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Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

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Wholesale demand response mechanisms Consultation paper

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Consultation Paper from the Australian Energy Market Commission (the Commission) on the wholesale demand response mechanisms

Snowy Hydro Limited is a producer, supplier, trader and retailer of energy in the National Electricity Market ('NEM') and a leading provider of risk management financial hedge contracts. We are an integrated energy company with more than 5,500 megawatts (MW) of generating capacity. We are one of Australia's largest renewable generators, the third largest generator by capacity and the fourth largest retailer in the NEM through our award-winning retail energy companies - Red Energy and Lumo Energy.

Existing and available commercial incentives for demand response in the NEM have led to numerous projects being undertaken across the NEM. There are no barriers to consumers providing demand side response and there is no factual evidence to suggest that there are insufficient incentives on retailers to offer demand response services. Snowy Hydro therefore strongly believes that the rule change proposals are a complex solution looking for a problem that simply does not exist

Snowy Hydro supports competitively neutral approaches that do not advantage one technology over another and support a transparent approach that aids the price discovery process. There are market-based solutions which include demand response as intended in the NEM design allowing demand side to respond to price signals in the spot market resulting in the best and most economical solutions for all parties. Demand response is occurring under current arrangements and this is increasing, driven by the value being presented by the changing NEM.

It is for that reason that Snowy Hydro does not support the wholesale demand response mechanism (DRM) and the separate wholesale demand response market (WDRM). The two rule changes are not supported by Snowy Hydro because:

- They are unjustified, distort the current market design where both the supply and demand side have clear pricing signals/incentives to either produce or to consume energy,
- Impose significant implementation costs,
- They distort the Contract/Financial markets and benefit a small group of large consumers at the expense of a much broader group of consumers,
- The lack of transparency around how much wholesale demand response is currently being utilised makes it difficult in understanding whether the level of demand response is efficient and the value it actually brings to the NEM,
- Demand response is still trying to find its position in the market and understanding the flexibility and resource it can provide to the market,

- Baselines ideally need to be dynamic, e.g vary with temperature, which is impossible to achieve as you don't take into other factors like generator outages etc,
- The separate wholesale demand response market would recover costs for wholesale demand response from all customers through a smeared manner. This would lead to a significant game theory outcome whereby if all customers curtail their load then the compensation for the demand response benefit would be unable to be allocated to anyone, and,
- Inaccurate baselines where consumers expected and actual consumption on a particular day did not reflect how the customer would have used energy would lead to the customer not obtaining the value they expected they would receive.

The Commission needs to properly acknowledge the repercussions of exposing small consumers to wholesale price risk. Commercial and industrial (C&I) are the most attractive sectors for demand response implementation, which currently provide demand response, as they are highly energy intensive in nature compared to the residential segment. It is therefore important that the Commission understand what it is targeting because demand response for C&I is happening now in the current market environment and doesn't require DRM or WDRM.

The DRM will require the Retailer to hedge to the customers Consumption Baseline. If the Customers offers demand response using the DRM, the customers actual consumption will be less than the customers Consumption Baseline. As a consequence actual generation will also be less than the customers Consumption Baseline. The distortion with the DRM is that NEM generators may be over hedged if contract volume was made at the level of the customers Consumption Baseline. This would result in unfunded contract difference payments. If Spot prices are high this would result in substantial contract losses to NEM generators.

The NEM would reach a new equilibrium where contract prices would be adjusted up by NEM generators to account for the risk of unfunded contract difference payments. There are arguments that the DR proponent would be in position to offer contracts that negate the uplift price of NEM generators. This is a highly speculative proposition because it is argued that the DR proponent would be unable to offer a similar and substitutable product comparable to the NEM generator. As a consequence Retail prices to consumers must increase relative to a base case scenario without DRM.

Should the Commission seek an alternative approach moving forward, then the wholesale demand response register would be Snowy Hydro's preferred option. The Australian Energy Council (AEC) proposed register would only require financially responsible market participants (FRMP) to negotiate demand response arrangements with Demand Response Aggregator (DRA)s in good faith, not imposing any binding obligation on an FRMP to come to an agreement with a DRA following a negotiation. Should any disputes arise from such negotiations they would be dealt with in accordance with the dispute resolution framework in Chapter 8 of the NER. This would leave open to counterparties that don't negotiate to find a solution.

The wholesale demand response register would allow retailers to develop non-standard or "market" demand response offers which would incentivise competition. There are however certain complexities that need to be solved such as if the DRA is only responsible for the energy supplied to or consumed or at the price responsive load metering point during periods where demand response is active. Such an arrangement would create added challenges on retailers in hedging load, settlement and managing obligations. In addition the scheduling of demand response on residential customers would also be problematic for the reasons mentioned above, a focus on large C&I customers would not encounter these problems.

Snowy Hydro appreciates the opportunity to respond to the Consultation Paper and any questions about this submission should be addressed to Panos Priftakis, Regulation Manager, by e-mail to panos.priftakis@snowyhydro.com.au.

Yours sincerely,

Kevin Ly
Head of Wholesale Regulation
Snowy Hydro

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DETAILED SUBMISSION

Demand Response in the current market

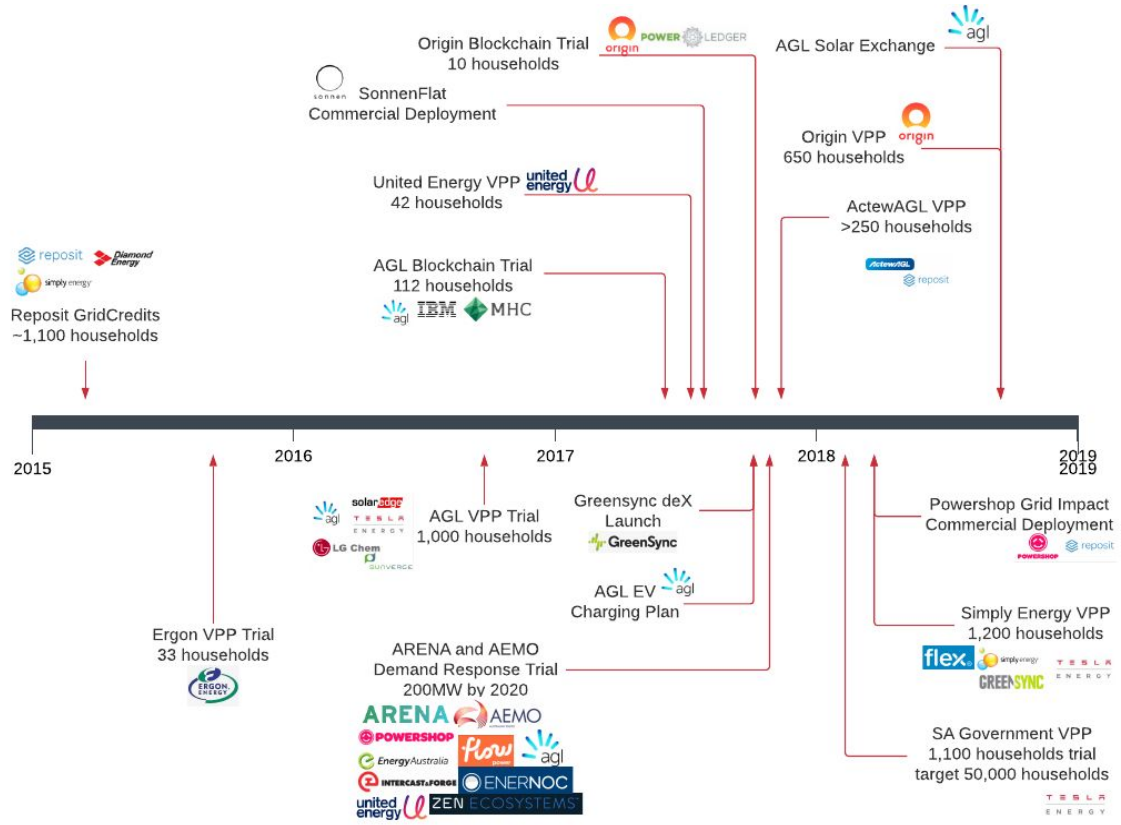
Snowy Hydro believes the existing and available commercial incentives for demand response in the NEM are sufficient. There are numerous existing and available commercial incentives for demand response in the NEM. There are no barriers to consumers providing demand side response and there is no evidence to suggest that there are insufficient incentives on retailers to offer demand response services.

Demand response is happening everyday in a proportionate cost to consumption from small and large customers that want to save on energy by switching off appliances when they are not required. For small consumers TOU pricing can be used to introduce behavioural response at required times (implicit demand-side response), without the need for an explicit demand response mechanism.

There are market-based solutions which include demand response as intended in the NEM design allowing demand side to respond to price signals in the spot market resulting in the best and most economical solutions for all parties. Demand response is occurring under current arrangements and this is increasing, driven by the value being presented by the changing NEM.

There is no evidence of market failure within the Australian market. There is no credible proof of a problem with the current market design, market signals and market frameworks not providing the appropriate price signals and incentives for the uptake of demand response. Figure 1 highlights what is being undertaken in the current market for demand response.

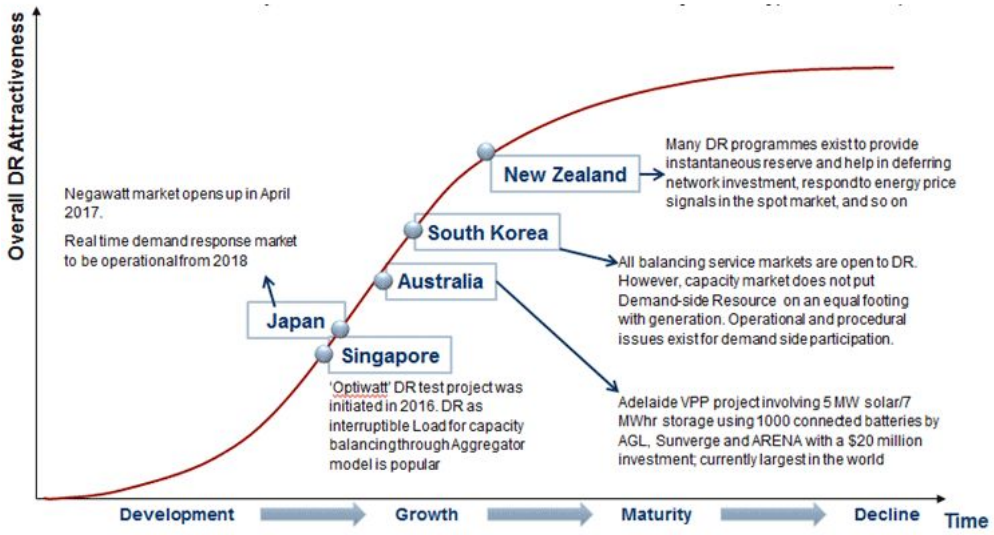
Figure 1: NEM DER Projects Timeline Snapshot



Consumers are being offered demand response products from retailers and third parties. As noted in the Consultation paper[1], Powershop is an electricity retailer that allows customers in Victoria who have a smart meter to reduce their electricity usage at times of peak demand in return for "power credits" which are applied to a customer's account. This is just one example of what is being offered in the market.

Further to this, the uncertainty of cost recovery for demand response will be improved due to the five minute settlement rule change. Five minute settlement was partly implemented to allow for the price signals for demand response and align the timing of such response with the physical need of the power system. Snowy Hydro considers there are numerous complementary regulatory changes assisting demand response and the Commission should consider these before proposing further recommendations aimed to support increased demand side integration into the wholesale market without properly assessing the cost implications these could have on market participants and the NEM's operation. As Figure 2 shows Australia is in a growth phase as demand response continues evolve in the market.

Figure 2: Overall DR Attractiveness by Country, Asia-Pacific, 2017[2]



Snowy Hydro owns two second tier retailers (Red Energy and Lumo Energy) and we firmly believe there are no barriers to consumers providing demand side response. Our retail businesses service over 1 million customers. We have received no complaints from our existing residential customers about the lack of demand response products available to them. Our customers are interested about understanding their data profiles and whether solar and/or storage products will suit their needs and whether the payback period meets their expectations.

The average residential consumer struggles to understand a non-flat tariff, let alone how to curtail their load to benefit from a wholesale market price spike. Highly engaged customers, have taken up more cost reflective tariff, have installed solar and/or storage and actively manage their load to maximise the benefit of their investment decisions. However, this is the minority of residential customers.

[1] AEMC, Wholesale demand response mechanisms, Consultation paper, 15 November 2018
[2] Is the Asia-Pacific Region Demand Response Ready?, <<
https://ww2.frost.com/frost-perspectives/asia-pacific-region-demand-response-ready/ >>

If a consumer truly valued Demand Response they have the option today to switch to a retailer that offers such a service, such as Powershop. If consumer wanted DR to the point of changing retailers then most retailers would offer DR as is the nature of a competitive market. The argument posed for DR mechanism is essentially claiming a demand where there isn't one and then blaming retailers for not supplying this artificial demand. The Commission notes that *"it is difficult for third party demand response providers to provide demand response products to consumers, either because of barriers to enter the retail market, or difficulties gaining and maintaining the value of wholesale demand response"*

These are the same issues faced by retailers, why should we create a special case for DR providers so they can operate a business without the costs and risks associated with servicing consumers in a contestable market?

Security of supply

Demand response is likely to play an increasingly important role in the future of the National Electricity Market (NEM). Snowy Hydro understands that demand response will improve through technological advancements however does not believe in the short-medium term that demand response can provide the flexible and dispatchable resources to accommodate the increasing penetration of variable renewable generation providing an alternative to peaking generation as noted by the Commission[3].

The role of demand response and peaking generation becomes increasingly important and cost-effective at very high penetrations of wind and solar. Although demand side can provide a range of services and benefits that contribute to the security and reliability of the NEM it is still trying to find its position in the market and understanding the flexibility it can provide to the market.

A peaking generation technology such as pumped hydro energy storage has very different characteristics to wholesale demand response. Both can provide a range of benefits including improved system operability, reduced network congestion costs and improved security of supply. Pumped hydro energy storage however as a mature technology can be deployed at scale, has a long operating life and is particularly well suited to applications requiring longer discharge times. Pumped storage efficiency of the cycle is typically about 70 per cent (meaning that for every 1 MWh of pumping the amount of generation that results is 0.7 MWh).[4]

The proposed Snowy 2.0 scheme would consist of 2,000 MW of pumped-hydro storage that can supply energy over seven consecutive days without the need to pump water. Snowy 2.0 is proposed to have a cycle efficiency of 76 per cent and may be expected to operate over a 40–60 year lifetime according to recent work from Marsden Jacob[5].

It is with this that Snowy Hydro is concerned with statements that "*wholesale demand response can provide a more cost-effective peaking capacity than using peaking generation*"[6] and that active demand side would adjust consumption during scarcity to maintain the supply-demand balance, often at a lower cost than doing so with expensive peaking generation, without properly understanding the service and flexibility that demand response can provide to the NEM.[7] We do not believe it can provide the same service as peaking generation.

[3] AEMC, Wholesale demand response mechanisms, Consultation paper, 15 November 2018
[4] Marsden Jacob Associates, 2018, "NEM outlook and Snowy 2.0", Report prepared for Snowy Hydro Limited
[5] Marsden Jacob Associates, 2018, "NEM outlook and Snowy 2.0", Report prepared for Snowy Hydro Limited
[6] AEMC, Wholesale demand response mechanisms, Consultation paper, 15 November 2018
[7] AEMC, Wholesale demand response mechanisms, Consultation paper, 15 November 2018

Recently the Federal Energy Regulatory Commission (FERC) in the United States found that demand response has contributed little in the wholesale power markets. Demand response was actually called on to meet 5.7 percent of peak demand in 2016 which was roughly a 10 per cent decline from the 6.6 per cent achieved in 2015[8]. According to the FERC report, *"since 2009, demand resource participation in wholesale markets has increased by approximately 6%, but has been outpaced by an approximately 16% increase in peak demand".*[9] Table 1 shows demand response in the wholesale market across the US.

Table 1: Demand response in the wholesale market across the US[10]

RTO/ISO	2015 Demand Resources (MW)	2015 Percent of Peak Demand [8]	2016 Demand Resources (MW)	2016 Percent of Peak Demand [8]
California ISO (CAISO)	2,160 [1]	4.4%	1,997 [9]	4.3%
Electric Reliability Council of Texas (ERCOT)	2,100 [2]	3.0%	2,253 [10]	2.9%
ISO New England (ISO-NE)	2,696 [3]	11.0%	2,599 [11]	10.2%
Midcontinent Independent System Operator (MISO)	10,563 [4]	8.8 %	10,721 [12]	8.9%
New York Independent System Operator (NYISO)	1,325 [5]	4.3%	1,267 [13]	3.9%
PJM Interconnection (PJM)	12,866 [6]	9.0%	9,836 [14]	6.5%
Southwest Power Pool (SPP)	0 [7]	0%	0 [7]	0%
Total ISO/RTO	**31,710**	**6.6%**	**28,673**	**5.7%**

When making direct comparisons to peaking generation it is important to note that demand response programs also can have significant implementation costs, for example, to attract participants, in particular residential, and manage their electricity demand. In many cases, demand response is most effective when combined with advanced metering Infrastructure (AMI), which can provide detailed end-use load information and continuous remote communications. The flexibility, duration and performance is the most important for the reliability and security of the NEM something which peaking generation has provided since the start of the NEM.

Peaking generators such as Snowy Hydro, and others, regularly invest large amounts of capital to ensure they are available during times of scarcity. They do everything possible, at their own cost and own risk, to ensure they are ready to generate during the relatively few periods when demand cannot be met by other types of market generation.

Baselines

An integral part of determining the value of wholesale demand response comes from baselines and there are significant uncertainties embodied in the treatment of baselines. A baseline will determine the quantity of demand response being provided.

The wholesale demand response mechanism would require a hypothetical baseline consumption profile of what the electricity consumer would have consumed in the absence of their actual demand side response. The third party or retailer is then paid the difference between the "baseline"

[8] Sioshansi, 2018, "The sorry state of demand response in the US", << https://energypost.eu/the-sorry-state-of-demand-response-in-the-u-s/ >>
[9] Sioshansi, 2018, "The sorry state of demand response in the US", << https://energypost.eu/the-sorry-state-of-demand-response-in-the-u-s/ >>
[10] Source: Assessment of Demand Response and Advance metering, FERC Staff report, Dece 2017

consumption and actual consumption multiplied by the spot price. This is problematic and inefficient which was recently shown in certain ARENA demand response trials which were undertaken.

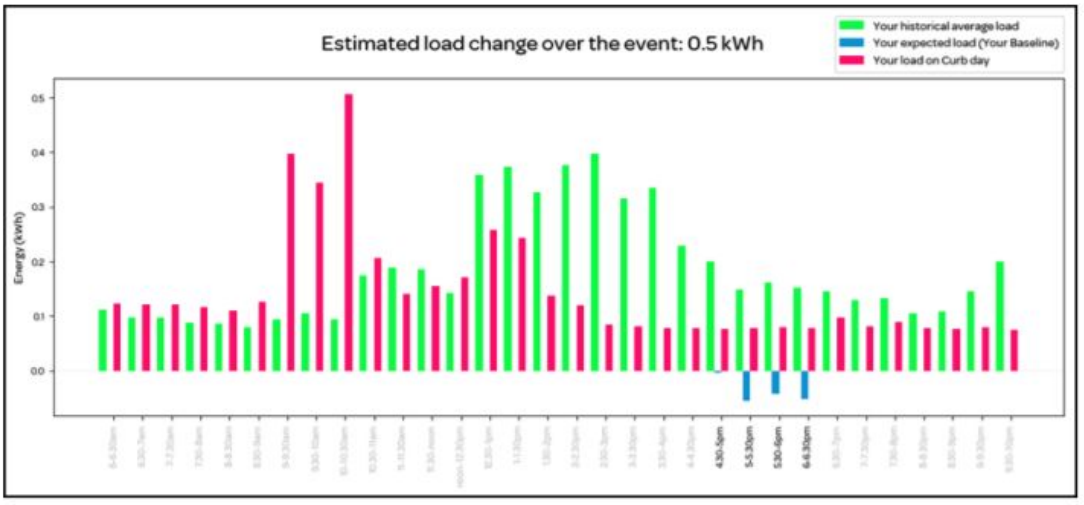
AGL noted that their program *"identified shortfalls in the current AEMO baseline calculation methodology that disadvantages temperature sensitive loads and fluctuating or intermittent loads"* and *"identified challenges in maintaining an effective year-round DR portfolio."*[11] For residential baselines the key challenge for AGL were that "*baseline methodology may not have detected genuine attempts at energy reductions*" finding a key challenge in the *"estimation of how much energy would have been consumed by a customer if they had not taken any reduction measures."*[12]

Powershop also conducted a demand response program over the period November 2017[13] to March 2018 providing an update to ARENA which also highlighted issues with the current method AEMO use to calculate baseline. The issues included:

1) **Negative baseline**

"Due to the calculation having additive factors, there are cases where a non-solar customer's baseline can fall below zero. This makes it impossible to show a reduction and hit a curb target."[14]

Figure 3: Estimated load change over the event: 0.5kWh[15]



2) **False negatives**

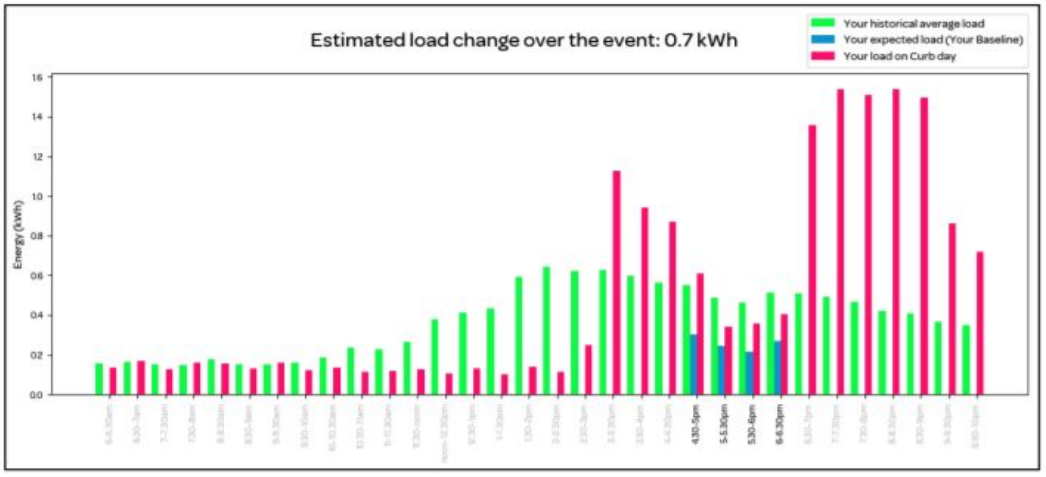
"A customer that shows a false negative is one that displays a reduction in usage during the time of the Event, however, the baseline calculation records minimal reduction. In the example below you can clearly see that the customer reduced their usage during the Event but the calculation says otherwise.[16]

This is a problem because the baseline is determined based on the average historical load, not taking into account those extremely hot days. Making baselines dynamic (varies with temperature) is

[11] AGL Energy, "*NSW Demand Response – ARENA Knowledge Sharing Report*", September 2018.
[12] AGL Energy, "*NSW Demand Response – ARENA Knowledge Sharing Report*", September 2018.
[13] Powershop, 2018, "Powershop Demand Response Program - Project Report – May 2018"
[14] *Powershop, 2018, "Powershop Demand Response Program - Project Report – May 2018"*
[15] *Powershop, 2018, "Powershop Demand Response Program - Project Report – May 2018"*
[16] *Powershop, 2018, "Powershop Demand Response Program - Project Report – May 2018"*

extremely difficult to achieve as you don't take into other factors like generator outages etc. We would be left with significantly inaccurate baselines.

Figure 4: Estimated load change over the event: 0.7kWh[17]



3) Solar baseline

"Solar customers add an extra level of complexity when attempting to calculate a baseline due to weather conditions having an impact on what is happening at the meter. There is no visibility around the amount of PV generation hence solar production is not taken into account when calculating the DR. This means the baseline can be manipulated by conditions outside of usage (i.e. solar radiance, cloud cover and weather are often unforgiving towards solar customers)."[18]

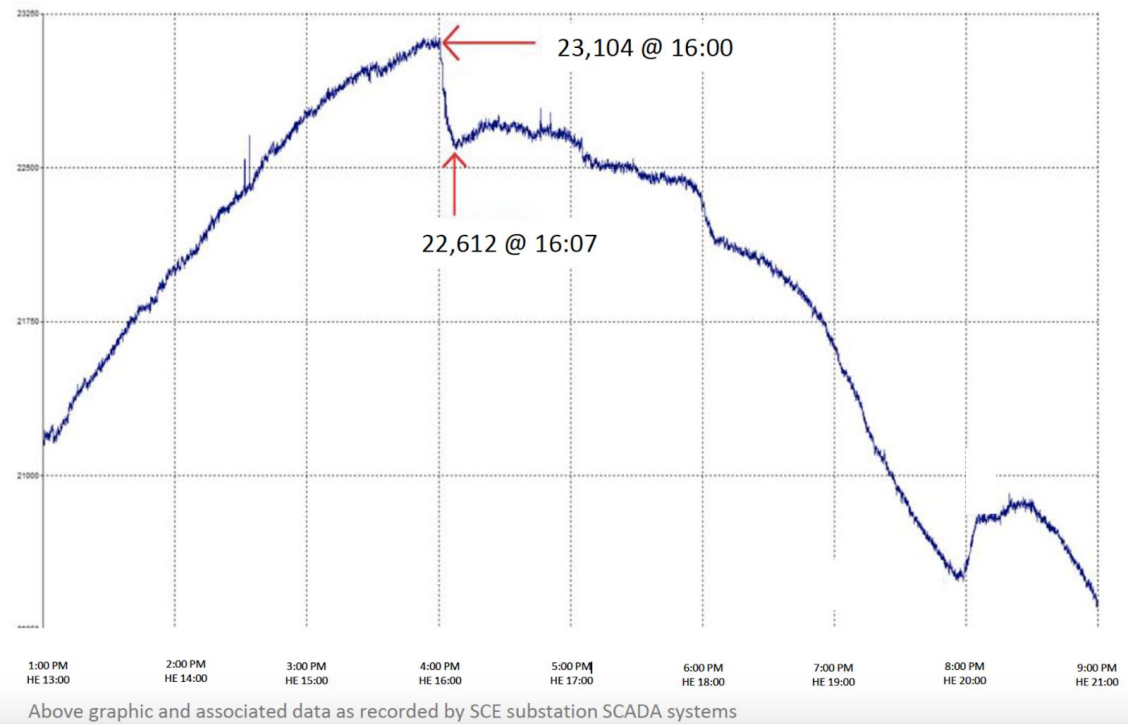
Baselines are extremely difficult to implement on a large scale especially for residential customers which to have any impact would require all residential customers to be scheduled.

In California[19] the demand response compensation mechanism overlooks what appear to be real reductions. Customers are taking steps to reduce demand and then not benefiting from it which has dampened interest in demand response programs.

The figure below highlights a dramatic 500 MW drop which was not recognised by the California Independent System Operator as a real reduction. The California Independent System Operator's (ISO) process for determining demand response payments decided that the customers' consumption was above their baseline. This means that the ISO charged SCE for these averages, rather than rewarding them for their customers' reductions.[20]

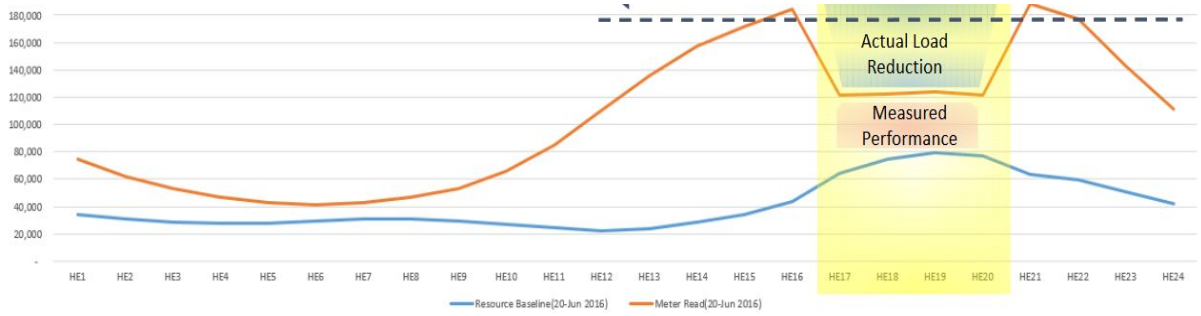
[17] *Powershop, 2018, "Powershop Demand Response Program - Project Report – May 2018"*
[18] *Powershop, 2018, "Powershop Demand Response Program - Project Report – May 2018"*
[19] Wolfram, C, 2017, "The Problem with Demand Response", <<https://energyathaas.wordpress.com/2017/09/25/the-problem-with-demand-response/ >>
[20] Wolfram, C, 2017, "The Problem with Demand Response", <<https://energyathaas.wordpress.com/2017/09/25/the-problem-with-demand-response/ >>

Figure 5: Southern California Edison (SCE) substation SCADA Systems - 20 June 2017[21]



The ISO calculates baselines using the average of the 10 most recent non-event business days (the "10-in-10" methodology) and following an early season heatwave, meant that recent average consumption was a lot lower than the peak levels reached during the high temperatures that day. The graph below shows what Southern California Edison reported for one of its residential demand response programs. The baseline (in blue) is one third lower than the actual June 20 load (in orange), even after the apparent reduction.

Figure 6: Southern California Edison residential demand response programs (2016)



Snowy Hydro therefore believes, following a significant amount of evidence that baselines are problematic and inefficient due to the following reasons:

1. Another unrequired regulatory intervention

The NEM design gives equal opportunity/incentives on both the supply side (generators) and the demand side. It can be argued that the demand side already has information asymmetry advantages

[21] Wolfram, C, 2017, "The Problem with Demand Response", <<https://energyathaas.wordpress.com/2017/09/25/the-problem-with-demand-response/ >>

over generators. That is, unscheduled demand consumers are not required to provide their intention to curtail load through market bids. The DRM further skews this advantage to the demand side with no economic benefit. Snowy Hydro believes the benefits of the proposed DRM are overstated as there are already existing commercial arrangements in place that allow demand side response when it is economic. These arrangements include interruptible tariffs, scheduled and unscheduled demand response, and spot price pass-through.

2. Compromises the current market design and its pricing signals

The NEM design gives equal opportunity/incentives on both the supply side (generators) and the demand side. Snowy Hydro is increasingly concerned by claims that any action that reduces short term high spot prices must be in the overall interest of consumers. 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.

3. Distortion to the Contract/Financial Markets

The introduction of the DRM would not reduce wholesale and retail market prices. The contracts market is dynamic and buyers and sellers would adjust hedging prices to account for exposure to the demand side response quantity. The net effect of the proposed DRM arrangements is to increase hedging risks for both generators and retailers. This increase risk would then lead to an increase in wholesale and retail electricity costs for end consumers.

4. The DRM would be very prone to gaming of the "consumption baseline"

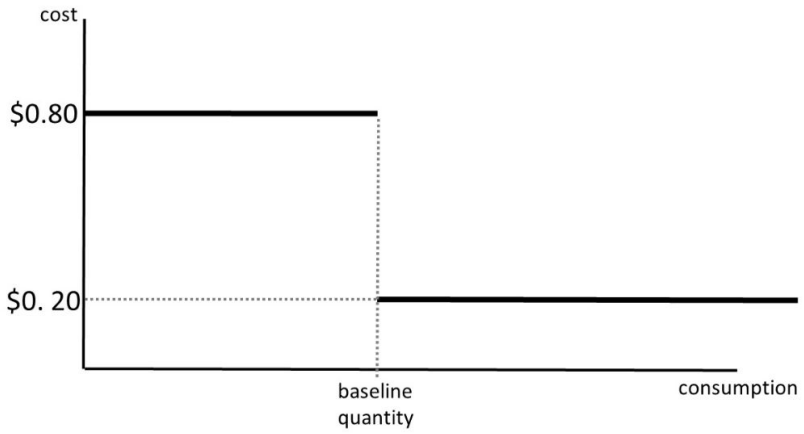
The Third Party or the Demand Response Aggregator (DRA) is incentivised to maximise the difference between the consumption baseline and their actual consumption. Customers could strategically increase their demand during baseline periods in order to later be paid to reduce relative to an inflated benchmark. Which actually means there is no real reduction from their actual demand. Customers could game their baselines or get paid through a demand response program for doing something they would have done otherwise, like going on vacation. In nearly all programs, baselines are based on the customer's consumption in the recent past, usually on other high-demand days.

In the US[22] the way baselines are set, on a typical critical day nearly half of all customers will be far enough above their baseline quantity that they won't have any shot at getting the rebate and therefore won't have any extra incentive to cut consumption.[23]

[22] Borenstein, S, 2014, "Money for Nothing?"
<< https://energyathaas.wordpress.com/2014/05/12/money-for-nothing/ >>

[23] Borenstein, S, 2014, "Money for Nothing?"
<< https://energyathaas.wordpress.com/2014/05/12/money-for-nothing/ >>

Figure 7: Economic cost of consuming a kWh changes drastically at baseline quantity



The economic cost of consuming a kWh changes drastically at baseline quantity

5. The implementation costs of the DRM are potentially significant

Duplicate metering, increased regulatory oversight and working groups to establish the consumption baseline methodology are a number of tangible costs that will be incurred to establish the DRM. The DRM will also require rigorous monitoring by an institutional body to ensure there is no gaming.

Snowy Hydro strongly believes that the DRM is a complex solution looking for a problem that simply does not exist. The DRM is unjustified, distorts the current market design where both the supply and demand side have clear pricing signals/incentives to either produce or to consume energy, would impose significant implementation costs, distort the Contract/Financial markets and benefit a small group of large consumers at the expense of a much broader group of consumers. Snowy Hydro strongly advocates that the DRM option was found to and continues to fail to meet the NEM Objective and should not be considered further.

Contract Market Impacts

The DRM will require the Retailer to hedge to the customers Consumption Baseline. If the Customers offers demand response using the DRM, the customers actual consumption will be less than the customers Consumption Baseline. As a consequence actual generation will also be less than the customers Consumption Baseline. The distortion with the DRM is that NEM generators may be over hedged if contract volume was made at the level of the customers Consumption Baseline. This would result in unfunded contract difference payments. If Spot prices are high this would result in substantial contract losses to NEM generators.

The NEM would reach a new equilibrium where contract prices would be adjusted up by NEM generators to account for the risk of unfunded contract difference payments. There are arguments that the DR proponent would be in position to offer contracts that negate the pricing power of incumbent generators to uplift the contract price. This is a highly speculative proposition because it is argued that the DR proponent would be unable to offer a similar and substitutable product comparable to the NEM incumbent generator. As a consequence Retail prices to consumers must increase relative to a base case scenario without DRM.

Table 2 below illustrates the impact of the DRM on incumbent generators, retailers, and customers.

Table 2: Impact of the DRM on incumbent generators, retailers, and customers - Illustrative example[24]

Quantities	Business as Usual with commercial DR	DRM, no price adjustment	DRM, with price adjustment
Baseline (MW)	N/A	10	10
Actual consumption (MW)	8	8	8
Demand response (MW)	2	2	2
CFD contract Volume (MW)	8	10	10
Prices			
Value / Efficient retail price	50	50	50
CFD strike price ($/MWh)	50	50	240
Spot price ($/MWh)	1000	1000	1000
Retail price ($/MWh)	50	50	240
Generator			
Spot market revenue	8000	8000	8000
CFD difference payment	-7600	-9500	-7600
Profit / Loss	400	-1500	400
Retailer			
Spot market payments	-8000	-10000	-10000
CFD difference payment	7600	9500	7600
Customer receipts	400	500	2400
Profit / Loss	0	0	0
Customer			
DRM Income	0	2000	2000
Value of electricity received	400	400	400
Retailer payments	-400	-500	-2400
Profit/Loss	0	1900	0

Column 2 “Business as usual with commercial DR” is the cashflow for commercially orientated customer who has a demand response arrangement with a Market Participant. There is no DRM income but some other income or avoided consumption cost associated with the 2 MW of demand response. The generator and the Retailer has a contractual arrangement swapping to hedge the Spot price exposure. Under these input assumptions the generator makes a profit of $400 for the hour. In all three scenarios the Efficient Retail Price (Tariff) to the Customer is $50/MWh.

Column 3 “DRM, no price adjustment” represents a scenario where the generator is contracted with the Retailer at the Customer Consumption Baseline of 10MW but can only generate 8MW due to 2MW of demand response under the DRM. In this scenario the Generator has a loss of -$1,500 and compared to the scenario in Column A is $1,900 (400+1500) worst off. This wealth transfer goes to the customer with the the 2MW of demand response under the DRM. This is an unsustainable

[24] Snowy Hydro analysis adopted from SFS Economics report, "Economic implications of the proposed Demand Response Mechanism"

situation and the NEM incumbent generators must change their contract prices up to make an appropriate return on assets.

Column 4 “DRM, with price adjustment” represents a scenario where a near equilibrium and sustainable situation is reached. In this scenario the Contract CFD strike price and the Retail price must go up to $240/MWh for the both the Generator and Retailer to be no worse with 2MW of demand response under the DRM. The customer with the demand response no longer receives the wealth transfer from the Generator.

In summary, this stylistic example demonstrates that the DRM could have significant unintended consequences where the Retail price increases substantially compared to a no DRM scenario. The DRM proponent may be indifferent to this Retail price increase but customers without demand response may be worse off if this Retail price increase is spread more widely.

Costs and Benefits of making a change

Snowy Hydro does not support the proposal to establish a wholesale demand response mechanism (DRM) or a separate demand response market (WDRM). The proposals to establish these measures will need accurate baselines, which as noted above have significant issues and have no quick fix solution, leading to significant complexities with significant implementation costs.

Both the aforementioned proposals suggested would require transferring from the existing Financially Responsible Market Participant (FRMP) to an aggregator which concerns Snowy Hydro. The challenge lies in any type of coordination scheme to aggregate households into usable Demand Response resource that would align the objectives of the retail mass market users with the objectives of the NEM. Not to mention the confusion with multiple retailer bills for the same period, and the obligations of which party has the obligation to provide the consumer protections (e.g. hardship) associated with any affordability issues. The costs in coordinating very large number of end users and also incorporating various constraints of their loads needed to obtain system wide benefits would be high. In addition, the options relies on the aggregator submitting a hypothetical baseline consumption profile of what electricity their consumers would have consumed in the absence of their actual demand side response.

We believe the assessment framework is missing a revenue allocation to complement the risk allocation. Under some of the proposed mechanisms the demand response aggregator would be able to tap into wholesale market revenue and provide a share to the customer without being impacted by customer credit risk. The retailer would remain fully exposed to that risk while having to give away some of its revenue.

The implementation costs of the two proposals can also potentially be significant. Duplicate metering, increased regulatory oversight and working groups to establish the consumption baseline methodology are a number of tangible costs that will be incurred to establish the DRM. The DRM will also require rigorous monitoring by an institutional body to ensure there is no gaming.

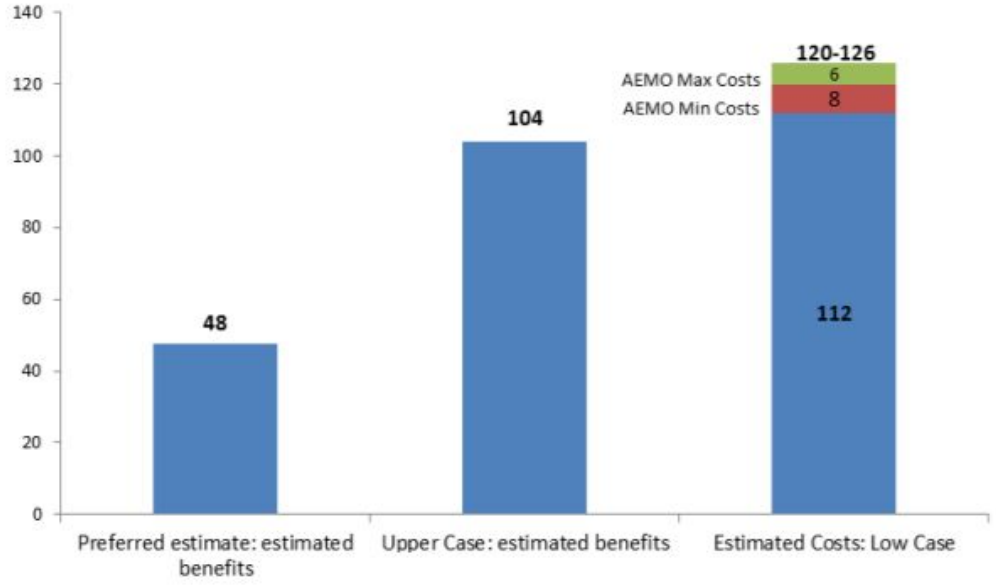
There will be major costs associated with the development of baselines, revising settlement mechanisms and scheduling demand response which is proposed across both proposals. Further to this the establishment of a transitional market would unlikely accelerate the provision of the services to the market instead it would impose transitional arrangements which would likely slow the development of the complete mechanism and distract stakeholders from other more pressing matters. Snowy Hydro strongly believes that the proposals are a complex solution looking for a problem that simply does not exist.

The Commission has correctly noted certain costs which will be required if the DR rule changes proceed:

- Retailers and AEMO would face costs to upgrade their systems and procedures.
- There may also be system costs and complexities associated with aggregating portfolios of small customers to participate in wholesale demand response, including the application of a baseline to a diverse collection of individual customers.
- The South Australian Government acknowledged that costs may be imposed on distribution networks to manage changes in electricity flows where wholesale peaks do not coincide with local network constraints

The Seed Advisory consultation paper titled "*the case for a Demand Response Mechanism in the NEM: an assessment*"[25] considered the benefits and costs of the Demand Response Mechanism proposed in 2013. The report noted "*negative net benefits between -$22 million to -$72 million from the DRM*" with the low case total cost of $120-$126 million to implement.

Figure 8: Estimated Benefits and Low Case Costs, DRM: 2013/14 to 2022/23, Present Value, $ million



Although the AEC proposal still requires some work, the proposed wholesale demand response register would have considerable lower costs than the wholesale demand response mechanism, as the AEC's proposal does not require changes to the FRMP-AEMO settlement relationship. The costs are noted by the Commission as associated with the establishment of the Connection Point DRA Register, the negotiation of demand response agreements between new retailers and DRAs and the system changes for AEMO to accommodate scheduling.

Snowy Hydro is concerned how the separate wholesale demand response market would recover costs for wholesale demand response from all customers. The smeared manner in which the SA Government proposes, will remove the ability of retailers and consumers to anticipates costs as the Commission notes, making it more difficult in hedging against any wholesale demand response costs or payments. This could lead to a significant game theory outcome whereby if all customers curtail

[25] Seed Advisory, 2013, *"The case for a Demand Response Mechanism in the NEM: an assessment", 16 December 2013*

their load then the compensation for the demand response benefit would be unable to be allocated to anyone.

In regards to the accuracy of baselines, Snowy Hydro believes that baselines need to be extremely accurate otherwise there will be significant costs associated with time spent on disputes with our retail arm and the customers leading it significant issues between parties. The issues would occur with consumers expected and actual consumption on a particular day which if inaccurate would not reflect how the customer would have used energy leading to the customer not obtaining the value they expected they would receive.

There needs to be a comprehensive cost benefit analysis on the significant changes proposed by the PIAC and SA Government proposal as it has significant implications on the industry who will be left footing the bill without properly assessing the proposals. Snowy Hydro therefore supports the Commission's view that "*for a wholesale demand response mechanism to advance the NEO, the benefits it brings to consumers' need to outweigh the associated costs.*"

Less than two years ago the Commission noted in their final rule determination for the Demand Response Mechanism and Ancillary Services Unbundling rule[26] that the implementation of DRM would not be in the long term interests of consumers because the benefits of the proposed DRM do not outweigh its implementation costs. The reasons outlines by the Commission included:

- Demand response can and already is happening in the NEM. There are no barriers to the continued proliferation of demand response that is currently underway.
- The DRM would not result in overall savings to consumers through lower electricity prices
- Under the DRM, spot prices will not reflect competition from demand response.
- The DRM requires costly changes to the wholesale market and retailer systems
- The DRM will not necessarily alleviate network constraints and defer network Expenditure
- The DRM can have unintended consequences and create distortions in the spot market and other related markets.[27]

Snowy Hydro believe these arguments are still relevant for the current market and are unclear how in less than two years this has significantly changed?

Engaging the demand side in the wholesale market - alternative approach

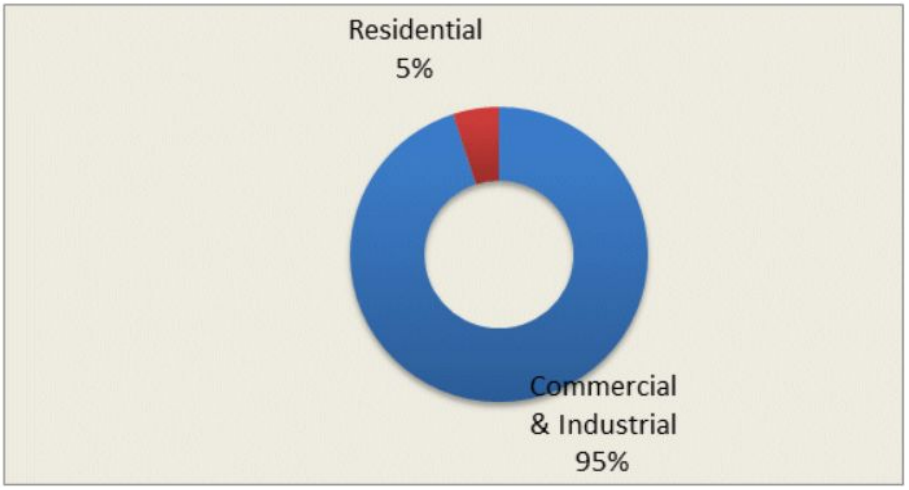
The Commission proposes an alternative approach for retailers not to provide wholesale price risk management, with the consumer on a spot price pass through arrangement. Snowy Hydro submits that this approach currently exists in the market, available to large customers (100 MWh/160MWh depending on jurisdiction). However proposing this approach to residential small customers will expose customers to wholesale price risk and we questions whether customers would want this risk. Energy is a utility not a financial instrument and we are unclear how the Commission is proposing to deal with small customers that have entered into this arrangement and can't afford to pay their bill when the spot market turns against them, say as a result of coal plant early retirement or interconnector outage?

[26] AEMC 2016, (Demand Response Mechanism and Ancillary Services Unbundling), Final Rule Determination, 24 November 2016, Sydney, pp6

[27] AEMC 2016, (Demand Response Mechanism and Ancillary Services Unbundling), Final Rule Determination, 24 November 2016, Sydney, pp6

The Commission needs to properly acknowledge the repercussions of exposing small consumers to wholesale price risk. Across the Asia-Pacific, commercial and industrial (C&I) are the most attractive sectors for demand response implementation as they are highly energy intensive in nature, compared to the residential segment, this can be shown in the chart below. It is therefore important that the Commission understand what it is targeting because demand response for C&I is happening now in the current market environment.

Figure 9: Total Demand Response Market: Percent Revenue Split by End Users, Asia-Pacific, 2017[28]



Wholesale Demand Response Register

The existing and available commercial incentives for demand response in the NEM are sufficient and there is no evidence to suggest a market failure within the Australian power market. Should the Commission however require further changes to the current environment then the wholesale demand response register would be Snowy Hydro's preferred option.

The AEC proposed register would only require FRMPs to negotiate demand response arrangements with DRAs in good faith, not impose any binding obligation on an FRMP to come to an agreement with a DRA following a negotiation. We support this approach and note that should any disputes arise from such negotiations they would then be dealt with accordance with the dispute resolution framework in Chapter 8 of the NER. This we believe would leave open to counterparties that don't negotiate to find a solution.

Assets however being stranded upon changing retailer should be a normal outcome of an efficient market whereby customers have the choice to remain with existing retailer/DRA if they see value or go to someone else.

The wholesale demand response register would allow retailers to develop non-standard or "market" demand response offers which would incentivise competition. As noted above, AEC proposal would also have considerable lower costs than the wholesale demand response mechanism, as it would not require changes to the FRMP-AEMO settlement relationship.

There is are certain complexities that need to be solved such as if the DRA is only responsible for the energy supplied to or consumed or at the price responsive load metering point during periods where

[28] Is the Asia-Pacific Region Demand Response Ready?, << https://ww2.frost.com/frost-perspectives/asia-pacific-region-demand-response-ready/ >>

demand response is active. Such an arrangement would create added challenges on retailers in hedging load, settlement and managing obligations. In addition the scheduling of demand response on residential would also be problematic for the reasons mentioned above, a focus on large C&I customers would not encounter these problems.

Load shedding compensation mechanism

Snowy Hydro believes that the Commission's Load Shedding Compensation Mechanism includes numerous complexities although is an important proposal that requires more detail to properly understand and assess. We are unclear how the proposal would reallocate financial exposure to an unknown amount of energy which would be part of a retail customer's settlements that have been reduced by reliability load shedding.

Understanding the energy volume to compensate would be very complex. The quantities would be difficult to measure which would require baselining for a specific reliability load shedding period while it would be unclear how funds would be collected from retailers, whether it would be AEMO requesting a certain amount or a separate fund is formed. This results in an additional implementation with all its attendant costs and risks.

Although AEMO recently highlighted in their additional information to support the Enhanced RERT rule change proposal that the risk of load shedding in the NEM is increasing while the Reliability Panel in late 2017 and early 2018 shows that the reliability standard was met in the national electricity market for all years following 2008/2009 and is projected to be met in all regions in the near to medium term.