Submission to AEMO NEM Virtual Power Plant Demonstrations Program Consultation Paper

December 21st 2018

Introduction

Monash University thanks AEMO for the opportunity to make this submission to its *NEM Virtual Power Plant (VPP) Demonstrations Program Consultation Paper*. This submission provides an overview of Monash's work related to VPPs, and provides a response to the consultation questions.

As part of its Net Zero Initiative, where the university will transform its energy infrastructure to achieve net zero emissions by 2030, Monash is developing a microgrid at its Clayton campus in south east Melbourne. The Momash Microgrid will enable the control of the various distributed energy resources (DER) deployed as part of the Net Zero Initiative, including a minimum of 1MW of solar panels, 20 buildings, 2 electric vehicle charging stations and 1 MWh of energy storage. Monash is working to demonstrate the value that a smart embedded network can provide to the broader energy market, the grid and local distribution network, and our customers. Monash is developing a VPP at an embedded network scale.

In partnership with Indra, Monash has received $2.9 million in funding from ARENA to develop the microgrid under the Smart Energy City project. This project will see the deployment of Indra's IOT hardware and Ingrid AGM software platform, which will enable the flexible control of various onsite DER including storage, buildings, electric vehicles and solar. The transactive energy market platform being developed as part of the project will orchestrate the response of the connected DER to both internal and external signals from both an energy and power perspective.

In addition to this, Monash has received funding from the Victorian Department of Environment, Land, Water and Planning through the Microgrid Demonstration program to deliver the Microgrid Electricity Market Operator project. Through this project, Monash will be assessing the market size for smart embedded networks across Victoria, as well as identifying and implementing suitable business models to maximise the value these smart embedded networks can provide. Monash will also be assessing the regulatory constraints these smart embedded networks face, and as a private network which has been set up to mimic a real city, Monash can demonstrate the value that can be unlocked through different regulatory regimes.

Monash wishes to express its interest in participating in the VPP Demonstrations Program, as there a lot of synergies between Monash's current activities and AEMO's desired outcomes for the program. Through the microgrid initiative, and the two projects outlined above, Monash believes that it can provide AEMO with a different perspective to other VPPs which are focused on the residential customer. The Monash Microgrid, which treats our various DER as individual customers, can provide a test bed for business models in both the commercial sector and for embedded networks. Monash's participation in the VPP Demonstrations Program will also enable the existing resources, from the University, industry and state and federal government, to be leveraged to feed into AEMO's work in this space.

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Response to consultation questions

Question 1.1: 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?

As part of the Smart Energy City project, Monash will be connecting 1 MWh of storage, 20 buildings of various types (aquatic centres, office buildings, apartments, laboratories, and retail outlets), 2 electric vehicle chargers and 1 MW of solar to the Monash Microgrid. Monash believes that the various forms of DER which can provide demand response should be incorporated into the VPP Demonstrations Program, so that their value can be assessed, along with storage and solar.

Question 2.1: Are these objectives logical and achievable? Should any other objectives be considered for these VPP Demonstrations?

The objectives outlined in the Consultation Paper are logical and achievable, and are aligned with and complimentary to the objectives of the Monash Microgrid. The microgrid has been developed as a knowledge sharing exercise, and the VPP Demonstrations will enable the lessons which are going to be learned from the microgrid to feed into industry relevant programs.

The provision of an API to "…enable participants to submit operational forecasts and actual performance data from their VPPs to AEMO" will assist in sharing the data generated with industry, and also potentially receive market information to feed into the transactive energy market being developed under the ARENA Smart Energy City project.

Under the Victorian Government funded Microgrid Electricity Market Operator project, Monash will be assessing the regulatory arrangements which affect smart embedded networks, and testing alternative regulatory arrangements. There are strong synergies between that project and the VPP Demonstrations objectives.

Question 2.2: How can projects involved in the VPP Demonstrations better capture consumer insights and improve customer experience and outcomes?

Whilst the Monash Microgrid is representing one customer, Monash University, it has been designed in such a way that each individual DER, including buildings, will be treated as an individual customer. The experimental nature of the Monash Microgrid will enable the testing of different incentives and interventions on different customers over time, and the customer response will be assessed. Monash would be happy to work with AEMO on testing different approaches to engage with customers and to better capture insights and improve customer experience.

Question 2.3: Is AEMO's high-level approach to the VPP Demonstrations appropriate? What other arrangements could be tested under the VPP Demonstrations framework?

Monash supports the high level approach put forward in the Consultation Paper.

Question 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?

Monash will be able to provide this data on a 5-minute basis.

Question 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?

Monash is designing its transactive energy market based on an end of 5-minute interval. We are unable to provide the average value across the 5-minute interval.

Question 4.3: 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?

As data uploading is likely to be a manual process, there will be a higher resource requirement for the more frequent uploading of data. Monash is unclear of the effort required to both collate and upload data. In principle, if daily data is not required, Monash would prefer either weekly or monthly, however Monash is happy to work with AEMO to determine the appropriate frequency to submit the required data as part of the VPP Demonstrations.

Question 4.4: Are there any regulatory or other obstacles to participants facilitating the data sharing arrangements contemplated in this section?

Further obstacles to data sharing will be dependent upon what AEMO plans to do with the data shared. One further consideration from Monash's perspective will related to any existing contractual arrangements related to IP surrounding the data. Further investigation will be required, but given Monash has already committed to sharing data as part of its contractual obligations with ARENA and DELWP, this is unlikely to be an issue.

Another further element which needs to be considered is security. Whilst unlikely, depending on the granularity of data shared, it may provide information on how a DER is being used. This is a potential issue for buildings, as it may, for example, indicate a time when a building is vacant. Again, Monash is willing to work with AEMO on this, and does not see it as a major challenge.

Further information
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