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9 November 2015

Mr John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

Dear Mr Pierce

INTEGRATION OF ENERGY STORAGE: REGULATORY IMPLICATIONS -
DISCUSSION PAPER

Ergon Energy Corporation Limited (Ergon Energy), in its capacity as a Distribution Network Service Provider (DNSP) in Queensland, welcomes the opportunity to provide comment to the Australian Energy Market Commission (AEMC) on its *Integration of Energy Storage: Regulatory Implications* – Discussion Paper.

Ergon Energy supports the development of a flexible regulatory framework for the integration of energy storage technologies. Furthermore, we support such a framework being underpinned by the principle of technology neutrality. With this principle at the fore, and to ensure the efficient integration of storage technologies into electricity networks, Ergon Energy does not agree that energy storage, with export capability should be defined as 'generation'. Forcing energy storage, a multi-functional technology, to operate under a set of rules designed for single functionality technology such as generation, will most likely prevent efficient outcomes and innovation.

Ergon Energy is also concerned the AEMC's position that the utilisation of energy storage capability by DNSPs be subject to a strict Ring-Fencing regime, is one that may not be in the best long-term interests of customers. In order for the technological and economic benefits of DNSP use of energy storage capability, in lieu of traditional augmentation investment, to be realised, it is essential that the regulatory framework does not include barriers to the achievement of this outcome. Specifically, it needs to be clear within the framework that DNSPs are able to utilise the technology without requiring a Ring-Fencing waiver, which would only add costs and hinder the integration of energy storage into distribution networks.

Further, as outlined in our submission, there are a number of uncertainties in the market which require flexibility in the regulatory framework to enable development of new business models and market paradigms, over time, that deliver the best outcome for customers.

Ergon Energy's response to each of the questions raised in the Discussion Paper is included in the attached submission. Should you require additional information or wish to discuss any aspect of this submission, please do not hesitate to contact either myself on (07) 3851 6416 or Trudy Fraser on (07) 3851 6787.

Yours sincerely

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Enc: Ergon Energy's submission

Submission on the *Integration of Energy Storage: Regulatory Implications* - Discussion Paper

9 November 2015

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Ergon Energy

9 November 2015

This submission, which is available for publication, is made by:

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1. Introduction

Ergon Energy Corporation Limited (Ergon Energy), in its capacity as a Distribution Network Service Provider (DNSP) in Queensland, welcomes the opportunity to provide comment to the Australian Energy Market Commission (AEMC) on its *Integration of Energy Storage: Regulatory Implications* – Discussion Paper (the Discussion Paper).

Over the next decade energy storage will become a key 'business-as-usual' component of the National Electricity Market (NEM) and the integration of this technology will underpin a major transformation of the sector. The Discussion Paper represents the first stage of an important process to ensure that the regulatory framework can appropriately accommodate the evolution of storage technologies in this regard.

Ergon Energy considers it essential that the principle of technology agnosticism underpins the AEMC's review and consideration of a fit-for-purpose framework into the future. At the highest level, the treatment of energy storage should be considered in the context of evolving, and related, regulatory investment and pricing frameworks. Furthermore, notwithstanding the AEMC's important role in this process, the overall framework will inherently be impacted by related guideline and policy issues, under the oversight and control of the Australian Energy Regulator (AER). As such it is imperative that the AEMC's review is not completed in isolation of these related issues.

Ergon Energy has responded to each of the questions raised in the Discussion Paper in the Attachment to this submission. Additionally, we have provided commentary below on a range of issues raised in the Discussion Paper.

Finally, as a member of the Energy Networks Association (ENA), the peak national body for Australia's energy networks, Ergon Energy supports the issues raised in the ENA's submission.

Definition of energy storage

The classification of energy storage as generation or otherwise is critical to the shaping of Australia's future energy sector. While the AEMC notes in the Discussion Paper, that an energy storage device can act as both a generator and a load, Ergon Energy considers that the capabilities of these devices extend well beyond this and as a consequence it is not appropriate to narrow their classification to these elements. For example, Ergon Energy's Grid Utility Support Systems (GUSS) program is proving energy storage can be a dynamic control device; voltage regulation device; loss support device; capacity management device; a static var compensation device; and a suitable alternative to conventional augmentation. Quite simply, an energy storage device is multi-functional, and can therefore be readily distinguished from generation technology which typically involves single functionality, being the production of energy. Consequently, Ergon Energy considers it inappropriate to apply the same National Electricity Rules (NER) definition to two completely different technologies, each with different practical applications.

In fact Ergon Energy considers that to define energy storage as 'generation' will restrict the efficient integration of storage into the electricity network and will also restrict future innovation in response to new market paradigms. This is because a reformist technology will be required

to function within the bounds of a decades old regulatory framework that was designed for an era of traditional 'generation' and 'poles and wires', not to accommodate or enable a multi-functional device that will cross between a host of different regulatory frameworks, including though not limited to, generation, load, engineering, augmentation and asset base maintenance. The application of an existing definition to energy storage to enable the technology to be accommodated within the existing regulatory framework will not drive the genuine reform of the market and the regulatory framework supporting it, that is essential to creating transactive electricity networks. As such, Ergon Energy strongly recommends that a new specific definition for energy storage is inserted in the NER.

Development of appropriate Ring-Fencing guidelines

In order for DNSPs to efficiently plan and deploy energy storage as part of delivering a safe, reliable, prudent and efficient network service, it is essential that any applicable Ring-Fencing Guidelines provide sufficient clarity in this regard. To the extent the AEMC still considers that energy storage devices are generators, a requirement for a DNSP to seek a Ring-Fencing waiver from the AER prior to deployment of such devices for network support and related purposes will represent an additional burden.

It is imperative that consideration be given to minimising Ring-Fencing restrictions on a DNSP owning and/or operating generation/storage for this purpose so as to not impede its use. Specifically, the use of generation or storage to provide network support and quality and reliability of supply services, must be distinguished from other forms of generation that are entered into solely for commercial gain. Ergon Energy proposes that there should be no requirement under the Ring-Fencing Guidelines for DNSPs to apply for a waiver to own and/or operate a generator or storage for genuine network support and related purposes such as voltage stabilisation.

Behind the meter storage

Ergon Energy supports the AEMC's contention that customers should be able to control and choose their behind the meter storage solutions. However, in preventing DNSPs from operating entirely in this space, the AEMC runs the risk of supersizing the 'battery storage network' and the grid, resulting in sub-optimal regulatory outcomes. Further, such an outcome will also likely prevent elements of Ergon Energy's customer base from obtaining the benefits of storage technologies.

Preliminary analysis of load data undertaken by Ergon Energy indicates that market load profiles can be smoothed and even flattened utilising relatively small two kilowatt (kW) sized batteries situated behind the meter; reducing peak demand and thus costs for all customers.

However, within a storage market framework that prevents DNSPs from engaging in activities behind the meter, it should not be assumed that DNSP access to household storage could be contracted from customers via an efficient price signal, as low take-up rates of air-conditioning demand response programs demonstrate. Under the AEMC's proposed model, DNSPs will be able to install battery storage for augmentation / network reliability purposes. In not being able to operate behind the meter, the combined investment of networks and customers in storage solutions will likely create significant market and economic inefficiencies and cost duplication

(as demonstrated in the example below). DNSP costs will be shared across the entire customer base, with those that are not able to take advantage of new energy solutions, such as tenants and low income households, being most impacted.

Example:

> *A transformer on the network is reaching capacity and requires an additional 500kW. With 2500 customers connected to the feeder lines, 250 2kW storage systems at the premise level would deliver the necessary augmentation. Flexibility is required to determine the most efficient model as the market develops over the short term. Specifically:*
>
> - *Could a DNSP contract with 12.5 per cent of this customer base to deliver the capacity needed, and is this solution more efficient than a solely network based investment?*
> - *When the constraint is identified, could a DNSP invest in increasing the size of new customer storage connections?*
> - *What guarantee is there that the 12.5 per cent uptake required via a price signal will be achieved to deliver an outcome that is the most efficient for the entire customer base?*
> - *How much will this uptake be hindered by the premium, 44c jurisdictional solar feed-in tariff (FiT)? Specifically, it is extremely unlikely that customers who currently have access to this FiT would be willing to install energy storage on the basis that it will render them no longer eligible for the FiT.*
> - *And importantly, will customers install storage devices that have surplus capacity the DNSP is unable to access, and must then duplicate this infrastructure at the network level?*

Fundamentally, there are too many unknown quantities such as cost, uptake, storage efficiency, network benefits etc., to effectively determine market rules today, that will not restrict innovation and enable the development of new market paradigms that will drive the most efficient outcomes. This is particularly apparent for Ergon Energy's rural and remote customer base. Preventing Ergon Energy from operating behind the meter is these areas will likely hinder our customers from accessing the benefits of energy storage technologies, as many such regions will most likely be an uneconomic market for the private sector due to costs associated with the provision of services in these areas. Ergon Energy is of the view that these issues cannot be resolved with any certainty at this point in time. However, we support the technologically agnostic approach being taken by the AEMC as an important foundation in this regard.

In addition to the issues raised above, Ergon Energy also envisages impacts on the future development of micro-grids and associated distributed generation capabilities. This is illustrated in the scenario below:

> *A greenfield housing estate is constructed to be supplied via a micro-grid using solar photovoltaics and storage to deliver 90 per cent of premises' energy needs. A connection to the electricity network provides the remaining 10 per cent along with some support capacity if the solar resource does not reach the demand required. Growth of the estate and an increase in demand at the premise level requires augmentation of the connection line. Potentially this occurs due to an under-forecast from the developer regarding the micro-grid's peak demand requirement. The installation of additional distributed generation and*

storage is more economic than traditional augmentation. The existing customer base is not willing / able to invest in additional capacity via the un-regulated market.

Application of Australian Standards

Ergon Energy disagrees with the suggestion that Australian Standard (AS) 4777 would provide too much 'control' to DNSPs. The paper states that "any energy storage system connected via a grid-connected inverter may need to be compliant with the revised AS4777, and may therefore be subject to a level of control over the inverter by the DNSP."

Ergon Energy would like to clarify that AS4777 does not require Demand Response Enabling Device (DRED) control modes other than Demand Response Mode Zero (DRM0). DRM0 is essential as it allows for disconnection for safety reasons, if doing so is required to perform works on the network, or is required by the Australian Energy Market Operator (AEMO).

All other control provisions in AS4777 do not provide DNSPs control over the inverter, but rather provide the customer with a choice as to whether to participate in a demand control program offered by either the DNSP or another party. Having this capability built into the inverter at very minimal cost upfront (mostly via software capabilities) means consumers will not have to invest more capital on specific products or add-ons, if they seek demand control options in the future.

All Demand Response Modes apart from DRM0 are "should" and not "shall" statements, meaning there is no requirement for the inverter to have the respective capability. The DRED capability should actually be viewed as a positive provision as it offers a standardised means of control (whether by a DNSP or another party) in order to deliver lower cost solutions to unlocking additional value streams, as opposed to proprietary solutions. Indeed, Ergon Energy is not aware of any DNSP that requires control of Micro Embedded Generators (Micro EGs) or Embedded Generators (EGs) (>30kW to 5 megawatts (MW)) unless it is directly being used for network support and therefore is receiving network support payments for the value it provides.

Connections

Ergon Energy supports the utilisation of existing Micro EG and EG connection processes for the connection of battery storage systems as these processes are based around AS4777: *The Grid connection of energy systems via inverters*, which is also the basis for the connection of energy storage devices. However, these processes and AS4777 will likely require updating to accommodate energy storage, and any such review could integrate a new definition of energy storage, that takes account of its multi-functional capabilities.

A connection agreement with the DNSP is essential in order to ensure the connection meets the relevant connection standards as stipulated by the DNSP to ensure a safe and reliable connection. This is because energy storage, particularly in aggregation, represents the capability to significantly disrupt the operation of electricity networks and cause capacity, voltage and frequency disturbances outside legislated or safe operating ranges. This includes the instigation of outages if aggregated loads are switched to charge at peak periods. It is

noted that this risk could be exacerbated where ‘gentailers’ use storage load to influence spot prices.

It also important to note that even non-export storage (i.e. for household consumption only) like non-export generation (e.g. solar PV), has the potential to disrupt the operation of electricity networks and cause capacity, voltage and frequency disturbances outside legislated or safe operating ranges. Requirements should be in place to submit to the formal connections process prior to connection and installation.

DNSPs must be provided visibility regarding aggregated loads and locations, potentially by the development of a national guideline stipulating load management standards (such as visibility, capacity and ramp up limitations). Such a guideline could be separately classed across central business district, urban, rural and isolated regions to enable market benefits as determined by capacity in various regions.

Consultation Paper Feedback Questions **1. Purpose and scope**	Ergon Energy Comment
Do stakeholders agree that the appropriate scope for the AEMC's work is the NEL and the NER as they relate to the integration of energy storage?	Yes. The National Electricity Law and the NER establish the regulatory framework that underpins the operation of the NEM, and apply in the majority of Australian jurisdictions. As such Ergon Energy agrees it is appropriate that the focus of the AEMC's work be centred on these instruments, which will be critical to the appropriate regulation of this evolving market.
Are there elements of the current consumer protection framework that need to be reviewed in relation to the penetration of energy storage?	As noted in the Discussion Paper it is essential that there are adequate consumer protections in place to protect consumers of energy storage products in what will likely be a rapidly evolving competitive market. While Ergon Energy appreciates that there is work being undertaken by the Council of Australian Governments - Energy Council and the Australian Energy Regulator (AER) in this space, a review of the adequacy of consumer protections under the National Energy Customer Framework may be required at some stage in the future to ensure that there are no gaps in the overall framework.
Are there jurisdictional and sub-jurisdictional instruments relevant to energy storage that the AEMC should also consider?	Considering the view expressed in the Discussion Paper that any system which exports electricity to the grid is a generating system, Ergon Energy considers that the AEMC should also consider the impacts of jurisdictional electricity legislation (Act and Regulations). For example, in Queensland the *Electricity Act 1994* and *Electricity Regulation 2006* include provisions governing connection of generators to the network, including a head of power for imposing conditions on such connections, for securing the safe and stable parallel operation of the supply network and the generating plant. Furthermore, it is essential to ensure that the mass uptake of energy storage devices occurs with adequate regard for safety and with the necessary protections in place. Consequently, jurisdictional instruments such as Queensland's *Electricity Safety Act 2002* and *Electrical Safety Regulation 2013* should also be considered, to ensure that any changes to the overarching national framework are made in consideration of these related frameworks.

2. End users and aggregators using storage 2.1 Connection processes	
Connection processes are new and still being implemented. Do you anticipate any issues with the connection process associated with storage?	Ergon Energy agrees that the connection of energy storage devices could reasonably be captured under the existing Micro EG connection processes. As noted in the Discussion Paper, existing connection offers for Micro EGs do not explicitly address any separate requirements or technicalities of energy storage devices, including any retrofitting of connected micro-embedded generators. However, Ergon Energy's preference would be for existing connection processes to be amended, which could include provisions to manage a new definition of energy storage, rather than a new suite of processes be developed specific to energy storage devices. As noted, despite the AEMC's indication in the Discussion Paper that in order to be considered a 'generator' an energy storage system must 'export electricity to the grid', Ergon Energy recommends that for the purposes of the connection process, consideration be given to extending the scope of when an energy storage device is considered a generator and as such cannot be connected to a DNSP's network without their consent. This is because battery storage will still export small amounts of energy to the grid for periods as the systems are imperfect at responding in sufficient time to prevent this export from occurring. Further, by virtue of the fact that the premise to which the non-export system is connected, is grid connected, there is necessarily the potential for network disruption as a consequence of variations in load profiles (unless of course the storage system is on a completely closed, non-grid connected circuit).
Do connection processes represent a barrier to storage? If so, what specifically is the issue?	Notwithstanding the potential market benefits to be derived through the integration of energy storage devices, there remains the potential for energy storage devices to disrupt the operation of the network, e.g. through capacity, voltage and frequency disturbances or network outages. As such Ergon Energy considers that the connection processes should be viewed as a necessity, rather than a barrier to storage. In this regard we note that the connections framework under the NER provides for simplified connection processes where the level of risk associated with a particular connection type is reduced.
Should DNSPs be required to have a connection offering that separately addresses	As noted earlier in this submission, Ergon Energy considers that existing connection processes for Micro-EG connections could reasonably be applied and/or adapted to cover

the connection of micro storage capability?	the connection of energy storage devices. As such, Ergon Energy does not consider there is a need for a separate offering to address the connection of storage capability. In fact we consider that the development of a separate connection process for energy storage devices would represent unnecessary duplication and result in unnecessary costs to both industry and customers. Furthermore, in the majority of instances energy storage will be coupled with generation (either via the same inverter or in parallel to a generator), will share the same connection assets, control mechanisms and protection, and will feed into the same circuits. On this basis, Ergon Energy considers it would be extremely difficult to separate out the processes.
Do connection costs represent a significant barrier to storage? If so, what specifically is the issue?	Ergon Energy does not consider that connection costs represent a significant barrier to storage. Specifically, we note that connection costs are regulated and approved by the AER, meaning protections are already in place to ensure customers are paying a fair and reasonable price for connection to the grid.
Would a separate industry standard for the connection of small or micro storage assets to a distribution network be appropriate? If so, what should be included?	No. As an energy storage device will connect to the network via an AS4777 inverter, then from network connection / technology neutrality perspectives, battery storage can be managed under the existing Micro EG connections processes, as an AS4777 inverter is the same manner in which a Micro EG connects to the network. . Further still, given storage also has the ability (like some generation sources) to supply a disconnected load during loss of grid supply, this capability is also covered under the definition and function of “Multi Mode Inverters” in AS4777.2-2015 and DR AS4777.1-2013 (with final version of part 1 expected mid 2016). A separate standard would result in the removal of technology neutrality, which could actually be to the detriment of storage uptake. A separate process would also result in a slow and complex connection process, leading to duplication of effort and cost overlap. Consequently, rather than an entirely separate standard and process, the combined Micro EG standard should be updated, if and as required, to include clauses relevant to storage capabilities. Finally, in support of our position regarding the absence of any need for an additional industry standard, Ergon Energy makes reference to the joint Ergon Energy / Energex connection standard for Micro EG Units (which at time of responding was undergoing

	review) and AS4777.2-2015; each of which support that from a connection perspective there is overlap between energy storage and generation.
2.2 Retailer authorisation and aggregator registration	
Do storage systems have characteristics, either individually or in aggregate, that mean regulation through the retail exemptions framework set out above is inappropriate for the relevant value stream? For example, there is no limit on the number or size of generating units a small generation aggregator can aggregate and so sell into the wholesale market. Does this present a concern?	Yes. Aggregators will have the ability to control considerable amounts of energy for release into the grid, which could cause challenges for AEMO, and / or the transmission / distribution network providers if the stored energy is within a single network zone (such as a distribution feeder). The control issues include not just managing any sudden export of large amounts of energy, but also this export occurring with a lack of ramp up / down, as happens with base load generation.
Aggregating parties would be required to register with AEMO if they intend to participate in the NEM. Will this provide any kind of barrier?	The requirement to register with AEMO should not create a barrier. Registration is vital to manage the potential for energy storage devices to cause disruptions on electricity networks, such as those outlined above. Registration is also important to ensure a level playing field for all market participants (e.g. equal sized generators and retailers), as well as for accurate reporting at a system level.
2.3 Standards for the installation, connection and operation of storage devices	
Does standard AS4777 represent a potential barrier to the deployment of storage by providers other than networks? What elements of the standard are problematic?	Please refer to earlier comments which suggest there is no need to develop a separate industry standard for the connection of small micro storage assets. Overall the new AS4777.2-2015 and the proposed DR AS4777.1-2013 are extremely well developed Standards that make use of standard inverter capabilities in a manner that actually facilitates greater Micro-EG,EG and in-turn energy storage connections (for as noted these process are based on AS4777: *The Grid connection of energy systems via inverters)*, by addressing concerns around safety, protection, and operation.

2.4 Provision of ancillary services	
Should aggregators be able to offer FCAS? If no, why not?	Yes.
What are the technical or data requirements that would need to be addressed?	Aggregators must be able to provide audit services that accurately show the value of that ancillary service at any point in time to ensure they correctly charge for the services provided.
2.5 Preliminary Findings	
Do you agree with these preliminary findings?	Ergon Energy: - Agrees existing connection processes can accommodate storage behind the meter. However, we disagree that there should be a separate connection offering created for storage connections as this does not align with the AEMC's principle of technology neutrality and will create process duplication and increase cost. - Disagrees that AS4777 provides too much control to DNSPs. The load control provisions are in place to ensure the safe operation of the network and to deliver load control capabilities at the consent of the customer. Also, Ergon Energy agrees with the ENA that the investigation of technical requirements should be undertaken with regard to the operational safety and system security reasons for the technical equipment specifications and remote control requirements.
Are there other issues which should be considered?	Electric Vehicles (EV) capable of Vehicle to Building (V2B) or Vehicle to Grid (V2G) have not been specifically considered in the paper. While a normal EV will be a load when connected and charging, V2B will be comparable to a non-export EG, and V2G will be equivalent to an export EG. Therefore Ergon Energy's suggests that EVs can be reasonably considered energy storage devices and as a consequence, should be included in the scope of AEMC's review.

1. Network businesses integrating storage	
Do stakeholders agree that there may be tensions and ambiguities within the distribution service classification framework that would benefit from clarification?	Ergon Energy agrees that there is potential for ambiguity under the current NER definitions, in terms of how they relate to storage assets. Specifically, as noted in the Discussion Paper, despite the AER's interpretation of the NER to mean that services provided from behind the meter at customer premises would fall within the definition of a 'distribution service' (on the basis of the installed assets forming part of a 'distribution system'), the absence of a clear definition in the NER of what constitutes an 'embedded network' arguably renders this issue uncertain. With this in mind, Ergon Energy also agrees with the suggestion in the Discussion Paper that current NER definitions lack certainty in terms of their applicability to the classification of services provided by storage assets.
Do these issues relate in particular to the potential for development of competition in the provision of energy services from storage?	Ergon Energy agrees with the comments made in the ENA submission that a lack of certainty over the treatment of service classification issues by the AER is likely to contribute to the deferral of otherwise efficient investment by all parties.
How should network business-controlled storage on the network be regulated – as standard or alternative control, or other?	In accordance with current economic regulatory practice, the form of regulation should stem from the nature of the service being delivered and who will benefit from the provision of that service. Ergon Energy considers that controlled storage on the network reasonably forms part of 'network support' and 'quality and reliability of supply' services, which benefit all customers, and as such should be regulated as a Standard Control Service.
Do stakeholders agree that the current rules applicable to networks are capable of integrating storage?	Ergon Energy agrees that the current rules applicable to networks appear capable of integrating storage. We also agree with the ENA that the regulatory investment test may require review in the future to provide a sound platform for truly technology agnostic assessments of network and distributed energy resource alternatives.
Is the incentive framework for distribution and transmission businesses creating any barrier to the deployment of storage where it is cost effective to do so?	No. In fact Ergon Energy considers the incentive framework is supporting the growth of the energy storage sector. Prior to wide-scale integration of energy storage important learnings, i.e. through trials, are first required in order to evaluate the reliability and performance of these systems. A key risk

	in utilising storage is that the storage device runs out of capacity prior to addressing the constraint it was installed for, and a network overload event occurs. Trials allow for effective algorithms to be developed which in fact lower the cost of energy storage installations by optimising the size of the system installed, rather than taking the less efficient approach of installing a larger system which costs much more. Importantly, the incentive framework supports building capacity in private industry, as DNSPs do not necessarily have the manufacturing or install capability in house for energy storage, and have to contract out. This has allowed a number of Australian energy storage manufacturers, integrators and aggregators to benefit from DNSP project funds in their own capability development.
Given the relatively unproven nature of battery storage should it be treated differently to other assets?	No. A significant component of the role of a DNSP for the past 100 years has been the management of risks (as with all infrastructure asset managers and operators). As such, DNSPs are well equipped to manage risk based on data, probabilistic analysis and confidence levels and do so in recognition of significant penalties for failure to supply or to meet reliability standards.
Are any of the timelines associated with regulatory processes likely to be problematic? For instance are the lead times in the planning process sufficiently long to capture the value of an incremental storage solution as a substitute for traditional network investment?	To the extent that energy storage devices are considered generators, the current requirement for some DNSPs to seek a Ring-Fencing waiver from the AER prior to deployment of such devices for network support and related purposes will represent an additional burden. Development of a nationally consistent approach (i.e. Ring-Fencing Guideline) is required relating to ownership and/or operation of generation or storage in this regard so as to not impede investments.
3.3.1 Network Businesses: Ring-Fencing	
Would current ring fencing guidelines address any concerns about a TNSP being able to impact the wholesale market or does storage raise unique issues? If changes are required, what are they?	No comment.

What will be required in the ring fencing guidelines to maximise the benefit of network use of storage?	Ergon Energy notes that current jurisdictional guidelines require a review and a nationally consistent approach is required in which Ring-Fencing restrictions on DNSPs owning and/or operating energy storage/generation for network support and related purposes are minimised. Specifically, the use of generation from storage assets to provide network support and quality and reliability of supply services, must be distinguished from other forms of generation that are entered into for commercial gain. As an outcome, there should be no requirement under the Ring-Fencing Guidelines for DNSPs to apply for a waiver to own and/or operate an energy storage device/generator for genuine network support and related purposes This framework would also support DNSPs becoming more familiar with the integration and operation of energy storage, making them more receptive to third party storage for network support, and the connection of behind the meter customer storage. In terms of the market, it will also likely increase the uptake of energy storage, particularly in the early stages.
What will be required in the ring fencing guidelines to minimise a network business's ability to unduly impact a contestable market?	Refer above comments.
3.3.2 Cost Allocation	
The current cost allocation arrangements do not appear to raise any issues in relation to the use of storage assets. Do you agree?	Yes
The current shared asset arrangements do not appear to raise any issues in relation to the use of storage assets. Do you agree?	Yes
3.4 Network businesses, Ring Fencing, cost allocation: Preliminary Findings	

Do you agree with these preliminary findings?	Service classification Ergon Energy agrees with the ENA that there is a need for enhanced regulatory certainty and rigour in terms of the application of service classifications relating to energy storage. In particular we note the apparent tension between the AER's current interpretation that a distribution system may stretch beyond the meter, and the AEMC's apparent reliance on the meter as the point of termination of the regulated network. For this reason we also agree with the ENA's proposal that the AEMC and AER jointly undertake future service classification processes on an integrated national basis. Cost recovery Ergon Energy agrees it is unlikely that networks purchasing storage for their network will prevent the development of a competitive market for storage devices – given the amount of activity by retailers and direct sellers. We also agree with the ENA that the deployment of network owned storage devices behind the meter would also be unlikely to prevent the development of a competitive market in storage, given that energy retail firms and others have already entered the storage and related markets. Furthermore, we agree that no extra powers are needed for the AER to exclude non-proven technologies from the regulated asset base. Finally, we support the ENA's assertion of the need for such arrangements to be flexible enough to accommodate innovative stand-alone power solutions that reduce total end costs to customers. Ring-Fencing Ergon Energy broadly supports the existence of a level playing field for investment in, and deployment of, contestable technologies. However, we agree with the ENA that there does not appear to be a strong empirical case for the conclusion that it is 'very important' and that 'strict' provisions are in place, and that the AEMC has pointed to rationales for Ring-Fencing approaches established in the context of generation and retail supply markets, which are then applied by analogy to the emergent storage market. Importantly therefore, the AEMC should not overlook the potential for the benefits of integrating these technologies to be lost through 'strict' Ring-Fencing arrangements.

Are there other issues which should be considered?	No comment.
2. Ownerships and Control	
Are the connection requirements that are being imposed by different distribution businesses for consumer- or retailer-controlled storage being used as a barrier? If so, how?	Please refer to earlier comments. Ergon Energy is not aware of any DNSP imposing connection requirements that would be a barrier to storage. Specifically, in the case of the joint Ergon Energy / Energex connection requirements for Micro EGs and EGs, there are no provisions that require control or impose technical requirements in excess of AS4777 standard capability. Where requirements are set – such as non-unity powerfactor – this is in-built inverter capability and imposes no additional cost etc. Furthermore, while the requirement for non-export capability may come at an additional cost to the customer, this is not a mandatory option, and may in fact be of benefit to the customer as the system will not require a technical assessment prior to approval for connection. In the >30 kilowatt (kW) range, Ergon Energy leverages International Electro-technical Commission standards for protection capability in order to allow for flexibility in solutions.
Does the ongoing degree of control that is being required by distribution businesses for consumer- or retailer-controlled storage represent a genuine safety, security or reliability need, or is it more appropriately a network interest that should be negotiated or signalled through prices?	As noted earlier in this submission, Ergon Energy disagrees with the suggestion in the Discussion Paper regarding the 'control' that AS4777 would provide to DNSPs. Ergon Energy is not aware of any DNSP that requires control of Micro EGs or EGs (>30kW to 5 megawatts (MW)), unless the generator is being directly used for network support, and consequently that the generator is receiving network support payments for the value the control provides. Control, such as that proposed through AS4777 with DRED, would be best managed as an option through price signals or negotiation, like other loads (e.g. hot water, pool pumps, air-conditioning). However, pricing signals by themselves will not deliver the optimal outcome. Tariff signals plus voluntary control will increase the value of storage dramatically for the network, the retailer and the customer, increasing the importance of the voluntary control provisions in AS4777.

4.1.7 Ownership and control: Preliminary Findings	
Do you agree with these preliminary findings?	Ergon Energy agrees that control of storage devices should, in all but a narrow band of circumstances related to system security and safety, be based on market price signals. However, we agree with the ENA that there is a need to clarify exactly what 'market-based prices' means in this context. From Ergon Energy's perspective, we consider the term 'market-based price signals', should be broadly defined to enable flexibility and innovation, and not restrict control of storage devices to just retailer hedging opportunities or daily tariff price signals.
Are there other issues which should be considered?	No.
4.2.1 Competitive neutrality – Preliminary Findings	
Do you agree with these preliminary findings?	Ergon Energy agrees that storage is a contestable service and the participation of network businesses in the market must be done on a level playing field with other market participants. Furthermore, while we support the AEMC's position that it would not recommend any policy decisions to actively encourage the deployment of storage by networks in contravention of a framework that assumes that competitive energy activities should be market-led, we agree with the ENA that the AEMC should broaden its recommendation to not *supporting any* policy decisions to actively encourage deployment of storage on any basis other than market-led rollout. Ergon Energy agrees with the conclusion that it will be important to monitor and adjust Ring-Fencing approaches over time. As noted by the ENA, it is not clear that present arrangements will achieve this, given that most networks are operating under Ring-Fencing rules set more than a decade ago, for the purpose of governing a DNSP's involvement in the retail supply and wholesale market. Ergon Energy does not agree with a restriction on DNSP managed behind-the-meter storage. As noted earlier in this submission, we consider that a simple prohibition on

	network control or ownership of storage behind the meter may result in a loss of benefits to all customers. Furthermore, as noted by the ENA, such a foreclosing prohibition also appears at odds with the AER's contention that the distribution system extends behind the meter.
Are there other issues which should be considered?	No comment.
5. Storage at the wholesale electricity level	
Is more clarity required in the definition of a 'generating unit'? If so, what changes would be necessary? How would such changes be necessary to preserve the registration requirements and eligibility criteria currently in place for generators?	As noted earlier in our submission, Ergon Energy considers energy storage, which is quite multi-functional in nature, should be given its own definition in the NER, so as not to constrain the technology within a rapidly evolving market, which has typically considered generation as a single functioning concept.
Are current registration requirements appropriate for storage that may be used both as generation and load? Should a person operating storage to both buy and sell electricity through the spot market be required to register as both a market customer and a generator?	Ergon Energy agrees that the current registration requirements for storage that may be used both as generation and load are appropriate. Furthermore, we agree that a person operating storage to both buy and sell electricity through the spot market should be required to register as both a market customer and a generator. However, a streamlined process could be created to facilitate those two levels of registration for parties that require it.
Do you see any issues with the current connections framework? For storage as a generator? For storage as a load?	No.
Do performance standards represent a barrier to storage connection? For storage as a generator? For storage as a load?	No.

5.3 Charges and 5.4 Ancillary services	
Is there anything unique about the use of storage devices that makes the existing arrangements regarding fees/charges for participation in the NEM not fit for purpose?	No comment.
What are the implications of current arrangements for ancillary service provision and cost recovery for storage?	Please refer to previous comments regarding ancillary services, in which Ergon Energy recommends a balanced approach to these services is taken to ensure electricity customers are allowed access to the full value streams of new technologies.
Are there other services that could potentially be provided by storage – such as a substitute for inertia through very fast response services – and does a lack of a market for these represent a potential barrier or opportunity?	No comment.
5.5 Charges and ancillary services: **Preliminary Findings (p86)**	
Do you agree with these preliminary findings?	Ergon Energy agrees that there is no need for a new category of registered participant to be introduced for persons operating a storage device. Specifically, consistent with the findings, a person seeking to participate in the NEM using a storage device should be registered according to the value stream from the storage device in relation to which that person intends to participate in the NEM.
Are there other issues which should be considered?	No.
Other Issues **Topic**	**Comment**

Aggregated energy storage at a distribution level	While the Discussion Paper recognises the aggregator's ability to influence the market, Ergon Energy considers an important gap exists in the ability of an aggregator to impact a distribution network by exacerbating peaks or creating new constraints. Specifically, an aggregator could be aware that a network service payment will be required to address a peak, and then create the peak (which could have been avoided through better management of their switching). For example while a 45kW connection would contribute to shared asset augmentation, 3 x 15kW connections side by side (with separate National Metering Identifiers) would not. These systems could be controlled by an aggregator as a single unit to influence a peak, with the aggregator selling their management service back to the DNSP.
Storage disposal	Ergon Energy recommends that consideration be given to a national framework for the safe recovery, recycling and disposal of the energy storage technology, and the allocation of any costs involved.