

Response to FERC Comments: Net Energy Metering and Double-counting

University of Delaware EV R&D Group
Comments to PJM Distributed Resources Subcommittee (DISRS)

25 May 2023

Rationale for Comment

- The UD Electric Vehicle R&D Group develops and demonstrates grid integration of Electric Vehicles using V2G technology. The goal is to provide EDC or RTO grid services during time parked, and receive payment for services rendered.
- We comment on policies that directly impact market access, cost, and effectiveness of this nascent technology.
- Most comments also are relevant to stationary storage behind a retail meter.
- This comment concerns NEM and potential double-counting in PJM, in relation to FERC's comments on PJM's compliance with FERC Order 2222.

FERC Comments

Summary of Sections 126, 127 & Section 136:

Together these sections establish the need for PJM to redefine, standardize, and account for double-counting/double compensation concerns. Per section 126, FERC determines that EDC review and subsequent PJM review of double-counting on a DERA basis was acceptable so long as PJM requires an assessment that the “same product is not also credited” by the EDC.

Sections 126, 127, & 139

126: “PJM states that the electric distribution company will assume the role of verifying whether a resource is enrolled in a net energy metering retail program, and will make the determination as to whether or not the resource is already being compensated for energy and/or capacity under the program... PJM will subsequently conduct a separate review to verify that there is no double counting.”

127: “PJM states that the electric distribution company is responsible for reviewing potential double counting conflicts under local RERRA rules, while PJM is responsible for reviewing conflicts under its Tariff and Operating Agreement.”

139: “Next, we find that PJM’s proposal to rely on the electric distribution company to account for different services provided by a Component DER participating in a net energy metering retail program through the registration process complies with the Order No. 2222 requirement ‘to describe how it will properly account for the different services that [DERs] provide in the RTO/ISO markets.’”

Section 127

127: “We agree with PJM that the proposal is narrowly designed because it does not broadly limit or restrict the participation of a Component DER that participates in a retail program from participation in PJM’s markets. However, PJM’s proposed tariff requires an assessment of whether the ‘same product is not also credited’ rather than whether, as the Commission discussed in Order No. 2222, the same service is being provided by the Component DER. Being credited for a product may not be the same as providing a service. This difference may be relevant because a Component DER participating in a net energy metering retail program, for example, may be credited for a product or service that it does not actually provide.”

UD Experience

Proven registration

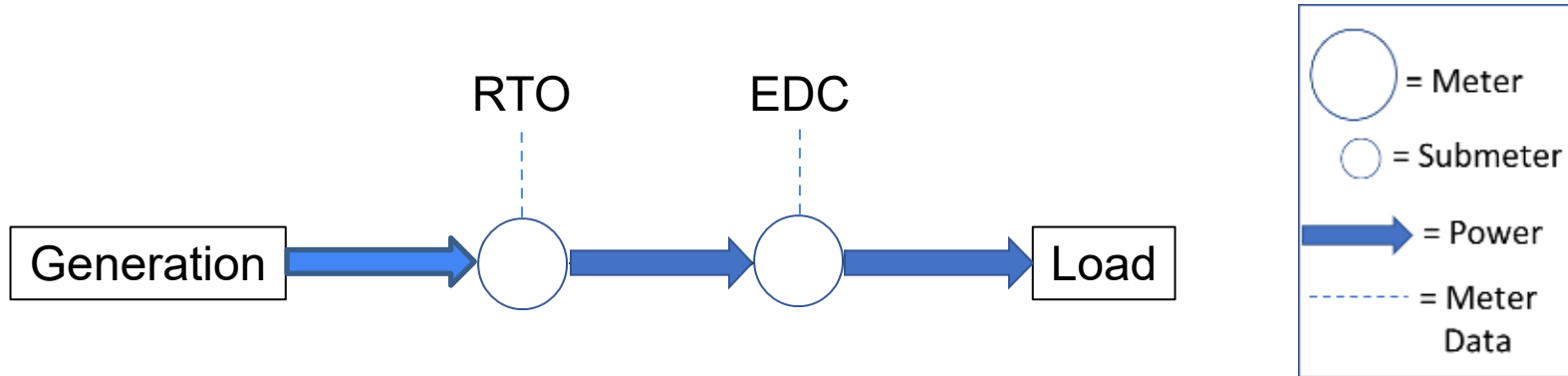
- We registered BTM batteries as DR within a Muni. The Muni approved backfeeding, net metering, and power flow through the muni distribution system.
- Used Muni's HV meter to the TO, to determine no energy sales into transmission grid.
- PJM allowed DR market access only to A/S "Regulation only", and only in Munis.

Our recent experience attempting to broaden market

- Attempt to register as small generator (SG) to locate DERs in IOUs and to sell other A/S, maybe capacity.
- Transmission operator insisted on compensating us for all kWh back-fed through retail meter. TO would not accept proof of no backfeeding at wholesale, assured net load into battery over time, nor assurance of setting energy price at \$0MWh.
- We perceived mental barriers to thinking about SG as an A/S, response, or capacity resource. There is fixation that SG must be an energy resource.
- Conclusion: Current tariff and current practice block DER and DERA participation in appropriate markets, thus blocking admitting a low-cost resource to contribute to grid services.

We explain with examples, then propose solutions

Meter Topology: “old school” Market: Wholesale and retail energy

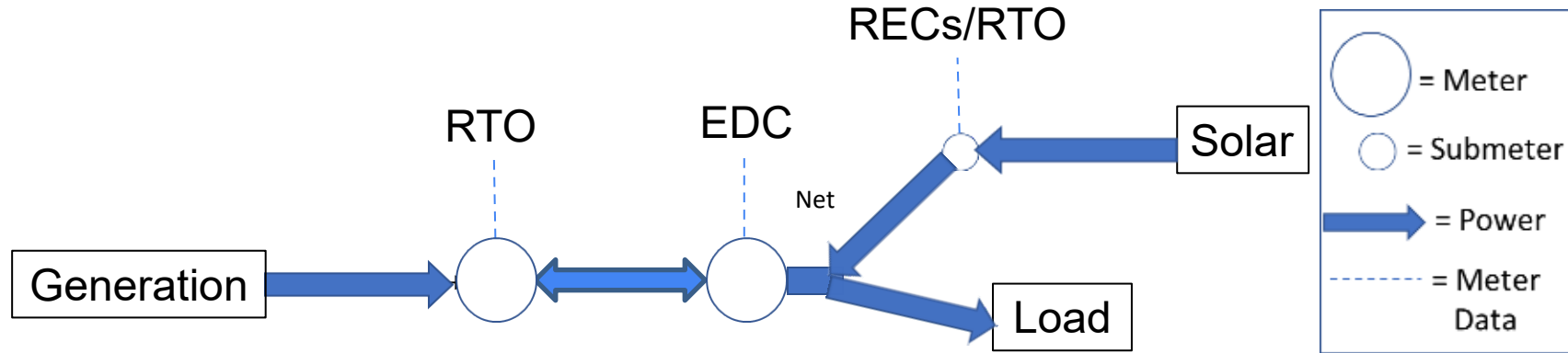


Load only

- EDC meter for billing load, RTO meter for generation to EDC.
 - The EDC pays wholesale to RTO and customer pays retail to EDC.
- No double-counting problem

Meter Topology: “Building load & solar on EDC meter + REC submeter”

Market: Energy and RECs



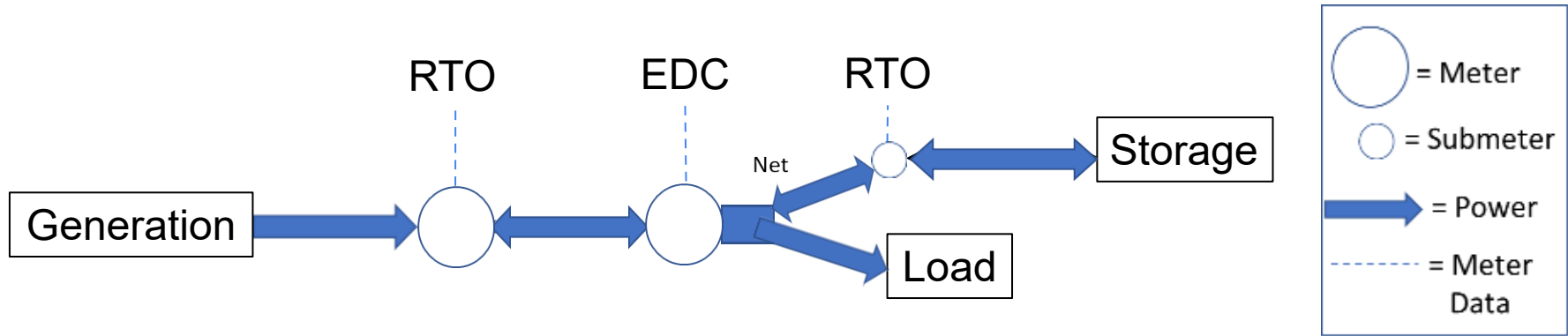
Solar with EDC net metering and selling RECs

- EDC net meters energy, payment via reduced retail bills
 - RTO or third party buys RECs via submeter
 - RECs are non-energy units
 - “Same product is not also credited” kWh vs. REC different products
- No double-counting problem

Straw man: Solar with EDC net metering and selling energy to the RTO

- EDC net meter, which reduces accumulated retail energy billing
 - RTO also buys energy via submeter
 - “Same product” is being credited by both kWh
- Yes, double-counting problem with energy

Meter Topology: “storage and load behind EDC meter, submeter storage” Market: Net metering and A/S reserves w/ energy

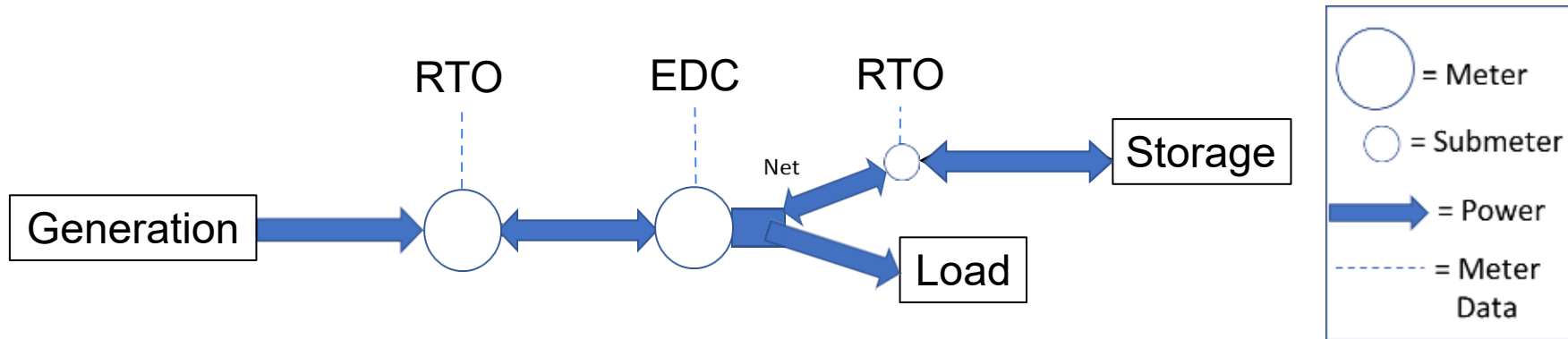


Storage & load behind EDC net meter, RTO paying for synchronous reserves using submeter

- Current practice is that Reserves only meters energy during dispatch events
 - Thus, RTO sees “generation” during dispatch events
 - In figure, RTO submeter measures power and time, high time resolution; telemetry to RTO, via DERA
 - EDC meter registers net energy of building load (storage never “generates” over a day, much less over a billing period)
 - Energy revenue during dispatch is very small, 10 min x 30/year = 5 hours/year incorrectly counted as energy production
 - (note: typical PJM reserves dispatch is 30 times/year, average 10 minutes each)
 - Primary value is in power and quick response to dispatch signal, energy value is minimal
- Yes, small double-counting (only because RTO may not meter during battery recharge)

Meter Topology: “storage and load behind EDC meter, submeter storage”

Market: Net metering and “A/S only” or “capacity only”



Storage behind EDC net meter. Suggestion: RTO crediting for “A/S only” or Capacity only, using submeter on dispatched DER

- Assume DER is in markets like “regulation only” with no energy payments from RTO
 - Net energy metering is at EDC meter, based on RERRA qualification of BTM storage for NEM
 - RTO need not monitor DER energy, only device power, e.g. ‘10 kW discharge within 2 seconds of AGC signal’
 - EDC meter registers net energy of load + storage, EDC customer pays for net load, e.g. ‘900 kWh load this month’
 - “Same product is not also credited” (energy versus power response)
- No possible double-counting

UD Proposed Solution

- The main issue with the current disqualification of NEM DERs is the current non-recognition of distinction between retail energy and wholesale for fast power response.
 - This should already meet the FERC criterion to not be double-counting when the “same product is not also credited.”
 - The distinct product can even be confirmed by the meters: accumulated net energy for EDC, power and high-resolution time for RTO “A/S only” services.
- The following slides are solutions for: interconnection, market access and double-counting.

Solution to Interconnection Problem

- Interconnection of BTM DERs are already handled by EDCs.
 - Injection requires EDC interconnection approval (including anti-islanding, harmonics, line capacity, powerflow, etc), all within jurisdiction of EDC.
 - No need for TO or RTO to be concerned with interconnection BTM on distribution system.
- One mechanism would be for PJM to treat BTM storage as a “DR with Injection”. That is, TO and RTO treat this as DR, thus, they are not approving interconnection. EDC treats it as injection on distribution system, requiring EDC approval.

Solution to Market Access Problem

- RTO would create “A/S only” and “capacity only” similar to existing “Regulation only”
- DERs that are net metered would be prohibited from RTO energy markets. Can be accomplished either:
 - By DER NEMs being restricted to “A/S only” and “capacity only” markets, or
 - By setting \$0/MWh for the energy component of RTO compensation to DER.
- Simple enforcement: DER registration as a “DR w injection” would imply that DER is ineligible for any RTO energy markets. If a DERA contains any DERs being paid for energy, the whole DERA may be disqualified from energy markets.
- In the far future, if DERA grows enough to influence TO bills to EDC, then:
 - EDC may pass that increase on to those retail customers who have caused this increase (with REERA approval), or
 - EDC may require, or contract with, the DERA to reduce power/energy flows thus eliminating any added costs at wholesale level.

Solution to Double-Counting

- EDC bills customer for energy, demand, and TOD use according to its RERRA-approved tariff.
- EDC meter runs all the time, thus storage cannot be net generation. Over time it is always DR.
- In non-energy markets like “A/S only”, RTO would pay DER only for power response to signal, not energy.
 - Thus, per FERC, the “same product is not also credited” thus no double-counting.
- FERC suggests the EDC determine whether the DER is already compensated for energy or capacity, then PJM reviews and determine if double-counting based on PJM’s tariff.
- We suggest clarification that: DER report to PJM which services it compensates, then PJM determine if a conflict, so
 - The EDC only reports how it is crediting this DER, for what services.
 - The EDC need not distinguish, for example, whether NEM conflicts with RTO “Regulation” versus “Regulation only”.
 - The RTO reviews EDC compensation, for which services. The RTO blocks the associated DERA from wholesale markets of any products for which the DER is already being compensated.

END