



Submission by Power Ledger to the consultation for the Western Australian DER Issues Paper - Roles & Responsibilities

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Dear Energy Transformation Taskforce

Thank you for the opportunity to make a submission in response to your Issues Paper: *DER Roadmap: Distributed Energy Resources Orchestration Roles and Responsibilities* on the proposed roles and responsibilities outlined in the paper. We acknowledge the complex and difficult work the ETT is undertaking to facilitate Western Australia's energy transition.

Power Ledger is a proud West Australian business with deep knowledge of electricity markets globally, operating in nine countries. We are committed to the efficient development of Western Australia's energy system. From our work in many countries and pioneering solutions with DERs, we have some unique insights insofar as how other jurisdictions are practically dealing with DERs and markets to facilitate the energy transition. We have spearheaded a series of deployments of our blockchain energy trading software in the USA, Europe and several parts of Asia and Australia. The solutions include P2P energy trading and an Optimised Marketplace for Distributed Energy offering automated VPP and Flexibilities using DERs. This submission seeks to draw on this collective knowledge and experience.

Power Ledger strongly supports the DER Roadmap initiative and its higher order goals. There is significant potential for policy development to support the creation of an energy system in which renewable energy technologies, along with complimentary DER assets such as storage, can grow in prominence while supporting grid stability and security. We also recognise that there are unique elements to the Western Australian energy system that cannot be ignored, which may mean that bespoke approaches are sometimes required.

That said, we strongly believe that decisions taken today should address needs in the short-to-mid-term but also enable the system and the market to develop, as society, and its requirements of the energy system change. While we do not know exactly what all these changes will be, it is possible to create market conditions that can be responsive to change while still supporting the underlying and guiding principles of energy system management - security, affordability and sustainability.

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Ahead of addressing the specific questions on the roles and responsibilities of both the DSO and DMO we would like to comment on how some of the decisions by the ETT essentially rule out some crucial options for the evolution of the market.

1. The decision to rule out discrete markets for distribution and transmission networks is premature. The roadmap may ideally begin with distribution and transmission networks being incorporated within a single market, but it is highly likely that the types of technologies that support DER services and the operating requirements for transmission and distribution networks will evolve differently and therefore require different market mechanisms to administer them and achieve the best outcomes.
2. Transactive energy trading is fundamentally necessary to solve the issue of increased DER penetration, as we move away from the traditional “copper plate” grid and manage a more complex grid with far more variables. Hence, utilities and regulators need to take a holistic and inclusive approach resulting in voluntary participation by small asset owners. This necessitates creating a market that is fit for purpose rather than being subsumed into what already exists. Germany, which has a much higher and rapidly growing amount of renewables in its system, is implementing local energy markets (LEMs) in order to facilitate further growth of renewables in a scalable way. In Germany, where there are what is being referred to as “yellow” network issues, as characterised by a traffic light concept of red: outages, yellow: constraint and green: no issues, LEMs will be created to address the ‘yellow’ issues. LEMs are discrete parts of a distribution network, i.e below lower voltage substations and will roll up to the wholesale market, but will operate as discrete markets.
3. It is possible and preferable from an outcome perspective to design a fit for purpose and separate Distributed Energy Market (DEM) while still supporting the underlying and guiding principles of energy system management: security, affordability and sustainability.
4. The DEM will have different characteristics to the main wholesale electricity market as it will have a large number of smaller participants, a large number of smaller assets as well as distinct commercial and business models associated with these assets. Incorporating the DEM into the wholesale market without taking account of these aspects, will likely cause unintended consequences and limit what's possible.
5. If the DEM is run as part of the existing wholesale electricity market, the market cost structures will be aggregated, which may create significant costs and barriers to entry for DER participants when considered against the alternative of a lean and distinct market, that is developed most efficiently taking account of the unique characteristics of the market. A forward facing DEM can incorporate a day ahead spot auction market as well as an intraday market with bidding 30 minutes ahead of delivery.
6. It is unclear in the Issues Paper whether the DSO always needs to undertake a competitive process to procure network services. We believe that a competitive process is essential to ensure the best solutions are achieved, whether this be through the use of traditional network investments or through contracting flexibilities services through new or existing DERs.
7. The Issues Paper focuses on the procurement of existing DER assets for the provision of flexibilities services. Whilst utilising existing DERs has merit, there is no information about what market signals will be used to encourage new DERs to be installed, e.g. forward-facing markets such as day ahead markets and intraday flexibilities markets. Market functions such as these would allow third parties to promptly

respond to the need for network services, with these potentially being a superior outcome from a cost perspective than current DER assets or from upgrading network infrastructure.

8. Western Power's recent procurement of several community-level grid-connected battery storage systems (operated as network assets and paid for through network tariffs) poses some challenges. Having the DSO own assets that provide network services means that, when the DSO role is established, Western Power will effectively be competing with private assets for the provision of these services and could therefore be in a position of conflict of interest. The platform should be transparent and only competitive offers should be considered in the market clearing engine. Otherwise the situation would have the practical effect of discouraging private investment in areas that are experiencing network constraints due to an inability to compete with a service paid for by consumers. One solution would be for Western Power to transfer ownership of the network assets to third parties, or a deregulated arm of the entity, once the immediate concerns of minimum operational demand are addressed.
9. Innovation from the private sector is crucial to solving the issues associated with the energy transition and Power Ledger wishes to register its disappointment in the direction taken by the ETT to only have government entities and government-owned entities involved in the DER Roadmap and associated projects. By closing the door on private sector involvement, the State Government has also closed the door on alternative business models that could deliver on the objectives of the DER Roadmap in a more efficient way. The industry is developing and already has developed solutions that can do many of the things that the DER Roadmap is looking to achieve - none of which are being included in initiatives such as Project Symphony. We find the coordination between Western Power, Synergy, AEMO and the Government, to the exclusion of private enterprise, puzzling, given the technology and capabilities currently available from that sector.
10. Several Australian technology businesses are developing and have developed platforms, which are capable of integrating with a wide variety of DER assets, visualising them for network operators, selecting assets to relieve acute localised network constraints, enabling communication between multiple parties and via an aggregator, allowing DERs to bid into wholesale markets. To take full advantage of the benefits of these technologies, incorporating them into the conception design of upcoming projects, in the early stages, will yield the greatest benefits, otherwise there may be lost opportunities from integration with legacy systems and to drive cost efficiencies. If they are just an add on in late project procurement phases, there will likely be lost opportunities.

While we are in some disagreement with the proposed DSO and DMO roles in their current form and hope to see these addressed through the alternative approaches suggested, we have provided specific responses to the questions posed in the Issues Paper to ensure the likely challenges the DSO and DMO will face are well understood.

Issues Paper Questions & Power Ledger Responses

- **Question D1: What processes or arrangements should be used or created to register an aggregator that provides network support services to the DSO (Western Power)?**
 - Registration processes should minimise requirements for the customer:
 - Ideally there should be minimal effort required by the DER owner aside from giving consent to the aggregator to use their DER asset, accessing platforms and setting up payment mechanisms.
 - Customers should be provided information regarding the reason their asset is being used, how and when it will be used and associated payments.
 - Once the DSO establishes the platform that will be used to communicate between DSO/DMO/aggregators, aggregator registration should mostly be pursued through said platform.
 - DER assets that the aggregator is using should be pulled from the DER Register created and maintained by the DSO to ensure reliability of the aggregators data.
 - Aggregator should provide security payments to ensure compliance with DSO's dispatch instructions and cover the cost of non-compliance. Security payments should also be held to ensure that customers participating in network services are compensated in the event that the aggregator becomes insolvent or is unable to function properly.
 - When DERs are assessed as having the potential to provide network services to the DSO as opposed to network upgrades, the DMO should determine which service provider to use via a market based process, ideally a forward facing market such as a day ahead market or an intraday market.

- **Question D2: Should different 'use of system' charges apply for DER customers? If so, how should the costs and benefits of DER be accounted for?**
 - DERs bring a lot of value to the network through improving grid resilience and by deferring network infrastructure upgrades.
 - Prudential discounting for customers that allow their DERs to be leveraged to alleviate network congestion and provide network services would be appropriate.
 - Consideration should be given to providing DER customers with a payment in situations where their DER asset serves to reduce peak energy demand during MHSP intervals lower than it would've been otherwise, similar to the value of the discount applied for the RT4 tariff for consuming during off-peak periods. This could be considered on an individual or distribution-level basis.

- **Question M2: Should energy exported from DER be more explicitly integrated into the WEM?**
 - Yes, absolutely. If a DEM is operated it can be netted up into the wholesale market to ensure the most economical outcome is achieved.

- **Question M3: Monitoring and compliance for participation in energy, capacity and ESS markets need to be considered for aggregated DER. How should aggregated DER be monitored and measured for compliance?**
 - As frequently and transparently as possible.
 - A standardised methodology and format for assessing the compliance and functionality of DER assets involved in providing network and market services should be developed.
 - DER assets can be remotely connected to a DERMS system that provides a baseline state assessment prior to the DER system responding to an instruction.
 - For a battery, the DERMS system might poll its charge state, inverter capacity, current output etc, to determine its potential to discharge for an event.
 - For a solar PV system, the DERMS system might poll the PV system's current output and inverter capacity to determine the PV systems ability to cut output.
 - The DERMS system should assess the performance of the DER asset during the time that it participates.
 - For a battery, the DERMS system might monitor the battery's ramp rate, total power output and discharge time.
 - For a solar PV system, the DERMS system might monitor whether the PV system fully stopped generating, when it stopped generating and the ramp down rate.
 - Inverter standards should require the ability to facilitate control by commands from the DSO or aggregator, to cut on or off and take into account DER wattage on controllability.
 - Ideally, this should be done through the inverter to avoid the need to install an additional meter/metering device at the customer's premises. Our experience in the RENEW Nexus trial showed that the need to install an additional device was a major factor in participant's decision to participate or not in the study and was not deemed to be worthwhile for the benefits granted.

- **Question M4: What performance standards should apply to aggregated DER facilities?**
 - The same standards as non-scheduled generation, with leeway given around dispatch quantities given the number of facilities involved in dispatching and the uncertainty that all units will respond as requested.
 - Aggregators should bear responsibility for ensuring their portfolio can meet dispatch requirements, not the end customer.

- **Question M5: Are any additional arrangements needed to incorporate aggregated DER facilities into the new scheduling and dispatch process (SCED)?**
 - There needs to be a flexibilities market to create the commercial imperative for aggregators to establish themselves and to aggregate DERs from prosumers.

- **Question M6: Other than for device level communications, what other communication is required to manage aggregated DER? For example, communications between the aggregator and the DSO (Western Power) or AEMO.**

- AEMO needs to be able to openly communicate pricing data to all parties.
 - DSO needs to provide as much information on the status of the network as possible without manual processes.
 - DSO needs to be capable of providing meter data to third parties in as close to real time as possible without manual processes.
- **Question A2: Are there any current barriers to DER aggregation? If so, what are they and how could they be overcome?**
 - There needs to be a flexibilities market to create the commercial imperative for aggregators to establish themselves and to aggregate DERs from prosumers.
 - The ability for an aggregator to communicate bidirectionally with a wide variety of DER systems will be a significant challenge:
 - Batteries are obvious candidates for aggregation, but an aggregator may need to also issue constraint commands to PV systems and heat pumps that have different operating parameters.
 - Different manufacturers will likely have different communication protocols and varying capabilities for sending and receiving information, e.g. some batteries can be issued commands on a per-device basis, whereas others can only receive a command as part of a fleet. Overcoming this may require the establishment of communication protocol standards to ensure that aggregators can communicate with a variety of DER types and manufacturers.
- **Question A3: What should be the key elements of a regulatory framework for aggregation?**
 - Consumer protection should be the main focus regarding:
 - Ensuring data privacy.
 - Transparency over device use and pricing is needed to ensure consumer acceptance.
 - Communications standards and processes should be implemented to ensure that consumers aren't locked into a single aggregator for technical reasons.
 - Clearly defined pricing schedules and guidelines for various services to ensure transparency for the consumer and the market.
- **Question A4: Should aggregators be able to participate in all WEM market segments in order to stack the value of available DER services?**
 - Yes, absolutely. DERs are capable of providing many services to the grid and should be compensated for them.
 - DERs still needs to be able to meet the reliability requirements needed to participate in the WEM market segments to ensure system security is maintained.

- **Question A5: Have stakeholders experienced difficulties in accessing consumer meter data for the purpose of providing DER services? If so, what were those difficulties and how did they limit opportunities to unlock the value of DER?**
 - Yes.
 - During the RENEW Nexus trial, difficulties were experienced in getting access to Western Power meter data within 5 days of the end of each month which limited customers ability to get insights from their energy usage data.
 - When the data was received, issues were experienced with the accuracy of some of the metering data. Meter readers had to be sent out to collect new data directly from the meter.
 - These issues caused significant delays in invoicing and settling customer invoices.
 - The DSO should aim to provide accurate meter data reliably in as close to real time as possible.

- **Question C1: Should a customer with new or upgraded DER be required to participate in an aggregation scheme to mitigate the risk of a significant proportion of DER in the SWIS remaining 'passive'? If yes, what should be the trigger for such a requirement? If not, why not?**
 - Forcing customers to participate in an aggregation scheme would likely lead to huge customer pushback.
 - Consumer concerns over centralised control of their private assets renders this approach infeasible.
 - Having another mechanism in place such that customer's DER assets that are not participating in an aggregation scheme can still remain connected to the DSO and respond to network emergencies would be a desirable alternative.
 - This would facilitate the customers choice to not participate in aggregation but still be able to respond to network pressures when needed

- **Question C2: What provisions need to be made for customers who make the choice [not] to participate in aggregation services, for example to limit their energy export while enabling them to use their DER for their own purposes**

[We believe the question is missing the word 'not' given the context of the preceding paragraph in the Issues Paper and have answered it accordingly.]

 - Customers that choose not to participate in an aggregator scheme should have the choice of:
 - Having their energy export limited where it would cause system issues or;
 - Paying costs in instances where the output of their excess energy causes problems for the system if they choose to not have their export limited.

- **Question C3: If the application of dynamic operating envelopes results in temporary limits on customer DER exports, what measures should be put in place to ensure that this does not**

unnecessarily limit DER output in preference to other alternatives such as load management or other generation sources. That is, what criteria should apply to the network operator's assessment of when to undertake a network enhancement to remove constraints that prevent the export of DER energy and to maximise the ability of small DER owners to participate equally with other energy resources?

- The first approach should be to create a market mechanism that incentivises the installation of additional DERs near to the point of consumption i.e have dynamic and locational network pricing; avoid creation of the problem.
 - If a problem exists, the approach should be to operate a forward-facing market (i.e. a day ahead or intraday flexibilities market) to resolve network issues at the lowest cost, to avoid curtailment and encourage deployment of DERs where they are needed.
 - If the cost of flexibilities or network augmentation is prohibitively high, then curtailment can be considered as a matter of last resort.
- **Question G1: Would aggregated DER providing services into the WEM require changes to metering and settlement arrangements? If so, how could this be implemented without multiple meters at a customer site and the associated costs?**
 - Changes to settlement arrangements will likely be necessary to allow DERs to participate in the WEM.
 - A customer that has an aggregator that is not their retailer may dispatch energy into the various WEM market segments such as the balancing and STEM energy markets, as well as the ancillary services markets (LFAS, SRES etc) where practical. If there is a single meter measuring the bidirectional flow of the household the DER is attached to, any exported energy that is for the WEM will have to be deducted from the energy purchased back by the customer's retailer.
- **Question G2: How can we ensure equity of access of DER to markets? That is, how can the greatest number of customers be allowed to install DER and provide services, if they choose? How could this be implemented?**
 - Having a market mechanism that allows for access of non contestable customers that is low cost and allows for maximum value capture. The higher the cost of participating in the DEM the less likely prosumers will buy batteries or size batteries for this purpose. A DEM that mimics the wholesale market will be prohibitive.
 - Having a separate distributed energy market to the wholesale market will minimise requirements on end-users. The market can be designed in a way to be low cost and create price signals that encourage the deployment of assets efficiently, and deliver a more real time, efficient market to accommodate more assets and participants.
 - Subjecting DERs to the same metering and control requirements as centralised generation would render DER participation infeasible due to the high costs involved. The requirements for DER participation should either be:
 - less restrictive than those imposed on other generation forms or;

- **Question G6: Who should be responsible for the dispatch of DER owned by Western Power to address network support needs?**
 - If there is a day ahead or intraday flexibilities market, any participant that has a need for flexibilities can signal their need in the market and DERs can bid for the supply of these services. With assets that are owned specifically by the DSO, the DMO should be responsible for its dispatch to ensure that the dispatch order is given by an independent organisation ensuring fair market practices are used to select those DERs providing flexibilities services.