

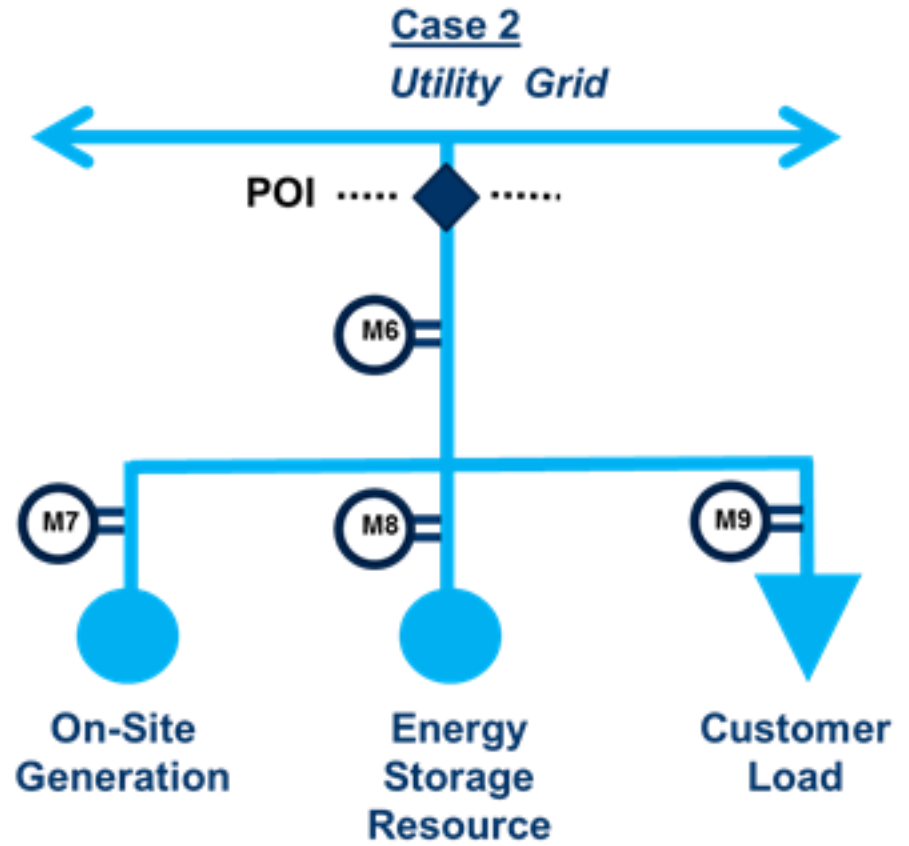
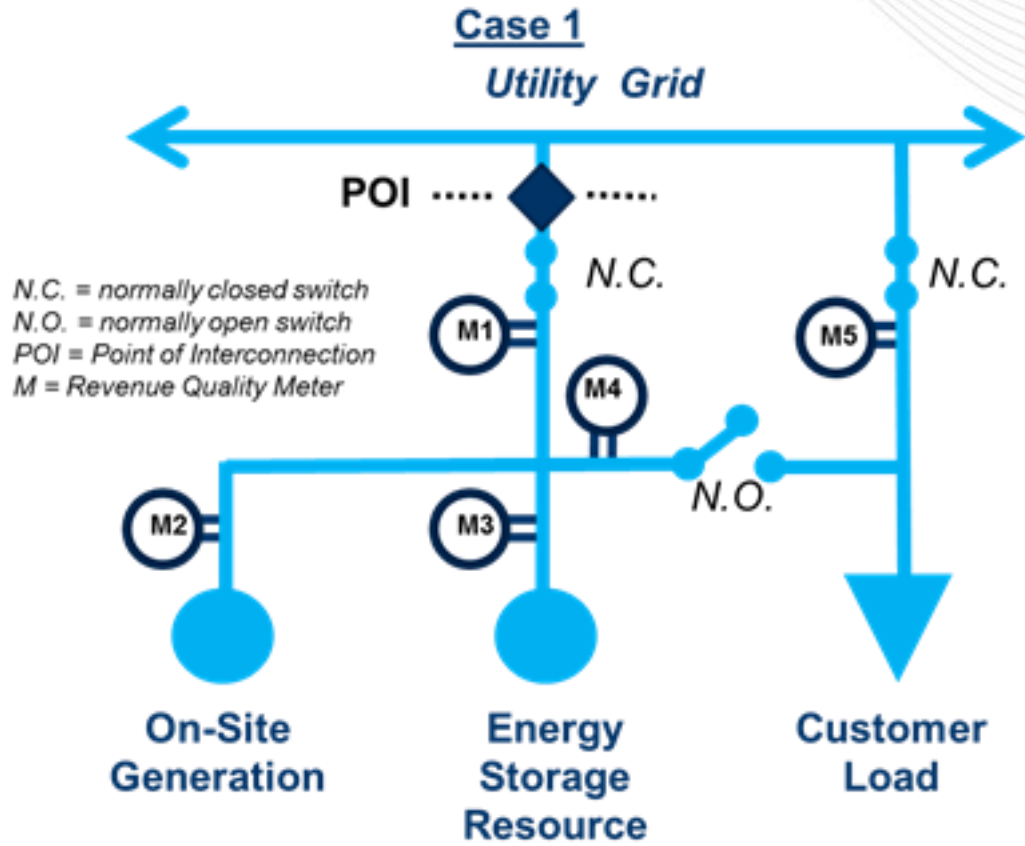
Metering and Methods for Distinguishing Direct Charging Energy and Load Serving Charging Energy at Energy Storage Resources

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June 10, 2019

PJM DER Subcommittee

Possible Load Serving Energy Storage Resources



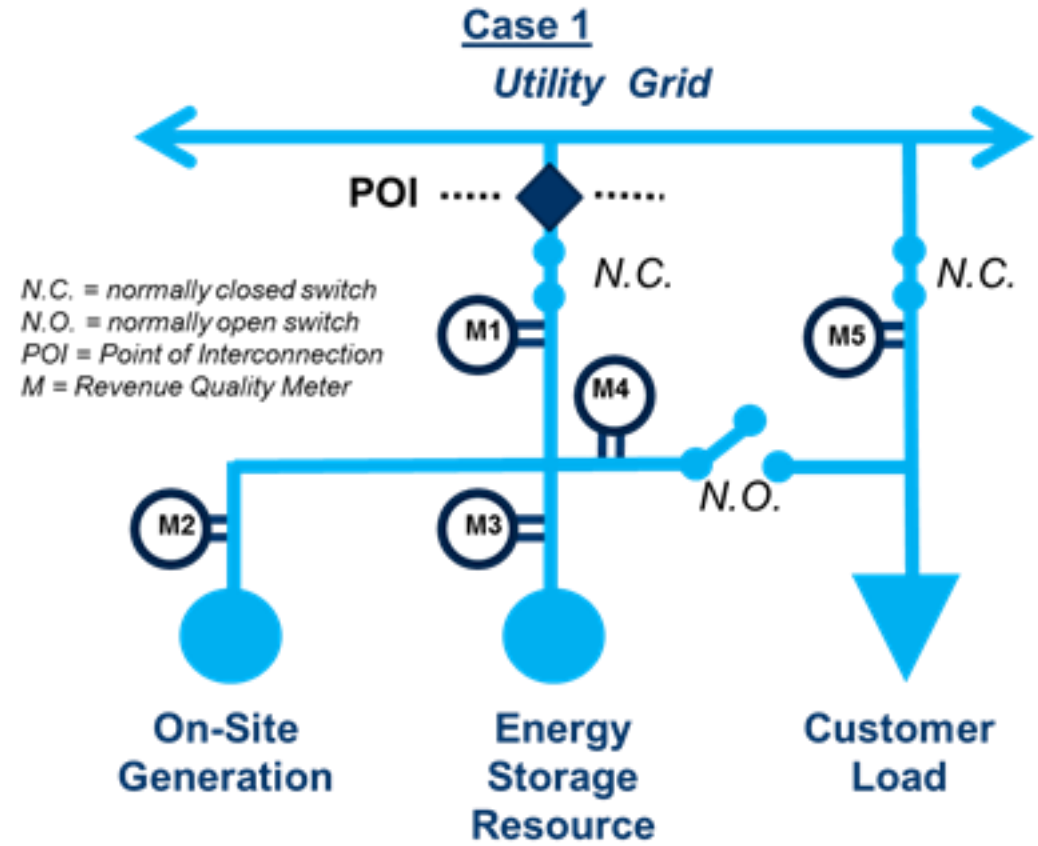
“Direct Charging Energy” shall mean the energy that an Energy Storage Resource purchases from the PJM Interchange Energy Market and (i) later resells to the PJM Interchange Energy Market; or (ii) is lost to conversion inefficiencies, provided that such inefficiencies are an unavoidable component of the conversion, storage, and discharge process that is used to resell energy back to the PJM Interchange Energy Market.

ESR purchase Direct Charging Energy.
Direct Charging Energy is settled as “negative generation”.

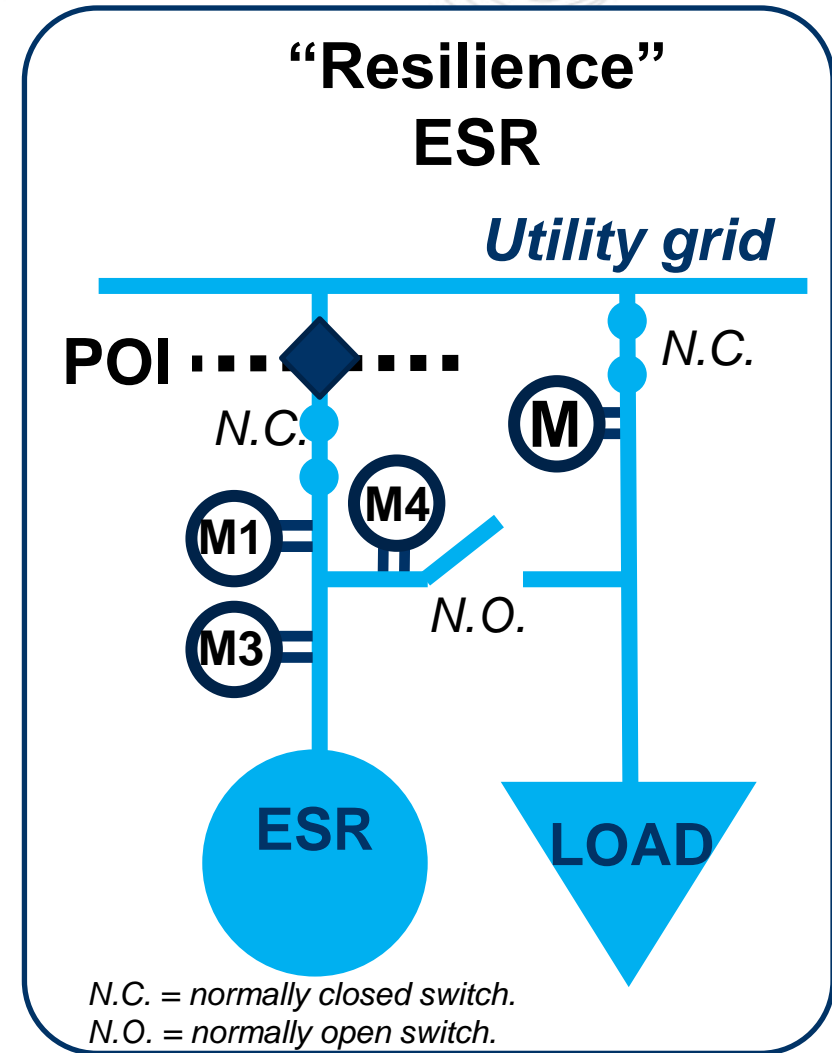
“Load Serving Charging Energy” shall mean energy that is purchased from the PJM Interchange Energy Market and stored in an Energy Storage Resource for later resale to end-use load.

→ Only a Load Serving Entity may purchase Load Serving Charging Energy.
Load Serving Charging Energy is settled as “load”.

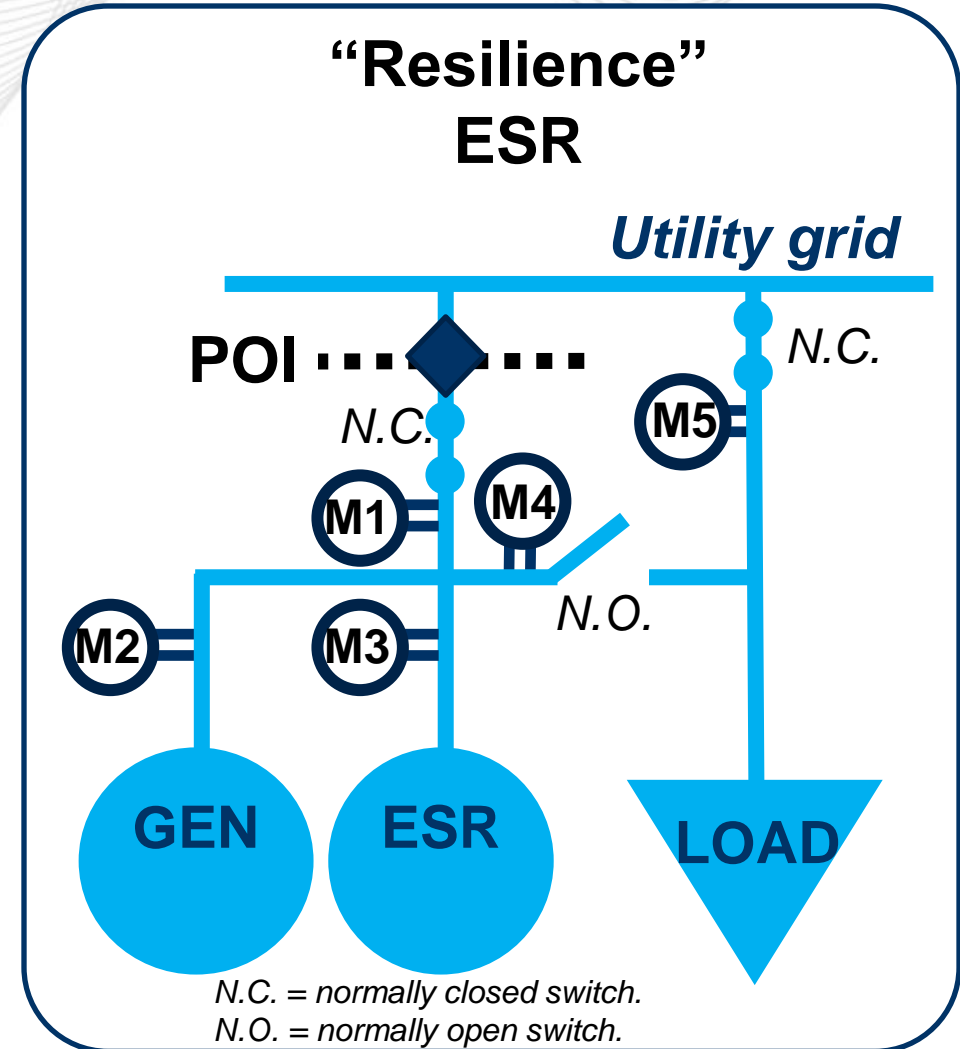
2. Metering and Method to Identify Load Serving Charging Energy at a Resilience ESR



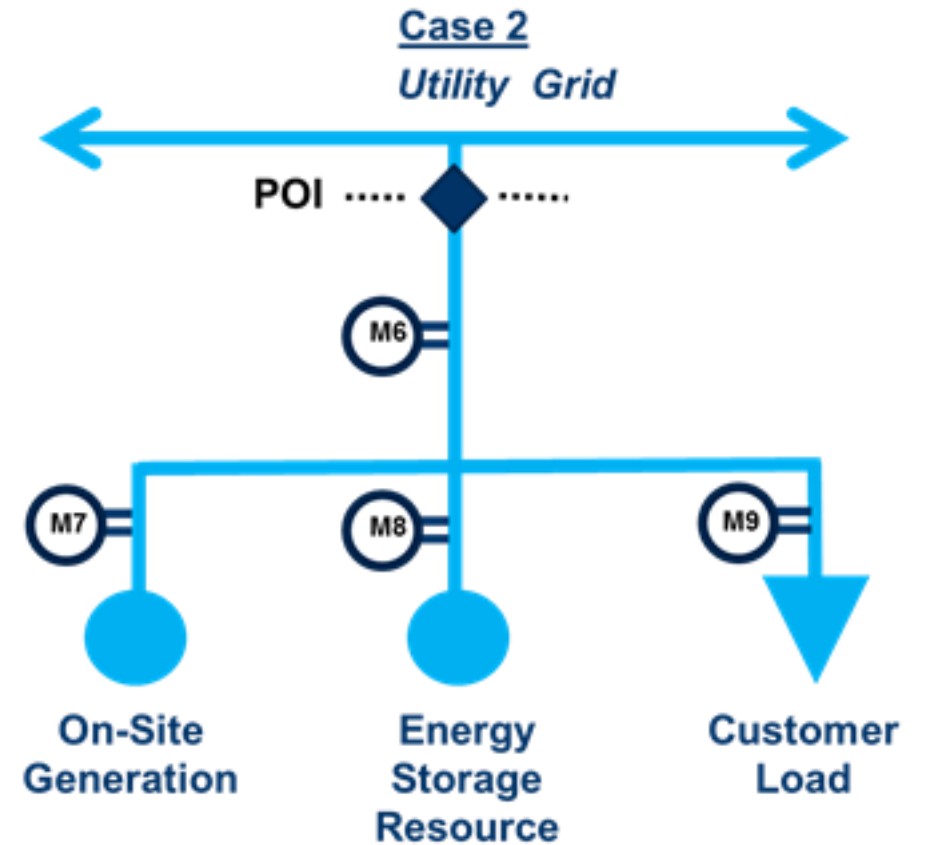
- 100% of withdrawals initially settled as negative generation (i.e., Direct Charging Energy)
- ESR can only charge from grid.
- **Monthly M4 appropriately captures stored grid energy that is sent to end user → monthly “Load Serving Charging Energy”.**
- The sum of M4 over a month is the monthly quantity that should be ex-post adjusted from “Direct Charging Energy” into “Load Serving Charging Energy”.



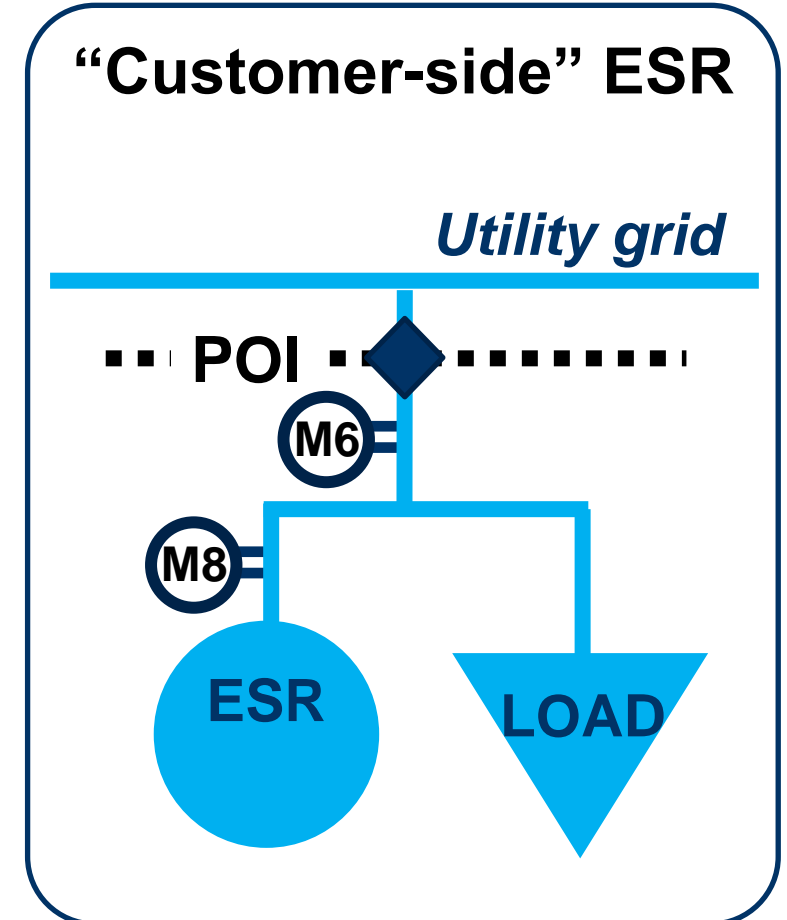
- 100% of withdrawals initially settled as negative generation (i.e., Direct Charging Energy)
- ESR can charge from grid or on-site gen.
- EDC to determine how much of the ESR inventory that was discharged to the end user consisted of energy charges from the grid → “Load Serving Charging Energy”
- **An appropriate billing convention: if monthly M2 > monthly M4, then all end-use energy came from stored or directly-provided on-site gen, and no Load Serving Charging Energy was consumed.**



3. Metering and Method to Identify Direct Charging Energy at a Customer-side ESR



- 100% of withdrawals initially settled as load (i.e., load and/or Load Serving Charging Energy)
- Net injections measured at M6 consist of previously-stored Direct Charging Energy.
 - Corresponding losses are also Direct Charging Energy. ESR can report losses to EDC through PJM, or EDC can work directly with ESR to quantify losses.
 - **Monthly Direct Charging Energy is the sum of monthly injections at meter “M6” plus associated losses.**
 - EDC calculates monthly quantity for ex-post adjustment from Load Serving Charging Energy into Direct Charging Energy.
- M8 is required to identify which intervals the ESR was charging to use in ex-post adjustment.



- Net injections measured at M6 could consist of Direct Charging Energy, self-supplied charging energy, and/or on-site Generation.
 - The inventory in the ESR could also consist of a mix of grid energy and self supplied energy.
 - Losses corresponding to stored grid energy that is resold to PJM is also Direct Charging Energy.
- **EDC calculates monthly Direct Charging Energy for ex-post adjustment.**
- M8 is required to identify which intervals the ESR was charging for ex-post adjustment.

