

Reactive Power in PJM: Clean Energy Caucus Solutions Package

Reactive Power Compensation Task Force
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Design Components

- Basis for Compensation
- Compensation Mechanism
- Eligibility for Compensation
- Reactive Capability Verification/Testing
- Eligibility for Reactive Services Uplift
- Implementation



Basis for Compensation: Cost-of-Service Rate Recovery

- Resources should be compensated based on their costs of investment in reactive power capability.
 - FERC generally permits cost-of-service rate recovery for reliability products.
 - Transmission owners are entitled to full cost-of-service recovery in transmission rate base for investments in reactive power service on the transmission system. Generation resources need to be treated the same.
- AEP Method is currently the only method that compensates a generator for the full investment in reactive power capability.
 - Not specific to synchronous generation.
 - The AEP Method is a generic means of identifying facility equipment at all types of generation that support the reactive power capability function.

Compensation Mechanism: Two Options to Streamline the Cost Recovery Process in PJM

- Option A: PJM develops and adopts a form that is based on the AEP Method and identifies the costs that support reactive power capability.
 - Form would also derive reactive power rate for individual generating unit.
 - Generator would fill in its costs in the AEP cost category buckets.
 - Form would include an officer attestation such as utilities now submit to FERC with a FERC Form No. 1.
 - FERC filing would still be required for each individual generating unit seeking recovery. However, it would be the completed template form adopted by PJM.

Compensation Mechanism: Two Options to Streamline the Cost Recovery Process in PJM

- Option B: PJM develops an AEP-derived stated rate by generation type (e.g., solar, wind, energy storage, etc.)
 - PJM would need to gather information regarding typical capital costs for each class of generators, accounting for regional and technology-specific differences.
 - PJM would revisit stated rate periodically, adjust for inflation, and adjust for technology changes.
 - Stated rate would be set forth in Schedule 2. No FERC filing would be required for each individual generating unit seeking recovery.

Compensation Mechanism: Two Options to Streamline the Cost Recovery Process in PJM

- Either streamlined AEP Method would address many of the concerns raised by PJM and FERC.
 - Reduces reliance on burdensome hearing and settlement process at FERC.
 - Option B would eliminate FERC filing altogether.
 - Provides certainty to all parties.
 - Creates “high quality” rate product that is consistent and transparent.

Eligibility for Compensation: ISA or WMPA

- Any generating unit that provides reactive power service and has an ISA or WMPA with PJM would be eligible for compensation under Schedule 2.
- PJM governing documents obligate all generation, regardless of voltage level of interconnection, to follow PJM dispatch instructions for reactive power service.

Reactive Power Capability/Testing: Nameplate

- NERC reactive capability testing generally does not require a full demonstration of a resource's potential ability to supply reactive power.
- System voltage conditions during testing are typically too high to allow a resource to safely generate their maximum reactive output. This is true for synchronous and non-synchronous generation.
- Weather and time of year can also affect a resource's testing capability.
- Manufacturer's technical specifications should be deemed adequate to support use of nameplate capability.
- PJM would still undertake eDART testing for use to manage the grid in real time.

Eligibility for Reactive Services Uplift: Fuel Neutral

- Synchronous and non-synchronous resources should be eligible for lost opportunity cost and/or uplift payments (i.e., when PJM dispatches the resource's real power output down in order for the resource to provide reactive power).
 - Energy Market revenues
 - Ancillary Services Markets revenues
- PJM should create a mechanism to compensate inverter-based resources reactive power when the resource is not providing real power.
 - Inverter-based resources may reflect their system designs by allowing solar facilities to recover their "Q at Night" costs, allowing wind facilities to recover "WindFREE" costs, and allowing storage facilities to reflect the portion of its inverters and storage system used to support reactive power capabilities.
 - Must be based on factors other than just energy market prices. Providing reactive power shortens the life of certain equipment and increases O&M expenditures.

Implementation: Prospective Following FERC Acceptance

- New reactive power compensation mechanism should be applied prospectively following acceptance of PJM's FPA section 205 filing by FERC.
- New reactive power compensation mechanism should not impact generating units that have rates on file with FERC, generating units that have a FPA section 205 filing pending at FERC at the time of filing, or projects that have a facilities study agreement signed by the interconnection customer.
- PJM should only make a FPA section 205 filing prior to FERC issuing a final rule in Docket No. RM22-2-000 if it has sector-weighted majority support.

Sponsor Companies and Organizations

- Advanced Energy Economy
- American Clean Power Association
- Apex Clean Energy
- Cypress Creek Renewables
- Enel North America
- Geenex Solar
- GlidePath Power Operations LLC
- Invenergy LLC
- Lightsource Renewable Energy Operations, LLC
- Open Road Renewables
- Pine Gate Renewables, LLC
- Solar Energy Industries Association
- TransAlta

Thank You