deflate the baseline. Depending on the methodology for determining the baseline, it is possible that the seller of demand response would have the opportunity to 'inflate' the baseline such that, when the demand response was dispatched, the baseline was artificially high. For example, this opportunity could arise if the baseline is determined based on recent past (at the time of the demand response event) consumption. Parties may inflate their consumption in the lead up to a demand response event, if it was not too expensive for them to do so. This would result in the demand response provider being credited for a greater amount of demand response than actually occurred – and distort consumption behaviour. The opposite could occur if a buyer has influence over the baseline; however, in practice it is likely to be more challenging for the buyer to manipulate the baseline.

- The seller of demand response could observe the inaccuracy in the baseline and use this to inform commitment decisions. For example, the seller could elect to provide demand response when the baseline was inaccurate and overestimating expected consumption. If this was possible, the seller would be more likely to provide demand response when the baseline was *inaccurately high*. Conversely, it would be less likely to undertake wholesale demand response when the baseline was *inaccurately low*. As such, while a backward looking assessment of the baseline methodology itself may have found it to be unbiased, the seller of demand response may take advantage of the errors in the baseline by favouring demand response at those specific times that the baseline was favourable (incorrectly high). This would result in additional, inefficient costs being imposed on the retailer.

Some baselines may be more robust to opportunities for participants to influence them. For example, if a baseline was reliant on an extensive catalogue of consumption history, it would be difficult for a consumer to undertake short term measures to inflate the baseline. However, the downside of such an approach would be that the baseline would likely become increasingly inaccurate if it did not reflect the natural variations in a consumer's load profile occurring closer to real time. There is therefore a trade-off between basing the baseline on recent data (which is more easily manipulated) and long term data (which is more likely to be inaccurate when applied to any specific short time interval).

Robustness and/or flexibility

A baseline should also be able to account for changes in the nature of the load being baselined. That is, a baseline methodology should remain accurate and unbiased following changes to the consumption i.e. errors should remain as close to zero as possible.

A baseline could be made more robust by:

- regularly revising or updating the methodology
- requiring participating consumers to advise of changes to typical operation or consumption.

In addition, different methodologies could be applied for different loads. For example, if a consumer installed rooftop PV, it could be transferred from one methodology to another that better accounts for the addition of rooftop PV.

Summary

Determining good methodologies and baselines is challenging, although it may become easier over time as technology evolves and new approaches are developed. If it is done poorly, it will result in costs being imposed on consumers for a service that wasn't provided. The final rule seeks to address these risks through the measures set out in appendix f.5.1.

F.3

F.3.1

Proponents' views

PIAC, TEC and TAI

In its proposal, PIAC, TEC and TAI proposed changes to the NER relating to baselines and baseline methodologies should focus primarily on high level principles. Under their proposal,

there would be principles in the NER for AEMO, and potentially the AER, to decide on the details of the implementation via procedures and guidelines. These procedures and guidelines could be readily adapted as the mechanism matures in the market.

The baselines under the PIAC, TEC and TAI proposal would be centrally determined, and centrally settled. That is, they would be determined by AEMO and settled in central market settlements.

The rule change request also noted that the baseline methodologies should also be refined through AEMO and ARENA's 2017-2020 in-market demand response trials (which are discussed in chapter 4).²⁷⁴

F.3.2

AEC

In its proposal, the AEC noted that the register would not rely on theoretically determined baselines. The AEC considered that centralised determination of baseline methodologies would be unlikely to be applicable for many commercial and industrial loads, and especially for residential loads. Under the AEC proposal, baselines would be determined in a decentralised manner and would be settled outside of market settlements, between retailers and demand response aggregators.²⁷⁵

F.3.3

South Australian Government

In its proposal, the South Australian Government noted that setting a baseline would be a key consideration in introducing a wholesale demand response mechanism. The South Australian Government proposed that a set of high level principles pertaining to the baseline methodology should be established by the Commission, including that the methodology be:²⁷⁶

- flexible and capable of being changed over time
- consistent across participants
- limit opportunities for gaming
- be verifiable
- place risk on the parties best placed to manage the risk.

The baselines under the South Australian Government proposal would be centrally determined, and centrally settled.

The South Australian Government suggested that the establishing the methodology in a guideline rather than the NER may better enable flexibility.

F.4

Stakeholder comments

In submissions to the second draft determination, a number of stakeholders provided comment on the framework for establishing baseline methodologies and using them in crediting wholesale demand response.

²⁷⁴ PIAC, TEC, and TAI, *Wholesale demand response mechanism - rule change request*, p. 15.

²⁷⁵ AEC, *Wholesale demand response register mechanism - rule change request*, pp. 3-4.

²⁷⁶ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, pp. 6-7.

General

- **AGL** supported baseline methodology framework in the second draft rule. It is important that the baseline methodologies are put in place well in advance of the wholesale demand response mechanism go live date to ensure DRSPs can get their capacity ready for the commencement of the mechanism.²⁷⁷
- **Momentum Energy** was pleased that participants are not required to develop their own baseline methodologies.²⁷⁸
- **Snowy Hydro** noted that the baseline methodology metrics should be specific enough such that only loads with stable baselines are able to participate in the mechanism.²⁷⁹
- **Energy Queensland** noted that baseline inaccuracies under the mechanism will tend to favour the DRSPs at the expense of the customer's retailer. Energy Queensland therefore suggested that baselines should be conservative to minimise impacts on retailers. Further clarity is also required as to whether retailers will be reimbursed for inaccuracies in baselines identified ex-post.²⁸⁰

Abnormal baseline conditions

- **EnergyAustralia** suggested that the relevant retailer/FRMP should also be notified of a change of baseline for abnormal operation for load forecasting purposes. This provision also creates significant potential operational complexities for AEMO and arbitrage risks for other participants that have not been fully explored by the Commission. Much clearer guidelines and criteria should be established around these provisions and when they can be enacted.²⁸¹

Spot price exposure

- **AEMO** submitted that the second draft rule presumes that a wholesale demand response unit can be spot-price exposed at some times but not at others, requiring a DRSP to submit an available capacity of 0 MW at these times. AEMO considered this is unlikely and that spot price exposure is better managed by excluding any WDRU that has spot price exposure.²⁸²
- **CS Energy** noted that it was not clear how either the customer or the DRSP would be able to ascertain with certainty prior to the trading interval that no proportion of the consumption will be exposed to the spot price (unless the pricing mechanism was fixed for that trading interval).²⁸³ Further, CS Energy considered large customers with consumption significantly in excess of the upper consumption threshold to be limited in their ability to participate in demand response as many have spot price exposed loads.²⁸⁴

277 AGL, submission to second draft determination, p. 2.

278 Momentum Energy, submission to second draft determination, p. 2.

279 Snowy Hydro, submission to second draft determination, p. 9.

280 Energy Queensland, submission to second draft determination, p. 6.

281 EnergyAustralia, submission to second draft determination, p. 7.

282 AEMO, submission to second draft determination, p. 5.

283 CS Energy, submission to second draft determination, p. 5.

284 Ibid, p. 4.

- **ERM Power** supported the steps taken to ensure that customers exposed to the spot price are not able to participate in the demand response during periods in which they are exposed to the spot price. However, ERM Power considered it unclear how AEMO will be able to accurately assess this is the case if it relies purely on the customer and DRSP to provide AEMO with this information. We believe it should be relatively simple to allow for a FRMP to object to the classification of a NMI as a wholesale demand response unit if it is a pool price customer, or to flag with AEMO when pool price pass through arrangements are in place.²⁸⁵
- **ENGIE** supported excluding customers who have elected to take up a spot price pass-through retail contract.²⁸⁶

Additionality

- **Mondo** would support a rule which allows additionality to be determined based on the point in time at which a DRSP or customer decided to invest in the relevant demand response solution. Such a provision may simply allow a DRSP to register the timing of substantial investments intended to deliver capacity to the wholesale demand response mechanism.²⁸⁷
- **EnergyAustralia** considered it unclear how the second draft rule adequately addresses the opportunities for load shifting between multiple NMI sites. For example, a corporate entity could reduce commercial production, ergo electricity consumption, at one location and simultaneously increase productivity at another location owned by, or related to, the corporate entity.²⁸⁸

Alternative baseline methodologies

- **AEC** noted that it will be important that AEMO is open to alternative methodologies. The AEC suggested that it may be appropriate for the rules to consider some timeframes for AEMO to consider request for alternative methodologies.²⁸⁹
- **Enel X** raised concern that there is no onus on AEMO to consider alternative baseline methodologies. It suggested requiring AEMO to consult annually on alternative methodologies and justify a decision not to adopt a methodology.²⁹⁰

Baseline methodology metrics and compliance

- **CS Energy** asked for further clarification of the process for setting methodologies, review and testing needs to be given, including consideration of the following. Presently, AEMO determines the frequency of the testing of baselines. There needs to be firmer commitment on what the testing regime will be given that inaccurate, or deviations against, baselines will impact retailers. Given that retailers have the most experience with

285 ERM Power, submission to second draft determination, p. 3.

286 ENGIE, submission to second draft determination, p. 3.

287 Mondo, submission to second draft determination, p. 2.

288 EnergyAustralia, submission to second draft determination, p. 6.

289 AEC, submission to second draft determination, p. 2.

290 Enel X, submission to second draft determination, p. 7.

the customer's load, will provisions be made to allow retailers input on the development of specific baselines.²⁹¹

- **Energy Queensland** noted that careful consideration will be required to avoid opportunities for DRSPs (or customers) to game the wholesale demand response mechanism through inaccurate or manipulated baselines and be paid for providing demand response when demand response is not actually provided.²⁹²
- **Enel X** suggested periodic tests of baseline compliance, such as annually, against tolerances is the best approach. It also suggested the Commission look at international best practice to inform the appropriate tolerance for baseline compliance.²⁹³
- **EnergyAustralia** noted that the draft rule outlines requirements on DRSPs to keep records and the AER to develop guidelines that support the additionality obligations (that demand response can only be provided through this mechanism if it would not have otherwise happened). EnergyAustralia considered these provisions insufficient. It will be challenging to identify violations of this provision so random audits by the AER should be mandated.²⁹⁴

F.5 Commission's analysis and conclusions

BOX 8: BASELINES UNDER THE FINAL RULE

The final rule introduces a framework for determining baseline methodologies for demand response load. Under the mechanism:

AEMO will determine one or more initial baseline methodologies in consultation with stakeholders prior to the commencement of the mechanism, and additional methodologies, or additional baseline settings that may be applied to a methodology, may be developed over time

- AEMO will also set baseline methodology metrics in consultation with industry, setting the parameters for accuracy and bias of baselines

²⁹¹ CS Energy, submission to second draft determination, p. 6.

²⁹² Energy Queensland, submission to second draft determination, p. 5.

²⁹³ Enel X, submission to second draft determination, p. 8.

²⁹⁴ EnergyAustralia, submission to second draft determination, p. 8.

- wholesale demand response will be settled through the wholesale market ex post, with reference to the baseline.

The final rule:

- requires AEMO to determine one or more initial baseline methodologies
- requires AEMO to prepare baseline methodology metrics to assess whether a particular baseline methodology can sufficiently accurately predict a particular load's consumption. These metrics will be prepared in line with principles set out in the NER, and through the Rules consultation procedure.
- requires AEMO to establish arrangements for regular and systematic testing of demand response loads against the approved baseline methodologies, to determine whether the loads remain compliant with the metrics
- requires AEMO to prepare wholesale demand response guidelines, which will cover:
 - the process for a DRSP to apply to AEMO to have a baseline methodology applied to a wholesale demand response unit
 - any other information or requirements relating to the supply of wholesale demand response that AEMO considers appropriate.
- places an obligation on AEMO to annually report on outcomes relating to baselines used under the mechanism, including on potential changes to improve the accuracy and reduce the bias of these baselines over time.

There have been minimal changes made between the second draft and final rule, other than drafting clarifications. These clarification are explained in appendix B of this determination.

Benefits of the final rule

The framework for determining baselines under the final rule will:

- allow DRSPs to sell demand response into the wholesale market
- allow AEMO to develop an approach to centrally determining and settling baselines in consultation with stakeholders, which will allow more innovative approaches to be included over time, while minimising the costs to AEMO of allowing this to happen
- sets out a baseline compliance process that means only loads that can have accurate and unbiased baselines will be able to participate. This should minimise the impact of baseline

inaccuracy on the rest of the market and provide greater confidence that the demand response provided under the mechanism is real and additional.

This section is structured as follows:

- How the final rule addresses challenges with baselines
- AEMO to set baseline methodology metrics
- DRSP compliance with baseline methodology metrics
- Adjusting baselines under abnormal conditions
- Monitoring and reporting on outcomes relating to baselines
- Spot price exposed loads
- The treatment of additionality
- AER assessment of compliance.

F.5.1

How the final rule addresses challenges with baselines

As discussed in appendix f.2, there are a number of challenges that arise with having centrally determined and administered baselines.

The final rule seeks to address or mitigate these challenges by:

- Requiring AEMO to develop a series of baseline methodology metrics relating to accuracy and bias in consultation with stakeholders and informed by principles in the NER.²⁹⁵ This will allow broad stakeholder input into determining the appropriate baseline metrics that will minimise the impact of any baseline errors on the market and market participants.
- Placing obligations on AEMO to regularly test how well a baseline methodology applies to individual loads, as well as requiring DRSPs to use good electricity industry practice to identify wholesale demand response units that do not satisfy the baseline methodology metrics.²⁹⁶ If the baseline methodology does not produce a baseline that meets the baseline methodology metrics when applied to a wholesale demand response unit, that unit will not be able to provide wholesale demand response.²⁹⁷
- Placing obligations on AEMO to regularly report on outcomes relating to the use of baselines.²⁹⁸
- Placing obligations on AEMO to report on whether stakeholders have proposed alternate baseline methodologies and whether it is developing new methodologies.²⁹⁹
- Placing obligations on DRSPs not to provide wholesale demand response in respect of loads that are spot price exposed.³⁰⁰

²⁹⁵ Clauses 3.10.2 and 11.125.2(b) of the final rule.

²⁹⁶ Clauses 3.8.2A(f) and 3.10.2 of the final rule.

²⁹⁷ Clause 3.8.2A(c) of the final rule.

²⁹⁸ Clause 3.10.6(b) of the final rule.

²⁹⁹ Clause 3.10.6(b)(1) of the final rule.

³⁰⁰ Clause 3.8.2A(d) of the final rule.

- Placing obligations on the AER to enforce and provide guidelines in relation to the wholesale demand response mechanism. Under the final rule, DRSPs must not provide wholesale demand response that is not additional. That is, wholesale demand response should not be settled under this mechanism when it would have occurred anyway (for example, due to other incentives such as network payments). The AER is required to develop guidelines in accordance with the Rules consultation procedures providing guidance on the information a DRSP must keep regarding compliance with its obligations relating to additionality, and these guidelines may also include guidance on DRSP requirements relating to baseline compliance and spot price exposure.³⁰¹

The rest of this section provides more detail on the treatment of baselines under the final rule.

F.5.2 AEMO to set baseline methodologies

Rationale

Under the final rule, AEMO would be required to develop baseline methodology metrics and a register of baseline methodologies. This register would set out the baseline methodologies that will be used to determine the quantity of wholesale demand response provided by a DRSP.

The Commission considers that a decentralised approach to determining a baseline is preferable in terms of risk allocation. That is, when baselines are determined between two market participants outside of the NER, these parties can allocate the risks of baseline inaccuracy between them. However, allowing DRSPs to directly participate in the wholesale market requires a framework in the NER that allows for baselines to be centrally administered for wholesale settlement. As such, the final rule places an obligation on AEMO to determine baseline methodologies. Over time, the Commission considers the market framework should move towards a decentralised approach such as a two-sided market where baselines are not required to be centrally determined.

Developing baseline methodologies can be challenging and resource-consuming. In addition to allowing third parties to participate, there are economies of scale benefits realised by having AEMO determine baseline methodologies centrally. Having baseline methodologies centrally determined will reduce the costs of establishing baselines for wholesale settlement at the commencement of the mechanism relative to requiring individual DRSP to determine these methodologies. In addition, the Commission understands that the administrative costs imposed on AEMO to administer baselines are materially reduced when it develops the baselines itself as opposed to allowing DRSPs to do so.

The methodologies determined and published by AEMO will be able to be used by market participants providing demand response through means other than the mechanism. The mechanism and AEMO's guidelines will not impact on, or prevent commercial entities agreeing to, alternative baseline arrangements outside of the NER for non-scheduled

³⁰¹ Clause 3.8.2A(g) of the final rule.

wholesale demand response (for example, in contracts between a retailer and end-user for behavioural demand response).

The baseline methodologies produced by AEMO should produce consistent results.³⁰² This means that the baseline produced by the methodology should be able to be replicated by the DRSP (or by a retailer) using metering data and other inputs. Having consistent results provided by the methodologies allows DRSPs and other parties to produce for their own purposes, for example in relation to bidding or hedging decisions, the same baselines that would be used by AEMO for settlement if a wholesale demand response unit was dispatched.

Wholesale demand response guidelines

Under the final rule, AEMO is required to develop wholesale demand response guidelines. These guidelines will provide details on a range of matters relating to wholesale demand response. In relation to baselines, these guidelines will set out:³⁰³

- information about the process for development of baseline methodologies, including how proposals for new baseline methodologies may be made
- the process for a DRSP to apply to AEMO for approval to apply a baseline methodology to a wholesale demand response unit when it is being classified (or at a later date, if the DRSP wishes to change to a different baseline)
- any other information relating to the supply of wholesale demand response under the NER.

In developing these guidelines, AEMO is required to follow the Rules consultation procedure.³⁰⁴ This will allow stakeholders to provide input into the guidelines.

Baseline methodology metrics

AEMO will also need to determine the baseline methodology metrics. These metrics will be used to test the efficacy of baseline methodologies in predicting a load's consumption patterns (when it is not providing demand response), both at the time of classification of wholesale demand response units and during regular testing of these loads after classification.

AEMO will need to develop the baseline methodology metrics in line with a set of principles in the NER. The metrics must assess accuracy and bias:³⁰⁵

- **Accuracy:** meaning the deviation between the baseline for a wholesale demand response unit and its actual consumption or export (in periods when it is not providing demand response).
- **Bias:** meaning the deviation between actual consumption or export of a wholesale demand response unit and its baseline for each of the measures of baseline accuracy consistently exhibiting error:

302 Clause 3.10.3(c) of the final rule.

303 Clause 3.10.1 of the final rule.

304 The Rules consultation procedures are set out in Rule 8.9 of the NER.

305 Clause 3.10.2 of the final rule.

- in a single direction, or
- under the same circumstances.

The baseline methodology metrics must be assessed in particular trading intervals and across multiple intervals for accuracy and bias.

In determining the metrics, AEMO must also have regard to:³⁰⁶

- the need to not distort the operation of the market
- the need to maximise the effectiveness of the wholesale demand response at the least cost to consumers
- the level of accuracy achieved by AEMO's short-term demand forecasts and forecasts of intermittent generation.

The Commission considers the metrics produced by AEMO should require baselines to exceed the levels of accuracy considered 'good' in the AEMO-ARENA demand response RERT trials.³⁰⁷ The standard for baselines used for wholesale demand response, which is required to be reliable and predictable, should be higher than that experienced with emergency demand response such as the RERT. This should reflect improvements in baseline methodologies arising from that trial and the likelihood of more frequent utilisation for the purposes of wholesale demand response. The baselines used for the RERT should also be improved where possible.

F.5.3

DRSP compliance with baseline methodology

Under the final rule, DRSPs will need to show that a baseline can be determined for the load that complies with the baseline methodology metrics both during classification and in an ongoing sense.

A wholesale demand response unit is considered baseline compliant if the baseline methodology and baseline settings applied to the wholesale demand response unit produce a baseline that satisfies the baseline methodology metrics. Conversely, a wholesale demand response unit becomes non-compliant when the baseline for a wholesale demand response unit does not meet the baseline methodology metrics.³⁰⁸

Under the final rule, AEMO must determine and publish arrangements for regular and systematic testing to show whether wholesale demand response units are baseline compliant.³⁰⁹ AEMO must also determine the frequency with which the baseline compliance testing will occur, which may be different for different wholesale demand response units or classes of wholesale demand response unit.³¹⁰

Under the final rule, DRSPs are required to demonstrate that their loads will be able to meet the baseline methodology metrics and other requirements under the wholesale demand

³⁰⁶ Clause 3.10.2(f) of the final rule.

³⁰⁷ Oakley Greenwood, *Baselining the ARENA-AEMO Demand Response RERT Trial*, prepared for ARENA, September 2019, p. 7.

³⁰⁸ Clause 3.10.4 of the final rule.

³⁰⁹ Clause 3.10.2(d) of the final rule.

³¹⁰ Clause 3.10.2(e) of the final rule.

response guideline. This means the DRSP will need to show that the load can meet the requirements relating to accuracy and bias of the chosen baseline methodology prior to being classified as a wholesale demand response unit.³¹¹

AEMO will be required to set out the process for DRSPs to demonstrate compliance with these metrics.³¹² For example, this could include calculating the baseline for a range of intervals in the previous year and comparing these to actual loads during those intervals.

Either during the classification process or in the course of periodic checks by AEMO or by a DRSP, where a load is found to be outside the specific metrics set out by AEMO in relation to the chosen baseline, the DRSP will not be permitted to provide wholesale demand response using that load.³¹³ This load will be prohibited from providing wholesale demand response until it is able to demonstrate compliance with the requirements in respect of its chosen baseline methodology. It could potentially do so by requesting approval to change to a different baseline methodology or different baseline settings, as outlined in appendix f.5.5.

The DRSP is required to establish and comply with measures to identify whether its wholesale demand response units are not baseline compliant.³¹⁴ If a DRSP becomes aware that its unit is not compliant, it is required to inform AEMO.³¹⁵ Likewise, if AEMO becomes aware that a wholesale demand response unit is not baseline compliant, it must inform the DRSP.³¹⁶ The onus remains on the DRSP to provide an availability of zero for this wholesale demand response unit.

While drafting changes have been made between the second draft and final rules for clarity, the principles governing baseline compliance in the final rule are not intended to change. These include the following:

- Where wholesale demand response units have been aggregated for dispatch, baseline compliance is tested separately for each wholesale demand response unit, not the aggregated unit.
- Determining whether a wholesale demand response unit satisfies the baseline compliance standard will require the use of metering data and the baseline methodology and so will be a rolling test, not a per trading interval test.
- AEMO will test for compliance under the baseline compliance testing framework. DRSPs must also take steps to identify non-compliance under clause 3.8.2A(f).
- When testing for compliance, time periods cannot be cherry-picked to produce a favourable result, although periods in which a wholesale demand response unit has been dispatched would need to be excluded.
- If a wholesale demand response unit is shown to be baseline non-compliant at any time, it remains non-compliant until it is shown to be compliant. To achieve compliance, the

311 Clause 2.3.6(e)(5) of the final rule.

312 Clauses 3.10.1 and 3.10.2 of the final rule.

313 Clause 3.8.2A(c) of the final rule.

314 Clause 3.8.2A(f) of the final rule.

315 Clause 3.10.2(i) of the final rule.

316 Clause 3.10.2(h) of the final rule.

DRSP may seek AEMO's consent to change the baseline methodology and baseline settings applied to the wholesale demand response unit.

F.5.4 Adjusting baselines under abnormal conditions

The final rule allows AEMO to establish a process by which DRSPs can nominate to AEMO that an event or circumstance will materially change the consumption pattern of the wholesale demand response unit, such that it proposes to temporarily vary its baseline.³¹⁷

If AEMO establishes this process, the DRSP may wish to use it in order to maintain compliance with the baseline methodology metrics. For example, in the circumstances where a load is operating at half capacity during maintenance, the DRSP will be able to notify AEMO of this fact, and have the baseline adjusted appropriately, in order to remain baseline compliant.

Under the final rule, AEMO may prepare abnormal baseline notice procedures.³¹⁸ In determining the abnormal baseline notice procedures, AEMO must set out conditions that:³¹⁹

- only permit an abnormal baseline notice to be given where the cause of the abnormality is not something that could have been reasonably accounted for in the baseline methodology
- limit the frequency of abnormal baseline notices and the number of trading intervals to which a factor specified in the notice may be applied.

In addition, AEMO may specify in the abnormal baseline notice procedures:³²⁰

- requirements for the submission of abnormal baseline notices including timing and content
- information to be provided to AEMO or records to be made by the DRSP in connection with an abnormal baseline notice
- events or circumstances that are taken to have been accounted for in the baseline methodology and in respect of which no abnormal baseline notice may be given
- conditions limiting or precluding the submission of an abnormal baseline notice where reasonably considered necessary by AEMO to maintain the accuracy and reliability of baseline calculations
- any other terms and conditions reasonably determined by AEMO.

The final rule does not allow for the DRSP to adjust the baseline upward and to use this baseline in settlement. This is to prevent DRSPs from manipulating baselines to receive payment for additional wholesale demand response that would have not actually occurred.

The Commission does not consider it necessary to notify the FRMP of the abnormal conditions. This process has been established for the purpose of assisting DRSPs with remaining baseline compliant under abnormal conditions and is not necessarily the result of

³¹⁷ Clause 3.10.5(b) of the final rule.

³¹⁸ Clause 3.10.5(b) of the final rule.

³¹⁹ Clause 3.10.5(d) of the final rule.

³²⁰ Clause 3.10.5(e) of the final rule.

the actions of the DRSP. As such, these abnormal conditions would likely be within the scope of behaviour of the load which should have been contemplated by the FRMP in developing its commercial arrangements with the consumer. Further, these 'abnormal conditions' are not the direct result of the load participating the mechanism. For these reasons, the Commission does not consider it necessary for retailers to be informed when a DRSP has notified AEMO of abnormal baseline conditions.

F.5.5 Developing new baseline methodologies

Under the final rule, market participants are able to submit proposals for the development of new baseline methodologies to AEMO for consideration.³²¹

Under the first draft rule, market participants were able to submit baseline methodologies to AEMO that AEMO would then need to consider against the baseline methodology metrics for that load.³²² However, AEMO advised that this framework would have imposed significant upfront costs on AEMO to be able to assess, implement and administer bespoke approaches to baselines.

As such, the second draft rule removed the framework for baseline methodologies to be directly submitted by market participants. This position has been retained for the final rule. It is important that the framework under the rule still allows for the development of new baseline methodologies. As has been demonstrated in the AEMO-ARENA RERT trial, baseline methodologies are not 'one-size-fits-all'. This trial also showed that market participants are equipped to develop new approaches that can reflect improvements in baselining or applying baselines to new types of loads.³²³

For this reason, the final rule provides for stakeholders to propose that AEMO develop new baseline methodologies. These methodologies would be able to be considered by AEMO and potentially implemented as a methodology that could be used under the mechanism. To provide transparency to the market about how new baseline methodologies are being developed, AEMO is also required, under the final rule, to report on both new baseline methodologies proposed to it, and new baseline methodologies being developed.³²⁴

The final rule would therefore enable innovative approaches to baseline methodologies to be developed over time, particularly as experience is gained using baselines for wholesale demand response. In facilitating the development of new baseline methodologies, the final rule balances this against the extent of the upfront cost in implementing and administering these new baselines.

The final rule does not place an obligation on AEMO to regularly review the baseline methodologies. The Commission does not consider it necessary to prescribe the regularity with which baseline methodologies should be updated, prior to the commencement of the

³²¹ Clause 3.10.1(a)(4) of the final rule.

³²² Clause 3.10.2(e) of the first draft rule.

³²³ See section 5 of the Oakley Greenwood report for a discussion of alternative approaches to baselines submitted by proponents in the RERT program. Oakley Greenwood, *Baselining the ARENA-AEMO Demand Response Trial*, prepared for ARENA, September 2019, p. 19.

³²⁴ Clause 3.10.6(b) of the final rule.

mechanism. Under the final rule, AEMO is able to develop baseline methodologies flexibly with stakeholders as the need arises. However, the Commission notes that it is tasked with a review of the mechanism three years after it commences operation. This would provide an opportunity to assess this flexible approach to baseline methodology development.

F.5.6 Monitoring and reporting of baselines

The final rule requires AEMO to report on outcomes relating to baseline accuracy. AEMO will be required to annually publish a report covering:³²⁵

- information about baseline methodologies available for use and the extent to which they are being used
- for each baseline methodology and type of wholesale demand response unit, an assessment of accuracy and bias as measured during the classification process and during ongoing testing
- any periods of time where wholesale demand response units have been ineligible for dispatch due to not being baseline compliant
- potential improvements which may include:
 - changes to baseline methodology metrics as a result of the development of new baseline methodologies
 - the development of new baseline methodologies
 - any other any measures that may be taken to improve the accuracy or reduce the bias of baseline methodologies
 - changes to the wholesale demand response guidelines or the NER
- the timing and process for making any improvements.

By having AEMO undertake monitoring and reporting on baselines, it will improve transparency to the rest of the market regarding the utilisation of centrally determined baselines.

F.5.7 Spot price exposed loads

The final rule places an obligation on the DRSP to submit zero availability to provide wholesale demand response from wholesale demand response units for intervals in which they are spot price exposed.³²⁶

The mechanism introduced in the final rule provides an additional avenue for consumers to respond to wholesale prices and capture the benefits. The appropriate customers for this mechanism are those who are not currently participating in wholesale demand response.

A number of stakeholders considered that, under the first draft rule, retailers could be exposed to significant risk if spot price exposed customers participated in the wholesale demand response mechanism. This was because:

³²⁵ Clause 3.10.6(b) of the final rule.

³²⁶ Clause 3.8.2A(d) of the final rule.

- retailers will be charged in the wholesale market for the baseline level of consumption
- the mechanism keeps retailers whole through the reimbursement rate, which is intended to reflect the wholesale price component of an average retail rate, and would not relate to retailer liability under a spot price pass through contract.

The Commission agrees that spot price exposed loads are not suited to participating in the wholesale demand response mechanism because:

- These customers already face a strong incentive to provide wholesale demand response by being exposed to the wholesale price. If spot price exposed customers were to participate, it would have the effect of exposing the retailer to the spot price and allowing the customer to 'double dip' i.e. avoid the spot price that would have been passed through by the retailer *and* receive a payment from the DRSP.
- The demand response provided by spot price exposed customers would likely not be additional. The Commission notes that this was the intent of the additionality provisions under the first draft rule (which are retained in the final rule). Spot price exposure provides customers with a strong incentive to respond to wholesale prices. The clauses relating to additionality provide that if a customer was already going to respond to wholesale prices, this response would not count as wholesale demand response under the mechanism. However, the Commission agrees that this outcome can be achieved more simply and directly by explicitly excluding demand response in spot-price-exposed intervals, reducing the risks imposed on retailers and the risks of double dipping.

Therefore, the final rule precludes a DRSP bidding to provide wholesale demand response for the intervals in which its customer will or is likely to be exposed to the spot price.

Under the final rule, a wholesale demand response unit is considered to be exposed to the spot price in a trading interval if the purchase price for electricity in the contract between that customer and the relevant FRMP is equal to, or varies by reference to, the spot price in that trading interval.³²⁷ This means that if, in a specific interval, the price in the retail arrangement between the customer for the wholesale demand response unit and the FRMP has some form of spot price exposure, that customer cannot also provide wholesale demand response through the mechanism. This includes if:

- the spot price exposure only applied to some of the load
- only a portion of the spot price was passed through.

The Commission notes that spot price exposure can vary from direct pass through to more complex arrangements, for example where only a share of the load is spot price exposed or that spot price pass through exposure only occurs if a certain threshold is met. Noting that the concerns around double dipping and retailer risks arise specifically in the intervals where the wholesale demand response unit is spot price exposed, which may be only a portion of the day or year (depending on the retail contract), the final rule only places the prohibition on those specific trading intervals. A DRSP would still be able to contract with a customer who has a spot price pass through arrangement with their retailer and offer wholesale demand response in the intervals where the customer is not spot price exposed.

³²⁷ Final rule chapter 10, definition of "spot price exposed".

The Commission also notes that this issue may alternatively be addressed by retailers making spot price pass through offers to customers conditional on not participating in the mechanism.

The Commission notes that the commercial arrangements between retailers and large customers can be highly complex and can often involve some degree of spot price exposure. Large customers that intend to participate in the mechanism can enter into retail arrangements that do not have these spot price pass through arrangements. This would provide the DRSP with greater clarity regarding the participation of these loads in the mechanism. Alternatively, DRSPs can manage these challenges in their commercial arrangement with the participating customers.

F.5.8

Additionality

Under the final rule, a DRSP may become liable for significant penalties if it makes a dispatch bid for wholesale demand response which will, if dispatched, not be the result of responding to instructions in central dispatch.³²⁸ This means that DRSPs should only offer wholesale demand response when it is additional to the activities that that load was already going to undertake. In effect, this is intended to prevent consumers paying for a demand reduction that was *already going to occur*.

The Commission considers it important that, if a customer was already going to reduce its consumption, and paying that customer more would not provide additional demand response, this payment should not occur. Such a payment would have the effect of increasing costs in the wholesale market without the procurement of any additional wholesale demand response. For example, the additionality provisions should prevent:

- a payment being made to a factory that had already decided to shut down for maintenance
- a payment being made to a customer if that customer had already decided to respond to a peak network event and a payment from the wholesale market would not elicit any more wholesale demand response.

This does not mean the final rule prevents value stacking in all circumstances. If value stacking enables a customer to provide additional demand response, a DRSP would be able to offer this in the wholesale demand response mechanism. In effect, this means that, through the introduction of the wholesale demand response mechanism, more value stacking for demand response should be able to occur than is currently the case. For example, if a payment from a network service provider alone was insufficient to encourage demand response from a customer, but the combination of that payment and a payment in the wholesale market enables a response, this would satisfy the additionality requirement³²⁹ and the customer would be eligible to offer that response in the wholesale market.

³²⁸ Clause 3.8.22A(a2) of the final rule, proposed to be part of the rebidding civil penalty provision, and the definition of "wholesale demand response activity" in Chapter 10 of the final rule. These provisions are discussed further below.

³²⁹ See paragraph (b) of the definition of "wholesale demand response activity" in Chapter 10 of the final rule: "the activity would not be undertaken but for the dispatch instruction."

The final rule also prevents wholesale demand response being offered by a DRSP where the response would be directly offset by an increase in consumption elsewhere at the same time.³³⁰ This is intended to prevent a demand reduction appearing to be provided at one NMI, but in reality load has simply been shifted to another NMI during the same interval. This behaviour could allow a DRSP to be credited with providing wholesale demand response that did not actually occur. As such, the final rule prevents DRSPs from offering this activity as wholesale demand response.

Under the final rule, when a DRSP submits a bid to provide demand response, it needs to know that the demand response offered is additional in respect of the interval for which it is bidding.³³¹ This is consistent with the Commission's understanding of the timeframes in which additionality concerns would arise operationally. For example, a consumer decision to reduce demand a day before dispatch that is not related to the provision of wholesale demand response through the mechanism should not be bid into the wholesale market because this would not be additional demand response.

F.5.9

AER assessing compliance

Under the final rule, the AER will have a role in assessing whether participants are manipulating baselines to inefficiently increase the amount of demand response credited.

The AER will need to enforce compliance in respect of DRSP bidding. This relates to the DRSP bidding in good faith, which incorporates the obligation on DRSPs to not offer wholesale demand response that would not have otherwise occurred.

When a DRSP is making a dispatch bid, the bid represents to other Market Participants in pre-dispatch that the wholesale demand response offered would be result of specific activity on behalf of the DRSP (that the DRSP would not otherwise undertake, i.e. it is additional, as discussed above).³³² A dispatch bid from a DRSP would be considered false or misleading if the DRSP does not have a genuine intention to honour that representation or a reasonable basis to make it.³³³

The AER must develop and publish wholesale demand response participation guidelines in accordance with the Rules consultation procedures which:³³⁴

- must include guidance about information DRSPs must retain regarding compliance with their obligations in relation to additionality, baseline compliance and spot price exposure, to assist the AER in monitoring these obligations, and
- may include guidance relating to the requirements on DRSPs in relation to baseline compliance and spot price exposure.

DRSPs are required to retain the information specified in the guidelines.³³⁵

³³⁰ See paragraph (e) of the definition of "wholesale demand response" and the definition of "baseline deviation offset" in Chapter 10 of the final rule.

³³¹ Clause 3.8.22A(a2) of the final rule.

³³² Clause 3.8.22A(a2) of the final rule. This is proposed to be a rebidding civil penalty provision.

³³³ Clause 3.8.22A(b) of the final rule.

³³⁴ Clause 3.8.2A(g) of the final rule.

³³⁵ Clause 3.8.2A(i).

G SETTLEMENT AND COST RECOVERY

G.1 Overview

This appendix sets out the approach to settlement and cost recovery under the demand response mechanism. Wholesale demand response which is provided through the wholesale demand response mechanism needs to be appropriately rewarded. The settlement and cost recovery framework sets out how DRSPs will be paid and the associated financial flows between market participants.

Cost recovery arrangements for wholesale demand response (other than through the new mechanism) involve either:

- the customer enjoying lower electricity bills via the benefit of having avoided the wholesale price, or
- an alternative arrangement, whereby the customer receives a payment that has been bilaterally negotiated between the retailer (or a network service provider) and the customer in return for reducing consumption.

However, under the new wholesale demand response mechanism, cost recovery occurs through AEMO's central settlement, similar to how generators are currently paid. This appendix sets out the settlement and cost recovery model applying under the final rule.

The remainder of this appendix outlines:

- approaches to rewarding consumers for providing wholesale demand response otherwise than through the new mechanism
- stakeholders' views on the settlement model proposed under the second draft rule
- the Commission's analysis and conclusions in relation to settlement and cost recovery under the mechanism.

G.2 Background

G.2.1 How is wholesale demand response currently rewarded in the NEM?

In the NEM, the wholesale spot price is able to rise considerably, up to the market price cap,³³⁶ in response to the short-term supply-demand balance, and so the demand side can respond to wholesale market price signals. To the extent that all consumers could fully participate in this, the NEM would become a true two-sided market, consistent with the vision that the Commission set out in its digitalisation discussion paper.³³⁷

In contrast, in other markets where participants are paid availability payments the spot price for energy generally has a much lower market price cap (reflecting the fact that generators receive much of their revenue from these capacity availability payments). As such, demand response providers are not exposed to high price signals incentivising them to reduce consumption and so an alternative source of payment (the availability payment) is required.

³³⁶ The market price cap is currently set at \$14,700 in accordance with the process set out in the NER.

³³⁷ AEMC, *How digitalisation is changing the NEM: The potential move to a two-sided market*, November 2019. Available at: <https://www.aemc.gov.au/sites/default/files/2019-11/How%20digitalisation%20is%20changing%20the%20NEM.pdf>.

If there is a high spot price in the NEM, parties directly exposed to the spot price should be incentivised to shift their consumption (or their customers' consumption) to avoid the high price at this point in time. The wholesale electricity market rewards reduced consumption with the *avoided costs* of purchasing from the wholesale market at that time.

There are a number of specific mechanisms in the NEM and in some types of energy contracts whereby consumers can be rewarded (either through a reduction in costs or a payment) for wholesale demand response, for example (some of these are also summarised in chapter 4):

- A consumer may be the FRMP (i.e. it may itself be a wholesale market customer) in which case it directly changes its exposure to the spot price by changing its consumption
- A consumer may be supplied electricity by a retailer, but be on a spot price pass through arrangement, which again means that it avoids the spot price by reducing its consumption
- A consumer may be supplied by a retailer and have a tariff that does not reflect the spot price in the short term. In this case, its retailer (which is exposed to the spot price) might incentivise the consumer to reduce its consumption. The retailer benefits if the reduction of its spot price exposure exceeds any payment made to its customer. The nature of this payment is a matter for commercial negotiation between the retailer and its customer. The existence and quantity of the reward depends on private negotiations between the retailer and the customer (rather than on an automatic market-based reward mechanism).

In each case, the retailer or consumer may have a commercial arrangement with a third party service provider to facilitate the consumer reducing its consumption at certain times.

In cases where the customer is not on a spot price pass through contract, the payment from the retailer for the demand response provided by the customer may be based on, or relative to, a baseline level of consumption. Both the baseline and the payment made by the retailer are determined by commercial negotiation between those two parties. No other parties are required to be involved in this process. Under these arrangements, to the extent that there is a *payment* to a consumer for reducing their demand at a particular point in time, this is funded by the parties participating in that arrangement. For example, if a retailer offers a demand response program, then it will give customers an amount to reward them for reducing their demand. This reward could either occur through a monetary payment, or a non-financial reward (e.g. a free movie ticket). The cost of this reward is recovered as part of the retailer's operating costs, which it recovers from all of its customers. Examples of existing demand response programs are set out in chapter 4.

Under such arrangements, at some times the cost to the retailer of providing the customer with a financial reward may exceed the benefit to the retailer of avoided wholesale costs. This risk is borne by the retailer. However, the retailer is also in a position to manage or mitigate this risk. In addition, retailers may realise value through these programs in other ways, such as increasing customer loyalty by offering such programs.

G.2.2 What is the difference between actual and baseline consumption?

The rule change requests refer to actual and baseline levels of consumption. Baselines are discussed in detail in appendix F. Loads that are participating in a wholesale demand response mechanism must, by definition, have both actual and baseline levels of consumption.

- The actual level of consumption is a consumer's metered, physical consumption of electricity. Under the arrangements prior to the introduction of the new mechanism, consumers are billed for their actual consumption and retailers are responsible for purchasing this load from the wholesale market.
- The baseline level of consumption is the predicted, counterfactual level of consumption that would otherwise have happened were it not for the demand response.

Ideally, if the customer is not providing demand response, then its baseline level of consumption should be the same as its actual level of consumption - because the baseline level of consumption is meant to be an approximation of consumption that would otherwise have happened in the absence of demand response.

G.3 Settlement model under the first and second draft rule

This section provides a high-level summary of the options for facilitating cost recovery which were considered in the first draft determination, as well as the settlement model that was proposed under the first and second draft rule.

The settlement models which were proposed by the rule change proponents and considered in the first draft determination included:

- **Integrated settlement:** This model was proposed by PIAC, TEC and TAI and the SA Government and would broadly operate as follows where a consumer has provided wholesale demand response:³³⁸
 - In order to have sufficient money from settlements in order to pay the demand response providers, retailers of the consumer which is undertaking demand response would be charged by AEMO for energy consumption at a NMI (at the NEM spot price) based on the baseline energy consumption rather than actual energy consumption.
 - The retailer would bill the customer for their baseline amount of energy consumption.
 - The DRSP would be paid the difference between the customer's baseline consumption and their actual consumption (i.e. the amount of demand response provided) multiplied by the spot price.
 - The DRSP (if it is not itself the customer that provided the demand response, noting that market customers could register as DRSPs and manage their own load accordingly) would share the value of that payment with the customer in accordance with the commercial agreement between those parties.
- **Separate settlement:** The SA Government also proposed a transitory demand response model which would allow third parties to sell wholesale demand response into a market

³³⁸ PIAC, TEC and TAI, *Wholesale demand response energy market mechanism: Rule change request*, August 2018, p. 4.

which is separate from the wholesale market, recovering costs via a charge levied on all retailers (and passed on to their customers).³³⁹ Under this settlement model, the costs for wholesale demand response would be recovered from consumers in a smeared manner, similar to the way in which the current RERT costs are recovered.

- **Private settlement:** The Australian Energy Council's proposal to establish a wholesale demand response register did not involve any changes to existing settlement arrangements in the NEM.³⁴⁰ Payments for wholesale demand response under this proposal would remain a matter for commercial negotiation between the parties involved and so would not be centrally settled.

The Commission proposed an alternative settlement model under the first and second draft rules which addresses a number of issues relating to practicality, implementation costs and market design principles associated with the models described above.

Under the settlement model proposed in the first and second draft determinations, settlement would operate as follows where a customer provides wholesale demand response through the mechanism:

- AEMO would bill retailers for the customer's baseline level of consumption at the wholesale price
- retailers would continue to bill customers for their actual consumption (as they do currently)
- DRSPs would be paid the spot price for the difference between the actual and baseline level of consumption
- retailers would recover the discrepancy between what they recover from the customer and what they are charged in the wholesale market from the DRSP, via AEMO's settlement process. This amount would be calculated based on a wholesale demand response reimbursement rate (reimbursement rate)
- the customer would receive a share of the payment to the DRSP for the wholesale demand response provided in accordance with the commercially agreed terms between those two parties.

The reimbursement rate under the first and second draft rule would be calculated on a quarterly basis and would be based on average wholesale prices over the previous 12 months. This rate is intended to be a proxy for the wholesale cost component of the customer's retail tariff. The first draft rule proposed that the reimbursement rate be calculated by the AER, while the second draft rule instead conferred this function on AEMO.

G.4 Stakeholder comments

A number of stakeholders commented on the settlement model in submissions to the second draft determination. Relevant comments included:

³³⁹ South Australian Government, rule change request, October 2018, p. 6.

³⁴⁰ AEC, rule change request, October 2018, p. 2.

- A number of stakeholders suggested that using average wholesale electricity prices to calculate the reimbursement rate would not adequately reimburse retailers because the rate retailers charge customers is based on forward contract prices at the time the contract is entered into.³⁴¹ These stakeholders generally also suggested that the reimbursement rate should be based on peak forward contract prices, as this would better reflect the cost to retailers at times when demand response is likely occur.³⁴²
- **Momentum Energy** noted its support for the decision to make AEMO responsible for the reimbursement rate, as opposed to the AER.³⁴³
- **ERM Power** proposed that a second reimbursement rate be developed and applied to customers that consume more than 70% of their load during peak demand periods (i.e. between 10am and 7pm on weekdays).³⁴⁴ This rate would be calculated based on the rolling 12-month average of NEM peak prices, calculated quarterly.
- **Energy Queensland** submitted that it should be possible to profile wholesale demand response (similar to a net system load profile) and to use the load-weighted price to calculate the reimbursement rate.³⁴⁵
- **ERM Power** and **EnergyAustralia** also submitted that an assessment of the efficacy of the methodology for determining the reimbursement rate should be subject to periodic review after the commencement of the demand response mechanism.³⁴⁶
- **EnergyAustralia** suggested that DRSPs may need to be subject to additional prudential requirements in respect of their obligation to reimburse retailers at the reimbursement rate.³⁴⁷
- **AEMO** raised concerns with the fact that the settlement model under the second draft determination would allow for "negative settlement" to occur where a wholesale demand response unit consumes above its baseline in a dispatch interval where it is dispatched to provide wholesale demand response, in which case the DRSP would be a pool price payer rather than a pool price recipient.³⁴⁸ AEMO suggested an alternative approach where AEMO would not perform settlement for a wholesale demand response unit if, on aggregate, the WDRU consumed above its baseline for the trading interval (including where the wholesale demand response unit was comprised of multiple aggregated units). In those circumstances, AEMO would settle the energy at each NMI to retailers as if no dispatch of wholesale demand response had occurred. AEMO suggested that the DRSP would be responsible for managing the outcomes of this situation with the load/s within the relevant WDRU, thereby placing incentives on DRSPs to make sure their wholesale demand response units comply with dispatch instructions.

341 Submissions to second draft determination: AEC, p. 2; AGL, p. 3; CS Energy, p. 8; ENGIE, p. 2; Infigen Energy, p. 2; Momentum Energy, p. 2; Snowy Hydro, pp. 9-10.

342 Submissions to second draft determination: AEC, p. 2; AGL, p. 3; CS Energy, p. 8; Momentum Energy, p. 2.

343 Momentum Energy, submission to the second draft determination, p. 2.

344 ERM Power, submission to second draft determination, p. 4.

345 Energy Queensland, submission to second draft determination, p. 10.

346 Submissions to second draft determination: EnergyAustralia, p. 7; ERM Power, p. 4.

347 EnergyAustralia, submission to second draft determination, p. 8.

348 AEMO, submission to second draft determination, p. 2.

G.5 Commission's analysis and conclusions

BOX 9: SETTLEMENT MODEL UNDER THE FINAL RULE

The final rule largely maintains the settlement model set out in the first and second draft rules, but introduces a cap on settlement and makes minor changes to the methodology for determining the reimbursement rate. This settlement model has the following key features:

- AEMO will bill retailers for the customer's baseline level of consumption in the wholesale market
- retailers will bill customers for their actual consumption
- retailers will recover the discrepancy between what they recover from the customer and what they are charged in the wholesale market (that is, the difference between baseline and actual consumption) from the DRSP, via AEMO's settlement process. This amount will be calculated based on a reimbursement rate.
- the reimbursement rate will be a rolling average of demand-weighted spot prices during peak demand periods (as defined by the ASX) over the previous 12 months and will be calculated by AEMO on a quarterly basis
- DRSPs will be paid for the quantity of wholesale demand response provided at the spot price. This payment will be capped at the maximum responsive component of the load at the relevant NMI.

Benefits of final rule

The Commission considers that the settlement and cost recovery model applying under the final rule addresses a number of significant issues associated with other models proposed by the rule change proponents. In particular, the settlement model will:

- allow retailers to continue to bill customers based on actual consumption, thereby significantly reducing the changes required to retailer billing systems and the associated implementation costs
- reduce the scope of the changes required to AEMO's settlement systems
- avoid imposing unmanageable or unhedgeable risks on retailers, which would have led to increased costs for consumers.

Further, the reimbursement rate methodology adopted under the final rule provides a simple, transparent and objective process for approximating the wholesale cost component of the retail tariff of a customer providing wholesale demand response in order to allow retailers to recover amounts they would otherwise have recovered from customers (had they not provided demand response).

Differences between second draft rule and final rule

There are two material difference between the second draft rule and the final rule with respect to the settlement process:

- Under the final rule, the methodology for calculating the reimbursement rate will be based on average spot prices during peak demand periods (i.e. 10am to 7pm on weekdays), rather than average spot prices during all periods. This approach will allow the reimbursement rate to better reflect the amounts retailers would otherwise have recovered from customers, while avoiding the issues associated with calculating the rate based on forward contract prices.
- The final rule imposes a cap on the amount payable to the DRSP for each WDRU. The wholesale demand response settlement quantity for which the DRSP is paid for a load within a WDRU will be capped at the maximum responsive component of the relevant load. This will mitigate the risk of a DRSP being paid for an over-delivery of demand response which results from changes in the underlying load at the connection point (i.e. the non-responsive component of the load).

There are a number of ways in which demand response providers could be compensated for reducing demand under a wholesale demand response mechanism involving centralised settlement. The approach taken to settlement and cost recovery can have a significant impact on the extent of the costs associated with changes to retailers' and AEMO's systems to accommodate the mechanism, which are ultimately borne by consumers.

Accordingly, the Commission has sought to develop a settlement model which is cost-effective for consumers and market participants. The settlement model adopted in the final rule addresses a number of issues associated with alternative models proposed by the rule change proponents and can be considered to be a pragmatic compromise between capturing the benefits of the separate settlement model proposed by the South Australian Government and still allowing the costs to be allocated to those retailers whose customers are participating in the mechanism.

The key features of this settlement model are discussed in detail below.

G.5.1

Wholesale market billing

The final rule introduces separate settlement equations for wholesale demand response. Under the final rule, the retailer will purchase electricity in the wholesale market for its customers' baseline level of consumption (consistent with the proposals in the models put forward by PIAC, TEC and TAI, and the South Australian Government). Given that the retailer is not the party facilitating the wholesale demand response by the customer, the retailer's exposure in the wholesale market should be the same regardless of whether the customer is providing demand response at any point in time. If the retailer were only billed by AEMO for the customer's actual reduced consumption where the customer is providing demand response through the mechanism, the retailer would receive the benefit of the reduced exposure to the spot price despite not having taken any action to facilitate this. In addition, this would result in a shortfall of funds required to pay the DRSP (and in turn the customer) for the demand response provided.

Payments to the DRSP

The DRSP will be paid in the wholesale market for the amount of wholesale demand response provided at the spot price. A settlement transaction would only occur for a DRSP in a trading interval in which its WDRU is dispatched to provide wholesale demand response. If a DRSP has an aggregated WDRU that is dispatched to provide wholesale demand response, a settlement transaction will occur for each of the loads within the aggregated unit. However, if the aggregated WDRU is not dispatched to provide wholesale demand response, no settlement transaction for wholesale demand response would occur for any loads within the unit (regardless of whether those loads did in fact reduce their consumption). The approach to dispatch under the final rule is discussed further in appendix D. The wholesale demand response settlement quantity for a load which is dispatched to provide demand response will be capped at that load's registered maximum responsive component. This is discussed further in Box 10.

Treatment of losses in settlement

The settlement equations under the final rule also account for distribution and transmission losses in transactions relating to wholesale demand response. This is based on feedback from AEMO that it is desirable to account for these losses to ensure that quantities of, and prices paid for, wholesale demand response more closely align with energy settlement.³⁴⁹ This is consistent with the principle that wholesale demand response should be treated equivalently to generation where possible.

Unaccounted for energy

The Commission has considered the interaction between the settlement of wholesale demand response and the changes to the allocation of "unaccounted for energy" (UFE) introduced by the National Electricity Amendment (Global settlement and market reconciliation) Rule 2018 No. 14 (global settlement rule).³⁵⁰ The Commission does not consider that any changes are required to the provisions in that rule relating to the calculation and allocation of UFE as a result of the introduction of the wholesale demand response mechanism. However, the settlement equations for wholesale demand response under the final rule have been amended to provide that the calculation of wholesale demand response settlement quantity is based on metered energy rather than adjusted gross energy, such that the amount of wholesale demand response provided will not be adjusted for unaccounted for energy (UFE) when the global settlement rule takes effect.

The settlement equations under the final rule also provide for retailers to be charged by AEMO for the difference between their customer's actual and baseline consumption in the wholesale market (i.e. to provide that retailers are liable up to the baseline level of consumption).³⁵¹ The calculation of this amount is separate to the existing calculation of a retailer's liability in the wholesale market for its customer's actual consumption, which is based on "adjusted gross energy" (AGE) for the customer's connection point.³⁵² The latter

³⁴⁹ AEMO, submission to first draft determination, p. 17.

³⁵⁰ Available at: <https://www.aemc.gov.au/rule-changes/global-settlement-and-market-reconciliation>.

³⁵¹ Clause 3.15.6B(b) of the final rule.

³⁵² NER, clause 3.15.6(a).

calculation already incorporates the retailer's allocation of UFE for the relevant distribution area and retailers will continue to be charged for this amount under the final rule.

In other words, AEMO will still be able to fully recover payment for UFE from retailers based on the methodology introduced by the global settlement rule. Wholesale demand response will not result in the creation of any additional UFE, as it does not create additional demand that must be supplied by generators (which may subsequently lead to increased UFE in the system). As such, the new settlement equations introduced under the final rule do not include any adjustments for UFE in respect of wholesale demand response.

Other matters

The wholesale demand response settlement equations also address cost recovery from the DRSP, via AEMO, in the form of the reimbursement rate paid to retailers, which is discussed in detail below.

AEMO will need to review its existing guidelines and procedures relating to settlement, and may need to develop new guidelines and procedures, to account for retailers being charged for the customer's baseline level of consumption where wholesale demand response is provided through the mechanism. The final rule includes transitional provisions to address this.³⁵³

G.5.2

Retail billing

Retailers will continue to bill customers based on their actual electricity consumption under the approach set out in the final rule. The Commission considers that there is a significant benefit to this approach, as it avoids substantial changes to retailer billing systems. The Commission understands that the changes to retailers' systems which would be required to facilitate billing customers for their baseline level of consumption (as proposed in the models put forward by PIAC, TEC and TAI, and the South Australian Government) would likely be the most significant component of the costs associated with implementing a demand response mechanism. As such, allowing retailers to continue to bill customers for actual consumption should substantially reduce the costs and complexity of implementation for retailers. This will also avoid any potential confusion that may arise from customers being billed by retailers for electricity they did not consume (i.e. if retailers were instead required to bill customers for their baseline level of consumption).

Given that network costs and the costs of environmental schemes are based on actual consumption, retailers will continue to recover these costs in full from customers.

G.5.3

Retailer hedging

Given that retailers will be required to purchase the baseline level of consumption in the wholesale market, the Commission expects that retailers will contract to hedge to this level. The Commission considers that this should not have a significant impact on retailers' approaches to risk management, as a customer's baseline should reflect the amount of electricity the customer would have consumed in the absence of providing wholesale demand

³⁵³ Clauses 11.125.2 and 11.125.6 of the final rule.

response. This means that a retailer's exposure in the wholesale market should be approximately unchanged following the implementation of a wholesale demand response mechanism, regardless of whether or not its customer is participating in the mechanism.

However, the Commission acknowledges that retailers may require additional information about customers that have an arrangement with a DRSP in order to adjust their hedging strategy for those customers if required in real-time (for example, in relation to higher-than-usual load after a period of providing demand response). The Commission has sought to address this concern by making such additional information available to retailers under the final rule. This is discussed further in appendix D.

G.5.4 Retailer cost recovery from DRSP

When the retailer is billed in the wholesale market at the baseline level of consumption and subsequently charges its consumers for their actual consumption, the retailer will under-recover. That is, there will be some amount of 'missing money'. This amount represents the difference between the actual and baseline consumption multiplied by the customer's retail rate, as this is the amount the customer would have paid the retailer under its retail contract (to cover the wholesale energy purchases the retailer would have made for that customer) if the customer had not provided demand response.

Under the settlement model implemented in the final rule, this cost will be recovered from the customer via the DRSP through AEMO's settlement process. This is intended to address the missing money issue and not impose any unmanageable costs on that retailer or its customers.

The amount the retailer is not recovering from the customer (due to the customer providing demand response) is equal to the difference between the customer's actual and baseline consumption (i.e. the demand response provided)³⁵⁴ multiplied by the customer's retail tariff. The amount payable by the DRSP to the retailer in respect of this under-recovery - the reimbursement rate - will then be accounted for by AEMO in the net amount payable by AEMO to the DRSP (for the demand response provided)³⁵⁵ and the net amount charged by AEMO to the retailer (for electricity purchased in the wholesale market).³⁵⁶ Subtracting this amount from the net amount paid to the DRSP by AEMO simplifies the cost recovery process, as this removes the need for AEMO to issue a separate bill to the DRSP charging it for this amount.

G.5.5 Examples illustrating settlement for wholesale demand response

The flows of money between the customer, the retailer, AEMO and the DRSP under the settlement rules are worked through in Box 10. These are simplified models and do not account for the impacts of retailers' hedging positions.

³⁵⁴ This amount is the "wholesale demand response settlement quantity" calculated under clause 3.15.6B(c) of the final rule.

³⁵⁵ This amount will be calculated under clause 3.15.6B(a) of the final rule.

³⁵⁶ This amount will be calculated under clause 3.15.6B(b) of the final rule.

BOX 10: SETTLEMENT UNDER THE FINAL RULE

Financial flows in a typical trading interval in the absence of wholesale demand response

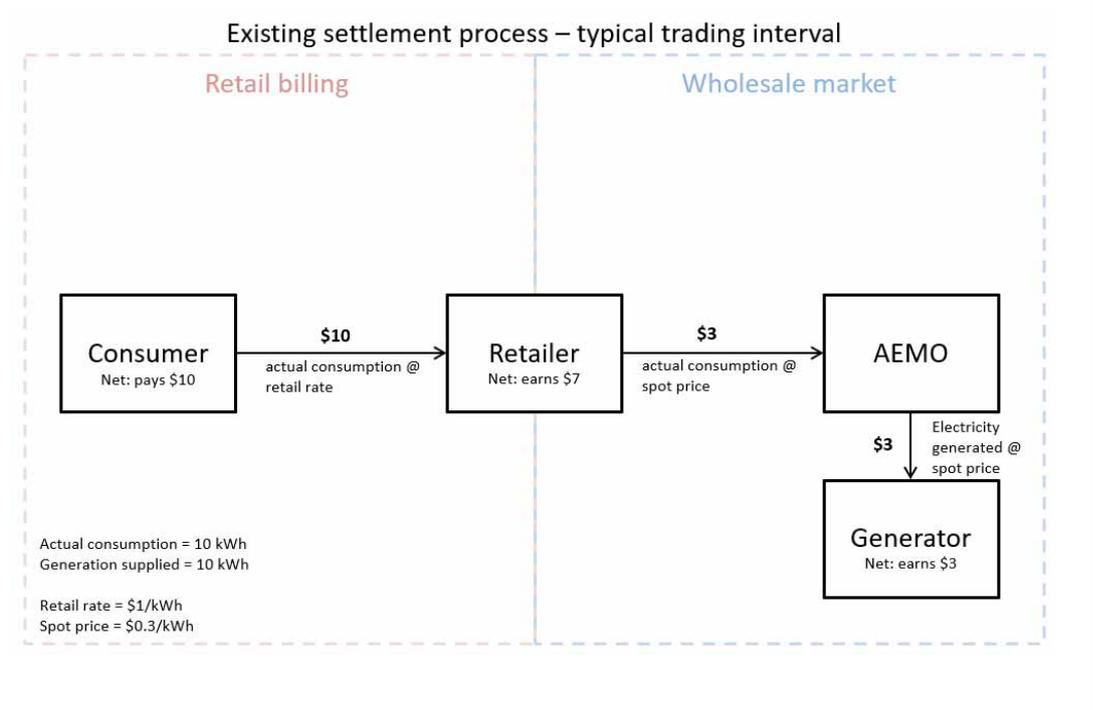
Under existing settlement processes (i.e. in the absence of wholesale demand response provided under the mechanism), in a typical trading interval where the spot price is relatively low (in comparison to the customer's retail tariff), the retailer would earn money as the amount it recovers from its customer is higher than the amount the retailer pays in the wholesale market.

In this scenario:

- the retailer is paid by the customer for the customer's actual consumption at the retail rate
- the retailer pays for the customer's actual consumption in the wholesale market at the spot price
- the generator is paid for the amount of electricity supplied at the spot price.

This scenario is depicted in Figure G.1. In this example, the customer is consuming 10 kWh of electricity at a retail rate of \$1/kWh and a spot price of \$0.3/kWh (these figures are for illustrative purposes only).

Figure G.1: Existing settlement process - no wholesale demand response (typical trading interval)

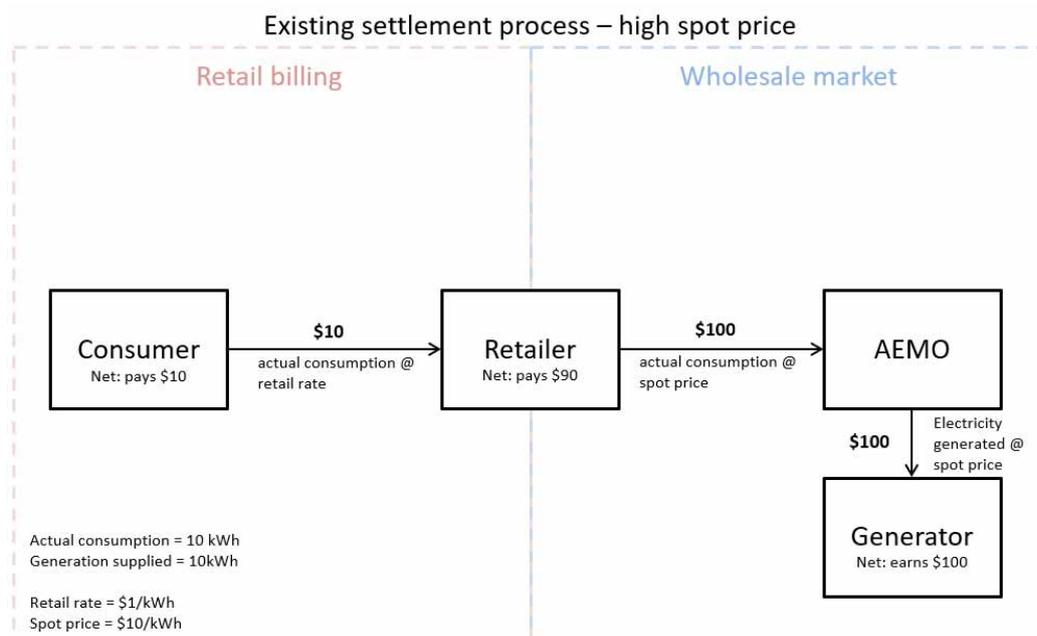


Financial flows during periods of high spot prices in the absence of wholesale demand response

While the example in Figure G.1 represents financial flows during a typical trading interval, wholesale demand response could be expected to be provided by customers primarily during trading intervals where the spot price is high relative to the customer's retail tariff, as this is when customers will receive the most value for demand response. In these trading intervals, the retailer is likely to make a net payment to the wholesale market.

This scenario is depicted in Figure G.2. In this example, the customer is consuming 10 kWh of electricity at a retail rate of \$1/kWh and a spot price of \$10/kWh (these figures are for illustrative purposes only).

Figure G.2: Existing settlement process - no wholesale demand response (high spot price)



The retailer recovers the following through the payment it receives from the customer:

- total network costs
- total environment scheme costs
- total wholesale costs
- total retail costs
- retail margin.

These are assumed away for the above examples.

actual consumption, rather than baseline consumption, would allow retailers to avoid making significant changes to their retail billing systems and is therefore expected to substantially reduce the implementation costs associated with the mechanism.

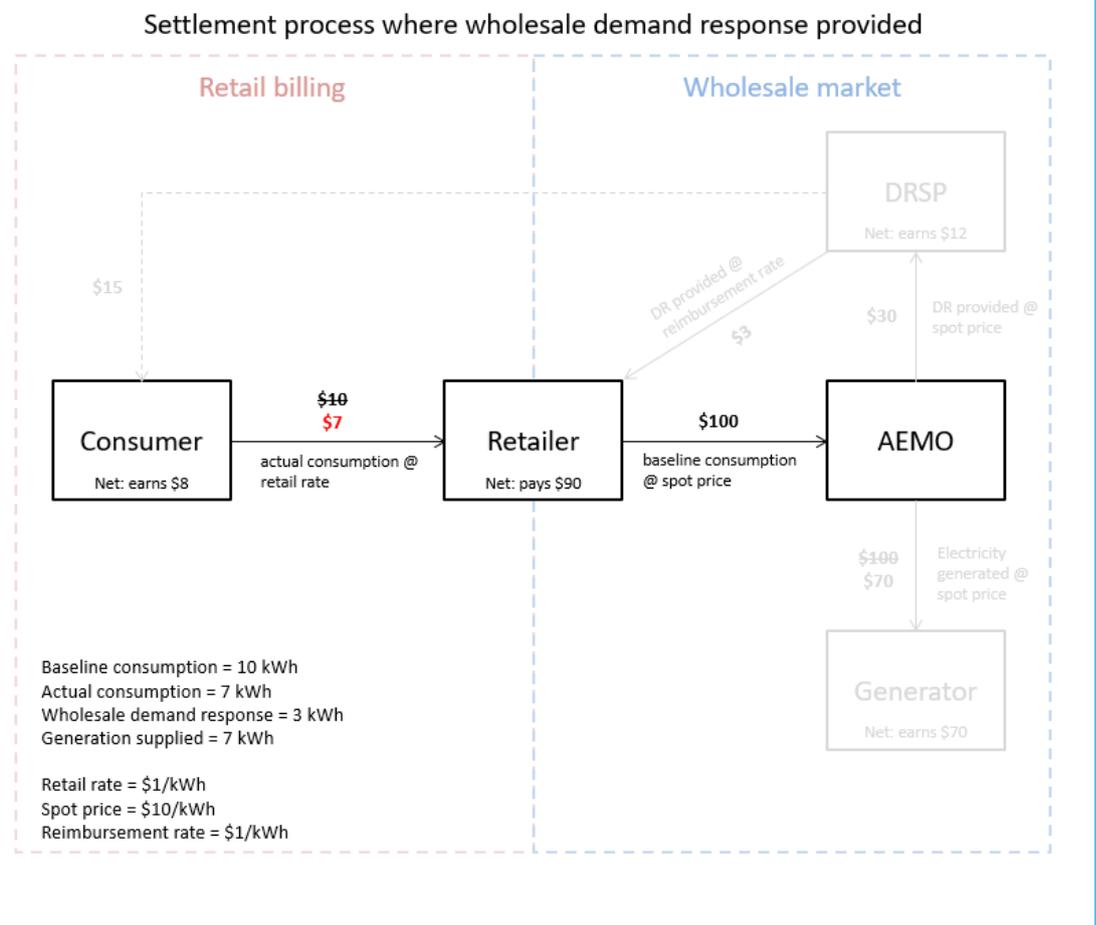
However, if the retailer is only charging the customer for actual consumption it is recovering payment from its customer for a lower amount of energy (in MWh) than the amount of energy for which it is liable to AEMO, as it is paying for the customer's baseline level of consumption in the wholesale market.

The settlement model applying under the final rule addresses this issue by providing for the retailer to recover a payment for this amount of energy from the DRSP, via AEMO's settlement process (as discussed further below).

Financial flows between retailer and AEMO

The retailer would pay AEMO for the customer's baseline level of energy consumption at the spot price in the wholesale market. This payment is depicted in Figure G.4.

Figure G.4: Settlement under the wholesale demand response mechanism - worked example (2 of 4)



This financial flow is calculated as follows:

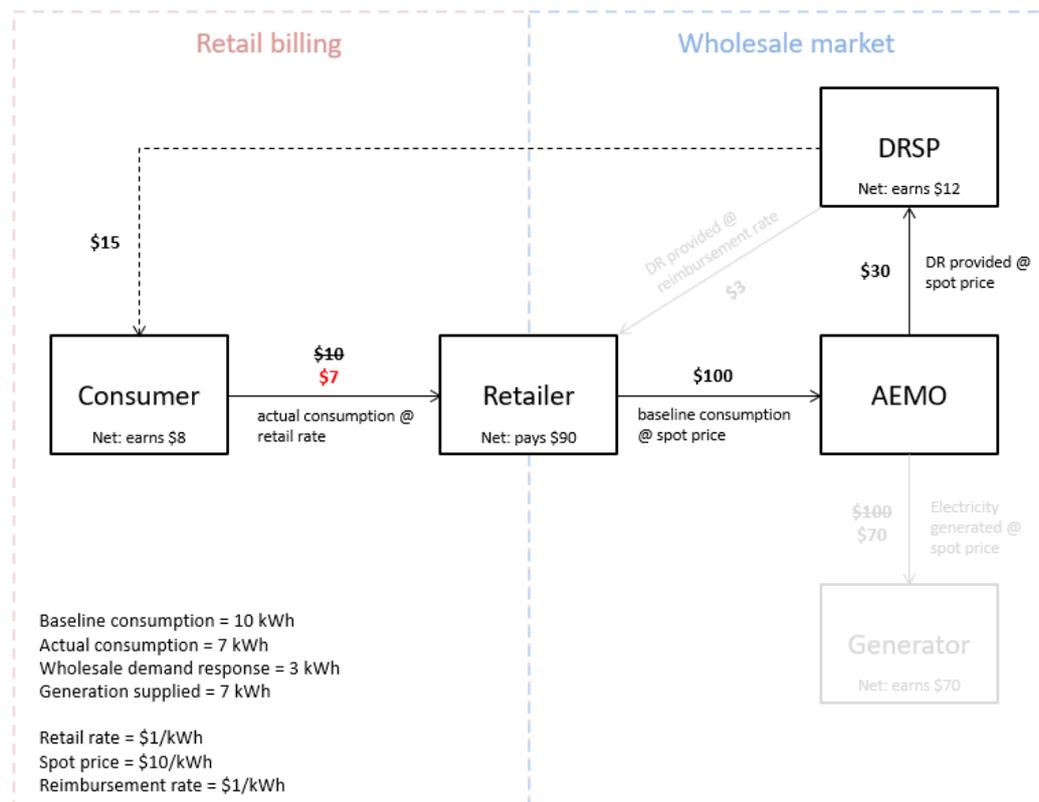
- Payment from retailer to AEMO = baseline consumption (10 kWh) x wholesale rate (\$10/kWh)

Financial flows between AEMO, DRSP and customer

The DRSP would be credited for the quantity of wholesale demand response in the spot market and would share some of this value with the customer, in accordance with its contract with the customer. These payments are depicted in Figure G.5.

Figure G.5: Settlement under the wholesale demand response mechanism - worked example (3 of 4)

Settlement process where wholesale demand response provided



These financial flows are calculated as follows:

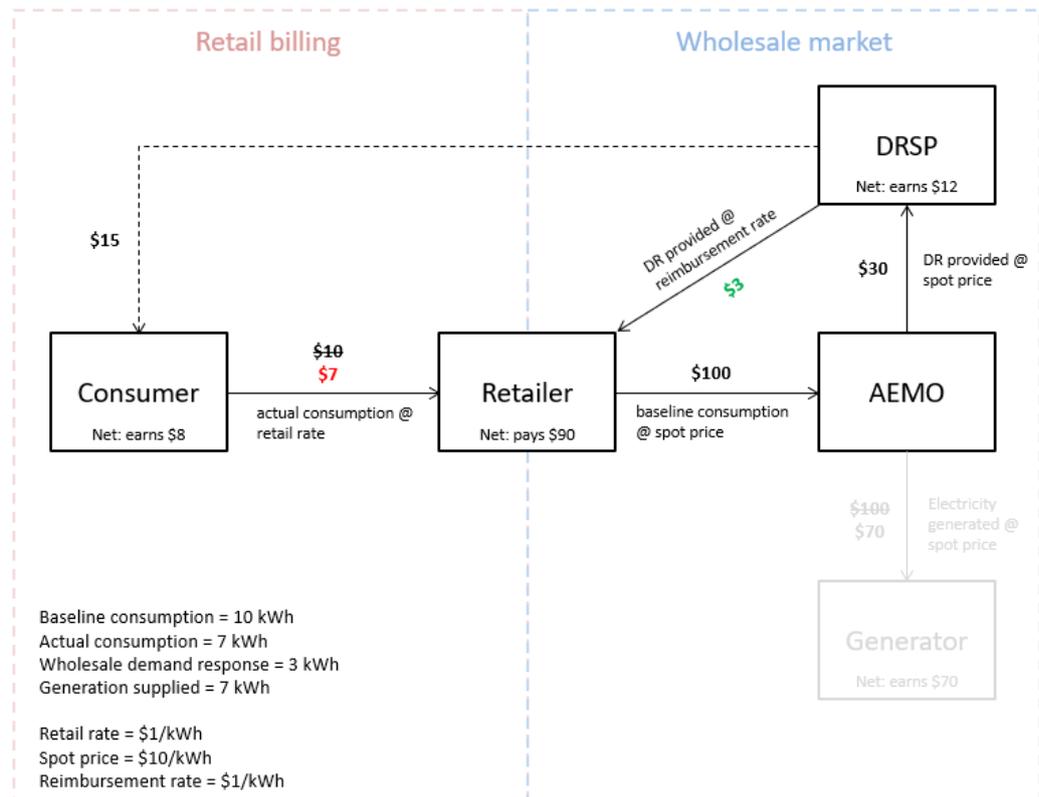
- Payment from AEMO to DRSP = difference between baseline and actual consumption (3 kWh) x wholesale rate (\$10/kWh)
- Payment from DRSP to customer is calculated in accordance with the commercial agreement between the parties.

Financial flow from DRSP to retailer

The amount the retailer does not recover from its customer as a result of the customer providing demand response is equal to the difference between baseline consumption and actual consumption multiplied by the customer's retail rate. Under this settlement model, the DRSP will be charged by AEMO for an amount which is intended to reflect this reduction in retailer revenue, and this payment would flow through to the retailer in settlement. This payment is depicted in Figure G.6.

Figure G.6: Settlement under the wholesale demand response mechanism - worked example (4 of 4)

Settlement process where wholesale demand response provided



This financial flow is calculated as follows for the purposes of this example:

- Payment from DRSP to retailer (via AEMO) = Difference between baseline and actual consumption (3 kWh) x reimbursement rate (\$1/kWh)

This payment allows the retailer to recover the same amount as it would if it billed the customer at the baseline (or if the customer had not provided demand response), without incurring the costs associated with changing its billing systems. (This is based on the

assumption that the reimbursement rate is the same as the wholesale component of the customer's retail tariff in this example.)

In this example, the retailer recovers the following through the payment it receives from the customer:

- total network costs
- total environment scheme costs (noting that these are based on actual consumption)
- wholesale costs for actual consumption
- retail costs
- retail margin for actual consumption.

The retailer recovers an amount in respect of the demand response provided by the customer through the payment received from the DRSP.

Summary

Over the course of the trading interval:

- The consumer has reduced consumption and only consumes 7 kWh. The consumer pays the retailer \$7 for the actual amount of energy, 7 kWh. The retailer subsequently purchases the baseline amount of energy, 10 kWh, from the wholesale market for \$100 (noting that this is the sum of the two separate amounts charged to the retailer).
- The DRSP is credited \$30 for the quantity of demand response.¹ The DRSP shares \$15 with the consumer for undertaking the demand response, in accordance with the previously agreed contract between the DRSP and the consumer.
- The retailer's liability to AEMO and recovery from the consumer are the same as if the consumer did not provide demand response, as the retailer recovers the difference between the baseline and actual consumption, 3 kWh, at the reimbursement rate, \$1/kWh, from the DRSP (via AEMO).²

Note: 1. This amount is the outcome of the calculation under clause 3.15.6B(a) of the final rule.

Note: 2. The retailer's net payment of \$90 is the outcome of the calculation under clause 3.15.6B(b) of the final rule.

This settlement model places each party involved in largely the same net position they would be in under the settlement model proposed by PIAC, TEC and TAI and the South Australian Government. The key difference is that under the settlement model in the second draft rule, the 'missing money' is recovered from consumers indirectly through the consumer receiving a lower payment from the DRSP. However, the net outcome for the consumer should be the same given that the consumer is also paying less to the retailer (for actual rather than baseline consumption). This approach facilitates the same settlement outcomes without requiring retailers to make costly changes to their billing systems.

G.5.6 Consumption above the baseline

In the event that the customer's actual consumption inadvertently goes above its baseline in a wholesale demand response dispatch interval (rather than reducing), the financial flows

depicted in Figure G.6 would effectively be reversed. Rather than receiving a payment for demand response, the DRSP would be required to pay an amount equal to the difference between the customer's baseline and actual consumption at the spot price. This payment would flow through to the customer's retailer, through AEMO.

The Commission acknowledges AEMO's comments in its submission to the second draft determination regarding the implications of allowing "negative settlement", including the need for AEMO to develop bespoke prudential requirements for DRSPs. However, the Commission considers that it is appropriate for the DRSP to be exposed to both the positive, as well as negative, monetary flows. This will provide DRSPs with a stronger incentive to ensure that they deliver wholesale demand response in accordance with their dispatch instructions.

G.5.7 Cap on settlement payments to DRSPs

The Commission recognises that the settlement model under the second draft rule created the potential for a DRSP to be paid for an over-delivery of demand response where this results from changes in the underlying load, particularly for loads that don't have direct metering on the responsive component of the load. The absence of separate metering on this part of the load means it is difficult to assess and enforce conformance with dispatch in these circumstances. For example, a DRSP could be dispatched to provide a 2MW demand reduction, provide this response from the responsive component of the load, and at the same time, the underlying load could decrease by 2MW in a way that wasn't predicted by the baseline for that load. In this instance, under the second draft rule the WDRU would have been paid for 4MW of demand response despite the intention being that they only be paid for reductions in the responsive component of the load. While it is possible for generators to be paid for similar over-delivery of generation, the causer pays framework provides a disincentive to such over-delivery, while real-time metering is also available to inform conformance assessment for generators.

To address this risk, the final rule caps the amount payable to a DRSP in respect of a load within a WDRU to the maximum responsive component of the load at that connection point multiplied by the spot price.³⁵⁷ This will remove the incentive on DRSPs to deliver more demand response than their registered maximum responsive capacity.

G.5.8 Behind-the-meter generation

In addition to reductions in demand, wholesale demand response may involve customers with behind-the-meter generation exporting electricity to the grid (where this export is in excess of the baseline, i.e. the amount of electricity the customer would otherwise be expected to export to the grid at that time).³⁵⁸ The customer's actual consumption would be below zero during those periods. The settlement model set out in the final rule will still apply in this scenario, meaning the customer's DRSP will be credited for providing wholesale demand response provided that the customer's actual consumption was below their baseline

³⁵⁷ Clause 3.15.6B(a) of the final rule, definitions of "WDRSQ" and "MRCSQ".

³⁵⁸ See clause 3.8.7B(g) of the final rule.

(noting that the customer's baseline could also go below zero if they are normally exporting during these periods).

For example, if a customer's baseline level of consumption in a particular trading interval is 10 kWh and the customer is actually exporting 2 kWh to the grid during that interval, the DRSP will be credited for 12 kWh of wholesale demand response at the spot price. The Commission considers that this framework provides appropriate incentives for consumers with behind-the-meter generation to participate in the wholesale demand response mechanism (noting that, for the reasons discussed in appendix D, customers exposed to the spot price in a particular trading interval will be unable to participate in the mechanism in that interval either by providing demand reductions or increased generation).

G.5.9 How is the payment from the DRSP to the retailer calculated?

Under the settlement approach discussed above, in order to calculate the amount to be recovered by the retailer from the DRSP, the DRSP and AEMO would need to know either:

- the actual retail tariff for the customer providing the demand response (which in the example above is assumed to be known), or
- if the actual tariff is not known (discussed further below), a wholesale demand response reimbursement rate (reimbursement rate) which would seek to reflect the wholesale component of an average retail rate (this rate is not intended to capture the retail margin, network costs and the costs of environmental schemes).

The Commission considers that there are a number of issues associated with requiring retailers to provide the actual retail tariffs of demand response customers to DRSPs and AEMO, which include:

- **Complex retail tariff arrangements:** Many existing customers that are capable of providing wholesale demand response are large commercial and industrial customers. The retail contracts for these customers are generally highly bespoke negotiated arrangements. These arrangements often involve complex tariff structures under which the customer is charged different rates based on a number of variable criteria, including the time of consumption and whether certain consumption thresholds are exceeded within a particular period. The Commission understands that it would be difficult for such complex retail tariffs to be recorded in AEMO's systems and used to calculate the amount to be recovered from the DRSP, as this would require all the criteria involved in calculating the customer's bill to be applied to the avoided consumption which constitutes the demand response provided by the customer. Given that many commercial and industrial customers participating in the demand response mechanism may be subject to such arrangements, this could significantly complicate the cost recovery process.
- **Implications for confidentiality and competition:** Details of the retail tariffs a retailer is offering to its customers, particularly in the context of bespoke arrangements for large customers, are information which is likely to be considered commercially sensitive and confidential. Further, there is no restriction under the second draft rule on retailers registering as DRSPs and participating in the demand response mechanism. Accordingly, imposing a requirement on retailers to provide details of the retail tariffs of

their demand response customers to DRSPs may result in them being compelled to provide this information directly to other competing retailers. This outcome may be detrimental to retail competition, as the retailer receiving this information could use it to gain an unfair competitive advantage in the market (e.g. by using this knowledge to approach a retailer's demand response customers and offer them a marginally cheaper retail tariff). While this risk could be reduced by only requiring this information to be provided to AEMO (which could use it to calculate the payments required in settlement), this would have commercial implications for DRSPs, as they would no longer have full visibility of the net amount they could expect to earn for providing demand response. The Commission understands from discussions with stakeholders that these confidentiality and competition concerns would be material in respect of commercial and industrial customers.

Given the issues described above, the Commission considers that the preferable approach is to provide for the cost to be recovered from the DRSP based on a predetermined reimbursement rate. Network costs and the costs of environmental schemes, which are based on actual consumption, will be recovered from the customer, as is currently the case.

Purpose of reimbursement rate

As discussed above, the reimbursement rate is intended to reflect the wholesale cost component of an average large customer's retail tariff. This is because the retailer is liable to AEMO for an amount of energy in the wholesale market in respect of which it will not receive payment from the customer where the customer provides demand response through the mechanism. This is the cost of the electricity the retailer is liable to purchase in the wholesale market which is not consumed by, and therefore not charged to, the customer. In the absence of demand response being provided by the customer, the retailer would have recovered an amount in respect of that cost from the customer through the customer's retail tariff. In general, a retailer would determine the total wholesale costs it expects to incur in relation to a particular customer by considering a number of variables, including the shape of the customer's load profile across different time periods. These costs would then be incorporated into the customer's retail rate and recovered by the retailer on a smeared basis across a particular time period (the duration of the customer's retail contract). A retailer would generally not directly recover the actual wholesale costs it incurs in a particular trading interval from the customer, unless that customer is on some form of spot price pass through arrangement with the retailer.

The purpose of the reimbursement rate is therefore to reflect, to the extent practicable, the wholesale cost component of an average large customer's retail tariff. In developing a methodology that achieves this outcome, trade-offs exist between the need for the methodology to be simple and transparent and the potential to incorporate additional complexity into the methodology for incremental improvements in accuracy. The Commission has considered these trade-offs in developing the methodology adopted in the final rule (as discussed further below).

The reimbursement rate is not intended to account for the retail margin of the retail rate charged to customers. The Commission considers that the significant complexity associated

with attempting to incorporate an average retail margin into the calculation of the reimbursement rate would outweigh the benefits of doing so, given that the retail margin on the amount of wholesale demand response provided by a large customer would ultimately be a very small and likely immaterial amount.

Given that the amount the retailer recovers from the DRSP will be calculated based on the reimbursement rate, this amount will not be precisely reflective of the amount the retailer does not recover from the customer in every transaction where the customer provides wholesale demand response. However, it can be expected that any discrepancy between the customer's actual retail tariff and the reimbursement rate for that customer will be relatively small. This approach also provides retailers with a higher degree of certainty about the costs they are able to recover from the DRSP than if this cost were required to be smeared across their customer base. In addition, retailers can address the potential risks associated with any deviation between the reimbursement rate and a particular customer's actual retail tariff through commercial negotiations with that customer. This approach may be particularly applicable to large customers with highly bespoke and commercially negotiated retail tariffs.

As discussed in appendix g.4, some stakeholders suggested that the reimbursement rate introduces unnecessary complexity into the settlement framework given the relatively small proportion of financial flows this rate will be used to determine. However, the Commission considers it is important that the settlement model under the final rule allows retailers to recover amounts in respect of their wholesale costs from the DRSP of the participating customer in order to maintain the integrity of the mechanism. In addition, it is appropriate for retailers to remain in the same financial position regardless of whether their customer is participating, given that the retailer will not be involved in the provision of the demand response through the mechanism.

The Commission considers that the model adopted in the final determination is preferable to one in which retailers are required to make significant and costly changes to their billing systems or are required to recover the costs from all consumers. Therefore, while there may be minor discrepancies arising from differences between the reimbursement rate and a particular retail rate, the Commission considers that the benefits gained far outweigh these costs.

Approach adopted under the first draft rule

Under the first draft rule, the Commission proposed that the reimbursement rate be calculated based on the average spot prices for the previous 12 months and be determined on a quarterly basis.³⁵⁹ The first draft rule conferred the function of calculating the reimbursement rate on the AER, given that it has existing functions relating to the monitoring of wholesale electricity markets under the National Electricity Law. It was proposed that the AER would provide the reimbursement rate to AEMO for application in settlement to calculate the payment from the DRSP to the retailer.

Approach adopted under the second draft rule

³⁵⁹ Ibid.

Under the second draft rule, the function of calculating the reimbursement rate was conferred on AEMO, rather than the AER. The Commission considered this approach to be more administratively efficient, given that AEMO is already responsible for administering the settlement process and the reimbursement rate would be based on publicly available data.

There was no change in the methodology for calculating the reimbursement rate between the first and second draft rule.

Consideration of alternative methodologies for calculating reimbursement rate

In determining the methodology that should apply to the calculation of the reimbursement rate under the final rule, the Commission has sought to understand the different outcomes for the reimbursement rate resulting from the different methodologies proposed by stakeholders, compared to the methodology set out in the first and second draft rule. This is important when determining the trade-offs between a simple or more complex methodology. To assess the materiality of the difference between the different methodologies, the Commission undertook quantitative modelling to determine the historical rates produced by different methodologies in each mainland NEM region. Analysis of the results of this modelling is set out in Box 11.

BOX 11: MODELLING OF REIMBURSEMENT RATE METHODOLOGIES

As discussed in the first draft determination and in section X above, a number of alternative methodologies for calculating the reimbursement rate have been proposed by stakeholders. The Commission has calculated the reimbursement rates that would be produced by a number of these methodologies over a three year period. The methodologies modelled and the rationale for doing so are described in Table G.1.

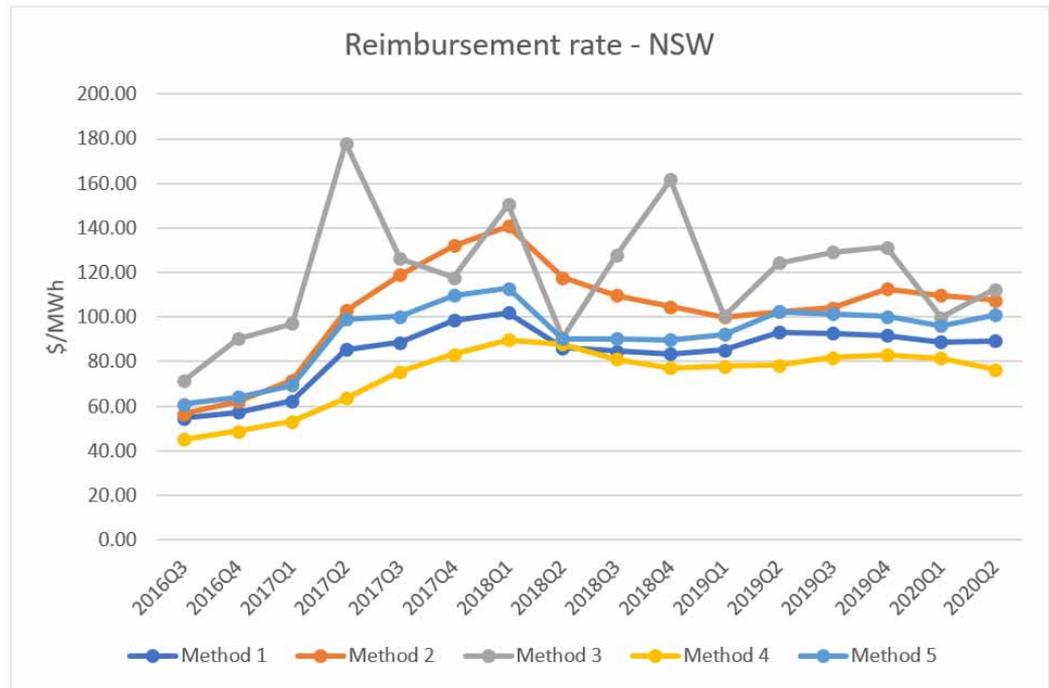
Table G.1: Reimbursement rate methodologies modelled

N O.	DESCRIPTION	RATIONALE
1	Rolling average of wholesale prices over the previous 12 months	This was the methodology set out in the first draft rule.
2	Rolling average of peak ASX futures contract prices over the previous 12 months	Some stakeholders suggested that forward contract prices form the basis of retailers' hedging strategies and peak forward contract prices would better reflect the periods in which demand response would be expected to be provided

N O.	DESCRIPTION	RATIONALE
3	Quarterly peak ASX contract prices traded in the 20 business days immediately prior to the beginning of the quarter in which the demand response is provided, multiplied by a risk weighting of 1.1	It was suggested that this risk weighting is appropriate to reflect the fact that the rate may not reasonably reflect the costs incurred by the retailer (an analogy was drawn to the framework for participant compensation following market suspension)
4	Rolling average of base ASX futures contract prices over the previous 12 months	It was suggested that this would allow a single reimbursement rate to be applied to any interval within the relevant calendar year, noting that high prices and demand response may occur in either peak or off-peak periods depending on the supply and demand conditions at the time
5	Rolling average of wholesale prices during peak demand periods (i.e. 10am to 7pm on weekdays) over the previous 12 months	It was suggested that this would better account for the likelihood that loads offering wholesale demand response may consume the majority of their load during these periods and that retailers would have reflected this in their retail tariffs for those customers.

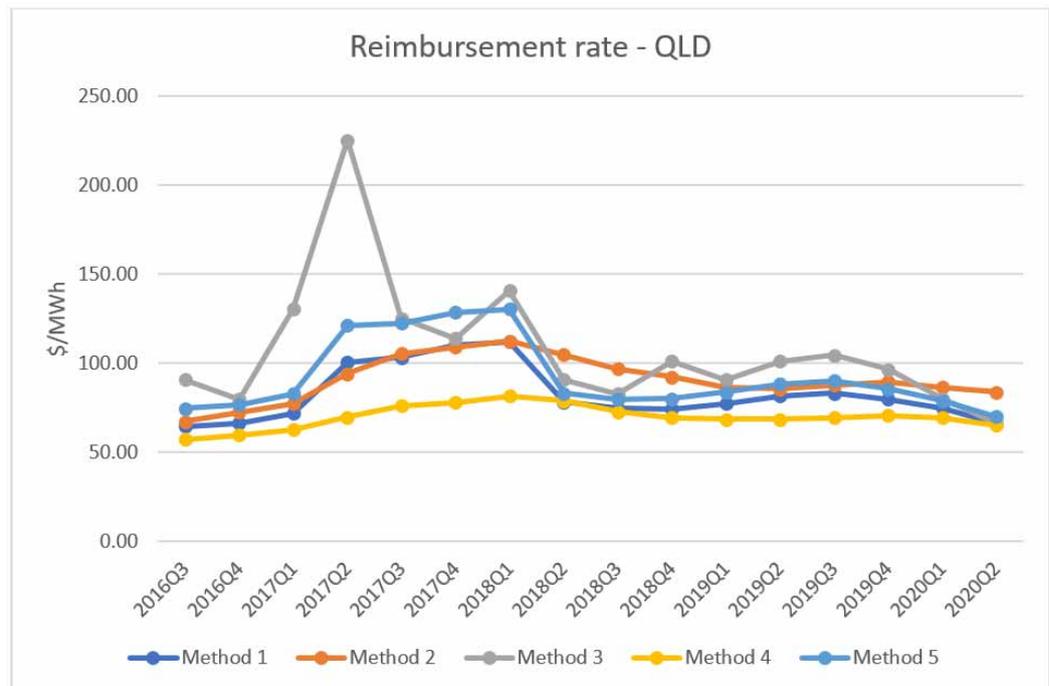
The results of this modelling for each jurisdiction are set out in the below figures.

Figure G.7: Reimbursement rate modelling - NSW



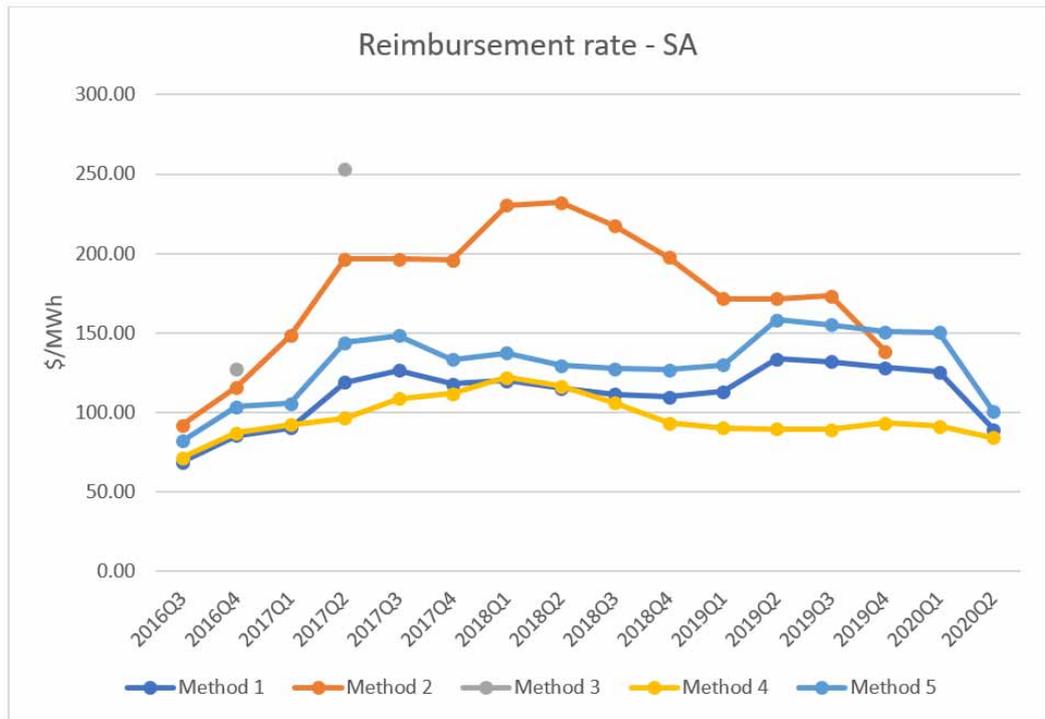
Source: AEMC internal modelling based on publicly available data.

Figure G.8: Reimbursement rate modelling - QLD



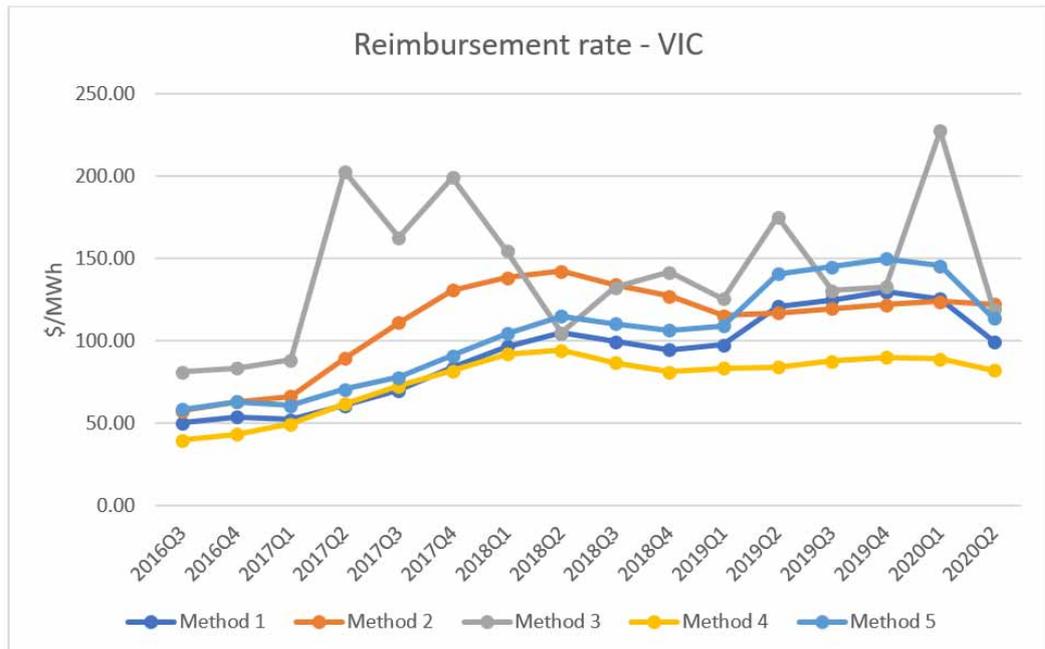
Source: AEMC internal modelling based on publicly available data.

Figure G.9: Reimbursement rate modelling - SA



Source: AEMC internal modelling based on publicly available data.

Figure G.10: Reimbursement rate modelling - VIC



Source: AEMC internal modelling based on publicly available data.

The following insights can be drawn from this modelling:

- In all regions, there is a relatively consistent variance between Method 1 (average spot prices), Method 4 (average forward base contract prices) and Method 5 (average spot prices during peak demand periods), with the rate for Method 1 sitting in between the rate for the other two methods. The magnitude of the difference between the rates is relatively small.
- Method 3 produces a very volatile rate, and is not practicable in South Australia due to the lack of liquidity in the contract market.
- Method 2 (forward peak contract prices) generally produces a higher reimbursement rate than Method 1 (average spot prices). However, the magnitude of the difference between these methods differs across jurisdictions and time periods. There are multiple periods in New South Wales, Queensland and Victoria in which the rates produced by these two methodologies are very similar. In South Australia, Method 2 would have historically produced a significantly higher reimbursement rate than Method 1. However, the two rates appear to be converging in all jurisdictions in recent quarters.

Approach adopted under final rule and rationale

Under the final rule, the reimbursement will be calculated on a quarterly basis and will be based on a rolling average of demand-weighted wholesale prices during peak demand periods (i.e. between 10am and 7pm on weekdays) over the previous 12 months. This represents a change from the methodology proposed under the first and second draft determinations. This approach has been informed by stakeholder feedback on the first and second draft determinations, discussions at technical working group meetings and the internal modelling presented in Box 11.

The Commission considers that there are a number of factors which support the reimbursement rate methodology proposed under the final rule. These include:

- Contract market liquidity issues in South Australia present challenges for methodologies that seek to utilise forward contract prices, as evidenced by the modelling in Box 11. While this may be addressed by adopting different methodologies for different jurisdictions, the Commission understands that this would involve additional costs due to the increased complexity this would impose on AEMO's settlement processes and systems. This also presents challenges for the proposal to adopt different reimbursement rate methodologies for different types of load.
- There is no clear or transparent basis on which an appropriate "risk weighting" can be determined for the purposes of Method 3. In any case, this method produces very volatile results in most regions, and does not currently produce any rate in South Australia.
- The Commission understands that retailers are likely to base customers' retail tariffs on forward contract prices at the time the retail contract is entered into, as these represent the retailer's hedging costs for that customer. However, given the issues discussed above with respect to using contract prices to determine the reimbursement rate, it is necessary

to consider alternative methodologies which allow retailers to recover these costs without reference to contract prices. In addition, it has been noted that hedge contract prices generally trade at a premium to spot prices, with a built in margin.³⁶⁰ This suggests that basing the reimbursement rate on the average spot price during all periods may not fully compensate retailers for these costs. The Commission therefore considers that a methodology based on the slightly higher average spot prices that occur during peak demand periods is more appropriate in this context.

- The retail tariffs of large customers are generally complex and incorporate peak rates to account for variations in load profile, particularly where the customer has high levels of consumption during peak demand periods. It is possible that a large number of loads providing demand response through the mechanism will consume the majority of their load during those periods, which would be reflected in their retail tariff.
- Stakeholders have acknowledged in technical working group meetings that there are options for calculating the reimbursement rate which may yield incremental improvements in accuracy, but would also add significant complexity to the process of determining the rate. In addition, no methodology is capable of producing a rate that accurately reflects the wholesale costs incurred for every retailer, as each retailer utilises different pricing strategies for their customers and different hedging strategies. The Commission considers that the modelling presented in Box 11 illustrates that the variance between the method adopted in the first and second draft determinations and the methodology adopted under the final rule is relatively small, and the payment based on this rate will only represent a small proportion of the amounts settled under the mechanism and a small proportion of the amounts the retailer otherwise receives from the customer.
- The average demand-weighted spot price during peak demand periods provides a simple, transparent and objective reference point to approximate the wholesale cost component of the average retail tariff. Spot prices during peak times are a well understood and regularly used concept, with prices for these periods already publicly reported by AEMO.³⁶¹ It should therefore be straightforward for AEMO to calculate the reimbursement rate based on this methodology.

Both AEMO and the AER suggested in submissions to the first draft determination that the responsibility for determining the reimbursement rate should be conferred on AEMO, rather than the AER, in order to reduce complexity. Given that the methodology adopted under the second draft rule maintains a simple and clear formula in the NER for determining the reimbursement rate based on transparent, publicly available information, the Commission agrees that it is appropriate and administratively expedient for AEMO to calculate the reimbursement rate. Accordingly, the final rule confers this function on AEMO. The Commission considers that this function is within the scope of AEMO's powers under the NEL.

360 Snowy Hydro, submission to the first draft determination, p. 6.

361 See the "PEAK RRP" figures reported in the Average Prices table on AEMO's data dashboard, available at: <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/data-dashboard-nem>.

The efficacy of the methodology for calculating the reimbursement rate may be reassessed as part of the AEMC's three-year review of the wholesale demand response mechanism required under the final rule. In undertaking this review, the AEMC could consider whether this methodology remains appropriate having regard to learnings from the operation of the mechanism.

H CONSEQUENTIAL AND COMPLEMENTARY CHANGES

H.1 Overview

This appendix sets out a number of complementary and consequential measures to the introduction of the wholesale demand response mechanism. This appendix sets out:

- consequential changes arising from introduction of the mechanism, including systems changes not covered elsewhere in the determination
- changes that are complementary to the introduction of a mechanism.

Table H.1: Overview of appendix

CONSEQUENTIAL CHANGES	COMPLEMENTARY CHANGES
<p>Changes relating to:</p> <ul style="list-style-type: none"> • the requirements applying to DRSP participation in the reliability and emergency reserve trader (RERT) • the interaction between wholesale demand response provided through the mechanism and the retailer reliability obligation (RRO) • the entitlement of a DRSP to claim compensation following a market suspension • AEMO's systems necessary to support the introduction of the wholesale demand response mechanism and the new DRSP participant category. 	<p>Changes and recommendations relating to:</p> <ul style="list-style-type: none"> • AEMO's DSP portal • Energy Made Easy • the relationship between CPT, APC and wholesale demand response • retailers facilitating more wholesale demand response.

Some of the measures identified involve changes to the NER under the final rule, while others do not require changes to the rules and can be progressed separately.

The remainder of this appendix outlines the background for each of the relevant measures, as well as the Commission's analysis and conclusions.

H.2 Commission's analysis and conclusions

BOX 12: FINAL RULE AND RECOMMENDATIONS

Systems changes

The final rule:

- requires AEMO to update a number of systems and procedures to accommodate the introduction of DRSPs. These systems include information provision and market settlement systems, and the related procedure documents.
- AEMO will need to store new standing data for NMIs relating to the allocation of a DRSP.
- AEMO will also need to store (and provide to DRSPs and retailers) data relating to the baseline methodology and settings, the maximum responsive component of a wholesale demand response unit, and the periods when the unit was dispatched to provide wholesale demand response.
- AEMO would need to be able to settle retailers and DRSPs for the amount of demand response provided.
- requires metering data providers (MDPs) to provide metering information to DRSPs in addition to the participants they currently provide with meter data.
- requires B2B Procedures to facilitate B2B Communications between the DRSP and other existing market participants.

The final rule does not include any material changes from the second draft rule in relation to these issues.

Benefits of the final rule

The final rule would require a more limited number of systems changes to accommodate the introduction of DRSPs, compared to the first draft rule. These systems changes would facilitate the settlement of DRSPs for wholesale demand response at a cost AEMO estimates to be considerably lower than would have been the case under the first draft rule.

Consequential changes

The final rule:

- clarifies how the existing out-of-market provisions relating to the RERT apply to DRSPs
- provides for a minor amendment to the RERT Guidelines, which is to be published by the Reliability Panel prior to the commencement of the wholesale demand response mechanism
- provides for the RERT Procedures to be amended by AEMO prior to the commencement of the wholesale demand response mechanism to take into account the amending rule
- amends the rules which give effect to the RRO to clarify that all wholesale demand response provided by a liable entity's customers will be included in the calculation of that liable entity's liable load for compliance purposes
- clarifies that a demand side participation contract that is a qualifying contract for the purposes of the RRO may include wholesale demand response

- amends the definition of "directed participant" to clarify that the term only applies to DRSPs in their capacity as providers of market ancillary services and not as providers of wholesale demand response (i.e. to maintain the existing position under the rules)
- amends the definition of "Market Suspension Compensation Claimant" to clarify that compensation is also available to DRSPs that provide wholesale demand response during a market suspension event.

Benefits of the final rule

The final rule:

- ensures that AEMO will provide guidance and transparency about how the RERT out-of-market provisions will apply to scheduled demand response
- preserves existing signals to the market that the RERT is an out-of-market service that is only to be used after market responses have been exhausted, including in relation to wholesale demand response
- clarifies the application of existing directions and compensation frameworks to DRSPs in order to reduce AEMO's implementation costs.

Changes from the second draft rule

The final rule includes minor changes from the second draft rule to clarify how compensation for DRSPs following market suspension is to be determined by AEMO.

Complementary changes

The final rule:

- requires AEMO to review the Demand Side Participation Information (DSPI) Guidelines to reflect the changes to the demand side reporting requirements under the final rule
- requires all registered participants to report in accordance with the DSPI Guidelines, even if the report states that the participant has no demand side information to report
- requires DRSPs to submit information regarding wholesale demand response over longer timeframes to AEMO using the DSP Portal
- requires AEMO to publish additional information regarding the demand side participation information submitted using the DSP Portal.

The final determination also notes that the Commission:

- recommends that AEMO review the DSP portal to ensure participants are able to report all wholesale demand response provided by their customers
- recommends that the AER consider the feasibility of making changes to the Energy Made Easy comparison tool to ensure that:
 - spot price pass through contracts and other demand response services offered by retailers are represented, and that their cost and competitiveness is accurately portrayed to users of the tool

- retailers provide easy-to-understand information about the risks and requirements involved with retailer-led demand response arrangements, particularly where customers are materially exposed to the wholesale market price.
- may request that the Reliability Panel review the APC in light of recent events highlighting the interaction between the APC and wholesale demand response
- will review the existing APC Compensation Guidelines to ensure the guidelines adequately deal with compensation for wholesale demand response providers, and may undertake a more holistic review of this guideline to clarify the circumstances in which different parties can claim compensation following the application of the APC
- recommends that retailers commit in the Energy Charter to facilitating greater access to demand response products and services for customers.

The final rule does not include any material changes from the second draft rule in relation to these issues.

Benefits of final rule and recommendations

The final rule, and the areas for further work highlighted in the second draft determination (if implemented):

- allow consumers and retailers to make better informed decisions in relation to the provision of wholesale demand response
- encourage retailers and DRSPs to provide competitive and fairly valued demand response products to consumers
- ensure that consumers have the appropriate incentives to provide wholesale demand response during periods of peak demand.

The following two sections provide more information on:

- the consequential changes arising under the final rule
- the complementary changes made in the final rule and other recommendations to facilitate wholesale demand response.

H.3 Consequential changes

The wholesale demand response mechanism under the final rule impacts on various aspects of the current market design. As such, the Commission has considered whether additional changes to the NER are required to account for the interaction between the mechanism and other existing parts of the regulatory framework. This section sets out the Commission's consideration of the key aspects of the NER that interact with the mechanism and whether incidental changes are required to account for these interactions.

The consequential issues arising from the final rule, and any associated changes, discussed in this appendix relate to the interaction between the mechanism and:

- the Reliability and Emergency Reserve Trader (RERT)

- the Retailer Reliability Obligation (RRO)
- the definition of the reliability standard
- the directed participants framework
- the compensation framework for affected participants
- the framework for compensation following market suspension
- changes to AEMO's systems.

H.3.1 Reliability and emergency reserve trader

The RERT is an existing mechanism that allows AEMO to contract for emergency reserves, such as generation or demand response, that are out of market. It is an important part of the regulatory framework that AEMO uses as a last resort at times when the market has not provided enough reserves to meet demand e.g. during extreme heat events. The RERT provisions in the NER provide AEMO with the flexibility and appropriate discretion when using the RERT (or emergency reserves) to manage the transition in the power system, while minimising costs to consumers, and in a transparent manner.

In May 2019 the Commission made a final rule amending the RERT provisions to clarify the out-of-market provisions in the NER.³⁶² The out-of-market provisions provide that:

- scheduled reserves which have been in the wholesale market during the 12 months prior to signing a RERT contract cannot provide emergency reserves and cannot be in the wholesale market for the duration of their RERT contract
- unscheduled reserves cannot be in the wholesale market for the trading intervals to which their RERT contract relates.

The purpose of these clarifications was to make it clear that the wholesale market is the primary means by which reliability is delivered and that incentives to invest in market reserves need to be preserved, so that costs of reliability are minimised for consumers.

A key principle underlying the wholesale demand response mechanism set out in the final rule is that wholesale demand response participating in the mechanism should be treated equivalently to generation in a range of respects. The Commission considers that it is appropriate for this treatment to extend to participation in the RERT. This will ensure that the existing signals to the market that the RERT is an out-of-market service that is only to be used after market responses have been exhausted will also apply to wholesale demand response.

As such, the final rule clarifies that the existing out-of-market provisions also apply to DRSPs. This means that AEMO must ensure that DRSPs:

- are not participating in the wholesale market for the term of their reserve contract³⁶³

³⁶² AEMC, *Enhancement to the Reliability and Emergency Reserve Trader* rule change, available at: <https://www.aemc.gov.au/rule-changes/enhancement-reliability-and-emergency-reserve-trader>.

³⁶³ Clause 3.20.3(g)(1) of the final rule.

- who have been in the wholesale market at any time during the 12 months prior to signing a RERT contract do not participate in the RERT.³⁶⁴

Under the out-of-market provisions, unscheduled emergency reserves, which may include demand response that is undertaken outside of the wholesale demand response mechanism, cannot be both in RERT and in the wholesale market for the trading intervals to which the RERT contract relates. The rules also require AEMO to be transparent in its RERT procedures regarding how it intends to apply the provisions for unscheduled reserves. The final rule extends this obligation on AEMO to also apply to scheduled wholesale demand response.³⁶⁵ This means that AEMO will be required to provide details in its RERT procedures about how the relevant provisions will be applied to DRSPs that are subject to a scheduled reserve contract. The Commission considers that this is appropriate given that wholesale demand response has not been scheduled in NEM in this manner in the past and it would be helpful to market participants for AEMO to provide guidance and transparency about how the out-of-market provisions will apply to scheduled demand response.

Retailers' liability for RERT payments is currently calculated based on the actual consumption of the retailers' customers.³⁶⁶ This would continue to be the case under the final rule. The Commission considers that if RERT payments were to instead be calculated based on baseline levels of consumption, this would reduce the incentive to provide demand response during periods in which the RERT is used as the reduction in energy use would have no impact on the retailers' RERT liability. In addition, customers providing demand response during these periods have presumably not contributed to the reliability issue in the market (and in fact may have assisted in the rebalancing of supply and demand) and should not therefore be charged for RERT at their baseline level of consumption. Continuing to calculate these amounts based on actual consumption should also minimise the extent of any changes required to AEMO's systems.

The final rule also provides for:

- a minor amendment to the RERT Guidelines, which is to be published by the Reliability Panel prior to the commencement of the wholesale demand response mechanism³⁶⁷
- the RERT Procedures to be amended by AEMO prior to the commencement of the wholesale demand response mechanism to take into account the amending rule.³⁶⁸

The AER also noted in its *Wholesale electricity market performance report 2018* that it intends to monitor the impact of AEMO's management of the RERT on market driven demand side participation.³⁶⁹

³⁶⁴ Clause 3.20.3(g)(2) of the final rule.

³⁶⁵ Clause 3.20.7(e)(1)(ii) of the final rule.

³⁶⁶ NER, clause 3.15.9.

³⁶⁷ Clause 11.125.8 of the final rule.

³⁶⁸ Clause 11.125.6(a)(6) of the final rule.

³⁶⁹ AER, *Wholesale electricity market performance report 2018*, December 2018. Available at: <https://www.aer.gov.au/wholesale-markets/market-performance/aer-wholesale-electricity-market-performance-report-2018>.

H.3.2 **Retailer reliability obligation**

The package of law and rule changes implementing the RRO commenced on 1 July 2019.

The RRO builds on existing spot and financial market arrangements in the electricity market to facilitate investment in dispatchable capacity and demand response. It is designed to incentivise retailers, on behalf of their customers, to support the reliability of the power system through their contracting and investment decisions. In other words, the RRO forms part of the NEM's reliability framework, creating additional signals for investment by providing incentives to retailers to obtain contracts that will support reliability further.

The RRO does this by requiring electricity retailers (and other liable entities) to demonstrate they have entered into sufficient contracts for dispatchable capacity (including demand response) to cover their share of system peak demand at the time of the gap between demand and supply. The obligation to secure sufficient qualifying contracts would be triggered if there is a material gap (i.e. a breach of the reliability standard) between forecast demand and supply three years out from the period in which the gap is forecast and the AER has subsequently made a 'T-3 reliability instrument'.³⁷⁰

If the gap persists one year out from the forecast gap, then AEMO is able to apply to the AER to make a 'T-1 reliability instrument'. If, one year out (T-1), a material reliability gap remains, the AER will require liable entities to report their net contract positions. AEMO may then commence procurement of emergency reserves at T-1 (i.e. 12 months ahead of the gap) through the RERT framework to address the remaining gap, with costs to be recovered through the Procurer of Last Resort cost recovery mechanism.

The intent of the RRO rules is to require retailers to enter into hedging contracts to cover their expected consumption 12 months in advance. A key question considered by the Commission is whether the obligations applying to retailers under the RRO should apply with respect to the actual level of consumption, or the baseline level of consumption, of the retailer's customers where those customers provide wholesale demand response.

A number of stakeholders commented on the interaction between the RRO and the wholesale demand response mechanism in submissions to the second draft determination:

- **CS Energy, ENGIE and ERM Power** disagreed with the approach under the second draft determination which provided that retailers' RRO liability will be calculated based on their customers' baseline level of consumption, rather than actual consumption.³⁷¹ ENGIE submitted that this would impose additional risk on retailers because the determination of a baseline is completely outside the retailer's control or influence.³⁷² ERM Power also noted this risk and suggested that the only way for retailers to manage this would be to over-hedge, and likely pass these additional costs on to consumers.³⁷³ ERM Power suggested that the approach under the second draft determination is inconsistent with

³⁷⁰ When AEMO identifies a material gap three years out, it has to apply to the AER to make a "T-3 reliability instrument". This instrument is then the trigger for the RRO mechanism and obligations, such as requiring retailers to have enough contracts in place.

³⁷¹ Submissions to draft determination: CS Energy, p. 6; ENGIE, p. 2; ERM Power, p. 3.

³⁷² ENGIE, submission to second draft determination, p. 2.

³⁷³ ERM Power, submission to second draft determination, p. 3.

the original intent of the RRO rules, which set out that demand response would only be 'added back' to a retailer's load for compliance purposes if the retailer was the FRMP for that load and was using a demand response arrangement as a qualifying contract.³⁷⁴

- **Snowy Hydro** suggested that the AER's contracts and firmness guidelines should also allocate risk associated with the firmness of consumers' wholesale demand response to be managed by the DRSP.³⁷⁵

Under the wholesale demand response mechanism, retailers will have no foresight of whether their customers may be dispatched for wholesale demand response over this period. While a retailer will know whether its customer has an arrangement with a DRSP, the retailer will not know the terms of that arrangement. In addition, if the customer is dispatched for wholesale demand response, the retailer will be liable in the wholesale market for the customer's baseline level of consumption. As such, the Commission expects that retailers will face the same incentives in relation to their hedging for this period regardless of whether the retailer has customers participating in the mechanism. As a result, the Commission considers that the obligations applying to the retailer under the RRO should be assessed with regard to the baseline level of consumption for any customers that were dispatched for wholesale demand response. The Commission acknowledges that some retailers expressed concern that differences between the baseline and retailers' own forecasts of customer consumption could impact on their compliance with their contracting obligations under the RRO and give rise to the potential for over-hedging by retailers to account for this risk. However, the intention of the RRO is to provide contracting incentives to retailers to facilitate the investment needed to underpin a reliable electricity system. As such, the Commission does not consider that some potential over-hedging by retailers would be inconsistent with this objective. The final rule therefore amends the rules which give effect to the RRO to clarify that all wholesale demand response provided by a liable entity's customers will be included in the calculation of that liable entity's liable load for compliance purposes.³⁷⁶

Contracts between customers and DRSPs will generally not be qualifying contracts for the purposes of the RRO. This is because the customer's retailer is not the counter-party to the contract (i.e. the contract allows the demand response to be sold into the wholesale market as a supply-side resource, not directly to the retailer). However, the contract between the DRSP and the customer may count as a qualifying contract where the DRSP and the retailer are the same entity. In addition, as noted by a number of stakeholders, DRSPs will be able to sell financial contracts to retailers for wholesale demand response. These contracts would be qualifying contracts for the purposes of the RRO. In those circumstances, the DRSP would have to ensure it can back the contract by managing how its customers are dispatched, consistent with how peaking generators defend cap positions. This scenario is already provided for under the rules.

374 Ibid.

375 Snowy Hydro, submission to second draft determination, p. 8.

376 Clause 4A.F.3(b)(3) of the final rule.

The final rule makes minor changes to the RRO rules to clarify that a demand side participation contract that is a qualifying contract may include wholesale demand response.³⁷⁷

The Commission recommends that the AER's contracts and firmness guidelines address the circumstances where a retailer has a qualifying contract for the provision of demand response with its own customer and that customer subsequently enters into a wholesale demand response arrangement with a DRSP.

H.3.3

Reliability standard

The reliability standard is the maximum expected unserved energy in a region of 0.002 per cent for a given financial year as a share of total energy demanded in that region. In general terms, 'unserved energy' means the amount of customer demand that cannot be supplied within a region of the NEM due to a shortage of generation or interconnector capacity. The reliability standard represents a trade-off between the prices paid for electricity and the cost of not having energy when it is needed: increasing levels of reliability involves increased costs. The reliability standard is set at a level that provides a balance between delivering reliable electricity supplies and maintaining reasonable costs for customers (i.e. an economic trade off between affordability and reliability, based on what consumers value).

The reliability standard is currently specified in the NER by reference to "generation and inter-regional transmission elements" in the NEM and is set as a maximum expected unserved energy in a region of 0.002% of the "total energy demanded in that region" in a financial year.³⁷⁸ The definition of the reliability standard does not expressly reference wholesale demand response. However, wholesale demand response is implicitly captured by the reliability standard, as the definition of unserved energy refers to the amount of energy "demanded, but not supplied, in a region".³⁷⁹ This definition does not apply to intentional reductions in energy usage by a consumer in response to wholesale prices (i.e. wholesale demand response), as this is not energy which is demanded by the consumer. As such, wholesale demand response can be considered as a reduction in the "energy demanded" in a particular region for the purposes of the reliability standard, which in turn reduces the amount of generation and inter-regional transmission elements needed to meet that demand.

Given that the Commission considers the reference to "energy demanded" in relation to the reliability standard implicitly captures wholesale demand response, the final rule does not propose any changes to the current definition of the reliability standard in the NER.

H.3.4

Directed participants

The NER currently provide for registered participants to be the subject of a direction by AEMO in respect of scheduled plant or market generating units.³⁸⁰ Such directions may require those participants to take action necessary to maintain or re-establish the power system to a secure operating state, a satisfactory operating state, or a reliable operating

³⁷⁷ Clause 4A.E.1 of the final rule.

³⁷⁸ NER, clause 3.9.3C(a).

³⁷⁹ NER, Chapter 10.

³⁸⁰ NER clause 4.8.9(a1)(1).

state.³⁸¹ In those circumstances, the directed participant is entitled to recover compensation for the service provided in order to comply with the direction.³⁸²

AEMO's power to issue a direction under the rules will not extend to DRSPs in respect of wholesale demand response, as the direction must relate to a "scheduled plant" or "market generating unit", which will not capture wholesale demand response units under the final rule.³⁸³ The Commission considers that allowing AEMO to direct DRSPs could have very significant implications for customers within the relevant wholesale demand response unit, as those customers could have valid financial and commercial reasons for not being able to reduce consumption during the relevant period (e.g. a manufacturing business that is working to fill a significant purchase order).

As DRSPs will not be subject to directions to provide wholesale demand response, the provisions relating to compensation for directed participants also do not apply to DRSPs in their capacity as providers of wholesale demand response under the second draft rule. DRSPs may however be subject to a clause 4.8.9 instruction issued by AEMO, as is the case with any other registered participant.³⁸⁴ No compensation is payable in relation to the issuing of a clause 4.8.9 instruction.

The Commission notes that the existing definition of "directed participant" expressly includes market ancillary service providers (MASPs). Given that this registration category is combined with DRSPs under the final rule, the final rule amends the definition of "directed participant" to clarify that the term only applies to DRSPs in their capacity as a provider of market ancillary services and not as a provider of wholesale demand response (i.e. to maintain the existing position under the rules). For consistency, the final rule also amends the definition of "scheduled plant" in respect of which AEMO can issue directions to include ancillary services loads, and includes a reference to demand response service providers (in respect of market ancillary services) in the formula providing for compensation to directed participants.³⁸⁵

H.3.5

Affected participants

The interventions framework in the NER provides AEMO with the tools to intervene in the market for reliability purposes (e.g. in the event of a breach of the reliability standard) or for power system security purposes (e.g. to maintain voltage). The interventions framework includes not only directions but the RERT and the issuing of instructions by AEMO.

When AEMO intervenes in the market, it is required to compensate both market participants who were directed, and those affected by the direction. Affected participants are those parties whose dispatch targets have been affected as a result of an AEMO intervention event, and therefore include entities which are not themselves subject to directions. Affected participants are entitled to receive from, or pay to, AEMO an amount that puts them in the position they would have been in but for the direction or RERT activation. For example, if a

³⁸¹ NER clause 4.8.9(a)(1).

³⁸² NER clause 3.15.7(a).

³⁸³ NER clause 4.8.9(a1)(1).

³⁸⁴ NER clause 4.8.9(a1)(2).

³⁸⁵ Clause 3.15.7(c) of the final rule.

generator's output is reduced as a result of an intervention, it will be paid compensation by AEMO to put it in the position that it would have been in had the intervention event not occurred.

Under the first draft rule, the definition of "affected participant" was amended to include a DRSP that has its dispatch quantity affected by a RERT-related intervention event. This would have meant that a DRSP would receive or pay compensation if it is affected by the exercise of the RERT, and this compensation would be calculated in the same way as for other affected participants.

The final rule does not expand the definition of "affected participants" to include DRSPs in relation to either directions or the RERT, and therefore DRSPs would not be eligible for compensation if they are affected by those interventions. This is based on advice from AEMO that including DRSPs in the affected participant compensation framework would require changes to a number of systems and processes that would materially increase the implementation costs of the mechanism.

In addition, the Commission made a final rule on the *Application of compensation in relation to AEMO interventions* rule change in December 2019 which provided that affected participant compensation is no longer payable if the intervention is to obtain a security service that is not traded in the market (e.g. system strength).³⁸⁶ The vast majority of AEMO intervention events currently occurring in the market relate to directions for system strength. While affected participants would still be entitled to compensation for intervention events that trigger intervention pricing, these are typically infrequent and short-lived. As such, the Commission considers that DRSPs would rarely be in a position to claim compensation in relation to an AEMO intervention event if they were to be included in the definition of affected participant.

Given the associated implementation costs, the Commission considers it appropriate not to include DRSPs in this framework under the final rule. This is consistent with the approach proposed under the second draft rule.

H.3.6

Compensation following market suspension

On 15 November 2018, the Commission made a final rule establishing a new compensation framework in the NER so that certain market participants who incur a loss during a market suspension event can be compensated.³⁸⁷ This was in response to a rule change request from AEMO in the wake of the 2016 market suspension in South Australia.

The compensation framework under the NER is designed to strike a fair and efficient balance between the interests of market participants and consumers. The framework will apply if, during a market suspension, prices are set by the Market Suspension Pricing Schedule (MSPS) rather than by the normal central dispatch and pricing process. The aim of the

³⁸⁶ AEMC, *Application of compensation in relation to AEMO interventions*, December 2019. Available at: https://www.aemc.gov.au/sites/default/files/documents/erc0282_-_national_electricity_amendment_application_of_compensation_in_relation_to_aemo_interventions_rule_2019.pdf.

³⁸⁷ AEMC, *Participant compensation following market suspension - final determination*, November 2018. Available at: <https://www.aemc.gov.au/rule-changes/participant-compensation-following-market-suspensi>.

existing framework is to ensure that, when prices in the MSPS are too low to cover generators' short run costs, compensation is available so that generators do not incur a loss. This is designed to remove the incentive that would otherwise exist for generators to withdraw from the market and await direction by AEMO when MSPS prices are low.

The final rule amends the definition of Market Suspension Compensation Claimant to clarify that compensation is also available to DRSPs that provide wholesale demand response during a market suspension event. AEMO noted in its submission to the second draft determination that market suspension compensation is funded from all market customers, whereas the funding of wholesale demand response is more targeted, with DRSPs being compensated by the retailer at the wholesale demand response unit's connection point.³⁸⁸ AEMO suggested that it may be economically inefficient to fund wholesale demand response through the smeared cost recovery of the market suspension compensation mechanism. However, the Commission considers this to be appropriate, as it is consistent with the principle of treating DRSPs as equivalent to generators and ensuring that they are subject to the same incentives and regulatory processes during and following a market suspension event, to maintain their incentive to supply wholesale demand response during the event.

Provisions relating to the calculation of compensation in these circumstances have also been amended to account for DRSPs. ERM Power suggested in its submission to the second draft determination that, for the purposes of the benchmark value used to determine compensation following market suspension, a DRSP's costs should be capped at an appropriate level in a manner similar to the differential approach used for batteries and hydro plant in the compensation due to market suspension pricing rule change, where these plants receive a value referenced to applicable gas plants in the same region.³⁸⁹ It was suggested that this would avoid the benchmark value for demand response being far more generous than that calculated for generators or FCAS providers, which could result in significant compensation recovery costs for consumers.

The Commission agrees that it is appropriate for the compensation payable to DRSPs to be calculated in a similar manner to generators. However, the Commission does not consider that the rules should be overly prescriptive in this regard and AEMO is best placed to determine the appropriate level of compensation for DRSPs following market suspension. The final rule therefore links the compensation payable to DRSPs to the methodology applied to a class of generator determined by AEMO in the market suspension compensation methodology.³⁹⁰ For example, AEMO could choose to apply the methodology used to calculate compensation for gas peaking plants following market suspension to DRSPs.

H.3.7

System changes

The final rule has a number of implications for systems within AEMO, retailers and metering data providers. These systems changes are necessary under the final rule to accommodate the introduction of DRSPs into market settlement.

³⁸⁸ AEMO, submission to second draft determination, p. 2.

³⁸⁹ ERM Power, submission to second draft determination, p. 6.

³⁹⁰ Clauses 3.14.5A(f1) and (h)(2A) of the final rule.

The final rule will result in some changes to the current arrangements for the flows of information and billing. In summary, the information flows under the final rule are as follows:

- Consumer electricity use would be measured and recorded at the consumer meter as it is currently.
- The MDP is required to read that meter and send information to the DRSP in instances where a DRSP has been allocated to that NMI. This would be in addition to the information being sent to the FRMP, AEMO and the DNSP.
- The meter data for each NMI would still go into MSATS. In MSATS, in accordance with current procedures:
 - a distribution loss factor is applied to each set of NMI data
 - the NMIs associated with each FRMP are summed by transmission node identifier
 - the data is sent to AEMO's energy market management system (EMMS) for settlement and prudentials.
- DRSPs would be able to use the actual metering data for reconciliation purposes (in a similar way to retailers). However, the DRSP would not need to directly use the metering data for settlement.
- AEMO's EMMS will send bills to retailers based on their customers' actual consumption in the wholesale electricity market.
- AEMO will determine baseline methodologies. These methodologies would be used to generate baselines for wholesale demand response units, allowing AEMO to quantify the amount of demand response provided. AEMO will then use this information to separately settle the retailer and the DRSP for the wholesale demand response.

In addition to these information flows, there would also be information provided by the DRSP that will need to be accommodated by AEMO. This information includes:

- **The approved baseline methodology and baseline settings:** these will be used for determining the baseline for the load at that NMI, as discussed in appendix F, which will in turn be used for market settlement.
- **The maximum responsive component** of the wholesale demand response unit, which functions as a cap on the amounts of demand response that can be bid and settled, as discussed in appendices D and G.
- **The DRSP:** AEMO will record the identity of the DRSP against the NMI. This would facilitate the transfer of metering data to the DRSP from the MDP. It will also facilitate market settlement for wholesale demand response.

Changes to AEMO systems

AEMO's submission to the first draft determination highlighted a number of systems changes that are required to implement the mechanism. This includes changes to systems relating to:

- registration
- dispatch
- forecasting

- system operations
- settlements
- prudentials.

Some of these changes are covered in more detail in other appendices, particularly appendices D and G. The final rule also includes a number of changes from the first draft rule which are designed to reduce the complexity of the changes to AEMO's systems required to implement the mechanism and thereby reduce the associated implementation costs. These changes were discussed in detail in chapter 5 of the second draft determination.

AEMO recommended that the second draft rule and determination not be prescriptive on the solution design, to allow flexibility for AEMO to implement the most efficient design.³⁹¹ AEMO reiterated this in its submission to the second draft determination, suggesting that the rules should avoid unnecessary prescription, particularly with respect to the use of MSATS, so that consultation between AEMO and market participants can guide the most efficient design of systems and processes.³⁹² Specifically, AEMO suggested the definition of MSATS in the final rule be amended to reflect that MSATS will only be used for recording the DRSP role.³⁹³

The changes to systems resulting from the new information provision requirements are covered below.

Information provision

As a result of the final rule, AEMO's systems for providing information to specific market participants will need to be updated to accommodate a number of changes. These changes include:

- new fields for NMI standing data including whether a customer has a DRSP and, if so, the identity of the DRSP
- allowing DRSPs to retrieve NMI standing data
- allowing the DRSP and retailer for a customer to access additional demand response information relating to that customer's load, including the applicable baseline methodology, baseline settings and maximum responsive component.

AEMO will also need to ensure there is a process for changing the DRSP recorded against a particular NMI (for example, where a customer switches from one DRSP to a different one). The Commission considers this process may include the following elements:

- If a customer is transferring between DRSPs:
 - The incoming DRSP would need to submit an application to classify that load as a wholesale demand response unit.
 - AEMO would undertake an eligibility check. This would include checking whether the NMI for that load is already associated with a different DRSP.

³⁹¹ AEMO, submission to first draft determination, p. 20.

³⁹² AEMO, submission to second draft determination, p. 3.

³⁹³ Ibid.

- If the NMI is already associated with a different DRSP, AEMO would notify the incoming DRSP, and that DRSP would then need to request its customer to terminate its contract with its original DRSP.
- The original DRSP would then be required to notify AEMO that the relevant NMI is no longer a qualifying load for that DRSP, and the load would then cease to be classified as a wholesale demand response unit for the original DRSP.³⁹⁴
- The incoming DRSP would then be able to classify that load as its wholesale demand response unit.
- Once classified, AEMO would record the identity of the incoming DRSP against that NMI in MSATS (visible to the incumbent retailer).
- If a DRSP's contract with a customer terminates (in circumstances where the customer is not transferring to a new DRSP):
 - the DRSP would be required to notify AEMO that the relevant NMI is no longer a qualifying load for that DRSP, and the load would then cease to be classified as a wholesale demand response unit for that DRSP.³⁹⁵
 - AEMO would then remove the notification of the DRSP against that NMI in MSATS.

Market settlement systems

The final rule introduces settlement provisions for wholesale demand response. These will require AEMO to either change its existing market settlement systems or introduce a new, separate system. The settlement system will need to:

- determine the quantity of demand response for the NMIs where demand response was provided
- pay the DRSP and bill the retailer for wholesale demand response, in each case adjusted to account for the reimbursement amount.

The final rule includes minor changes from the second draft rule to avoid unnecessary prescription regarding the use of MSATS to record information on the maximum responsive component of WDRUs and baseline methodologies and settings. AEMO will consult with stakeholders on how this information will be provided and the arrangements will be set out in the wholesale demand response guidelines.³⁹⁶

New obligations for MDPs

Under the final rule, the existing obligations on MDPs remain, including their obligation to provide metering data to all registered participants with a financial interest in the energy measured by the meter.³⁹⁷ This would now extend to DRSPs, as they are registered participants and, once they have a contract with a customer relating to wholesale demand response, would have a financial interest in the energy measured by that customer's meter.

³⁹⁴ Clauses 2.3.6(k) and (l) of the final rule.

³⁹⁵ Clauses 2.3.6(k) and (l) of the final rule.

³⁹⁶ Clause 3.10.1(a)(7) of the final rule.

³⁹⁷ Clause 7.10.2(a)(3) of the NER requires MDPs to provide information to persons referred to in clause 7.15.5(c)(1) of the NER, which includes all registered participants with a financial interest in the energy measured by the metering installation. Clause 7.10.3 of the NER requires the MDP to do so in accordance with the NER and AEMO's procedures.

DRSPs would need to become accredited with AEMO as B2B e-Hub Participants in order to receive this data. The MDP would need to reference the NMI standing data maintained in MSATS to determine if there is a DRSP and, if so, the identity of the DRSP.

The final rule places this obligation on MDPs because the actual meter data is likely to be useful for DRSPs in informing and reconciling settlement. In addition, it is unlikely to place additional burdens on the MDP as they are currently required to send the same meter data to multiple parties.

Recipients of metering data and NMI standing data must comply with requirements under applicable privacy legislation before, as applicable, accessing, receiving or disclosing NMI standing data or metering data, including if appropriate making relevant disclosures or obtaining relevant consents from retail customers.³⁹⁸ Under the final rule, this obligation will be extended to DRSPs accessing or receiving metering data and NMI standing data.³⁹⁹

H.4 Complementary changes

The Commission considers that the supplementary changes detailed in this section will help facilitate greater uptake and transparency of a range of forms of wholesale demand response in the NEM. Many of these measures can be implemented relatively easily and without imposing significant costs on market participants.

The measures which are discussed in this section include:

- increasing the utility of AEMO's demand side participation (DSP) portal
- consideration of changes to the AER's Energy Made Easy website to increase the visibility of retail contracts involving spot-price pass-through and demand response
- consideration of the impacts of the administered price cap (APC) on wholesale demand response
- revising the Energy Charter to include a commitment by retailers to facilitate more wholesale demand response.

H.4.1 AEMO's DSP portal

Background

The Commission made a final rule in 2015 that sought to improve the quality of information on demand side participation in the NEM. Under that final rule, registered participants in the market (including retailers and network businesses) are required to provide information on demand side participation to AEMO, in accordance with the DSPI Guidelines.⁴⁰⁰

³⁹⁸ Clause 7.15.5(f) of the NER.

³⁹⁹ Clause 7.15.5(f)(5) of the final rule.

⁴⁰⁰ AEMC, *Improving demand side participation information provided to AEMO by registered participants*, final determination, March 2015, available at: <https://www.aemc.gov.au/rule-changes/improving-demand-side-participation-information-pr>.

This has been implemented through the creation of AEMO's demand-side participation portal.⁴⁰¹

The data provided through this process is intended to provide greater visibility of demand-side resources that are price sensitive, and so those which are engaging in wholesale demand response, for the purposes of improving AEMO's load forecasts. The information to be provided to AEMO through the portal includes information in relation to:⁴⁰²

- contractual arrangements between a retailer and a customer, in which they agree to the curtailment of non-scheduled load or the provision of unscheduled generation in specified circumstances
- the curtailment of non-scheduled load or the provision of unscheduled generation in respect of the demand for, or price of, electricity.

The information sought by AEMO is relatively detailed and is intended to provide greater transparency regarding the extent of wholesale demand response in the NEM. This information is important in being able to draw conclusions on the efficiency of the system-wide level of demand response.

We understand from informal consultation with stakeholders that further clarity on the reporting requirements applying under the NER and improvements to the functionality of the DSP portal would assist in ensuring that the information captured is accurate and transparent. Relevant issues highlighted by stakeholders include:

- It is currently not clear whether participants that do not have any demand response arrangements with customers are required to report this to AEMO. This makes it difficult to determine whether participants that have not reported information to AEMO are in breach of the NER.
- The functionality of the DSP portal can present challenges when seeking to report certain types of demand response in a participant's customer portfolio.⁴⁰³ The Commission understands that AEMO has sought to rectify some of these issues.
- The types of information AEMO expects to receive could be made clearer in the DSPI Guidelines.
- There was a lack of clarity about how AEMO uses the information submitted to the DSP portal.

In its submission to the second draft determination, **EnergyAustralia** submitted that AEMO's reporting obligations with respect to the DSP portal should include reporting on the number of NMIs (and associated MW capacity) in each region that have switched between different arrangements (e.g. NMIs changing from a spot price pass-through contract to a

401 For more information, see: https://www.aemo.com.au/-/media/Files/Stakeholder_Consultation/Consultations/Electricity_Consultations/2017/DSPIG/Demand-Side-Participation-Information-Guidelines.pdf.

402 Clause 3.7D(e)(1) of the NER.

403 For example, the Commission understands that the interaction between the DSP portal and MSATS makes it difficult to accurately submit information about demand response where the relevant demand response arrangement is between a customer and a retailer-related entity that is not itself a registered participant.

specific demand response product with their retailer, or from retailer-led demand response arrangements to DRSP-led arrangements).⁴⁰⁴ EnergyAustralia suggested that this reporting will support analysis on the additionality of demand response resulting from the demand response mechanism.

Commission's analysis and conclusions

The Commission considers that increasing the transparency and accessibility of the information submitted to the DSP portal would assist in understanding the impact of retailer-led demand response in the wholesale market. Currently, AEMO is not required to publish information regarding the data submitted by market participants to the DSP portal. Further, AEMO is only required to publish general information about the extent to which the data provided to it in the portal informed its development or use of load forecasts. As discussed in section 3, AEMO's most recent report was published in August 2019 and provided estimations of current levels of demand side participation. This report included analysis of the volumes and types of potential demand response capacity that exists in the NEM.

The Commission considers it appropriate that the NER expressly identify particular types of information that should, at a minimum, be included in AEMO's reporting on information submitted to the DSP portal. This is intended to ensure that this information is captured in AEMO's reports and is transparent to market participants on an ongoing basis.

DRSPs are required to submit detailed information to AEMO when classifying a load as a wholesale demand response unit (see appendix C) and this form of demand response will be scheduled and therefore visible to AEMO. However, as discussed in appendix E, DRSPs are not required under the final rule to submit information to AEMO for the purposes of MT PASA. The Commission considers it appropriate for DRSPs to submit information of this nature through the DSP portal. It would therefore be efficient for AEMO to report on demand response provided by DRSPs⁴⁰⁵ at the same time as it reports on the demand side participation information submitted through the DSP portal.⁴⁰⁶

The final rule amends the NER to clarify the requirements that apply to the submission of information about demand side participation in the NEM to AEMO by registered participants and how AEMO deals with that information. The Commission acknowledges that AEMO has already started to report on some of the additional demand side information required under the final rule.⁴⁰⁷

Changes to demand side participation information reporting requirements

The final rule:

- specifies that DRSPs are required to report, using the portal, information on their contractual arrangements for the provision of wholesale demand response, which may

404 EnergyAustralia, submission to second draft determination, p. 6.

405 Under clause 3.10.6 of the final rule.

406 Under rule 3.7D(c) of the final rule.

407 See AEMO, *Demand side participation forecast and methodology*, August 2019. Available at: https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEM_ESOO/2019/Demand-Side-Participation-Forecast-Methodology-2019.pdf.

include the quantity of wholesale demand response to be provided and the circumstances and location in which it would be provided⁴⁰⁸

- requires entities that do not have any demand side participation information for a period to report that fact to AEMO⁴⁰⁹
- requires entities to report on arrangements for the adjustment of non-scheduled load, including arrangements for increases as well as decreases in consumption (e.g. to incentivise increased consumption during low-price periods).⁴¹⁰

Under the current framework, the AER has no way of knowing whether a participant that did not submit a report decided not to do so because it has no demand response customers, or simply failed to comply with its requirements under the NER. Clarifying that participants are required to submit a report to AEMO even where they have no demand response arrangements with customers will therefore make it easier for the AER to enforce compliance with the reporting requirements.⁴¹¹

In addition, the Commission recommends that the requirement for registered participants to report information in accordance with the DSPI guidelines be classified as a civil penalty provision, for improved compliance and enforcement ability.⁴¹²

Changes to how AEMO deals with demand side participation information

The final rule:

- increases access to information about wholesale demand response by requiring AEMO to make the following information on wholesale demand response publicly available (without disclosing any confidential information):⁴¹³
 - an analysis of volumes and types of demand response reported through the DSP portal, including an analysis of trends in this information
 - the different types of variable network tariffs which are currently used to facilitate network-led demand response and the proportion of customers on these tariffs
- clarifies that AEMO must distinguish between participant types (retailers, network service providers and DRSPs) when reporting such information.⁴¹⁴

The final rule requires AEMO to publish an annual report each year setting out the information specified above. This is intended to clarify minimum reporting requirements AEMO must meet with respect to information submitted to the DSP portal. However, this requirement is not intended to limit the types of information AEMO can report in this regard.

Further, expressly requiring AEMO to publish information relating to wholesale demand response procured by retailers, network service providers and DRSPs (based on information submitted to the DSP portal) will ensure that:

408 Rules 3.7D(a) and (e) of the final rule.

409 Rule 3.7D(b)(2) of the final rule.

410 Rule 3.7D(e) of the final rule.

411 Rule 3.7D(b)(2) of the final rule.

412 Rule 3.7D(b) of the final rule.

413 Rule 3.7D(c) of the final rule.

414 Rule 3.7D(c)(2) of the final rule.

- registered participants are provided with guidance and transparency about how the information they submit to the DSP portal is used by AEMO
- the market has guidance on the level of participation in, and effectiveness of, the demand response mechanism
- market participants are able to develop more accurate demand forecasts, potentially leading to more efficient operational and investment decisions.

The Commission does not consider that it would be practical to require AEMO to report on the number of NMIs that have changed from one type of demand response arrangement to another, as this may not always be clear to AEMO based on the information submitted to the DSP portal. For example, there is nothing to prevent a customer that has a demand response arrangement with their retailer to then enter into an arrangement with a DRSP, while still maintaining their arrangement with the retailer. This would not be visible to AEMO as a change in the customer's demand response arrangement. As such, the Commission notes that such additional reporting requirements would not be informative. However, under the final rule AEMO is required to report the amount of demand response provided through the mechanism and separately report on the DSP portal. The Commission considers that this would provide sufficient information to the market regarding trends in wholesale demand response.

The Commission also understands that the DSP portal may not currently capture information about certain types of demand response in the NEM due to limitations in the functionality of the portal. Accordingly, the final rule requires AEMO to undertake a review of the DSPI Guidelines⁴¹⁵ and the Commission also recommends that AEMO consult with stakeholders to identify changes which can be made to the DSP portal to ensure that participants are able to report all wholesale demand response provided by their customers. AEMO's submission to the first draft determination notes that AEMO "would welcome the opportunity to work directly with stakeholders providing information into the portal to address some of the more operational concerns".⁴¹⁶ The Commission encourages stakeholders who have concerns to reach out to AEMO and discuss these directly.

The amended DSPI Guidelines are to be published by 31 December 2020 in order to allow participants to refer to the amended Guidelines before commencing their next round of data submissions when the DSP portal opens on 31 March 2021.

DSP portal and qualifying contracts

The Commission notes that under the current rules for the Retailer Reliability Obligation (RRO), a "demand side participation contract" is only a qualifying contract for the purposes of the RRO if it is also registered in the DSP portal.⁴¹⁷ In the final rule, wholesale demand response contracts (as with other demand side participation contracts) may only be qualifying

415 Clause 11.125.7 of the final rule.

416 AEMO, submission to first draft determination, p. 22.

417 NER clause 4A.E.1(c).

contracts if they are registered in the portal and meet the other relevant criteria.⁴¹⁸ This is consistent with the approach proposed under the second draft rule.

Other than in the circumstances described in the third last paragraph in appendix h.3.2 above, if a customer initially has a demand response contract with a retailer which is reported in the DSP portal and counted as a qualifying contract for the RRO, but then engages a DRSP and provides wholesale demand response through the mechanism instead, the retailer will be required to cease reporting that contract as its qualifying contract in its next report to the DSP portal. The Commission considers this is appropriate as, in these circumstances, the DRSP rather than the retailer will control the customer's demand response.

The interaction between the RRO and the introduction of the mechanism under the final rule is discussed further in appendix h.3.2 above.

Reporting by AEMO on DRSP-led wholesale demand response

The final rule also requires AEMO to publish an annual report including the following information on DRSP-led wholesale demand response (without disclosing any confidential information):⁴¹⁹

- the number of registered DRSPs
- the number and capacity of loads classified as wholesale demand response units
- the amount of demand response dispatched in the wholesale market under the wholesale demand response mechanism, as well as the frequency of dispatch
- analysis of the spot price levels at which wholesale demand response was dispatched
- analysis of the impact of wholesale demand response on the procurement and use of market ancillary services
- relevant trends, including year-on-year changes, in the above data over time.

The Commission considers that these changes complement the other reforms required to facilitate the implementation of a wholesale demand response mechanism.

H.4.2

Energy Made Easy website

Background

Energy Made Easy⁴²⁰ is a price comparison website developed and maintained by the Australian Energy Regulator (AER) in accordance with the NERL⁴²¹ and the AER's Retail Pricing Information Guidelines (RPIG).⁴²² The website is aimed at helping residential and small business consumers compare electricity and gas plans offered by different retailers and find the plan which best suits their consumption behaviour and financial circumstances. Energy Made Easy may include other information in addition to the prices of standing offer

418 Clause 4A.E.1(c) of the final rule.

419 Clause 3.10.6(c) of the final rule.

420 See: www.energymadeeasy.gov.au.

421 NERL section 62.

422 Available at <https://www.aer.gov.au/retail-markets/retail-guidelines-reviews/retail-pricing-information-guidelines-2018>.

and market offer plans offered by retailers if the AER considers that such additional information would achieve the purpose of a price comparator.⁴²³

The price comparison tool on the Energy Made Easy website does not currently display spot price pass through contracts offered by retailers in the NEM. There is also no information provided about the nature of demand response products or how consumers may benefit from such products. This deprives consumers of the opportunity to compare such products with other offers that adopt more traditional tariff structures.

Commission's analysis and conclusions

The Commission is aware that there are a number of retailers offering wholesale demand response products (as detailed in chapter 4), but considers that these products may not be readily understandable, or easily found by customers who want to engage in wholesale demand response. The Commission also considers that more of these products will emerge in the near-term given consumer preferences and technology trends.

The Commission considers that it may be desirable for changes to the Energy Made Easy comparison tool to be made such that:

- spot price pass through contracts and other demand response services offered by retailers are represented, and that their cost and competitiveness is accurately portrayed to users of the tool
- retailers provide easy-to-understand information about the risks and requirements involved with retailer-led demand response arrangements, particularly where customers are materially exposed to the wholesale market price.

The Commission considers that such changes would increase the awareness and transparency of retailer-led demand response products among consumers and would allow consumers to make more informed choices when considering such products. Increasing access to information about the risks associated with such products is also important to make sure that consumers understand that consumers bear some (or all) of the wholesale price risk under these products and that they should carefully consider whether this is suitable for their particular circumstances.

Further, broadening the scope of the information retailers are required to submit would allow consumers and retailers to make better informed decisions in relation to the provision of wholesale demand response offers and services (provided this information is publicly available). This may also increase competition for retailer-led demand response products in the NEM, as consumer demand for such products may grow as public awareness of the potential value of demand response increases.

Making this information more accessible will reduce the existing information asymmetry between consumers and retailers which disadvantages consumers seeking to provide wholesale demand response. It is anticipated that this will help empower consumers to realise greater value from their wholesale demand response, thereby creating greater

423 NERL section 62(5).

incentives to provide demand response and helping to expose the efficient level of wholesale demand response in the NEM over time.

The demand response comparison tool could provide an estimate of the potential value a customer on a flat retail tariff may be able to capture by entering into a demand response arrangement with a DRSP (this may take into account, for example, the customer's tariff and usage information, as well as historical market data). This will allow consumers to make more informed choices when considering DRSP demand response contracts.

In its submission to the first draft determination, the AER noted that it was undertaking a major redevelopment of the Energy Made Easy website and the changes described above are beyond the scope of this project. While the AER agreed in principle with the objectives of increasing the awareness and transparency of retailer-led demand response, it also noted that any changes to Energy Made Easy should be informed by consultation and consumer testing, and that the timing for any such changes will depend on available resources and funding in the context of the AER's broader work program.⁴²⁴ The Commission agrees with the AER's comments and considers that the proposed changes should be progressed at the next available opportunity.

Given that the NERR do not apply in Victoria, the Victorian Government administers its own price comparison website for energy products.⁴²⁵ The Commission recommends that the Victorian Government consider similar changes to its price comparison website to ensure that Victorian consumers also receive the benefits of the proposed changes.

H.4.3

Relationship between CPT and APC and wholesale demand response

Background

Peak demand events during January 2019 provided insight into how the cumulative price threshold (CPT) and administered price cap (APC) impact on consumers' willingness to provide wholesale demand response.

The CPT imposes a cap on the total market price that can occur over seven consecutive days. The CPT is currently set at \$221,100.⁴²⁶ The CPT seeks to maintain the overall integrity of the NEM by limiting market participants' exposure to sustained high prices which could threaten the financial viability of prudent market participants. The CPT should be set at a level such that prices over the long term incentivise enough new investment in generation so the reliability standard is expected to be met.

If the sum of the spot prices over a seven-day period exceed the CPT, the APC is triggered. The APC is currently set at \$300/MWh.⁴²⁷ The APC also seeks to maintain the overall integrity of the NEM by limiting market participants' financial exposure to sustained high prices, while

⁴²⁴ AER, submission to first draft determination, p. 6.

⁴²⁵ See <https://compare.energy.vic.gov.au/>.

⁴²⁶ AEMC, *Schedule of Reliability Settings*, February 2020. Available at: https://www.aemc.gov.au/sites/default/files/2020-02/Schedule%20of%20reliability%20settings%20-%20Calculation%202020-21%20financial%20year_0.pdf.

⁴²⁷ AEMC, *Administered Price Cap Schedule*, November 2011. Available at: <https://www.aemc.gov.au/sites/default/files/content/Schedule-for-the-Administered-Price-Cap.pdf>.

maintaining incentives for participants to supply energy during the period of trading after the CPT is exceeded (this period is known as an "administered price period").

The Reliability Panel (Panel) is responsible for assessing whether the level of the CPT and the APC remain appropriate to support reliability in the NEM as part of its *Reliability standard and settings review* (RSSR), which the NER require to be undertaken at least every four years.⁴²⁸ The most recent review was completed in April 2018. In its final report, the Panel recommended keeping the current reliability standard and reliability settings unchanged.⁴²⁹ The reasoning for maintaining the APC at \$300/MWh included that this is considered to be sufficient to cover the short run marginal costs of most existing low capacity generators in the NEM. However, it has become evident that this price may not provide a sufficient incentive for many consumers that are capable of providing demand response to do so when needed (as discussed below).

On 25 January 2019, the APC came into effect after a period of prolonged high prices. The Commission understands from informal discussions with stakeholders that when this occurred, it may have led to some customers that had been undertaking wholesale demand response at the time to cease doing so, as prices were not high enough to justify a reduction in load. Instead, some of those customers started to increase their consumption when the APC was triggered.

This was complicated by the fact that at the time, the Reliability and Emergency Reserve Trader (RERT) was being used and AEMO had also instructed involuntary load shedding. The Commission understands that some customers who had previously been providing demand response were requesting RERT contracts from AEMO in order to gain payment above the APC for continuing to provide demand response.

Commission's analysis and conclusions

In light of these events, the Commission considers that it would be useful for the Panel to consider whether the APC remains appropriate, given recent experiences of how the current APC impacts on wholesale demand response during periods of peak demand.

Wholesale demand response currently makes a higher contribution to the demand/supply balance in the NEM, particularly during reliability events, compared to when the APC was set in 2008. The fact that some wholesale demand response providers appeared to stop responding when the APC was triggered in January 2019 meant that the reliability issue occurring at the time could have been exacerbated, leading to either more RERT contracts being used or a higher amount of involuntary load shedding. This behaviour may not have occurred if the APC (or CPT) was set at a higher level. On the other hand, a higher APC would reduce the protection the APC affords to consumers from sustained high prices.

The APC is reviewed by the Panel as part of the RSSR. The next RSSR is currently scheduled for publication in 2022, although the Commission did note in the final determination for the *Enhancement to the RERT* rule change that the Panel may turn its mind to the reliability

428 NER clause 3.9.3A(d).

429 Reliability Panel, *Reliability standard and settings review*, final report, 30 April 2018. Available at: <https://www.aemc.gov.au/markets-reviews-advice/reliability-standard-and-settings-review-2018>.

standards and settings sooner depending on the outcome of the AER's VCR estimates, which were published in December 2019.

It is worth noting that the RSSR considers the reliability settings together as a package, given that a change to one particular setting may necessitate a change to another. For example, if the market price cap is changed, then it needs to be considered whether or not the cumulative price threshold also needs to be changed. This is why the reliability standards and settings are reviewed comprehensively together. As such, it may be considered challenging or inappropriate to consider the APC on its own.

However, the Commission considers that it is reasonably clear that a liquid wholesale demand response market was not a consideration when the APC was set. Therefore, it may be worth the Panel turning its mind to potential changes in respect of this issue before it undertakes the next RSSR depending on the timing of this review (as discussed further below). Such consideration would include the following issues:

- what theoretical framework should apply to considering changes to the APC in order to better account for wholesale demand response
- what considerations should be taken into account e.g. the change to the automatic price floor
- how may this impact on the contract market (particularly since caps are typically referenced by a price related to the administered price cap)
- how changing the APC may impact on the ability for wholesale demand response to contribute to the reliability of the system.

If this interim review were to occur, this would allow the Panel to be better prepared when it undertakes the next RSSR, particularly given the large number of market changes it will have to take into account. The conclusions from this scoping exercise can be used as an input into the next RSSR. The Commission notes that the ESB has been tasked by the COAG Energy Council with undertaking a review of the reliability standard and providing advice to the Council for consideration, and draft rules on an Interim Reliability Reserve are out for public consultation until 12 June 2020. The timeframes and approach for the next RSSR will become clearer following the completion of this work by the ESB and the COAG Energy Council.

A separate but related issue is the fact that, while parties can claim compensation following the application of an APC, it is not clear that this is well-known. The Commission has published a set of guidelines about how this compensation is determined, which were last reviewed in September 2016.⁴³⁰ The current objective of the payment of compensation under the NER is to maintain an incentive for: scheduled generators, non-scheduled generators and scheduled network service providers to supply energy; ancillary service providers to supply ancillary services; and market participants with scheduled loads to consume energy during price limit events.⁴³¹ While scheduled loads can make a claim if they face a net loss, the

430 AEMC, *Final Amended Compensation Guidelines*, September 2016. Available at: <https://www.aemc.gov.au/sites/default/files/content/6bdf3d79-1caa-4508-859b-ca6c5d99c222/Final-Amended-Compensation-Guidelines.PDF>.

431 NER clause 3.14.6(c).

consideration of this in the rules and guidelines is if an administered floor price in the region applies, not an administered price cap.⁴³²

The final rule makes minor changes to the NER to clarify that DRSPs can claim compensation following the application of an APC, and includes a corresponding requirement on the Commission to review and, if necessary, update the compensation guidelines to reflect the amending rule.⁴³³

The Commission may also consider undertaking a more holistic review of these guidelines to determine whether changes are necessary to clarify the circumstances in which different parties can claim compensation.

H.4.4

Retailers facilitating more wholesale demand response

The lack of existing demand response products available to consumers and the possible conflicts of interest which may reduce the incentives for vertically-integrated retailers to offer such products are key issues which were raised by the rule change proponents and other stakeholders.

Wholesale demand response can provide a range of services and benefits that contribute to the security and reliability of the NEM, as well as increasing the efficiency of the market and providing consumers with greater choice and control over their energy consumption. The Commission considers that these benefits align with the commitments made by signatories to the Energy Charter, which was launched in early 2019. The Energy Charter is focused on "embedding a customer-centric culture and conduct in energy businesses to create tangible improvements in affordability and service delivery".⁴³⁴ The Charter identifies principles which signatories should seek to implement as core elements of their culture and the way they conduct their business. A number of these principles are relevant to the provision of demand response products and services to consumers, including that signatories will put customers at the centre of their business and the energy system and will improve the customer experience. Given that retailers that are signatories to the Charter have committed to facilitating customer outcomes which are consistent with these principles, the Commission considers that it is incumbent on such retailers to consider providing greater opportunities for customers to engage in demand response. The Commission would expect that the disclosure and reporting regime applying to Charter signatories will shed light on the extent to which this is occurring.

The Charter states that it will be periodically reviewed and improved to reflect changing expectations and learnings.⁴³⁵ The first review is planned to follow the publication of the first Accountability Panel Evaluation Report on 30 November 2019.

432 Clause 3.14.6(a)(2) of the NER.

433 Clauses 3.14.6(e) and 11.125.6(d) of the final rule.

434 *The Energy Charter*, January 2019. Available at: <https://www.theenergycharter.com.au/publications>.

435 *Ibid*, p. 6.

The Commission noted in its *2019 Retail Energy Competition Review* that the Commission supports the efforts of energy businesses to improve consumer outcomes through the Energy Charter and encourages more widespread adoption of the Energy Charter.⁴³⁶ The Commission therefore recommends that DRSPs also sign up to the Energy Charter, given that they will have a direct and ongoing relationship with energy customers.

436 AEMC, 2019 Retail Energy Competition Review, June 2019. Available at: <https://www.aemc.gov.au/market-reviews-advice/2019-retail-energy-competition-review>.

I SUMMARY OF OTHER ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the stakeholder submissions on the second draft determination for these rule change requests and the Commission'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 I.1: Summary of issues raised in submissions to second draft determination

STAKEHOLDER	ISSUE	COMMISSION RESPONSE
Cost benefit analysis		
AusNet Services, pp. 1-2	<p>Having regard to the proposed transition to a two sided market, AusNet Services queries whether the cost of introducing the wholesale demand response mechanism outweighs its implementation cost.</p> <p>The AEMC should carefully consider the costs and benefits of incremental reforms to avoid mounting regulatory compliance costs which will ultimately be passed onto consumers. There needs to be a high degree of confidence that the benefits outweigh the costs of such reforms before they proceed.</p> <p>A key question when considering the benefits of this reform is the level of additional demand response that is expected to be identified as a result of this mechanism in the short term.</p>	<p>In considering any rule change request, including this one, the Commission considers whether the change is in the long term interests of consumers. The Commission considers that the final rule is likely to be in the long-term interests of consumers for the reasons set out in chapter 2.</p> <p>A cost benefit assessment would not be able to robustly or comprehensively quantify the net benefits of the mechanism. It is also difficult to directly attribute incremental costs of implementing a change to the regulatory framework to a particular rule change at a time when there are numerous complementary and concurrent changes underway.</p> <p>However, the Commission has considered the potential impact of the wholesale demand response mechanism on the efficient utilisation of electricity services (that is, using electricity when more is gained by that use than the costs of providing that electricity) in relation to the potential implementation costs, as part of its overall assessment of whether this mechanism is likely to contribute to achieving the NEO. This is set out in chapter 2 of this determination.</p>
CS Energy	<p>The benefits of the wholesale demand response mechanism are not apparent and even the AEMC repeatedly states in the Draft Rule that it “is unclear how much demand response will occur from the mechanism”. The second draft determination has instead focused on reducing the implementation costs to justify the mechanism. While a reduction in implementation costs has been achieved, the</p>	<p>Noting the limitations inherent in models trying to quantitatively assess the impacts of introducing a wholesale</p>

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	<p>flow-on impact of these changes and their associated costs have not been adequately considered. Furthermore, the fact that the implementation costs have been reduced does not stand as a reflection of the overall effectiveness and efficiency of the mechanism, particularly when the benefits are not clear. The AEMC also argues that the wholesale demand response mechanism will provide a valuable testing environment for scheduling demand side participation and the associated systems and processes. It would seem more appropriate to conduct such testing in a funded trial rather than jump to a full-scale implementation within the market that imposes costs without certainty of benefits.</p>	<p>demand response mechanism into the NEM, the Commission considers this demonstrates that under a reasonable set of assumptions, the efficiency gains enabled by this mechanism should exceed the implementation costs, promoting the long-term interests of consumers.</p> <p>This analysis has been used to inform the Commission's decision-making in addition to the qualitative assessment of the mechanism as set out in chapter 2 of this determination.</p>
<p>Energy Queensland</p>	<p>Energy Queensland recommends that the AEMC release a comprehensive and transparent cost-benefit analysis to market participants which makes clear that the benefits outlined in the second draft determination outweigh the costs associated with implementing the WDRM, prior to the release of the final rule determination</p>	
<p>EnergyAustralia, p. 1.</p>	<p>EnergyAustralia is disappointed that the AEMC hasn't attempted to quantify possible additional DR to be uncovered through this reform, instead indicating only that an undefined number of customers have expressed interest.</p> <p>It remains unclear to EnergyAustralia that the introduction of additional market participants, transfer prices and complex billing and settlements arrangements will provide significant benefits to the market, nor prove more efficient</p>	

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	than retailer or network-led DR. The proposition that this reform will genuinely reduce investment in peaking generation, thereby lowering prices for customers, remains speculative.	
Snowy Hydro, p. 5.	The WDRM will likely undermine the efficiency of the energy only market. Energy only markets are designed in allowing generators to recover capital costs at times of tight demand supply, the idea being that at these times prices will be high. However, the introduction of a demand side market that incentivises C&I customers to bid their energy through the wholesale demand response mechanism, reducing peak prices for generators, reduces the time frames for them to recover their capital costs. This comes at a particularly sensitive time when the market is transitioning to renewable generation.	
Metering and information provision		
Enel X, p. 6.	Enel X remains concerned that giving retailers visibility of when a customer enters into an agreement with a DRSP will undermine the success of the framework, for reasons set out in our submission to the first draft determination.	The Commission considers that it is important that retailers have access to this information in order to adjust their risk management strategies for that customer. The Commission also remains of the view that retailers are likely to face competitive pressures to facilitate that customer's desire to participate in demand response.
EnergyAustralia, p. 6.	The draft rules allow DRSPs to receive NMI metering data associated with their customers (draft cl. 7.15.5(f)(5)). The rules should specify that this information can only be used by a DRSP for the purposes of its role as a DRSP, such as	The Commission does not consider access to NMI metering data would provide a competitive advantage to retailers that are DRSPs (compared to retailers that are not). Consumers can access this information, meaning prospective retailers will

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	<p>validating settlements and assessing baseline compliance, as approved by the customer. As a DRSP could be the same entity as a competing FRMP, there is a risk that this information could be used for retail competition activities, providing FRMPs with DRSP registration competitive advantages in the retail market.</p>	<p>also be able to access this information by engaging with a new customer the retailer is seeking to sign up.</p>
<p>EnergyAustralia, p. 8.</p>	<p>Clarity is needed on whether a DRSP is able to initiate a meter churn or metering services. Given retailers will retain responsibility for metering and have commercial arrangements with metering and metering data providers (and will retain responsibility for billing customers for any services associated with DRSP use of meter data), it would be inappropriate for DRSPs to request services directly that are subsequently charged to a retailer.</p>	<p>It is not intended that a DRSP would be able to initiate a meter churn or request other metering services directly. However, it may ask the customer to request metering services. To the extent that additional metering costs are imposed due to participation in the mechanism, these costs could be attributed to the customer through the existing retail contract.</p>
<p>AEMO, p. 7.</p>	<p>The inclusion of DRSPs accessing and receiving NMI Standing Data and metering data under this provision is unnecessary and creates confusion as to whether a DRSP is entitled to metering data or NMI Standing Data of a connection point at which it does not have a relationship with the customer. The provision has the effect that NMI Standing Data and metering data is not confidential information under the rules with respect to DRSPs. AEMO does not consider this to be appropriate, and in particular notes that it is not contemplated the DRSPs would be entitled to NMI Discovery in the way that is provided to retailers.</p>	<p>Under the final rule, DRSPs should not have access to NMI standing data and metering data prior to entering into a relationship with that customer. Clause 7.15.5(c)(1) only allows DRSPs with a financial interest in the energy measured at the meter (ie a DRSP with a contract with the relevant customer) to access metering data and NMI Standing Data. As noted in the final paragraph of section H.3, the inclusion of DRSPs in clause 7.15.5(f) is to extend to DRSPs the requirement to comply with requirements under applicable privacy legislation <i>before</i> accessing the NMI Standing Data or metering data that it has a right to access under clause 7.15.5(c)(1).</p>

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Reporting		
Enel X, p. 9.	Enel X sought clarity on what “capacity” AEMO will be required to report on annually in respect of wholesale demand response units. We do not support the publication of detailed information about which individual NMIs are providing wholesale demand response, and thus suggest that clause 3.10.6(c)(2) of the second draft rule is amended to refer to “total” or “average” capacity.	The Commission considers that AEMO is best placed to determine how the information in its annual report is presented in order to meet its reporting obligations, having regard to the information available for the period under review and the complexity of aggregating different types of information.
ERM Power, p. 4.	ERM Power recommended an addition to Clause 3.14.4(r), to provide information on the regional aggregated dispatch of wholesale demand response. By aggregating this at a regional level it would help protect the identity of individual WDRUs while providing a greater level of information to the market on the supply provided by demand response units.	The final rule enables market participants to understand the regional aggregated dispatch of demand response.
Interaction with other reforms		
CS Energy, pp. 7-8	The AEMC has yet to determine how the wholesale demand response mechanism will interact with the access reforms proposed under its Coordination of Generation and Transmission Investment (CoGaTI) review. A lack of clarity on whether DRSPs will be subject to locational marginal pricing will not only impose further risk on retail contracting under the wholesale demand response mechanism but increases the longer-term risk to industry. This provides further weight to consideration of absorbing the wholesale demand response mechanism into the longer-term work underway.	The Commission has considered the interaction between various regulatory reforms as part of its policy development process, as suggested in KPMG’s 2019 framework to consider congruency of wholesale market reforms. However, the Commission cannot make a rule on the assumption that a separate rule may or may not be made in the future. Following the extension for making a final determination in December 2019, the Commission has improved the design of the mechanism in light of the prospect for a longer term transition to a two-sided market.

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CS Energy, p. 4.	The ability to facilitate multiple trading relationships (MTR) at a NMI has long been recognised as a key barrier to demand side participation. The Draft Rule also acknowledged the role of MTR in two-sided markets and is scheduled to release a report on this by 30 June 2020. The MTR would be a more applicable “first step” to a two-sided market that would deliver more benefits than the wholesale demand response mechanism in its current form as it would more efficiently address the identified barrier and would be applicable across all customer classes.	These ongoing projects will need to consider their interactions with this final rule.
EnergyAustralia	The AEMC has outlined in the draft determination that DRSPs will be exempt from the notice of closure provisions... we suggest that it should apply to DRSPs whose portfolio exceeds a certain threshold, to minimise impacts to the market. Consideration could be given to reducing the notice period for such loads as the removed capacity could be feasibly replaced in less than 3 years by an alternative DRSP. This obligation should apply to DRSPs, not the loads themselves, consistent with the current framework.	The Commission does not consider this requirement to be appropriate for loads participating in the mechanism. The concepts of closure or retirement do not apply to loads in the same way as generators. It is therefore not clear that any such obligation would be useful or practical. The Commission also notes that DRSPs will be required to comply with other information provision processes that currently apply to generators.
Tesla, p. 2.	The current Small Generator Aggregator framework is not fit for purpose for small scale distributed energy resources (DER) participating in the energy markets at scale. Allowing market participation without requiring the establishment of a second connection point is an important step.	The Commission generally agrees with these comments. The final rule allows: <ul style="list-style-type: none"> • DRSPs to participate in the mechanism without requiring the establishment of a second connection point for the relevant loads

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	<p>Co-optimisation across energy and FCAS markets is important as it will be inefficient for market participants to have to register under multiple participant IDs to provide both energy and other market services.</p> <p>Ultimately DER utilisation will be most valuable if it includes both demand side reduction and exports.</p>	<ul style="list-style-type: none"> the combination of the existing MASP category with the new DRSP category, such that a DRSP can participate in both the wholesale demand response mechanism and FCAS markets DRSPs to provide wholesale demand response through reductions in load or increased exports at a connection point.
<p>The Australia Institute, p. 2.</p>	<p>We wish to express serious concern about the proposal to delay 5 Minute Settlement, as a result of the COVID-19 crisis, and note this issue is being addressed currently by the market bodies, in advice to COAG Energy Council. Delay to 5 Minute Settlement will undermine the wholesale demand response market substantially and harm the interest of consumers, who are meant to be protected in this statutory process. We oppose any delay to 5 Minute Settlement.</p>	<p>This issue is separate to this rule change and is being considered through the <i>Delayed implementation of five minute and global settlement</i> rule change process.</p>
<p>Load shifting</p>		
<p>EnergyAustralia, p. 6.</p>	<p>It is unclear how the rule adequately addresses the opportunities for load shifting between multiple NMI sites. For example, a corporate entity could reduce commercial production, ergo electricity consumption, at one location and simultaneously increase productivity at another location owned by, or related to, the corporate entity. It is unclear how the provisions of the rules will address this behaviour, nor how this will be monitored, as AEMO does not collect information regarding corporate entities associated with</p>	<p>Obligations relating to bidding and participation in dispatch are imposed on the DRSP, not the corporate entity that that owns, or is related to, the sites at which participating loads are located. The final rule prevents wholesale demand response being offered by a DRSP where the response would be directly offset by an increase in consumption elsewhere at the same time.</p>

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	NMIs.	
Dispatch		
South Australian Government, p. 3	The Division requests the Commission to further consider whether the demand response mechanism could be used to reward increasing demand in negative pricing periods.	<p>The dispatch and settlement models under the final rule do not provide for DRSPs to be paid for increasing load during negative pricing periods due to system limitations associated with NEMDE.</p> <p>The Commission will consider changes to the dispatch process that would allow loads to be rewarded for responding to negative prices in this way through other work streams, including its work on two-sided markets and the Integrating energy storage systems into the NEM rule change.</p>
Registration and aggregation		
EnergyAustralia	We request confirmation that the existing lower capacity limit on MASPs is removed. It is implied by the proposal to combine the MASP category with the new DRSP category, which has no defined limit.	The final rule does not make substantive amendments to the requirements for classifying loads as ancillary services loads.
Snowy Hydro, p. 7.	The focus should be for both transparency reasons and to provide scheduling obligations that this should apply for large loads over 5MW. The aggregations for anything below 5MW could make the task for AEMO complicated which is why the 5MW threshold should be used to avoid making the calculation of baselines inaccurate.	<p>The final rule does not require loads to be aggregated into a 5MW portfolio for the purposes of registration or dispatch. The Commission understands that this will make the process of approving the classification of a wholesale demand response unit easier for AEMO and DRSPs and therefore less costly.</p> <p>AEMO has proposed that any load with a maximum responsive component of 5MW or above would be required to provide SCADA (or an approved equivalent) for the maximum</p>

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		responsive component. This will make sure that changes in these larger loads are visible to AEMO in real time, thereby allowing fluctuations in these loads in response to wholesale prices to be managed more effectively.
Review of mechanism		
EnergyAustralia, p. 7.	The draft rules include the requirement for the AEMC to review the rule change after three years (draft cl. 3.10.7). This report could be improved if it was conducted in conjunction with AEMO and incorporated AEMO’s experiences concerning operational forecasting and dispatch, billing, baseline calculation and application, the impact of aggregate sites, system frequency and system stability. The AEMC should also consider reporting on customer insights from their experiences of being a WDRU, and retailer experiences such as an assessment of the suitability of the reimbursement rate.	The Commission notes these suggestions. The final rule allows the AEMC to consider any matters relating to the mechanism the AEMC considers relevant in undertaking this review.
ENGIE, p. 3.	One thing it would be useful to monitor is the extent to which apparent demand reductions achieved by the mechanism are actually being delivered by behind the meter generation or storage. Customers with such devices have the ability to carry out a form of “mechanism shopping”, whereby they are likely to be able to participate in the DRM, the small generation aggregation framework, or the RERT (or presumably the proposed emergency reserve now under development). Understanding if there is a preference for one of these mechanisms over the other and	

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	why will be a useful input to determining the effectiveness and efficiency of each of these mechanisms.	
Transitional arrangements		
AEMO, p. 7.	AEMO is obliged to publish an annual WDR report within six months of the end of each calendar year. This appears to include a requirement to publish a report in the first half of 2022 that covers the 69 days of operation of the WDR mechanism in 2021. Suggest delaying first report to be published in 2023.	The final rule includes a transitional provision to clarify that AEMO's annual reporting obligation in relation to the mechanism does not apply to the calendar year in which the mechanism commences (i.e. 2021). AEMO will be required to prepare the first annual report on the operation of the mechanism by mid-2023. This report will cover the period from the commencement of the mechanism to the end of 2022.
EUAA, p. 2.	There may also be justification for a less stringent approach to areas such as developing baselines and eligibility criteria around metering and telemetry to facilitate a level of "learning by doing", at least in the first 12-18 months. This would help maximise participation and allow a "proof of concept" approach by companies as they find their way in this new market for the first time.	Under the final rule, AEMO is responsible for developing baseline methodologies and determining the telemetry requirements that will apply to loads seeking to participate in the mechanism. As such, AEMO could allow for greater flexibility in these processes and requirements in the early phase of the mechanism's operation if it considers this appropriate.
Other		
ERM Power, p. 5	Regarding existing changes to clause 3.20.7, it seems incongruous to have made changes to paragraphs (b) and (d) to add a reference to wholesale demand response units but to not add an equivalent reference in paragraph (c).	This has been addressed in the final rule. For completeness, a reference to wholesale demand response units has been included in paragraph (c).
Energy Queensland, p. 7.	Energy Queensland notes that under the revised proposal it will be possible for child NMIs in embedded networks to	The Commission considers the ability for all large customers to access wholesale demand response through the

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	<p>participate in the WDRM. It is expected that this arrangement will create even greater complexity for settlement in embedded networks and Energy Queensland questions whether this is appropriate.</p>	<p>mechanism important.</p> <p>The Commission is aware that there are currently small generation aggregators operating in embedded networks.</p> <p>The Commission considers any additional complexity appropriate in order to provide access to embedded large customers, given these arrangements can already accommodate small generation aggregators.</p>
<p>Richard Cerny</p>	<p>The submission advocates for a pumped hydro storage project at Burdekin Dam in North Queensland.</p>	<p>The development of specific energy generation and storage projects is not within the Commission's jurisdiction and is outside of the scope of this rule change.</p>