Stakeholder Feedback Template

Organisation: Mondo

Contact name: Margarida Pimentel

Contact details (email / phone): Email - margarida.pimentel@mondo.com.au ; Phone – 03 9695 6061 or 0403 008 873

Questions		Feedback
Section 2 – Energy Storage System (ESS) definition		
1	Do you have any views on whether a definition of ESS should be included in the National Electricity Rules (NER)?	Yes, Mondo agrees that a definition of ESS should be included in the NER.
2	Do you have any views on whether a definition of ESS should be generic and encompass technologies other than batteries, for example, pumped hydro?	Mondo agrees that the definition, and registration category, should be technology neutral and accommodate all energy storage types, using classifications to differentiate between any specific technical characteristics that impact an ESS' ability to participate in the NEM - scheduled, non-scheduled or otherwise.
3	Do you have any views on AEMO's suggested definition of ESS?	Mondo agrees that the definition adequately captures a technology neutral definition and is sufficient to future proof the definition for new technologies and operational approaches.
Section 2 – Integrating ESS		
4	Do you have any views on the appropriate participation model for integrating ESS into the NEM?	Mondo agrees with Option 2a – the Bi-directional Resource Provider Registered Participant category - which allows for aggregation of geographically diverse ESSs, generation and load. We are keen to understand: • The process or requirements for existing Customers, Generators and Small Generation Aggregators who augment their connections to incorporate ESSs. • Whether ESSs that have been registered under the current interim arrangements would be required to be re-classified.

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5	Would the proposed aggregation model meet your future needs, both in terms of participating in the NEM with an individual ESS or where multiple resources (e.g. ESS and generating units) are to be aggregated? AEMO is particularly interested to understand the additional benefit that you would derive from aggregating hybrid systems and offering them to the market as a single resource that is not available by separately offering the components to the market.	As indicated earlier, Mondo supports Option 2a. We agree that the aggregation of multiple resources and their use as a single, aggregated resource will require Bi-directional Resource Participants to utilise appropriately sophisticated energy management and bidding systems. However, it is apparent that a number of Market Participants who are currently engaged in the activities of establishing Virtual Power Plants have already, independently and commercially, chosen to invest in developing these systems. We would like to confirm our understanding of the threshold applicable to determine whether a (aggregate) hybrid system must be: • Registered - Will this remain consistent with AEMO's Guide to Generator Exemptions and Classification of Generating Units, which requires that a battery system that has a nameplate rating of 5 MW or above is required to register? • Scheduled - Our understanding is that this would be determined by the size of the largest individual supply resource within the hybrid system. That is, if the hybrid system contained a supply resource of greater than or equal to 5 MW, it would be required to be scheduled. However, a hybrid system with an aggregate supply capability greater than 5 MW, but with individual supply resource capabilities of less than 5 MW, would not be required to be scheduled. We question AEMO's thresholds regarding registration. AEMO refers to an ESS' extremely fast ramp rates, ability to impose instantaneous changes of 10 MW (for a 5MW ESS), and inability to readily forecast their operation as key rationale for current requirements. However, we would argue that: • In the context of an aggregate hybrid system, the shifts in aggregate export and import will be forecast in PASA and pre-dispatch systems, providing AEMO with full visibility of current and forecast aggregate behaviour. This should also address concerns about ramp rates. • Issues regarding the ability to forecast and manage locational network stability and limits can be dealt with by segmenting these forecasts by connection point, for an aggregate hybrid system that spans across multiple connection points. • If we assume that forecasts will be provided, consistency with the threshold applied for

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		scheduled generation would mean that a threshold of no less than 15 MW should be applied to the system, which allows for instantaneous changes of up to 30 MW using the most conservative assumption that all of the system's supply/export is provided by ESSs. Benefits from aggregating hybrid systems and offering them to the market as a single resource include: • The ability to manage supply across a diversity of locations to adapt to changing locational system conditions (whether they be network, resource or otherwise), whilst maintaining an aggregate stable, continuous and constant MW export to the market. However, we recognise that there is a key question around how MLFs across different connection points may impact the aggregate capability of the VPP. • The flexibility to optimise the cost, efficiency and technical characteristics of the aggregated system to meet a specific request (for example, for FCAS or network services) through leveraging the individual components that best suit the immediate need. • Removing the potential for overlap and/or double counting that may arise when submitting separate generator and customer bids. • By allowing the participant to have control of how the individual components within an aggregated hybrid system are coordinated to meet NEM needs or provide specific services, we give them the flexibility to develop and apply innovative techniques to maximise their opportunity for dispatch. • Enabling customers to manage their exposure to NEM/retail prices, and engage in the market to provide services.
6	Do you have any views on AEMO's proposed approach to implement a single participation model to integrate ESS and other 'new' business models into the NEM?	Mondo supports the implementation of a single participation model to integrate ESSs and related new business models into the NEM. This model: • Reflects the actual behaviour and interaction of aggregated or non-aggregated hybrid systems in the NEM. • Reduces the confusion associated with separately representing simultaneous generation and consumption in the NEM, and removes the potential for double-counting of individual components in bidding to provide different services. • Allows Market Participants with greater flexibility in how they respond to and meet NEM needs by optimising across resources, technologies and locations. We believe it would be prudent to implement an off-line trial to practically test any proposed

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		approach to applying marginal loss factors to an aggregated hybrid system. AEMO's proposed VPP trial, scheduled for 2019, may provide a good opportunity to undertake these off-line tests.
7	Do you have any views on the key requirements AEMO has identified for an ESS participation model?	Mondo suggests that AEMO should consider: • Applying a single, consistent set of performance standards across charge and discharge cycles for ESSs. • Applying a round trip efficiency requirement, rather than separate import and export efficiency requirements for ESSs. • How the degradation profile of an ESS may impact the medium to long term forecasting of available or expected generation export, and how this can be represented • When calling on ancillary services, not relying on the registered nameplate capacity of the site. AEMO should call out to the market for services, rather than directly targeting Market Participants. Consideration should also be given to the value of AEMO requiring SCADA for each resource in the hybrid system, thereby gaining visibility of all individual resources rather than limiting its visibility to the total contribution of the system. We note that a VPP may be comprised of a variety of resources, with different performance characteristics, which may impact the VPP's ability to deliver services to AEMO's requirements. It is our understanding that the Bi-directional Resource Provider will be responsible for meeting the performance standards and dispatch targets at the connection point. Operationally, this brings into question the need for AEMO to have visibility beyond the connection point. However, we also recognise the potential value of AEMO having access to: • SCADA data, which provides visibility of unexpected changes in a hybrid system that may require an emergency response. • actual performance data for the individual components of a hybrid system, which may inform improvements to performance standards and operational practices.
Section 2 – NER recovery mechanisms		

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4	Do you have any views on how to integrate ESS into the NEM's recovery mechanisms? If so, please provide them.	Mondo supports: • The extension of non-energy recovery and NEM Participant fees and charges to Bi-directional Resource Participants. • A holistic review of use of system charges at both transmission and distribution level, with particular focus on Bi-directional Resource Participants • The application of consistent principles and approaches across all distribution networks for distribution use of system charges. We believe that ESSs with the intended purpose of supporting the power system should not attract TUOS or DUOS charges, where these services are primarily energy supply chain services that provide the benefit of energy to consumers, and are subject to dispatch control by a market or system operator. Any review of use of system charges should consider the potential for change in the current NER.
Section 3.1 – The application of performance standards to a generating system or load in an exempt network		
5	Are there other options to address the issue identified for connecting plant in an exempt network?	Mondo agrees with the principle that all Market Participants that have the ability to impact the reliability and security of the NEM, should be subject to consistent operational, visibility, and compliance requirements.
6	Are there other costs, risks and benefits associated with the options presented? If so, please indicate what these are.	None identified.
7	Which option to address the issue is your preferred option? Why?	Mondo prefers Option 1, as it is directly targeted towards connecting plant, and is less likely to result in unanticipated flow-on impacts to other Market Participants.
Section 3.2 – Providing NEM information to project developers		
8	Should a person intending to develop or build a generating system or ESS (and not subsequently	Yes, subject to the test of:

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	register as a Generator) be allowed to register as an Intending Participant?	1. satisfying AEMO of its intent to build a system to be used in the NEM, and 2. the relevance of NEM data to designing and assessing this system. Mondo believes that all proponents who are investing in systems that will rely on the NEM (in full or in part) for revenue should have equal access to NEM data. The inclusion of all NEM development proponents in the Intending Participant category also means that public market forecast information regarding generation, storage and load developments remains accurate and current, allowing investors to make informed decisions.
9	What is the market benefit associated with allowing a person intending to develop or build a generating system (and not subsequently register as a Generator) to be an Intending Participant?	Greater access to data should mean that more informed decisions could be made regarding project timing, viability, location and technologies, particularly in the context of resource availability, network capacity and market revenue expectations. This will mean that there is reduced likelihood of uneconomic investment and asset stranding, which should result in cheaper electricity prices for customers.
10	Referring to section 3.5.3, are there other options to provide a person intending to develop or build a generating system (and not subsequently register as a Generator) with the necessary NEM data?	No other options identified.
11	Are there other costs, risks and benefits associated with the options presented? If so, please indicate what these are.	None identified.
Section 3.3 – Separation of operational and financial responsibility		
12	What is the market benefit associated with allowing the separation of operational and financial responsibilities?	Mondo agrees that the disaggregation of operational and financial responsibilities for a generating system will: • Facilitate the successful staged financial closure and development of separate smaller investments in generating "sub-systems" within a larger, overarching generating system. • Allow proponents of generating "sub-systems" to utilise a shared, single NEM connection point across "sub-systems", reducing the cost of grid connection works. • Allow for innovative business models and greater direct customer ("off-taker") investment.

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		• Provide customers ("off-takers") with an avenue to manage their energy cost exposure, in a similar way that hedging allows Retailers to manage their exposure to energy market spot prices. The above-listed outcomes would increase the diversity of Market Participants, increasing competition and placing greater pressure on electricity prices.
13	What are the risks associated with allowing the separation of operational and financial responsibilities?	Performance standards of the proposed metering arrangement need to be considered and maintained to standard by each off-taker and the Financially Responsible Market Participant (FRMP). The details around operational control need to be considered especially in the event of faults or runback. The cost of enabling this separation needs to be considered. In particular Mondo notes that the Multiple Trading Relationships Rule change process, undertaken in 2016, highlighted the potential for high costs arising from the practical implementation of this separation.
14	Are there other models of separate operational and financial responsibilities that should be considered?	There are already current regulatory rules and arrangements in place that stipulate appropriate metering to meet the required performance standard at the existing connection point. If the Participant decides that it is in the best interest of the site it can include additional performance standards downstream of the connection point. This should be at the discretion of the Participant/s.
Section 3.4 – Logical metering arrangements		
15	What is the market benefit associated with using logical metering arrangements?	The benefit of logical metering relates to cost. There are two costs in relation to these types of installation. The first is the capital and operational cost of installing a NEM-compliant meter where energy flows may otherwise be reasonably deduced using a logical meter. The second is the extra degree of freedom with respect to not being required to maintain a NEM-compliant meter. With NEM-compliant HV metering installations, access for maintenance often requires total shutdown which has significant operational and financial impacts. A logical meter avoids this.

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16	What are the risks associated with allowing the use of logical metering arrangements?	Given the magnitude of energy flows, logical metering installations may not always provide the required level accuracy.
17	If logical metering arrangements are permitted to be used instead of a NEM compliant metering installation, who should pay for this? Please identify any cost recovery arrangements that you consider appropriate.	This would depend on the circumstances, however we would suggest the party receiving the benefit of the logical metering installation should pay.
Other Comments		
23	Do you have any further comments?	No further comments