

Capacity Sales for Host Generation With Curtailable Co- located Load

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Brookfield
Renewable U.S.



Constellation[®]

Situation Overview

- PJM and its stakeholders are becoming increasingly concerned with reliability/resource adequacy issues as the load/supply mix evolves. They are also concerned about the costs of ensuring reliability in the face of that evolution
- Customers are also seeking to procure increasing amounts of physical, clean electricity on a behind-the-generator basis.
- PJM should pursue rules that encourage such clean behind-the-meter load development in a manner that enables PJM to cost-effectively preserve reliability/resource adequacy.
- The Constellation/Brookfield Renewable proposal does just that: it enables clean resources to satisfy growing customer behind-the-meter needs, while allowing these resources to remain available to PJM to cost-effectively ensure resource adequacy and respond to system stress situations

Proposal Summary

The Constellation/Brookfield proposal accomplishes these objectives without (i) implicating complicated federal/state jurisdictional issues, (ii) forcing capacity to de-list, (iii) ISA/Planning concerns or (iv) other issues:

- The co-located load does not consume any energy from the PJM system
- The co-located load is interruptible
- Relay schemes will curtail co-located load contemporaneous with generator trip
- Host generator retains existing Capacity Accreditation/CIRs
- Consistent with the IMM's definition of "Capacity Fulfilled" (i.e. physical deliverability, (re)callability in an emergency, competitive energy offer, and more).
- Host generator provides all Ancillary Services necessary for delivery of power from Host generator to co-located customer
- Interconnection Services Agreement: No change to ISA review process

Key Benefits of Proposed Reforms

1. Retains generation for reliability and to respond to system stress
2. No reliability, legal, or market impediments to the proposal
3. Preserves the existing Ancillary Services paradigm
4. Addresses all Planning, ISA and Reliability concerns by utilizing the existing Necessary Study Agreement process
5. Jurisdiction: No modification to existing federal/state jurisdiction
6. Allows low-cost resources to remain fully in the capacity market relative to status quo “de-list” scenario
7. Enhances customer choice for physical, clean, reliable power supply
8. States enjoy significant economic development benefits of new commercial activity

PJM Rules Do Not Directly Address Capacity Market Participation of Generation with Co-located Load

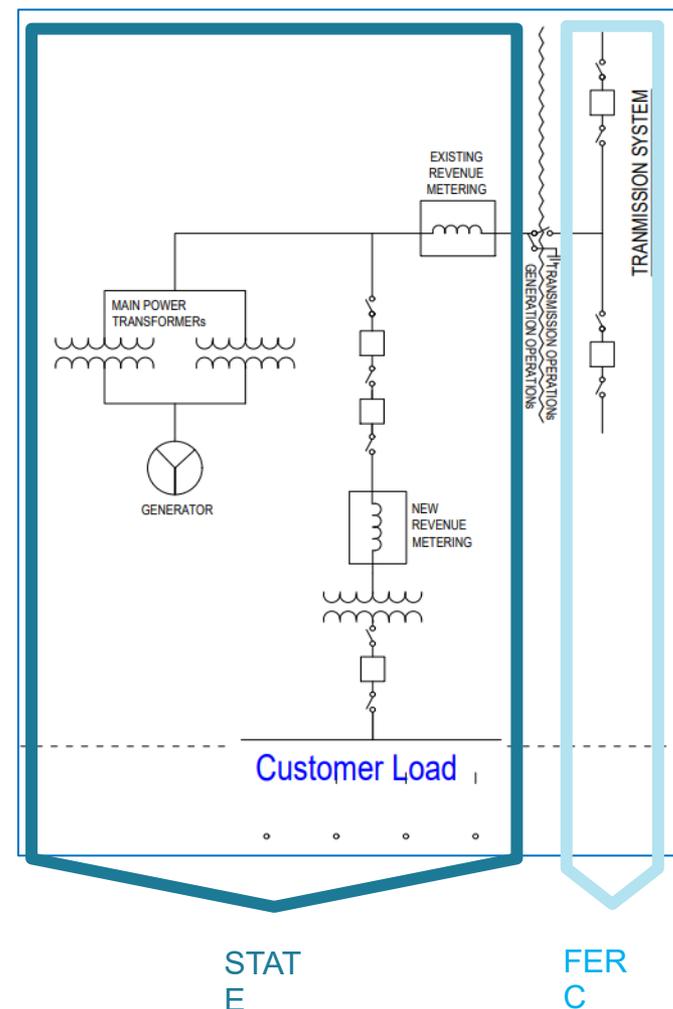
- New, large commercial customers are choosing to locate their highly interruptible loads behind the meter of generation resources to reduce cost and assure physical supply of carbon-free power (E.g., hydrogen electrolyzers, data centers)
- Currently, PJM rules do not *directly* address Host Generator market obligations in the presence of Co-located load
- Initially, PJM opined that Host Generators serving Co-Located Load must “de-list” (i.e., retire and forfeit Capacity Injection Rights) the portion of the unit serving the Co-located Load, depriving PJM of existing (potentially low-cost) capacity supply. See, [*PJM Rules Regarding the Siting of New Load Behind the Meter of Existing Generation*](#) (11/29/21)
- PJM also initially suggested that Behind the Meter *Generation* rules should be applied – *but our reform is **not addressing any generation behind a wholesale meter***
- Indeed, our reform effort is only addressing obligations of generators that are interconnected to the PJM grid (not BTM Generation).

PJM and customers can retain the full capacity supply of Host Generators where the behind the meter load is curtailable

Reform Opportunity

PJM rules must be developed to address the capacity obligations of Host Generation that can curtail BTML

- Customer takes service directly from Host Generator
- Customer does not need or want FERC-jurisdictional wholesale transmission service
- Host Generator provides all ancillary services necessary for delivery of power from generator to customer
- PJM studies the generator interconnection for reliability/stability issues (Necessary Studies Agreement)
- Relay schemes assure no BTML consumption from grid
- Generator sells full capacity to PJM
- Generator submits full committed capacity to PJM energy market in Delivery Year; PJM can fully-recall on cost-based offer for reliability
- Market-based energy offer for MW serving BTML are offered to PJM at the verified opportunity cost of curtailing the BTML
- PJM dispatches net output of Host Generator
- If generator is offline, BTML is interrupted or shifted to another generator at the station
- Full Host Generator response to an energy call is as fast as sync reserve requirements (much faster than response for many capacity resources)
- Any distribution costs are determined by local utility retail

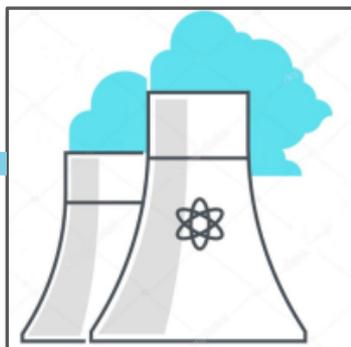


Simple Operation Example – Grid LMP Low

Generating Station

1000 MW Max Facility Output

1000 MW Capacity Sale



200 MW

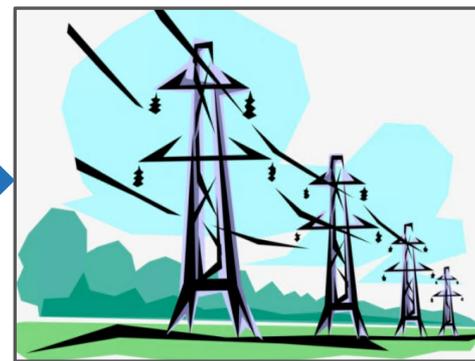
STATE

JURISDICTION
AL

FERC JURISDICTIONAL
800 MW

ISO Grid

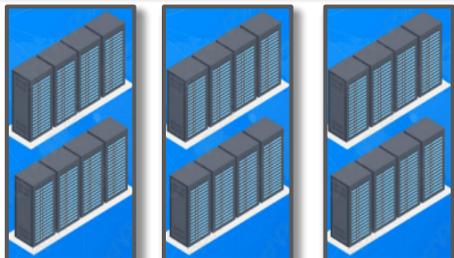
LMP = \$50



Behind the Meter Customer

200 MW

Fully Interruptible <10 min @
\$500



Operational Assumptions

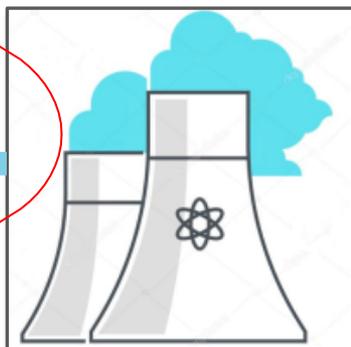
1. Generator commits full capacity value to ISO
2. Generator provides unit-specific interruptible power to BTM customer
3. Generator fulfills capacity commitment via daily DAM energy offer
 - 800 MW @ SRMC, e.g., \$0
 - 200 MW @ Opportunity Cost of BTML interruption, e.g., \$500
4. Generator curtails BTML when LMP exceeds market-based offer

Simple Operation Example – Grid LMP High

Nuclear Station

1000 MW Max Facility Output

1000 MW Capacity Sale



0 MW

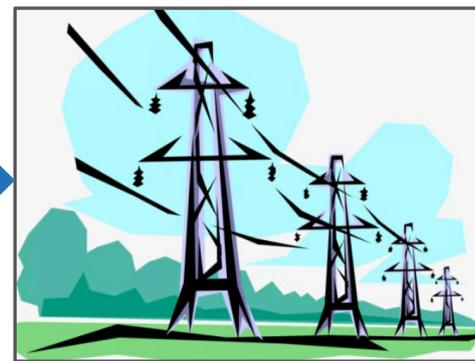
STATE

JURISDICTION
AL

FERC JURISDICTIONAL
1,000 MW

ISO Grid

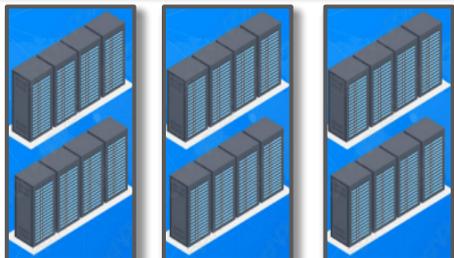
LMP = \$501



Behind the Meter Customer

0 MW

Fully Interruptible <10 min @
\$500



Operational Assumptions

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