

Stephen Procter
Office of Energy and Climate Change

13 May 2022

Dear Mr Procter

Re: Peak Demand Reduction Scheme, Consultation paper for Rule 1

Thank you for the opportunity to provide feedback on the consultation paper for Rule 1 of the *Peak Demand Reduction Scheme (PDRS)*.

Enel X operate the largest virtual power plant in Australia.¹ We are the first demand response service provider in the national electricity market's (NEM) wholesale demand response mechanism (WDRM),² and a significant operator in the NEM's frequency control and ancillary services markets.³ We work with commercial and industrial energy users to develop demand-side flexibility and offer it into the NEM's energy and ancillary services markets, the RERT mechanism, and to network businesses.

This submission sets out Enel X's views on the consultation paper for Rule 1. Enel X strongly supports the introduction of a PDRS to support greater capacity that can reduce demand at peak times. We are supportive of the draft Rule and acknowledge the need for the activities in the scheme's first year to be narrow. We are interested in becoming an accredited peak reduction certificate provider (ACP), however, the current activities allowed under Rule 1 do not cover activities that would allow us to participate in the scheme – at least initially.

As such, we strongly support the intent to explore further activities that can be included in the scheme from 2023. Our submission is structured to first provides some overarching comments on the scheme and then proposes potential future activities that may be included in the scheme in response to question 9 from the paper. These activities would allow Enel X and others to become an ACP and help ensure the scheme delivers the desired outcomes and provides value for money for NSW consumers.

The future PDRS activities proposed are:

1. Wholesale demand response mechanism assets registered with AEMO.
2. Battery energy storage systems (BESS) of commercial and industrial sites that are capable of demand response and shifting registered with AEMO.

¹ Bloomberg New Energy Finance – Virtual Power Plants Primer, 22 February 2021.

² Australia Energy Market Operator, Quarterly Energy Dynamics Report, Q1 2022.

³ Bloomberg New Energy Finance – Virtual Power Plants Primer, 22 February 2021.



3. Electric vehicles (EVs) enabled with smart charging systems that can shift their demand outside of the peak window.
4. EVs enabled with vehicle-to-grid capability can respond within or shift their demand outside the peak window.

Regards

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Overarching comments on PDRS

Enel X is encouraged by the design of the peak demand reduction scheme to date. We consider it well-placed to achieve the objectives of the scheme efficiently. We support the scheme's design, particularly the peak reduction and scheme certificate targets.

We offer some reflections on the following points, many of which we note the Office is already enacting and have stated will be the focuses of the 5-yearly reviews of the scheme.

- **Significant benefits can be derived for NSW consumers from good quality demand response capacity during, and after, the transition to renewable energy.** These benefits are the scheme's three sub-objectives of improving reliability by peak reduction, affordability by placing downwards pressure on prices, and sustainability by increasing load flexibility. Demand response and shifting activities will achieve these sub-objectives by:
 - adding efficient, reliable and flexible capacity available to the market to meet peak loads
 - providing option value for AEMO to operate NSW power system if forecasts turn out to be wrong
 - financially supporting a variety of businesses throughout the market
 - delivering on a proven global track record of improved grid reliability and sustainability.

We consider the PDRS is well placed to realise these benefits through the addition of demand response and shifting activities into the scheme from year two.

- **We urge the Office to maintain a high eligibility threshold such that only reliable assets and activities are allowed to participate in the scheme.** This will ensure the scheme's efficacy for all NSW consumers and safeguard its sustainability. This can be achieved by requiring assets to *demonstrate a general capacity to respond to signals of peak demand*, which can mitigate the potential risk of 'cowboy' or rent-seeking behaviour.

Enel X is supportive of the PDRS's focus on providing incentives for increasing the installed capacity of demand response and load shifting technology, while allowing their enablement to be left to existing market mechanisms. However, this capacity should have to clearly demonstrate how it will contribute to peak demand reduction.

Without this check on enablement, the scheme may issue certificates to low-quality assets that do not help the scheme meet its objectives. Therefore, we consider this requirement will be critical to the delivery of peak demand reduction and so key to the PDRS's success and integrity.

- **A key focus of the scheme's next stage should be C&I demand response and shifting activities:** we acknowledge the need for the first year of the scheme to be limited to demand savings activities but note that these activities should have low firming factors for peak reduction certificates. C&I demand response and shifting activities will

complement the work provided by the demand-saving activities by delivering efficient and effective peak demand reduction for the PDRS. These activities once included in the scheme will be a cost competitive certificate provider to liable entities.

Why C&I? High value assets for reliable, high-quality demand response and shifting activities are available in commercial and industrial sites. C&I assets capable of demand response and shifting activities provide the scheme with a technology that is a very cost-effective source of peak reduction. Accommodating such activities in the PDRS will increase competition, driving down the cost of the scheme. This C&I capacity comes from a broad range of sectors, including HVAC, manufacturing, mining, data centers, cold storage, and agriculture. These sectors have assets that are compatible with the FCAS and WDRM markets and have demonstrated price and peak reduction benefits for consumers through participation in these markets. Therefore, we consider this segment will deliver the large capacity of peak reduction from a comparatively more reliably and lower cost participants. Enel X considers a focus on how to incentivise this sector's assets to become part of the PDRS will be critical to the effectiveness of the scheme in meeting its objectives of a ten per cent reduction in peak demand by 2030.

Why demand response and shifting? Demand response and shifting activities have comparatively higher reliability than demand saving activities where these activities are exposed to market price signals. This is because these activities have the ability to contribute to reducing peak demand when the market is signalling that it is required using more reliable assets. These assets will respond to every possible peak event as well as the most critical demand peak intervals during the window. Whereas energy savings technology, such as lighting upgrades, may not reduce demand at peak times if they are deployed in certain contexts because they do not need to recover costs related to market price signals. Therefore, these activities will have a higher value to the scheme's objectives and should be considered more valuable through the volume of certificates awarded to these activities compared to those under Rule 1.

How would PDRS incentives assist increased demand response and shifting capacity in NSW? In Enel X's experience, the majority of the difficulty in enabling C&I demand response assets is in convincing C&I sites to participate given the upfront capex costs they will incur in return for uncertain future revenues available through participation in demand response. The PDRS incentive as designed is transparent and therefore easily written into an investment case for C&I sites. This will serve to both make the decision to participate much simpler for these sites as well as broaden the set of sites for which participation will be viewed as economically attractive. Additionally, our experience shows there are ongoing opex costs involved in the continued participation of these programs. This means that not all costs for some activities, such as the WDRM, are sunk costs in our experience and incentives for continued (or expanded) participation should be carefully considered in the PDRS design.

Therefore, the scheme's incentives should aim to provide additionality to peak demand response capacity in NSW that would otherwise exist. Typically, to do this participation is restricted to new participants from the date of the scheme's implementation. Our view

is a nuanced approach is required for the PDRS – that eligibility for participation in the scheme should be linked to when certificates can be deemed. That is, we consider:

- a restriction to new participates should be made to activities that can deem certificate for the lifespan of the asset, like demand savings activities included in Rule 1 and proposed activity 2 (BESS systems).
- No restriction to new participates – so existing assets can deem certificates where they meet other eligibility requirements - for activities, such as proposed activity 1, 3 and 4, where certificates are deemed each year. That is,

This approach provides incentives for continued or expanded participation in PDRS activities where ongoing operation expenditure investment trade-offs have to be made, which is also why we consider annual certificate deeming is required. Additionally, this approach would also have the benefit of encouraging efficient capacity expansions by existing PDRS participates.

- **Flexibility in the demand window:** the Office should maintain sufficient flexibility in the demand window in the Rule and legislation that will allow the scheme to adapt to changing market conditions. This allows for the scheme to remain purposeful when the underlying peak demand window shifts, such as a move away from a broad summer peaking market. This could result in a change in the hours for the demand window or the compliance period itself. While this is not an immediate challenge, it is worthwhile addressing during the establishment of the program.
- **Peak reduction that a retailer performs shouldn't reduce their liability by more than if that activity had been performed by a PDR provider.** In principle, retailers' activities to reduce their demand during the liable peak times should be treated equally to those that are supplying peak reduction and earning certificates. That is, a kW reduction from a liable retailer should not be worth more than a kW contribution from a provider to the scheme.
- **Retailers should be prohibited from double dipping from the same activity.** The scheme should be carefully designed to ensure a retailer cannot reduce their liability and earn certificates from the scheme through the same kW. If allowed this would undermine the scheme and reduce the incentive for non-retailer peak reduction activities.

Proposed activity 1: Wholesale demand response participants

Summary of proposed new PDRS activity 1	
Area of PDRS	Demand response
Eligibility test	The asset must be registered with AEMO through a <i>demand response service provider</i>
Verification of capability	Dispatch test check
Certificate forward deeming period	None – must be deemed annually following a successful dispatch test check (be that a load drop test or evidence of a real dispatch in the previous 12 months)

Certificate creation capacity	Equivalent to its DUID capacity
Likelihood of peak reduction	Very high – WDRM is highly incentivised to respond as there is a high value to capture ⁴
Proposed introduction into PDRS	Year two/2023

Enel X considers the easiest way to get large energy users and demand response assets into the PDRS is to utilise the National Energy Rule's Wholesale demand response mechanism (WDRM). This mechanism commenced on 24 October 2021 and was designed with a high level of integrity by the AEMC and AEMO along with significant market scrutiny. These activities would be relatively easy to incorporate into the PDRS because AEMC and AEMO have already completed much of the required design work.

The WDRM allows demand side (or consumer) participation in the wholesale electricity market at any time, however, most likely at times of high electricity prices and electricity supply scarcity, like that which occurs at times of peak demand. Therefore, the purpose and response times of the WDRM have a high overlap with the PDRS window/objectives. *Demand Response Service Providers* (DRSPs) classify and aggregate the demand response capability of large market loads for dispatch through the NEM's standard bidding and scheduling processes. The DRSPs receive payment for the dispatched response, measured in megawatt hours (MWh) against a baseline estimate, at the electricity spot price.

We consider all registered assets of a *Demand response service providers* participating in the WDRM would be a timely and economical inclusion in the PDRS as it allows:

- High-quality demand response to be eligible through the leveraging AEMO's robust processes, including:
 - Existing DRSP registration processes, and in so doing reducing the administrative burden required by the scheme whilst also protecting it against gaming.
 - Baseline methodologies and metrics for eligibility and compliance testing. This would result in avoiding duplication between the NEM and the PDRS as well as allow innovation to occur as this process includes enablement of new baselines in the PDRS.
 - DRSP's capacity and network loss factor, as determined in the NEM's dispatch engine against each of its dedicated unit identifiers (DUID), can be used for certificate creation. Specifically, the capacity can replace the act as the 'peak

⁴ This is in comparison to a residential voluntary demand response program, for example retailers asking their customers to turn off air conditioning units during high priced wholesale market events, where there is little incentive (maybe only a few dollars) and a small amount of flexibility to respond, so less likely there will actually be a response.

demand savings capacity’ as the demand response equivalent for the certificate creation calculation. See below for more on this proposed calculation.

- Clear, straightforward verification of the capacity and capability level provided to the market. That is, it would be clear for the Office (or IPART as relevant) to check the provider can comply with dispatch instructions, or has done so in the past. We suggest compliance/verification be an annual dispatch test check if there has not been any real dispatches.
- No double-dipping would be available through this mechanism. For example, retailers can currently offer load into RERT and get paid as well as earn wholesale price through reduction in load for the same activity. Utilising the WDRM, which does not allow spot-exposed load to participate nor allow dual-participation in RERT, wholly prevents the risk of double-dipping.

We consider the proportion of the peak reduction window the asset is able to earn certificates for should be based on availability, rather than reduction duration. By way of an example, that is, an hypothetical demand response asset can be available to respond anywhere in the six-hour window, even if it can only actually respond and reduce demand for two hours. That is because the WDRM will incentivise that asset to respond in the most valuable two hours of the peak.

Certificates for this activity should not be deemed forward over the full asset life, but rather be deemed annually for that year’s compliance period after verification the asset continues to have the capability to respond to peak events. This asset capabilities demonstration can be done through either:

- Market data, or other relevant evidence, the asset has been dispatched in a peak event in the previous 12-24 months (dispatch test check).
- Performing a load drop test.

The dispatch test check will work well for verifying the asset can receive that year’s certificates. A load drop test will allow new participants to immediately gain access to certificates following commissioning rather than having to wait until a peak event occurs.

Proposed activity 2: Battery energy storage systems (BESS) in commercial and industrial settings

Summary of proposed new PDRS activity 2	
Area of PDRS	Demand response and shifting
Eligibility test	Registered with AEMO, e.g. as a <i>Small Generator Aggregator</i> (SGA) ⁵
Verification of capability	None

⁵ AEMC’s recent rule change on [Integrating energy storage into the NEM](#) that will change fold the SGA framework into the new Integrated Resource Provider category in 2024.

Certificate deem period	Lifetime of asset
Certificate creation capacity	Nameplate capacity of BESS
Likelihood of peak reduction	Very high – BESS is highly incentivised to respond as and when there is a high value to capture
Proposed introduction into PDRS	Year two/2023

Commercial and industrial owned or co-located battery energy storage systems (BESS) are the most valuable, high-quality demand shifting asset types that can be included in the PDRS. These distributed BESS systems can reliably shift energy charging from within the peak period to outside of the peak in response to signals from the wholesale market. Not only can they reduce the peak by not charging in the period, but can also discharge in that period.

In so doing, a BESS can be thought of as providing up to two times its nameplate capacity of peak demand reduction. Despite this, we do not consider that BESS should be given two times its nameplate capacity of demand reduction certificates as the business case is made through arbitraging low and high wholesale market prices. The point to be made is that BESS are the highest quality demand shifting assets available and should be highly incentivised under the PDRS in comparison to more general demand saving technology and less reliable.

Also, we propose no verification of this activity should be required if the eligibility requirements are designed correctly. BESS are high capex and high-reliability assets and as such should be allowed to deem their certificates for their useful life. This is consistent with the logic for deeming the ESS-type activities in the scheme this year. The result will be simpler and clearer business cases for BESS in C&I spaces as the revenue stream from this scheme designed to assist the creation of such demand shifting capacity will be known upfront.

As with activity 1, the Office should ensure that activity 2 assets are fairly incentivised under the scheme by using availability to determine the proportion of the window for which it can deem certificates. That is, a two-hour BESS system is more valuable and should be rewarded to receive more than a third of the six-hour peak window's value as it will be used at the highest value period each day. This is because a BESS is incentivised to respond to the most valuable period within the window, which will also be the most critical demand peak. Additionally, a BESS will be responding every day, whereas there's no guarantee that an aircon or pool pump will be on in that period to get any efficiency savings.

Proposed activity 3: Electric vehicle (EV) smart charging assets

Summary of proposed new PDRS activity 4	
Area of PDRS	Demand response and shifting
Eligibility test	Third-party registration

Verification of capability	Potential dispatch test check or load drop test
Certificate deem period	Lifetime of asset
Certificate creation capacity	Nameplate capacity of the asset
Likelihood of peak reduction	Medium – will be able to shift demand outside of the window successfully through control systems, but may be limited where customers require charging during the window
Proposed introduction into PDRS	Year three/2024 onwards due to considerations this activity will take longer to develop

EV utilisation is an emerging and growing area, especially for electricity demand in Australia. BloombergNEF projections show that 2.6 TWh by 2030 will come from electric vehicles in Australia.⁶ That figure explodes to 17.7TWh by 2040. EVs have the potential to contribute to peak electricity demand if not properly incentivised and Enel X considers the PDRS a perfect avenue to provide good incentives to various EV systems entering the market.

Two main EV categories to be considered for the PDRS – are those with smart charging (inclusion of those with vehicle-to-home capabilities) and those with vehicle-to-grid (V2G) capabilities. This activity looks into the former while V2G EVs are discussed in activity 5.

Eligibility for these assets should be determined by a third party, similar to that proposed for activity 1 by AEMO through the WDRM framework. This will reduce the administrative burden on the Office and IPART, as well as reduce the regulatory barriers present to new entrants who wish to participate in this scheme. This is an emerging space and who is best placed to provide this assessment of eligibility is not clear at this time. Despite this, we consider it should be a body, like AEMO or an appropriate government agency, that is open source, transparent, and does not require private membership for assessment.

Further, we consider that some verification of the asset's ability to shift its load outside of the demand window should be included in the eligibility test to be considered robust. This could be a verification test ahead of its certification, or a spot compliance test during the lifespan of the asset. Ensuring that only high-quality assets are included in the PDRS will protect the value of the scheme by maintaining a fair price for peak reduction certificates.

The nameplate capacity of the EV system should be deemed upfront for the useful life of the asset. Similar to BESS systems, the incentives provided by the PDRS should reflect that these are high capex and highly reliable systems.

Proposed activity 4: Electric vehicle (EV) with 'vehicle-to-grid' enabled charging assets

⁶ BloombergNEF, *Long-term electric vehicle outlook 2021*, Electricity demand by electric vehicles – Australia chart. Note these figures include two- and three-wheeler, buses, and commercial and passenger vehicles and that electric vehicle charge unit installations are cumulative.

Summary of proposed new PDRS activity 5	
Area of PDRS	Demand response and shifting
Eligibility test	Third-party registration
Verification of capability	Potential dispatch test check or load drop test
Certificate deem period	Lifetime of asset
Certificate creation capacity	Nameplate capacity of EV charger
Likelihood of peak reduction	High – will be able to shift demand outside of the window successfully through control systems, but may be limited where customers require charging regardless of peak window. Charge and discharge capabilities increase likely due to how critical reaction to peak signals is to business case
Proposed introduction into PDRS	Year three/2024 onwards due to considerations this activity will take longer to develop

Similar to proposed activity 4, EVs that have vehicle-to-grid (V2G) capabilities should be treated differently from those that are only smart charging. This is because a V2G EV system can both provide demand response and demand shifting by charging outside of the peak demand window as well as demand response by discharging, similar to a BESS system. Also, a V2G will have a higher potential kW response. This is because Smart EV chargers can interrupt charging (e.g. 7kW), whereas V2G can discharge (e.g. 25kW for a fast bidirectional charger).

Eligibility and verification of V2G EVs should therefore differ from EVs with only smart charging capabilities. Despite this, it would be preferable for the same third party that is being used for the smart charging eligibility checks also be the body used for this activity. Additionally, the verification check should only be required if the eligibility test is not considered robust at the time of Rule 2 being made.

Additionally, we consider the incentives provided to V2G EVs should be higher than smart EV chargers (activity 3) to reflect their greater contribution to peak demand reduction. This could be through a greater ‘firming factor’, using the energy savings terminology. Alternatively, it could come through preferable consideration of the period for the peak window that these assets can deem certificates for. That is, a two-hour EV battery capacity can be determined to be greater than simply two hours. This is because of its incentive to respond in the most valuable period in the window, and therefore a more reliable, higher contribution to the peak reduction.