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Distributed Battery Storage in PJM Markets Problem Statement and Opportunity

Problem Statement

Currently, there is no clear path to market for distributed battery storage systems in the PJM markets.

Batteries that would like to participate in PJM markets have two entry options: i) Generation Resource under the normal PJM queue process with associated Wholesale Market Participation Agreement (WMPA) or Interconnection Service Agreement (ISA) or, ii) Demand Response Resource with associated registration and certification process.

When designated as a Generation Resource, and installed on an End Customer's premise, the battery must be installed in-front-of the retail Electric Distribution Company (EDC) meter in place with the End Customer.

When designated as a Demand Response Resource, the battery must be installed behind-the retail EDC meter in place with the End Customer.

It is cost-prohibitive and time consuming for small batteries to go through the PJM queue process and be designated as a Generation Resource for two specific reasons.

- i. A second utility service line is required to be installed at the end user facility dedicated just for the battery storage system.
- ii. Costly measurement and verification processes are introduced if the battery storage system intends to provide any service to the end user facility other than PJM market services. In this case PJM requires a mixed wholesale and retail tariff to be applied to the battery storage system where power charged by the battery is charged at full retail value and power discharged from the battery is credited at wholesale LMP.

Further, the value a storage unit can provide to the market is limited when designated as a DR resource. PJM Demand Response regulation certification requires that DR resources will never inject beyond the load meter which often requires additional metering costs and controls and limits participation in PJM markets based on minimum instantaneous load during the hour. Batteries are often installed as part of a wider behind the meter system, which includes solar panels that produce more power than consumed by the load on an instantaneous basis. Retail net-metering is a State jurisdictional policy, and allows the solar system (or any other Class 1 Renewable) to produce more power than consumed by the load on an instantaneous basis, as long as the solar does not produce more power than consumed by the load over a monthly or annual basis. PJM Demand Response participation, however, is only permitted when there is instantaneous demand/load even when a retail net metering agreement is in place with the EDC Transmission Owner. The provision limits the DR value wholesale opportunity based on the amount of instantaneous load, which therefore severely limits the value the DR resource can provide to the market revenue opportunity for the battery.

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Opportunity

The market for distributed battery storage at small commercial and residential facilities is gaining momentum and warrants PJM stakeholder consideration on the most effective and least cost solution to integrate these systems into the PJM market.

Private and public funding is in place to support the deployment of distributed battery storage for grid resiliency and grid support purposes.

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For example, the following are a few public funding opportunities in place today:

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- i. The New Jersey Board of Public Utilities, under its Clean Energy Program, awarded incentives to 13 battery storage projects, 9MW in aggregate and totaling \$2.9M in incentives, as part of its Fiscal Year 2015

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Renewable Electric Storage Incentive Solicitation. An additional \$6.0M has been allocated for battery storage projects under this program for Fiscal Year 2016. All battery systems need to be co-located with customer sited solar.

- ii. The Maryland Energy Administration (MEA) under its Game Changers Grant Program has awarded funding to battery storage projects at residential homes with solar to participate in the PJM Frequency Regulation market. This is an active project with WMPA agreements in place for 20 homes totaling 100 kW in aggregate. The MEA recently closed another Grant Solicitation specific to battery storage for behind the meter applications.