

Thursday, 5 November 2015

John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235
Lodged Electronically

Dear Mr Pierce,

**RE: SEA0002 Integration of Energy Storage: Regulatory Implications,
Discussion Paper Submission**

The Clean Energy Council (CEC) works with Australian renewable energy businesses across all technologies to accelerate the transformation of Australia's energy system into one that is smarter, cleaner and more consumer-focused.

As the Commission is aware the CEC has been undertaking leading work on the integrity of storage installations and standards through our Energy Storage Roadmap. The most recent achievement of this work is the introduction of a new accreditation extending the scheme for solar PV installers to incorporate battery storage. Although this work does not extend to the treatment of storage under the NER it is closely related to the Commission's consultation.

The CEC would be pleased to provide a briefing for the Commission on the status of the Roadmap tasks at a convenient time.

The CEC welcomes the Australian Energy Market Commission discussion paper as a constructive and proactive step towards understand the resilience of our electricity market to emerging technologies.

Overview

The CEC supports the Commission's view that for the purposes of network regulation, storage should be considered a contestable service and we agree that customers who provide network services should be rewarded. However, the CEC does not believe that the current degrees of freedom afforded to DNSPs are appropriate for a market where electricity customers are adopting storage and micro-embedded generation technologies on mass.

In particular the CEC draws attention to the non-negotiable nature of the connection of micro-embedded generators and storage devices to the grid and the application of DNSP-specific

technical requirements for connection. As the NER fails to capture these requirements DNSPs are afforded significant degrees of freedom in prescribing technical outcomes.

While these outcomes could easily be extended to the control of AS4777 compliant inverters this standard is not the appropriate place to regulate electricity markets and the role of DNSPs. Regulation needs to be adapted by changing the National Electricity Rules to ensure consumers remain protected. The direction of tariff reform should accelerate the need for this regulation.

Distributed generation and storage is expected to become ubiquitous with electricity supply and will rapidly become a major competitor to the traditional 'poles and wires' business of DNSPs. It would be anti-competitive to allow DNSPs to continue to enjoy quasi-regulatory powers over their competition by controlling technical requirements for connection and connection approvals. A longer term-view would look to transfer the connection approval powers to an independent organisation with no commercial interest in the outcome and the role of AEMO should be considered here.

This submission sets out the following key recommendations:

- 1) Develop and incorporate nationally consistent standards for the connection of embedded generation into the NER so that the degrees of freedom afforded to DNSPs can be managed appropriately on a market-wide basis.
- 2) New regulation is required to manage consumer protections from risks of DNPS control of customer equipment created by the introduction of the revised AS4777. There are two possible solutions to ensure consumer protections from DNSP control of inverters:
 - Australian Energy Regulator approved standing offers for network support provided by AS4777 compliant inverters.
 - Amend the NER with a mechanism to return to customers any revenues collected by DNSPs from micro-embedded generation and storage customers when the DNSP has activated an AS4777 compliant inverter's demand response mode.
- 3) Clarify the extent of the quasi-regulatory powers available to DNSPs in relation to the connection approval of non-exporting storage or micro-embedded generating systems.
- 4) Investigate opportunities for alternative connection approval arrangements, including transferring connection approval powers to an independent organisation with no commercial interest in the outcome. Expanding AEMO's role in this area should be considered.
- 5) Consider the benefits of a combined registration category that incorporates market demand and generation under one registered participant.
- 6) The current limitation of small generator aggregators from the frequency control ancillary services market should be removed.

The scope of the Commission's work as it relates to the integration of energy storage

While it is appropriate that the scope of the Commission review should be the NEL and the NER this submission also incorporates aspects of the National Energy Retail Rules (NERR) as they relate to the treatment of the non-exporting storage and embedded generators as retail customers.

Additionally, the CEC notes that the Commission's remit does not extend to:

- consumer protection issues associated with storage, which will be addressed separately by governments in the context of the current broader review of energy-specific consumer protection and the relationship with Australian Consumer Law; and
- instruments at the jurisdictional or sub-jurisdictional level that may affect the integration of storage; and
- technical, building and safety standards for electricity storage devices and their installation along with appropriate skills and practices for storage installers.

Elements of the current consumer protection framework that need to be reviewed in relation to the penetration of energy storage

There are elements of the consumer protection framework that need to be reviewed in relation to the penetration of energy storage. The CEC's views on this matter were outlined in some detail in:

- A February 2015 submission to the Australian Energy Regulator (AER) on 'Regulating innovative energy selling business models under the *National Energy Retail Law*'; and
- A March 2015 submission to the Energy Market Reform Working Group of the Council of Australian Governments (COAG) Energy Council regarding the regulatory implications of battery storage for the consumer protection framework for the electricity market.

(Copies of these submissions can be found on the CEC's website¹).

A key point raised in those submissions is that low cost battery storage will enable use of 'micro grids' and consumer protection issues could arise if large numbers of energy customers obtain their electricity through micro-grids that are not part of the interconnected

¹ <https://www.cleanenergycouncil.org.au/policy-advocacy/submissions.html>

national electricity system. It might therefore be desirable to extend the scope of the National Energy Customer Framework (NECF) beyond the “interconnected national electricity system”.

Connection processes, standards and agreements for storage and generating systems that export to the grid

The CEC generally agrees that the well-understood connection *process* for AS4777 compliant energy systems is sufficient for storage systems that wish to export to the grid. Similarly, as the NER already classifies such systems as micro-embedded generators under NER cl. 5A.B.1 (b)(2) there is not a clear need for a stand-alone connection agreement for this technology. However, the treatment of services that storage could provide needs further consideration.

CEC supports the Commission’s view for the purposes of network regulation storage should be considered a contestable service. We agree that customers who provide network services should be rewarded by networks. While it follows that DNSPs should contract for these services under a different network support agreement, there are likely to be significant challenges for micro-storage customers in negotiating such contracts. The AER should be required to determine an appropriate ‘standing offer’ for these customers when providing network services.

The Commission has noted that charging for augmentation may be required to export from a storage system with a micro-embedded generator². However, this is unlikely when considering that the typically large costs for augmentation would exceed the benefit that customers get from the storage system. The more likely scenario is that customers would install a storage system to complement an embedded generation system while avoiding augmentation costs.

Consumers avoiding high augmentation costs while installing a desirable generator size is more consistent with economically rational outcomes under the National Electricity Market’s (NEM’s) ‘causer-pays’ arrangements. This outcome is also consistent with the customer being able to reasonably respond to price signals that are provided by DNSPs in their network tariffs. Unnecessary regulation should not stand in the way of customers making decisions to reduce their exposure to high prices.

² Discussion Paper, p. 13.

DNSP control of AS 4777 compliant inverters

Irrespective of the intent of the NER the conditions for connection of AS4777 compliant equipment (*micro-embedded generators*) are assumed to be non-negotiable minimum access standards, storage projects should be considered in the same way. Customers do not have the knowledge and market power needed to negotiate a less onerous outcome. Regardless, individual negotiation on the standards for the connection of each micro-embedded generator is unlikely to be consistent with the National Electricity Objective (NEO).

The lack of uniform approaches and standards for the technical requirements for connection already give individual DNSPs significant degrees of freedom in determining requirements for connection. Additionally, an inverter is a customer device and is not consistent with the definition of ‘network device’ as currently drafted by the Commission’s Competition in Metering Rule Change to provide some limitations on control by DNSPs.

The CEC shares the Commission’s concerns that DNSPs should not be able to gain implicit control of the value from storage through onerous connection regimes that can require control of dispatch. The revised AS4777 standard’s demand response modes (DRM) significantly enhance a DNSP’s freedoms. In the most basic form this standard requires an inverter to allow the DNSP to prevent electricity generation (termed ‘DRM0’). Additional demand response modes give wide-ranging control to the DNSP if required under the connection agreement.

However, AS4777 is not the best place to regulate electricity markets and the role of DNSPs. AS4777 should set the technical capability of inverters, but it should not act as implicit regulation that allows unfettered use of that capability by DNSPs.

Tariff reform is currently moving the NEM towards peak demand-based Distribution Use of System pricing. Under this new regime a DNSP would only have to exert a short-term DRM influence to have a significant impact on the revenues they collect. For example recently published DNSP Tariff Structure Statements include demand components for residential customers that are based on 15 or 30 minutes of peak demand during each month.

Recommendation 1

Nationally consistent standards for the connection of embedded generation are critical for the ensuring the NEM can deliver efficient outcomes into the future. AS4777 is a device and customer installation standard and the degrees of freedom afforded to DNSPs in connection requirements beyond this expose micro-embedded generator and storage customers to significant risk.

The Commission should develop and incorporate nationally consistent standards for the connection of embedded generation into the NER so that such risks can be managed appropriately on a market-wide basis.

Recommendation 2

New regulation is required to manage the gap created by the introduction of the revised AS4777 as the standard itself is not the appropriate place to do so. There are two possible solutions to ensure consumer protections from DNSP control of inverters:

- 1) DNSPs can be given permission to control an AS4777 inverter where a customer has a demand management contract in place. Such contracts would have to be developed to provide appropriate compensation for the customers and be approved by the AER in the form of a 'standing contract', or;
- 2) Amend the NER with a new mechanism to return to customers any revenues collected by DNSPs from micro-embedded generation and storage customers when the DNSP has activated an AS4777 compliant inverter's demand response mode. Such a scheme would need to be mandatory and incorporate:
 - Public reporting of the use of demand response signals for AS4777 compliant inverters;
 - Notices to all affected customers of the financial impact of this use including the methodology under which this impact is derived;
 - Returning the network charges that the customer would have avoided had the demand response not been in use; and
 - Updated Model Standing Agreements under Chapter 5A to specify the details of this scheme.

Connection processes, standards and agreements for non-exporting storage and generating systems

As noted previously DNSPs have tightly controlled approval of micro-embedded generator and storage connections. Given the opportunity created by the additional economic values of storage, DNSPs are likely to utilise their monopoly position to exercise even greater control of approval of connections of solar with storage.

In some cases DNSPs might already be extending their quasi-regulatory powers beyond what the regulations allow. One clear area where this is occurring is with the connection of non-exporting storage or micro-embedded generating systems³.

The CEC acknowledges the Commission's interpretation of the National Energy Retail Rules' deemed connection contracts that the installation of a generator would require a new

³ As defined by NER Chapter 5A.

connection application under Chapter 5A⁴. However, the CEC also acknowledges, and agrees with, the Commission's statement that the rules consider any system that never exports to the grid is a load⁵. It therefore does not follow that a retail customer who installs an appropriate control scheme to prevent a micro-embedded generator and/or storage system exporting to the grid should be required to follow a process to connect a generator.

As the Commission has pointed out, however, the installation of such a system does not change the customer's status under the NER: that is they remain a retail customer. Under the Deemed Connection Contracts these customers are only required to inform the DNSP of the intent to install the equipment. But because Chapter 5A is not explicit about the distinction between exporting and non-exporting customers the treatment of 'non-exporting generating and storage systems' is a matter of interpretation by DNSPs (as cited by the Commission). Although, augmentation of the network would never be required because the customer cannot export to the grid, and these generating systems are typically compliant with the AS4777 standard⁶, the default position of DNSPs is to classify such a connection as 'negotiated'⁷.

As the Commission is aware, negotiated connections are exposed to increased uncertainty in timeframes and costs. They also create additional unnecessary commercial risks. Although non-exporting generating systems pose little to no risk to the DNSP's ability to retain reliable and safe supply to other customers, the use of a Negotiated Connection Contract exposes these non-exporting customers to terms and conditions which are far more onerous than that intended by Deemed Connection Contracts. For example, while being specific about limitations on the DNSP's liability, they remain silent on a limitation for the retail customer. The entire reasoning for a Deemed Connection Contract is that retail customers should not have to negotiate around unreasonable terms and conditions such as these.

These issues show that the current treatment of non-exporting generation or storage systems is inconsistent with the NEO. In particular,

- Productive efficiency is not maximised because the customer bears the unnecessary costs to undergo a connection process designed for an embedded generator, and;
- Allocative efficiency is not maximised because the customer is carrying unreasonable risks and the associated costs placed on them by negotiated connection contracts.

⁴ Discussion Paper, p. 90.

⁵ Ibid, p. 11.

⁶ Including any solar PV or storage system.

⁷ It is now common practice to apply this process to solar PV connections down as low as 5 kVA, far lower than that intended by Chapter 5A's treatment of micro-embedded generators under a Basic Connection Contract.

Recommendation 3

The Commission should clarify the extent of the quasi-regulatory powers available to DNSPs in relation to the connection approval of non-exporting storage or micro-embedded generating systems. In particular:

- Clarify that non-exporting generating or storage systems are treated as retail customers under both the NER and NERR and that they should not be treated as embedded generators;
- Clarify the NER to ensure that any non-exporting generating or storage system is subject to a model standing offer for retail customers who are *not* embedded generators under NER cl. 5A.B.1 (b)(1); and
- Incorporate the appropriate technical requirements for non-exporting generating or storage systems into the NER as part of the development of connection standards for embedded generators. Failing this the NER should require that DNSPs specify and publish the technical requirements for non-exporting generating or storage systems (noting that some DNSPs have already done so).

Ring-fencing arrangements

The CEC agrees with the Commission's view that ring-fencing arrangements need to adapt as emerging contestable markets evolve with new technologies.

As noted previously technical standards for the connection of micro-embedded generators and connection processes are not considered negotiable to a connecting party. DNSPs enjoy a uniquely powerful position as monopoly businesses that enjoy the benefits of extreme information asymmetry and quasi-regulatory powers over their competition in connection processes and approvals. These conditions mean that a DNSP would be able to exert influence over connection processes with preference to a ring-fenced entity even if this entity were legally separated.

In the medium to longer term, distributed generation and storage will be a major competitor to the traditional 'poles and wires' business of DNSPs. It is unacceptable for DNSPs to continue to exercise quasi-regulatory powers over their competition and the current ring-fencing arrangements appear inadequate to deal with this issue. A longer term-view would look to ensure the appropriate technical standards are in place within the NER (Recommendation 1) and transfer the connection approval powers to an independent organisation with no commercial interest in the outcome.

Similarly, as storage and distributed generation become increasingly widespread their interactions with the power system will become increasingly important. Power system security has always been managed by the Australian Energy Market Operator on the basis of social good, rather than for profit. As embedded generation and storage become ubiquitous

the continued involvement of DNSPs in their quasi-regulatory role for embedded generation and storage challenges this paradigm.

Recommendation 4

The Commission should investigate opportunities for alternative connection approval arrangements, including transferring connection approval powers to an independent organisation with no commercial interest in the outcome. Expanding AEMO's role in this area should be considered.

Market participation

The CEC does not believe there are any significant barriers to storage registering and participating in the wholesale market. However, in order to charge efficiently for registration, AEMO's registration arrangements may need to include a category for storage arbitrage that encompasses both generation and load from the same registration.

The current limitation of small generator aggregators from the frequency control ancillary services (FCAS) market should be removed as this structural limitation is inconsistent with the market-based principles applied to the design of the NEM. Additionally, small generator aggregators are already liable for ancillary service charges so where a small generator aggregator wishes to provide FCAS to the market they should not be restricted from doing so.

Recommendation 5

Consider the benefits of a combined registration category that incorporates market demand and generation under one registered participant.

Recommendation 6

The current limitation of small generator aggregators from the frequency control ancillary services (FCAS) market should be removed.

Summary

In summary, the CEC supports many of the preliminary findings made by the Commission and considers that the Commission and considered the appropriate areas of the market in the Discussion Paper. The main points and recommendations raised in this submission shed additional light on the preliminary findings and the CEC provide options for enhancing the performance of the NEM as micro-embedded generation and storage become an increasing prevalent aspect of the market.

Please do not hesitate to make contact on the details below as the CEC would be more than happy to discuss this submission in detail.



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