

# CAISO ESDER 3:

Electric Vehicle Supply Equipment (EVSE)  
Load Curtailment as Proxy Demand Resource (PDR)

Joint EV Charging Parties

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# EVSE Load Curtailment / Sub-Metering as PDR

- Market Participation Issue:
  - CAISO market participation by flexible demand from EV charging is significantly hindered
- Existing frameworks:
  - Direct metering of generating units, providing load curtailment, known as Meter Generator Output (MGO), is permitted under PDR model as a result of ESDER 1
    - Direct metering of consuming devices not permissible under MGO
- Proposed Solution:
  - Adapt MGO framework for submetered EVSEs to allow for direct measurement and control of EVSE resources

# EVSE Load Curtailment / Sub-Metering as PDR

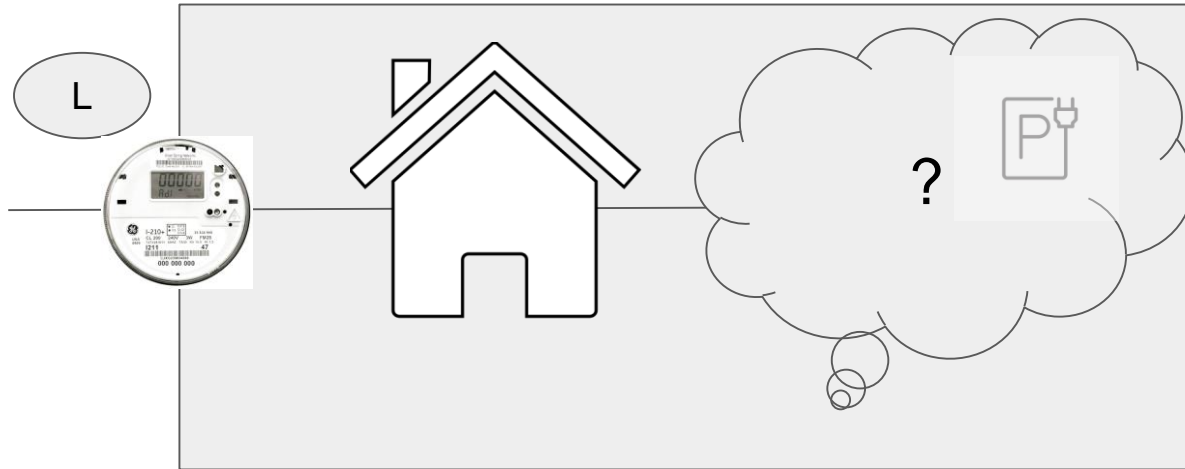
- Several stakeholders support inclusion within ESDER 3 final scoping
  - Strong Support (3) - Joint EV Charging Parties, CESA, SDG&E
  - Support DER Sub-Metering in Scope (2) - PG&E, Olivine
  - Did Not Oppose (5) - All Other Commenters
- EVSE is distinguishable from other sources of consumption
  - Clear policy support from legislature, CPUC, CEC, CARB and CAISO
  - Commonly commingled with other substantial electricity uses behind utility meter
  - Highly distributed, high power, precise flexible load control and embedded, low cost, accurate metering
- By permitting direct metering of ESVE under PDR
  - Reduce barriers to achieving significant proportions of EVSEs becoming available for CAISO dispatch
  - Alternative pathway to enabling EVSEs to provide ancillary services, as DERP NGR is not currently workable or attractive

# EVSE Market Participation Considerations

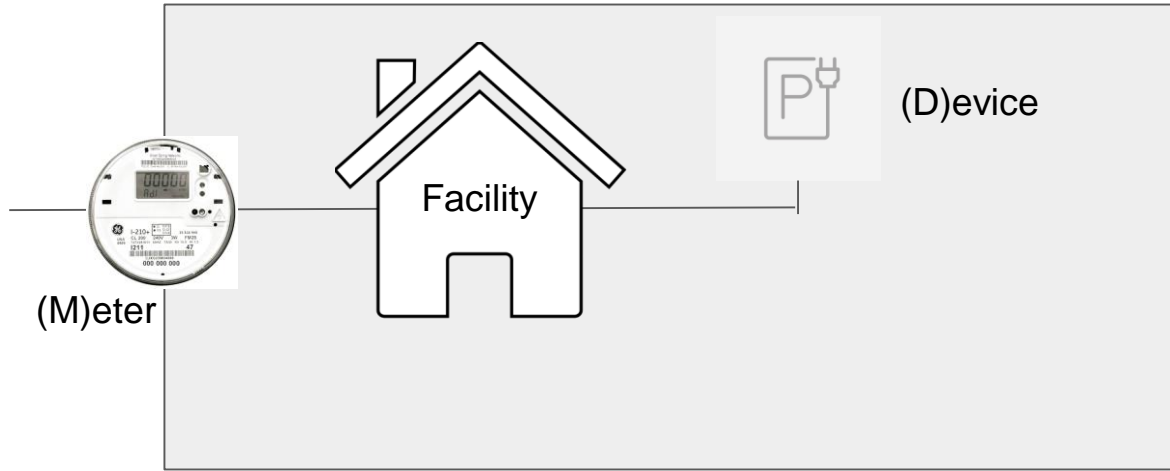
- Workplace / public charging
  - When installed without EV-only utility meters, hosts will participate via PDRs at modest rates due to commingled uses behind utility meter
  - Multiple events per day disrupts day-of adjustments for other weather sensitive loads on premise
- Electric fleets
  - Similar issues as workplace charging, but with more valuable, predictable special purpose use cases
  - Reducing participation barriers can unlock economic value that can tip the switch to EV for fleet operators
  - Would provide highly reliable and large resources to the CAISO
- Residential charging
  - Will participate in PDR at a modest level
  - Potential for risk aversion to market participation due to non-EV uses commingled behind the utility meter
  - Participation in current and future A/S products severely challenged

Appendix:  
Adaptation of  
Metered Generator Output (MGO)  
to  
Metered Device Input (MDI)

# Current Landscape

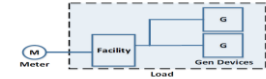


# Existing ISO performance evaluation methodology supported with Metering configuration A



- A baseline is established using the physical meter (M).
  - ISO is unaware of contributors to (facility) load reduction.
  - Measured performance cannot recognize a behind-the-meter consumption device separately.

Existing ISO performance evaluation methodology supported with Metering configuration A [Revised]



- A baseline is established using the physical meter (M).
  - ISO is unaware of contributors to (facility) load reduction.
  - Measured performance cannot recognize a behind-the-meter generator or device separately.
  - Any negative M metered quantity is set to zero by the SC prior to summing individual location meter data.

# Meter Device Input (MDI)

MGO is “a performance evaluation methodology, used when a generation asset is located behind the Demand Resource’s revenue meter, in which the Demand Reduction Value is based on the output of the generation asset”.

– NAESB Business Practices for Wholesale Demand Response

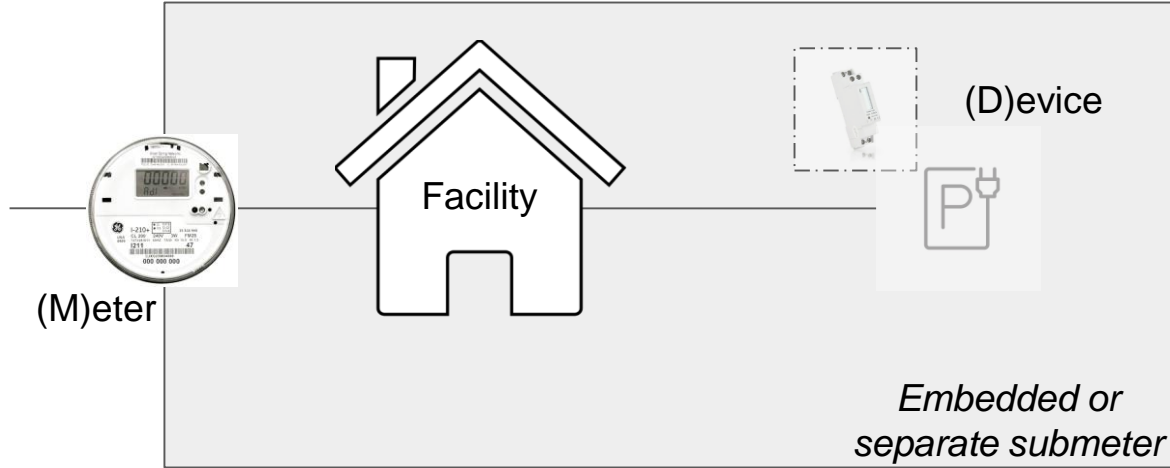
The performance of the PDR resource is therefore the unaltered meter value on the generator during the demand response call and may be implemented mathematically as  $\text{Baseline} = 0$ .

MDI would be “a performance evaluation methodology, used when a consumption device is located behind the Demand Resource’s revenue meter, in which the Demand Reduction Value is based on the change in the input of the consumption device”.

The performance of the PDR resource is therefore the unaltered meter value on the device during the demand response call.



# Meter Configuration B



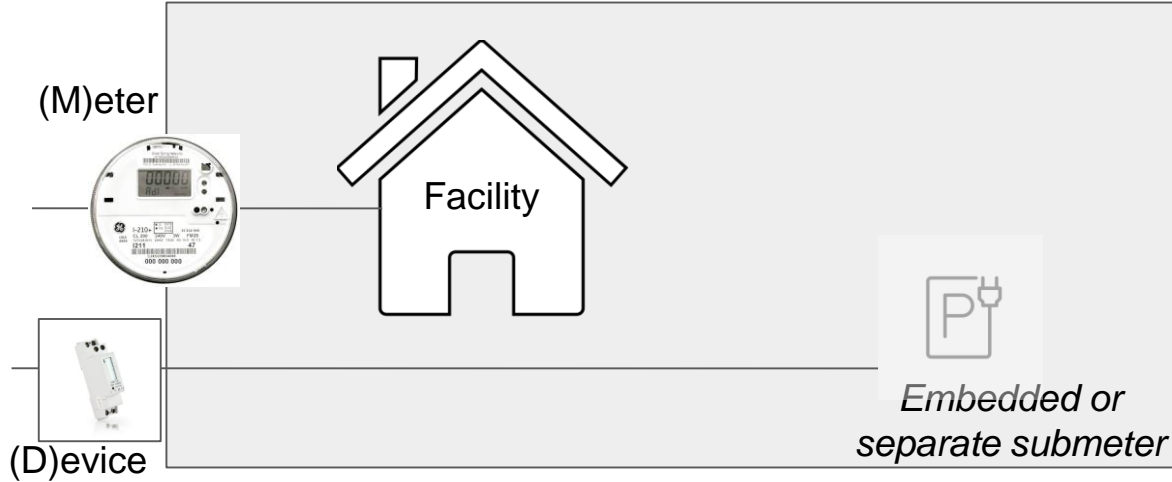
## Meter Configuration B



- In this scenario, the PDR would be a single Resource with two attached Registrations/Locations
- Load Registration = standard Performance Evaluation Method (using N-G as a "virtual" meter)
- Generation Registration = MGO method (using G as a physical meter).
- For example, if  $N = 8$  MWh and  $G = -2$  MWh, the virtual load meter  $L = N - G = 8 - (-2)$  MWh = 10 MWh. Assuming a sign convention where Load = +, Generation = -

- In this scenario, the PDR would be a single Resource with two attached Registrations/Locations
- Load Registration = standard Performance Evaluation Method (using M-D as a "virtual" meter)
- Device Registration = MDI method (using D as a physical meter).

# Meter Configuration C



- Mathematically identical to Meter Configuration B (N-G replaced L)
- Required if separate participants are independently managing the load and generation
- If load and gen not combined in the same PDR, the generation source alone cannot be considered a PDR; it must be considered a Non-Generator Resource (NGR) or a Participating Generator (PG)

- Mathematically identical to Meter Configuration B (M-D replaced overall meter load)
- Required if separate participants are independently managing the non-device load and device
- Device Registration = MDI method (using D as a physical meter).