

Australian Energy Market Commission

DRAFT RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (WHOLESALE DEMAND RESPONSE MECHANISM) RULE 2019

NATIONAL ENERGY RETAIL AMENDMENT (WHOLESALE DEMAND RESPONSE MECHANISM) RULE 2019

PROPONENTS

Public Interest Advocacy Centre, Total Environment Centre and the Australia Institute

Australian Energy Council
South Australian Government

18 JULY 2019

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 draft determination sets out a series of changes proposed by the Commission 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. The opportunity to introduce a wholesale demand response mechanism arises because:
 - Evolving technologies are 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 determination, highlight a growing interest across industry for the wholesale market to accommodate consumers who are able to engage in the wholesale market.
 - Wholesale demand response may contribute to promoting reliability and security in a more affordable way than peaking generation.
- 2 The draft rule implements a wholesale demand response mechanism, which allows third parties to participate directly in the wholesale market as a substitute for generation, and be paid for providing demand response. The draft rule also makes a number of complementary changes to increase the transparency of other types of wholesale demand response.
- 3 The draft rule is made in response to three rule change requests made to the Commission from a wide range of stakeholders, including industry, governments and representatives of consumers. The Commission's draft rule is a more preferable rule. The implementation date for the draft rule allows for AEMO to make the necessary systems changes to accommodate the mechanism. As such, wholesale demand response would start being dispatched from 1 July 2022.
What is wholesale demand response?
- 4 Demand side participation is an umbrella term for all of the actions a consumer can take regarding their consumption, responding to different incentives and variables. It also implies a degree of transparency where consumers can signal to the rest of the market what they are intending to do.
- 5 In electricity markets, active demand side participation promotes efficient consumption of electricity. The more consumers can participate in the market and respond to market price signals, the more accurately they can pick the right level of electricity consumption for them. In the long-run, the greater the level of demand side participation, the lower the cost of the combination of resources used to meet the supply-demand balance.
- 6 Demand response is a subset of demand side participation. There are different types of demand response: wholesale, emergency (for example, participating in the RERT), network (for example, using demand response to offset the need for network build) 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.

- 7 Wholesale demand response relates to consumers of electricity changing their level of consumption in the short-term in response to signals to do so. Consumers can increase, decrease or delay consumption based on expectation of the wholesale spot price.
- Rationale for wholesale demand response mechanism**
- 8 The rule change requests the subject of this draft determination seek to facilitate **wholesale demand response** in the NEM. There are a number of different types of wholesale demand response. For example, customers can provide direct load control of their appliances to a third party (e.g. a retailer who is exposed to the wholesale market); consumers can be on a time of use retail contract and simply reduce consumption at high price times; or third parties can be allowed to bid demand reductions into the wholesale market as a substitute for generation under a wholesale demand response mechanism. These first two types already occur in the NEM; while the latter is the subject of this draft determination.
- 9 There are other wholesale demand response programs that rely on behavioural or non-firm demand changes by consumers. For example, providing consumers with a reward if they reduce consumption by an unspecified amount. This demand response will continue to grow but would likely not be provided through the mechanism due to the nature of the scheduling obligations. Instead, this mechanism will better facilitate automated demand response that is able to follow dispatch instructions from the market operator.
- 10 Providing wholesale demand response has been difficult to date because consumers need to be technically equipped to respond (e.g. 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.
- 11 Recently, 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.
- 12 The role of consumers, and importantly the technology to enable consumers, is changing. Technology has evolved and become cheaper, such that more consumers want to and can participate directly in the wholesale market. There is therefore capability and significant interest now to accommodate consumers who want to engage and participate.
- 13 As the sector continues to transform, we are increasingly seeing more variability, not only on the supply side (with more weather dependent generation), but also on the demand side. Increases in solar rooftop PV, the uptake of batteries and electric vehicles, will increasingly make forecasting demand challenging, and a poor reflection of actual outcomes, without more information being provided consumers responding to signals.
- 14 Therefore, the Commission considers that there need to be changes in the wholesale market to facilitate greater levels of 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 or generation substitute.

- 15 Benefits from more active demand side participation include:
- 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 secure limits, for example 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.
- Two-sided market is the long term fix**
- 16 The electricity system will continue to transform and the variability in the system will continue to increase as demand side devices and generation sources become more flexible and responsive. In light of this, the electricity system and the associated market framework will need to continue to adapt in order to make sure we continue to have electricity market outcomes that are in the long-term interests of consumers.
- 17 In the longer term, the Commission considers that moving to a two-sided market will assist the NEM in effectively evolving and transitioning to the future power sector, whatever that future may look like. 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 future NEM characterised by increased variable supply and more flexible, price responsive demand.
- 18 With these expanded opportunities, a longer term 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 the mechanism.
- 19 The mechanism will eventually be outgrown because it provides consumers with opportunities to substitute for generation. This will not be sustainable in the long-run as more consumers seek to engage. For example, if all of the demand-side became technologically capable of participating in the mechanism, the supply in the wholesale market would consist of both actual supply (generation) and also demand response (through the mechanism).
- 20 The wholesale demand response mechanism under the draft rule also relies on setting a baseline quantity against which the value of demand response would be calculated and paid. However, it is impossible to exactly know this counterfactual level of electricity consumption. If the baseline is set too high, consumers will pay more than they need to. If it is too low, then there won't be enough incentive to encourage demand response in the market. The draft rule seeks to minimise these consequences. Moving to a two-sided market in the long-run means that there would be no need to determine these artificial benchmarks.
- 21 Significant time and resources will be required to move from the current arrangements to a two-sided market. It will require careful consideration to determine the roles for consumers, aggregators, retailers and other market participants in a two-sided market. In the meantime,

there is a growing number of consumers that are likely to have latent flexibility that potentially remains under-utilised. The draft rule seeks to address this by providing consumers with greater opportunities to substitute for generation by providing demand response in the wholesale market.

- 22 The Commission considers the process of developing a two-sided market and the associated transition path should start. In the meantime, the draft rule will facilitate consumers looking to participate in wholesale demand response through the mechanism. The draft rule will assist in providing greater opportunities for wholesale demand response and promoting increased consumer engagement. This should subsequently allow for a transition to a two-sided market when technology is mature enough and a clear path has been determined.

Overview of the draft rule

- 23 The Commission has determined to make a more preferable draft electricity rule.

- 24 The wholesale demand response mechanism introduced under the draft rule would:

- promote greater demand side transparency and assist with 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
- allow aggregators to value stack different types of 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
- minimise the extent of upfront costs imposed on AEMO and the market, specifically retailers.

- 25 The draft rule puts in place a number of changes to introduce a wholesale demand response mechanism. The draft 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 generators, for example, similar information provision 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
- 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 time frames for the new mechanism.

- 26 DRSPs would need to participate in central dispatch in a transparent, scheduled manner. DRSPs will submit dispatch offers and receive dispatch targets, and will be able to set the

wholesale market price. Consequently, DRSPs will have a number of obligations and incentives consistent with the obligations imposed on scheduled generators, including compliance with dispatch targets and providing information into ST-PASA and MT-PASA. These obligations are key to maintaining the integrity of the central dispatch and price setting process, as well as increasing the transparency of the demand side.

27 The principle that DRSPs should be treated in a similar manner to scheduled generators guides the Commission's approach to how DRSPs should participate in these processes. However, in some instances the Commission has modified obligations to better suit the nature of DRSPs and wholesale demand response. There may be challenges with requiring DRSPs to meet the proposed obligations. However, without scheduling, the reliability benefits associated with the mechanism would be reduced.

28 The draft rule sets up a process for determining a baseline for wholesale demand response. The framework under the draft rule captures the benefits of having a central body determining the baseline while also allowing for innovative approaches to be developed over time.

29 The Commission has set out a settlement model which would reduce the upfront costs for consumers and market participants. This model would:

- 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.

30 In addition, the Commission has made a number of other smaller changes and recommendations, including increasing the transparency of the demand side portal that AEMO currently operates to increase the visibility of other types of wholesale demand response.

The Commission has not made a draft retail rule

31 The Commission has determined to not make a draft retail rule in response to the rule change requests, as a broader consideration of the appropriate energy specific consumer protections is required.

32 The Commission considers it important to provide opportunities to all consumers to participate in wholesale demand response. However, it is also important to make sure that appropriate energy specific consumer protections are provided to consumers participating in the mechanism.

33 Energy-specific consumer protections apply to the sale and supply of electricity and natural gas to retail customers and applies to both the NEM and to natural gas markets. These energy-specific consumer protections act to protect small customers in their electricity and gas supply arrangements. Jurisdictions are responsible for defining the consumption threshold that defines a small customer (these thresholds range from 40-160MWh of electricity per annum).

- 34 Through its 2019 *Retail competition review*, the Commission has committed to undertaking a review of *if* and *what* energy-specific consumer protections would apply to non-traditional energy service providers, including demand response providers.
- 35 As a result, the draft rule does not provide for small consumers to participate in the mechanism. Without having holistically considered the appropriate protections, the Commission does not consider that the national energy retail objective would be promoted by allowing small customers to participate in the wholesale demand response mechanism.
- 36 Once the consumer protections framework has been reviewed, it may be appropriate to revisit the role of small customers in the wholesale demand response mechanism. Small consumers will continue to be able to participate in wholesale demand response as they are under the existing arrangements.

Implementation

- 37 The substantive parts of the rule implementing the wholesale demand response mechanism are proposed to commence on 1 July 2022. 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 Commission has received advice from AEMO that the wholesale demand response mechanism is not able to be implemented prior to that time, due to the amount of systems and procedures that need to be updated to accommodate the mechanism. AEMO will continue to consider whether this implementation date can be revised.
- 38 Some aspects of the draft rule which relate to specific processes or matters unrelated to the implementation of the mechanism will commence earlier. The final rule would also contain transitional clauses, commencing on the date the rule is made.

Consultation and next steps

- 39 The Commission invites submissions on this draft rule determination, including the more preferable draft rule, by 12 September 2019. Following consideration of submissions, the Commission intends to publish its final determination and final rule by 14 November 2019.
- 40 The Commission will be holding detailed workshops with stakeholders to discuss the draft determination and the draft amending rule. Registrations will be made available on the project page: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>.
- 41 If any stakeholder wants to discuss aspects of this draft determination, please do not hesitate to contact Declan Kelly on (02) 8296 7800 or Declan.Kelly@aemc.gov.au to request a meeting.

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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.¹
- 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.²
- 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.³

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.⁴

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.⁵

1 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>

2 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>

3 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>

4 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.

5 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.⁶

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.⁷ 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.⁸

1.3

Solutions 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).⁹

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:¹⁰

- 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.

⁶ AEC, *Wholesale demand response register mechanism - rule change request*, p. 1.

⁷ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 2.

⁸ Ibid, p. 3.

⁹ 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.

¹⁰ 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 rule 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:¹¹

- 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.¹² 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.

¹¹ AEC, *Wholesale demand response register mechanism - rule change request*, p. 2.

¹² 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 AEMC published the final report for its *Reliability frameworks review*.¹³ In the final report, the Commission made a series of complementary recommendations aimed at supporting increased demand side integration into the wholesale market.¹⁴ 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 were that:¹⁵

- 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). This is the subject of this draft rule determination, following the submission of the three rule change requests discussed above.
- A voluntary, contracts-based short-term forward market be implemented that would allow participant-to-participant trading of financial contracts closer to real time than is currently readily possible. This would provide the demand side with more opportunities to lock in price certainty, and so make it easier for large consumers to engage in the wholesale market and change their consumption in response to expected wholesale prices. AEMO has submitted a rule change request to the Commission on this matter. A consultation paper was published on this in April 2019, and a draft determination is due in August 2019.¹⁶
- Consumers should be allowed to engage multiple retailers/aggregators at the same connection point (known as multiple trading relationships), promoting competition between retailers, supporting new business models for demand response and providing consumers with greater opportunities to engage in wholesale demand response with parties other than their incumbent retailer. The Commission has not received a rule change request relating to multiple trading relationships to date.

¹³ AEMC, *Reliability frameworks review - final report*, July 2018.

¹⁴ These recommendations are discussed in more detail in chapter 2.

¹⁵ AEMC, *Reliability frameworks review - final report*, July 2018, p. 45.

¹⁶ For more information, see: <https://www.aemc.gov.au/rule-changes/short-term-forward-market>

1.5 The rule making process to date

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

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

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.¹⁷ 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 are discussed and responded to throughout this draft rule determination. Issues that are not addressed in the body of this document are set out and addressed in appendix J.

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. 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.

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.

¹⁷ This notice was published under s.95 of the National Electricity Law (NEL) and s.251 of the National Energy Retail Law (NERL).

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

- on 22 March 2019
- on 15 April 2019
- on 27 May 2019.

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

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

- 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*.

1.6 Consultation on draft rule determinations

The Commission invites submissions on this draft rule determination, including the more preferable draft rule, by 12 September 2019.

Any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any request for a hearing must be made in writing and must be received by the Commission no later than 25 July 2019.

The Commission will be holding detailed workshops with stakeholders to discuss the draft determination and the draft amending rule. Registrations will be made available on the project page: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>.

Submissions and requests for a hearing should quote project number ERC0247 and may be lodged online at www.aemc.gov.au.

All enquiries on this project should be addressed to Declan Kelly on (02) 8296 7861 or Declan.Kelly@aemc.gov.au.

A final determination and final rule are scheduled for publication on 14 November 2019.

1.7 Structure of draft determination

The rest of the draft determination is structured as follows:

- Chapter 2: context for this draft rule determination
- Chapter 3: the Commission's proposal to consider the development of a two-sided market

¹⁸ These notices were published under section 93(1)(a) of the NEL and section 248 of the NERL.

- Chapter 4: the draft rule determination, including the Commission's assessment framework and summary of reasons
- Chapter 5: an overview of the draft rule
- Appendix A: legal requirements for making this draft rule
- Appendix B: the registration process introduced under the draft rule for a new participant category, a demand response service provider
- Appendix C: how demand response service providers will be integrated with central dispatch
- Appendix D: the information provision requirements placed on demand response service providers
- Appendix E: the process for determining baselines under the draft rule
- Appendix F: the settlement model introduced in the draft rule
- Appendix G: the other systems changes needed to enable the wholesale demand response mechanism
- Appendix H: other changes proposed by the Commission to improve the integration of the demand side
- Appendix I: implementation and consequential changes
- Appendix J: summary of other issues raised in stakeholder submissions.

2 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 of the market, 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 sides of the market to accommodate the increasing penetration of variable renewable 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 more accurately 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 side participation (e.g. advanced metering, monitoring and communications equipment) posed a barrier to many consumers, particularly small customers, undertaking demand response. However, declining 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 participate on the demand side in a manner convenient to them.

These technology changes, along with the increasing recognition of the utility of demand side participation, is driving the emergence of new programs and product offerings which increase consumers' ability to participate on the demand side and help to assess the capabilities and potential contribution of demand side participation 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 during these periods. However, most consumers, particularly small customers, do not currently receive these price signals under their electricity supply arrangements. These rule change requests focus on ways to increase signals and incentives for consumers to engage in wholesale demand response.

The remainder of this section explores some of the existing programs and trials relating to demand side participation 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 encourage demand reductions at certain times.

A wholesale demand response mechanism would provide an additional avenue for certain consumers to undertake wholesale demand response. However, this is only one type of wholesale demand response that will occur in the wholesale market. Other types of wholesale demand response are currently being trialled. As technologies continue to emerge and become cheaper, and consumer awareness of demand side participation grows, customers will continue to experiment with different ways of participating on the demand side, including those that sit outside of a wholesale demand response mechanism.

2.1

What is demand side participation and demand response?

2.1.1

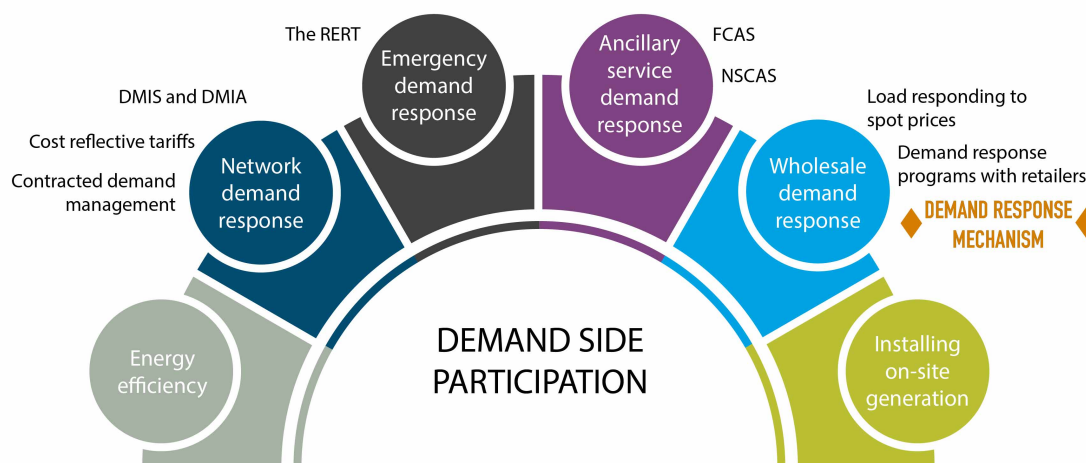
Categories of demand response

Demand side participation is an umbrella term for all of the actions a consumer can take regarding their consumption, responding to different incentives and variables. It also implies a degree of transparency where consumers can signal to the rest of the market what they are intending to do.

In electricity markets, active demand side participation promotes efficient consumption of electricity. The more consumers can participate in the market and respond to market price signals, the more accurately they can pick the right level of electricity consumption for them. In the long-run, the greater the level of demand side participation, the lower the cost of the combination of resources used to meet the supply-demand balance.

As shown in the figure below, wholesale demand response is a subset of demand side participation. The demand response facilitated through the demand response mechanism is a further subset of wholesale demand response.

Figure 2.1: Demand side participation



Source: AEMC

Note: Note that these are not necessarily mutually exclusive. For example, on-site generation can be used to provide demand response.

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 side participation. For example, there are interactions between wholesale and emergency demand response.

The Australian Competition and Consumer Commission (ACCC) has highlighted these interactions in its recent *Retail Electricity Pricing Inquiry*, noting that there are coordination issues to consider when it comes to demand response 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).¹⁹ It should also be noted that emergency demand response typically sits outside of the wholesale market.

Table 2.1: Types 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	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

¹⁹ 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>.

TYPE	DESCRIPTION	CURRENT STATUS
	positions in the contract market.	efficient. Wholesale demand response is the subject of these rule change requests.
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 two 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 (RERT).
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.

Active demand side participation, 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 active demand side participation 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,²⁰ to help inform the AEMC's assessment of three rule change requests. The Brattle Group's findings are set out in Box 1.

BOX 1: 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 ERCOT.

These markets can be considered to be a cross-section of different types of market design. Some are where capacity payments are paid to 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 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 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 does 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

²⁰ The Brattle Group, *International Review of Demand Response Mechanisms*, October 2015. Available at: <https://www.aemc.gov.au/rule-changes/demand-response-mechanism>.

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 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 is so 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 retailers to be compensated by the aggregators 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>.

2.1.2

Types of wholesale demand response

The rule change requests the subject of this draft 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 2.2.

Table 2.2: 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 either through:</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 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 as a substitute for generation under a wholesale demand response mechanism. Paying for these reductions is counted on the supply side of the wholesale market. Therefore, under this approach, the supply side equals generation and demand response.</p>	<p>Potential cost savings for businesses and residential consumers</p> <p>Price signals for customers which would allow them to more effectively manage their peak electricity usage and reduce costs</p>	<p>Specialist third party demand response aggregators - direct access to the wholesale market</p> <p>Retailers - hedging strategies and billing systems</p> <p>NSPs - may have some</p>	<p>Large commercial and industrial energy users</p> <p>Residential and small business consumers</p> <p>Specialist third party demand response aggregators</p>

DESCRIPTION	CONSUMER IMPACTS	IMPACTS ON MARKET PARTICIPANTS	PARTIES INVOLVED
		<p>network augmentations savings</p> <p>Some cost impacts - IT systems and customer management</p>	

2.2 Existing demand side participation trial initiatives in the NEM

This section sets out a number of trials aiming to facilitate the integration of demand response in the NEM which are currently under way.

2.2.1 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 NER.²¹ The trial will run for three years from summer 2017/18 to summer 2019/20.

The objectives of this initiative include:²²

- 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,²³ Victoria and South Australia.²⁴

Further details on the programs funded under this program and the lessons learnt from the first year are set out in Table 2.3.

21 The RERT is a function conferred on AEMO under the NER. 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.

22 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>.

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

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

Table 2.3: Overview of projects funded as part of the ARENA demand response RERT trial

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
AGL	Retailer	<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>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> <p>The Managed For You program was initially launched</p>	18	20

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		<p>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>		
Enel X	Demand response aggregator	Advancing Renewables Program: Commercial and industrial demand response	50	50

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		<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 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.</p>		
EnergyAustralia	Retailer	<p>EnergyAustralia's demand response portfolio draws on initiatives across all customer segments.</p> <p>The portfolio employs the following approaches:</p>	38	49

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		<p>Mass Market (MM) Behavioural Demand Response: Residential demand response</p> <p>Residential customers receive incentives under this 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</p>		

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		<p>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> <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	Retailer	<p>Energy Under Control: Commercial and industrial demand response</p> <p>Flow Power is working with commercial and industrial</p>	5	20

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		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.		
Intercast & Forge	Industrial customer	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 energy systems that allows it to provide dispatchable demand response by powering down furnaces during peak events.	10	10
Powershop	Retailer	<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> <p>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</p>	5	5

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		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.		
United Energy	Distribution network service provider	Demand Response Service 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.	12	30
Zen Ecosystems	Demand response aggregator	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	5	15

PROPONENT	PROPONENT TYPE	PROGRAM DESCRIPTION	MW CONTRACTED	
			YEAR 1	YEAR 3
		<p>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>		

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.²⁵ The report notes that, while the performance by individual participants was varied, overall the combined portfolio delivered more emergency demand response than was contracted for across the year. Early results also indicate that the success of the trial will continue to build in 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:²⁶

- Challenges with the baseline methodology used in the trial were noted early in Period 1 of the program.²⁷ 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 time frames 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 emergency demand response events, challenges created by technology issues and approaches to manage the risk of under-delivery of demand response. As such, 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.

2.2.2

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,

²⁵ ARENA, *Demand Response RERT Trial Year 1 Report*, March 2019.

²⁶ Ibid, p. 16.

²⁷ 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 is establishing 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.

The VPP Demonstrations aim to:

- allow VPPs to demonstrate their capability to deliver the full value stack
- provide AEMO with operational visibility to help AEMO consider how to integrate VPPs effectively into the NEM
- allow the AEMC and AEMO to make informed changes to the regulatory frameworks, systems and processes required to facilitate the smooth integration of VPPs.

AEMO published a consultation paper seeking stakeholder feedback on the demonstrations program in November 2018.²⁸

The Commission understands that AEMO will shortly be publishing the technical specifications for participants in the demonstrations.

2.2.3

State Government programs

Most jurisdictions in the NEM have established, or are developing, programs to incentivise the uptake of technology that will enable demand side participation.

South Australia

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.²⁹ 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 in the second half of 2019.

The South Australian Government has also recently 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.³⁰ Under the scheme,

²⁸ 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>.

²⁹ For more information, see: <https://virtualpowerplant.sa.gov.au/>.

³⁰ For more information, see: http://www.energymining.sa.gov.au/energy_and_technical_regulation/energy_resources_and_supply/south_australian_demand_management_trials_program.

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. Successful applicants have not yet been announced.

New South Wales

The NSW Government is currently developing its *Empowering Homes* program.³¹ 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 NSW residents to install solar and battery systems.

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 in 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, with the rate of installation expected to increase through 2019.³²

Queensland

The Queensland Government has a concessions program in place under which households and small businesses can apply for interest-free loans or grants to purchase a battery system or a combined solar and battery system. Assistance packages are available offering grants of \$3,000 and interest-free loans of up to \$6,000, repayable within 10 years. 3,650 assistance packages are available across both the loans and grants for battery systems and the loans and grants for combined solar and battery systems.³³

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.³⁴

2.3

Availability of wholesale 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 participate in the provision of wholesale demand response. A number of retailers and third party service providers either utilise wholesale demand response or enable consumers to do so themselves with offerings which sit outside

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

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

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

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

trials noted above. These are examples of the different types of wholesale demand response referred to in section 2.1.2.

Some retailers that are facilitating wholesale demand response under the current framework are highlighted in Box 2.

BOX 2: EXISTING WHOLESALE DEMAND RESPONSE PRODUCTS OFFERED BY RETAILERS THAT ARE NOT PART OF TRIAL PROGRAMS

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.

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.

Despite the arrangements identified in Box 2, there are a range of views regarding the availability of, and level of competition for, such products in the market. Historically, such products have generally been developed and offered by new entrant retailers in the market. Some stakeholders have raised concerns that consumers are unable to undertake wholesale demand response due to the absence of offers being made available by retailers.

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.³⁵ Approximately one in four consumers said that they would only reduce their consumption with a financial incentive.³⁶

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.³⁷

The AER also considered the levels of wholesale demand response in the NEM in its most recent *Wholesale electricity market performance report*.³⁸ 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" RERT.³⁹ 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.⁴⁰ The AER also noted that it intends to monitor the effect of

35 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>.

36 Ibid.

37 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>.

38 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>.

39 Ibid, p. 35.

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.⁴¹

In 2018, PIAC conducted a research project involving anonymous phone calls to 23 retailers in NSW asking 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.⁴²

2.4 Rule changes relating to demand side participation

In 2015, the Commission made a final rule requiring registered participants to provide information about demand side participation to AEMO through AEMO's Demand Side Participation (DSP) Portal.⁴³ The final 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 transparent to the market. As such, it is of limited use in assessing the levels of wholesale demand response which currently exist in the NEM. The draft rule sets out changes to increase the transparency and utility of the information submitted to the DSP Portal. These are discussed in detail in appendix H.

The AEMC also made a final 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.⁴⁴ The rule amended the existing arrangements in the NER to provide greater 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 will reward 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 will be used to fund innovative projects that have the potential to deliver ongoing reductions in demand or peak demand.

The Commission is currently considering a rule change request submitted by Energy Networks Australia which seeks to require the AER to develop a DMIS and DMIA for

⁴⁰ Ibid, p. 61.

⁴¹ Ibid, p. 65.

⁴² PIAC, submission to consultation paper, p. 6.

⁴³ 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>.

⁴⁴ AEMC, *Demand Management Incentive Scheme rule change* - final determination, August 2015. Available at: <https://www.aemc.gov.au/rule-changes/demand-management-embedded-generation-connection-i>.

transmission networks. The AEMC published a consultation paper on this rule change request in May 2019.⁴⁵

Stakeholders' comments on the issues discussed above are set out in detail in section 2.5 below.

2.5 Stakeholder comments

Stakeholders have provided mixed views on the accessibility of wholesale demand response products in the NEM and the ways in which retailers are facilitating a greater uptake of wholesale demand response. Some stakeholders suggested that existing barriers to consumers engaging in wholesale demand response and a lack of competition for such products have limited the levels of wholesale demand response in the NEM. However, others have suggested that wholesale demand response is already being undertaken in substantial quantities and that existing regulatory frameworks do not present a barrier to this occurring.

In addition to those highlighted in Box 2, a number of retailers noted in submissions to the consultation paper that they are either developing or already offering various types of products involving demand side participation to customers, including Origin Energy⁴⁶, AGL⁴⁷, EnergyAustralia⁴⁸, Stanwell⁴⁹, ERM Power and Flow Power.⁵⁰ Others considered that the current design of the NEM already incentivises demand side participation through existing price signals.⁵¹

Some of the products and programs highlighted by stakeholders involve:

- contracts with large customers under which the retailer can curtail the customer's load in certain circumstances⁵²
- network demand response to assist network operators with managing peak demand and network issues⁵³
- curtailable small customer load through VPPs in various regions⁵⁴
- emergency demand response through the ARENA RERT trials⁵⁵
- development of products and platforms which allow customers to take control of their energy consumption and undertake orchestrated demand response⁵⁶

45 AEMC, *Demand management incentive scheme and innovation allowance for TNSPs rule change* - consultation paper, May 2019. Available at: <https://www.aemc.gov.au/rule-changes/demand-management-incentive-scheme-and-innovation-allowance-tnsps>.

46 Origin Energy, submission to consultation paper, pp. 1, 5.

47 AGL, submission to consultation paper, pp. 1-2.

48 EnergyAustralia, submission to consultation paper, p. 1.

49 Stanwell, submission to consultation paper, p. 5.

50 Flow Power, submission to consultation paper, p. 1.

51 Alinta Energy, submission to consultation paper, p. 1.

52 Submissions to consultation paper: AGL, p. 2; Stanwell, p. 5; ERM Power, p. 2; Major Energy Users, p. 8.

53 Submissions to consultation paper: AGL, p. 2; Energy Queensland, p. 13; Major Energy Users, p. 8.

54 Submissions to consultation paper: AGL, p. 2; Origin, p. 5.

55 Submissions to consultation paper: AGL, p. 2; EnergyAustralia, p. 1.

56 Submissions to consultation paper: Origin, p. 5; EnergyAustralia, p. 1.

- load control of hot water storage to manage the excess solar PV generation causing voltage rise and reverse flows on networks⁵⁷
- time of use tariffs and spot price pass through contracts.⁵⁸

This feedback illustrates that there are a range of different ways consumers can provide demand response, and new technologies which are being developed or trialled by retailers should continue to make these opportunities more accessible.

However, the perspective offered by a number of stakeholders representing consumers in the NEM has been that there are very limited pathways for consumers to participate in demand response. Specific challenges highlighted by these stakeholders include:

- large retailers generally have little interest in offering demand response products to customers⁵⁹
- vertically integrated retailers have a disincentive to offer such products due to their market position and risk management strategies⁶⁰
- customers do not always receive appropriate compensation for the demand response they provide.⁶¹

In its submission, PIAC noted that evidence of the absence of a market for wholesale demand response was demonstrated by involuntary load shedding in South Australia, AER reports on wholesale market performance and the result of PIAC's research survey of retailers offering demand response programs to residential customers discussed in section 2.3.⁶²

AEMO also acknowledged that the number of demand response providers, the number of customers participating on the demand side, and the sophistication of the offerings has been somewhat limited due to the limitation of not allowing these providers direct access to the wholesale market.⁶³

These comments suggest that, despite the range of existing or planned demand response products and programs identified by retailers, many consumers are yet to experience the benefits of these offerings and still find it difficult to participate in demand response.

Importantly, several stakeholders considered that the introduction of a wholesale demand response mechanism will not by itself increase demand side participation or completely address the inhibiting factors for consumers seeking to engage in demand response, regardless of their views on whether the mechanism should be implemented.⁶⁴ This supports the perspective that, while the implementation of a wholesale demand response mechanism will provide benefits to some consumers and will facilitate a specific type of wholesale

57 Energy Queensland, submission to consultation paper, p. 12.

58 Submissions to consultation paper: EnergyAustralia, p. 1; ERM Power, p. 4.

59 Submissions to consultation paper: BlueScope Steel, p. 3; Enel X, p. 4; PIAC, TEC and TAI, pp. 2, 6-7; ARENA, p. 4.

60 Submissions to consultation paper: BlueScope Steel, p. 3; Enel X, p. 4.

61 Submissions to consultation paper: BlueScope Steel, p. 3; Energy Users Association of Australia, p. 1; Major Energy Users, p. 9; Energy Efficiency Council, p. 9.

62 PIAC, submission to consultation paper, p.4.

63 AEMO, submission to consultation paper, p. 4.

64 Submissions to consultation paper: BlueScope Steel, p. 3; Energy Queensland, p. 15.

demand response, further changes may be required to unlock the full range of demand side participation in the NEM. This may include, for example, reforms relating to cost-reflective tariffs and network tariffs.

It was also noted that any rule changes should be complementary to broader work programs relating to the integration of distributed energy resources and VPPs.⁶⁵

⁶⁵ Tesla, submission to consultation paper, p. 3.

3 DEVELOPMENT OF A TWO-SIDED MARKET

This draft rule introduces a mechanism that will enable some consumers to more readily participate in the wholesale market by undertaking wholesale demand response. As discussed in chapter 4, the opportunity to introduce a wholesale demand response mechanism arises because:

- Evolving technologies are 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 determination, highlight a growing interest across industry for the wholesale market to accommodate consumers who are able to engage in the wholesale market.
- Wholesale demand response may contribute to promoting reliability and security in a more affordable way than peaking generation.

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

The electricity system will continue to transform and the variability in the system will continue to increase as demand side devices and generation sources become more flexible and responsive. In light of this, the electricity system and the associated market framework will need to continue to adapt in order to make sure we continue to have electricity market outcomes that are in the long-term interests of consumers.

The Commission considers that moving to a two-sided market will assist the NEM in effectively evolving and transitioning to the future power sector, whatever the future may look like. A two-sided market is characterised by the active participation of the supply and demand side in dispatch and price setting.

The development of a two-sided market, alongside other priority reform areas for the Commission such as transmission access arrangements, will be critical to the functioning of the NEM in an environment of increasingly variable demand and supply.

The rest of this chapter discusses:

- the unique nature of electricity markets and the role of the consumer
- the current design of the electricity market which places an emphasis on changing supply to meet demand
- the changing nature of the electricity market with new technologies
- the need to develop a two-sided market to accommodate these changes
- a plan for how a two-sided market could be implemented
- the role for the wholesale demand response mechanism.

3.1 Unique nature of electricity markets

When electricity markets were first developed, it was initially considered that these markets would share the characteristics of other commodity markets. That is, there would be active participation from both the supply and demand side in clearing the market. However, the unique characteristics of electricity and the state of technology at the time of the initial market design meant that a greater emphasis was placed on the supply side of the market. This has led to a relatively limited amount of active participation of the demand side in the wholesale market, compared to the supply side. For example, the only scheduled loads currently operating in the NEM are large scale storage.

In order for the electricity system to operate securely, the production of electricity must equal the consumption of electricity near instantaneously. It is for this reason that electricity is priced in the wholesale market every five minutes, and prices are allowed to vary within a range of -\$1,000/MWh to \$14,700/MWh. The short pricing intervals and sharp price changes send signals to market participants about what the system requires at that particular point in time, and so encourages production and operational decisions (and, in theory, consumption decisions) that maintain the supply-demand balance.

In most other commodity markets, production does not have to equal consumption instantaneously, because the commodity can be stored, and so pricing reflects the supply and demand over far longer periods of time.

Historically, it has been the supply-side of the electricity market that has actively changed its output in order to match changes in demand. This has occurred for a number of reasons:

- Responding to short term price signals requires being able to measure consumption or generation in short time frames. This also needs to be communicated to AEMO in close to real time so that AEMO can operate wholesale market dispatch. Historically, there were a small number of large generators and a very large number of small customers. As such, it was economically feasible for large generators to meter information at a granular level and provide it to AEMO. However, it has been cost-prohibitive and technically infeasible to meter every consumer of electricity at a high level of accuracy and collate this information for central dispatch.
- Active participation in central dispatch comes with responding to significant variations in the wholesale price. Even when consumption could be measured on a more granular basis, the large majority of consumers (i.e. the demand side) have typically had limited ability to respond effectively to granular prices.
- The majority of consumers place a high value on consuming electricity, meaning that for the vast majority of pricing intervals the value they place on consumption exceeds the wholesale price, and they would not want to adjust their consumption even if exposed to the wholesale price.

Due in part to the reasons outlined above, most consumers have retail contracts that manage the risk of variations in the wholesale price and so obviate the incentive to respond to the wholesale price. Consumers on these contracts have the option to consume electricity at a

pre-agreed and relatively flat rate,⁶⁶ and so are not exposed to fluctuations in the wholesale price.

These contracts manage the risk to consumers of volatility in the spot price, but also reflect the historic reality that it was difficult for consumers to measure or control their response to the wholesale market.

These contracts are unusual in other markets, reflecting the unusual characteristics of electricity noted above. For example, consumers do not enter into fixed price, unlimited volume contracts with their petrol station.

3.2 Current design of the wholesale market

The original NEM market design recognised in order to keep the system balanced, it would be necessary to adjust supply to match demand. It was a deliberate design choice to not place obligations on the demand side to actively participate in the wholesale market. This was because it would not have been feasible due to the technology limitations of metering and load control, as noted above.

Currently, most large-scale generators are scheduled. This means they:

- are required to provide information to AEMO and the rest of the market about their availability well in advance of real time
- are required to submit offers to AEMO in order to be dispatched and receive revenue
- receive dispatch targets instructing them to generate at a level according to the optimisation undertaken by AEMO.

On the other hand, the vast majority of loads do not participate in the same manner. Instead, under the current framework:

- AEMO makes long term forecasts of demand to inform planning and investment decisions
- AEMO makes short terms forecasts of demand for the purposes of dispatch and assumes that essentially all demand is willing to consume at the market clearing price
- individual loads are not required to bid in the market and do not receive a target from AEMO to consume at a set level.

As a result, the enduring approach to matching supply and demand has been to alter supply to meet expected demand.

3.3 Need for development of a two-sided market

However, the changing context of the electricity market and changing nature of electricity consumers are challenging the assumptions underpinning the original market design. The technological barriers to demand side participation that existed at the inception of the NEM are continually reducing. Further, the nature of the supply mix is becoming increasingly variable.

⁶⁶ Retail rates may vary from time-to-time, but they are flat relative to the five-minute variability of the wholesale market.

3.3.1 Embracing growing consumer engagement

Participating in wholesale demand response to date has often posed a challenge to consumers. These consumers have generally needed:

- To be technically equipped to respond, which involves having the appropriate metering and control over consumption. This often required consumers to manually change their consumption, which required sufficient notice periods.
- An incentive to respond to wholesale prices. As discussed earlier, retail contracts have typically provided consumers with limited dynamic price signals.

However, the role for consumers in electricity markets is fundamentally changing. Consumers are likely to become increasingly capable and willing to engage in the market. 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. For example, the emergence of Flow Power and Amber Electric have demonstrated a change in the 'typical' retailer service.⁶⁷

Increased consumer engagement is being driven by a range of factors:

- There is an emphasis on the affordability of electricity. Increased awareness of electricity costs have driven consumers to seek to address these costs, leading to uptake of distributed energy resources, demand side flexibility and energy efficiency.
- Technology will enable demand side participation that minimises the impact on the consumer. Whereas demand side participation may have previously involved manual intervention, advances in technology are providing consumers with the opportunity to participate with little to no tangible impact on their well-being. This is starting to emerge already, with specific loads such as electric hot water, pool pumps and air conditioners being controlled remotely to reduce costs without impacting the consumer. These trends will be accelerated by the entrance of non-traditional energy players or even non-energy players, such as Samsung, which is marketing a home energy management service.⁶⁸
- Not only are these enabling technologies being developed, the costs of these technologies are falling substantially. Previously, distributed energy resources were inaccessible to most consumers due to high upfront costs. The improvements in communications technologies, coupled with the proliferation of 'smart devices' means the technology to respond to price signals will be increasingly ubiquitous.
- Consumers have demonstrated a desire to align consumption of electricity with the output of renewable energy sources. For example, residential consumers with solar rooftop PV change their consumption of electricity to better take advantage of the output of their solar panels. In addition, entities that have signed corporate PPAs are incentivised to align their consumption with the output of the seller of the PPA. This is driving consumer interest in batteries and demand side flexibility.

⁶⁷ More examples of developments in retailer models and service provision to consumers can be found in chapter 2 and in the Commission's 2019 *Retail competition review*.

⁶⁸ For more information, see: <https://www.samsungsds.com/global/en/solutions/off/hms/SamsungSmartHome.html>

As consumers increasingly engage in the market, the underpinning market frameworks should be adapted to embrace and fully capture the efficiencies arising from this engagement. As detailed in this determination, enabling wholesale demand response through a mechanism will allow those consumers who are equipped to do so, to engage in the wholesale market and respond to wholesale prices. However, the Commission considers (for the reasons set out in this determination) that in order to minimise the risks imposed on consumers and extract the greatest benefit, participation in the mechanism should be scheduled and participants should comply with baseline accuracy requirements. Consequently, while participation in the mechanism will deliver material reliability and price related benefits, it may not be accessible for all consumer types or all types of demand response. However, the Commission considers that the future development of a two-sided market would be able to address challenges associated with the changing nature of the wholesale market, and more readily capture the efficiencies of greater demand side participation.

When the demand side can actively engage in central dispatch, it will have a significant flow on benefit for all consumers.

In the short term, demand side participation would result in demand shifting from high priced periods to low priced periods. This would have the benefit of suppressing high wholesale spot prices. Further, given that demand side participation can potentially be used as a substitute for generation in the wholesale market, it would be expected that providing for efficient changes in demand would increase competition in the wholesale market. It would also be able to address a tight supply-demand balance at lower cost than some peaking generation. As a result, demand side participation would lower wholesale prices and help manage the supply-demand balance at a lower cost.

In the long term, efficient demand side participation should lead to the development of the least-cost combination of resources to meet the supply-demand balance. For example, efficient demand side participation should lead to:

- reduced need for peaking capacity as the demand side responds to higher prices
- consumers being able to take better advantage of low prices, for example during the middle of the day as increasing solar output lowers wholesale prices, or during other periods where the wholesale price is low.

Demand side participation should also assist with managing the 'duck curve' to the extent that the wholesale price is able to reflect the value of electricity during solar troughs and as the solar output declines and operational demand ramps up.

The net effect would be a reduction in generation with high marginal costs and an increase in the utilisation of generation with a low marginal cost. This would flow through to reduced total system costs which would in turn reduce the costs as seen by consumers.

The integration of the demand side would also have the ability for the demand side to mitigate supply side market power. Under conditions where there are limited sources of supply available, this can lead to the exercise of market power and consumers paying above what would be the efficient price for electricity. However, with the integration of the demand

side, consumers would be able to place competitive pressure on suppliers by changing their level of consumption and employing distributed energy resources.

If the market arrangements can be adjusted to effectively incorporate the demand side into the market, it will introduce substantial benefits to all consumers.

3.3.2

Changing trends and nature of the wholesale market

The functioning of the wholesale market is reliant on AEMO's ability to forecast demand accurately. Forecasting the demand side is a complex task and it is likely to become increasingly difficult as the capacity for demand response among consumers grows. AEMO's ability to accurately forecast the consumption and output of batteries and electric vehicles will diminish as these resources become more responsive to market price signals. Advances in communications and control technology will soon enable all manner of electrical devices to be controlled and optimised in response to wholesale prices and to participate in ancillary service markets. As a result, the centrally determined demand forecast used in dispatch, pre-dispatch and PASA is likely to become an increasingly poor reflection of actual outcomes without more information being provided by the demand side.

There are also changing trends in the supply of electricity from large-scale generators. There have been, and will continue to be, substantial increases in the capacity of solar and wind generation installed in the NEM. These generators are now the lowest cost form of generation and will represent a growing proportion of the supply mix. While the ability to forecast the output of intermittent generation is improving, this increased level of intermittent generation adds uncertainty to supply forecasts. This uncertainty impacts on the forecasts of prices and the ability for all market participants to make informed decisions about when to consume or generate.

This is the case for demand side participants. The Commission is aware of a number of demand side participants that respond to the wholesale price that have expressed the increasing difficulty of doing so. Often demand side participants will make commitments to undertake demand response hours ahead of real time in response to forecast price spikes. However, increasingly these price spikes do not eventuate and the demand side participant has incurred the cost of providing demand response but has not avoided any increased electricity costs. Demand side participants can manage this price volatility through the existing contract markets; however, these contracts may not always be easily accessible to demand side participants. This is being considered by the Commission in a rule change request looking at the introduction of a short term forward market.⁶⁹

The increased variability for wholesale participants will add costs to the contract market and hedging arrangements. A less certain wholesale market will add costs to those parties trying to defend contract positions. This cost will be reflected in an increased premium on these hedge contracts that will ultimately be borne by the demand side.

⁶⁹ See: <https://www.aemc.gov.au/rule-changes/short-term-forward-market>

3.3.3 Addressing these trends through a two-sided market

These trends would be best accommodated by moving toward a two-sided market characterised by:

1. active participation from the supply **and** demand sides of the market
2. prices being set in accordance with the revealed preferences of the supply **and** demand side.

A two-sided market would facilitate the increased involvement of the demand side in the wholesale market dispatch and information provision processes.

Since 2013, a number of rule changes originating from the *Power of Choice* review have been implemented. These include changes to the principles for distribution pricing, new metering frameworks, measures to address access to consumers' data, improvements in demand side participation information provided to AEMO, and demand management incentives and enabling demand response. These changes have represented incremental changes to the market framework with an intent to better engage the demand-side of the market.

In the longer term, the Commission considers that the active role of the demand side in the wholesale market will need to be much more prominent. The demand side will play an integral role in the future of the NEM. It is therefore critical to continue to consider the reform trajectory that will lead to the development of a two-sided market. This is discussed further below.

3.4 Moving to a two-sided market

Alongside reform to the access arrangements, the Commission considers moving to a two-sided market should enable the transition to a future NEM characterised by increased variable supply and more flexible, price responsive demand.

There are numerous considerations in moving to a two-sided market:

1. **Increased information from the demand side.** A number of changes have been made recently that increase the level of information provided to the market by the demand side. These include the introduction of the distributed energy resources register and the demand side participation portal. However, in moving toward a two-sided market greater amounts of information should be provided by the demand side into dispatch, pre-dispatch and PASA. This could involve increased demand information and forecasts being provided by retailers to AEMO to improve the quality of the central demand forecasts.
2. **The demand side should start to be actively involved in the price setting process.** The demand side should interact directly with supply to set real time prices. As a result, consumers would be able to individually consume at a price reflective of the value they place on consuming. This would in turn benefit all consumers by avoiding the need to build and operate more expensive peaking capacity. Eventually, the entire demand side would be revealing their preferences to the rest of the market in the same manner as generators do currently. This would not necessarily occur by individual

consumer. Instead, aggregators and retailers will continue to have a role in managing this complexity on behalf of consumers.

3. **Review of load scheduling requirements.** 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. The Commission does not necessarily consider it appropriate for the entire demand-side to be scheduled in a two-sided market; however, it may be appropriate to review the obligations placed on scheduled loads to see whether they remain fit-for-purpose. In addition, given that scheduled loads provide benefits to the rest of the market, consideration should be given to whether there should be greater incentives for loads to become scheduled.
4. **Providing consumers with greater price certainty.** It will be important that the development of a two-sided market provides consumers with tools to achieve price certainty. Participating in the market and responding to wholesale prices can mean a consumer deciding to consume incurs a cost such as lost productivity in order to reduce exposure to anticipated high wholesale prices. However, if a consumer does not have confidence that the avoided wholesale electricity costs would outweigh the incurred costs a consumer may not be able to undertake demand response, even where it is efficient.
5. **Maintaining appropriate 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 energy-specific consumer protections has not been adapted to these changes. This applies to demand response providers as well. In moving toward a two-sided market, it will be important to maintain the appropriate consumer protections. This is discussed further in chapter 4.
6. **Managing power system security.** In moving toward a two-sided market, there should be consideration of any complementary reforms that would also assist with maintaining power system security.

The Commission notes that this would constitute a major reform in its entirety, with a number of considerations. For example, there are a number of changes that would likely be needed in order to fully incorporate demand-side bidding into the NEM. Business rules, software, and communications will need to change. These changes will need to address new issues as well as change existing infrastructure and rules to incorporate demand-side bidding.

In addition, this reform will need to allow time for:

- working through the design of a future two-sided market
- making the necessary changes to systems and hedging arrangements
- working through any potential changes to NEMDE
- developing the appropriate consumer protections under a two-sided market.

The Commission also notes that a fully developed two-sided market would involve the entire demand side. While not every consumer would be required to individually participate, those who have access to the more recent technological developments would capture more of the benefit. As such, it will be important to make sure the transition to a two-sided market

coincides with the increased uptake of relevant technological developments by consumers, to the point where a majority of the demand side can participate in some form.

3.5 Role for the wholesale demand response mechanism in the move to a two-sided market

Significant time and resources will be required to move from the current arrangements to a two-sided market. It will require careful consideration to determine the roles for consumers, aggregators, retailers and other market participants in a two-sided market. In the meantime, there is a growing number of consumers that are likely to have latent flexibility that potentially remains under-utilised. The draft rule seeks to address this by providing consumers with greater opportunities to substitute for generation by providing demand response in the wholesale market.

The Commission considers the process of developing a two-sided market and the associated transition path should start. In the meantime, the draft rule will facilitate consumers looking to participate in wholesale demand response through the mechanism. The draft rule will assist in providing greater opportunities for wholesale demand response and promoting increased consumer engagement. This should subsequently allow for a transition to a two-sided market when technology is mature enough and a clear path has been determined.

The mechanism will eventually be outgrown by the market because it provides consumers with opportunities to substitute for generation (i.e. on the supply side of the market). This will not be sustainable in the long-run as more consumers seek to engage. For example, if all of the demand-side became technologically capable of participating in the mechanism, the supply in the wholesale market would consist of both actual supply (generation) and also demand response (through the mechanism). While the Commission appreciates that this scenario is unlikely in the short-term, it also highlights the necessity of moving to a two-sided market over time as technology and consumer preferences adapt.

The wholesale demand response mechanism under the draft rule also relies on setting a baseline quantity against which the value of demand response would be calculated and paid. However, it is impossible to exactly know this counterfactual level of electricity consumption. If the baseline is set too high, consumers will pay more than they need to. If it is too low, then there won't be enough incentive to encourage demand response in the market. The draft rule seeks to minimise these consequences.

In addition, the nature of baselines mean that very regular participation in the wholesale market will not be enabled under the mechanism. A baseline uses historical consumption (from when demand response was not provided) to determine a counterfactual level of consumption *as if the consumer was not responding to the wholesale price*. Therefore, if a consumer were to respond to the wholesale price every day, there would be no reasonable grounds on which a counterfactual could be determined. However, moving to a two-sided market in the long-run means that there would be no need to centrally determine these artificial benchmarks.

4

DRAFT RULE DETERMINATION

4.1

The Commission's draft rule determinations

The Commission has determined to make a more preferable draft electricity rule.⁷⁰ This more preferable draft rule:

- introduces a new participant category, a demand response service provider (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 much as practicable, replicate those applied to scheduled generators, for example, similar information provision 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
- 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 time frames for this draft rule.

A summary of the draft rule is provided in chapter 5. More detail on the various aspects of the draft rule is also provided in the appendices.

The Commission's reasons for making this draft determination are set out in section 4.4.

However, the Commission has determined to not make a draft retail rule in respect of the rule change requests.⁷¹ This is because the energy-specific consumer protections (which are set out in the NERL, NERR and parts of the NER) require a broader update to account for new non-traditional energy services and products, including wholesale demand response. Energy consumers are protected by energy specific provisions that 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 not apply to customers of DRSPs given that the service provided by DRSPs to customers is not a sale or supply of energy.

There has been significant market evolution in recent years in relation to non-traditional energy services and products. The nature and application of energy-specific consumer protections has not been adapted to these changes. This applies to wholesale demand response as well – as noted above customers providing wholesale demand response through

⁷⁰ This draft determination is made in respect of the rule change requests from the Public Interest Advocacy Centre, Total Environment Centre and the Australia Institute, Australian Energy Council, and the South Australian Government, consolidated under project code ERC0247 on the AEMC website.

⁷¹ The relevant project codes are RRC0023, in relation to the consolidated rule change requests from PIAC, TEC and TAI, the AEC, and the South Australian Government.

an entity who is not a retailer would not be covered by the consumer protections in the retail law in respect of the services provided by that entity.

The Commission has committed through its 2019 *Retail competition review* to review the retail law and rules over the next year. Any amendments to the retail law will require consideration by the COAG Energy Council. The Commission's reasons for not making a draft retail rule are set out in section 4.5.

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 draft electricity rule meets the national electricity objective
- why the proposed retail rules do not meet 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.⁷²

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

4.2

Rule making tests

4.2.1

Contributing to achieving the NEO and NERO

The rule change requests covered by this draft rule determination relate to both the NER and the NERR. As such, in making a draft rule 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).⁷³ This is the decision making framework that the Commission must apply.

The NEO is:⁷⁴

to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

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

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:⁷⁵

⁷² *National Electricity (Northern Territory) (National Uniform Legislation) Act 2015*, referred to here as the NT Act.

⁷³ Section 88 of the NEL.

⁷⁴ Section 7 of the NEL.

⁷⁵ Section 14A of the NT Act, inserting section 88(2a) into the NEL as it applies in the Northern Territory.

- (a) the national electricity system
- (b) one or more, or all, of the local electricity systems⁷⁶
- (c) all of the electricity systems referred to above.

For the rule change requests considered in this draft 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 draft rule would not have effect in relation to the local electricity systems).

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).⁷⁷ This is the decision making framework that the Commission must apply.

The NERO is:⁷⁸

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").⁷⁹

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.⁸⁰ 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.

4.2.2

Making a more preferable 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 and the NERO.

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

⁷⁶ These are specified Northern Territory systems, defined in schedule 2 of the NT Act.

⁷⁷ Section 236(1) of the NERL.

⁷⁸ Section 13 of the NERL.

⁷⁹ Section 236(2)(b) of the NERL.

⁸⁰ That is, the legal tests set out in s. 236(1) and (2)(b) of the NERL.

4.2.3

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.⁸¹ Under those regulations, only certain parts of the NER have been adopted in the Northern Territory.⁸²

As the Commission has determined to make a more preferable draft rule which relates to parts of the NER that apply in the Northern Territory,⁸³ the Commission is required to consider whether to make a uniform or differential 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.⁸⁴ A differential rule is a rule that:

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

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

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.⁸⁵

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.

4.3

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, as well as through its technical working group.

Wholesale demand response relies on consumers changing their consumption of energy in response to a signal to do so. Consumers can respond to these signals and choose to consume less or more compared to what they otherwise would have done. For example,

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

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

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

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

85 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.

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 mechanism set out in the rule change requests is one such way, but not the only way, to promote wholesale demand response.

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. The benefits of enabling this are discussed in chapter 3.

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 peaking capacity than using peaking 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 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 request against the NEO and the NERO, the Commission has considered the following principles:⁸⁶

- 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.

These principles are discussed in more detail below.⁸⁷

4.3.1

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

⁸⁶ In submissions to the consultation paper, a number of stakeholders expressed support for the principles set out by the Commission. Submissions to consultation paper: AEMO, p. 7; BlueScope Steel, p. 3; Origin Energy, p. 3; Meridian Energy, p. 2.

⁸⁷ Stakeholders suggested a number of additional principles for consideration in submissions to the consultation paper and through the technical working group. The Commission has added consumer protections to its assessment framework. Regarding the other principles submitted, the Commission has incorporated these into the assessment framework principles where appropriate.

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.

4.3.2

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.

4.3.3

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.

4.3.4 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.

4.3.5 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 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 be passed on to consumers in terms of higher prices 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.

4.3.6 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 assessed the implementation efficiency of the proposals set out in the rule change requests. This is necessary so that the implementation and ongoing costs, ultimately borne by consumers, do not exceed the benefits of introducing a mechanism.

4.3.7 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.

4.4

Summary of reasons - more preferable draft electricity rule

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

Further detail on the more preferable draft rule can be found in chapter 5 below.

The introduction of a wholesale demand response mechanism at this time reflects the facts that:

- Evolving technologies are 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 determination, highlight a growing interest across industry for the wholesale market to accommodate consumers who are able to engage in the wholesale market.
- Wholesale demand response may contribute to promoting reliability and security in a more affordable way than peaking generation.

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

- **Promoting reliability and transparency:**
 - The mechanism introduced under the draft rule will promote greater demand side transparency and assist with reliability. Under the draft 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 therefore lower the wholesale electricity price. 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 draft rule requires these parties to be scheduled, since 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 draft rule, DRSPs will also be required to provide the relevant information through pre-dispatch, ST-PASA and MT-PASA. This will provide a greater level of information to AEMO and the market, which will further promote more efficient operational and investment decisions by AEMO and market participants.
- The draft rule also increases the transparency and reporting relating to the demand side participation portal, which relates to other forms of wholesale demand response. That is, wholesale demand response provided by parties who are not DRSPs.
- **Promoting efficient utilisation of electricity services:**
 - The draft rule promotes the ability for consumers who participate in the mechanism to change their level of consumption in response to the wholesale electricity price. This will occur through their consumption competing directly with the supply-side, and so the supply-side should be more competitive, with this reflected in the wholesale price.
 - Consumers who sell demand response 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.
 - In the short term, wholesale demand response has the effect of reducing demand in high priced periods. 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 on the supply-side to meet demand. This will reduce the costs that are recovered from all consumers.
- **Promoting consumer choice and competition:**
 - The mechanism introduced under the draft rule will increase the level of consumer choice in relation to wholesale demand response. By increasing the ability for consumers to access wholesale demand response through the mechanism, it would 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 draft rule when compared to the current arrangements.
 - In the draft rule, wholesale demand response is added to the supply side of the market and so competes with generation, increasing competition on the supply side.
- **Minimising the extent of any distortionary impacts:**
 - The draft rule seeks to 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. The Commission acknowledges the potential for distortionary impacts and costs being imposed on the market through the introduction of centrally determined baselines. The draft rule seeks to address these impacts in the following ways:

- The draft 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, both when classifying load as a wholesale demand response unit and prior to participating in 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.
- The draft rule provides for these metrics to be made more rigorous as baseline methodologies improve over time. The draft rule provides for a process by which registered participants can submit baseline methodologies to AEMO. If a baseline methodology is determined to be accurate, AEMO will approve it. In addition, where the submitted baseline methodology is more accurate than is currently required by the baseline methodology metrics, AEMO would review these metrics and may update them. However, the Commission notes that centrally determined baseline-related risks cannot be entirely avoided under the wholesale demand response mechanism. Baselines will be impossible to accurately determine, and particularly difficult for variable loads. As noted in chapter 3, the Commission considers a longer term solution will be to move toward a two-sided market which would not rely on centrally determined baselines.
- The draft 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 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 draft rule also proposes having DRSPs' settlements adjusted to account for the additional hedging costs imposed on the retailer. 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 draft 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 settlement model introduced under the draft 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 draft rule minimises the extent of

the changes required to retailer billing systems. This will result in materially reduced upfront costs that would be imposed on 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 draft rule will require a number of changes to AEMO systems. In developing the draft rule, the Commission has sought to reduce the extent of these upfront 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.

The Commission considers the draft rule is likely to better contribute to the achievement of the NEO than the proposal set out in the AEC's rule change request. The AEC's rule change request proposed an extension of the current arrangements for wholesale demand response. However, the Commission considers the draft 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 was 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 draft rule, a change of retailer would not affect a consumer's demand response arrangements with a DRSP, promoting competition and consumer choice.

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

- The proposal set out by the South Australian Government would have imposed costs on retailers that they would have no ability to manage. This would have resulted in increased costs being imposed on consumers. The draft 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 draft rule also avoids making any changes to retailer billing systems. In addition, both the South Australian Government proposal and the draft rule would require changes

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

4.5 Summary of reasons - no draft retail rule

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

- **Consumer protections should be maintained for small customers participating in wholesale demand response:**
 - Energy consumers are protected by energy specific provisions under the retail law and associated rules that 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 participating in wholesale demand response through that retailer. For example, through the programs described in chapter 2.
 - However, these protections would not apply to customers of DRSPs given that the service provided by DRSPs to customers is not a sale or supply of energy. The retail law would not require a DRSP to be an authorised retailer (and nor would a DRSP be a distributor)
 - 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.⁸⁸ It is important to consider the application of consumer protections more broadly in light of new energy services and increased roles for aggregators more broadly.
- **The retail rule change request would not allow for holistic consideration of consumer protections for small customers:**
 - The retail rule change request submitted to the Commission would not allow the Commission to undertake a holistic review of consumer protections.
 - 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 could not be made through these rule change requests.
- **The Commission is planning to undertake 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

⁸⁸ A number of stakeholders noted the importance of maintaining consumer protections for small customers, including Energy Queensland, PIAC, TEC, TAI, AGL, Alinta and Enel X. Submissions to consultation paper: Energy Queensland, p. 10; PIAC, TEC, TAI, p. 5; AGL, pp. 3-4; Alinta, p. 6; Enel X, p. 23.

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*⁸⁹ 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.
- In the 2019 *Retail competition review*, the Commission committed to reviewing the consumer protections framework, and analysing if and what consumer protections are necessary to extend to new service providers and reduce barriers to innovation. The review will likely analyse the regulatory approach for new non-traditional energy services and products, including wholesale demand response.
- **The Commission has decided to not make a draft retail rule and not immediately allow for small customer participation in the mechanism:**
 - Given the importance the Commission places on the application of the appropriate consumer protections, the draft rule will not permit small consumers to participate in the wholesale demand response mechanism until the related consumer protections issues have been adequately assessed. This may occur before the proposed implementation date of the mechanism.
 - For the purposes of this draft rule determination, the Commission has determined to not make a draft rule in relation to the retail rules for this request. Instead, the Commission will consider, in a formal review, the application of consumer protections to new energy service providers more generally, including DRSPs. The Commission considers that this approach is preferable given that it allows consumer protections to be considered in a holistic, comprehensive manner so that these can be made fit for purpose, no matter what the future may bring.

Accordingly, the Commission's draft rule determination is to not make a draft retail rule.

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

5 OVERVIEW OF DRAFT RULE

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

The Commission has determined to not make a draft retail rule in respect of the rule change requests. This is because the energy-specific consumer protections (which are set out in the NERL, NERR and parts of the NER) requires a broader update to account for new non-traditional energy services and products, including wholesale demand response. Energy consumers are protected by energy specific provisions under the retail law and rules that 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 not apply to customers of demand response service providers (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).

There has been significant market evolution in recent years in relation to non-traditional energy services and products. The nature and application of the retail law and 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 in respect of the services provided by that entity. The Commission considers it important that the retail law and associated consumer protections extend to consumers participating in wholesale demand response, as well as other non-traditional energy services and products. It is important to consider the application of consumer protections more broadly in light of new energy services and increased roles for aggregators more broadly.

Given the importance the Commission places on the application of the appropriate consumer protections, the draft rule does not permit small consumers to participate in the wholesale demand response mechanism until the related consumer protections issues have been adequately assessed. This may occur before the proposed implementation date of the mechanism.

The Commission's reasons for not making a draft retail rule are set out further in chapter 4.

5.1 Wholesale demand response mechanism

5.1.1 Participant category and registration

The draft 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 would 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 would need to register as such with AEMO and have loads classified as demand response loads by AEMO.

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 accurately determined.

Under the draft rule:

- The DRSP registration category will be combined with the existing registration category for market ancillary service providers (MASP).⁹⁰
- To be eligible for registration as a DRSP, a person must satisfy AEMO that it intends to classify a load as an ancillary service load or a wholesale demand response unit within a reasonable amount of time.⁹¹
- Once a person is registered as a DRSP, they would need to obtain AEMO's approval to classify load as a wholesale demand response unit and/or market ancillary services load. For classification as a wholesale demand response unit, this would require the DRSP to satisfy AEMO that the load meets a range of requirements, including:
 - the NMI for the load represents a large customer⁹²
 - the DRSP has an arrangement with the customer for the provision of wholesale demand response⁹³
 - the load meets a number of technical requirements relating to metering, wiring, communication and telemetry and other requirements AEMO considers relevant⁹⁴
 - the load satisfies the baseline methodology metrics and is able to comply with the requirements set out in AEMO's baseline methodology guidelines.⁹⁵
- AEMO must develop a guideline that outlines the above technical requirements, as well as any others AEMO considers relevant for classifying load as demand response loads, and sets out the evidence or information DRSPs would need to provide to AEMO to satisfy these requirements.⁹⁶

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

91 Clause 2.3AA.1(b) of the draft rule.

92 Clause 2.3.6(b) of the draft rule.

93 Clause 2.3.6(c)(1) of the draft rule.

94 Clauses 2.3.6(c)(3) and (4) of the draft rule.

95 Clause 2.3.6(c)(2) of the draft rule.

96 Clause 3.10.1 of the draft rule.

- A customer transfer process would facilitate different national meter identifiers (NMIs) joining and leaving the DRSP's portfolio (independent of the customer transfer process relating to a change of retailer).⁹⁷

5.1.2

Dispatch and pre-dispatch

Under the draft rule, DRSPs would participate in central dispatch in a transparent, scheduled manner. DRSPs are treated in a similar manner to scheduled generators, i.e. a DRSP would submit dispatch offers and when cleared by NEMDE, receive dispatch targets to provide wholesale demand response. DRSPs would also be able to set the wholesale market price. Consequently, DRSPs would have a number of obligations and incentives consistent with the obligations imposed on scheduled generators, including:

- compliance with dispatch targets
- incurring FCAS contribution factors for deviating from dispatch targets.

These obligations and incentives are key to maintaining the integrity of the central dispatch and price setting process.

The principle that DRSPs should be treated in a similar manner to scheduled generators guides the Commission's approach to how DRSPs should participate in these processes. However, it is worth noting that in some instances we have modified obligations to better suit the nature of DRSPs and wholesale demand response. Despite this, there may be some practical challenges with requiring DRSPs to meet the proposed obligations. Without scheduling, the availability of demand response is less certain and this would substantially reduce the reliability benefits associated with the mechanism.

Under the draft rule:

- DRSPs would be able to elect when they participate in central dispatch, in which case they will be scheduled and will face the same obligations as scheduled generators.⁹⁸
- DRSPs would be required to submit dispatch offers for all dispatch intervals for the purposes of providing information for pre-dispatch. If a DRSP does not intend to participate in central dispatch for a particular interval, its dispatch offer for that interval will state this, and AEMO would not be able to dispatch it for that interval.⁹⁹
- When participating in central dispatch, a DRSP would be required to submit dispatch offers in price and quantity pairs in whole MW increments.¹⁰⁰
- A DRSP's dispatch offer must specify:¹⁰¹
 - whether the DRSP is participating in dispatch for the relevant dispatch interval

⁹⁷ In Chapter 10 of the draft rule, the definition of Market Settlement and Transfer Solution Procedures (MSATS) has been updated to reference procedures published by AEMO governing the recording of the classification of a connection point as a wholesale demand response unit, the DRSP responsible for that unit, the transfer of the responsibility between market participants and the baseline methodology applicable to the unit.

⁹⁸ Clause 3.8.7B of the draft rule.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

- the quantity of demand response being offered relative to the physical operating level of the wholesale demand response unit at the beginning of the dispatch interval (or, if the DRSP is already providing demand response, relative to the physical operating level of the unit at the beginning of the first of the contiguous intervals in which the DRSP provides demand response). This demand reduction would be represented in dispatch as a positive quantity given that the DRSP would be treated as equivalent to a generator offering supply in the market
- a price at which the DRSP would offer this reduction
- ramp up and ramp down rates
- an expected consumption profile for the scheduled wholesale demand response unit for the 30 minutes after that dispatch interval, if the DRSP were to cease participating in central dispatch.
- When a DRSP makes a dispatch offer that is cleared by AEMO, it would receive a dispatch instruction to provide a quantity of wholesale demand response that will be relative to the level of consumption of the scheduled wholesale demand response unit at the start of the dispatch interval in which it was first dispatched.¹⁰²
- If a DRSP's dispatch offer is not cleared in the market, or the DRSP makes no wholesale demand response available, the DRSP would not be dispatched.¹⁰³
- 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 submitted¹⁰⁴
 - would have been undertaken anyway, even in the absence of a dispatch instruction.¹⁰⁵

5.1.3

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 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 scheduled generators, unless a particular requirement is not appropriate or necessary to apply to DRSPs.

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

- medium term projected assessment of system adequacy (PASA) inputs applying to the DRSPs wholesale demand response units, including PASA availability for each day, taking

¹⁰² Clause 3.8.2A(d)(3) of the draft rule.

¹⁰³ Clause 3.15.6A(o) of the draft rule.

¹⁰⁴ Clause 3.8.2A(a) of the draft rule.

¹⁰⁵ Clause 3.8.2A(b) of the draft rule.

into account the ambient weather conditions forecast at the time of the 10% probability of exceedence peak load, and weekly wholesale demand response constraints¹⁰⁶

- aggregate wholesale demand response unit PASA availability for each region¹⁰⁷
- 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 constrained wholesale demand response units¹⁰⁸
- any information required for publication by AEMO in the *Electricity Statement of Opportunities* (ESOO).¹⁰⁹

AEMO is required to publish the information specified above in the medium-term PASA,¹¹⁰ short-term PASA¹¹¹ and ESOO¹¹² (as applicable).

5.1.4

Determination of baselines

The draft 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 counterfactual 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.

The framework under the draft rule captures the benefits of having a central body determining the baseline while also allowing for innovative approaches to be developed over time.

AEMO is required to:

- determine the baseline methodology metrics which set out the parameters for assessing a particular baseline methodology,¹¹³ which must include an assessment of accuracy and freedom from bias¹¹⁴
- determine arrangements for regular and systematic testing of baselines' compliance with the baseline methodology metrics¹¹⁵
- develop a guideline, in consultation with stakeholders, which sets out:¹¹⁶

¹⁰⁶ Clause 3.7.2(d) of the draft rule.

¹⁰⁷ Clause 3.7.2(f)(5C) of the draft rule.

¹⁰⁸ Clause 3.7.3(e) of the draft rule.

¹⁰⁹ Clause 3.13.3A(f) of the draft rule.

¹¹⁰ Clause 3.7.2(a) of the NER.

¹¹¹ Clause 3.7.3(a) of the NER.

¹¹² Clause 3.13.3A(a) of the draft rule.

¹¹³ Clause 3.10.2(a) of the draft rule.

¹¹⁴ Clause 3.10.2(b) of the draft rule.

¹¹⁵ Clause 3.10.2(e) of the draft rule.

¹¹⁶ Clause 3.10.1(a) of the draft rule.

- the baseline methodology metrics and the thresholds for an acceptable baseline methodology
- the process for demonstrating that these thresholds are satisfied when classifying load as demand response load
- arrangements for regular and systematic testing of baselines' compliance with the baseline methodology metrics
- the process for market participants to submit alternative baseline methodologies to AEMO for approval
- monitor and report on the baseline methodologies used under the demand response mechanism.¹¹⁷

DRSPs must:

- demonstrate that a load is capable of complying with the baseline methodology metrics in order to classify that load as demand response load¹¹⁸
- demonstrate that a load complies with the baseline methodology metrics on an ongoing basis in accordance with the testing requirements set out in the guidelines developed by AEMO.¹¹⁹

5.1.5

Settlement and cost recovery

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. In particular, the settlement model applying under the draft determination would:

- 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 draft rule (and under the DRSP's contract with the customer) would be as follows:

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

¹¹⁷ Clause 3.10.6 of the draft rule.

¹¹⁸ Clause 2.3.6(c)(2) of the draft rule.

¹¹⁹ Clause 3.10.2(e) of the draft rule.

- The retailer would be charged by AEMO for two amounts in the wholesale market, both at the wholesale price:
 - The customer's actual level of consumption
 - The quantity of demand response provided by the customer (i.e. the customer's baseline level of consumption minus its actual consumption)¹²⁰
- The DRSP would 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 price¹²¹
- The DRSP would 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 the cost it incurs by paying for the customer's baseline level of consumption in the wholesale market, the DRSP would 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 rate¹²²
- The reimbursement rate would be calculated by the AER on a quarterly basis and would be based on average wholesale prices over the previous 12 months.¹²³

The financial flows described above are illustrated in Figure 5.1.

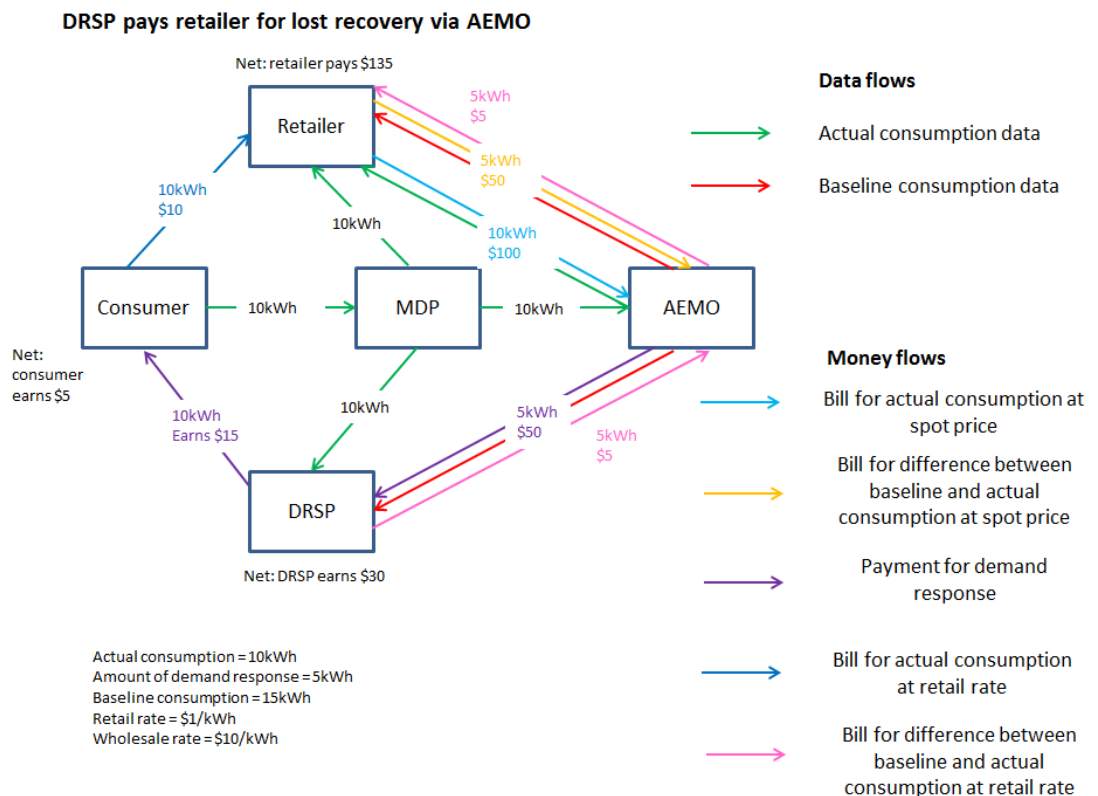
120 The quantity of demand response provided for the purposes of settlement is calculated under clause 3.15.6B(c) of the draft rule.

121 Clause 3.15.6B(a) of the draft rule.

122 Clauses 3.15.6B(a) and (b) of the draft rule.

123 Clauses 3.15.6B(e) and (f) of the draft rule.

Figure 5.1: Settlement model under the draft determination - worked example



5.1.6

Systems changes

The information flows under the draft rule are as follows:

- Consumer electricity use would be measured and recorded at the consumer's meter as it is currently
- The metering data provider (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 retailer, AEMO and the distributor)¹²⁴
- The meter data for each NMI will still be entered into AEMO's market settlement and transfer solution (MSATS)¹²⁵
- In MSATS, in accordance with current procedures the data is sent to AEMO's energy market management system (EMMS) for settlement and prudentials

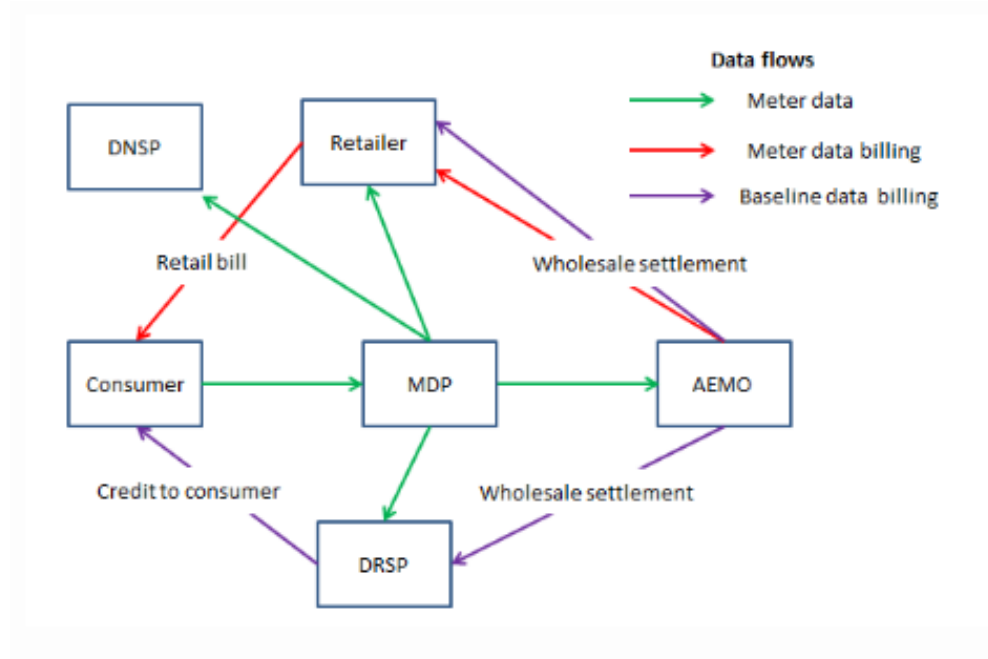
¹²⁴ Clauses 7.10.3(a) and 7.15.5(c)(1) of the NER and clause 7.15.5(f)(5) of the draft rule.

¹²⁵ Clause 7.16.2(c) of the draft rule.

- DRSPs would be able to use the actual metering data for reconciliation purposes (in a similar way to retailers), but would not need to directly use the metering data for settlement
- AEMO's EMMS would send bills to retailers based on both their actual consumption in the wholesale electricity market and the amount of wholesale demand response provided, and will send payments to DRSPs based on the amount of wholesale demand response provided (as discussed above in relation to settlements).

These information flows are illustrated in Figure 5.2.

Figure 5.2: Data flows under wholesale demand response mechanism



The draft rule requires AEMO to update a number of systems and procedures to accommodate the introduction of DRSPs, including MSATS and market settlement systems, and related procedure documents. The B2B Procedures are also required to be revised to facilitate communications between DRSPs and other existing market participants.

5.2 Other changes

Under the draft rule:

- AEMO is obliged to:
 - publish annual reports (without disclosing any confidential information) setting out a range of information about:

- retailer-led and network-led wholesale demand response, based on the data submitted to the Demand Side Participation (DSP) Portal¹²⁶
 - DRSP-led wholesale demand response¹²⁷
- review the Demand Side Participation Information Guidelines as necessary to reflect the amending rule¹²⁸
- Registered Participants are required to submit a report in the DSP Portal even where they have no demand response arrangements with customers.¹²⁹

The draft determination also notes that the Commission:

- recommends that the AER consider the feasibility of making changes to the Energy Made Easy price comparison tool to ensure that products involving retailer-led demand response are represented on the website, and that their cost and competitiveness is accurately portrayed to users of the tool
- may request that the Reliability Panel review the administered price cap (APC) in light of recent events highlighting the interaction between the APC and wholesale demand response
- is interested in stakeholders' views on the existing APC Compensation Guidelines, specifically whether changes are necessary to clarify the circumstances in which different parties can claim compensation following the application of the APC and to ensure the guidelines adequately deal with compensation for demand response providers
- recommends that retailers commit in the Energy Charter to facilitating greater access to demand response products and services for customers.

5.3 Implementation

The substantive parts of the rule implementing the wholesale demand response mechanism would commence on 1 July 2022. 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 Commission has received indications from AEMO that the wholesale demand response mechanism is not able to implemented prior to that time, due to the extent of updates to systems and procedures needed to accommodate the mechanism. AEMO will continue to consider whether this implementation date can be revised.

Some aspects of the draft rule which relate to specific processes or matters unrelated to the implementation of the mechanism (e.g. those set out in section 5.2) will commence earlier. The final rule would also contain transitional clauses, commencing on the date the rule is made.

¹²⁶ Clause 3.7D(c) of the draft rule.

¹²⁷ Clause 3.10.6 of the draft rule.

¹²⁸ Clause 11.118.6(a) of the draft rule.

¹²⁹ This would be a "no activity" report. Clause 3.7D(b)(2) of the draft rule. The Commission proposes to recommend that the reporting requirements clause be made a civil penalty provision.

The commencement dates for the various components of the draft rule are set out in Table 5.1.

Table 5.1: Commencement time frames under the draft rule

SCHEDULE OF AMENDING RULE	PARTS OF THE NER COVERED BY SCHEDULE	COMMENCEMENT DATE OF SCHEDULE
1	Chapter 2 - Registered participants and registration	1 July 2022
2	Rule 3.7D - Demand side participation information	31 March 2021
3	Chapter 3 - Market rules	1 July 2022
4	Chapter 4 - Power system security Chapter 4A - Retailer Reliability Obligation Chapter 7 - Metering	1 July 2022
5	Chapter 10 - Glossary	1 July 2022
6	Chapter 11 - Savings and transitional rules	On publication of the final rule 14 November 2019

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	Australian Renewable Energy Agency
Commission	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 standards and setting 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 AEMC to make this draft rule determination.

A.1 Draft rule determination

In accordance with s. 99 of the NEL and s. 256 of the NERL the Commission has made this draft rule determination in relation to the rule change requests 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 draft rule determination are set out in section 4.4.

A copy of the more preferable draft rule is attached to and published with this draft rule determination. Its key features are described in chapter 5.

A.2 Power to make the rule

The Commission is satisfied that the more preferable draft rule falls within the subject matter about which the Commission may make rules. The more preferable draft 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 rule
- the rule change requests
- feedback provided at the public forum on 5 March 2019
- feedback provided at its technical working group meetings¹³⁰
- submissions received during first round consultation¹³¹
- the ways in which the proposed rule will or is likely to contribute to the NEO and the NERO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for these rule change requests.¹³²

¹³⁰ Summaries of these meetings are available on the project page: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

¹³¹ These submissions can be accessed on the project page: <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

¹³² 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.

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.¹³³ The more preferable draft rule is compatible with AEMO's declared network functions because it would 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 draft more preferable 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.

Table A.1: Amendments to existing provisions

CLAUSE	SUBJECT OF CLAUSE AND PROPOSED 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). It is proposed to amend the clause to replace Market Ancillary Service 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. It is proposed to amend the clause 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. It is proposed to amend the clause to replace Market Ancillary Service Provider with DRSP.

¹³³ Section 91(8) of the NEL.

CLAUSE	SUBJECT OF CLAUSE AND PROPOSED CHANGE
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. It is proposed to amend the clause to replace Market Ancillary Service Provider with DRSP.
Clause 3.7.2(d)	Requirement that certain medium term PASA inputs be submitted by each relevant Scheduled Generator or Market Participant in accordance with the timetable. It is proposed to amend the clause so that the certain medium term PASA inputs include PASA availability of each scheduled wholesale demand response unit, and weekly wholesale demand response constraints applying to each scheduled wholesale demand response unit.
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. It is proposed to amend the clause so that the certain short term PASA inputs include available capacity of each scheduled wholesale demand response unit, PASA availability of each scheduled wholesale demand response unit and projected daily wholesale demand response availability for load response constrained scheduled wholesale demand response units.
Clause 3.8.4(a)	Requirement that Scheduled Generator and Market Participant notify AEMO of available capacity of certain scheduled units. It is proposed to amend the clause so that the certain scheduled units include scheduled 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. It is proposed to amend the clause 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 PROPOSED CHANGE
	It is proposed to amend the clause to include scheduled wholesale demand response units.
Clause 3.8.19(b)	Requirement that where 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. It is proposed to amend the clause to include scheduled 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. It is proposed to amend the clause to include DRSPs.
Clause 3.9.7(a)	Requirement that in the event that a network constraint causes a scheduled generating unit to be constrained-on in any trading interval, the scheduled generating unit must comply with dispatch instructions from AEMO. It is proposed to amend the clause to include scheduled wholesale demand response units.
Clause 3.12A.4	Requirement that where mandatory restrictions apply, each scheduled generating unit or scheduled network service subject of an accepted restriction offer must rebid the total capacity the subject of such restriction offer by varying the respective dispatch offers or network dispatch offers in accordance with the procedures developed pursuant to clause 3.12A.1(a)(4). It is proposed to amend the clause to include scheduled 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. It is proposed to amend the clause to include scheduled 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. It is proposed to amend the clause to include scheduled 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.

The Commission's draft more preferable 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 Commission will seek the AER's agreement to a joint recommendation to the COAG Energy Council to this effect at the time the final rule is published.

A.4.2

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

The Commission's draft more preferable 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 Commission will seek the AER's agreement to a joint recommendation to the COAG Energy Council to this effect at the time the final rule is published.

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

CLAUSE	SUBJECT OF PROPOSED NEW CLAUSE
Clause 2.3.6(i)	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(h).
Clause 2.3.6(j)	Requirement that DRSP in respect of a load that has been classified as a wholesale demand response unit only sell the wholesale demand response produced using that load through the spot market in accordance with the provisions of Chapter 3 and as part of the scheduled wholesale demand response unit to which the wholesale demand response unit is allocated.
Clause 2.3.6(k)	Requirement that DRSP immediately notify AEMO if a load it has classified as a wholesale demand response unit ceases to meet the requirements for classification under clause 2.3.6.
Clause 2.3.7(c)(1)	Requirement that DRSP ensure that wholesale demand response provided using a scheduled wholesale demand response unit is provided in accordance with the co-ordinated central dispatch process operated by AEMO under the provisions of Chapter 3.
Clause 2.3.7(c)(2)	Requirement that DRSP that submits a dispatch offer in respect of a scheduled wholesale demand response unit comply with the dispatch instructions from AEMO in accordance with the Rules.
Clause 3.8.2A(b)	Requirement that DRSP not submit a dispatch offer for a scheduled wholesale demand response unit that is not eligible under clause 3.8.2A(a) to participate in central dispatch during the time for which

CLAUSE	SUBJECT OF PROPOSED NEW CLAUSE
	the dispatch offer is made.
Clause 3.8.2A(c)	Requirement that DRSP only make a dispatch offer to provide wholesale demand response in a trading interval where and to the extent that, if dispatched, the wholesale demand response is or will be the result of wholesale demand response activities in that trading interval.
Clause 3.8.4(f)	Requirement that Scheduled Generator and Market Participant 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 scheduled wholesale demand response units.
Clause 4.9.2B(b)	Requirement that DRSP ensure that appropriate personnel or electronic facilities are available at all relevant times to receive and immediately act upon dispatch instructions issued by AEMO.
Clause 4.9.8(f)	Requirement that DRSP ensure that each of its scheduled wholesale demand response units is at all times able to comply with its latest dispatch offer.
Clause 4.11.1(c1)	Requirement that the provider of any wholesale demand response 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 proposes to insert new clause 3.8.22A(a2), which provides that for the purposes of the requirement in clause 3.8.22A(a) that a dispatch offer must not be false, misleading or likely to mislead, the making of a dispatch offer by a DRSP in respect of a scheduled wholesale demand response unit is deemed to represent to other Market Participants through the pre-dispatch schedules published by AEMO that the wholesale demand response the subject of the dispatch offer will, if dispatched, be the result of wholesale demand response activity.

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 Commission will seek the AER's agreement to a joint recommendation to the COAG Energy Council to this effect at the time the final rule is published.

A.5 Conduct provisions

The Commission cannot create new conduct 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 conduct provisions.

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

B PARTICIPANT CATEGORY AND REGISTRATION

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

The DRSP will be consolidated with the market ancillary service provider (MASP) category so that the DRSP can 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 draft rule. It sets out:

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

B.1 Overview

The draft rule introduces a new service to be provided in the wholesale market: wholesale demand response. To enable the provision of this service, the draft rule establishes a new market participant category, a DRSP, and a registration process in order to allow entities providing this service to directly participate in the wholesale market.

DRSPs would be the only participant class that is able to sell wholesale demand response through the wholesale demand response mechanism. If retailers wanted to provide wholesale demand response through the mechanism, they would need to also register as a DRSP.

A DRSP would need to register as such with AEMO and have loads classified as demand response loads by AEMO.

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 accurately determined.

The draft rule includes a process for assessing the eligibility of loads to participate in a demand response mechanism. This is necessary because these participants are likely to be scheduled, disaggregated portfolios of loads, which the NEM, to date, has not accommodated in central dispatch. All scheduled wholesale market participants are scheduled generators or

storage facilities (which are also scheduled loads).¹³⁴ 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, particularly when each load in the portfolio is small relative to the size of the portfolio itself. Without a demand response load classification regime such as the one proposed in the draft 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. As a result, the draft rule introduces a demand response load classification step following registration. This would allow AEMO to assess the technical suitability of each load in an aggregated portfolio of resources seeking to provide wholesale demand response. It would also allow AEMO to assess whether the DRSP is likely to be able to meet the requirements as specified under the baseline methodology metrics.

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 draft rule, the MASP registration category would be subsumed into the DRSP category. This means there will be a single registration category that would allow persons to classify loads as wholesale demand response loads 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.

B.2 Proponents' views

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

B.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:¹³⁵

- 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.

¹³⁴ Market ancillary service providers 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.

¹³⁵ 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.¹³⁶

B.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:¹³⁷

- 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.

B.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:¹³⁸

- 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.¹³⁹

B.3

Stakeholder comments

Stakeholders commented on the appropriate registration thresholds for demand response aggregators:

- **Meridian Energy** submitted that there is logic in utilising existing market thresholds, for example the maximum exempted generation (30MW) or the current limits for small generation aggregation (5MW).¹⁴⁰
- **BlueScope Steel** suggested that the threshold should be as low as 1MW to encourage a broad range of demand side response participants.¹⁴¹
- **Stanwell** suggested the registration thresholds for providing wholesale demand response should reflect the service being provided to the market. It noted AEMO could provide

¹³⁶ Ibid.

¹³⁷ AEC, *Wholesale demand response register mechanism - rule change request*, p. 1

¹³⁸ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, pp. 4-5.

¹³⁹ Ibid, p. 5.

¹⁴⁰ Meridian Energy, submission to consultation paper, p. 8.

¹⁴¹ BlueScope Steel, submission to consultation paper, p. 7.

exemptions or variations on a case-by-case basis where there is a clear operational need or benefit.¹⁴²

Other stakeholder comments included:

- **Tesla** asked whether performance standards would apply at an individual asset level and if so, what the metering requirements would be.¹⁴³
- **EnergyAustralia** suggested that many of the options proposed by the proponents are complex and costly when applied to mass market customers and may be better suited for large customers.¹⁴⁴

In its submission, **AEMO** noted:¹⁴⁵

- A guideline would be needed to detail the information that a demand response provider must submit to AEMO to associate a customer site with its aggregated facility. Such a framework could, for example, allow a single customer to be associated with one aggregated facility for the provision of wholesale demand response and a separate aggregated facility (with a different grouping of customers) for the provision of FCAS.
- The detailed design should consider whether any geographical limitations should be placed on the loads within an aggregated facility, to ensure that the transparency and scheduling is consistent with the management of security constraints in the central dispatch process.
- For wholesale demand response to be an alternative to other sources of supply, it will need to meet equivalent technical requirements where applicable (including its visibility and controllability) to promote a level playing field.

In its submission, **PIAC** considered that:¹⁴⁶

- consumers of all sizes, including small customers should be able to participate in wholesale demand response in the way they choose to do so.
- while some stakeholders are concerned about the consumer protections implications of allowing small consumers to participate, with careful consideration of these issues and amendments to the NERR as well as NER can be addressed.
- it may, however, be desirable to place a minimum threshold on directly bidding into the wholesale market.

B.4 Commission's analysis and conclusions

¹⁴² Stanwell, submission to consultation paper, p. 7.

¹⁴³ Tesla, submission to consultation paper, p. 4.

¹⁴⁴ EnergyAustralia, submission to consultation paper, p. 20.

¹⁴⁵ AEMO, submission to consultation paper, pp. 7, 11.

¹⁴⁶ PIAC, submission to consultation paper, p. 17.

BOX 3: DRAFT RULE - REGISTRATION AS A DRSP AND CLASSIFICATION OF LOADS AS DEMAND RESPONSE LOADS

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 draft rule.

The draft 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.

Benefits of the draft rule

The registration process under the draft rule would allow 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.

The draft rule introduces a demand response load classification step following registration. This would allow AEMO to assess the technical suitability of each load in an aggregated portfolio of resources seeking to provide wholesale demand response.

B.4.1

Interaction with other registration categories

Under the draft rule, the DRSP participant category would be combined with the MASP participant category into a single category.¹⁴⁷ Following registration, a DRSP would be able to classify loads as:¹⁴⁸

- demand response loads for the purposes of providing wholesale demand response, and/or
- ancillary service loads for the purposes of providing market ancillary services.

The draft 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 process, 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 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*

¹⁴⁷ The transitional arrangements under the draft rule would transfer the registration of existing MASPs to this new participant category. These existing MASPs would not need to re-register. See clause 11.118.8 of the draft rule.

¹⁴⁸ Clause 2.3AA of the draft rule.

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 draft 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.

The distinction between these services is reflected in the ongoing obligations set out in the draft 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 changed 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.¹⁴⁹ 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 would 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 to accommodate a customer with a DRSP. The draft rule does not alter the obligations and responsibilities that currently sit with the FRMP.

B.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 would be required to be registered in order to provide wholesale demand response in the wholesale market, in accordance with the draft rule.

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

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

¹⁴⁹ 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.

To be eligible for registration as a DRSP, the draft rule requires that the person seeking registration intends to classify, within a reasonable amount of time, a load as an ancillary service load or as a wholesale demand response unit.¹⁵⁰

A DRSP would be required to subsequently classify these resources as wholesale demand response loads and/or ancillary service loads, as discussed below. Upon classification, end-users' NMIs would be tagged as being involved in the provision of the relevant service(s).

A customer transfer process would facilitate different NMIs joining and leaving the DRSP's portfolio (independent of the customer transfer process relating to a change of retailer).

While it is not expected that a DRSP would be regularly indebted to the market, under the draft 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.¹⁵¹

AEMO may exempt a person from the requirement to register as a DRSP subject to such conditions as AEMO deems appropriate where the exemption is not inconsistent with the national electricity objective. This is consistent with AEMO's existing powers for the registration of other market participant categories.

B.4.3

Classification of loads as wholesale demand response units

The draft rule allows for DRSP to classify loads as wholesale demand response units. In doing so, the DRSP must:¹⁵²

- apply to AEMO for classification
- allocate the load to a scheduled wholesale demand response unit, and
- if it wishes to aggregate more than one load as a scheduled wholesale demand response unit, apply to AEMO to aggregate units for the purposes of bidding.

Under the draft rule, a small customer would not be eligible for classification as a wholesale demand response unit.¹⁵³ As set out in chapter 4, the Commission considers that a thorough review of the changes necessary to the retail law and rules is needed before small consumers should be able to participate in the mechanism. It is more appropriate for this to be holistically assessed through the Commission's upcoming work on the appropriate consumer protections that should apply to small customers for a range of new services, including wholesale demand response.

Prior to a DRSP being allowed to use the load at a particular NMI to provide demand response, under the draft rule the DRSP must demonstrate the suitability of that load as a

¹⁵⁰ Clause 2.3AA.1 of the draft rule.

¹⁵¹ See clause 2.4.2(a) of the NER, which DRSP would be subject to as Market Participants.

¹⁵² Clause 2.3.6 of the draft rule.

¹⁵³ Clause 2.3.6(b) of the draft rule.

wholesale demand response unit through a classification process. To be eligible for classification as a wholesale demand response unit, the DRSP must:¹⁵⁴

- **Have a relationship with the customer:** the draft rule requires the DRSP to have an arrangement with the retail customer at each connection point where the load will be providing wholesale demand response.
- **Meet the requirements relating to baseline suitability:** when classifying loads as wholesale demand response units, the DRSP would need to nominate a baseline methodology that can produce an adequate baseline for the load. This is discussed in more detail in appendix E.
- **Meet technical requirements, including metering and communications:** 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. The loads must also have the appropriate communications and telemetry for the issuing of dispatch instructions.
- **Other requirements as determined by AEMO:** under the draft rule, AEMO must determine and publish a wholesale demand response guideline. Through this guideline, AEMO can determine any additional requirements considered necessary when classifying loads as wholesale demand response units.

When applying to AEMO to classify a load as a wholesale demand response unit, the DRSP is required to:¹⁵⁵

- identify the load by NMI
- demonstrate how the load will provide wholesale demand response
- nominate a baseline methodology
- provide all other information required as set out in the wholesale demand response guidelines.

The draft rule places an obligation on AEMO to develop a guideline that outlines the above technical requirements, as well as any others AEMO considered relevant for classifying load as demand response loads. The guideline would also set out the evidence or information DRSPs would need to provide to AEMO to satisfy these requirements.¹⁵⁶

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 is elaborated on in appendix G. This means that, without consent to transfer a customer between DRSPs, a DRSP would not be able to classify a load as a demand response load where that load already has an allocated DRSP.

¹⁵⁴ Clause 2.3.6(c) of the draft rule.

¹⁵⁵ Clause 2.3.6(d) of the draft rule.

¹⁵⁶ Clause 3.10.1 of the draft rule.

B.4.4

Establishment of scheduled wholesale demand response units

Following classification of loads as wholesale demand response units, a DRSP will be able to apply to AEMO to establish scheduled wholesale demand response units.¹⁵⁷ To do so, the DRSP must satisfy AEMO that the proposed scheduled wholesale demand response unit is capable of providing 5 MW of wholesale demand response. For the avoidance of doubt, a wholesale demand response unit can comprise an aggregated portfolio of load.

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.

The Commission considers that 5 MW is consistent with AEMO's position that batteries of 5 MW have the potential to impact power system security, and therefore a battery must be registered in the NEM and treated as a scheduled participant. Wholesale demand response has a similar capacity to impact power system security, and therefore the Commission considers that only wholesale demand response units over this size should be able to participate, and a consequence of doing so is that they have to be scheduled.

¹⁵⁷ Clause 2.3.7 of the draft rule.

C

C.1

INTEGRATION WITH CENTRAL DISPATCH

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 draft rule, DRSPs would participate in central dispatch in a transparent, scheduled manner. DRSPs are treated in a similar manner to scheduled generators, i.e. DRSP would submit dispatch offers and when cleared by NEMDE, receive dispatch targets to provide wholesale demand response. DRSPs would also be able to set the wholesale market price. Consequently, DRSPs would have a number of obligations and incentives consistent with the obligations imposed on scheduled generators, including:

- compliance with dispatch targets
- incurring causer-pays factors for deviating from dispatch targets.

These obligations and incentives are key to maintaining the integrity of the central dispatch and price setting process.

The principle that DRSPs should be treated in a similar manner to scheduled generators guides the Commission's approach to how DRSPs should participate in these processes. However, it is worth noting that in some instances we have modified obligations to better suit the nature of DRSPs and wholesale demand response. Despite this, there may be some practical challenges with requiring DRSPs to meet the proposed obligations. Without scheduling, the availability of demand response is less certain and this would substantially reduce the reliability benefits associated with the mechanism. Therefore, we are interested in stakeholder views on how these parties will interact with central dispatch.

For example, DRSPs are unlikely to have the same level of control over demand side resources as scheduled generators have over their generating units. As such, the Commission has sought to accommodate this by not requiring DRSPs to be scheduled in every dispatch interval. Instead, DRSPs will be required to comply with dispatch targets when they elect to participate in central dispatch.

Under the draft rule, settlement for wholesale demand response will not be linked directly to physical outcomes. This is because the quantity of wholesale demand response provided is assessed against a baseline that reflects a counterfactual level of consumption (as opposed to physical load). However, the central dispatch process is based on the physical matching of supply and demand. Therefore, under the draft DRSPs will be dispatched based on the actual, physical capability of the wholesale demand response units at the time of providing 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.

C.2

Background

C.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 crucial to rely on this capacity for reliability purposes.

C.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. 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.

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.

C.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.¹⁵⁸ If AEMO is satisfied that the market customer has submitted the right data and has adequate telemetry/communications equipment to support the issuing of dispatch instructions and audit of responses, AEMO must classify the market load as a scheduled load.¹⁵⁹

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,¹⁶⁰ 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.

C.3

Proponents' views

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

¹⁵⁸ Clause 2.3.4(d) of the NER.

¹⁵⁹ Clause 2.3.4(e) of the NER.

¹⁶⁰ These must register both as scheduled generators and scheduled loads under AEMO's interim guidance for storage facilities.

C.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.¹⁶¹

The proponents noted:¹⁶²

- 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.

C.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:¹⁶³

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.

C.3.3

South Australian Government

In its proposal, the South Australian Government noted:¹⁶⁴

- 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.

¹⁶¹ PIAC, TEC and TAI, *Wholesale demand response mechanism - rule change request*, pp. 9, 14.

¹⁶² Ibid, p. 15.

¹⁶³ AEC, *Wholesale demand response register mechanism - rule change request*, p. 3.

¹⁶⁴ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 3.

- 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.

C.4 Stakeholder comments

A number of stakeholders comments on the role for demand response in central dispatch.

Some stakeholders suggested that demand response should be encouraged to participate transparently in the market:

- **ERM Power** considered scheduling to be an important part of any demand response mechanism. It noted that consumers as a whole will see greater benefits if demand response is able to contribute to the price-setting process rather than simply responding to price spikes that have already occurred.¹⁶⁵
- **Stanwell** submitted that increasing the amount of demand response that is scheduled and in-market should be a primary consideration.¹⁶⁶
- **Alinta** noted that having demand response scheduled into the market improves the accuracy of AEMO's and participants forecasts in a manner which is transparent, subsequently creating significant operational efficiencies as participants can plan their operational running profiles and strategies according to the most accurate demand-supply window available. Alinta also noted that given a number of aggregators and large loads already closely monitor the market, these loads could participate in scheduling at relatively low cost.¹⁶⁷
- **AEMO** noted that the effective integration of wholesale demand response can improve the visibility and predictability of demand response and expand the options for it to be scheduled in response to central price signals that relate to physical system requirements. These measures can enhance the overall efficiency of the market and support the reliability and security of the power system.¹⁶⁸

However, stakeholders noted the challenges for demand side participants in meeting the obligations that come with being scheduled:

- **ERM Power** suggested that a strict compliance regime may place too great a burden on some demand response and in fact create a barrier to participation.¹⁶⁹
- **Flow Power** submitted that for demand side participants, unlike generators, operation does not solely depend on the spot price, processes and downstream customer demands are extremely important factors. As a result, scheduling and providing long term information on levels of load is likely to be extremely difficult. Flow Power also noted that providing metering capable of providing SCADA to AEMO is not a realistic proposal for

¹⁶⁵ ERM Power, submission to consultation paper, p. 5.

¹⁶⁶ Stanwell, submission to consultation paper, p. 6.

¹⁶⁷ Alinta, submission to consultation paper, p. 4.

¹⁶⁸ AEMO, submission to consultation paper, p. 4.

¹⁶⁹ ERM Power, submission to consultation paper, p. 5.

aggregated DR portfolios consisting of a large number of smaller customers, and that applying causer pays to specific loads could unfairly punish variable loads.¹⁷⁰

- **EnergyAustralia** considered there to be less costly alternatives to scheduling for the purpose of capturing and providing information regarding the operation of demand response providers to the market. EnergyAustralia noted that the intent of the rule change proposals is to reduce barriers to entry; however, scheduling requirements could have the opposite effect due to the additional obligations this places on participants.¹⁷¹
- **BlueScope** submitted that while participants will be able to accurately predict the shed-able load, variability in overall load can be significant and very difficult to forecast particularly for large complex processes. Given this variability, it may be more appropriate to treat demand response as semi-scheduled rather than scheduled.¹⁷²
- **Energy Queensland** noted that as it is very difficult to determine how much load is available for demand response, it will also be difficult to participate as a scheduled load.¹⁷³

Some additional points made by stakeholders included:

- **ERM Power** noted that if demand response is scheduled and it doesn't comply with its scheduling obligations, this would transfer risks to the rest of the market.¹⁷⁴
- **EnergyAustralia** set out an alternative approach managing demand response in aggregate, which it considered likely to be more cost effective than require individual participants to participate in centralised scheduling. It suggested:¹⁷⁵
 - AEMO currently receives DSP data that identifies loads that are price responsive. This information could be used to segregate load into elastic price responsive, and inelastic non-price responsive segments, with each forecast separately. This would enable AEMO to produce demand forecasts that capture an expectation of load response to price.
 - To address concerns that AEMO does not have visibility of DR when making decisions during tight demand-supply conditions, retailers could be required to provide information about non-scheduled demand response when an LOR3 is predicted.
- **Tesla** noted that the measurement of output forming the bid will also impact on causer pays liability. The ability of a market participant to absorb this risk will depend on a number of factors, including portfolio size and how the causer pays factor is applied.¹⁷⁶
- **AEMO's** submission noted:¹⁷⁷
 - Transparency in the dispatch process requires an agreed level of operational visibility. AEMO obtains operational visibility of scheduled generators at a four second

¹⁷⁰ Flow Power, submission to consultation paper, pp. 3-4.

¹⁷¹ EnergyAustralia, submission to consultation paper, p. 17.

¹⁷² BlueScope Steel, submission to consultation paper, p. 5.

¹⁷³ Energy Queensland, submission to consultation paper, p. 14.

¹⁷⁴ ERM Power, submission to consultation paper, p. 5.

¹⁷⁵ EnergyAustralia, submission to consultation paper, p. 19.

¹⁷⁶ Tesla, submission to consultation paper, p. 5.

¹⁷⁷ AEMO, submission to consultation paper, p. 9.

resolution through the SCADA system. It is anticipated that many resources that could participate in DRSP portfolios in future may not be connected to SCADA and other means of obtaining operational visibility should be explored.

- AEMO is investigating this through its VPP Demonstrations. AEMO has proposed a framework for the Demonstrations in which participating VPPs submit operational data for their aggregated fleets on a five-minute resolution, refreshing every five minutes.

In its submission, **PIAC** sought consistency between the provisions for generation and demand response in the wholesale market with respect to scheduling. It also noted the specific importance of obligations to notify the market of intended wholesale demand response. PIAC's submission made a number of points in relation to scheduling of wholesale demand response:¹⁷⁸

- To avoid the risk of gaming, DRSPs should be required to provide AEMO with notification of a demand response event no later than the start of the event.
- DRSPs with capacity up to 5MW of wholesale demand response should effectively be non-scheduled and participate at will, similarly to generators of the same size.
- DRSPs with wholesale demand response capacity from 5 to 29MW should effectively be non-scheduled, similarly to generators of the same size. It may be appropriate to place some obligations for further advance notice, for example with respect to timing, volume and duration, for portfolios bigger than 5MW; however, these obligations should not be more onerous than those that apply for semi-scheduled generators.
- DRSPs with capacity above 30MW should be required to bid and be centrally dispatched, similarly to generators of the same size.
- Unlike generators, the available capacity of DRSPs would be expected to grow and contract, and may move between these different size bands. To avoid placing excessive demands on a given DRSP, there should be some flexibility placed on size thresholds.

Enel X highlighted a number of points in relation to the scheduling of wholesale demand response:¹⁷⁹

- It sought clarification that, under the proposals, demand response could be offered and scheduled on a portfolio, not individual load, level.
- A requirement to only be scheduled for those intervals where the DRSP intends to offer demand response would reduce the operational complexity of having to bid into every dispatch interval.
- For the purposes of scheduling, there should be recognition that the cost/benefit trade-off for communications protocols are very different for large aggregations of small loads than it is for traditional centralised generators.
- Alternatives to requiring demand response to follow a linear dispatch trajectory should be considered.

¹⁷⁸ PIAC, supplementary submission to consultation paper, p. 9.

¹⁷⁹ Enel X, submission to consultation paper, pp. 12-15.

- Enel X does not consider it necessary or appropriate to require DRSPs to provide four second data. Such a requirement is likely to be incredibly costly and outweigh any potential benefits of participation in a demand response mechanism. If DRSPs are to be liable for regulation FCAS costs, an alternative means to calculating contribution factors may be required.
- Not all loads are likely to be able to follow a linear dispatch trajectory (unless coupled with storage capability). Requiring loads to follow a linear dispatch trajectory like generators, and exposing them to regulation FCAS costs in relation to a deviation from that trajectory, would likely diminish the potential benefits of the mechanism and thus reduce participation.

C.5 Commission's analysis and conclusions

BOX 4: DRAFT RULE

The draft rule sets out:

- a process for DRSPs to participate in central dispatch - wholesale demand response units will be scheduled in the wholesale market
- the obligations that apply to DRSPs as scheduled participants, including obligations to comply with dispatch targets and the application of causer pays FCAS cost recovery
- a process through which the DRSP would be scheduled only in elected periods
- how DRSPs would participate in the pre-dispatch process
- changes to the NER necessary to accommodate the integration of DRSPs into pre-dispatch and dispatch.

Under the draft rule, settlement for wholesale demand response will not be linked directly to physical outcomes. This is because the quantity of wholesale demand response provided is assessed against a baseline that reflects a counterfactual level of consumption (as opposed to physical load). However, the central dispatch process is based on the physical matching of supply and demand. Therefore, under the draft rule DRSPs will be dispatched based on the actual, physical capability of the wholesale demand response units at the time of providing wholesale demand response. Settlement for wholesale demand response (as set out in appendix F) will be based on a subsequent assessment of how much wholesale demand response was provided, with reference to the baseline.

Benefits of the draft rule

The draft rule will facilitate the transparent participation of DRSPs in the wholesale market. In the short term, this will allow DRSPs to be dispatched ahead of more expensive peaking generation and lower the wholesale electricity price. 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.

This section is structured as follows:

- Benefits of transparency in the wholesale market
- DRSP participation in central dispatch
- AEMO's operation of 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.

C.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 time frames 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. 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 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 draft rule sets out a process by which DRSPs can participate in the wholesale market as scheduled participants.

C.5.2

DRSP participation in dispatch

This section sets out in detail how DRSPs will participate in central dispatch under the draft rule.

Overview

Under the draft rule, the Commission has sought consistency of treatment between scheduled wholesale demand response units and scheduled generating units in central dispatch. The Commission considers the value of wholesale demand response facilitated through the mechanism is greater if it occurs transparently. By responding transparently, it will improve the functioning of the wholesale market and contribute to power system reliability.

While in principle the draft decision treats DRSPs similarly to scheduled generators, it is worth noting that in some instances these obligations have been modified to better account for the technical characteristics of DRSPs and wholesale demand response. As such, the draft rule seeks to accommodate the practical challenges with requiring DRSPs to meet these obligations while still achieving the reliability benefits associated with the mechanism. We are interested in stakeholder views on how these parties will interact with central dispatch and the appropriate balance of obligations.

Stakeholders have suggested the concept of wholesale demand response being 'soft-scheduled' i.e. where the full suite of obligations would not apply to the scheduling of wholesale demand response. The Commission has incorporated this concept in the draft rule, which provides for DRSPs managing the obligations that come with scheduling by allowing them to opt in to participate in central dispatch in specific intervals, as opposed to all the time.

The Commission also noted that AEMO will not necessarily have a SCADA link to each wholesale demand response unit. The information provided by AEMO by participants through SCADA is integral to the functioning of dispatch and to demand forecasting. As such, the DRSP will need to provide the same information to AEMO. The draft rule does not specify that this information must be conveyed through a SCADA link. Instead, AEMO will have the flexibility to specify a process through which it would be able to receive information from DRSPs.¹⁸⁰

The draft rule will allow for regulation FCAS costs to be recovered from DRSPs.¹⁸¹ The NER currently sets out a process, known as causer pays, by which AEMO recovers the cost of regulation FCAS services from market participants on the basis of their contribution factors calculated over a period of a month. These factors reflect the degree to which the generators' actual output differs from the targets assigned by the NEMDE. This provides scheduled participants with an incentive to ramp linearly to meet their dispatch targets, which has the benefit of reducing the impact on power system frequency.

¹⁸⁰ 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>

¹⁸¹ See sub clause 3.15.6A(i) of the draft rule.

Under the draft rule, DRSPs would have a contribution factor determined in the dispatch intervals in which they are instructed to provide wholesale demand response. However, the Commission notes that the current determination of contribution factors for scheduled participants relies on four second data conveyed via SCADA systems. The draft rule does not specify the granularity with which DRSPs must provide data to AEMO. Consequently, the current method for determining contribution factors may not be applicable to DRSPs. If this is the case, AEMO may need to update its causer pays procedures to set out how contribution factors for DRSPs could be determined.¹⁸²

DRSP wholesale demand response offers

Under the draft rule, DRSPs will be able to elect when they participate in central dispatch. When participating, DRSPs will face the same obligations as scheduled generators. When a DRSP is not participating, it will not receive a dispatch target and will not be subject to causer-pays. Even when not participating in dispatch, a DRSP will still need to participate in pre-dispatch. DRSP participation in pre-dispatch is detailed more in appendix c.5.4.

For central dispatch, DRSPs will make dispatch offers for wholesale demand response provided by scheduled 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:¹⁸³

- the quantity of demand response being offered relative to the physical operating level of the wholesale demand response unit.¹⁸⁴ As the DRSP will be treated as a supplier in the market, a demand reduction would be represented as a positive quantity. For example, if an aggregation of loads in a wholesale demand response unit were consuming at 100MW and were capable of reducing to 80MW, the DRSP would offer in 20MW.
- a price at which the DRSP would offer this reduction
- ramp up and ramp down rates
- whether the DRSP is participating in dispatch for the relevant dispatch interval.

When providing offers to AEMO, a DRSP will also need to provide additional information that will assist AEMO in maintaining the supply-demand balance when the DRSP ceases to participate in central dispatch:¹⁸⁵

- The aggregate consumption of the scheduled wholesale demand response unit at the end of the previous dispatch interval.

¹⁸² AEMO's causer pays procedure is available here: <https://www.aemo.com.au/Stakeholder-Consultation/Consultations/Causer-Pays-Procedure-Consultation>

¹⁸³ See clause 3.8.7B of the draft rule.

¹⁸⁴ See sub clause 3.8.2A(d) of the draft rule.

¹⁸⁵ See sub clause 3.8.7B(c) of the draft rule.

- An expected consumption profile for the scheduled wholesale demand response unit for the 30 minutes after that dispatch interval, if the DRSP ceased to participate in central dispatch.

This information will assist AEMO in adjusting dispatch targets following the withdrawal of a DRSP from central dispatch, presumably after offering wholesale demand response. If a load has provided wholesale demand response by reducing consumption and the DRSP withdraws from dispatch, AEMO needs to know whether the wholesale demand response should be substituted by generation. However, this would only be necessary in the event that the load was intending to return to its previous consumption level in the short term.

DRSP is not participating

When a DRSP has elected to not participate in central dispatch, it will not be required to make dispatch offers.

The draft rule accommodates the expectation that DRSPs will not have direct control over these loads at all times and, as such, will only be obliged to act as a scheduled participant during the periods where demand response is provided. When it is not dispatched the DRSP will be a passive participant and the respective retailers for the loads will be exposed to any variability in the consumption at those connection points (compared to their baselines).

The DRSP will still need to participate in pre-dispatch in these intervals, by providing AEMO with the relevant information.

DRSP is participating, but not cleared or not available

If a DRSP has elected to participate in dispatch by submitting a dispatch offer, the DRSP will receive dispatch instructions from AEMO.

In the case where either a DRSP's dispatch offer is not cleared in the market, or the DRSP makes no wholesale demand response available, the DRSP will receive a dispatch target of zero MW. That is, the DRSP would not be cleared to provide wholesale demand response.

When the DRSP is instructed to provide 0MW of wholesale demand response, it will be obligated to comply with its dispatch target. That is, the loads comprising the wholesale demand response unit would be expected to remain at the same level of consumption.

The Commission considers that in the periods where the DRSP is dispatched, the associated scheduling obligations should apply even where the DRSP is providing zero MW of wholesale demand response. That is, in the intervals where a DRSP has made itself available for dispatch and was cleared to provide zero MW of wholesale demand response, it will be expected to comply with that dispatch target.

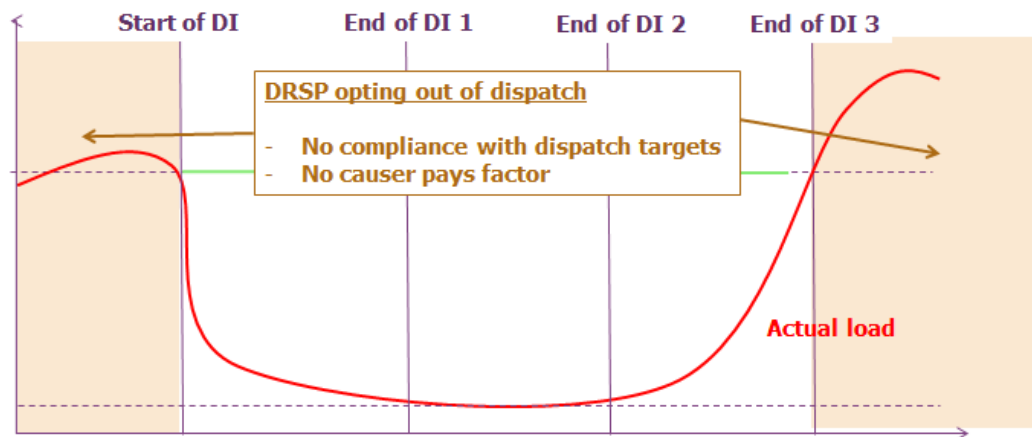
However, due to the specific nature of wholesale demand response loads, the Commission considers it would be excessively onerous for DRSPs to be directly exposed to variations in load in the periods where the DRSP is not providing wholesale demand response. Therefore, the draft rule will not apply a causer pays factor to a DRSP in the periods where it has been cleared to provide zero MW of wholesale demand response, and is not providing wholesale demand response at that point. If a DRSP is cleared to provide zero MW of wholesale

demand response at a point where it *is* providing wholesale demand response, causer pays would apply.

Figure C.1 below shows:

- outside the three dispatch intervals, the DRSP has opted not to participate in central dispatch
- in those intervals where the DRSP is not participating in central dispatch, it will not receive a dispatch target and would not incur a causer pays contribution factor.

Figure C.1: Reduced obligations when DRSP is opting out of dispatch



Source: AEMC

DRSP instructed to provide wholesale demand response

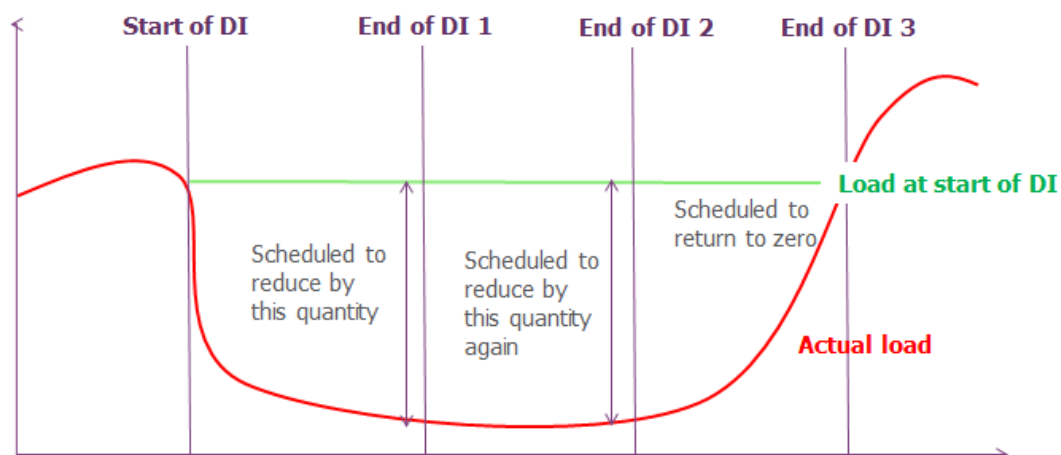
When a DRSP makes a dispatch offer that is cleared by AEMO, it will receive a dispatch instruction to provide a quantity of wholesale demand response. The amount of wholesale demand response provided will be relative to the level of consumption of the scheduled wholesale demand response unit at the start of the first contiguous dispatch interval for which it is cleared to participate, as shown in Figure C.2 below (start of DI 1). The dispatch target will account for any ramp rate limitations on the scheduled wholesale demand response unit.¹⁸⁶

The DRSP will be obligated to comply with this dispatch target. It will also be liable to incur a contribution factor for causer pays in these intervals.

In subsequent dispatch intervals where the DRSP continues to provide wholesale demand response, the quantity of wholesale demand response will be relative to the level of consumption when the DRSP was first dispatched. This is demonstrated in the figures below (DI 2).

¹⁸⁶ See sub clause 3.8.2A(d) of the draft rule.

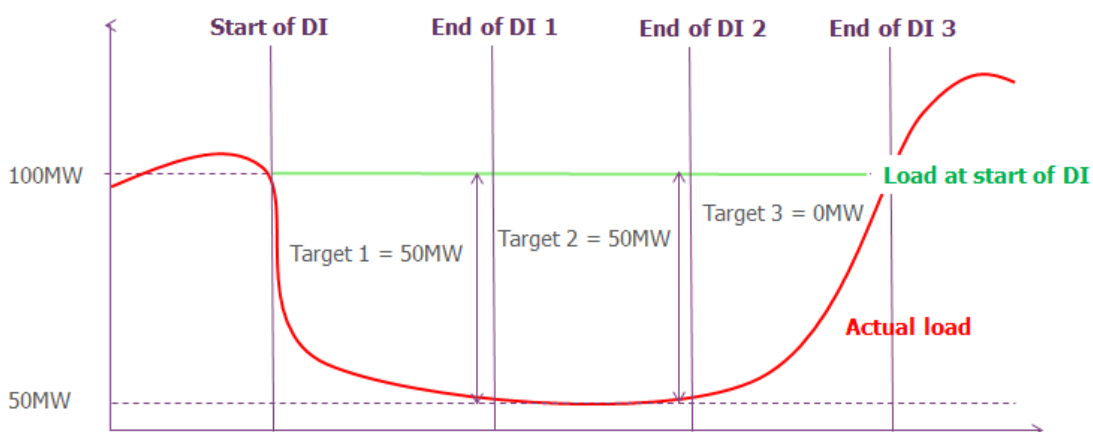
Figure C.2: Scheduling wholesale demand response



Source: AEMC

By adding numbers to the figure above, Figure C.3 below demonstrates that the dispatch targets for the scheduled wholesale demand response unit remain relative to the level of consumption at the start of the first dispatch interval.

Figure C.3: Scheduling wholesale demand response with numbers



Source: AEMC

DRSP instructed to no longer provide wholesale demand response

If a DRSP is instructed to no longer provide wholesale demand response, it will receive an instruction to return to zero MW. The DRSP will be subject to all scheduling obligations (including incurring a causer pays factor) until it has returned to a zero MW level.

Alternatively, the DRSP may elect to no longer participate in central dispatch. Prior to doing so, the DRSP must have submitted to AEMO the expected consumption profile of the scheduled wholesale demand response unit for the next 30 minutes. With this information, AEMO will be able to adjust dispatch outcomes following the withdrawal of the DRSP to account for either:¹⁸⁷

- the load comprising the scheduled wholesale demand response unit increasing its consumption. This would require AEMO to schedule supply capacity.
- the load comprising the scheduled wholesale demand response unit not changing its consumption. This would not require AEMO to schedule additional supply capacity.

Causer pays

The contribution factors for DRSPs will be determined in respect of scheduled wholesale demand response units.

The draft rule will allow for regulation FCAS costs to be recovered from DRSPs.¹⁸⁸ DRSPs would have a contribution factor determined in the dispatch intervals in which they are instructed to provide wholesale demand response. The contribution would reflect how the scheduled wholesale demand response units met dispatch targets, and whether this had an adverse impact on power system frequency.

Recovering FCAS costs from DRSPs through the causer pays mechanism will provide DRSPs with an incentive to ramp linearly between dispatch targets. DRSPs will be able to manage this risk by managing the provision of wholesale demand response, which will in turn reduce the impacts on power system frequency.

DRSPs would also be required to pay a portion of the contingency raise FCAS costs alongside generators.¹⁸⁹

C.5.3

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 limitation of the power system.

Under the draft rule, AEMO will be required to operate dispatch accounting for the participation of DRSPs. DRSPs will compete with generators in the wholesale market. Scheduled wholesale demand response units will be treated equivalently to scheduled generating units by NEMDE.

The process set up under the draft rule seeks to minimise impacts on the existing central dispatch process by maintaining consistency between the requirements placed on scheduled generating units and scheduled wholesale demand response units. The most notable difference is the flexibility afforded to DRSPs regarding participation in dispatch. The ability

¹⁸⁷ See sub clause 3.8.7B(c) of the draft rule.

¹⁸⁸ See clause 3.15.6A of the draft rule.

¹⁸⁹ Ibid.

for DRSPs to nominate the time periods where it will participate in central dispatch has implications for how AEMO maintains the supply-demand balance.

C.5.4 DRSP participation in pre-dispatch

At all times, DRSPs will need to submit dispatch offers for all the relevant dispatch intervals for the purposes of pre-dispatch. They will need to indicate, for these dispatch intervals:

- the quantity of demand response being offered relative to the physical operating level of the wholesale demand response unit
- a price at which the DRSP would offer this reduction
- ramp up and ramp down rates
- whether the DRSP is intending to participate in dispatch for the relevant dispatch interval.

This information will inform AEMO's pre-dispatch forecasts.

C.5.5 AEMO's operation of pre-dispatch

AEMO's operation of pre-dispatch should be adjusted to account for the additional capacity provided by scheduled wholesale demand response units over the pre-dispatch time frames.

The load forecasts shown in pre-dispatch should not be adjusted to account for any wholesale demand response provided by DRSPs. This would result in wholesale demand response being accounted for twice - once as additional capacity, and once as a reduction in demand.

C.5.6 Separation of dispatch and settlement

Under the draft rule, settlement for wholesale demand response will not be linked directly to physical outcomes. This is because the quantity of demand response provided is assessed against a baseline that reflects a counterfactual level of consumption (as opposed to physical load).

As a result, DRSPs will be dispatched based on the physical capability of the wholesale demand response units at the time of providing wholesale demand response. Settlement for wholesale demand response will be facilitated through a subsequent assessment of how much wholesale demand response was provided, with reference to the baseline.

The DRSP will be dispatched and settled on different quantities. This imposes additional complexity on the DRSP in formulating its dispatch offers as the DRSP will need to account for the settlement implications separately to dispatch.

However, the Commission considers the additional complexity imposed on the DRSP is unavoidable. The alternative would require scheduling DRSPs to provide wholesale demand response relative to their baselines. The Commission considers this infeasible because it will result in the total amount of supply being scheduled by the market varying depending on the baseline methodologies in use at the time.

Alternatively, DRSPs could be settled on the wholesale demand response they provide through dispatch. However, in practice, this would mean the DRSP would have the ability to

influence the baseline in the period directly prior to dispatch. Consumers would be incentivised to turn loads on and then immediately turn them off. By using baselines for settlement, the draft rule seeks to mitigate these short term incentives to influence the amount of wholesale demand response provided.

To assist the DRSP in managing this complexity, it will have access to the baseline methodology for each of its wholesale demand response units. This will provide the DRSP with the information necessary to adjust dispatch offers with regard to expected settlement outcomes.

C.5.7

Clause 4.8.9 directions for DRSPs

Under the draft rule, DRSPs would not be able to be directed under clause 4.8.9 of the NER. The Commission considers that the provisions relating to directions would not provide a DRSP with reasonable grounds to not respond to a direction. For example, if the DRSP had no 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 draft 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 existing arrangements.

The Commission is interested in stakeholder views on whether DRSPs should be subject to direction under clause 4.8.9 and, if so, the appropriate grounds on which a DRSP could notify AEMO of its inability to comply with a direction.

D INFORMATION PROVISION

D.1 Overview

This appendix considers the requirements regarding the information demand response service providers (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:

- current information provision requirements under the NER
- stakeholders' views on information provision requirements for DRSPs
- the Commission's draft analysis and conclusions.

D.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 short-term 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.¹⁹⁰ 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. The role of the DSP Portal in increasing the transparency of non-mechanism demand response in the NEM is discussed further in appendix H.

D.3 Stakeholder comments

A number of stakeholders commented in submissions to the consultation paper on the provision of information to AEMO by DRSPs participating in a wholesale demand response mechanism. Relevant comments included:

¹⁹⁰ The AEMC has received a rule change request from ERM Power seeking to amend the NER to extend the MT PASA forecast period from two years to three years. The rule change request is currently pending and is available at <https://www.aemc.gov.au/rule-changes/extension-mt-pasa-duration>.

- **Stanwell** considered that the benefits of increased transparency from the demand side requires appropriate obligations to be imposed on DRSPs, including in relation to the provision of forecast information.¹⁹¹
- **Flow Power** noted that, unlike a generator, the operation of a demand responsive load does not depend solely on the spot price, particularly for large customers. Business processes and downstream customer demands are extremely important factors. As a result, Flow Power considers that providing long term information on levels of load is likely to be extremely difficult.¹⁹²
- **EnergyAustralia** noted that AEMO currently receives data identifying price responsive loads through the Demand Side Participation Information Portal. EnergyAustralia suggested that this information could be used to segregate load into elastic price responsive, and inelastic non-price responsive segments, with each forecast separately. This would enable AEMO to produce demand forecasts that capture an expectation of load response to price. In EnergyAustralia's view, this approach to managing demand response in aggregate is likely to be more cost effective than requiring individual participants to participate in centralised scheduling.¹⁹³
- **Enel X** stated that DRSPs should be able to provide information on how much demand response they expect to be able to provide across their portfolio. Enel X noted that it currently does this for its FCAS portfolio and that, while complex, particularly for some customer types, it is reasonable to expect DRSPs to do this ahead of time.¹⁹⁴
- **Meridian Energy** noted that there will be a need for some DRSPs to participate in the relevant information provision processes (e.g. pre-dispatch, MT PASA, ST PASA etc.), although it is likely that the majority of demand response will be incorporated in these processes via AEMO's forecasts of expected demand response outcomes.¹⁹⁵
- **Ready Energy** noted that residential and business metering products and systems exist that would enable a DRSP to provide accurate real time and forecast data to AEMO's pre-dispatch and PASA processes.¹⁹⁶
- **BlueScope Steel** noted that information could be provided to AEMO on the quantity of demand response available via pre-dispatch and, at a less accurate level, the short-term PASA. However, BlueScope considers that forecasting available demand response beyond these time frames would be almost impossible and would provide little benefit due to the high potential for inaccuracy.¹⁹⁷

D.4 Commission's analysis and conclusions

¹⁹¹ Stanwell, submission to consultation paper, p. 8.

¹⁹² Flow Power, submission to consultation paper, p. 3.

¹⁹³ EnergyAustralia, submission to consultation paper, p. 19.

¹⁹⁴ Enel X, submission to consultation paper, p. 13.

¹⁹⁵ Meridian Energy, submission to consultation paper, p. 5.

¹⁹⁶ Ready Energy, submission to consultation paper, p. 16.

¹⁹⁷ BlueScope Steel, submission to consultation paper, p. 5.

BOX 5: DRAFT RULE

The draft rule:

- requires DRSPs to provide information relating to the availability of wholesale demand response over various time frames to AEMO for the purposes of the ESOO, MT PASA and ST PASA, in accordance with the existing requirements imposed on market participants.
- 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.

Benefits of the draft rule

Requiring DRSPs to provide the relevant information to AEMO would 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 generators should also apply to DRSPs to the extent possible. This 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.¹⁹⁸ The more transparency possible, the more benefits are provided through the mechanism.

However, 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 D.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.

¹⁹⁸ NER clause 3.1.4(a).

Table D.1: AEMO's information processes under existing framework

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
Forecast time frame	Ten years NER clause 3.13.3(q)	Two years NER clause 3.7C(b)(1)	Two years NER clause 3.7.2(a)	Six days NER clause 3.7.3(b)	One day Clauses 3.13.4(e), 3.8.20(a) Note: AEMO also publishes a five-minute pre-dispatch
Frequency of publication	Annually (by 31 August) NER clause 3.13.3(q)	At least annually NER clauses 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 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 3.13.3(q)(5)	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 clause 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 two years in advanced. 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>information to AEMO as soon as practicable after participant becomes aware of any information required for publication by AEMO.</p> <p>NER clause 3.13.3(t)</p>	<p>constraints associated with that GELF.</p> <p>NER clause 3.7C(i)</p>	<p>timetable published by AEMO.</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 & capability based on latest plant and weather conditions.</p>	<p>genuine intention to honour; or</p> <p>2) does not have a reasonable basis to make, the offer.</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 D.2 sets out how the existing information provision requirements imposed on market participants would apply to DRSPs under the draft determination. To the extent practicable, the Commission considers that the existing requirements imposed on generators should be extended to DRSPs (with appropriate amendments). This is reflected in the draft rule.

Table D.2: Application of existing information processes to DRSPs under draft determination

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
Requirements applying to DRSPs under draft rule	<p>DRSPs are subject to the same information provision requirement as existing 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>The existing requirement on scheduled generators to submit GELF declarations to AEMO does not apply to DRSPs under the draft 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 it does not face the same fuel input constraints as</p>	<p>DRSPs are subject to the same information provision requirement as existing generators.</p> <p>DRSPs should be capable of providing this information to AEMO. While it may be difficult to forecast the availability of a load or groups of load to provide demand response over a two-year time frame (depending on the load in question), the NER does not prescribe that this information must meet particular standards of accuracy. Ultimately, it is up to AEMO to determine how it factors such information into MT</p>	<p>DRSPs are subject to the same information provision requirement as existing generators.</p> <p>It is expected that DRSPs will be able to forecast their demand response availability over the relevant time frame with a reasonable degree of accuracy.</p>	Refer to appendix C for details on scheduling requirements.

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
		traditional generators.	<p>PASA, including the weight that it ascribes to the information provided by any particular participant.</p> <p>The Commission's final report for the <i>Reliability Frameworks Review</i> recommended that the AER submit a rule change request for the AER to consult on and prepare a guideline on how they will report on the differences between forecast and actual values in the MT PASA, ST PASA and pre-dispatch forecast processes, and produce a quarterly, public report in accordance with the guideline. This process would expose the extent to which DRSPs' forecasts are</p>		

VARIABLES	ESOO	EAAP	MT PASA	ST PASA	PRE-DISPATCH
			accurate and reliable for the purposes of MT PASA and may inform future changes to this process.		
Do the information provision requirements applying to generators differ for DRSPs under the draft rule?	No – the requirements applying to DRSPs will be the same in principle as those currently imposed on generators. ²	Yes – the requirements currently imposed on generators do not apply to DRSPs under the draft rule.	No – the requirements applying to DRSPs will be the same in principle as those currently imposed on generators. ³ However AEMO's MT PASA Process Description will require amendment to clarify the specific processes which will apply to DRSPs. Relevant terms such as "PASA availability" have been amended to accommodate demand response. ⁴	No – the requirements applying to DRSPs will be the same in principle as those currently imposed on generators. ⁵ However AEMO's ST PASA Process Description will require amendment to clarify the specific processes which will apply to DRSPs. Equivalents to relevant terms such as "energy constrained scheduled generating unit" have been developed for demand response. ⁶	Refer to appendix C for details on scheduling requirements.

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. Clause 3.13.3A of the draft rule.

3. Clause 3.7.2 of the draft rule.
4. Chapter 10 of the draft rule - see amended definition of "PASA availability".
5. Clause 3.7.3 of the draft rule.
6. Chapter 10 of the draft rule - see new definitions of "scheduled wholesale demand response unit" and "wholesale demand response constraint".

E DETERMINATION OF BASELINES

E.1 Overview

The draft 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 counterfactual 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 draft rule:

- requires AEMO to, in consultation with stakeholders, develop a baseline methodology guideline. This guideline would set out:
 - the thresholds for an acceptable baseline methodology
 - the process for showing that these thresholds are met when classifying load as demand response load
 - the process for regular testing of DRSP baselines
 - the process for market participants to submit alternative baselines methodologies to AEMO and, where these are found by AEMO to be an improvement versus the incumbent methodology employed by AEMO, having them replace that methodology.
- 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 baseline methodology in order to classify load as demand response load. DRSPs would also need 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.

This appendix provides more detail on the role for baselines in the demand response mechanism. It sets out:

- an overview of baselines in the draft 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.

E.2 Background

This section provides more information on why the draft rule sets up a framework for centrally determining baselines.

E.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 where the baseline will be used.

For wholesale demand response, there are 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 E.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 draft 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 methodology for the baseline agreed between two participants.	There would be no central approach to determining or settling baselines. This is how wholesale demand response currently occurs.

E.2.2 Why are baselines needed under the mechanism?

Demand response is the difference between actual consumption and an estimated counterfactual consumption. The estimated counterfactual consumption is the baseline which is used to work out how much demand response has been provided, for the purpose of settlement.

Under the centralised wholesale demand response mechanisms proposed by the proponents, a baseline is used to work out how much demand response a DRSP has provided. This then allows for the DRSP to be credited in market settlements for the wholesale demand response sold.

E.2.3 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 the characteristics of baselines are discussed in more detail.

Accuracy

The accuracy of a baseline refers to how well it is able to predict the counterfactual 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 counterfactual, 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 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,¹⁹⁹ over time, 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

¹⁹⁹ That is, the average amount that the baseline methodology over or under-estimates the demand response quantity

medium-term if the average error in the baseline is zero. This effect is demonstrated when using baselines for aggregated portfolios.

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 does have 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 one of the parties (i.e. the retailer or the DRSP depending on the direction of 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 overcharged 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 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, or 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 being influenced. 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 baseline methodologies and good 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 draft seeks to address these risks through the measures set out in appendix e.5.

E.3

E.3.1

Proponent's 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 DR trials (which are discussed in chapter 2).²⁰⁰

E.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.²⁰¹

E.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:²⁰²

- be flexible and capable of being changed over time
- be 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.

²⁰⁰ PIAC, TEC, and TAI, *Wholesale demand response mechanism - rule change request*, p. 15.

²⁰¹ AEC, *Wholesale demand response register mechanism - rule change request*, pp. 3-4.

²⁰² South Australian Government, *Mechanisms for wholesale demand response - rule change request*, pp. 6-7.

E.4 Stakeholder comments

Stakeholder submissions to the consultation paper provided substantial comment on the role for baselines in wholesale demand response. This section breaks these stakeholder comments up by a number of sub-headings.

General

A range of stakeholder raised concerns about the proposed use of baselines in the NEM:²⁰³

- **Meridian Energy** highlighted that in its experience, baseline calculation methodologies have significant issues which can lead to some level of customer confusion, angst and eventually disengagement in demand response activities.
- **Alinta** noted that many of the challenges relating to accurate baseline construction arise because a customer's electricity consumption profile is "private" in the sense that it is only known and truly controlled by the customer.
- **Aurora Energy** submitted that due to the inability to set a perfectly accurate baseline, the true value of a customers demand response is uncertain.
- **Flow Power** submitted that much has been written on baselines and the issues of gaming and complexity. These are problematic and should be avoided.
- The **AEC** and **EnergyAustralia** highlighted the difficulties in trying to develop accurate baselines
- **Ready Energy** considered the risks of using baseline and actual data could not be understated.
- **Energy Queensland** submitted that deemed response is considered unreliable and not consistent with the NER as price is settled on measured, not deemed, response.

The **AEC** and **EnergyAustralia** noted that using baseline exposes all market participants to risks relating to inaccuracy, gaming and information asymmetry.²⁰⁴ EnergyAustralia noted that any market reform that introduces baselines into settlement processes should be approached with a high degree of caution, particularly when applying to mass market customers.²⁰⁵

ERM Power noted that baselines are central to the development of any demand response mechanism. As such, it considered it crucial that the AEMC consider them at this juncture. ERM Power did not consider baseline methodologies have evolved significantly in the past two years.²⁰⁶

Other stakeholders suggested that the challenges with baselines could be overcome:²⁰⁷

²⁰³ Submissions to consultation paper: Meridian Energy, pp. 6-7; Alinta Energy, p. 3; Aurora Energy, p. 1; Flow Power, p. 6; AEC, p. 1; EnergyAustralia, p. 3; Ready Energy, p. 19; Energy Queensland, p. 19; ERM Power, p. 4.

²⁰⁴ Submissions to consultation paper: AEC, p. 1; EnergyAustralia, p. 3.

²⁰⁵ EnergyAustralia, submission to consultation paper, p. 3.

²⁰⁶ ERM Power, submission to consultation paper, pp. 4-5.

²⁰⁷ Submissions to consultation paper: Energy Efficiency Council, p. 11; Enel X, p. 21; PIAC, p. 18; Joint submission - PIAC, TEC, TAI, renew, Queensland Council of Social Service, Smart Energy Council, Coalition for Community Energy, Consumer Action Law Centre, p. 4.

- **Enel X** noted that it has considerable experience working with international jurisdictions on appropriate baseline methodologies. In its experience centrally-determined baselines are key to a non-trivial level of demand response participation.²⁰⁸
- Enel X also noted that the customers most likely to be signed up are the customers with predictable load profiles.²⁰⁹
- In a joint submission, a number of stakeholders proposed a principles-based approach to developing baselines be embedded in the NER.²¹⁰
- The **Energy Efficiency Council** noted that decades of overseas experience in demand response have led to the development of effective methods for determining quanta of demand response.²¹¹

Accuracy and bias

A number of stakeholders highlighted the risks of consumers having incentives to inflate consumption in order to increase the amount of demand response credited.²¹²

- **Meridian Energy** submitted that it is imperative that the baseline methodology is robust enough to limit gaming and bias as this potentially has negative outcomes for the consumer (in general), consumers (in demand response programs) and the market. Errors in baseline calculations may be mitigated if incentives are based on customers achieving a specific directional target or threshold and over achieving the reduction target does not necessarily result in greater rewards.²¹³
- In its submission, **ERM Power** highlighted a number of ways to game a baseline: by running equipment harder, such as by turning on chillers or pre-cooling or heating areas, or increasing consumption in other ways; demand could be shifted from one NMI to another; behind the meter generation such as battery storage could be dispatched; or embedded solar could even be switched off to create an artificially higher baseline.²¹⁴
- The **AEC** suggested that consumers with regular processes such as manufacturing industries will have some ability to do develop accurate baselines although they will be affected by such considerations as weather and their order books. However, the AEC noted that smaller consumers will have significant more variation in their load, and baselines are less likely to be accurate.²¹⁵
- **Alinta** suggested that the risks borne out of information asymmetry leads to moral hazards and incentives for gaming.²¹⁶

²⁰⁸ Enel X, submission to consultation paper, p. 21.

²⁰⁹ Ibid, p. 25.

²¹⁰ Joint submission to consultation paper, PIAC, TEC, TAI, renew, Queensland Council of Social Service, Smart Energy Council, Coalition for Community Energy, Consumer Action Law Centre, p. 4.

²¹¹ Energy Efficiency Council, submission to consultation paper, p. 11.

²¹² Submissions to consultation paper: Origin Energy, p. 7; Flow Power, p. 6; Meridian Energy, p. 9; ERM Power, p. 4; AEC, p. 3; Alinta Energy, p. 3; Snowy Hydro, p. 12; AusNet Services, p. 6; Energy Queensland, pp. 19-20; AGL, p. 4;

²¹³ Meridian Energy, submission to consultation paper, p. 9.

²¹⁴ ERM Power, submission to consultation paper, p. 4.

²¹⁵ AEC, submission to consultation paper, p. 3

²¹⁶ Alinta Energy, submission to consultation paper, p. 3

- **Energy Queensland** does not support the use of centrally determined baselines as determining baseline calculations that are both accurate and designed in such a way so as to limit bias and gaming are among the most challenging aspects of demand response programs as they can only estimate the counterfactual.²¹⁷
- **AGL** noted that while the use of baselines can have an acceptable level of error across a large portfolio, its experience is that there is a high risk of inaccurate baselines for individual customers.²¹⁸
- In its submission, **Origin Energy** noted that if a baseline is inaccurate or 'inflated', this would ultimately result in higher costs to retailers that would be recovered from their consumers.²¹⁹
- **AusNet Services** submitted that designing against bias and gaming is immensely important to the efficiency and effectiveness of the reform.²²⁰

Ready Energy submitted that it is important to design to protect against bias and gaming and that having accurate real time data (and accurate historical data for previous (corresponding) periods/intervals) in a common format will be accessible to AEMO, AER and other parties and will make it very difficult to game the market.²²¹

Other stakeholders suggested that concerns relating to bias and accuracy could be mitigated through design.²²²

- **Enel X** noted that there is sufficient evidence to suggest that the baseline methodologies used in mature demand response markets overseas are robust to gaming. For example, where dynamic baseline methodologies apply, day of adjustments aren't permitted immediately before the dispatch interval. This means that, to inflate the baseline, a customer would have to increase their consumption for multiple hours – at considerable cost – on the off-chance that prices will later rise to a level that would cause it to be dispatched. Such a methodology, combined with regulatory oversight, undermines any incentive to game.²²³
- The **Energy Efficiency Council** suggested that in order to game a baseline, an energy user would need to inflate their energy use for large periods of time on the chance of a small reward for demand response. Any energy user that attempted to do this would make a huge loss. Therefore, if the appropriate protocols are followed, the potential for gaming should be negligible.²²⁴
- **PIAC** suggested that gaming could be addressed as:²²⁵

217 Energy Queensland, submission to consultation paper, p. 19.

218 AGL, submission to consultation paper, p. 4.

219 Origin Energy, submission to consultation paper, p. 7.

220 AusNet Services, submission to consultation paper, p. 6.

221 Ready Energy, submission to consultation paper, p. 23.

222 Submissions to consultation paper: Enel X, pp. 10-11; Energy Efficiency Council, p. 11; PIAC, p. 19.

223 Enel X, submission to consultation paper, p. 11.

224 Energy Efficiency Council, submission to consultation paper, p. 11.

225 PIAC, submission to consultation paper, pp. 18 - 19.

- much demand response is likely to be automated, making it easier to measure and control as well as being somewhat simpler to baseline compared to entirely manual DR
- There is significant reputational risk to gaming baselines that will serve as a deterrent to DRSPs doing so.
- Opportunities for consumers to inflate baselines are limited
- **PIAC** considered it important that the accuracy of baselining for individual participants within an aggregated group – particularly individual households – is not of critical importance and must not be a barrier to implementation.

Design

A number of stakeholders provided feedback on the design of baselines and a framework for determining baselines.

- **PIAC** proposed a principles-based approach whereby the objectives of baselining would be included in the NER, and AEMO would have the responsibility for developing and refining the methodology. AEMO would also be able to respond to the potential for inaccurate baselines to cause problems with the NEMDE.²²⁶
- PIAC also suggested baseline provisions should allow for the direct metering or measurement of energy flows at any circuit or sub-circuit on the customer side of the meter.²²⁷
- PIAC noted that measures could be introduced to support more accurate baselines, including monitoring and enforcement by the AER, bidding in good faith style arrangements, and continual improvement of baseline approaches by AEMO.²²⁸
- **AusNet Services** noted that there are a number of variables that should be accounted for when determining baselines, including temperature, time of data and day of the week.²²⁹
- **EnergyAustralia** noted that the administration, complexity, costs and risks of billing customers on baseline usage are much more significant for mass market. Baselines are less accurate for mass market consumers and the costs of implementation are likely to outweigh any benefits.²³⁰
- **Meridian Energy** suggested that baseline methodologies should be robust and dynamic enough to allow for long term changes in a customer's overall level of demand without overcomplicating the baseline methodology, which can be expensive and administratively burdensome.²³¹

²²⁶ PIAC, submission to consultation paper, p. 19.

²²⁷ Ibid, p. 20.

²²⁸ Ibid, p. 20.

²²⁹ AusNet Services, submission to consultation paper, p. 6.

²³⁰ EnergyAustralia, submission to consultation paper, p. 21.

²³¹ Meridian Energy, submission to consultation paper, p. 10.

- **Enel X** noted that the integrity of the mechanism would rely on the appropriate checks and balances being put in place, market rules being enforced and market outcomes being regularly reviewed.²³²
- Enel X suggested that, while they may be more complex to administer than static baselines, high X of Y baseline methodologies (and other dynamic approaches) are much better able to address long-term or permanent changes in a customer's overall demand than static approaches, and reduce the risk of systemic bias.²³³
- Enel X also suggested that good baseline design results from adherence to three principles: accuracy, simplicity and integrity.²³⁴
- **AGL** submitted that if baselines are to be used, they should be periodically reviewed and updated to maximise accuracy. This would capture permanent changes in the customer's load profile over time. There could also be an independent audit process to make sure an appropriate baseline is being applied to customers, and a regular review to make sure the best baseline is still being used for each customer.²³⁵
- **Alinta** suggested that should a decision for a centrally administered model be made, the Singapore model is worthy of further consideration by the AEMC.²³⁶

Retailer impact

A number of stakeholder submissions noted the risks associated with baselines for retailer costs and retailer premiums.²³⁷

- **Hydro Tasmania** suggested use of baselines may create perverse incentives to game the baselines, result in greater demand forecast errors, increase retailer risk premiums.
- **Aurora Energy** noted that under the baseline approach, risk premiums for customers would likely increase to reflect the volume risk being under control of a third party, as the retailer may be exposed to higher prices should the third party not ultimately provide the scheduled demand response
- **EnergyAustralia** noted that there will be uncertainty for the retailer in estimating what their exposure to the wholesale market will be if it changes between actuals and a baseline level.
- **Origin Energy** noted that if a baseline is inaccurate or 'inflated', this would ultimately result in higher costs to retailers that would be recovered from their consumers.

Due to the inherent issues with rewarding individual consumers against a statistical baseline, **AGL** has elected to move away from this approach in the 2018/19 Peak Energy Rewards trial to an alternative consumer incentive mechanism.²³⁸

Disputes

²³² Enel X, submission to consultation paper, p. 26.

²³³ Ibid, pp. 25-26.

²³⁴ Ibid, p. 24.

²³⁵ AGL, submission to consultation paper, p. 14.

²³⁶ Alinta, submission to consultation paper, p. 3.

²³⁷ Submissions to consultation paper: Hydro Tasmania, p. 2; Aurora Energy, p. 3; EnergyAustralia, p. 11; Origin Energy, p. 2.

²³⁸ AGL, submission to consultation paper, p. 4.

A number of retailers highlighted concerns with billing customers at a baseline level, particularly regarding the risk of bill disputes.²³⁹ **AGL** noted that in the event of a dispute regarding the baseline level of consumption, a customer is likely to raise this dispute with the retailer. AGL also noted that the customer would have few avenues to dispute the baseline calculations.²⁴⁰ **Meridian Energy** suggested that there would need to be a dispute resolution mechanism built in to allow involved parties to maintain confidence in the mechanism.²⁴¹

Process

Meridian Energy noted that the proposals do not include an agreed, standard baseline approach. The process for agreeing and settling the baseline methodology is complex and will require time to design and test as well as a broad range of stakeholder involvement.²⁴²

EnergyAustralia submitted that it does not support a rule being introduced before the issues relating to baselines, and other issues, are resolved, and there is broad testing and industry acceptance of a standard methodology. If a rule was implemented before a methodology had been developed, there is a risk that AEMO would have to develop one within the rule implementation time frame which would reduce the rigour of the process and put the success of the reforms at risk.²⁴³

Embedded generation

A number of stakeholders highlighted the likely challenges of trying to develop baselines for embedded storage.²⁴⁴ **LO3 Energy** submitted that the baseline approach would not work for services such as electric vehicle charging, peer-to-peer trading and virtual power plants.²⁴⁵

Tesla suggested the development of baselines would be complicated and will require detailed consideration by the Commission.²⁴⁶

PIAC suggested that baselining for embedded generation and direct control devices would become more manageable by allowing for more direct metering.²⁴⁷

Distortionary impact

Origin Energy submitted that with centrally determined baselines, customers' consumption decisions would therefore be driven, at least in part, by the 'wedge' they are able to create between the baseline consumption calculated at the retail tariff rate and their metered consumption calculated at wholesale prices.²⁴⁸

Snowy Hydro noted that a distortion with a wholesale demand response mechanism is that generators may be over-hedged if contract volume was made at the level of the customers'

239 Submissions to consultation paper: Aurora Energy, p. 2; AGL, p. 16; AEC, p. 2; EnergyAustralia, p. 12; Meridian Energy, p. 7.

240 AGL, submission to consultation paper, p. 16.

241 Meridian Energy, submission to consultation paper, p. 7.

242 Meridian Energy, submission to consultation paper, p. 8.

243 EnergyAustralia, submission to consultation paper, p. 12.

244 Submissions to consultation paper: Clean Energy Council, p. 2; Enel X, p. 22; LO3 Energy, p. 2.

245 LO3 Energy, submission to consultation paper, p. 2.

246 Tesla, submission to consultation paper, p. 6.

247 PIAC, submission to consultation paper, p. 21.

248 Origin Energy, submission to consultation paper, p. 2.

baseline. This would result in unfunded contract difference payments. In the event of high spot prices, this would result in substantial contract losses to generators in the NEM.²⁴⁹

Other comments

Alinta the development of consumption baselines comes with material corresponding costs in terms of both time and resources for AEMO relating to the ongoing monitoring, forecasting, and settlement dispute mechanisms for the setting and maintenance of baselines.²⁵⁰

Origin Energy noted that some of the impacts of inflating baselines may be mitigated through increased monitoring and repeated verification of baseline methodologies, the cost of this oversight would ultimately be passed onto consumers.²⁵¹

Ready Energy highlighted the availability of accurate, granular real time data and noted that this should be utilised for the purposes of determining the baseline.²⁵²

AEMO/ARENA RERT trials

ARENA provided a summary of outcomes from the joint AEMO/ARENA RERT demand response trial. These outcomes can be found in attachment B of the submission and are summarised in chapter 2.²⁵³

EnergyAustralia noted a number of problems arising with the baselines it had used for the RERT:²⁵⁴

- The ability for the baseline to properly account for embedded generation.
- Customers shifting load to provide demand response which consequently inflates the baseline, exaggerating the measured amount of demand response provided.
- Changes in consumption due to unexpected changes behaviour unrelated to providing demand response.
- The impact of unplanned outages.
- Consumption patterns that are industry specific and not accounted for e.g. increased shopping centre loads on Thursday nights.

Meridian Energy submitted that the current baseline used by AEMO (e.g. for RERT) did not accurately account for embedded generation and other dynamic resources that might exist behind the meter.²⁵⁵

E.5

Commission's analysis and conclusions

²⁴⁹ Snowy Hydro, submission to consultation paper, p. 2.

²⁵⁰ Alinta Energy, submission to consultation paper, p. 3.

²⁵¹ Origin Energy, submission to consultation paper, p. 7.

²⁵² Ready Energy, submission to consultation paper, p. 20.

²⁵³ ARENA, submission to consultation paper.

²⁵⁴ EnergyAustralia, submission to consultation paper, pp. 11-12.

²⁵⁵ Meridian Energy, submission to consultation paper, p. 9.

BOX 6: DRAFT RULE

The draft rule introduces a framework for determining baseline methodologies for demand response load. Under the mechanism:

- the baseline methodologies will be centrally determined or centrally agreed (i.e. registered participants may propose a baseline methodology but it will only be accepted and used if it is shown to meet certain criteria)
- baselines for specific loads and intervals will be centrally determined, using the relevant baseline methodology and load data
- wholesale demand response will be settled through the wholesale market, with reference to the baseline.

The framework requires AEMO to develop a series of methodologies in consultation with stakeholders. The framework also allows for registered participants to submit their own baseline methodologies for consideration. If a submitted methodology meets criteria relating to accuracy and freedom from bias, it may be utilised by a DRSP.

The draft rule:

- requires AEMO to prepare wholesale demand response guidelines. Under these guidelines, AEMO is required to set out a series of requirements to assess whether a particular baseline methodology can sufficiently accurately predict a particular load's consumption. These guidelines will be prepared in line with principles set out in the NER, and through the Rules consultation procedure. These guidelines will set out:
 - AEMO's determination of the baseline methodology metrics, relating to accuracy and bias
 - AEMO's determination of the process for baseline compliance testing
 - the requirements for the form and content of a baseline methodology
 - the process for a registered participant to submit a proposed baseline methodology
 - the process for a DRSP to change the baseline methodology used for a wholesale demand response unit
 - any other information or requirements relating to the testing and approval of baseline methodologies that AEMO considers appropriate.
- places an obligation on AEMO to annually report on outcomes relating to baselines used under the mechanism, and how AEMO proposes to improve the accuracy and reduce the bias of these over time.

Benefits of the draft rule

The framework for determining baselines under the draft rule will:

- Allow DRSPs to sell demand response into the wholesale market
- Allow AEMO to develop an approach to centrally determining and settling baseline in consultation with stakeholders

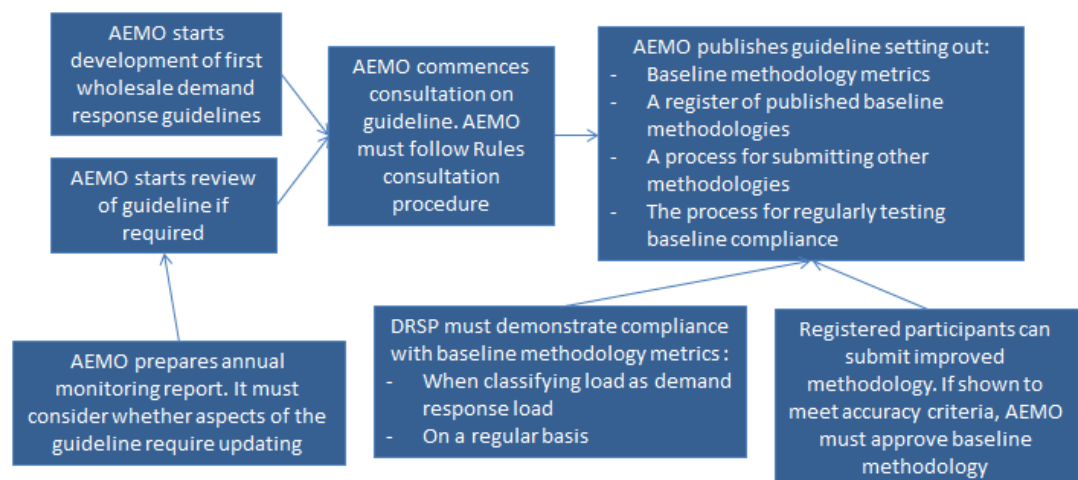
- Encourage market participants to develop approaches to determining baselines that are more accurate and improve the methodologies developed by AEMO.

This section is structured as follows:

- How the draft rule addresses challenges with baselines
- Establishing and maintaining compliance with the baseline methodology
- Governance of the framework for baseline methodologies
- Monitoring and reporting on outcomes relating to baselines
- Updating the baseline methodology guideline.

The figure below provides an overview of the process set out in this appendix.

Figure E.1: Baseline methodology process



E.5.1

How draft rule addresses challenges with baselines

As discussed in appendix e.2, there are a number of challenges that arise with having centrally determined and administered baselines.

The draft 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. 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.
- Allowing market participants to submit alternative baseline methodologies. If these methodologies meet the baseline methodology metrics in respect of a particular type of load, AEMO will approve them and they may be used by DRSPs (subject to confidentiality

considerations). This will improve outcomes for the retailer, DRSP and consumer at that connection point. In addition, AEMO is obligated to report on potential changes to the baseline methodology metrics as a result of the development of a baseline methodology submitted by a participant.²⁵⁶

- Placing obligations on AEMO to regularly test how well a baseline methodology applies to individual loads. If the baseline methodology does not produce a baseline that meets the baseline methodology metrics, that wholesale demand response unit will not be able to provide wholesale demand response.²⁵⁷
- Placing obligations on AEMO to regularly report on outcomes relating to the use of baselines.
- Placing obligations on the AER to monitor outcomes under the wholesale demand response mechanism. Under the draft rule, DRSPs should not provide wholesale demand response that was not additional. That is, wholesale demand response should not be settled when it would have occurred anyway. The AER will be required to develop guidelines in accordance with the Rules consultations procedures providing guidance about how it will monitor compliance and the information that DRSPs must retain to assist the AER's monitoring.²⁵⁸

The rest of this section provides more detail on the draft rule.

E.5.2

AEMO to set baseline methodologies

Rationale

Under the draft rule, AEMO is required to develop a baseline methodology guideline and a register of baseline methodologies. This register will set out the initial set of 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 draft rule places an obligation on AEMO to determine baseline methodologies.

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. This will reduce the costs of establishing baselines for wholesale settlement.

There can be challenges with information asymmetry when a central body determines a baseline. That is, the participating consumers will often better understand the expected

²⁵⁶ Clause 3.10.7 of the draft rule.

²⁵⁷ Clause 3.10.3 of the draft rule.

²⁵⁸ Clause 3.10.6 of the draft rule.

changes in their consumption than a central body can determine using a statistical approach. In addition, only allowing a central party to determine a baseline methodology would limit the capacity for market participants to innovate new, better baseline methodologies. As such, the draft rule provides for a process by which registered participants are able to submit improved baseline methodologies to AEMO for consideration. This is discussed more in appendix e.5.5.

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 wholesale demand response (for example, in contracts between a retailer and end-user).

Wholesale demand response guidelines

Under the draft rule, AEMO will be required to develop wholesale demand response guidelines. These guidelines will provide detail on the process for determining and administering baselines. In relation to baselines, these guidelines will set out:²⁵⁹

- AEMO's determination of the baseline methodology metrics (discussed more below)
- AEMO's determination of the process for baseline compliance testing
- AEMO's determination of the process for modifying a baseline
- the requirements for form and content of a baseline methodology
- a description of any classes of loads that in AEMO's opinion may reasonably be expected to seek classification as wholesale demand response unit and for which AEMO proposes to develop baseline methodologies
- the process and timing for a Registered Participant to submit a proposed baseline methodology and for AEMO to seek clarification or additional information and make a decision
- any other information or requirements relating to the testing and approval of baseline methodologies that AEMO considers appropriate.

In developing these guidelines, AEMO would be required to follow the Rules consultation procedure.²⁶⁰ This will allow stakeholders to provide input into its development.

In setting out the wholesale demand response guidelines, AEMO will 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 in the classification of demand response loads and during periodic 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:²⁶¹

²⁵⁹ Clause 3.10.1 of the draft rule.

²⁶⁰ This is set out in NER Rule 8.9.

²⁶¹ Clause 3.10.2 of the draft rule.

- Accuracy: meaning the deviation between the baseline for a wholesale demand response unit and its actual consumption (in periods when it is not providing demand response).
- Bias: meaning the deviation between actual consumption of a wholesale demand response unit and its baseline for each of the measures of baseline accuracy consistently exhibiting error:
 - in a single direction
 - 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:²⁶²

- 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 exceed the levels of accuracy demonstrated in the AEMO-ARENA demand response RERT trials. 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.

Under the draft rule, AEMO will need to develop the baseline methodologies it considers best meets the principles for one or more classes of wholesale demand response units. It must also publish the baseline methodologies developed by it in a register.²⁶³

The guideline determined by AEMO will also need to set out a process by which registered participants are able to submit baseline methodologies that better meet the accuracy and bias metrics set out by AEMO. The guideline will need to set out this process, which is discussed in more detail in appendix e.5.5.

E.5.3

DRSP compliance with baseline methodology

Under the draft rule, wholesale demand response units 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 applied to the wholesale demand response unit produces a baseline that satisfies the baseline methodology metrics.

Under the draft rule, AEMO must determine and may amend arrangements for the regular and systematic testing of each wholesale demand response unit against the baseline methodology metrics using the applicable baseline methodology.²⁶⁴ AEMO must determine and may amend the periods over which baseline compliance testing will occur.

²⁶² Clause 3.10.2(g) of the draft rule.

²⁶³ Clause 3.10.5 of the draft rule.

²⁶⁴ Clause 3.10.2(e) of the draft rule.

Under the draft rule, DRSPs are required to demonstrate that their loads will be able to meet the requirements under the baseline methodology 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.²⁶⁵

As part of the baseline methodology guideline, AEMO will be required to set out a separate methodology for DRSPs to demonstrate compliance with these metrics. 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, where a load is found to be outside the specific metrics set out by AEMO in relation to the chosen baseline, that load will not be able to provide wholesale demand response.²⁶⁶ 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 submitting a preferred baseline methodology, as outlined in appendix e.5.5.

E.5.4 Adjusting baselines under abnormal conditions

The draft rule provides for a process by which DRSPs can nominate to AEMO that an event or circumstance that will materially change the consumption pattern of the wholesale demand response unit. The DRSP will be able to do so in order to maintain compliance with the baseline methodology metrics.²⁶⁷ For example, in the circumstances where a load is operating at half capacity during maintenance, the DRSP will be able to notify AEMO in order to remain baseline compliant.

The DRSP will be able to specify:

- a factor between (and including) zero and 1 to be applied to the baseline produced by the baseline methodology; and
- the trading intervals in which the factor must be applied.

The draft 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 provide additional wholesale demand response that would have not actually occurred.

E.5.5 Framework for submitting alternative baseline methodologies

Under the draft rule, there is a framework by which market participants are able to submit baseline methodologies they consider to be more effective than the methodology being employed at that time for specific loads.²⁶⁸

Allowing these parties to submit baseline methodologies means the framework will be able to capture the benefits of innovation while still retaining the benefits of having AEMO determine

²⁶⁵ Clause 2.3.6(c)(2) of the draft rule.

²⁶⁶ Clause 3.10.3 of the draft rule.

²⁶⁷ Clause 3.10.4(b) of the draft rule.

²⁶⁸ Clause 3.10.2(c) of the draft rule.

(and periodically review and update) an initial set of baseline methodologies in consultation with stakeholders.

AEMO's wholesale demand response guidelines will set up a process by which parties are able to submit an alternative baseline methodology. The submitted baselines will need to be a form that is accepted by AEMO. For example, they must rely on information that is accessible to AEMO and be in a form that AEMO can utilise. AEMO will be required to consider whether the submitted baseline methodology meets the baseline methodology metrics in respect of the relevant types of load.

- If the DRSP submits an improved baseline methodology and AEMO approves it, the DRSP may change to the new baseline methodology for its wholesale demand response units.
- If AEMO considers the submitted baseline methodology does not meet the metrics, AEMO must notify the party that submitted the methodology. AEMO must provide an explanation of why the submitted methodology was not approved.²⁶⁹

If a submitted baseline is found to better meet the metrics, the party that submitted it will be able to decide whether it is published in AEMO's register.²⁷⁰ This will allow the submitting party to allow the baseline methodology to be used in respect of other wholesale demand response units. It also promotes the development of better baseline methodologies by not requiring the methodology to be published, as a publication requirement may discourage innovation given that commercially sensitive data may be involved. In the event that a new methodology is submitted and approved, AEMO can change the metrics to reflect improvements in baseline methodologies.²⁷¹

A DRSP seeking to classify a load as a demand response load will choose from the list of published methodologies, and must select the methodology that best meets AEMO's accuracy criteria when applied to that load. Alternatively, it will be able to submit its own methodology, which must be approved by AEMO before being able to be used.²⁷²

Registered participants are also able to submit baselines to AEMO at any time.

E.5.6 Monitoring and reporting of baselines

The draft rule requires AEMO to report on outcomes relating to baseline accuracy. AEMO will be required to annually publish a report covering:²⁷³

- information about baseline methodologies available for use and the extent to which these methodologies are being used
- for each baseline methodology and type of load, 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

²⁶⁹ Clause 3.10.2(e) of the draft rule.

²⁷⁰ Clause 3.10.2(f) of the draft rule.

²⁷¹ Clause 3.10.6(b)(4) of the draft rule.

²⁷² Clause 2.3.6(d)(3) of the draft rule.

²⁷³ Clause 3.10.6(b) of the draft rule.

- potential improvements which may include:
 - changes to baseline methodology metrics as a result of the development or approval 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.

The report must also cover and analyse the trends relating to:²⁷⁴

- the number of registered DRSPs
- the number and capacity of wholesale demand response units
- the number and average capacity of scheduled wholesale demand response units
- the amount of dispatched wholesale demand response and the frequency of dispatch
- the spot market price levels at which wholesale demand response was dispatched.

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.

E.5.7

AER assessing compliance

Under the draft rule, the AER will also 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 as well as an obligation on DRSPs to not offer wholesale demand response that would not have otherwise occurred.

When a DRSP is making a dispatch offer, the offer 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. A dispatch offer from a DRSP would be considered false or misleading if the DRSP does not have a genuine intention to honour the offer or a reasonable basis to make it.²⁷⁵

The AER must develop enforcement guidelines in accordance with the Rules consultation procedures providing guidance to DRSPs about:²⁷⁶

- how the AER intends to monitor compliance by DRSPs in regards to providing wholesale demand response that is only the result of action taken by the DRSP
- information DRSPs must retain to assist the AER in monitoring the above point.

The AER must publish these enforcement guidelines and may amend them from time to time.

²⁷⁴ Clause 3.10.6(c) of the draft rule.

²⁷⁵ Clause 3.8.22A(b) of the draft rule.

²⁷⁶ Clause 3.10.6(d) of the draft rule and the definition of "wholesale demand response activity" in Chapter 10 of the draft rule.

F SETTLEMENT AND COST RECOVERY

F.1 Overview

This appendix sets out the proposed approach to settlement and cost recovery under the demand response mechanism. Wholesale demand response which is provided under 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.

Under current market arrangements, cost recovery arrangements for wholesale demand response involve either the benefit of having avoided the wholesale price, or an alternative arrangement that has been bilaterally negotiated between the retailer (or a demand response aggregator) and the customer.

However, under a wholesale demand response mechanism, cost recovery occurs through central settlement. This appendix explores a number of ways in which this could occur and sets out the settlement and cost recovery model applying under the draft rule.

The remainder of this appendix outlines:

- current approaches to rewarding consumers for providing wholesale demand response
- stakeholders' views on how wholesale demand response should be paid for under a demand response mechanism
- the Commission's analysis and conclusions.

F.2 Background

F.2.1 How is wholesale demand response currently rewarded in the NEM?

In the NEM, the wholesale spot price is able to rise considerably 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 chapter 3.

In contrast, the spot price for energy in markets where participants are paid availability payments 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.

If there is a high spot price in the NEM, parties 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 2):

- 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 (i.e. there is currently no 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 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 current 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 2.

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 cost is borne solely by the retailer. In addition, retailers may realise value through these programs in other ways, such as increasing customer loyalty by offering such programs.

F.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 e. 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 current arrangements, 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.

F.3

F.3.1

Proponents' proposed settlement models

Integrated settlement

In their rule change requests proposing the implementation of a wholesale demand response mechanism, PIAC, TEC and TAI and the SA Government proposed that the settlement framework would broadly operate as follows where a consumer has provided wholesale demand response:²⁷⁷

- 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.

PIAC reiterated its support for this approach to settlement in its submission to the consultation paper.²⁷⁸

A worked example showing the financial flows for wholesale demand response under this settlement model is set out in Box 7.

BOX 7: COSTS RECOVERED DIRECTLY FROM PARTICIPATING CONSUMER

A DRSP sees forecasts of high prices and calls on a consumer (with whom it has a pre-existing commercial relationship) to reduce consumption. The consumer's baseline level of consumption is centrally determined by AEMO to be 15 kWh. The wholesale price reaches

²⁷⁷ PIAC, TEC and TAI, *Wholesale demand response energy market mechanism: Rule change request*, August 2018, p. 4.

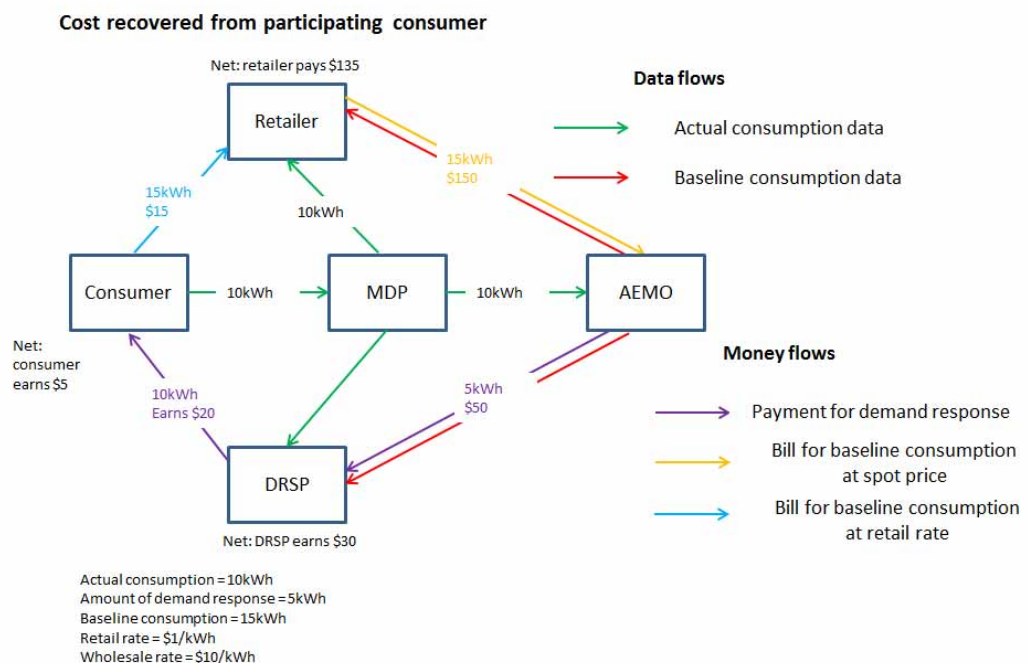
²⁷⁸ PIAC, submission to consultation paper dated 11 January 2019, p. 22.

\$10/kWh and the consumer reduces its actual consumption to 10 kWh. The consumer purchases the *baseline* quantity from the retailer at its retail rate of \$1/kWh. The retailer subsequently purchases the baseline quantity from the spot market at the wholesale price. The DRSP is credited for the quantity of wholesale demand response in the spot market and shares some of this value with the consumer. Over the course of one hour:

- The consumer has reduced consumption and only consumes 10 kWh over the hour. The consumer pays the retailer \$15 for the baseline amount of energy, 15 kWh. The retailer subsequently purchases 15 kWh from the wholesale market for \$150.
- The third party is credited \$50 for the quantity of demand response (ie, the reduction between the baseline - 15 kWh - and the actual - 10 kWh - multiplied by the wholesale price). The third party shares \$20 with the consumer for undertaking the demand response, in accordance with the previously agreed contract between the third party and the consumer.

This model is illustrated in Figure F.1 below.

Figure F.1: Settlement model proposed by PIAC, TEC and TAI and SA Government



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

The financial flows in this model are calculated as follows:

- Payment from customer to retailer = baseline consumption (15 kWh) x retail rate (\$1/kWh)

- Payment from retailer to AEMO = baseline consumption (15 kWh) x wholesale rate (\$10/kWh)
- Payment from AEMO to DRSP = difference between baseline and actual consumption (5 kWh) x wholesale rate (\$10/kWh)
- Payment from DRSP to customer is calculated in accordance with the commercial agreement between the parties.

F.3.2

Separate settlement

The South Australian Government, in addition to the model described above, also proposed a transitory demand response model. The settlement proposal under the transitory model would allow third parties to sell wholesale demand response into a market which is separate from the wholesale market, recovering costs via a charge levied on all retailers (and passed on to their customers). Such a settlement model could also be applied to a demand response mechanism which is integrated with the existing wholesale market.

Under this settlement model, the costs for wholesale demand response would be recovered from consumers in a smeared manner. This is similar to the way in which the current RERT costs are recovered. This can be contrasted with the above approach since the individual consumer which is undertaking demand response does not pay their retailer at the baseline. Rather, customers would be charged for their actual consumption. There would then be a separate line item added to customers' bills reflecting the cost of wholesale demand response being recovered from all consumers. The payment to the DRSP needs to be recovered in a smeared manner because there is no direct payment to the wholesale market by the customer that is equivalent to the payment made to the DRSP.

A worked example showing the financial flows for wholesale demand response under this settlement model is set out in Box 8.

BOX 8: COSTS RECOVERED FROM ALL CONSUMERS

A DRSP sees forecasts of high prices and calls on a consumer (with whom it has a pre-existing commercial relationship) to reduce consumption. The consumer's baseline level of consumption is centrally determined to be 15 kWh. The wholesale price reaches \$10/kWh and the consumer reduces its actual consumption to 10 kWh. The consumer purchases the *actual* quantity from the retailer at its retail rate of \$1/kWh. The retailer subsequently purchases the baseline quantity from the spot market at the wholesale price. The DRSP is credited for the quantity of wholesale demand response in the spot market and shares some of this value with the consumer. Over the course of one hour:

- The consumer has reduced consumption and only consumes 10 kWh over the hour. The consumer pays the retailer \$10 for the actual amount of energy, 10 kWh. The retailer

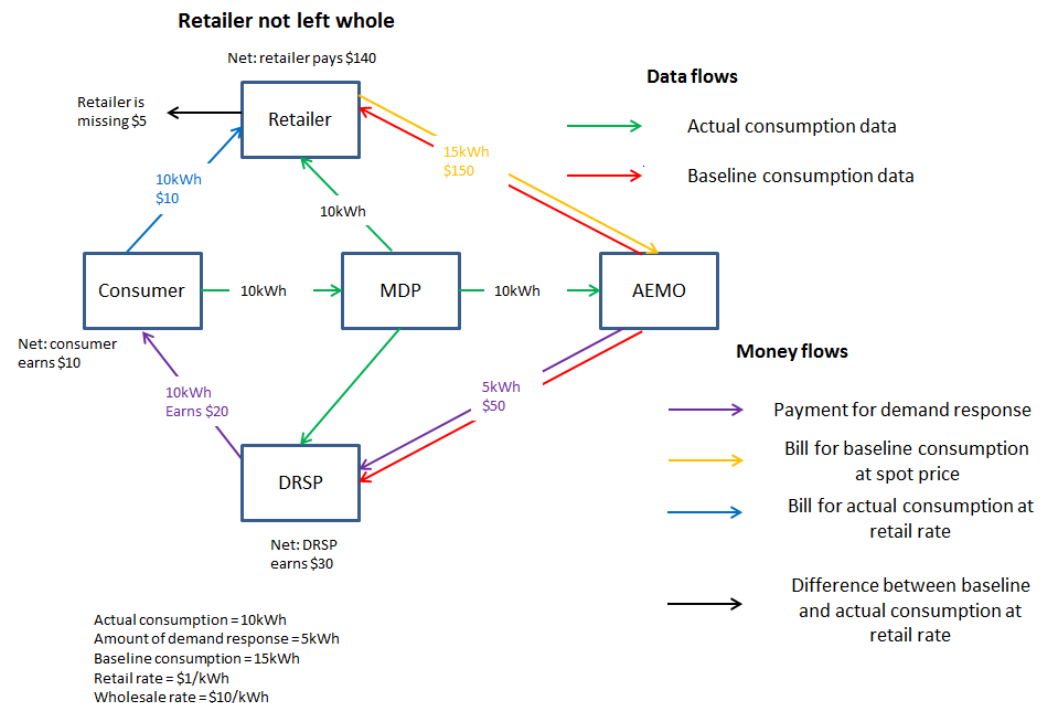
subsequently purchases the baseline amount of energy, 15 kWh, from the wholesale market for \$150.

- The third party is credited \$50 for the quantity of demand response. The third party shares \$20 with the consumer for undertaking the demand response, in accordance with the previously agreed contract between the third party and the consumer.

The retailer is not initially left whole, as it does not recover the difference between the baseline and actual consumption, 5 kWh, at the retail rate of \$1/kWh, from the consumer. This 'missing money' amounts to the costs to the retailer to manage its exposure to the wholesale market to the baseline level that the retailer is not recovering from its consumers by charging for actual consumption. If the retailer is not able to recover this cost from somewhere, this may result in the retailer raising its retail rates across its customer base to account for the increased risk exposure.

This scenario is illustrated in Figure F.2 below.

Figure F.2: Settlement model proposed by South Australian Government adapted to a wholesale demand response mechanism - retailer not left whole



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

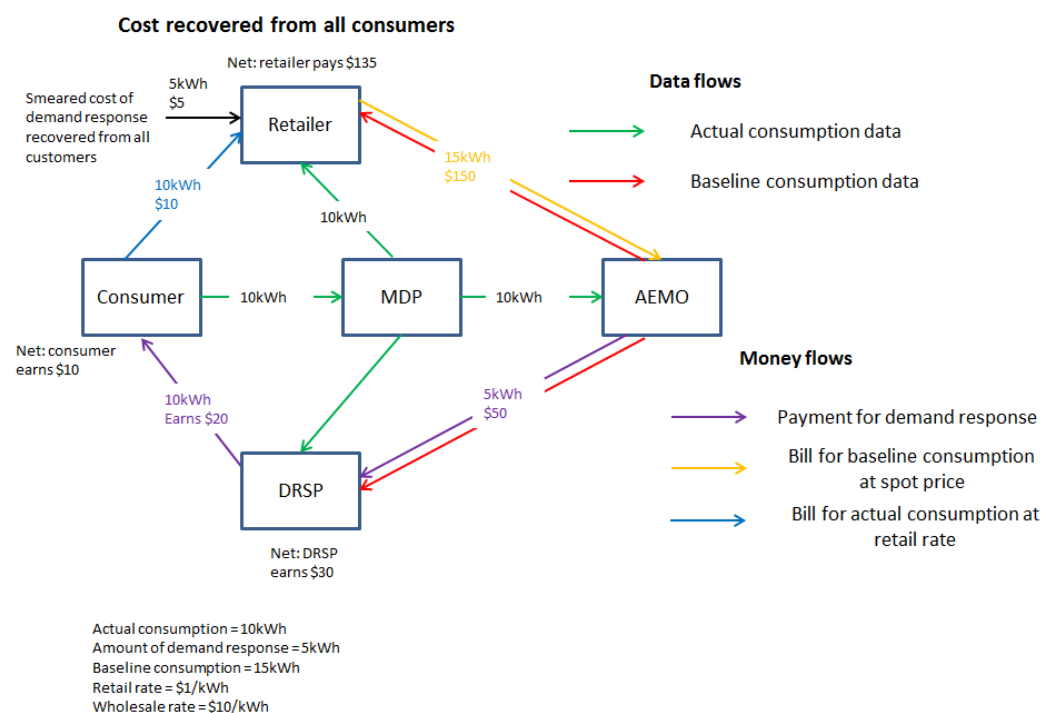
The value of demand response which is not recovered by the retailer in Figure F.2 (i.e. the missing \$5) would be recovered by smearing this cost either:

- all of the retailer's customers

- all of the retailer's customers providing demand response.

This approach to cost recovery is illustrated in Figure F.3.

Figure F.3: Settlement model proposed by South Australian Government adapted to a wholesale demand response mechanism - smeared cost recovery



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

The financial flows in this model are calculated as follows:

- Payment from customer to retailer = actual consumption (10 kWh) x retail rate (\$1/kWh)
- Supplementary payment from customer to retailer = a proportion of the difference between the actual and baseline consumption (5 kWh) x the retail rate (\$1/kWh) smeared across the retailer's customers
- Payment from retailer to AEMO = baseline consumption (15 kWh) x wholesale rate (\$10/kWh)
- Payment from AEMO to DRSP = difference between baseline and actual consumption (5 kWh) x wholesale rate (\$10/kWh)
- Payment from DRSP to customer is calculated in accordance with the commercial agreement between the parties.

F.3.3

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. 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.

F.4

Stakeholder comments

The majority of stakeholders did not comment directly in submissions to the consultation paper about how demand response providers should be paid under a wholesale demand response mechanism or how the cost of such payment should be recovered. To the extent that comments were provided, they primarily related to the costs associated with system changes required to facilitate settlement under the mechanism as proposed by PIAC, TEC and TAI. These stakeholder comments are set out in more detail in appendix g. Stakeholders also commented on the use of centrally determined baselines, which are an integral feature of the settlement algebra. These are discussed in appendix e.

In summary, a number of retailers emphasised that the changes required to retailer billing systems to facilitate billing customers for baseline consumption instead of actual consumption, and the costs associated with these changes, would be significant. This view has been reaffirmed by retailers in the technical working group meetings facilitated by the Commission. Retailers also generally rejected the suggestion that the costs of these systems changes could be reduced by incorporating them with other changes currently under way to accommodate five minute settlement.

Enel X suggested that these upfront costs could be reduced by allowing retailers to manually adjust customer bills as required following the implementation of the demand response mechanism.²⁷⁹ Retailers could then implement a fully-automated approach at a time that is convenient for them, and in a way that is reflective of participation levels in the mechanism. **ERM Power** noted that retailer systems are generally not designed to accommodate manual adjustments of data²⁸⁰

EnergyAustralia suggested a number of concerns may be able to be addressed by a settlement model whereby:²⁸¹

- DRSPs are able to participate directly in the wholesale market, as proposed by PIAC, TEC and TAI
- Retailers are billed at the baseline level of consumption in the wholesale market, but are able to continue billing customers based on their actual consumption and recover the difference from all customers.

²⁷⁹ Enel X, submission to consultation paper, pp. 18-20.

²⁸⁰ ERM Power, submission to consultation paper, p. 6.

²⁸¹ EnergyAustralia, submission to consultation paper, p. 13.

EnergyAustralia also noted that charging retailers for the baseline level of consumption in the wholesale market would increase their hedging costs, which would need to be recovered from consumers.²⁸²

Enel X suggested that settling the retailer on the baseline level of consumption during periods in which the customer responded provided wholesale demand response is also likely to be less risky for retailers, as they will buy from the market and sell the customer essentially what they were expecting to, such that the customer's response to an event has no impact on them.²⁸³

AEMO considered that baseline settlement would also minimise market distortions that can arise from separate payment of wholesale demand response.²⁸⁴

AGL noted that it is unclear how a demand response mechanism would accommodate situations where the customer's actual consumption exceeds their baseline.²⁸⁵

Energy Queensland considered that any demand response mechanism should also accommodate generation curtailment as a means of demand response during peak generation periods.²⁸⁶

Tesla considered that a wholesale demand response mechanism should also accommodate exports of electricity, as this would lead to the most efficient market outcomes.²⁸⁷ Tesla noted that requiring DRSPs to act as scheduled loads would not accommodate this.²⁸⁸

The **AEC** considered that the existing settlement framework already encourages innovation and competition between retailers, as well as between demand response aggregators.²⁸⁹

F.5

Commission's analysis and conclusions

BOX 9: DRAFT RULE

The settlement model proposed under the draft rule has the following key features:

- AEMO would bill retailers for two separate charges in the wholesale market - the customer's actual consumption and the difference between the actual and baseline level of consumption
- retailers would bill customers for their actual consumption
- retailers would recover the discrepancy between what they recover from the customer and what they are charged in the wholesale market (that is, the difference between

282 EnergyAustralia, submission to consultation paper, p. 10.

283 Enel X, submission to consultation paper, p. 27.

284 AEMO, submission to consultation paper, p. 12.

285 AGL, submission to consultation paper, p. 12.

286 Energy Queensland, submission to consultation paper, p. 18.

287 Tesla, submission to consultation paper, p. 4.

288 Ibid, p. 5.

289 AEC, submission to consultation paper, p. 3.

baseline and actual consumption) from the DRSP, via AEMO's settlement process. This amount would be calculated based on wholesale demand response reimbursement rates (reimbursement rates) as discussed below.

Benefits of draft rule

The Commission considers that the settlement and cost recovery model applying under the draft rule addresses a number of significant issues associated with other models proposed by the rule change proponents. In particular, the proposed settlement model would:

- 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.

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. This section sets out the Commission's analysis of three potential approaches to settlement under the demand response mechanism that were set out above. These approaches are summarised in Table F.1.

Table F.1: Comparison of approaches to settlement and cost recovery

NO.	SUMMARY	WHOLESALE MARKET	RETAIL MARKET	COST RECOVERY
1	Retailer recovers the value of demand response provided directly from the participating consumer (analogous to	Retailer is billed based on its customer's baseline level of consumption	Retailer bills its customer based on the baseline level of consumption	The retailer recovers the difference between actual and baseline consumption from the customer when it bills the customer at the baseline. This difference is paid to the DRSP via AEMO, at the wholesale rate.

NO.	SUMMARY	WHOLESALE MARKET	RETAIL MARKET	COST RECOVERY
	model proposed by PIAC, TEC and TAI and SA Government)			
2	Retailer recovers the value of demand response provided from all consumers	Retailer is billed based on its customer's baseline level of consumption	Retailer bills its customer based on the actual level of consumption	<p>The retailer recovers the difference between actual and baseline consumption at retail rates from either:</p> <ul style="list-style-type: none"> all of the retailer's customers, or all of the retailer's customers that are providing demand response. <p>This difference is paid to the DRSP via AEMO, at the wholesale rate.</p>
3	Retailer recovers the value of demand response provided from the DRSP (model applying under the draft rule)	Retailer is billed based on its customer's baseline level of consumption. This is split into two amounts by AEMO: <ul style="list-style-type: none"> its customer's actual level of consumption the difference between its customer's actual and baseline consumption. 	Retailer bills its customer based on the actual level of consumption	<p>The retailer recovers the difference between actual and baseline consumption from the DRSP, at the reimbursement rate. The net payment made to the DRSP by AEMO is reduced by this amount.</p>

The Commission considers that the first two options in the table above present a number of significant issues relating to practicality, implementation costs and market design principles.

On that basis, the Commission has developed a settlement model which addresses a number of these issues 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. In particular, the settlement model applying under the draft determination would:

- 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.

Further analysis of each of the options in Table F.1 is set out below.

F.5.1

Recover the value directly from the participating consumer

The primary benefit of this model is that, by recovering the difference between the customer's actual and baseline consumption from the participating customer, the retailer is not exposed to the unhedgeable costs associated with smeared cost recovery and there is a clear method for recovering the amount which needs to be paid to the DRSP for the demand response provided.

However, the key practical implication of this settlement model is 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 change their existing retail billing systems to facilitate the substitution of actual consumption data for baseline consumption data for demand response customers. Such changes would be complex and time-consuming, particularly given the changes market participants are already undertaking to implement a number of other regulatory reforms, including five minute settlement. Further, the Commission understands that the required changes would be the most significant contributor to the implementation costs for retailers under this settlement model - costs which would ultimately be borne by consumers. These costs can largely be avoided if retailers are instead able to continue to bill customers based on their actual consumption, as this would reduce the necessary changes to retailer billing systems.

Some stakeholders have suggested that, under a wholesale demand response mechanism, retailers could make manual adjustments to their retail bills to substitute data for individual customers providing demand response as required, and decide for themselves when the number of participating customers becomes large enough to warrant making the necessary changes to their systems. However, the Commission understands that manually adjusting bills may not be practical for all retailers. In addition, as retailers would have no ability to influence the number of their customers providing wholesale demand response, retailers would have little ability to plan for making the necessary systems changes. The Commission considers alternative models under which the retailer can continue to bill all customers for actual consumption, and thereby avoid any retail billing system changes and associated implementation costs, to be preferable.

Billing customers for baseline consumption also has the potential to create confusion, particularly for residential customers. Under this approach, a customer's bill will show that the customer is paying their retailer for electricity consumption based on a baseline level, some proportion of which the customer did not actually consume. If the consumer tried to match the baseline consumption on their bill to their actual metered consumption there would be a discrepancy, which may lead to confusion, increased complaints by customers to retailers and potentially further disengagement from the retail sector.

In addition, by billing the customer at the baseline, there would be a risk that price signals from the local network service provider (i.e. through network tariffs) would be blunted. As the customer would be required to pay at the baseline, the customer would be paying the network component of the tariff at the baseline as well, despite a lower level of physical consumption. This could result in a situation where a consumer would not be able to respond to price signals to provide wholesale demand response through a DRSP, and at the same time respond to coincident price signals from their distributor. As a result, there is a risk that the mechanism could stifle network demand response under this settlement model.

However, having the retailer billing the customer only based on their actual consumption preserves the effect of price signals from the distributor to the consumer. This allows the consumer to better capture multiple value streams for demand response. As such, consumers will be able to respond to price signals conveyed by the DRSP and by the network service provider.

F.5.2

Recover the value from all consumers

An alternative approach is to allow retailers to continue to bill customers for actual consumption. This involves recovering the value of the payment to the DRSP for providing demand response from all, or a specific subset, of the retailers' consumers (e.g. smearing the costs across only consumers that provide demand response).

The key advantage of this approach is that it avoids the implementation costs associated with retailers needing to change their retail billing systems to accommodate charging customers for baseline consumption. While changes would still be required to AEMO's systems to bill retailers for baseline consumption in the wholesale market, the total system change costs are expected to be much lower than if all retailers were also required to update their systems. This approach may also reduce the potential for confusion amongst customers, given that their retail bill would still reflect their actual metered consumption of electricity.

However, the Commission considers there are some significant issues with this model:

- A common concern expressed by retailers in relation to costs that must be recovered in a smeared manner from all customers is that such costs are very difficult to incorporate into retailers' hedging strategies, thereby exposing their customers to greater risk posed by high prices.
- This approach would effectively result in a wealth transfer from those customers of a retailer who are not providing demand response to those customers of that retailer who do provide demand response.

- Even if retailers were to only recover the cost from their demand response customers in order to avoid imposing costs on non-participating customers, this would result in an allocation of costs between those customers providing demand response, penalising those customers who participate less often.

F.5.3

Recover the value from the DRSP

The Commission has sought to develop a settlement and cost recovery model which addresses the issues described in the two models above, while also allowing retailers to continue to bill customers for actual consumption. This could be considered a pragmatic combination of the two options discussed above.

This section therefore describes this settlement and cost recovery model, which is adopted under the Commission's draft rule. The Commission considers that this approach addresses a number of issues associated with the models discussed above. In particular, the model developed by the Commission seeks to:

- minimise the extent of the changes required to AEMO's settlement systems
- avoid any significant changes to retailer billing systems
- allow the value of wholesale demand response to be recovered indirectly from the participating customer.

The key features of this settlement model are discussed in detail below.

Wholesale market billing

Under the model, 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). However, rather than being charged for a single amount by AEMO (i.e. for the baseline level of electricity consumption), the retailer will be charged for two separate amounts, both at the spot price:

- its customers' actual consumption (in accordance with the existing settlement process)
- the difference between its customers' actual and baseline consumption for those participating in wholesale demand response.

The Commission considers that there are a number of advantages to this model. The key benefit of this approach is that it still allows the retailer to be charged for the customer's baseline consumption in the wholesale market while reducing the scope of the changes to AEMO's systems required to facilitate this. This is because the customer's actual consumption would continue to be settled in the wholesale market in accordance with existing systems and processes. However, separating out the two amounts charged to the retailer allows the second amount, being the difference between the baseline and actual consumption, to be dealt with through a separate settlement system and process to be developed by AEMO. This would effectively serve as a new settlement process for the demand response provided by the customer, which is additional to the customer's actual consumption.

The Commission understands through discussions with AEMO that this approach is preferable to the settlement models proposed by the rule change proponents, whereby AEMO would

charge the retailer for a single amount reflecting their customer's baseline level of consumption. AEMO has advised that it is likely to be cheaper and faster to build a new settlement system for demand response which operates in conjunction with the existing settlement system, because such a system can be developed in isolation without requiring further changes to existing systems (which are already undergoing significant changes to facilitate the implementation of other regulatory reforms). In contrast, if AEMO were to only charge retailers for a single amount reflecting the baseline consumption (as illustrated in Figure F.1 and Figure F.3), the changes required to facilitate this would need to be integrated into AEMO's existing settlement systems, which would be a complex and costly exercise. Accordingly, the approach proposed under the draft rule is likely to reduce the implementation costs and time frames in relation to AEMO's settlement systems compared to the approaches proposed by the rule change proponents.

AEMO would need to review its existing guidelines and procedures relating to settlement, and may need to develop new guidelines and procedures, to account for the changes to the settlement process described above.

Retail billing

Retailers would continue to bill customers based on their actual electricity consumption under the approach set out in the draft rule. The Commission considers that there is a significant benefit to this approach, as it avoids substantial changes to retailer billing systems. As discussed above, the Commission understands that the changes to retailers' systems which would be required to facilitate billing customers for their baseline level of consumption 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 approach also ensures that the existing retail billing process (i.e. retailers charging customers for actual consumption) would continue to align with the existing settlement process (i.e. AEMO charging retailers for actual consumption).

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 any 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 response. This means that the 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 their customer is participating in the mechanism.

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. In the scenario described in Figure F.2 above, the "missing" \$5 which the retailer doesn't directly recover remains with the

consumer, as they have only paid for their actual energy consumption rather than their baseline consumption. This amount therefore represents the difference between the actual and baseline consumption multiplied by the customer's retail rate. This 'missing money' amounts to the costs to the retailer to manage its exposure to the wholesale market to the baseline level that the retailer is not recovering from its consumers by charging for actual consumption.

Under the settlement model set out in the draft rule, this cost would be recovered from the customer via the DRSP through AEMO's settlement process. This would address the missing money issue and not impose any unmanageable costs on that retailer or its customers.

The amount the retailer is not recovering in Figure F.2 is equal to the difference between the customer's actual and baseline consumption (i.e. the demand response provided)²⁹⁰ multiplied by the customer's retail tariff - in that example, 5 kWh multiplied by \$1/kWh. The amount payable by the DRSP to the retailer would then be accounted for by AEMO in the net amount payable by AEMO to the DRSP (for the demand response provided)²⁹¹ and the net amount charged by AEMO to the retailer (for electricity purchased in the wholesale market).²⁹² 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.

The flows of money and information between the customer, the retailer, AEMO, the DRSP and the metering data provider (MDP) under this settlement model are worked through in Box 10.

BOX 10: COSTS RECOVERED FROM DRSP

A DRSP sees forecasts of high prices and calls on a consumer (with whom it has a pre-existing commercial relationship) to reduce consumption. The consumer's baseline level of consumption is centrally determined to be 15 kWh. The wholesale price reaches \$10/kWh and the consumer reduces its actual consumption to 10 kWh.

Financial flows between retailer and AEMO

In the wholesale market, the retailer purchases:

- the customer's actual consumption at the wholesale price
- the difference between the customer's actual consumption and their baseline level of consumption at the wholesale price.

These payments are depicted in Figure F.4 below.

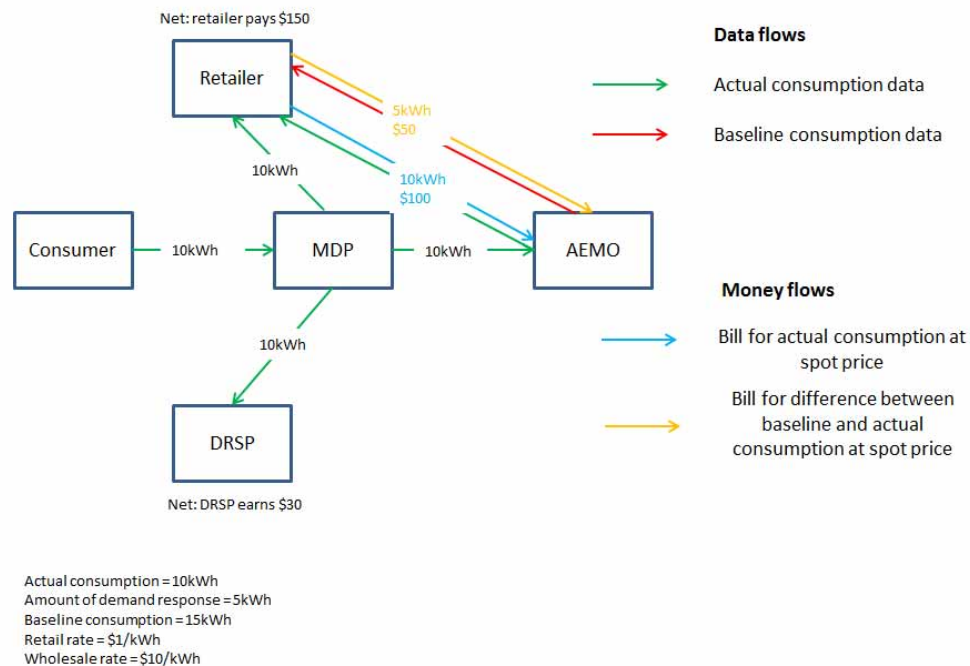
²⁹⁰ This amount is the "wholesale demand response settlement quantity" calculated under clause 3.15.6B(c) of the draft rule.

²⁹¹ This amount will be calculated under clause 3.15.6B(a) of the draft rule.

²⁹² This amount will be calculated under clause 3.15.6B(b) of the draft rule.

Figure F.4: Settlement model under the draft determination - worked example (1 of 4)

DRSP pays retailer for lost recovery via AEMO



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

These financial flows are calculated as follows:

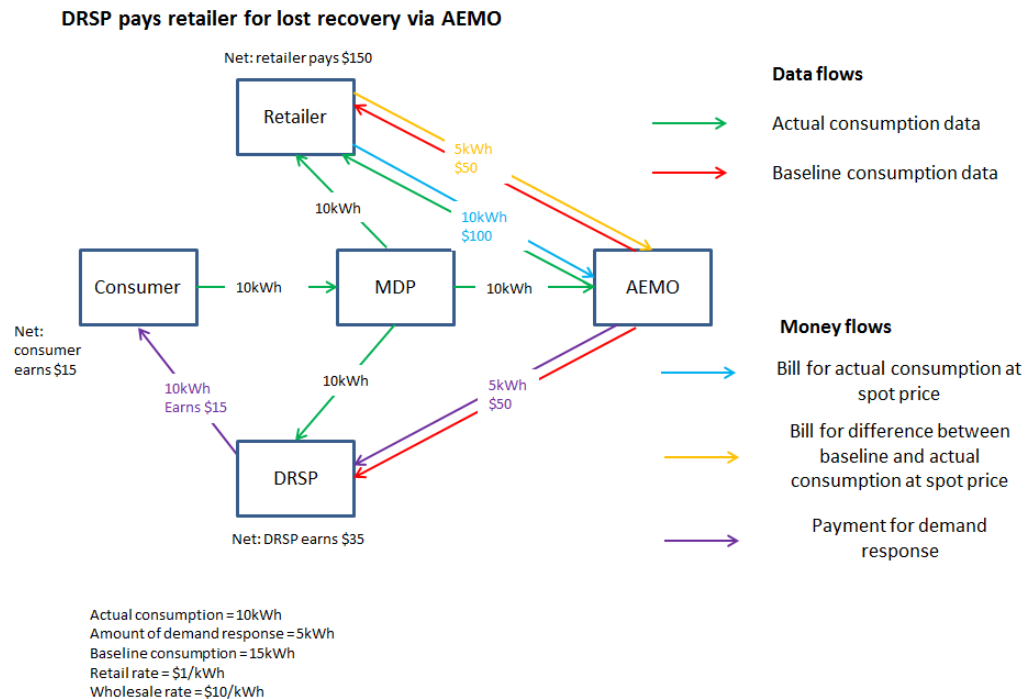
- Payment from retailer to AEMO = baseline consumption (15 kWh) x wholesale rate (\$10/kWh)

As discussed above, it is expected that establishing a new settlement process for AEMO to charge the retailer for the demand response provided by the customer (in addition to the existing process for charging for the customer's actual consumption) would reduce the extent of the changes required to AEMO's settlement systems while allowing the retailer to be charged for the baseline level of consumption in the wholesale market.

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 consumer. These payments are depicted in Figure F.5.

Figure F.5: Settlement model under the draft determination - worked example (2 of 4)



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

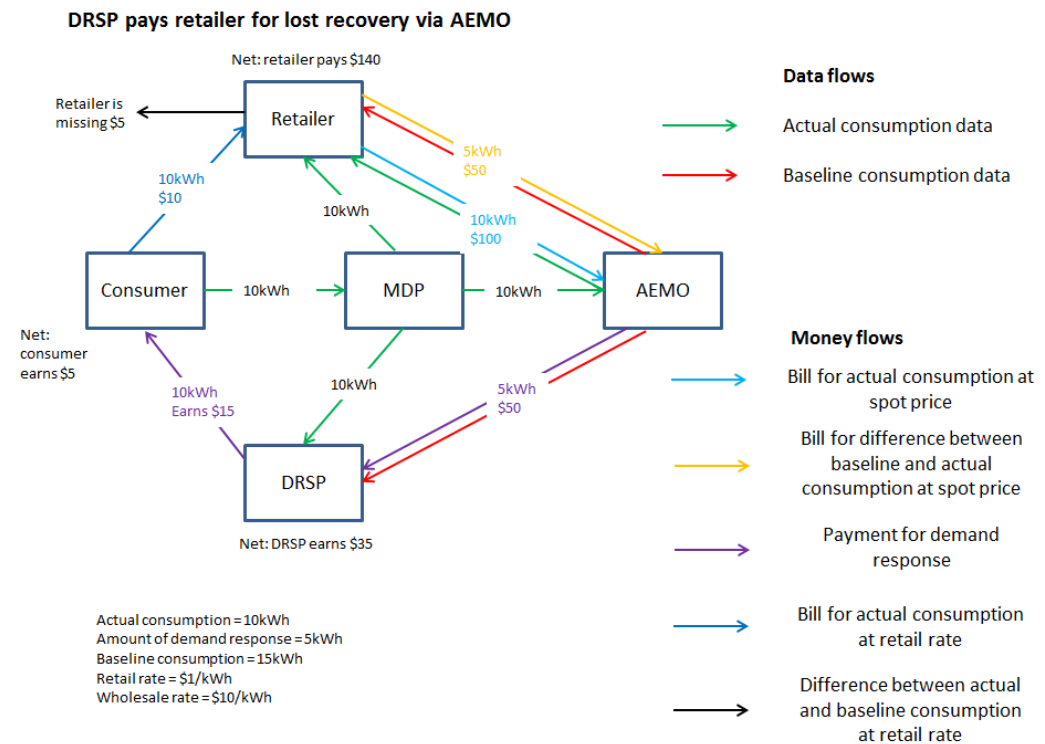
These financial flows are calculated as follows:

- Payment from AEMO to DRSP = difference between baseline and actual consumption (5 kWh) x wholesale rate (\$10/kWh)
- Payment from DRSP to customer is calculated in accordance with the commercial agreement between the parties.

Financial flows between customer and retailer

The retailer would charge the customer for its actual energy consumption at the customer's retail rate. This payment is depicted in Figure F.6.

Figure F.6: Settlement model under the draft determination - worked example (3 of 4)



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

This financial flow is calculated as follows:

- Payment from customer to retailer = actual consumption (10 kWh) x retail rate (\$1/kWh)

Importantly, as discussed above, facilitating the retailer continuing to bill the customer for 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, as discussed in relation to the settlement model set out in the background section of this appendix and Figure F.2, if the retailer is only charging the customer for actual consumption it is not left whole, as it paying for the customer's baseline level of consumption in the wholesale market.

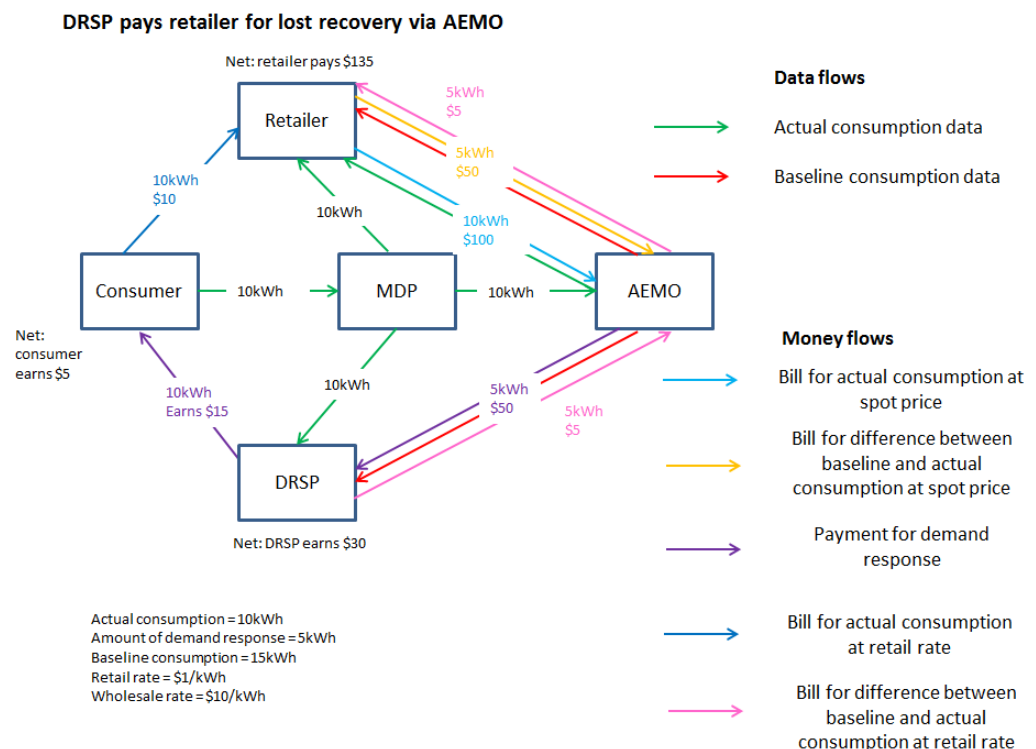
The settlement model applying under the draft rule addresses this issue by providing for the retailer to recover this amount from the DRSP, via AEMO's settlement process.

Financial flow from DRSP to retailer

The amount the retailer does not recover from its customer is equal to the difference between baseline consumption and actual consumption multiplied by the customer's retail rate. Under this settlement model, the DRSP would be charged for this amount by AEMO and

this payment would flow through to the retailer in settlement. This payment is depicted in Figure F.7.

Figure F.7: Settlement model under the draft determination - worked example (4 of 4)



Note: There may also be a flow of data between the consumer and the DRSP where the DRSP has installed monitoring devices on the consumer's equipment or appliances.

This financial flow is calculated as follows:

- Payment from DRSP to retailer (via AEMO) = Difference between baseline and actual consumption (5 kWh) x retailer rate (\$1/kWh)

This payment allows the retailer to recover the same amount as it would if it billed the customer at the baseline, without incurring the costs associated with changing its billing systems.

Summary

Over the course of the hour:

- The consumer has reduced consumption and only consumes 10 kWh over the hour. The consumer pays the retailer \$10 for the actual amount of energy, 10 kWh. The retailer subsequently purchases the baseline amount of energy, 15 kWh, from the wholesale market for \$150 (noting that this is the sum of the two separate amounts charged to the retailer).

- The DRSP is credited \$50 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 third party and the consumer. This assumes that the amount the DRSP shares with the customer is reduced compared to the scenario illustrated in Box 7 to account for the amount to be recovered from the DRSP by the retailer.
- The retailer is left whole, as it recovers the difference between the baseline and actual consumption, 5 kWh, at the retail rate, \$1/kWh, from the DRSP (via AEMO).²

Consumption above the baseline

In the event that the customer's actual consumption goes above their baseline in a wholesale demand response dispatch interval, the financial flows depicted in Figure F.7 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 means that the DRSP is exposed to both the positive, as well as negative, monetary flows, which the Commission considers is appropriate. This payment would flow through to the customer's retailer, through AEMO.

Behind-the-meter generation

In some circumstances, 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). The customer's actual consumption would be below zero during those periods. The settlement model set out in the draft rule would 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 (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.

1. This amount is the outcome of the calculation under clause 3.15.6B(a) of the draft rule. 2. The retailer's net payment of \$135 is the outcome of the calculation under clause 3.15.6B(b) of the draft rule.

This settlement model places each party involved in the same net position they would be in under the settlement model proposed by PIAC, TEC and TAI and the South Australian Government and set out in Figure F.1. The key difference is that under the settlement model in the 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.

How is the payment from the DRSP to the retailer calculated?

Under this approach, 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 average retail rate, excluding the retail margin, for that particular type of customer, excluding 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. It may 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 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 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.

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.

This approach requires an objective and transparent process for determining the reimbursement rate. In the Commission's view, the AER is the most appropriate body to perform this task, given that it has existing functions relating to the monitoring of wholesale electricity markets.²⁹³ Accordingly, the draft rule confers the function of determining the reimbursement rate on the AER.²⁹⁴ The reimbursement rate is to be calculated based on the average spot prices for the previous 12 months and will be determined on a quarterly basis.²⁹⁵ The AER will provide the reimbursement rate to AEMO for application in settlement to calculate the payment from the DRSP to the retailer.

The reimbursement rate will not 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 may 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 compared to the likely high prevailing spot prices when demand response is in effect. Retailers may also over-recover in some cases and under-recover in others and it would be anticipated that these outcomes will approximately balance over time. 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 any case, 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.

The Commission considers that the model adopted under in the draft determination is preferable to one in which retailers are required to make significant and costly changes to their billing systems (i.e. the model set out in appendix f.3.1) or are required to recover the costs from all consumers (i.e. the model set out in appendix f.3.2). Therefore, while there may be minor discrepancies arising from the reimbursement rate, the Commission considers that the benefits gained far outweigh these costs.

²⁹³ NEL, Part 3, Division 1A.

²⁹⁴ Clause 3.15.6B(f) of the draft rule.

²⁹⁵ Ibid.

G SYSTEMS CHANGES

G.1 Overview

The draft rule has a number of implications for systems within AEMO, retailers and metering data providers. These systems changes are necessary under the draft rule to accommodate the introduction of DRSPs into market settlement.

This appendix sets out the implications of the draft rule for:

- AEMO systems
- retailer systems
- MDP operations.

This appendix sets out:

- background to the systems changes introduced in, or that may be needed as a result of, the draft rule
- a summary of relevant views from the proponents
- a summary of relevant stakeholder comments
- the Commission's analysis and conclusions.

This appendix is closely related to the settlement model introduced under the draft rule, discussed in appendix F, and should be read in conjunction with that appendix.

G.2 Background

G.2.1 Overview of roles under existing framework

There are three main roles relating to data flows under the existing framework that would be impacted by the draft rule:

- **Metering data providers:** MDPs are responsible for collecting metering data from meters and providing it to AEMO and the relevant parties, including the retailer. The retailer and AEMO use this information for billing.
- **Retailers:** retailers receive metering data for each NMI from the MDP. This data is used for customer billing purposes. Retailers have a number of systems in place to incorporate this data and produce a customer bill. Retailers also receive a bill for wholesale settlement from AEMO, based on the information supplied to AEMO by the MDP.
- **AEMO:** AEMO receives metering data from the MDP. This information is processed by AEMO for wholesale market settlement.

These three participants currently enable end-user consumption to be billed by the retailer and settled with AEMO in the wholesale market. The following section provides a high-level overview of the information flows that facilitate settlement.

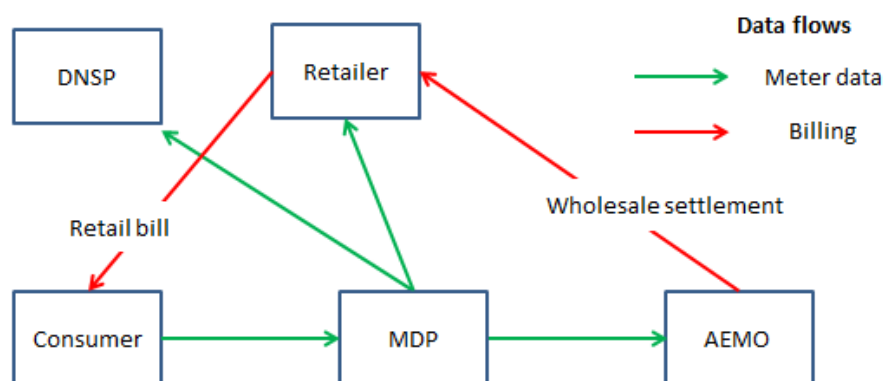
G.2.2 Information flows under existing market framework

Under the current arrangements, there are a number of systems and frameworks that link consumer metering data to settlement. In summary:

- Consumer electricity use is measured and recorded at the consumer meter
- The MDP is required to read that meter and send information to AEMO and to the FRMP (typically a retailer)
- The metering data for each NMI goes into MSATS at AEMO. In MSATS:
 - 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.
- After the data to be used for settlement is approved in MSATS, reports are made available by AEMO to assist participants (i.e. the FRMP) in reconciling the information from AEMO with the information received by MDPs.
- The metering data sent from the MDP to the retailer is used for individual customer billing. Retailers take the metering data and send the consumer a bill based on the appropriate tariff.
- AEMO's EMMS would send bills to retailers based on the consumption for which they are responsible in the wholesale electricity market.

This is shown diagrammatically below.

Figure G.1: Information and billing flows under existing arrangements



Source: AEMC

The processes are set out in the NER and AEMO procedures.

G.3

G.3.1

Proponents' views

PIAC, TEC, TAI

In their rule change request, PIAC, TEC and TAI made limited reference to the systems changes needed to accommodate their proposal. The proposal would require a number of changes to systems to be made to accommodate the introduction of baselines into

settlement, with the most significant changes being made to AEMO and retailer billing systems. The proponents noted there should be:²⁹⁶

- confirmation of a DRSP's right to request a review of B2B decisions
- little or no impact on retailer operations. They considered the costs of retailer system changes, as reported in a 2013 Seed Advisory report,²⁹⁷ to be unsubstantiated. Further, they noted that under their proposal, retailers would not be required to update automated systems. Instead, they can opt to manually modify data until such a time as the cost of doing so is higher than the cost of system upgrades.

They noted that with regard to procedures governance, reporting requirements, prudentials and consequential changes, the AEMC should consider the *Demand response mechanism and ancillary services unbundling* rule change request submitted to the Commission in by the COAG Energy Council in 2015.²⁹⁸

G.3.2

AEC

The AEC's proposal had minimal impact on existing systems as it sought to leave the current settlement arrangements untouched. It would have introduced an additional negotiation process between retailers and demand response aggregators.

G.3.3

South Australian Government

The South Australian Government noted that its proposal would impact on market participant systems, including AEMO's settlement systems, but noted that the extent of the impact was unclear. The South Australian Government suggested the Commission should consider these costs in assessing the proposal.²⁹⁹

G.4

Stakeholder comments

A number of stakeholders commented in submissions to the consultation paper on the changes to retailers' and AEMO's systems which may be required to implement a wholesale demand response mechanism as proposed by PIAC, TEC and TAI. Relevant comments included:

- **Meridian Energy** noted that the introduction of demand response providers and baselining techniques would require significant upfront development costs, especially given the significant impact on data management, billing and metering processes and systems. Based on their experience from other recent rule changes involving substantial systems changes, they estimated that the costs to Powershop (owned by Meridian Energy) could exceed \$1 million, or \$10 per customer, in the first year.³⁰⁰

²⁹⁶ PIAC, TEC, TAI, *Wholesale demand response mechanism - rule change request*, pp. 10-11, 14, 18.

²⁹⁷ Seed Advisory, *The case for a Demand Response Mechanism in the NEM: An assessment*, December 2013.

²⁹⁸ This rule change request is available on the AEMC's website: <https://www.aemc.gov.au/rule-changes/demand-response-mechanism>

²⁹⁹ South Australian Government, *Mechanisms for wholesale demand response - rule change request*, p. 11.

³⁰⁰ Meridian Energy, submission to consultation paper, p. 6.

- **AEMO** noted that it currently obtains operational visibility of scheduled generators at a 4-second resolution through the SCADA system. It suggested that alternative means of obtaining operational visibility of demand response loads should be explored, as it is anticipated that many resources that could participate in DRSP portfolios in future may not be connected to SCADA. AEMO is investigating this through its VPP demonstrations, in which participating VPPs submit operational data for their aggregated fleets on a five-minute resolution, refreshing every five minutes.³⁰¹
- **Tesla** expressed support for the approach taken by AEMO in the VPP demonstrations, where asset data is collected in aggregate at five minute intervals. Tesla suggested that this will provide full transparency without the additional administrative implications arising from being treated as a Scheduled Load.³⁰²
- **AGL** identified a number of changes to its systems that would be required to facilitate the implementation of a demand response mechanism, including:³⁰³
 - updating the meter data upload process and systems to accommodate a second data stream for baseline data – AGL anticipates that this system upgrade will be the most expensive aspect of implementing the reform for its systems.
 - updating the billing process, including:
 - reformatting customer bills as needed
 - adding new lines to bills to include different data streams
 - calculating the difference between baselines and actual meter data
 - updating the reconciliation process and settlement process to take into account demand response volumes
- **AGL** also cautioned against incorporating additional reforms into the five-minute settlement / global settlement implementation process.³⁰⁴
- **PIAC** suggested that previously reported estimates of implementation costs are not grounds for rejecting a wholesale demand response mechanism, given the potential benefits the mechanism would provide to the market. PIAC also suggested a number of methods to reduce the upfront costs of implementing a demand response mechanism, including:³⁰⁵
 - allowing retailers to settle with both consumers and networks on baseline consumption (as distinct from 'split' calculation for settling the wholesale charges on the baseline and network charges on actual consumption) until the systems changes required to implement global settlement and five minute settlement are completed
 - requiring DRSPs to become the meter provider for connections they contract with during a specified transitional period.

301 AEMO, submission to consultation paper, p. 9.

302 Tesla, submission to consultation paper, p. 4.

303 AGL, submission to consultation paper, p. 10.

304 AGL, submission to consultation paper, p. 11.

305 PIAC, submission to consultation paper, p. 14.

- **ERM Power** noted a number of challenges associated with the required systems changes, including:³⁰⁶
 - retail systems are designed to receive actual values from meter data and use this for billing purposes – it was unclear to ERM how retailers could receive a notice to tell them that consumption data for certain trading intervals is to be replaced by a baseline value
 - it would need to duplicate billing, forecasting and settlement systems to enable the baseline values to be incorporated, which is a complex and costly endeavour
 - its systems, and likely those of other retailers as well, are not designed to be manually adjusted, meaning changes would be required to maintain the integrity of these systems if a demand response mechanism is implemented
 - it rejected the suggestion that implementation costs may be lower due to the changes required to implement systems changes for the five-minute settlement rule change, as additional changes to cater to a wholesale demand response mechanism would alter the scope of existing systems changes already underway.
- **Alinta** noted that substantial implementation costs will be associated with changes to AEMO's settlement processes, billing systems, dispute mechanisms, baseline construction and metering and other associated infrastructure investments, on an ongoing basis to facilitate demand response.³⁰⁷
- The **AEC** noted that changing billing and settlement systems would be a significant impost on the industry.³⁰⁸
- **Enel X** provided the following comments:³⁰⁹
 - If AEMO and retailers are unable to provide detailed costing information about the required systems changes, it may be prudent to develop a mechanism that applies to large customers first (presumably requiring fewer system upgrades) and then move to incorporate small customers at a later stage once the benefits of the mechanism are tested.
 - The billing and settlement functionality required for wholesale demand response is likely to be very similar to that which is currently required for generators in embedded networks. In such an arrangement, retailers subtract the metered 'sub-consumption' from the parent meter to determine the net load for billing purposes. However, Enel X acknowledged that under a demand response mechanism, retailers would need to know the baseline consumption rather than metered consumption in order to make these calculations.
 - Customer participation in a wholesale demand response mechanism is likely to be gradual. Enel X considers that retailers would not be forced to incur significant costs to upgrade their billing and settlement systems to accommodate wholesale demand response by their entire customer base in the early stages of the mechanism. Rather,

³⁰⁶ ERM Power, submission to consultation paper, p. 6.

³⁰⁷ Alinta, submission to consultation paper, p. 4.

³⁰⁸ AEC, submission to consultation paper, p. 3.

³⁰⁹ Enel X, submission to consultation paper, pp. 18-20.

Enel X suggested that retailers can take a more manual approach while the number of participating customers is small, and implement a fully-automated approach at a time that is convenient for them, and in a way that is reflective of participation levels. It also suggested that synchronising the implementation of a wholesale demand response mechanism with that of five-minute settlement would seem an obvious approach.

- **Energy Queensland** noted that the addition of further systems modifications concurrent to those required for five minute settlement and global settlement would add greater complexity to those work programs and potentially extend the time frame required for implementation.³¹⁰
- **EnergyAustralia** noted that five minute settlement predominantly impacts energy trading and wholesale settlement systems, whereas the demand response mechanism would mostly impact on retail billing systems. Given the different systems and business expertise required, EnergyAustralia suggested that these changes would likely be implemented separately with negligible savings from joint implementation. EnergyAustralia suggested that joint implementation could create resourcing pressures for businesses leading to increased risk of implementation delays or issues.³¹¹
- **The South Australian Government** identified two approaches which it considers may limit the costs associated with changing AEMO's systems:³¹²
 - Allow demand response to be bid into the wholesale market using the Market Customer registration category, with the market load classified as scheduled load
 - Develop rules for a limited transitional mechanism that would not prohibit AEMO using the NEM pre-production dispatch engine to manage the demand response market.
- **Ready Energy** suggested that there would be significant benefits to the use of a standard platform that provided all essential data to all DRSPs and AEMO, as well as data that could be used by consumers to compare demand response products and services. It also noted that a standard platform would enable a customer to easily migrate between DRSPs if desired. In effect, such a platform would provide a type of Metering Provider and/or MDP to DRSPs.³¹³

G.5

Commission's analysis and conclusions

BOX 11: DRAFT RULE

The draft rule:

³¹⁰ Energy Queensland, submission to consultation paper, p. 14.

³¹¹ EnergyAustralia, submission to consultation paper, p. 21.

³¹² South Australian Government, submission to consultation paper, p. 2.

³¹³ Ready Energy, submission to consultation paper, p. 19.

- would require AEMO to update a number of systems and procedures to accommodate the introduction of DRSPs. These systems include MSATS and market settlement systems, and the related procedure documents.
 - MSATS will need to store new standing data for NMIs relating to the allocation of a DRSP, the load type and the baseline methodology. There would also need to be procedures updated to allow DRSPs to request changes to NMI standing data.
 - The market settlement systems would need to be able to settle retailers and DRSPs for the amount of demand response provided. This would be set up as separate settlement system to the existing settlement system.
- would require MDPs to provide metering information to DRSPs in addition to the participants they currently provide with meter data.
- would require B2B Procedures to facilitate B2B Communications between the DRSP and other existing market participants.

Benefits of the draft rule

The draft rule would require a number of systems changes to accommodate the introduction of DRSPs. These systems changes would facilitate the settlement of DRSPs for wholesale demand response.

G.5.1

Information flows under draft rule

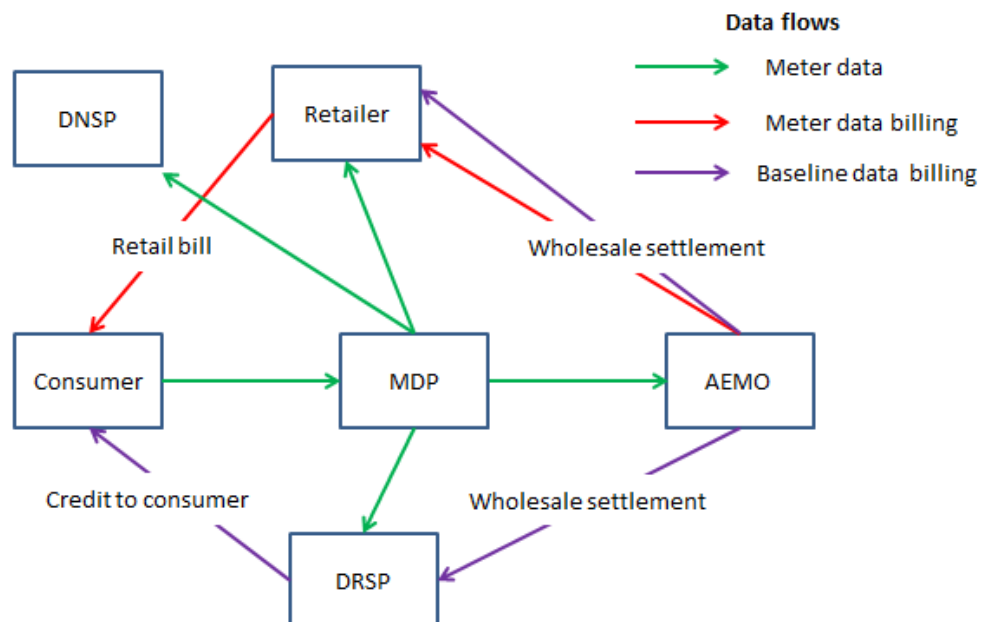
The draft rule would result in some changes to the current arrangements as they relate to the flows of information and billing. In summary, the information flows under the draft rule are:

- 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 at AEMO. 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 consumption in the wholesale electricity market. AEMO would need to determine a baseline methodology. This

methodology would be used to generate baselines for demand response loads, allowing AEMO to quantify the amount of demand response provided. AEMO would then use this information to separately settle the retailer and the DRSP for the wholesale demand response.

This is shown diagrammatically below.

Figure G.2: Arrangements under the draft rule



Source: AEMC

In addition to these information flows, there would also be information provided by the DRSP that will need to be accommodated in MSATS. This information includes:

- **The approved baseline methodology:** this would be used for determining the baseline for the load at that NMI, which will in turn be used for market settlement, discussed in appendix E.
- **The load type:** this would be used for determining the appropriate reimbursement rate applicable to the load at that NMI. This is also detailed in appendix F.
- **The DRSP:** MSATS would need to 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.

G.5.2

Changes to AEMO systems

The changes to AEMO's systems would predominantly relate to MSATS. However, there would also be implications for its settlement systems.

There are also changes to dispatch procedures to accommodate the dispatch of demand response. This is detailed in appendix C.

The rationale for some of the changes to AEMO's systems is set out in appendix F, which details the settlement model introduced under the draft rule.

MSATS

The Market, Settlements and Transfer Solution (MSATS) system is a system maintained by AEMO which stores for each NMI:

- standing data pertaining to that NMI, including the entities responsible for the various roles associated with a NMI, such as the financially responsible market participant (e.g. the retailer), the party responsible for metering, the distribution network service provider etc.
- the metering data associated with the NMI.

The processes for transferring customers or changing roles and compiling data for market settlement are all implemented via MSATS.

As a result of the draft rule, MSATS would need to be updated to accommodate a number of changes. These changes include:

- new fields for standing NMI data relating to:
 - whether a customer has a DRSP and, if so, the identity of the DRSP
 - the selected baseline methodology for the NMI
- a process for transferring NMIs between DRSPs
- allowing DRSPs to retrieve NMI standing data.

AEMO would also need to ensure there is a process in MSATS 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 a change request. To do so, it must provide the necessary information to accompany its change request.
 - AEMO would need to undertake an eligibility check. This check would assess whether the DRSP is a registered participant, and the DRSP has entered into an arrangement with the customer. If the request passes the eligibility check, the transfer would automatically occur. If the eligibility check fails, AEMO would automatically lodge an objection. Unless more information is provided by the DRSP, the request would be cancelled.
 - The existing DRSP and retailer would be notified of the transfer under the same time frames that apply to the transfer of retail customers between retailers (as of the date the amending rule enters into force).
 - The MDP and MC roles would not change with a change of DRSP.

- A DRSP can submit a request to end its relationship with a NMI (in circumstances where the customer is not transferring to a new DRSP):
 - AEMO would also need to undertake an eligibility check.
 - If this is approved, the retailer would receive a notification.
- AEMO's procedures would need to outline the appropriate time frames for facilitating the above processes.

EMMS/market settlement systems

The draft rule introduces a settlement model for wholesale demand response. This would require AEMO to either change its existing market settlement systems or introduce a new, separate system. The settlement system would 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.

G.5.3

Changes to retailer systems

The Commission understands from submissions to the consultation paper, discussions with the technical working group and bilateral discussions with stakeholders that, under the wholesale demand response mechanism proposed by PIAC, TEC and TAI, and the South Australian Government, retailers would need to modify their IT systems to facilitate the changes to their retail billing and wholesale settlement processes. Enabling these systems to incorporate an additional data stream for baseline electricity consumption and associated changes to the data reconciliation process would likely impose the significant and costly changes on retailers.

The Commission has sought to reduce the implementation costs faced by retailers by adopting the settlement model set out in appendix F. Under this approach, rather than billing customers based on baseline consumption as proposed by PIAC, TEC and TAI, retailers can continue to bill customers for actual consumption. The Commission understands that this may reduce the extent of the changes required to retailers' retail billing systems, thereby reducing the associated implementation costs. However, the Commission notes that retailer systems are not uniform and the specific systems changes required are likely to be different for each retailer. Further details on the proposed settlement model and the associated changes to data flows are provided in appendix F.

G.5.4

New obligations for MDP

Under the draft rule, the existing obligations on MDPs would remain, including their obligation to provide metering data to all registered participants with a financial interest in the energy measured by the meter.³¹⁴ This would now extend to DRSPs.

³¹⁴ Clause 7.15.5(c)(1) of the NER.

MDPs send metering data to participants using the B2B e-Hub. The B2B e-Hub is an electronic information exchange platform that is provided, operated and maintained by AEMO to facilitate B2B communications. It was established to enable participants to transact with each other.

Under the draft rule, MDPs would be required to send consumer metering data to a DRSP when one is allocated to that NMI.³¹⁵ 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 draft 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.

³¹⁵ Clause 7.15.5(f)(5) of the draft rule.

H

H.1

OTHER CHANGES

Overview

This appendix sets out a number of additional measures which the Commission considers to be complementary to the implementation of a wholesale demand response mechanism. These supplementary changes 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 appendix include:

- increasing the utility of AEMO's demand side participation (DSP) portal
- 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.

Some of the measures identified involve changes to the NER under the draft rule, while others do not require changes to the rules and can be progressed separately from this rule change process.

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: DRAFT RULE AND DRAFT RECOMMENDATIONS

The draft rule:

- requires AEMO to review the Demand Side Participation Information (DSPI) Guidelines to reflect the changes to the demand side reporting requirements under the draft 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 AEMO to publish additional information regarding the demand side participation information submitted using the DSP Portal.

The draft 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
- easy access is provided by retailers 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
- is interested in stakeholders' views on the existing APC Compensation Guidelines and whether changes are necessary to clarify the circumstances in which different parties can claim compensation following the application of the APC and ensure the guidelines adequately deal with compensation for wholesale demand response providers
- recommends that retailers commit in the Energy Charter to facilitating greater access to demand response products and services for customers.

Benefits of draft rules and draft recommendations

The draft rules and the areas for further work highlighted in the draft determination would, 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.

H.2.1

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 the 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.³¹⁶

This has now been implemented through the creation of AEMO's demand-side participation portal.³¹⁷

³¹⁶ 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>.

³¹⁷ For more information, see: https://www.aemo.com.au/-/media/Files/Stakeholder_Consultation/Consultations/Electricity_Consultations/2017/DSPIG/Demand-Side-Participation-Information-Guidelines.pdf.

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 provided to AEMO through the portal should include information in relation to³¹⁸:

- 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.

In 2018, the first year in which reports were due, there was a low level of compliance amongst market participants with the requirement to submit their data to AEMO's online portal within the specified time frames. We understand from participants that this was due in part to a lack of communication about the portal, as well as functionality issues which made the portal difficult to understand and use effectively. This was flagged in the AER's quarterly compliance report for April to June 2018.³¹⁹ The AER noted that, due to a lower than expected number of participants submitting demand side participation data to AEMO by the deadline of 30 April 2018, the deadline was extended to 8 May 2018. Despite this extension, it was estimated that more than half of the total expected responses were not received by the extended deadline.

As a result, AEMO did not receive sufficient demand side participation information in time to be included in its 2018 *Electricity Statement of Opportunities* publication. This year, market participants were required to submit their data to AEMO's online portal by 30 April 2019.

We understand from informal consultation with stakeholders that participants' concerns about the portal have not been resolved at this time. These concerns include:

- It is 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 current functionality of the DSP portal makes it very difficult to capture information about all the demand response within a participant's customer portfolio when reporting to AEMO.³²⁰

³¹⁸ NER clause 3.7D(e)(1).

³¹⁹ AER, *Quarterly Compliance Report – April to June 2018*. Available at: <https://www.aer.gov.au/system/files/Quarterly%20Compliance%20Report%20-%20April%20to%20June%202018.PDF>.

³²⁰ 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 a registered participant.

- The DSPI Guidelines do not provide sufficiently clear guidance on the types of information AEMO expects to receive.
- There is a lack of clarity about how AEMO uses the information submitted to the DSP portal.

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 considering other elements of the rules, and how they relate to demand response. 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 the DSP portal is intended to increase the visibility of demand response that would not otherwise be visible to AEMO, the Commission considers that there is no need to require DRSPs to report information on wholesale demand response through the DSP portal. DRSPs are required to submit detailed information to AEMO when classifying a load as a demand response load (see appendix b) and this form of demand response will be scheduled and therefore visible to AEMO. It may be efficient for AEMO to report on demand response provided by DRSPs³²¹ at the same time as it reports on the demand side participation information submitted through the DSP portal.³²²

Therefore, the draft 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.

Changes to demand side participation information reporting requirements

The draft rule:

- specifies that DRSPs are not required to report using the DSP portal in respect of wholesale demand response³²³
- requires entities that do not have any demand side participation information for a period to report that fact to AEMO³²⁴
- 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).³²⁵

Changes to how AEMO deals with demand side participation information

The draft rule:

³²¹ Under clause 3.10.6 of the draft rule

³²² Under rule 3.7D(c) of the draft rule.

³²³ Clause 3.7D(a) of the draft rule; Without such a change, the DSP reporting requirement would automatically apply to DRSPs as DRSPs will be registered participants. NER rule 3.7D(b) requires registered participants to report to AEMO.

³²⁴ Clause 3.7D(b)(2) of the draft rule.

³²⁵ Clause 3.7D(e) of the draft rule.

- increases access to information about wholesale demand response by requiring AEMO to make the following information on retailer-led and network-led wholesale demand response publicly available (without disclosing any confidential information):³²⁶
 - 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 when reporting such information.³²⁷

The draft rule requires AEMO to publish an annual report each year setting out the information specified above.

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.³²⁸

The Commission also notes that under the draft rules for the Retailer Reliability Obligation (RRO), a “demand side participation contract” will only be a qualifying contract for the purposes of the RRO if it is also registered in the DSP portal.³²⁹ This is likely to provide a greater incentive for participants to ensure that all such contracts are registered in the DSP portal once the RRO comes into effect.

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.³³⁰

Further, requiring AEMO to publish information relating to retailer-led and network-led wholesale demand response (based on information submitted to the DSP portal) and DRSP-led wholesale demand response (based on market data for the previous 12 months) will:

- provide greater guidance and transparency to retailers and network service providers about how the information they submit to the DSP portal is used by AEMO
- provide the market with guidance on the level of participation in, and effectiveness of, the demand response mechanism
- assist market participants in developing more accurate demand forecasts, potentially leading to more efficient operational and investment decisions.

³²⁶ Clause 3.7D(c) of the draft rule.

³²⁷ Clause 3.7D(c)(2) of the draft rule.

³²⁸ Clause 3.7D(b)(2) of the draft rule.

³²⁹ ESB, *Retailer Reliability Obligation – Draft Rules Consultation Paper*, 8 March 2019. Available at: <http://www.coagenergycouncil.gov.au/publications/energy-security-board-%E2%80%93-retailer-reliability-obligation-draft-rules-consultation-paper>

³³⁰ Clause 3.7D(b) of the draft rule.

The Commission also understands that the DSP portal does not currently capture information about a potentially substantial proportion of wholesale demand response in the NEM due to limitations in the functionality of the portal. This significantly reduces the utility of the portal, as AEMO is not receiving complete information on the levels of wholesale demand response in the market. Accordingly, the draft rule requires AEMO to undertake a review of the DSPI Guidelines³³¹ 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. The amended DSPI Guidelines are to be published by 31 December 2020 in order to allow participants to review the amended Guidelines before commencing their next round of data submissions when the DSP Portal opens on 31 March 2021.

Reporting by AEMO on DRSP-led wholesale demand response

The draft rule also requires AEMO to publish the following information on DRSP-led wholesale demand response (without disclosing any confidential information):³³²

- the number of registered DRSPs
- the number and capacity of loads classified as demand responsive loads
- the average demand response capacity of individual loads and aggregated demand response portfolios
- the amount of demand response bid in the wholesale market under the demand response mechanism
- the amount of demand response dispatched in the wholesale market under the demand response mechanism, as well as the frequency of dispatch
- analysis of the spot price levels at which wholesale demand response was dispatched
- relevant trends, including year-on-year changes, in the above data over time.

The draft rule requires AEMO to publish an annual report each year setting out the information specified above.

The Commission considers that these changes complement the other reforms required to facilitate the implementation of a wholesale demand response mechanism.

H.2.2

Energy Made Easy website

Background

Energy Made Easy³³³ is a price comparison website developed and maintained by the Australian Energy Regulator (AER) in accordance with the NERL³³⁴ and the AER's Retail Pricing Information Guidelines (RPIG).³³⁵ The purpose of the RPIG is to provide guidance to

³³¹ Clause 11.118.6 of the draft rule

³³² Clause 3.10.7 of the draft rule.

³³³ See www.energymadeeasy.gov.au.

³³⁴ NERL section 62.

³³⁵ Available at <https://www.aer.gov.au/retail-markets/retail-guidelines-reviews/retail-pricing-information-guidelines-2018>.

retailers on the presentation of standing offer and market offer prices in order to assist small customers to consider and compare such offers.³³⁶ The RPIG may specify:³³⁷

- the manner and form in which details of standing and market offer prices must be presented when publishing, advertising or notifying the AER of those prices or any variation;
- the types of market offers to be provided for the purposes of Energy Made Easy, including by reference to areas, classes of small customers or tariff classes;
- any additional matters the AER considers necessary or convenient to assist customers to consider and compare offers by retailers.

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 and market offer plans offered by retailers if the AER considers that such additional information would achieve the purpose of a price comparator.³³⁸

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 2), 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
- easy access is provided by retailers 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 amongst consumers and would allow consumers to make more informed choices when considering such products. Increasing

³³⁶ NERL, section 61(2).

³³⁷ NERL, section 61(3).

³³⁸ NERL section 62(5).

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 participants are required to submit would allow consumers and retailers to make better informed decisions in relation to the provision of wholesale demand response (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 incentives and helping to expose the efficient level of wholesale demand response in the NEM over time.

The Commission therefore considers that the AER should explore when and how the above two proposed modifications to Energy Made Easy, as well as an equivalent to Energy Made Easy for DRSP demand response offers to small customers, may be implemented. 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 would allow consumers to make more informed choices when considering DRSP demand response contracts.

Given that the NERR has not been adopted in Victoria, the Victorian Government administers its own price comparison website for energy products.³³⁹ 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 these changes.

H.2.3

Relationship between CPT and APC and wholesale demand response

Background

Recent 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 \$221,100.³⁴⁰ 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

³³⁹ See <https://compare.energy.vic.gov.au/>.

³⁴⁰ AEMC, *Schedule of Reliability Settings*, February 2019. Available at: <https://www.aemc.gov.au/sites/default/files/2019-02/Schedule%20of%20reliability%20settings%20%28MPC%20and%20CPT%20for%202019-20%29.pdf>.

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.³⁴¹ The APC also seeks to maintain the overall integrity of the NEM by limiting market participants' financial exposure to sustained high prices, while 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.³⁴² 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.³⁴³ 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

³⁴¹ 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>.

³⁴² NER clause 3.9.3A(d).

³⁴³ 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>.

occurring at the time could have been exacerbated, leading to either more RERT 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 recent final determination for the *Enhancement to the RERT* rule change that the Panel may turn its mind to the reliability standards and settings sooner depending on the outcome of the AER's VCR estimates, which are due to be published in late 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 to consider the APC on its own.

However, the Commission considers that the issues being raised in relation to the APC in the context of wholesale demand response are relatively self-contained. 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, before it undertakes the next RSSR. 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 were to occur, this would allow the Panel to be better prepared when it does turn its mind to the next RSSR, particularly given the large number of market changes it will have to take account of. The conclusions from this scoping exercise can be used as an input into the next RSSR.

The Commission is interested in stakeholder views on this matter, i.e. should the Commission direct the Panel to undertake a stand-alone scoping exercise of how the APC is set in a world where there is a material level of wholesale demand response. This will inform the Commission's recommendation in the final determination.

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 AEMC has published a

set of guidelines about how this is determined, which were last reviewed in September 2016.³⁴⁴ 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 (NSPs) to supply energy; ancillary service providers to supply ancillary services; and market participants with scheduled loads to consume energy during price limit events.³⁴⁵ It is not clear that demand response neatly falls into one of these definitions. While scheduled loads can make a claim if they face a net loss, the consideration of this in the guidelines is if an administered floor price in the region applies, not an administered price cap. Accordingly, the draft rule makes minor changes to the NER to clarify that DRSPs can claim compensation following the application of an APC.³⁴⁶ The Commission may also consider undertaking a further review of these guidelines to determine whether changes are necessary to clarify the circumstances in which different parties can claim compensation and ensure the guidelines adequately deal with compensation for wholesale demand response providers.

H.2.4

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.

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. Given the important role of demand response in the current, and future, energy system, the Commission recommends that retailers commit to facilitating greater access to demand response products and services for customers.

The Commission considers that this may be something that retailers could consider including in the recently launched Energy Charter, which has a focus on "embedding a customer-centric culture and conduct in energy businesses to create tangible improvements in affordability and service delivery".³⁴⁷ The Charter states that it will be periodically reviewed and improved to reflect changing expectations and learnings,³⁴⁸ with the first review to follow the publication of the first Accountability Panel Evaluation Report in November 2019. This review would be an opportune time to incorporate a commitment in the charter in relation to the facilitation of wholesale demand response participation in the NEM.

344 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>.

345 NER clause 3.14.6.

346 Clause 3.14.6 of the draft rule.

347 *The Energy Charter*, January 2019. Available at: <https://www.theenergycharter.com.au/publications>.

348 *Ibid*, p. 6.

The Commission noted in its *2019 Retail Energy Competition Review* that the Commission supports the approach from energy businesses to improve consumer outcomes through the Energy Charter and encourages more widespread adoption of the Energy Charter.³⁴⁹ 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.

349 AEMC, 2019 Retail Energy Competition Review, June 2019. Available at: <https://www.aemc.gov.au/market-reviews-advice/2019-retail-energy-competition-review>.

I IMPLEMENTATION AND CONSEQUENTIAL CHANGES

I.1 Overview

This chapter sets out the steps and timetable for implementing the final rule, including the interim steps that will need to be taken by AEMO. The chapter also discusses consequential changes to other aspects of the rules arising from the draft rule.

The substantive parts of the rule implementing the wholesale demand response mechanism would commence on 1 July 2022. 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 Commission has received indications from AEMO that the wholesale demand response mechanism is not able to be implemented prior to that time, in order to best co-ordinate the substantial changes that need to be in place by mid-2021 and the complementary changes that would need to be made to accommodate the mechanism. AEMO will continue to consider whether this implementation date can be revised.

However, some aspects of the draft rule which relate to specific processes or matters unrelated to the implementation of the mechanism will commence earlier. The final rule would also contain transitional clauses, commencing on the date the rule is made. This chapter sets these out.

The consequential changes arising from the draft rule discussed in this chapter relate to the interaction between the mechanism and:

- the Reliability and Emergency Reserve Trader
- the Retailer Reliability Obligation
- the definition of the reliability standard
- the compensation framework for directed participants.

I.2 Stakeholder views

This section sets out stakeholder comments on implementation time frames for a wholesale demand response mechanism and any associated consequential changes.

Some stakeholders suggested that aligning the implementation of a wholesale demand response mechanism with the start date for five minute settlement may provide efficiency benefits and reduce the upfront costs and time frames for the systems changes required by retailers.³⁵⁰ A number of retailers contended that this is an incorrect assumption and that implementing a wholesale demand response mechanism in conjunction with five minute settlement may increase the costs, complexity and time frames associated with this process.³⁵¹ Additional stakeholder comments on the systems changes required to implement five minute settlement and other ongoing reforms are set out in appendix g.

³⁵⁰ BlueScope Steel, submission to consultation paper, p. 7; PIAC, TEC and TAI, submission to consultation paper dated 31 January 2019, p. 17.

³⁵¹ EnergyAustralia, submission to consultation paper, p. 21; AGL, submission to consultation paper, p. 11; Energy Queensland, submission to consultation paper, p. 15; ERM Power, submission to consultation paper, p. 6.

Meridian Energy considered that simple proposals to promote transparency of demand response could be implemented in a relatively short time frame (e.g. 12 to 18 months).³⁵² It acknowledged that the implementation of more complex proposals involving DRSPs will require significantly longer time frames (e.g. 24 to 36 months) and transitional arrangements.³⁵³ Meridian Energy also commented that a staged approach commencing with increased transparency, followed by the identification of potential further action, would assist in managing time frames, costs and risks.³⁵⁴

PIAC, TEC and TAI noted that it may be appropriate to put in place transitional measures for settlement, metering and scheduling until global settlement is introduced in February 2022 in order to minimise implementation costs for retailers and AEMO.³⁵⁵

Energy Queensland considered that the wholesale demand response register proposed by the AEC would potentially have the shortest implementation time frame of the three rule change proposals due to the comparatively minimal system and process changes required.³⁵⁶

The **AEC** noted that the developing nature of demand response at a residential level was the basis for the suggestion in its rule change request that any rule change be reviewed three years after it takes effect.³⁵⁷

Flow Power suggested that any arrangements for demand response will need to fit into other regulatory arrangements, such as a RRO.³⁵⁸ Similarly, **Origin Energy** noted that consideration should be given to impact on other related reforms, such as five minute settlement, the RERT, and the short term forward market.³⁵⁹

BlueScope Steel suggested that it would be beneficial to implement a rule change for a wholesale demand response mechanism in combination with a short-term forward market.³⁶⁰

I.3

Commission's analysis and conclusions

I.3.1

Implementation

The implementation of the wholesale demand response mechanism set out in the draft rule will require a range of changes to existing systems and processes used by market participants and AEMO, including in relation to central dispatch, settlement, metering data, forecasting, participant registration and contract management.

The Commission has considered the scope and complexity of these changes, as well as their interactions with other ongoing regulatory reforms, in determining the implementation time frames applying under the draft rule.

352 Meridian Energy, submission to consultation paper, p. 8.

353 Ibid.

354 Ibid.

355 PIAC, TEC and TAI, submission to consultation paper, p. 5.

356 Energy Queensland, submission to consultation paper, p. 19.

357 AEC, submission to consultation paper, p. 3.

358 Flow Power, submission to consultation paper, p. 2.

359 Origin Energy, submission to consultation paper, p. 3.

360 BlueScope Steel, submission to consultation paper, p. 1.

Systems changes

The Commission understands that AEMO and market participants are dedicating substantial amounts of time and resources towards progressing systems and procedural changes required to facilitate a number of regulatory reforms. The most significant of these is five minute settlement, which will commence on 1 July 2021. The final rule to change the settlement period for the electricity spot price from 30 minutes to five minutes was made by the Commission on 28 November 2017.³⁶¹ The implementation time frame for five minute settlement was intended to give industry time to adjust to this major change which affects the spot and contract markets, metering and IT systems. The full commencement of five minute settlement will also coincide with the "soft commencement" of the global settlements rule change, which moves settlements of the demand side of the wholesale electricity market from the current "settlements by difference" framework to a "global settlements" framework.³⁶²

Given the scale and complexity of the changes to IT systems required to facilitate the commencement of these reforms by 1 July 2021, the Commission understands from AEMO that it would not be feasible for the additional systems changes required to facilitate the wholesale demand response mechanism to be incorporated into this process.³⁶³ Aligning the commencement of the mechanism with the existing commencement date for five minute settlement and global settlements as suggested by PIAC, TEC and the Australian Institute, may risk delaying the commencement of all of these reforms, as this would disrupt the existing implementation plans being progressed by AEMO and market participants and would add significant complexity to this process. AEMO has advised the Commission that significant work on the implementation of the mechanism is unlikely to be able to be progressed until after five minute settlement has commenced.³⁶⁴ The relevant systems required to accommodate the mechanism will also require extensive testing before they are used in the operation of the spot market.

In addition to feedback provided to the Commission from AEMO, this has also been emphasised by feedback provided to the Commission in submissions on the consultation paper, by the technical working group and in bilateral meetings with stakeholders.

The Commission expects that some changes to systems and processes to implement the mechanism will be able to be progressed prior to the commencement of five minute settlement. Further, the framework of the mechanism set out in the draft rule seeks to minimise the scope of the changes required to AEMO's and retailers' systems to accommodate the mechanism. Accordingly, the Commission anticipates that the full range of

361 AEMC, *Five Minute Settlement* rule change - final determination, November 2017. Available at: <https://www.aemc.gov.au/rule-changes/five-minute-settlement>.

362 AEMC, *Global settlement and market reconciliation* rule change - final determination, December 2018. Available at: <https://www.aemc.gov.au/rule-changes/global-settlement-and-market-reconciliation>.

363 This was recognised by some stakeholders, such as Energy Queensland, who noted that the addition of further system modifications would undoubtedly add greater complexity to these work programs and potentially extend the time frame required for implementation. See: Energy Queensland, submission to consultation paper, p. 16.

364 For more information on AEMO's implementation program for five minute settlement, see <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>.

changes required to implement the mechanism could be finalised in a relatively timely manner following the commencement of five minute settlement.

Impacts on contract positions

The Commission acknowledges the important role financial contracts play in the electricity market. The contract market enables retailers to deliver price stability for consumers, and allows them to secure financing for their own operations. The Commission understands based on feedback from stakeholders that, following the implementation of the wholesale demand response mechanism, retailers are likely to contract to cover their exposure up to their baseline level of energy consumption, as this is the amount they will be required to purchase in the wholesale market for customers providing demand response under the mechanism. However, the baseline level of consumption should reflect the amount the customer would have consumed in the absence of providing wholesale demand response. Accordingly, the retailer's exposure in the wholesale market will be approximately the same regardless of whether their customer is participating in the wholesale demand response mechanism. Nevertheless, the Commission acknowledges that the implementation of the mechanism may require retailers to make adjustments to their risk management strategies and incur administrative costs associated with the renegotiation or replacement of existing contracts. The Commission considers that adopting an adequate transition period prior to the mechanism commencing will assist retailers in managing these changes.

Development of new documents and processes

AEMO and market participants will need to revise a range of existing processes, as well as develop new processes, guidelines and procedures, prior to the implementation of the mechanism. In AEMO's case, this will include the development of comprehensive wholesale demand response guidelines. These guidelines will need to specify a range of important matters relating to the mechanism, including:³⁶⁵

- the technical requirements which must be met in order for a DRSP to classify a load with AEMO as a demand response load, including requirements relating to metering, wiring, communications and telemetry and any other matters AEMO considers relevant
- the evidence or information DRSPs would need to provide to AEMO to satisfy these requirements
- the baseline methodology metrics
- AEMO's approach to the development, testing and amendment of baseline methodologies
- the process for market participants to submit baseline methodologies to AEMO for approval.

The Commission expects that the time frames for publication of these guidelines will also impact on the ability of prospective DRSPs to prepare for the commencement of the mechanism, as the guidelines will set out requirements that will have implications for the ability of DRSPs to participate in the mechanism.

³⁶⁵ Clause 3.10.1 of the draft rule.

A number of existing guidelines, procedures and other documents will also need to be revised prior to the commencement of the wholesale demand response mechanism (e.g. MSATS and market settlement systems, and related procedure documents, will require revision by AEMO).

Implementation time frames under the draft rule

The Commission acknowledges the feedback from market participants in relation to the magnitude of the changes required to support the implementation of five minute settlement and the time frames within which these changes can be made. The Commission is of the view that a transition period can be used to mitigate the costs and the risks associated with implementing the wholesale demand response mechanism.

If the Commission makes a final rule that reflects the draft rule, the aspects of the final rule that implement the wholesale demand response mechanism will commence on 1 July 2022.³⁶⁶ This reflects the shortest time that the Commission believes is reasonable to enable market participants and AEMO to manage the implementation risks, particularly with respect to IT system changes, taking into consideration the impacts of other regulatory reforms. During the transition period AEMO will undertake market readiness planning and implementation activities in consultation with market participants.

The following specific aspects of the draft rule will commence before 1 July 2022:

- Schedule 2 of the draft rule, which includes the changes to the obligations on AEMO and market participants 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 draft rule, which sets out the transitional rules relating to the establishment of the wholesale demand response mechanism, will commence on publication of the final rule, which is scheduled for 14 November 2019. The transitional rules relate primarily to the development or amendment of guidelines and procedures by AEMO and the AER.

The commencement dates for the various components of the draft rule are summarised in Table I.1.

Table I.1: Commencement time frames under the draft rule

SCHEDULE OF AMENDING RULE	PARTS OF THE NER COVERED BY SCHEDULE	COMMENCEMENT DATE OF SCHEDULE
1	Chapter 2 - Registered participants and registration	1 July 2022
2	Rule 3.7D - Demand side participation information	31 March 2021

³⁶⁶ This includes Schedules 1, 3, 4 and 5 of the draft rule.

SCHEDULE OF AMENDING RULE	PARTS OF THE NER COVERED BY SCHEDULE	COMMENCEMENT DATE OF SCHEDULE
3	Chapter 3 (except rule 3.7D) - Market rules	1 July 2022
4	Chapter 4 - Power system security Chapter 4A - Retailer Reliability Obligation Chapter 7 - Metering	1 July 2022
5	Chapter 10 - Glossary	1 July 2022
6	Chapter 11 - Savings and transitional rules	On publication of the final rule (14 November 2019)

1.3.2

Consequential changes

The wholesale demand response mechanism to be implemented under the draft rule impacts on various aspects of the current market design. As such, it is important to consider whether additional changes 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.

Reliability and emergency reserve trader

On 2 May 2019, the Commission made a final rule on the *Enhancement to the Reliability and Emergency Reserve Trader (RERT)* rule change.³⁶⁷ 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 Commission's final rule provides AEMO with the flexibility and appropriate discretion when using the RERT (or emergency reserves) in a transparent manner to manage the transition in the power system, while minimising costs to consumers.

A key element of the Commission's final determination was the clarification of the out-of-market provisions in the NER. 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.

³⁶⁷ AEMC, *Enhancement to the Reliability and Emergency Reserve rule change - final determination*, May 2019. Available at: <https://www.aemc.gov.au/rule-changes/enhancement-reliability-and-emergency-reserve-trader>.

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 draft 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 draft 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 contract³⁶⁸
- 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.³⁶⁹

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 draft rule extends this obligation on AEMO to also apply to scheduled wholesale demand response.³⁷⁰ 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.³⁷¹ This will continue to be the case under the draft 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.

³⁶⁸ Clause 3.20.3(g)(1) of the draft rule.

³⁶⁹ Clause 3.20.3(g)(2) of the draft rule.

³⁷⁰ Clause 3.20.7(e)(1)(ii) of the draft rule.

³⁷¹ Clause 3.15.9 of the NER.

The draft 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 mechanism³⁷²
- 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.³⁷³

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.³⁷⁴

Retailer Reliability Obligation

The package of law and rule changes implementing the Retailer Reliability Obligation (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 will form 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'.³⁷⁵

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 Commission does not consider that any changes are required to the rules which give effect to the RRO to account for the implementation of the wholesale demand response 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

³⁷² Clause 11.118.7 of the draft rule.

³⁷³ Clause 11.118.5(a)(3) of the draft rule.

³⁷⁴ 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>.

³⁷⁵ 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.

respect to the actual level of consumption, or the baseline level of consumption, of the retailer's customers.

Under the demand response mechanism, retailers will have no foresight of whether their customers may be dispatched for wholesale demand response over this period. 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 generally be assessed with regard to actual levels of consumption, as is the case under the current RRO rules. However, in order to manage the risk of the retailers' compliance obligations being distorted if they have a number of customers in relationships with DRSPs, the Commission considers that the current rule appropriately provides that the baseline level of consumption for any customers that were dispatched for wholesale demand response will be used for the purposes of determining retailers' compliance obligations.

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.³⁷⁶ 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.

To the extent that the operation of the wholesale demand response mechanism impacts on AEMO's demand forecasts at the resolution of the *Electricity Statement of Opportunities* (ESOO), this will result in revised demand forecasts for the time period where retailers are expected to comply with the RRO. Given that the obligations imposed on retailers will apply to their actual demand, the Commission does not consider that this introduces any material issues in this regard.

The draft 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

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

³⁷⁶ Submissions to consultation paper: Enel X, p. 19; Meridian Energy, p. 4.

³⁷⁷ Clause 4A.E.1 of the draft rule.

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.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 standard can be met by a combination of generation, inter-regional transmission elements *and* wholesale demand response. This is because 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.

On that basis, the draft rule clarifies the definition of the reliability standard in the NER by amending this clause to expressly include a reference to wholesale demand response.³⁸⁰ This change ensures that the rules expressly reflect the way wholesale demand response is currently treated with respect to the reliability standard.

Payment to Directed Participants

The NER currently provide for scheduled generators, semi-scheduled generators, market generators, market ancillary service providers, scheduled network service providers and market customers to be the subject of a direction by AEMO.³⁸¹ 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 state.³⁸² In those circumstances, the directed participant is entitled to recover compensation for the service provided in order to comply with the direction.³⁸³ AEMO's power to issue a direction under the rules would not extend to DRSPs, as the direction must relate to a "scheduled plant" or "market generating unit", which will not capture DRSPs under the draft rule.³⁸⁴ The Commission considers that allowing AEMO to direct DRSPs could have very significant implications for customers within the relevant scheduled 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 such, 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 draft rule.

The Commission notes that the existing definition of "directed participant" expressly includes market ancillary service providers (MASPs). Given that this registration category is combined

³⁷⁸ Clause 3.9.3C(a) of the NER.

³⁷⁹ Chapter 10 of the NER.

³⁸⁰ Clause 3.9.3C(a) of the draft rule.

³⁸¹ Clause 4.8.9(a1)(1) of the NER.

³⁸² Clause 4.8.9(a)(1) of the NER.

³⁸³ Clause 3.15.7(a) of the NER.

³⁸⁴ Clause 4.8.9(a1)(1) of the NER.

with DRSPs under the draft rule, the draft 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). However, while MASPs are referenced in the definition of "directed participant", it does not appear that AEMO's existing ability to direct a registered participant extends to a MASP, as ancillary services loads do not fall within the definition of a "scheduled plant" or "market generating unit" in respect of which AEMO can issue directions. Accordingly, the Commission is interested in stakeholder feedback on whether it is appropriate to remove any reference to DRSPs from the definition of "directed participant", such that this definition would also cease to capture DRSPs in their capacity as market ancillary service providers.

J SUMMARY OF OTHER ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the stakeholder submissions on the consultation paper on 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 J.1: Summary of other issues raised in submissions

STAKEHOLDER	ISSUE	COMMISSION RESPONSE
Benefits of demand response		
AEMO, p. 3.	Advanced intelligence in the networks, and increased levels of DER investment that supports more elastic and flexible price-responsive demand, can become an asset for supporting reliability in a more efficient manner if they can be relied upon by AEMO.	The Commission agrees. The draft rule promotes transparent wholesale demand response that should contribute to reliable power system outcomes.
AEMO, p. 4.	Demand response may be able to provide new services once a bidding and dispatch capability is developed under the proposed mechanisms. This could include voltage support or reactive power services.	In its system security work, the Commission will continue to consider the frameworks to deliver the necessary system services, and the role for the demand side in delivering these services.
AEMO, p. 13.	Low or negative prices should incentivise load adjustments over time to take advantage of these prices during the middle of the day or night.	The Commission agrees. The mechanism would primarily facilitate wholesale demand response during periods of high demand associated with high spot prices.
ARENA, p. 3.	Significantly higher penetrations of near-zero marginal cost variable renewable energy sources may create market opportunities for demand response beyond current levels.	The Commission agrees. Flexibility on the demand side will become increasingly important to accommodate the increasing penetration of variable renewable generation and provide an alternative to peaking generation.
ARENA, p. 4.	The prevalence of demand response products may be influenced by relatively flat current wholesale market conditions.	The Commission acknowledges that there are a number of factors that contribute to the existing levels of wholesale demand response in the NEM.

STAKEHOLDER	ISSUE	COMMISSION RESPONSE
Energy Efficiency Council, p. 13.	This mechanism would deliver significant benefits by facilitating a rapid expansion in the level of demand response, potentially reducing costs for energy consumers by billions of dollars over the coming decade. The benefits of introducing a DRM would vastly outweigh the modest costs of implementing the DRM.	The Commission considers that the implementation of a wholesale demand response mechanism as set out in the draft rule would facilitate increased participation in wholesale demand response. The Commission has sought to develop a framework which minimises the costs associated with implementing the mechanism.
Views on the wholesale demand response mechanism		
Enel X, p. 9.	A demand response mechanism could improve liquidity in the contract market.	The Commission agrees and notes that DRSPs will be able to offer financial contracts for wholesale demand response.
BlueScope Steel, p. 4.	Wholesale demand response should reduce volatility especially as demand response providers may be more willing to help satisfy demand at prices less than the market price cap compared to peaking generators.	The implementation of a wholesale demand response mechanism would help to reveal the prices at which customers are willing to adjust consumption. Wholesale demand response may provide a cheaper alternative to peaking generation, making it an important resource as the penetration of variable renewable generation increases.
ERM Power, p. 3.	When prices volatility is high there is a strong case for demand response. Yet, as demand responds, volatility should decline, thereby reducing the incentive to engage in demand response. Naturally during periods of oversupply, the economic reward offered to customers will be lower – this is demonstration of market economics at play, not evidence that retailers are not offering	The Commission considers that providing third party demand response aggregators with direct access to the wholesale market will provide greater opportunities for consumers to respond to these price signals. This would in turn have the effect of reducing price volatility.

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	commercially competitive demand response terms.	
EnergyAustralia, p. 20.	Many retailers hold a short position to the market and wholesale demand response in this sense would be a highly valuable tool to manage exposure.	The Commission agrees.
EnergyAustralia, p. 10.	The proposed mechanism does not directly create new value for participating customers or the broader market.	While some consumers can access the value of wholesale demand response under the current regulatory framework, the mechanism would allow consumers easier and more competitive access this value and is expected to facilitate a more active and engaged demand side in the NEM over time.
Meridian Energy, p. 5.	As demand response is unlikely to address all issues of volatility and high prices it is unlikely to have significant impact on the need for capacity protection and therefore limited impact on long term wholesale price outcomes. It will however, provide valuable competition in the wholesale market at times of low reserves when competition is currently limited. This will assist in ensuring the wholesale market delivers fair prices.	Wholesale demand response can play an important role as a supply-side resource as the penetration of variable renewable generation in the power system increases. Increased competition in the wholesale market, particularly during times of low reserves, should lead to more efficient price outcomes. The mechanism would not address all of the issues contributing to volatility and high spot prices. In the long term, a move toward a two-sided market and greater demand side participation should promote more efficient wholesale market outcomes.
Meridian Energy, p. 6.	It is unclear whether the demand response mechanism will actually increase demand response significantly, given	The implementation of the wholesale demand response mechanism would not prevent retailers

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	the potential displacement of existing less visible programs.	from continuing to offer demand response products to customers. The Commission considers that increasing competition for such products would improve outcomes for consumers.
PIAC, p. 13	Retailers can manage their costs by deferring the modification of their systems at a later date while doing other routine upgrades (such as those that will be required for five minute settlement and global settlement), in the context of which the incremental cost of upgrades for the mechanism will be minor.	As set out in appendix F, the draft rule sets out a settlement model that should minimise the extent of systems changes required.
Consumer protections		
Energy Queensland, p. 10.	Particular attention will need to be given to consumer protections for small customers.	For the reasons outlined in chapter 4, the Commission decided to not apply the mechanism to small customers under the draft rule given the need to consider consumer protections in further detail as requested by a number of stakeholders.
PIAC, TEC and TAI, p. 5.	We understand that some stakeholders are concerned about the consumer protections implications of allowing small consumers to participate, and we consider that with careful consideration of these issues and amendments to the NERR as well as the NER, it is entirely practical to address these concerns.	
AGL, pp. 3-4.	It is vital to at least maintain the existing consumer protections and not expose customers to any risks, particularly small customers.	
Alinta, p. 6.	Under any potential structural changes to the AEMO, Retailer, FRMP relationship, that customers maintain the existing levels of protection.	
Embedded generation		

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Alinta, p. 5; Meridian Energy, p. 8.	Inclusion of embedded generation and storage accurately may be difficult.	The mechanism introduced in the draft rule would allow for the participation of embedded generation. To participate, it would need to demonstrate that a baseline can be determined that consistently meets the baseline methodology metrics. The settlement model set out in appendix F accommodates customers exporting electricity from their connection point while providing wholesale demand response.
ERM Power, p. 4.	Demand response of any variety, but especially behind the meter generation, should be separately metered.	
AusNet Services, p. 5.	Generation from embedded generators and storage can have the impact of either decreasing load through behind-the-meter supply or increasing generation (export from site). The proposed mechanism should be designed to accommodate embedded generation and storage.	
Existing levels of demand response		
Enel X, p. 5.	It may be informative for the AEMC to work out the efficient level of demand response.	The Commission does not consider that it would be possible to quantify the efficient level of demand response, since this depends on wholesale prices, technology prices, the processes driving consumption and other matters at a particular point in time.
Energy Efficiency Council, p. 1.	There is substantial evidence that the level of wholesale demand response in the NEM is below the economic potential.	
Origin Energy, p. 2.	There are factors that may limit the level of wholesale demand response, including reduced number of price spikes, other value streams for DR and customers participating in the RERT.	The Commission has considered the impacts of the RERT on the provision of wholesale demand response in appendix H.
Interaction with network services		
AusNet Services, p. 1; Energy	Any proposed mechanism should consider the impacts of	As set out in appendix C, the Commission has

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Networks Australia, p. 2.	load switching on networks and the application of operating limits to demand response that are similar to AEMO’s application of ramp up and ramp down limits to registered generators and market customers.	imposed ramp rates on wholesale demand response units that participate in the mechanism.
International experience		
AEMO, p. 5.	Demand response is a feature of almost every energy market around the world, including every US market, Japan, Korea, the UK and the WEM.	The Commission engaged Brattle Group to update its previous study into international markets, and how demand response has been incorporated. These lessons learnt have been incorporated into the draft rule.
Enel X, p. 19.	Enel X’s experiences in international markets has shown the significant benefits to consumers, demand response aggregators and the broader market by more explicitly enabling demand response to participate in the central dispatch process alongside generators. However, the costs of overly onerous regulatory requirements that cannot be minimised by DRSPs will erode the benefits to consumers and the broad provision of wholesale demand response.	
Origin Energy, p. 8.	International experiences with demand response mechanisms found that the demand side should participate through retail markets as opposed to directly participating in the wholesale market.	
Load shedding compensation mechanism (LSCM)		
AEMO, p. 9.	The implementation of such a mechanism would represent a retrograde step in that it would run the risk of entrenching the idea that demand response is only useful as load shedding tool.	The Commission is not proposing to progress the development of a load shedding compensation mechanism as part of this rule change.

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AGL, p. 19.	AGL notes that load shedding for reliability reasons occurs rarely and that AEMO and networks are responsible for deciding which customers are curtailed. Retailers are unlikely to be able to anticipate such a load interruption and therefore would not be in a position to forecast and contract greater levels to avoid the load shedding.	
AEC, p. 4.	This seems an excessively complex proposal to reallocate financial exposure to an infinitesimal amount of energy. Determining the energy volume to compensate would be very complex. The quantities are not measurable, and a new form of baselining would be required specific to reliability load shedding resulting in implementation costs and risks.	
Enel X, p. 31.	This mechanism would not in itself facilitate greater levels of wholesale demand response. It appears that its intention is to facilitate higher levels of reliability.	
Energy Networks Australia, p. 2.	The LSCM be considered by the Reliability Panel in its review of the reliability standard.	
Energy Queensland, p. 24.	Does not support the introduction of a LSCM as it is unclear how such a complex mechanism would work in practice, particularly with the RERT function and the obligations on retailers under the RRO.	
EnergyAustralia, p. 15.	Reliability-related interruptions account for a very small percentage of total supply interruptions. It is unclear that this mechanism would create additional value.	

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Flow Power, p. 2.	This proposal fails to appreciate the nuances and potential for demand response in the wholesale market. Instead, it reduces demand response to a brute force instrument of last resort.	
Origin Energy, p. 9.	The LSCM is unlikely to drive any additional benefits for consumers.	
PIAC, TEC and TAI, p. 3.	This option does not address the core principles, since it limits DR to emergency load shedding events.	
Meridian Energy, p. 12.	The RRO should be allowed to be implemented and assessed before additional obligations are place on retailers.	
Snowy Hydro, p. 19.	This includes numerous complexities although is an important proposal that requires more detail to properly understand and assess.	
Intelligent Energy Systems proposal		
Intelligent Energy Systems (IES) submission to consultation paper.	IES submitted an alternative proposal for facilitating wholesale demand response in the NEM. The proposal is contained in the IES submission available on the project page.	<p>The draft rule has not implemented the proposal set out in the IES submission.</p> <p>The Commission thanks IES for developing and submitting an alternative proposal for consideration.</p> <p>The proposal put forward by IES would provide an avenue for consumers to respond to price signals in the wholesale market and would not necessarily require the engagement of the retailer to do so.</p> <p>However, the proposal does not inherently</p>

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		<p>encourage wholesale demand response. For example, if the period under which this swap operated was at market price cap the whole time, there would be no incentive for the consumer to respond because the average price would be the same as the dispatch prices.</p> <p>Instead, the proposal incentivises arbitrage of price differentials within the swap period. Therefore, the proposal would indirectly encourage the consumer to respond to wholesale price but predominantly in periods of volatility and opposed to adjusting demand in peak conditions.</p> <p>It is also reliant on consumers forming an expectation regarding the average spot price to inform real time consumption decisions and informing the duration of the swap-style arrangement.</p> <p>The Commission was not convinced that this model would not introduce additional risks for retailers in managing their exposure to the wholesale market.</p> <p>As such, the Commission has decided to not introduce this proposal in the draft rule.</p>
Wholesale demand response mechanism		
AEMO, p. 7.	AEMO supports the proposals to provide direct access for	The Commission agrees. The draft rule would

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	third-party service providers and aggregators to offer WDR to the market.	implement a wholesale demand response mechanism that facilitates this.
Energy Consumers Australia, p. 4; EUAA, p. 1; LO3 Energy, p. 1; National Irrigators Council, p. 3; Coalition for Community Energy, p. 1.	These stakeholders support the introduction of a wholesale demand response mechanism.	
Enel X, p. 2.	It is difficult for consumers to participate in wholesale demand response because retailers are the only parties currently able to access the full value of wholesale demand response on behalf of their customers, but do not have a natural incentive to offer wholesale demand response products.	The draft rule would implement a wholesale demand response mechanism that address this barrier by allowing third party demand response aggregators to directly access the wholesale market.
Clean Energy Council, p. 1.	The development of a wholesale demand response mechanism should continue to encourage product innovation that delivers demand response, particularly from smaller and new entrant retailers, rather than potentially dissuade it.	The Commission considers that the framework for the wholesale demand response mechanism set out in the draft rule would facilitate innovation while ensuring that risks are appropriately allocated. The implementation of a wholesale demand response mechanism would not preclude retailers from offering demand response products.
Origin Energy, p. 1.	The uncertainty/firmness of demand response has generally meant that it cannot be relied on in significant volumes to manage risk, as retailers would likely need to over procure demand response capacity (to effectively increase its firmness) at a greater expense than procuring the equivalent cap contract cover.	Under the draft rule, the risk associated with the firmness of consumers' wholesale demand response would need to be managed by the DRSP.

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Meridian Energy, p. 4.	Do not believe regulatory solutions can address this issue and it is best addressed by retailers and other market participants who can accurately value their exposure.	The Commission considers that providing third party demand response aggregators with direct access to the wholesale market is necessary to overcome existing barriers to wholesale demand response in the NEM. See chapter 4 for more detail on the Commission's reasoning for its draft determination.
EnergyAustralia, p. 10.	Retailers are best placed to deliver the benefits of demand response to customers, either independently or in conjunction with demand response specialists, by optimally utilising DR within their portfolios to reduce the costs of supplying electricity.	
Flow Power, pp. 1-2.	The current spot market provides the correct value signals to incentivise demand response and provides a pathway for the permanent integration of a demand response mechanism into the spot market.	
Wholesale demand response register		
ACCC, p. 2.	The ACCC strongly opposes the register and considers any model that requires demand management providers to negotiate with gentailers would risk perpetuating the current barriers to the provision of demand response to smaller customers.	The Commission is not proposing to implement a wholesale demand response register as part of this rule change as discussed in chapter 4.
AEMO, p. 8.	The register mechanism proposal is unlikely to promote competition and consumer choice to the extent that would be achieved by the facilitation of direct market access for third-party wholesale demand response providers.	
Enel X, p. 16.	This model is unlikely to deliver the benefits of a competitive demand response market. Limiting the market to participants who have no natural incentive to offer demand response products, and have historically not done	

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	so to any significant degree, is unlikely to result in consumers having access to any more demand response products than are currently present in the NEM.	
Energy Efficiency Council, p. 15.	At best, this proposal would entail substantial transaction costs in the development of demand response capacity, reducing market efficiency. At worst, a retailer could significantly impede their customers from engaging third-party demand-response aggregators.	
Energy Networks Australia, p. 2.	Affording retailers such a centralised role could have adverse competition impacts. End use consumers should be free to switch retailers at a connection point without influencing their demand response arrangements.	
National Irrigators Council, p. 3.	The register for wholesale demand response would enable generators and retailers to capture the market opportunities at the expense of consumers.	
PIAC, TEC and TAI, p. 3.	The register proposed may be an unnecessary red tape burden for energy solutions companies and thus create a cost for consumers, while having questionable benefits.	
AGL, p. 17.	AGL considers this to be a significantly lower cost option than the wholesale demand response mechanism option, given it does not require changes to meter data, settlement and billing systems.	
Alinta, p. 3.	Preference is for the construction of a wholesale demand response register disaggregated model, which moderates some of the more material baseline administration costs and associated hazards.	

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Aurora Energy, p. 1.	Supports the AEC register proposal.	
AEC, p. 3.	The rules should offer the flexibility for customers to decide, based upon their own circumstances, whether to contract with DRAs or retailers to provide demand response services, or participate in the market more directly.	
AusNet Services, p. 6.	AusNet support the use of a demand response register. This could be accompanied by standardised contracts that provide increased transparency and consistency of arrangements across retailers.	
BlueScope Steel, p. 6.	Retailers should be obliged to encourage and facilitate demand response. If retailers only have an obligation to negotiate in good faith, the customer is left at the whim of the retailer's appetite to enter into a demand response agreement.	
Energy Queensland, p. 17.	A demand response register would provide greater transparency of the availability of demand response to the market. We do not consider that there is currently sufficient justification for placing further obligations on retailers.	
ERM Power, p. 7.	A register would help improve the market's wider knowledge about the scale and appetite for demand response as well as help existing demand response providers in negotiations with retailers. This can be done at a far lower cost than the other two rule change proposals.	

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Flow Power, p. 1.	Flow Power supports the AEC register proposal. The register does not require customers or aggregators to meet prudential requirements, does not rely on baselines and can be implemented faster.	
Meridian Energy, p. 11.	Support this approach as a means of ensuring that demand response is more transparent.	
Snowy Hydro, p. 16.	The proposed wholesale demand response register would have considerably lower costs than the wholesale demand response mechanism, as the AEC’s proposal does not require changes to the FRMP-AEMO settlement relationship.	
Scheduling		
Snowy Hydro, p. 19.	The scheduling of demand response from residential customers would be problematic.	For the reasons outlined in chapter 4, the Commission decided to not apply the mechanism to residential customers under the draft rule.
AEMO, p. 9.	The current dispatch process accommodates scheduled loads, and the requirements for scheduled loads as part of a demand response mechanism could be improved and refined, providing an added benefit for participants.	Under the draft rule, DRSPs will be able to elect when they participate in central dispatch. When participating, DRSPs will face the same obligations as scheduled generators. When a DRSP is not participating, it will not receive a dispatch target and will not be subject to causer-pays. For central dispatch, DRSPs will make dispatch offers for wholesale demand response. These will be offers to reduce demand from the scheduled wholesale demand response unit's actual level of
Enel X, p. 10.	Enel X does not support a requirement for demand response to participate as scheduled load, unless several concerns can be addressed, such as the concern that a load's baseline consumption might not equal actual consumption at the start of a dispatch interval.	
Flow Power, p. 4.	There are challenges in dispatching loads through NEMDE.	

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		consumption at the beginning of the dispatch interval. As such, baselines would not be required to be used in central dispatch.
Ready Energy, p. 16.	A big issue with scheduled load is having accurate data and being able to respond accordingly. DNSP constraints might also affect dispatch. Causer-pays seems somewhat problematic.	Recovering FCAS costs from DRSPs through the causer pays mechanism will provide DRSPs with an incentive to ramp linearly between dispatch targets. DRSPs will be able to manage this risk by managing the provision of wholesale demand response, which will in turn reduce the impacts on power system frequency.
Enel X, p. 27.	The risks of not complying with a dispatch instruction should lie with the participant, not with AEMO.	
EnergyAustralia, p. 18.	By first identifying the loads that can be predicted with reasonable confidence, AEMO may reduce its need to implement complex scheduling arrangements.	The Commission considers that scheduling participants provides the market operator with greater certainty that this capacity will be available, which is crucial for accounting for this capacity in the reliability framework. The draft rule does not change the arrangements for scheduled loads. AEMO is currently able to adjust some of the requirements placed of scheduled loads to make them less onerous, where this would be appropriate.
Separate wholesale demand response market		
AEMO, p. 13.	AEMO expects that separating the settlement of wholesale demand response and avoiding changes to the energy settlement process could also offer significant reductions in implementation cost, time and risk.	The Commission is not proposing to implement a separate market for wholesale demand response as part of this rule change. The Commission considers that the settlement

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		model for the wholesale demand response mechanism set out in the draft determination captures the benefits of the separate market proposal (i.e. avoiding implementation costs associated with retailer billing systems changes) while also avoiding the need for retailers to recover their costs from all consumers.
AGL, p. 15.	It can be difficult for retailers to hedge costs that are smeared across energy users, such as the RERT.	
AEC, p. 3.	This proposal would effectively double the economic value for demand response. If a retailer used an affiliate for providing demand response services, it would have the effect of doubling its benefit. The cost allocation would result in consumers facing increasing costs for consuming more electricity.	
AEC, p. 4.	The separate market does not avoid the major costs associated with the development of baselines, revising settlement and scheduling demand response. As such, this proposal would not necessarily be faster to implement.	
BlueScope Steel, p. 9.	BlueScope is not convinced that an out of market temporary mechanism is more time or cost effective than implementing a market mechanism.	
Enel X, p. 28.	Enel X is not convinced that a separate wholesale demand response market will be any quicker or easier to implement than an in-market, wholesale demand response mechanism. This would also avoid the need to smear the costs of wholesale demand response across consumers.	
Energy Queensland, p. 22.	Energy Queensland does not support the recovery of the costs associated with introducing and operating a separate, transitional demand response market from all customers regardless of whether or not they choose to	

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	participate.	
EnergyAustralia, p. 13.	This would spread the actual costs of the market onto all consumers. This would create a situation where all consumers are paying for a service from which only a small sub-section of consumers benefit. This would not be in the long-term interest of consumers.	
Flow Power, p. 2.	The separate market would result in a high risk of inefficient outcomes, require significant investment of time and money and be a transitional market only.	
Origin Energy, p. 7.	This proposal would further distort incentives for participation in the wholesale market; exposing retailers to additional costs that are difficult to hedge; and exposing consumers to additional costs, with all consumers subsidising the cost of demand response undertaken.	
Meridian Energy, p. 10.	Meridian is always concerned about disaggregating the national electricity market into multiple separate markets as this has the potential for undermining some of the core value drivers for consumers that the existing market mechanism provides.	
South Australian Government, p. 2.	Mechanisms could be put in place to address concerns about additional costs, including a cap on the level of demand response or cohort of market participants that could be settled in the separate market (to limit the potential costs) or by limiting the separate market to certain jurisdictions where there is an immediate need for DR, such as South Australia.	

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South Australian Government, p. 3.	The South Australian Government would support the trialling of the transitional model in South Australia.	
Snowy Hydro, p. 16.	Snowy Hydro is concerned how the separate wholesale demand response market would recover costs for wholesale demand response from all customers.	
Stanwell, p. 4.	Stanwell is opposed to the South Australian Government’s proposal to have a transitional market for DR that is separate to the wholesale market.	
Tesla, p. 2.	Creating a demand response market will not provide AEMO with an accurate representation of how assets will participate in the existing wholesale energy market. In addition, it may result in additional costs being passed through to consumers, rather than increased competition and cost reduction.	
Energy Efficiency Council, p. 14.	A transitional market for demand response has the potential benefit of allowing the rapid development and deployment of a market for wholesale demand response outside the wholesale energy market, which would enable issues such as baselining to be further refined prior to opening up the wholesale energy market to large quantities of demand response.	
Spot price pass through contracts		
Enel X, p. 8.	Requiring all electricity customers to be exposed to the spot price is theoretically efficient and would likely result in higher levels of wholesale demand response. However, it is unlikely to be a practical solution for all customers.	While this was raised as a possible complementary measure alongside the AEC register proposal in the consultation paper, the Commission is not proposed to mandate the offering of spot price

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EnergyAustralia, p. 14.	It is likely that retailers would need prudentials from the customers and that additional consumer protections would be required.	pass through contracts in the draft rule.
Snowy Hydro, 17.	Proposing this approach to residential small customers will expose customers to wholesale price risk and we questions whether customers would want this risk.	
Standing demand response offers		
AGL, p. 18.	There is a trade-off between introducing a regulated default contract with standard terms, prices and baselines to minimise administrative costs, and allowing some flexibility to best suit the arrangement.	While this was raised as an idea in the consultation paper, the Commission is not proposing to mandate the offering of standardised demand response products as part of this rule change.
Enel X, p. 31.	Enel X agrees that a standard wholesale demand response contract has the potential to simplify the negotiation process between a DRA and a retailer and reduce transaction costs for all parties, when compared to the proposal put forward by the AEC. However this approach is unlikely to satisfy the NEO.	
Energy Queensland, p. 23.	Energy Queensland does not have any significant objections to the proposal to develop a standard demand response contract. However, Energy Queensland would prefer that it be used as a non-mandatory tool.	
EnergyAustralia, p. 14.	Mandating a standing wholesale DR offer is unlikely to result in increased availability of contracts that are in the interests of all customers.	
Customer size		

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AEMO, p. 12.	Participation thresholds should be designed to avoid distortions.	For the reasons outlined in chapter 4, the Commission decided to not apply the mechanism to small customers under the draft rule given the need to consider consumer protections in further detail as requested by a number of stakeholders.
Enel X, p. 22.	Large customers are likely to be better equipped to participate in central dispatch than smaller customers.	The Commission notes that any required changes to the retail law and rules may be able to be implemented before the mechanism commences on 1 July 2022.
PIAC, TEC and TAI, p. 5.	Consumers of all sizes should be able to participate in wholesale demand response in the way that meets their needs. Therefore, we strongly oppose excluding any consumers from participating.	
Other issues		
AEMO, p. 13.	AEMO agrees that wholesale demand response, the short-term forward market and other reforms should be considered as a package of reforms to streamline the resources required to implement the resulting changes required, but designed in such way to be foundational to broader distribution level market and DER integration more generally.	The Commission agrees that there may be complementary benefits between a demand response mechanism and a short term forward market.
BlueScope Steel, p. 6.	The uncertainty associated with the calculation of expected revenue is extremely high due to the inherent unpredictability of the market. As such, BlueScope believe that introducing a short term forward market as a means of reducing risk and increasing certainty of revenue is extremely important measure in increasing the participation and efficiency of DSR.	The Commission is considering the implementation of a short term forward market through a separate rule change request.

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Energy Networks Australia, p. 2.	The design of a wholesale demand response mechanism should not establish an exclusive and closed platform that might preclude NSPs from engaging the same demand response providers for the provision of network services.	The wholesale demand response mechanism in the draft rule is designed to allow DRSPs to bid wholesale demand response into the wholesale market as a supply-side resource. This does not prevent NSPs from engaging the same DRSPs to provide network services. Such services would fall outside the scope and purpose of the mechanism.
Flow Power, p. 3; Major Energy Users, p. 5.	Loads are different to generators e.g. end users buying electricity is only a part of their operations.	The Commission acknowledges this and has sought to treat DRSPs equivalent to generators to the extent practicable under the draft rule, making appropriate modifications to the relevant obligations where necessary.
AusNet Services, p. 5.	Where practical, demand response services should be treated similarly to generation services	
Enel X, p. 27.	If demand response is to participate in the mechanism as scheduled load, then yes there would possibly be circumstances where the demand response provider would be responsible for 'selling' electricity to the customer in the event the customer does not reduce its consumption in response to a signal. Enel X is unclear on what implications this has for the regulatory framework, and whether this constitutes a "multiple trading relationship", which is currently not permitted under the rules.	<p>The Commission is not proposing to implement multiple trading relationships as part of this rule change.</p> <p>The settlement model set out in the draft rule provides for DRSPs to pay amounts to AEMO for the difference between a customer's actual and baseline consumption where the consumption exceeds the baseline. The Commission considers that this provides an appropriate incentive for the DRSP to ensure the baseline is accurate and that their customers can provide firm demand response.</p> <p>However, the DRSP would not be considered to be selling electricity for the purposes of the retail law</p>

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		and rules in those circumstances.
ARENA, p. 3.	The <i>Reliability frameworks review</i> set out an option for customers or aggregators to unbundle and take responsibility for flexible resources, such as a solar-battery system, which may be able to be managed in the market without having to be intermediated by their existing FRMP. ARENA considers this approach has some merit.	The Commission is not proposing to consider multiple trading relationships further as part of this rule change.
Energy Networks Australia, p. 1.	Energy Networks Australia does not support the proposal for limiting the number of demand response aggregators per connection point, as this may restrict competition in provision of electric vehicle charging where an existing solar and/or battery demand response provider is operating, or vice versa.	
Stanwell, p. 7.	The predominant barrier to market participation by smaller customers was identified in all three rule changes as the inability to have multiple trading relationships (MTR) at a single connection point. The AEC's submission presented an approach to circumvent the need to establish MTR by proposing retailers negotiate in good faith with third-parties, while the AEMC has already indicated to AEMO that it should submit a rule change request to facilitate MTR.	
EnergyAustralia, p. 9.	RERT has created competition for traditional demand response, incentivising DR to exit the wholesale market. We remain concerned about these developments in the market and would encourage the AEMC to consider the	The Commission is aware of this issue. Appendix H provides details of the Commission's proposed approach to addressing this concern in collaboration with the Reliability Panel.

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	distortionary signals this is creating and its impact on further in-market demand response being developed.	
EnergyAustralia, p. 20.	It is argued in the consultation paper, that it is difficult for third parties to participate in the current framework as they do not have the required expertise to register as a retailer. However, it is likely that DRAs would need to develop some expertise in retailer capabilities under a DRM.	The Commission acknowledges that DRSPs would have to develop some similar expertise to retailers, for example in relation to billing and customer management. However, the business model of a DRSP participating in the mechanism would be quite different to that of a retailer operating in the wholesale market and would require a different range of capabilities.
ERM Power, p. 7.	Another option is establishing a second NMI through an embedded network arrangement. The costs of metering have fallen dramatically. This would allow for separate retailing of demand responsive loads.	The Commission notes that embedded network framework can facilitate a multiple trading relationship arrangement. However, this may not be practical for many customers seeking to participate in wholesale demand response.
Hydro Tasmania, p. 2.	There is a risk of customer confusion with multiple parties engaging with consumers behind the same connection point.	For the reasons outlined in chapter 4, the Commission decided to not apply the mechanism to small customers under the draft rule given the need to consider consumer protections in further detail as requested by a number of stakeholders. The Commission considers that large customers that engage DRSPs would be capable of managing these relationships.
Snowy Hydro, p. 11.	It can be argued that the demand side already has information asymmetry advantages over generators. That is, unscheduled demand consumers are not required to	Under the draft rule, DRSPs would be scheduled and participating in central dispatch. They would also be subject to all of the associated information

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	provide their intention to curtail load through market bids.	provision processes, including PASA and pre-dispatch. As such, the mechanism would provide greater transparency of wholesale demand response in the NEM. This should assist decision making for all market participants.
Snowy Hydro, p. 12.	The introduction of the DRM would further distort and dampen high spot price signals. Longer term customer outcomes are best protected by undistorted pricing signals that provide the investment signal for ongoing investment in new assets.	The wholesale demand response mechanism set out in the draft rule would allow wholesale demand response to be utilised as a supply-side resource in the spot market. Under this framework, wholesale demand response could potentially provide a cheaper alternative to peaking generation, which would lead to better price outcomes for consumers.
Tesla, p. 4.	Would like to see all services that can be provided by DER being provided under a single market classification	The Commission has combined the DRSP and MASP participant categories under the draft rule. The Commission considers that this would provide efficiency benefits for participants that are capable of providing both types of services.
Wattwatchers, p. 5.	Metering and control technologies in this space should not be bound by the current requirements for billing meters (i.e. NMI pattern-approved) and also the AEMC minimum specifications under chapter 7 of the NER and in addition those introduced as part of Power of Choice. These are outdated given the rapid evolution of superior digital technologies including cloud-enabled services.	Under the draft rule, loads registered as wholesale demand response units must have a type 1, 2, 3 or 4 meter for the purpose of recording time varying load data. This data is needed for the purposes of settlement and baseline determination. DRSPs could utilise additional technologies to enhance their monitoring and control capabilities in respect of such loads.

STAKEHOLDER	ISSUE	COMMISSION RESPONSE
		<p>AEMO would also be able to specify the use of different meter types to inform baselines.</p> <p>Changes to the metering requirements set out in chapter 7 of the NER could be considered if stakeholders wanted to submit a rule change request.</p>
Wattwatchers, p. 5.	Specific consideration that demand response aggregators do not have to be licensed energy retailers. Rather, there should be provision for third-party providers of demand response and virtual power/demand plant aggregation services, managing the enablement and coordination of sites to participate in demand response programs.	The draft rule would not require DRSPs to also be registered retailers. These would remain separate participant categories. However, retailers would also not be prevented from registering as DRSPs.