Open Energy Networks Submission

Prepared by: Reposit Power Pty Ltd

For: Energy Networks Australia and AEMO's joint consultation, Open Energy Networks

Contents

Introduction **3**

Responses to Consultation Questions **3**

Path-ways for DER to provide value 3

Maximising passive DER potential 4

Maximising active DER potential 5

Frameworks for DER optimisation within distribution network limits 5

Immediate actions to improve DER coordination 6

Introduction

Reposit Power has built a business model around the delivery of all sources of value for active and passive DER. Our control and optimisation platform is the most advanced platform available and we have vast experience in optimising the value of customers' DER systems' value. Some of the value streams that we have trialed and implemented include:

- Active DER control in response to market signals and in preparation for grid outages for South Australia Power Network (SAPN) in the Salisbury region of South Australia
- Voltage Management through real and reactive power delivery for Essential Energy as part of the ARENA funded Networks Renewed project
- Dynamic control of exports from passive and active DER through our Feed in Management (FiM) functionality for Horizon Power
- Network Support Services for Evoenergy's VPP trial in the ACT consisting of over 500 consumer owned storage systems. This is currently the largest single Virtual Power Plant (VPP) in operation in Australia.
- Network Support Services for United Energy's storage trial in the Melbourne region and Endeavour Energy's battery storage trial in NSW
- Network Support Services for the ARENA funded CONSORT project, in collaboration with the Australian National University, the University of Sydney, and University of Tasmania and TasNetworks at Bruny Island, off of the east coast of Tasmania
- Wholesale Energy Market participation for Diamond Energy
- SN-RERT participation for Powershop

Having worked with multiple Retailers and almost every DNSP in Australia in delivering all sources of value mentioned in the consultation paper, we are uniquely positioned to provide insights to the challenges and opportunities presented by the increasing uptake of DER technologies.

Responses to Consultation Questions

Path-ways for DER to provide value

1. Are these sources of value comprehensive and do they represent a suitable set of key use-cases to test potential value release mechanisms?

The potential value release mechanisms are comprehensively captured in the Consultation paper but there are important factors that need to be considered while stacking these value mechanisms for the customers, most importantly, the opportunity cost to the customers, and customer perception and willingness to take up these additional sources of value.

Traditionally customers tend to be wary about a third-party controlling their DER systems. Any attempt at increasing the sources of value for DER owners needs to take an open market approach towards its structure and operation. The customer should always be left better off financially than he would have been otherwise. Besides overcoming the potential opportunity cost for using these systems for Market participation and/or Network Support, the customers' perception of the said mechanism also needs to be considered. At the minimum, this would require effective customer engagement, preferably through a single source of information to avoid overloading customers with complex and potentially conflicting information.

2. Are stakeholders willing to share work they have undertaken, and may not yet be in the public domain, which would help to quantify and prioritise these value streams now and into the future?

Partnering with Energy Retailers and through various trials and projects with DNSPs across Australia, Reposit has already tested and implemented most of the potential sources of value for customers with active DER systems, including:

- Wholesale energy market participation in partnership with Diamond Energy
- RERT services in partnership with Powershop
- Voltage Control as part of the ARENA funded Networks Renewed project, partnering with Essential Energy and University of Technology Sydney
- Network Aware Coordination (NAC) of DER at Bruny Island as part of the ARENA funded CONSORT project, in partnership with University of Tasmania, the Australian National University, University of Sydney, and TasNetworks. This project has aimed at tackling most of the social and technical challenges that would form the foundation for an effective OEN architecture.
- Dynamic Feed in Management of DER exports on Horizon Power's network

Network Support Services are also being trialed with United Energy, Evoenergy, and Endeavour Energy. Reposit may be willing to share learning from these projects, trials, and commercial Retailer offerings to aid the process of development of a mechanism that would enable provision of these services while protecting the energy markets and the distribution and transmission networks from adverse effects of orchestration of active DER.

Maximising passive DER potential

1. Are there additional key challenges presented by passive DER beyond those identified here?

A key challenge beyond the ones identified in this section is of network protection. Among other protection issues, an increased penetration of passive DER could result in failure modes in network protection equipment. This further increases the need for monitoring and control of DER offered by centralised orchestration mechanisms which would help inform DNSPs' protection schemes for effectively incorporating embedded generation on the distribution network.

2. Is this an appropriate list of new capabilities and actions required to maximise network hosting potential for passive DER?

Yes, if informed by real-time network constraints and coupled with planning based on forecasts, these capabilities and actions would maximise network hosting potential for DER. One such implementation is the capability Repsoit has developed for dynamically managing DER for Horizon Power. Horizon is using their DER Monitoring and Control System (DMCS) to inform Feed in Management of the DER. The way this has been designed to operate is that through this functionality, a dynamically changeable ceiling would be implemented across the active DER, allowing them to provide all other services while remaining within this limit. This effectively combines maximising hosting capacity with increasing potential sources of value from active and passive DER.

3. What other actions might need to be taken to maximise passive DER potential?

From Reposit's experience and as discussed in the Consultation paper, passive DER don't provide much help with managing Network constraints and even introduce more challenges. To tackle these, some form of individual customer-level control and monitoring needs to be implemented.

Currently less than 10% of total DER installed is done with a smart gateway or a smart control device. To increase this DERs' potential, efforts need to be made in converting passive DER into active DER. It is most

cost-effective to do so at the time the DER is being installed. Incentives in the form of some level of guaranteed value needs to be introduced to increase the uptake of these smart devices with new installs.

Maximising active DER potential

1. Are these the key challenges presented by active DER?

An additional challenge introduced by active DER is the relative priority of services being procured by different parties. The need for DER to operate within threshold levels informed by near real-time network constraints needs tighter integration with the control and monitoring systems of the DNSP.

Orchestration mechanisms of active DER are only as smart as the information they receive. For example, the VPP in Salisbury referenced in the consultation paper, solely operated on market price signals and wasn't told to consider network constraints. This model is the first step in realising maximum value from active DER and is not a complete end-to-end solution. Reposit has trialed other value streams in different trials and projects but in order to effectively stack these values for all stakeholders, there needs to be tighter integration with the DNSP's control and monitoring sytems.

2. Would resolution of the key impediments listed be sufficient to release the additional value available from active DER?

The speed of response to changes in the market, but even more importantly to the changes in network conditions, is imperative to releasing additional value from active DER. In our view, it can only be done by integrating with the DNSP for ensuring network security and resolving potential conflicts in requests.

3. What other actions might need to be taken to maximise active DER potential?

Active DER potential in network support cases is often related to the concentration (and the ratio as compared to passive DER) of these systems on a particular network asset. Steps need to be taken to encourage or perhaps mandate the uptake of smart devices which change passive DER to active DER.

4. What are the challenges in managing the new and emerging markets for DER?

Traditionally energy markets operate on the basis of balancing demand with generation capacity. The new and emerging markets would need a close integration with DNSPs' DMS/ADMS systems to incorporate near real-time network constraints and load conditions in deciding what capacity can actually be dispatched. The markets would also need to consider the relative importance of operations requested from the DERs. Also, owing to the diverse nature of implementation of VPPs, standardising the participation terms and the operation of these markets would be a major challenge.

5. At what point is coordination of the Wholesale, FCAS and new markets for DER required?

In order to tackle the emerging and forecasted challenges of DERs, the sooner these steps are taken, the better. Even at a relatively lower capacity, VPP orchestration of DERs concentrated on a single network asset can cause security of supply issues for the network.

Frameworks for DER optimisation within distribution network limits

1. How do aggregators best see themselves interfacing with the market?
2. Have the advantages and disadvantages of each model been appropriately described?
3. Are there other reasons why any of these (or alternative) models should be preferred?

Reposit sees itself interfacing with the market via Retailers and DNSPs. It is of utmost imporatance that the "available capacity" for market participation is informed by the network constraints at all times. The preferred model should be one which maximises value for the end-customer while ensuring the protection of network

assets. Adding more steps/parties in the process would only dilute the value for the DER owners and increase complexity in the operation.

Immediate actions to improve DER coordination

1. Are these the right actions for the AEMO and Energy Networks Australia to consider to improve the coordination of DER?
2. Are there other immediate actions that could be undertaken to aid the coordination of DER?

Any immediate actions should be aimed at not stifling innovation. For effective orchestration of DERs, smart solutions need to be developed. Standardisation needs to be at the highest level which encourages innovation rather than inhibiting it.