NOTES:
1. All Interval metering requires telemetry.
2. Grouped meter location and installation shall be according to National Grid’s jurisdiction applicable service and tariff requirements. See ESB 750 and ESB 756 Appendix C for the MA service jurisdiction (https://www.nationalgridus.com/ProNet/Technical-Resources/Electric-Specifications).
   - IC installs meter socket trough grouped at service location accessible for National Grid’s AMR meters (net type for load + DER and bi-directional for MA SMART DER).
   - < 60 kW applications are watthour type revenue meters and > 60 kW are interval type.
   - All kWh measured through the MA SMART meter is compensated through the MA SMART incentive rate.
3. Generator disconnect installed according to NEC and National Grid’s MDPU Interconnection Tariff.
4. Inverters shall be UL 1741 or UL 1741 SA certified for parallel operation with the utility (area EPS).
5. Where existing PCC meter is inside, the IC will upgrade their service connection to change it to outside location grouped with MA SMART Solar meter.
6. Bypass meter sockets required in accordance to ESB 750 table 7.2-1.
7. Certified Inverter-based DER Interconnections <25kW may not be required to have an additional disconnecting means in accordance with ESB 756 Appendix C.
8. The following drawings are conceptual only. It is the responsibility of the customer to adhere to all applicable codes, standards and requirements.
9. For systems 25 kW and below a disconnecting or isolation means shall be required to be located between the Company meter installation and the DER device to allow for Company testing of the meter socket prior to meter installation.(1) This device may be located based on customer preference, although where this device is not accessible to the Company(2), this may cause delay with associated meter installation and testing.
10. Line side Disconnect in addition to the load side disconnect required for 480/277 Volt installations.
11. All Interval Meters will require telemetry
12. Ganged metering sockets are not allowed in this program.
13. PV and ESS will be wired to the load side of the Meter Socket.

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(1) The need for this disconnect is not a new requirement for testing meter socket installations. With existing load customer as well as behind-the-meter DER installations, the customer’s main service or parallel power production disconnect is in a position where isolation has been available. This isolation has typically been the main service overcurrent protection device. With the inclusion of sub metering installations, the main service OCP is no longer between the circuit path between the sub meter and the connected DER device, therefore an isolation point to allow for testing is required.

(2) The Company recommends locating this outside, adjacent to the meter socket to allow for the most flexibility for meter installation and future change-outs.
RETAIL

Residential/Commercial DG Customer
Behind the Meter MA SMART < 60 kW
(Behind Main Service Equipment)

UTILITY – AREA EPS

INTERCONNECTION
CUSTOMER – LOCAL EPS

PCC

INTERCONNECT

UTILITY SERVICE METER

UTILITY PV GENERATION METER

UTILITY STORAGE METER

All Meters >60 kW; Bi-directional with Telemetry

DG

Main Service Equipment

Generator Disconnect

Protection & Control

FACILITY LOADS

OUTSIDE

INSIDE

Line

Load

See Note 9
 Disconnect required for metering testing.

REVENUE METERS ARE BI-DIRECTIONAL, NET METER AMR TYPE AND UTILITY OWNED.
METER LOCATIONS DETERMINED BY UTILITY FOR AMR ACCESS REQUIREMENTS.

This diagram is representative of one proposal and the utility may require other configurations.
RETAIL

Residential/Commercial DG Customer
Behind the Meter MA SMART < 60 kW
(Tap Ahead of Main Service Equipment)

UTILITY – AREA EPS

PCC

INTERCONNECTION
CUSTOMER –
LOCAL EPS

Tap Box cannot be associated with the meter socket

OUTSIDE
INSIDE

Main Service Equipment #1
FACILITY LOADS

Main Service Equipment #2
(Generator Disconnect)

DG

PoC

Line

See Note 9
Disconnect required for metering testing.

UTILITY SERVICE METER
UTILITY PV GENERATION METER
UTILITY STORAGE METER
All Meters >60 kW; Bi-directional with Telemetry

This diagram is representative of one proposal and the utility may require other configurations.

REVENUE METERS ARE BI-DIRECTIONAL, NET METER AMR TYPE AND UTILITY OWNED.
METER LOCATIONS DETERMINED BY UTILITY FOR AMR ACCESS REQUIREMENTS.
RETAIL

Residential/Commercial DG Customer
Behind the Meter MA SMART < 60 kW
With AC ESS SYSTEM
UTILITY – AREA EPS

INTERCONNECTION
CUSTOMER – LOCAL EPS

PCC

OUTSIDE
INSIDE

Main Service Equipment
DG Protection & Control

Generator Disconnect

DG

FACILITY LOADS

EB System

REVENUE METERS ARE BI-DIRECTIONAL, NET METER AMR TYPE AND UTILITY OWNED.
METER LOCATIONS DETERMINED BY UTILITY FOR AMR ACCESS REQUIREMENTS.

This diagram is representative of one proposal and the utility may require other configurations.

UTILITY SERVICE METER
UTILITY PV GENERATION METER
UTILITY STORAGE METER

All Meters >60 kW; Bi-directional with Telemetry

See Note 9
Disconnect required for metering testing.
RETAIL

Residential/Commercial DG Customer
Behind the Meter MA SMART < 60 kW
With DC ESS SYSTEM
UTILITY – AREA EPS

INTERCONNECTION
CUSTOMER – LOCAL EPS

This diagram is representative of one proposal and the utility may require other configurations.

- UTILITY SERVICE METER
- UTILITY PV GENERATION METER
- UTILITY STORAGE METER
  All Meters >60 kW; Bi-directional with Telemetry

REVENUE METERS ARE BI-DIRECTIONAL, NET METER AMR TYPE AND UTILITY OWNED.
METER LOCATIONS DETERMINED BY UTILITY FOR AMR ACCESS REQUIREMENTS.

Version 10-04-2018
STGU AC Connection to Utility EPS 60 to 500kW

Utility’s Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

Service Point or PCC

Utility Entrance

Customer

Service Entrance

Note 10

Wh

Utility Service Meter

Utility PV Generation Meter

Utility Storage Meter

All Meters >60 kW; Bi-directional with Telemetry

Main Service Equipment

Main Service Disconnect

Main Distribution Panel

PV Generator Disconnect

Premises Loads

Inverter (string)

PV Array

Generator or DG Facility

Collector PV Array AC Disconnect

This diagram is representative of one proposal and the utility may require other configurations.
This diagram is representative of one proposal and the utility may require other configurations.

Utility Service Meter

Utility PV Generation Meter

Utility Storage Meter

All Meters >60 kW; Bi-directional with Telemetry

ESS Battery + STGU Paired AC Connection to Utility EPS 60 to 500kW

Behind the Meter MA SMART
Utility’s Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

Service Point or PCC — Utility — Customer
Service Entrance

PV Generator Disconnect
Main Service Disconnect
Main Distribution Panel
Premises Loads

PV Array
Collector PV Array
AC Disconnect
Inverter (string)

Generator or DG Facility

ESS System
Inverter (charge & discharge)
Battery Storage

Note 10
DC ESS Battery + STGU Paired Connection to Utility EPS 60 to 500kW

Behind the Meter MA SMART

Utility’s Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

- Service Point or PCC
- Utility Customer
- Service Entrance
- Note 10

Main Service Equipment
Main Service Disconnect
Main Distribution Panel

- Collector PV Array
- AC Disconnect
- Inverter
- Generator or DG Facility
- PV Array
- Battery Storage

ESS System

This diagram is representative of one proposal and the utility may require other configurations.

- UTILITY SERVICE METER
- UTILITY PV GENERATION METER
- UTILITY STORAGE METER
All Meters >60 kW; Bi-directional with Telemetry

Note 10
ESS Battery + Multiple STGU Paired AC Connection to Utility EPS 60 to 500kW

Behind the Meter MA SMART
Utility's Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

Service Point or PCC
Service Entrance
Utility
Customer

PV
Disconnect
Main Service Disconnect
Main Distribution Panel
PV Generator
Premises Loads

Battery
Storage
Inverter
(charge & discharge)

ESS System

This diagram is representative of one proposal and the utility may require other configurations.

Note 10
STGU Paired AC Connection to Utility EPS 500kW and Greater

Behind the Meter MA SMART

Utility's Radial Distribution
Primary 3-Phase, 4-Wire System
Primary Metering

MAIN INTERRUPTING DEVICE

This diagram is representative of one proposal and the utility may require other configurations.

- **M** UTILITY SERVICE METER
- **M** UTILITY PV GENERATION METER
- **M** UTILITY STORAGE METER
  All Meters >60 kW; Bi-directional with Telemetry

See Note 2

Utility

Customer

Main Bus

Premises Loads

DER Customer Main Service Equipment

Customer's DER Facility

PV Step-Up Transformer

Collector PV Array
AC Disconnect & O.C. Protection
Aux. Load

Inverter

PV Array DC Disconnect

PV Array
ESS AC Battery + STGU Paired AC Connection to Utility EPS 500kW and Greater

Behind the Meter MA SMART

Utility’s Radial Distribution
Primary 3-Phase, 4-Wire System
Primary Metering

Point of Common Coupling (PCC) or Service Point

MAIN INTERRUPTING DEVICE

PV Step-Up Transformer

Collector PV Array
AC Disconnect & O.C. Protection
Aux. Load

Inverter

PV Array
DC Disconnect

ESS Step-Up Transformer

ESS Battery
AC Disconnect & O.C. Protection
Aux. Load

Inverter
(charge & discharge)

Battery DC Disconnect

PV Array

ESS Battery

Customer’s DER Facility

See Note 2

This diagram is representative of one proposal and the utility may require other configurations.

UTILITY SERVICE METER
UTILITY PV GENERATION METER
UTILITY STORAGE METER
All Meters >60 kW; Bi-directional with Telemetry
ESS DC Battery + STGU Paired AC Connection to Utility EPS 500kW and Greater

Behind the Meter MA SMART

Utility’s Radial Distribution
Primary 3-Phase, 4-Wire System
Primary Metering

Point of Common Coupling (PCC) or Service Point
See Note 2

Utility’s Radial Distribution
Primary 3-Phase, 4-Wire System
Primary Metering

MAIN DISCONNECT
MAIN INTERRUPTING DEVICE

Main Bus

Utility Customer

PV Step-Up Transformer

Collector PV Array
AC Disconnect & O.C. Protection
Aux. Load

Inverter

PV Array DC Disconnect

PV Array

Customer’s DER Facility

(charge & discharge)

ESS Battery

Utility Storage Meter

Utility PV Generation Meter

Utility Service Meter

All Meters >60 kW; Bi-directional with Telemetry

This diagram is representative of one proposal and the utility may require other configurations.

M UTILITY SERVICE METER
M UTILITY PV GENERATION METER
M UTILITY STORAGE METER

All Meters >60 kW; Bi-directional with Telemetry
RETAIL

Residential/Commercial DG Customer
Stand Alone MA SMART < 60 kW

UTILITY – AREA EPS

PCC

INTERCONNECTION
CUSTOMER – LOCAL EPS

Main Service Equipment
Generator Disconnect

Aux. Load

DG

This diagram is representative of one proposal and the utility may require other configurations.

UTILITY SERVICE METER
UTILITY PV GENERATION METER
UTILITY STORAGE METER
All Meters >60 kW; Bi-directional with Telemetry

REVENUE METERS ARE BI-DIRECTIONAL, NET METER AMR TYPE AND UTILITY OWNED.
METER LOCATIONS DETERMINED BY UTILITY FOR AMR ACCESS REQUIREMENTS.
RETAIL

Residential/Commercial DG Customer
Stand Alone MA SMART < 60 kW
With AC ESS SYSTEM
UTILITY – AREA EPS

Interconnection
Customer –
Local EPS

See Note 9 < 25 kW required for metering testing.

ESS System

Revenue Meters are Bi-directional, Net Meter AMR Type and Utility Owned.

Meter Locations Determined by Utility for AMR Access Requirements.

This diagram is representative of one proposal and the utility may require other configurations.

Utility Service Meter
Utility PV Generation Meter
Utility Storage Meter

All Meters >60 kW; Bi-directional with Telemetry.
RETAIL

Residential/Commercial DG Customer
STAND ALONE MA SMART < 60 kW
With DC ESS SYSTEM
UTILITY – AREA EPS

INTERCONNECTION
CUSTOMER –
LOCAL EPS

PCC

Aux. Load

Main Service Equipment
Generator Disconnect

DG Protection & Control

Inverter
(charge & discharge)
Battery
Storage

DG

ESS System

This diagram is representative of one proposal and the utility may require other configurations.

UTILITY SERVICE METER
UTILITY PV GENERATION METER
UTILITY STORAGE METER
All Meters >60 kW; Bi-directional with Telemetry

REVENUE METERS ARE BI-DIRECTIONAL, NET METER AMR TYPE AND UTILITY OWNED.
METERlocations DETERMINED BY UTILITY FOR AMR ACCESS REQUIREMENTS.
STGU AC Connection to Utility EPS 60 to 500kW

Standalone MA SMART
Utility's Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

This diagram is representative of one proposal and the utility may require other configurations.

- Utility Service Meter
- Utility PV Generation Meter
- Utility Storage Meter

All Meters >60 kW; Bi-directional with Telemetry

Main Service Equipment

Main Service Disconnect
Main Distribution Panel

Aux. Load

Collector PV Array
AC Disconnect

Inverter (string)

PV Array

Generator or DG Facility

Note 10

5a
AC ESS Battery + STGU Paired AC Connection to Utility EPS 60 to 500kW

STAND ALONE MA SMART
Utility’s Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

---

Service Point or PCC
Service Entrance

---

Utility
Customer

---

PV Generator Disconnect
Main Distribution Panel

---

PV Generator Disconnect

---

Battery Disconnect

---

ESS Disconnect

---

Inverter (string)

---

Collector PV Array
AC Disconnect

---

Battery AC Disconnect

---

Inverter (charge & discharge)

---

ESS System

---

Aux. Load

---

Note 10

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This diagram is representative of one proposal and the utility may require other configurations.

Wh
UTILITY SERVICE METER

Wh
UTILITY PV GENERATION METER

Wh
UTILITY STORAGE METER

All Meters >60 kW; Bi-directional with Telemetry
DC ESS Battery + STGU Paired AC Connection to Utility EPS 60 to 500kW

This diagram is representative of one proposal and the utility may require other configurations.

- Utility Service Meter
- Utility PV Generation Meter
- Utility Storage Meter

All Meters >60 kW; Bi-directional with Telemetry

Note 10
AC ESS Battery + Multiple STGU’s Paired AC Connection to Utility EPS 60 to 500kW
With Different Smart Incentive Rates if allowed

**STAND ALONE MA SMART**
Utility’s Radial Distribution
3-Phase, 4-Wire System
Secondary Metering

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This diagram is representative of one proposal and the utility may require other configurations.

- **WH** UTILITY SERVICE METER
- **WH** UTILITY PV GENERATION METER
- **WH** UTILITY STORAGE METER

All Meters >60 kW; Bi-directional with Telemetry

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Stand Alone Different Array with Different Smart Incentive levels
STGU AC Connection to Utility EPS 500kW and Greater
STAND ALONE MA SMART
Utility's Radial Distribution
Primary 3-Phase, 4-Wire System
Primary Metering

Main
Interrupting
Device

Point of Common
Coupling (PCC) or Service
Point

Utility
Customer

Customer's DG
Facility

See Note 2

Interrupting
Device

PV Step-Up
Transformer

Collector PV Array
AC
Disconnect &
O.C. Protection
Aux. Load

Inverter

PV Array
DC
Disconnect

PV Array

This diagram is representative of one proposal and the utility may require other configurations.

M  UTILITY SERVICE METER
N  UTILITY PV GENERATION METER
B  UTILITY STORAGE METER
All Meters >60 kW; Bi-directional with Telemetry
This diagram is representative of one proposal and the utility may require other configurations.

- **UTILITY SERVICE METER**
- **UTILITY PV GENERATION METER**
- **UTILITY STORAGE METER**

All Meters >60 kW; Bi-directional with Telemetry

---

See Note 2
DC ESS Battery + STGU Paired AC Connection to Utility EPS 500kW and Greater

**STAND ALONE MA SMART**

Utility’s Radial Distribution  
Primary 3-Phase, 4-Wire System  
Primary Metering

---

Point of Common Coupling (PCC) or Service Point  
Main Bus

---

PV Step-Up Transformer

---

Collector PV Array  
AC Disconnect & O.C. Protection  
Aux. Load

---

Inverter

---

PV Array DC Disconnect

---

PV Array  
Customer’s Electrical Energy Sources (Current)

---

ESS Battery  
(charge & discharge)

---

Customer’s DER Facility

---

Utility Customer

---

This diagram is representative of one proposal and the utility may require other configurations.

- M UTILITY SERVICE METER
- M UTILITY PV GENERATION METER
- M UTILITY STORAGE METER

All Meters >60 kW; Bi-directional with Telemetry