

WATTWATCHERS RESPONSE TO CAPACITY MECHANISM PROJECT HIGH-LEVEL DESIGN PAPER

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Introduction to our submission

Wattwatchers Digital Energy (Wattwatchers) appreciates this opportunity to respond to the high-level design consultation for a capacity mechanism to be added to the National Electricity Market (NEM) in Australia, adapting what is currently an ‘energy-only market’ to include a ‘capacity market’ operating in parallel.

In particular, this submission focuses on the subject of demand response, which is included in the high-level design paper as a planned capacity option, although with very little further indication of how it would be implemented, which consumers would be eligible to participate, and what technologies and data-driven solutions could be utilised.

We highlight the opportunity to extend demand response, and also energy efficiency, from large-scale industrial and commercial electricity consumers to include mass-market household and small business consumers. In doing so, we align strongly with positions articulated in other submissions from the ‘voice of small customers’ advocacy organisation Energy Consumers Australia (ECA) and its expert advisers.

Who we are

Wattwatchers is Australia’s leading digital energy platform, enabling fast, powerful and scalable solutions to monitor, analyse and control electrical circuits in real time – maximising the benefits from renewable electricity, sustainable building and energy management.

Our solutions suite spans devices, datasets, analytics, software and Internet of Things (IoT) connectivity, for energy and non-energy applications across home, community, commercial and industrial, and utility use cases.

Our open business model promotes technology collaborations, with dozens of third-party partner integrations with our REST API - in Australia, and internationally. Product brands include Wattwatchers (hardware and data to the cloud), MyEnergy (mobile app) and ADEPT (agile IoT platform for managing multi-technology fleets in real-time).

This is a 'two-sided market' opportunity

Our submission urges the Energy Security Board (ESB) to use this process of consultation and the detailed design phase now underway to ensure that any capacity mechanism introduced will overtly allow for mass-market participation through demand response and energy efficiency at the level of household and small business consumers.

This will reflect the growing focus of the ESB, the Australian Energy Market Commission (AEMC) and other industry regulatory and market bodies on customer engagement and involvement, demand-side activities and opportunities, and distributed energy resources (DERs) like rooftop solar and home batteries - which increasingly are being recognised as 'customer energy resources' (as a recent Wattwatchers blog post¹ highlighted when ESB and AEMC chairperson Anna Collyer spoke at a 2022 stakeholder forum event hosted by the Board of the ECA).

As such, the ESB has an opportunity to correct the industry's course in regard to small-scale customer participation in the energy market - and what may become a dual energy and capacity market by 2025 - after the AEMC in 2020 declined to extend the groundbreaking introduction of a Wholesale Demand Response Mechanism (WDRM) to include household and small business electricity consumers as well as large commercial and industrial ones.

Wattwatchers further submits that broad-based small-scale customer participation in the electricity system, facilitated by direct inclusion in a capacity mechanism (if this eventuates), and also through revisiting other mechanisms like the WDRM, will help to achieve a timely and orderly transition to a more flexible, clean, reliable and affordable energy future; and to Net Zero greenhouse gas emissions for electricity at a faster rate and lower cost than will be the case in its absence.

To achieve genuine customer participation in the evolving energy system, policy-makers, regulators, market operators and other industry players need to ensure that this objective is consistently built into every relevant aspect of the transition agenda and market architecture, including the foreshadowed introduction of a capacity mechanism for the NEM.

¹ <https://wattwatchers.com.au/customer-versus-distributed/>

Consumer-facing technologies and data-driven solutions, the territory which Wattwatchers operates in, are vital to enabling this customer participation in an increasingly flexible electricity system as it moves from Grid 1.0 to Grid 2.0 and beyond, and to what the AEMC has described as the ultimate objective of a ‘two-sided market’.

The AEMC’s announcement of its WDRM rule change decision in 2020² said in part: ‘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.’

To match the needs, expectations and functionality requirements of today’s often tech-savvy consumers, and to move up progress towards an effective and inclusive two-sided market, solutions need to extend on the current regulated metering, billing and market reconciliation approaches. Ultimately, the ability for suitably-equipped homes and small businesses to participate in a capacity mechanism and other parts of the market should drive value beyond the energy system, including enhancing property values (i.e. we note the recent 2022 Domain Sustainability in Property Report³ which highlighted the positive impact of energy efficiency improvements on home sales, in terms of both speed and prices).

An important aspect of this evolution is to expand the ‘digitisation ecosystem’ beyond the regulated market’s ‘smart meters’ and ‘advanced metering infrastructure’ to include customer-side Internet of Things (IoT) era solutions such as smart monitoring and sensing, inverters, chargers, remote controllers, software apps and platforms, and more. (To this end, Wattwatchers also is participating in stakeholder engagement in regard to the current AEMC metering review⁴, and is making similar arguments in regard to customer empowerment and technology flexibility.)

Neutrality on ‘the case’ for a capacity mechanism

For its part, as a homegrown Australian energy technology company, Wattwatchers is neutral as to whether the introduction of a capacity mechanism is the best intervention to help reset the NEM to a) better manage the rapid transition to high penetration of Variable Renewable Energy (VRE), and to b) achieve Net Zero for Electricity, with:

- the inevitable phasing out of traditional coal-fired generation;

² <https://www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism>

³ <https://www.domain.com.au/research/domain-sustainability-in-property-report-1147058/>

⁴ <https://www.aemc.gov.au/market-reviews-advice/review-regulatory-framework-metering-services>

- increasing electrification of the built environment, industry and mobility;
- growing participation of consumers in the energy system; and
- ongoing innovation and technology advances.

If a capacity mechanism does proceed, however, then it presents an important opportunity to advance demand response and energy efficiency enabled by technologies like Wattwatchers, which create new data resources and points of connection to intermediate between the highly-regulated energy markets and end customers who are using, and often generating electricity too, as part of everyday living.

Core assumption for this submission

Based on the high-level design consultation paper and process, this submission assumes that the ESB is committed to this reform path, and notes that there are abundant international precedents for incorporating a capacity mechanism in Australia. As ECA consultant David Heard, the principal of Finncorn Consulting, says in his submission to this consultation ‘... we are dealing with a question of how - if it is to be put in place - a capacity mechanism may be optimally designed from a consumer perspective.

We also note that there is considerable public controversy around the plan for a capacity mechanism, much of it focused on concern that this path could result in, or even is intended to bring about, prolonging the operating life of coal-fired generation - which in turn could hold back progress in Australia and globally towards Net Zero greenhouse gas emissions.

As a matter of principle, Wattwatchers itself does not support the use of a capacity mechanism to prolong the operating life of coal-fired generation plants, and we welcome the ESB’s statement on this topic in the consultation paper, which says: ‘*For the avoidance of doubt, the purpose of a capacity mechanism is not to extend the lifespan of ageing coal generators.*’

It follows that by specifically allowing for mass-market customer-side participation in any introduction of a capacity mechanism, an enlightened, and we would argue inevitable position that is consistent with customer-centric policy-making, the ESB can help to allay any remaining concerns about the agenda behind pursuing this market reform initiative.

Mass-market participation opportunity

The forthcoming detailed design stage, now being consulted on, is critical to ensuring that the seemingly inevitable implementation of a capacity mechanism by 2025 is effective for the system and fair for consumers, making the electricity market more flexible, reliable,

affordable and fit for purpose, while not creating major new problems or further exacerbating old ones.

As signalled earlier, we submit it provides a compelling opportunity to accelerate the growth of demand response in Australia, and to some extent energy efficiency as well, and in particular to underpin a greater degree of mass-market participation (i.e. reaching beyond large industrial and commercial customers to engage and aggregate households and small businesses, of which there are 9-10 million in Australia).

To this end, we urge that ultimate design of a capacity mechanism also should take into account how it will work with other 'mechanisms' in the solutions ecosystem that can support an orderly transition to a Net Zero, highly-electrified energy future, including but not limited to:

- The Wholesale Demand Response Mechanism (WDRM)
- Emerging peak demand reduction schemes (e.g. current NSW consultation)
- The long awaited prospect of a national energy efficiency certificate scheme similar to those already operating in NSW and Victoria
- The potential for a new Renewable Energy Target
- Enhanced consumer/customer participation in the energy system enabled by technology (and the standards, functionality and communications required)
- Electrification including programs and policies to accelerate the uptake of EVs

We submit it is time for step-change, coordinated reform of the energy system rather than incremental change, with a deliberate focus on empowering consumers to participate in a genuinely two-sided market. If a capacity mechanism proceeds, then it should be a core part of this scaling up of policy reform ambition and achievement on the customer front.

Alignment with Energy Consumers Australia's position

In framing our submission, and as mentioned earlier, Wattwatchers has had the benefit of previewing submissions to this consultation process being prepared by and for the ECA, and we are broadly supportive of the analysis and recommendations the ECA has assembled in tandem with its expert consultants (led by Dr Neil Lessem of Econalytics and David Heard of Finncorn Consulting).

The paragraph below from the Econalytics report commissioned by the ECA neatly encapsulates the position that Wattwatchers supports conceptually, and which Wattwatchers - and a number of other innovative solution providers - can enable in an operational sense with technologies and data:

'The intention of this report is to propose and discuss several policies and market design choices to enable significant and meaningful mass-market (residential and small business) demand response and energy efficiency participation in the capacity market. Such policies will ensure more efficient use of existing resources, thereby lowering costs for consumers. Consumers who provide demand response and energy efficiency resources will receive further benefits. Bringing about large-scale mass-market participation in demand response is essential in ensuring sufficient dispatchable and flexible supply to meet system needs as fossil fuel generators retire, more intermittent generation comes online and demands on the grid increase with electrification of the economy. While most demand response capacity has historically been provided by larger customers, it is our belief that mass-market participation will increase over time as electrification and falling telemetry and computational costs increase the volume of mass-market load that is cost-effectively controllable.'

As Wattwatchers sees it, strong provision for demand response and energy efficiency will help to fill out the 'value stack' for Virtual Power Plants (VPPs) - which effectively can be Virtual Power and Demand Plants (VPDPs) - thus advancing the further integration of Customer Energy Resources, or CERs (also known as Distributed Energy Resources, or DERs)* into grids. In our submission, business models for delivering VPPs/VPDPs should be open to specialist non-retailer third-party aggregators as well as to retailers.

We reference a recent IEEFA paper⁵ in regard to the importance of additional value streams to underpin further development of VPPs/VPDPs.

**Wattwatchers notes and supports the move by the ECA to rename the term 'Distributed Energy Resources (DERs)' to the more end-user friendly 'Customer Energy Resources (CERs)'. This recognises that while New Energy era technologies and assets like solar PV, storage batteries and electric vehicles may be 'distributed' in contrast to large centralised traditional power stations, they are owned or controlled by customers rather than energy industry players.*

Getting demand response (and energy efficiency) right is key

Much of the consultation paper's contents is outside of Wattwatchers' remit as a digital energy technology company in scale-up mode. However, as indicated above, the clear intention to include demand response as a form of 'capacity' alongside generation, storage and transmission is very welcome, and is of core relevance not only to our technology and data-driven solutions, but also to those of our customers and other solution providers, including our competitors in the digital energy technology space.

On page iii of the consultation paper, it says: 'The ESB proposes that all resources contributing to capacity requirements are to be eligible to participate in the capacity

⁵ <https://ieefa.org/articles/ieefa-virtual-power-plants-are-future-electricity-retailing>

mechanism. This will include demand-side resources, which will have an important role to play in a decarbonised grid.'

We agree wholeheartedly. Thus our submission urges the ESB to further elevate its initial focus on demand response as a pillar of any capacity mechanism, including overtly seeking to encourage 'by design' mass-market demand response services aimed at small-scale electricity consumers (i.e. households and small businesses).

We submit that the final design for the capacity mechanism should prioritise promoting new capacity, specifically including enhanced and expanded demand response and energy efficiency measures that reach household and small business consumers, over existing capacity - and especially over existing coal-fired power generation.

Wattwatchers supports 'best design principles' put forward by David Heard, of Finncorn Consulting, in his submission to this consultation on behalf of the ECA, which include:

- Total wholesale costs paid by consumers should demonstrably decrease
- Mechanism should not overcompensate sunk costs of existing assets
- Capacity providers should face the consequences of unreliability
- Consumers should have a clear opportunity to fund their own reliability via demand response
- Energy efficiency gains and consumer-led DR (demand response) are likely to be cheaper than marginal new capacity

The other main ECA consultant for this consultation process, Dr Neil Lessem of Econalytics, has laid out the role for demand response and energy efficiency in a capacity mechanism, and Wattwatchers also supports his analysis and position, which includes:

'Demand response is a temporary and voluntary reduction in consumption in response to a signal, while energy efficiency is a permanent reduction. Demand response and, to a lesser degree, energy efficiency, are common products in a number of capacity markets and have regularly demonstrated an ability to either shift load to another period or to reduce peak demand. As a flexible and fast acting resource, demand response can also help to integrate intermittent renewable generation. For example, a hot water heater could receive signals to run concurrently with solar generation, but momentarily shut down when cloud cover reduces output.

'Energy efficiency and demand response can reduce the need for expensive capacity to be built to meet just a few hours of peak demand per year. A recent study by the Australian Renewable Energy Agency (ARENA), found that enabling load flexibility would reduce electricity system costs for consumers over the next twenty years by \$6-18 billion in net

present value,⁶ with the higher values achieved in scenarios with greater levels of electrification and consumer adoption of self-generation (solar and batteries).⁷

‘These consumer savings are realised through:

- Load reduction and load shifting which reduces the need to build new generation and storage capacity, resulting in lower build costs to the system
- Load flexibility which lowers generation dispatch at peak times, resulting in lower fuel and variable cost savings
- Load flexibility which allows consumers to avoid price spikes, lowering their exposure to high priced periods in the wholesale market.’

Whatever may have been true in the past, the technology and data-driven solutions to support small-scale consumer participation are now available. But a key challenge remains to make customer participation more compelling by attaching greater financial and other rewards for those consumers who a) have suitable loads available, and b) want to participate and be rewarded for doing so. The capacity mechanism is a prime opportunity to address this ‘reward equation’ effectively.

IEA’s ‘tenfold increase’ demand response position

In endorsing this embrace of demand response by the ESB in its capacity mechanism process, and in urging it to go even further in this regard during the detailed design phase, Wattwatchers highlights the position of the International Energy Agency (IEA) outlined in a recent tracking paper⁸.

While the IEA celebrated recent progress in development and implementation of demand response in a number of countries, including Australia, it also strongly recognised the need for further rapid expansion of demand response capacity as part of the electricity sector’s contribution to the clean energy transition and net zero carbon emissions by 2050. It’s tracking paper says:

‘...even faster progress is needed: 500 GW of demand response should be brought onto the market by 2030 to meet the pace of expansion required in the Net Zero Emissions by 2050 Scenario (NZE), a tenfold increase on the deployment levels in 2020. In the NZE, the equivalent of 15% of average annual demand can be shifted to some extent by 2050 (shares are higher in many advanced economies with demand response markets in operation

⁶ *In the study, the costs of controlling, orchestrating and aggregating load are outside of the model. These costs will ultimately be borne by consumers, lowering the estimated load flexibility benefits.*

⁷ ARENA (2022), [“Valuing Load Flexibility in the NEM”](#), p.111

⁸ IEA Tracking Paper on demand response published in November 2021
<https://www.iea.org/reports/demand-response>

today). Demand response can be unlocked through actions taken in this decade to open markets to demand-side participation, encourage new business models and establish controllability standards for equipment and appliances.’

We welcome the ESB’s assurance on page 19 of the consultation paper that stakeholder feedback from the earlier Initiation Paper consultation phase is to be directly addressed in the detailed design phase, and includes: ‘While being technology neutral, the mechanism design should recognise the advancements in new technologies and their ability to participate including emerging types of capacity such as DER (CER) and demand response.’

The inclusion of strong demand-side measures in a capacity mechanism, enabled by digital technologies, can help to ensure that electricity consumers don’t end up paying more for power (a concern that the ESB acknowledges in its consultation paper, and cites the need to address through the design stage). As the ECA has highlighted in its own response to this consultation, from ECA CEO Lynne Gallagher, demand-side participation can be cost-effective:

‘The fundamental reason capacity is needed is to meet peak consumer demand for electricity. Solving this problem needs to focus as much on demand as on supply. Demand response and energy efficiency are low-cost resources that the capacity mechanism should be designed to specifically procure.’

Relevant consultation questions

Q15 - What are your views on how existing and new capacity should be treated in the auction process?

Wattwatchers response: New capacity should be prioritised, and if existing capacity is to be allowed then this must be designed to avoid double-dipping or double-counting, and to minimise if not eliminate any prolonging of the operating life of coal-fired generation plants that might otherwise close in the absence of a capacity mechanism. In regard to demand response, Wattwatchers supports an aggressive dedicated ‘carve out’ allocation to help ensure a strong focus on mass-market, small-scale customer participation..

Q16 - Are there other considerations the ESB should take into account for the detailed design?

Wattwatchers response: We strongly endorse the ECA submissions, and in particular its proposals for an independent ‘Mechanism Monitor’, and for demand response and energy

efficiency 'potential studies' both before a capacity mechanism is implemented, and then regularly during its operation.

Q38 - Do you agree that costs should be passed on via retailers, rather than NSPs?

Wattwatchers response: Yes, we support retailers being a key channel for passing on capacity mechanism-related costs to consumers. We further note, however, that non-retailer specialist aggregators of demand response capacity should be encouraged, either as agents for retailers, or in their own right.

In conclusion: this doesn't need all consumers to participate - just the right ones

The primary purpose of utility-style metering technologies - aka 'smart meters' or 'advanced metering infrastructure', but also including millions of old-style analogue meters still in operation in Australia - is to allow all electricity consumers to be supplied and billed in consistent and similar ways.

Alternative technologies which can fill out the energy ecosystem and increase its flexibility, including via enabling customer-side demand response and energy efficiency down to small-scale sites, do not need to be installed at all premises. The availability of relevant CERs/DERs and controllable discretionary loads varies greatly across residential and small business sites, and balancing the grids of the future will not require all consumers to participate in the same way - just the right ones to do the job required, at lowest cost.

If reforms like a capacity market help to improve the 'value stack' for retailers doing DR and VPP/VPDP-style aggregation, and for specialist non-retailer aggregators as well, then the technologies required for actual visibility, load control and coordination, and real-time measurement and verification (M&V) can be built into the business models and installed at the sites where additional services need to be enabled.

Wattwatchers envisages a technology and data-enabled future - a relatively near-term future, bringing forward the destination of a two-sided market - where high-quality aggregators will manage substantial fleets of small-scale sites in real time, and will even compete for the best customer participants to maximise their delivery of reliable (and verifiable) demand response and energy efficiency capacity. In this regard, energy system flexibility needs to extend to metering and management technologies like Wattwatchers.

This report has been prepared for Wattwatchers (www.wattwatchers.com.au) by its Head of Impact and Communications, Murray Hogarth. Mobile +61 (0) 417267235 Email murray@wattwatchers.com.au (contact details can be published).