

FERC ORDER 2222
FIRSTENERGY

Scenarios/Configurations

May 5, 2021



Agenda



RESIDENTIAL NON-
MARKET
PARTICIPATION



RESIDENTIAL
MARKET
PARTICIPATION



SMALL AND LARGE
C&I NON-MARKET
PARTICIPATION



SMALL AND LARGE
C&I MARKET
PARTICIPATION

Key: Scenarios/Configurations

Key:

AMI – Automated Metering Infrastructure

NIM – Non-Interval Meter

IM – Smart Meter

BM – Bi-directional Meter

NEM – Net Energy Meter Rider (*generally applicable to renewables only*)

NMP – Non-PJM Market Participant

MP – Market Participant

PV – Photovoltaic

EV – Electric Vehicles & Chargers

ES – Energy Storage

DR – Demand Response

DER – Distributed Energy Resources

Dx – Distribution System

Tx – Transmission System

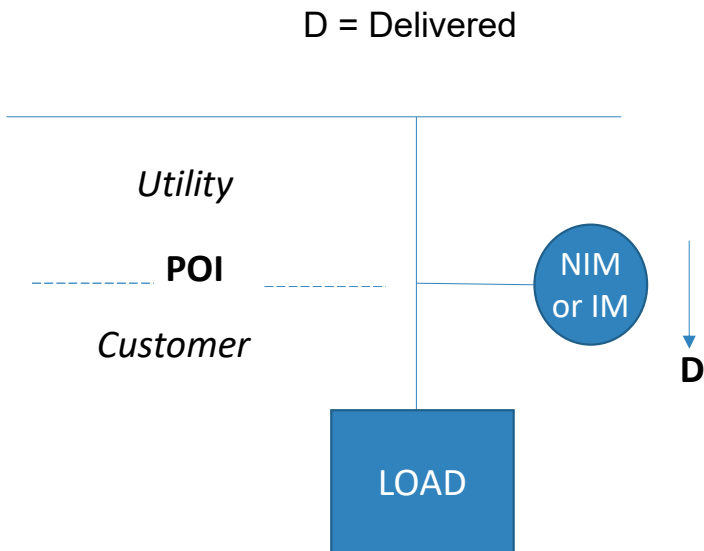
PURPA – Public Utility Regulatory Policies Act

QF – Qualified Facility



Residential
Non-Market Participation

Residential NIM or IM / NMP

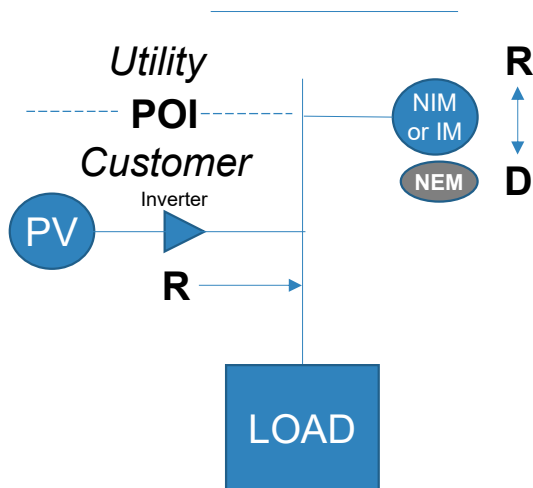


NIM – Non-Interval Meter
IM – Smart Meter
NMP – Non-PJM Market Participant Facility

- **Retail Premise NIM**
 - Measure kwh usage only (D), manually read monthly
- Represents most residential FE customers: MP, PE, JCP&L, parts of OE, TE, CEI
- **Retail Premise IM**
 - Measure kwh usage only (D); hourly interval read daily
- ME, PN, WPP, PP – full deployment
- JCP&L – 36-month full deployment, 2023-2025
- OE, TE, CEI – targeted deployment 30% complete
- MP, PE – none

Residential NIM or IM / BM / NEM / NMP – PV that injects to the grid

D = Delivered
R = Received



• Retail Premise NIM or IM

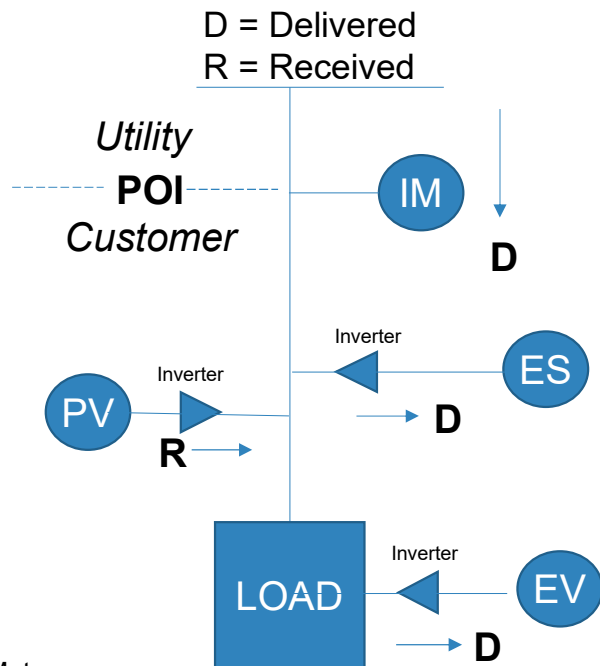
- BM; measures monthly kwh delivered/received
 - NIM manually read monthly
 - IM AMI read daily
- NEM Rider - Monthly Netting
- PV – with injection to the grid
 - Option 1 – no PV meter for SREC (inverter data)
 - Option 2 – PV meter required for SREC

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Residential
Market Participation

Residential IM / Not BM / MP “DR Load Drop” - Any EV, DR, ES, PV that does not inject to grid

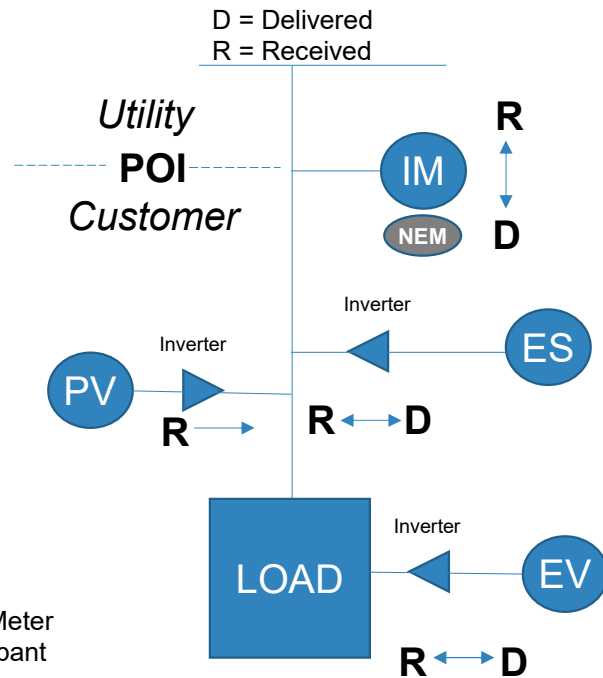


IM – Smart Meter
BM – Bi-directional Meter
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• Retail Premise IM

- Measure hourly kw delivered; AMI read daily
- EV, DR, ES, PV – no potential for injection to the grid
- EV, DR, ES, PV
 - Sub-metering not required for Single Curtailment Service Providers (CSP's); may be required for market participation if Multiple CSPs

Residential IM / BM / NEM / MP “DER Injection” - Any EV, DR, ES, PV that injects to grid



• Retail Premise IM

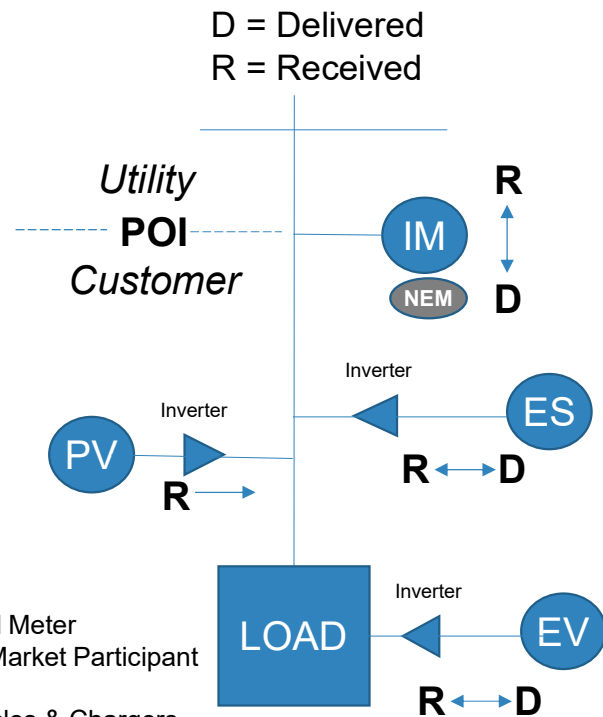
- BM; measures hourly kw delivered/received; AMI read daily
- Any EV, DR, ES, PV that has the potential for injection into the grid as either a Market Participant and/or EDC retail
 - NEM will now require EDC sub-metering and telemetry for market participation
 - Sub-meter interval data for all DER types daily needed to perform retail bill kwh adjustments
 - Sub-meter accuracy requirements to be determined by State Commissions
 - EDC costs to purchase, install, operate, maintain and own any metering/telemetry required for market participation to be determined by State Commissions
 - Retail interconnection/market participation agreements shall address the additional costs
- Single or Multiple DERA-Heterogeneous or Homogeneous DERs can be facilitated

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Small and Large C&I
Non-Market Participation

C&I w/without Demand IM / BM / NEM - PV only injects to grid / NMP “Retail Load Drop” - Any EV, DR, ES



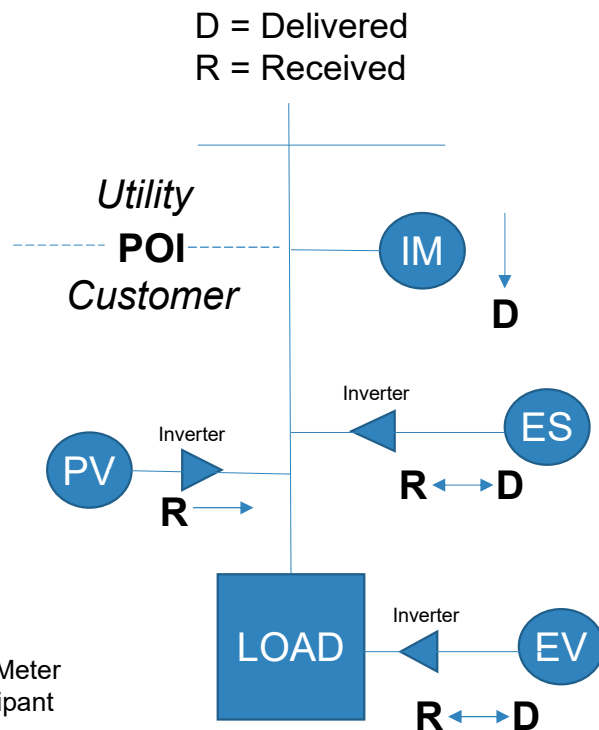
- **Retail Premise IM**
 - BM; measures 15-minute interval data kW delivered/received; majority read daily; some read monthly
 - NEM Rider - Monthly Netting
- PV – with injection to the grid
 - PV meter required for SREC & NEM
- EV, DR, ES
 - Device(s) providing load drop each requires sub-metering to segregate from NEM performance
- Large C&I measures some combination of kW, kWh, kVAR, kVA, not just kW or kWh as for Small C&I

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Small and Large C&I Market Participation

C&I w/without Demand IM / Not BM / MP “PJM Load Drop” - Any EV, DR, ES, PV that does not inject to grid

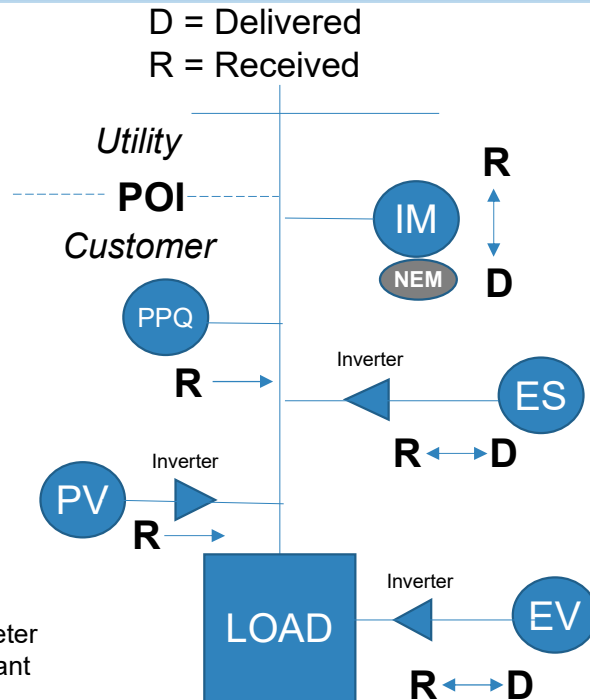


IM – Smart Meter
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 ES – Energy Storage
 DR – Demand Response

• Retail Premise IM

- Measures 15-minute interval data kW delivered/received; majority read daily; some read monthly
- Settlement is at the POI for PJM Load Drop
- EV, DR, ES, PV
 - No potential for injections to the grid
 - PV meter required for SREC
 - Sub-metering not required for Single Curtailment Service Providers (CSP's); may be required for market participation if Multiple CSPs
- Large C&I measures some combination of kW, kWh, kVAR, kVA, not just kW or kWh as for Small C&I

C&I w/without Demand IM / BM / NEM / MP - Any EV, DR, ES, PV that injects to grid



• Retail Premise IM

- BM; Measures 15-minute interval data kW delivered/received; majority read daily; some read monthly
- Any EV, DR, ES, PV that has the potential for injection into the grid as either a Market Participant and/or EDC retail NEM will require EDC sub-metering and telemetry
- Large C&I measures some combination of kW, kWh, kVAR, kVA, not just kW or kWh as for Small C&I
- Single or Multiple DERA-Heterogeneous or Homogeneous DERs can be facilitated
- PJM Project Queue (PPQ) – ES, PV, any BTM generation (>100kw)
 - Device(s) providing PPQ output requires sub-metering
 - FERC jurisdictional DER(s) would require Interconnection & Construction Service Agreements following PJM queue study process

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Considerations

- EDC metering & telemetry (communications) will be needed behind the POI to disaggregate retail and wholesale usage
- EDCs and State Commissions will need to coordinate on tariff revisions (*i.e. metering and telemetry cost recovery, revised state interconnection agreements and standards, market/retail participation rules, information sharing*)
- Significant EDC investments are likely and will need to be approved for cost recovery by State Commissions
- Sufficient time will be needed for implementation