

21 December 2018



Ms Audrey Zibelman
Chief Executive Officer
Australian Energy Market Operator
GPO Box 2008
MELBOURNE VIC 3001

Dear Ms Zibelman

NEM Virtual Power Plant (VPP) Demonstrations Program

Energy Queensland appreciates the opportunity to provide a submission to the Australian Energy Market Operator (AEMO) on the *NEM Virtual Power Plant (VPP) Demonstrations Program* consultation paper (consultation paper). The purpose of the consultation paper is to seek feedback from stakeholders and potential participants on the proposed VPP demonstrations program framework, which is a joint collaboration between AEMO, the Australian Energy Market Commission, the Australian Energy Regulator and members of the Distributed Energy Integration Program, including the program's objectives and participation requirements.

Energy Queensland's responses to the questions raised in the consultation paper are provided in the attached submission. Should you require additional information or wish to discuss any aspect of the attached submission, please do not hesitate to contact either myself on (07) 3851 6787 or Charmain Martin on (07) 3664 4105.

Yours sincerely

A handwritten signature in black ink that reads "Trudy Fraser".

Trudy Fraser
Manager Policy and Regulatory Reform
Telephone: (07) 3851 6787 or 0467 782 350
Email: trudy.fraser@energyq.com.au

Energy Queensland

**Submission to the Australian
Energy Market Operator**

**NEM Virtual Power Plant (VPP)
Demonstrations Program
Consultation paper**

Energy Queensland Limited

21 December 2018



About Energy Queensland

Energy Queensland Limited (Energy Queensland) is a Queensland Government Owned Corporation that operates a group of businesses providing energy services across Queensland, including:

- Distribution Network Service Providers, Energex Limited (Energex) and Ergon Energy Corporation Limited (Ergon Energy);
- a regional service delivery retailer, Ergon Energy Queensland Pty Ltd (Ergon Energy Retail); and
- affiliated contestable business, Yurika Pty Ltd (Yurika).

Energy Queensland's purpose is to safely deliver secure, affordable and sustainable energy solutions with our communities and customers and is focussed on working across its portfolio of activities to deliver customers lower, more predictable power bills while maintaining a safe and reliable supply and a great customer experience.

Our distribution businesses, Energex and Ergon Energy, cover 1.7 million km² and supply 37,208 GWh of energy to 2.1 million homes and businesses. Ergon Energy Retail sells electricity to 740,000 customers.

The Energy Queensland Group also includes the new energy services business Yurika which will provide customers with greater choice and control over their energy needs and access to the next wave of innovative technologies and renewables.

Contact details

Energy Queensland Limited
Trudy Fraser
Phone: +61 (7) 3851 6787
Email: trudy.fraser@energyq.com.au

PO Box 1090, Townsville QLD 4810
Level 6, 420 Flinders Street, Townsville QLD 4810
www.energyq.com.au

Energy Queensland Limited ABN 96 612 535 583

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1 Introduction

On 23 November 2018, the Australian Energy Market Operator (AEMO) published a consultation paper on the *NEM Virtual Power Plant (VPP) Demonstrations Program* (consultation paper). The purpose of the consultation paper is to seek feedback from stakeholders and potential participants on the proposed VPP demonstrations program framework, including the program's objectives and participation requirements.

The VPP demonstrations program is a joint collaboration between AEMO, the Australian Energy Market Commission, the Australian Energy Regulator and members of the Distributed Energy Integration Program. It is the first stage of a program of work to determine changes required to the regulatory frameworks, systems and operational processes necessary to effectively facilitate the integration of VPPs into the National Electricity Market (NEM).

AEMO has requested that interested parties make submissions on the issues raised in the consultation paper by 21 December 2018. Energy Queensland's comments are provided in Sections 2 and 3 of this submission.

We are available to discuss this submission or provide further detail regarding the issues raised.

2 General comments

Energy Queensland is a Queensland-based energy business that delivers electricity to its customers via an integrated business model that enables enhanced flexibility and choice in the energy market. Since its inception on 30 June 2016, Energy Queensland has worked collaboratively to form the largest electricity distribution company in Australia whilst also operating its retail business and establishing an affiliated contestable energy services business. Energy Queensland is focused on effectively leveraging its diverse capability across the portfolio to support the prosperity of Queensland communities through the provision of safe, secure, affordable and reliable energy.

The Australian electricity industry has been undergoing significant and disruptive change over recent years, impacting all levels of the supply chain. A key component of the evolving energy landscape is the emergence of VPPs that can be used to provide services traditionally provided by conventional power plants. Energy Queensland is a strong supporter of new technologies that not only provide customers with the opportunity to maximise the value of their investment in distributed energy resources and lower their power bills but also provide system benefits during periods of peak load.

Energy Queensland has established an affiliated contestable business, Yurika, which has developed a VPP product. Through utilising this new technology, Yurika is effectively collaborating with its customers to reduce their electricity bills and help them maximise the value of their embedded generation assets by accessing new sources of revenue in energy markets. As the platform intelligently manages different power sources, Yurika's VPP responds to energy markets by increasing liquidity and reliability of the system and lowers prices. This is a long-term, sustainable solution, allowing us to optimise the use of energy.

Although the potential benefits of VPPs are well-understood, further work is required to better understand their technical impacts and how best to enable their effective integration into the NEM while ensuring the ongoing reliability and security of supply. We see positive outcomes for customers and the wider community from a program of work that will provide AEMO with greater visibility of the operation of VPPs and assist in identifying any necessary changes to regulatory frameworks and operational systems and process. This work is particularly important as VPPs continue to increase in numbers and size. Energy Queensland is therefore fully supportive of the VPP demonstrations program.

Energy Queensland would welcome further participation in the trials and would be happy to provide any assistance required. We note, however, that the focus of the demonstrations program is on VPPs aggregating battery storage systems. As Yurika does not currently include battery storage systems in its VPP product we would be interested in exploring opportunities for Yurika to participate with AEMO further. As also noted in section 3 below, Energy Queensland considers that it is essential that AEMO work closely with the distribution networks in conducting the trials in order to better understand issues such as the interaction between VPPs and existing load control programs. Energex and Ergon Energy are also therefore available to provide assistance in this regard.

3 Detailed comments

Number	AEMO Question	Energy Queensland Response
1.1	<p>The primary focus of these trials is to demonstrate VPP aggregating battery storage systems. Do intending participants envisage incorporating demand response resources into your aggregated portfolios, and should this be incorporated into the VPP Demonstrations?</p>	<p>VPPs could combine residential solar PV, demand response, home energy management systems, embedded synchronous generation and, in the future, electric vehicles. As a key benefit of the VPP is to provide a financially preferable option to network augmentation, Energy Queensland considers demand response resources, both broad and targeted, should be incorporated into the demonstrations.</p> <p>Including demand response in the demonstrations will allow observations as to how traditional demand response assets, such as diesel generators, can be recorded and assessed and ensure any established performance requirements, data frameworks and Application Programming Interfaces (APIs) are appropriately considered.</p> <p>Energy Queensland also considers that using generators to provide Frequency Control Ancillary Services (FCAS) should be considered as an alternative approach to batteries.</p> <p>Currently, Energy Queensland’s affiliated contestable business, Yurika, does not include battery storage systems in its VPP product but may do so during the course of the demonstrations. Yurika would therefore be interested in exploring opportunities to participate in the demonstrations with AEMO further.</p>

Number	AEMO Question	Energy Queensland Response
2.1	Are the VPP Demonstrations objectives logical and achievable? Should any other objectives be considered for these VPP Demonstrations?	<p>Energy Queensland generally supports the objectives of the VPP demonstrations and considers them to be logical. However, there are a number of issues that may require further consideration to ensure those objectives are achievable. These issues are summarised as follows:</p> <ul style="list-style-type: none"> • Given the types of resources and third parties involved, there are potential risks that could impact timeframes, particularly with respect to cyber security risks associated with third party systems and interfaces. • Forecasting of VPPs and establishing bidding mechanisms for VPPs could prove difficult. It may therefore be necessary to consider a confidence metric for forecasting. • It is anticipated that difficulty may be experienced in transferring data and that a manual approach may be required initially to ensure the trial commences as expected. • As part of the API development process, consideration should be given to using Worldwide Web Consortium (W3C) standards rather than the traditional industrial protocols, such as Inter Control Center Protocol (ICCP). W3C (which is used by South Australia Power Networks) is a broader standard used worldwide across multiple industries, whereas ICCP is only used by utility-based industries. • Communications will also require further exploration, including differing levels of communications infrastructure in inner cities and outer suburbs, as well as in rural or regional locations. <p>Further, while Energy Queensland acknowledges that the VPP demonstrations will not seek to address distribution network limits to be considered when</p>

Number	AEMO Question	Energy Queensland Response
		<p>dispatching distributed energy resources (as this element is being addressed separately), we do consider that it is important for AEMO to work closely with DNSPs to understand particular network configurations and limitations as part of the demonstrations. Although AEMO has excellent visibility of the market, it does not have any visibility of the limitations and flows on the distribution network (as opposed to the transmission network). A VPP can have significant impacts on the distribution system in terms of capacity, voltage and power quality. Therefore, analysis of these impacts, how systems should be assessed, the dispatch constraints that should be applied and protection implications must all be considered and included as part of the demonstrations.</p> <p>It is also important, that as part of the demonstrations, distribution networks should have visibility of the VPPs to better understand what distributed energy resources and other distribution connected resources form part of the VPP and how they will impact upon distribution network assets (e.g. the Tesla VPP in South Australia).</p>
2.2	How can the VPP Demonstrations projects better capture consumer insights and improve customer experience and outcomes?	<p>Energy Queensland considers that customer and participant interviews, surveys and feedback questionnaires or sessions are useful methods for engaging with customers.</p> <p>Energy Queensland also notes that the VPP demonstrations can provide data that can be used to analyse when customers use electricity and thereby inform demand management strategies for shifting load and undertaking load curtailment in order to lessen the need to build stronger networks and reduce electricity prices for customers.</p>

Number	AEMO Question	Energy Queensland Response
2.3	Is AEMO's high-level approach to the VPP Demonstrations appropriate? What other arrangements could be tested under the VPP Demonstrations framework?	<p>Energy Queensland is generally supportive of AEMO's high-level approach to the VPP demonstrations. However, we provide the following comments for further consideration:</p> <ul style="list-style-type: none"> • Further clarity is required as to how the physical limitations of the distribution network will be factored into dispatch of distributed energy resources for the purposes of the demonstrations. • In addition to market customers and market ancillary service providers (MASPs), participation in the VPP demonstrations program should also be open to participants with a small generation aggregator (SGA) registration. Where a participant is registered as both a SGA and MASP, they should be able to participate in both energy and FCAS markets. • Trial arrangements should allow for participation by projects that come online after the commencement of the trial and allow for "pre-registration" to streamline participation once the trial is in progress.
4.1	AEMO would like the aggregated VPP dataset to be refreshed every five minutes to align with its operational forecasting function. Are VPP operators able to provide this data on a 5-minute refresh basis?	Yurika's VPP can provide data on a 5-minute refresh basis.
4.2	Should the values be reported as an average value across the 5-minute interval or an instantaneous value at the end of the 5-minute interval, or both?	Energy Queensland's preference would be to report average values as they are considered more representative of performance during the interval. Alternatively, we would support the reporting of both values.

Number	AEMO Question	Energy Queensland Response
4.3	<p>What is the appropriate frequency for VPP operators to submit the device level dataset to AEMO? Is there a material difference in resources required to upload the data on a daily, weekly, or monthly basis?</p>	<p>Further clarity is required as to whether VPP operators will use the same channels as existing generation, i.e. ICCP via the network service provider or whether a separate mechanism is proposed.</p> <p>Further consideration will also need to be given as to how changes in customer preferences are managed in the VPP as well as interactions with multiple VPP providers, especially in geographically diverse networks.</p> <p>Daily upload of data would be achievable but would place additional workload on participants. We therefore recommend either weekly or monthly uploads until the process can be automated.</p>
4.4	<p>Are there any regulatory or other obstacles to participants facilitating the data sharing arrangements contemplated in this section?</p>	<p>As noted in the consultation paper, any data sharing arrangements will need to comply with:</p> <ul style="list-style-type: none"> • the National Electricity Rules, including ring fencing requirements with respect to access to energy data; • the <i>Privacy Act</i> and the Australian Privacy Principles; and • the Consumer Data Right Bill 2018 (which, once passed, will amend the <i>Australian Competition and Consumer Act</i>). <p>Further, the terms of agreements with customers will need to be consistent with any contracts that customers have with retailers.</p>