Distributed Energy Resources Interconnection Seminar Standard / Expedited Process

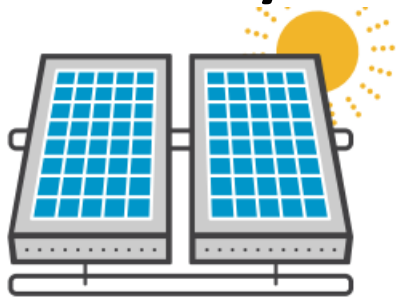
May 7, 2025

Thank you for joining us.

The presentation will begin at 11:00am.

Please mute your phones to avoid any feedback.

Thank you.



EXPEDITED Interconnection Contacts

Eversource Energy – Eastern MA DG

Smart

- Email: **SMART@eversource.com**
- Toll Free Number: 844-726-7573
- **MA.SMART@CLEAResult.com**, 888-989-7752

- Brandon Natale:
- Email: brandon.natale@eversource.com

- Evan Melillo:
- Email: evan.melillo@eversource.com

- Kelly Musto:
- Email: kelly.musto@eversource.com

- Melanie Khederian:
- Email: melanie.khederian@eversource.com

- Zach Tedford:
- Email: zachary.tedford@eversource.com

Summer Safety Tip :

To stay safe during summer, prioritize sun protection, staying hydrated, and being aware of heat-related risks like heatstroke. Also, be mindful of water safety, insect repellent, and the risks associated with open flames and fireworks.

Introductions & Agenda

- Powerclerk
- Expedited/ Standard Interconnection Process
- DG Interconnection Documentation Requirements
- Engineering Design to Pre-Construction
- Metering
- RTAC Requirements
- Distribution Group Studies
- Transmission Group ASO Studies
- Helpful Website Links
- Questions

POWER CLERK EXPEDITED APPLICATIONS

- Systems greater than 15 kW AC single phase or greater than 25 kW AC three phase
- System configuration does not correspond with the service configuration (such as using single phase inverters on a three-phase service)
- System includes non-inverter-based generator, co-generator, wind, hydro or other facility
- System is on a radial distribution circuit

Proposed generation equipment must meet IEEE 1547.1 standards.

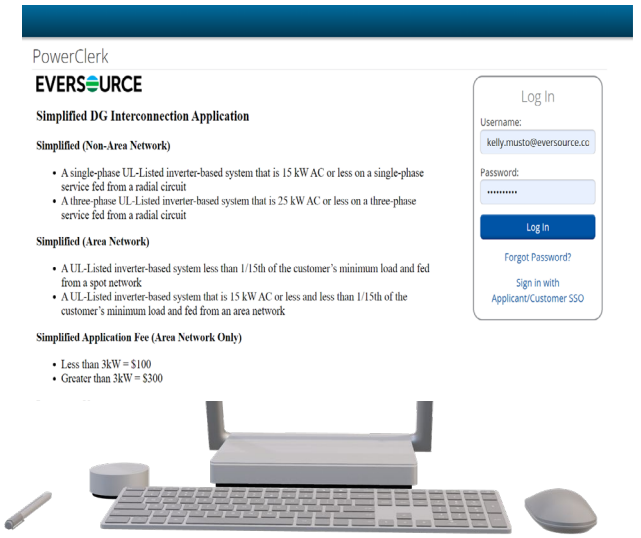
Expedited/Standard application fee = $4.50 per kW (minimum fee of $300; maximum of $7,500)

You will be prompted to submit a pre-app if you are installing a generation facility of 250 kW AC or greater. Pre-App fees are $250 for projects up to 500 kW and $750 for projects over 500kW.

APPLICATION FEES CAN NOW BE PAID ONLINE

Contractors/Installers
Please login to Eversource.com and register for the access

Customers
Request read/write access from your installer



Eversource | PowerClerk Log In

Expedited Standard Process
(single phase >15kw and three phase >25kw) - All Technologies

INITIATION PHASE

- 250kW and greater Pre-app takes place before submitting application.
- Site plans
- One-line diagram
- Cut sheets
- Energy Storage Narrative
- Application fee
- Application reviewed for completion

ENGINEERING REVIEW

- Depending on project type and size various levels of engineering groups are involved
- System Planning Engineering determines if Impact Study is required or not

IMPACT STUDY

- Impact Study Agreement or supplemental agreement or both and Payment
- Impact Study Completed with a +/-25% Interconnection Cost Estimate
- ISA Executed
- Group Study (if applicable. See link below)

NO IMPACT STUDY

- A determination is made if any local upgrades are needed to the existing service or system.
- ISA Executed

DETAILED ENGINEERING

- Scheduled to begin after Customer pays 100% payment after ISA
- Final Sketch complete, Final Costs compiled, Easements by Property Owner Paperwork compiled, Town Hearings Scheduled, etc…

CONSTRUCTION PHASE

- ES construction
- Install meter and meter communication
- Relay settings confirmed
- Close out documents
- Schedule witness test

FINAL PHASE

- Test Energization
- Witness Test
- PTO
- Verify set up bill

One Line Diagram (SLD)

- **Requires MA Certified PE Stamp**
- Shows Existing Metering and proposed meter/interconnection
- Point of Common Coupling with Interconnecting Device, please note existing pole, transformer, meter number
- Size of main breaker
- External disconnect switch needs to be lockable in the open position and accessible to the utility 24/7
- Generator connection point, breaker and size
- kW rating needs to match application (name plate)
- Interconnecting Customer transformer configuration (if applicable) and impedance must match application.
- Cold Sequence Metering Required (Customer Equipment – Disconnect Switch – Meter)
- Recloser Required for 500 kW AC (Recloser – Primary Meter – Customer Equipment)
- **Title block with Customer name, address, date, drawing number and revision number**
- Inverter settings in table form
- Definitive relay settings in table form, relay(s), PT’s and CT’s
- When limiting export, the SLD must show limited kW and the method of limiting, a manufacturer curtailment letter may also be required

Site Plan

- Must show property/lot lines, street names
- Interconnecting Pole Numbers
- Must show revenue meter location, location of inverter(s) and/or generators and disconnect
- Must show production meter if Net Metered
- Does not need to be PE Stamped
- Must be a plan form view i.e. vertical
- NOT “bird’s eye”, isometric, 3/4 view, google maps
- **Title block with Customer name, address, date, drawing number and revision number**

https://www.eversource.com/content/docs/default-source/builders-contractors/default-ieee1547-2018-settings-requirements-issued.pdf?sfvrsn=160fb831_2

Field Layout and Pre-Construction

Engineering and Design & Field Layout starts when…

Payment is Received (100% Payment per the ISA is Received)

Customer Confirms Previously Provided SLD/Site Plan and all other provided documentation remains the same or Updated Interconnection Documents are provided which will be Re-Screened thru Change Order Process

Town Permits have been approved for Proposed Design

Site Visit for all parties to confirm Utility Equipment Locations

Eversource Construction starts when….

100% payment received Post Design Completion

All Easements are Completed – Private and Public

Customer has delineated property extents and access road location

Entrance is cleared

Changes made after Design has been finalized will only increase timeline

Avoid…

- Relocating site entrance
- Changing interconnection location/orientation
- Modifying site conditions

https://www.eversource.com/content/residential/about/doing-business-with-us/interconnections/massachusetts/distributed-energy-resources-project-costs

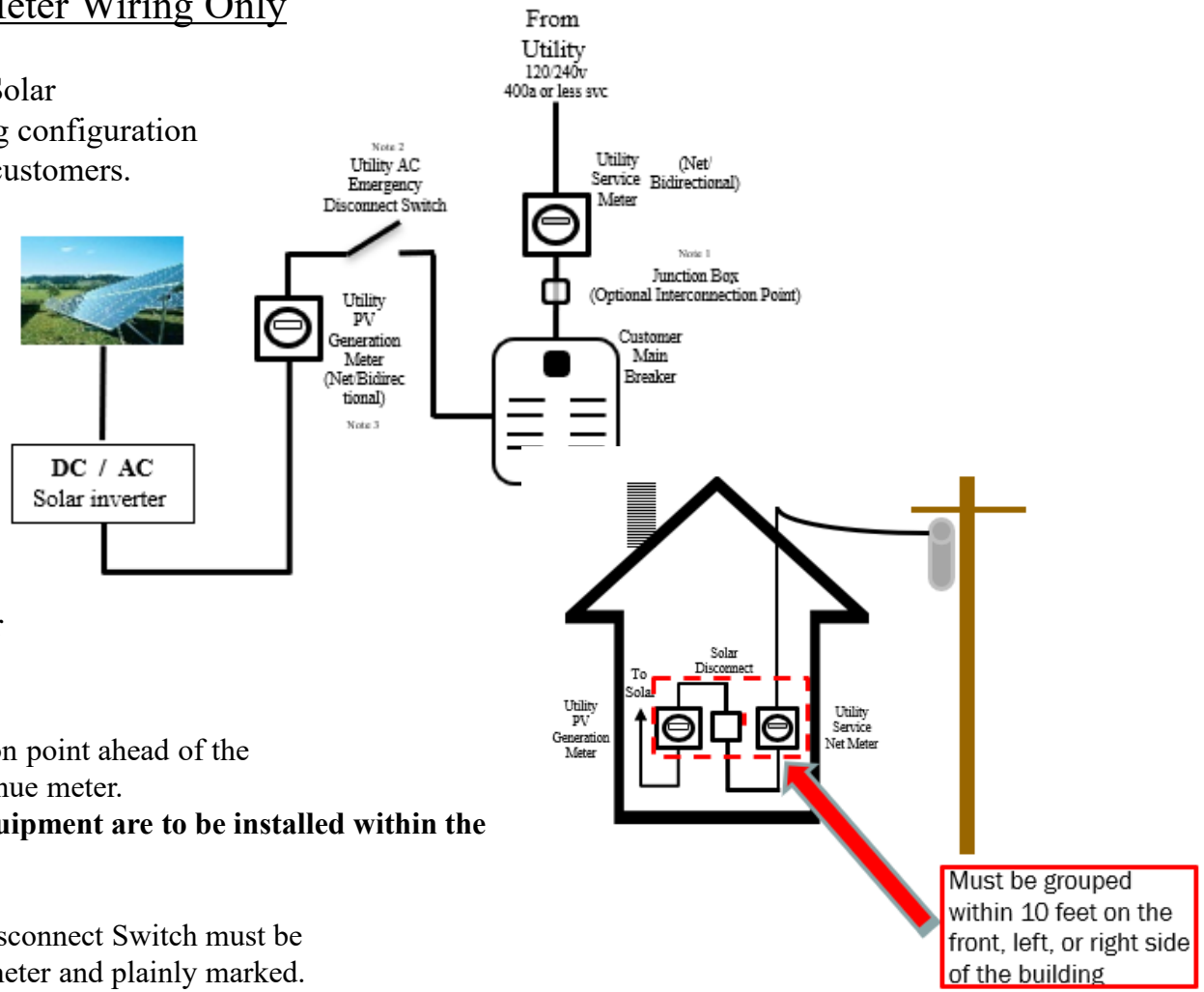
MA Metering Review

Tony King
Manager Meter Operations
EMA

Meter Wiring

Solar and Production Socket Meter Wiring Only

Scenario – Behind the Meter (BTM) Solar
Description: typical solar meter wiring configuration for residential and small commercial customers.



Solar Prod Meter
(Utility PV Generation Meter)
< 60KW = Scalar meter
(Monthly consumption)
> 60KW = Interval Recording meter

Note 1: Optional acceptable interconnection point ahead of the main breaker, but behind the revenue meter.
No connections, splices or measuring equipment are to be installed within the revenue meter socket.

Note 2: Customer provided Emergency Disconnect Switch must be Located next to the Eversource Revenue meter and plainly marked.

Note 3: Utility PV Generation and the Utility Storage meters must be wired with Utility feed to the top of the Meter socket; Solar panels to the bottom of the meter socket

Meter Wiring

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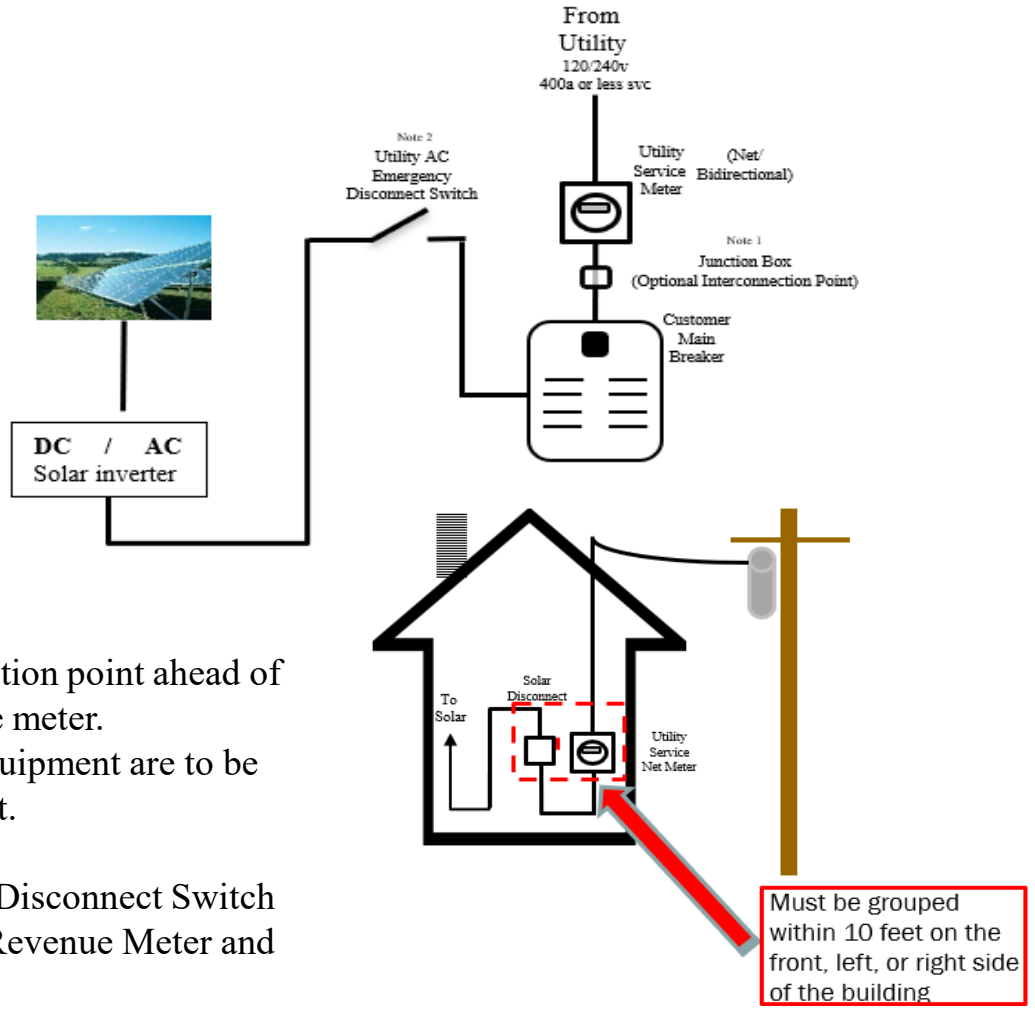
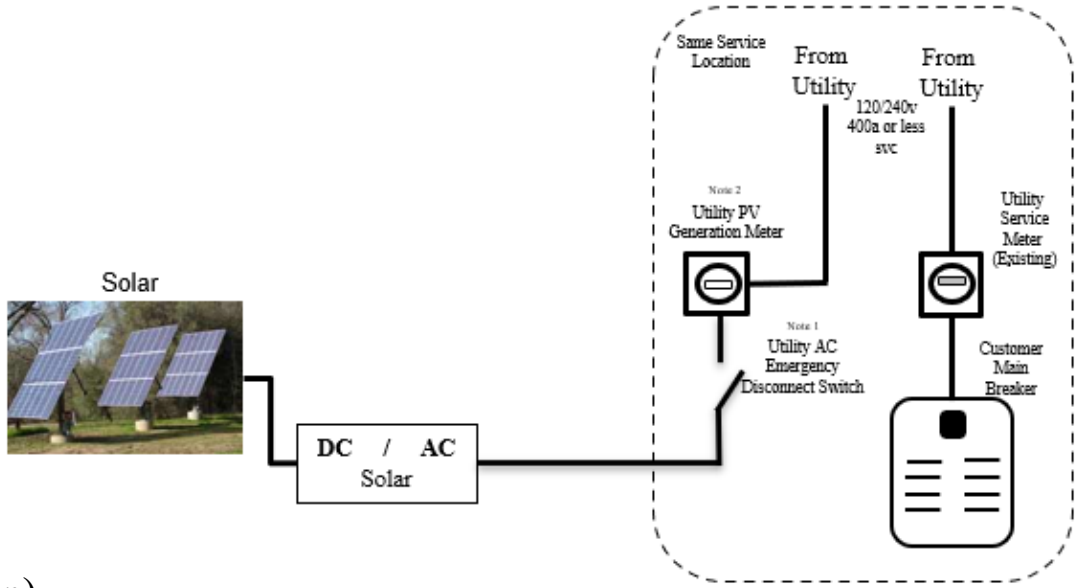


Note 1: Optional acceptable interconnection point ahead of the main breaker, but behind the revenue meter.
No connections, splices or measuring equipment are to be installed within the revenue meter socket.

Note 2: Customer provided Emergency Disconnect Switch must be located next to the Eversource Revenue Meter and plainly marked.

Meter Wiring

Scenario – Standalone Meter at Existing Service location
Description: typical meter wiring configuration for residential and small commercial customers where the solar is installed at an existing location, but not behind the meter.



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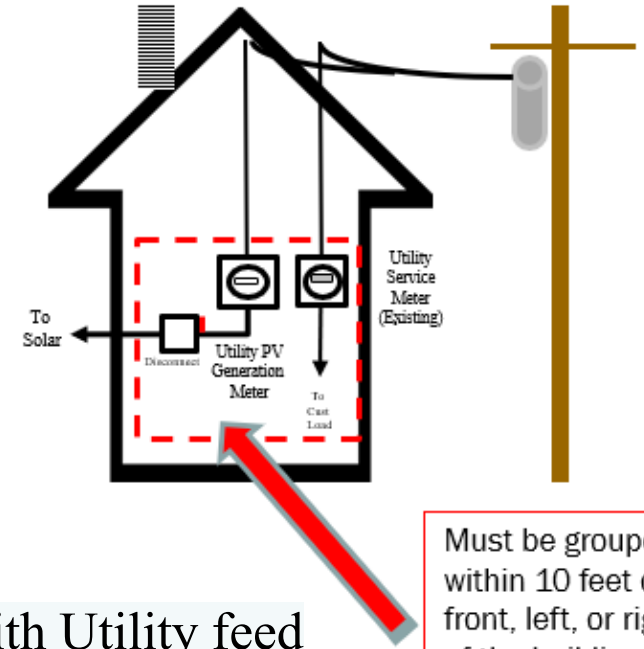
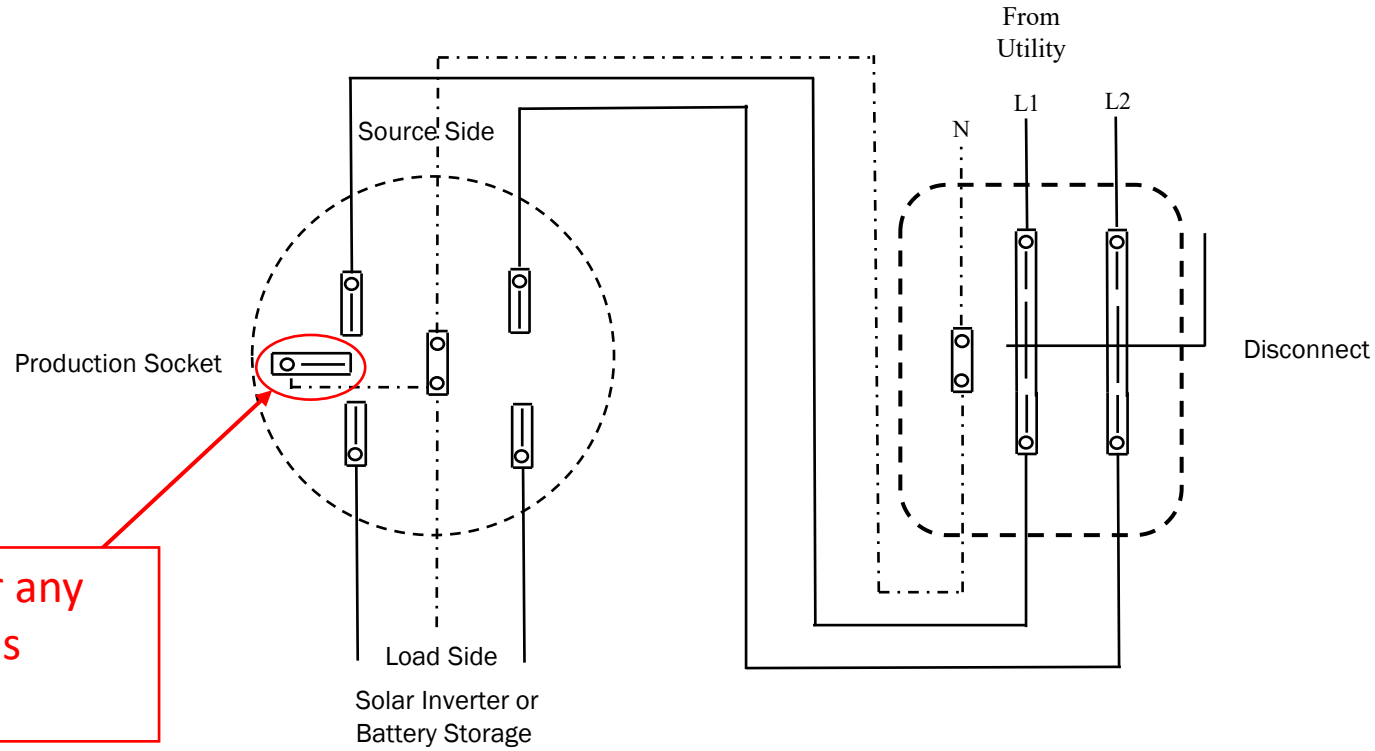


Note 1: Customer provided Emergency Disconnect Switch must be Located next to the Eversource Revenue meter and plainly marked.

Note 2: Utility PV Generation and the Utility Storage meters must be wired with Utility feed to the top of the Meter socket; Solar panels to the bottom of the meter socket

Production Socket Wiring

Utility PV Generation and the Utility Storage meters must be wired with Utility feed to the top of the Meter socket; Solar panels and Battery storage to the bottom of the meter socket



This 5th jaw is required for any single-phase service that is 120/208

Note: If you are installing battery storage behind a production socket you will need a second disconnect on the load side of the production socket

Information about metering socket use

- Consult the EMA I&R book for approved meter sockets.
- Link to EMA I&R book:
- Using a meter socket listed in the EMA I&R book will AVOID DELAYS.
- All Stand-alone scenarios are considered as new services and MUST follow all I&R requirements.
- A new service request must be submitted for any revenue meter upgrades that are needed to proceed with solar installation. The new service request needs to be completed first before the DG request can moved forward.
- No meter socket can be used as raceway or a splice box. The only wires allowed in a meter socket are the line side, load side and a bonding wire. No grounding wire is allowed. (Grounding wire is a wire the goes out of the meter socket directly to a ground rod)

Instrument Transformer (IT) Rated Services

What does the Installation Contractor Provide?

- ✓ Diagrams – 1-line and 3-line diagrams
- ✓ Approved IT cabinet
- ✓ Approved Meter Socket w/Test Switch
- ✓ Emergency disconnect

Provide all diagrams and equipment spec sheets to Eversource for review.

What does the Eversource Provide?

- ✓ Necessary Current Transformers
- ✓ Meter

Eversource EMA will install all CTs and wire the secondary side to the test switch.

All service above 400amps will require Current transformers.

Secondary CTs will be either 600:5 bar types or 2000:5 window types.

Any services above 3000 A will be primary metered.

IT Rated Services:

What type of equipment do I use?

- Consult the EMA I&R book for approved meter sockets AND IT rated transformer enclosures.

- All IT metering must be Cold Sequenced.

- Label Label Label.
  Clearly mark the Emergency Breaker, all IT cabinets and meter sockets. The more we know when we go out to wiring the equipment, the fewer delays you will encounter.

IT Rated Services:

Process to install metering equipment?

- Notification of job
- Inspection, schedule install (BTM, Stand alone, Amps, service size, 1 line diagram,)
  - Cold sequence, **pg 80**
  - Lockable line side disconnect, **pg 69**.
  - 1 ½ inch conduit with pull string
  - Neutral bar (grounding strip) 4-wire installations
  - Buss bar, 3-wire installations
  - Label for unit
  - Line side / Load side marked
  - Double hinged door with hasp for padlock
  - 3 foot clearance
  - Maximum 75 feet to meter socket
- Update PTWO (verify info, meter info)
- Install metering equipment
- Complete PTWO (meter info)

RTAC Overview

Michael N Taniwha

Manager, Grid Modernization Technology

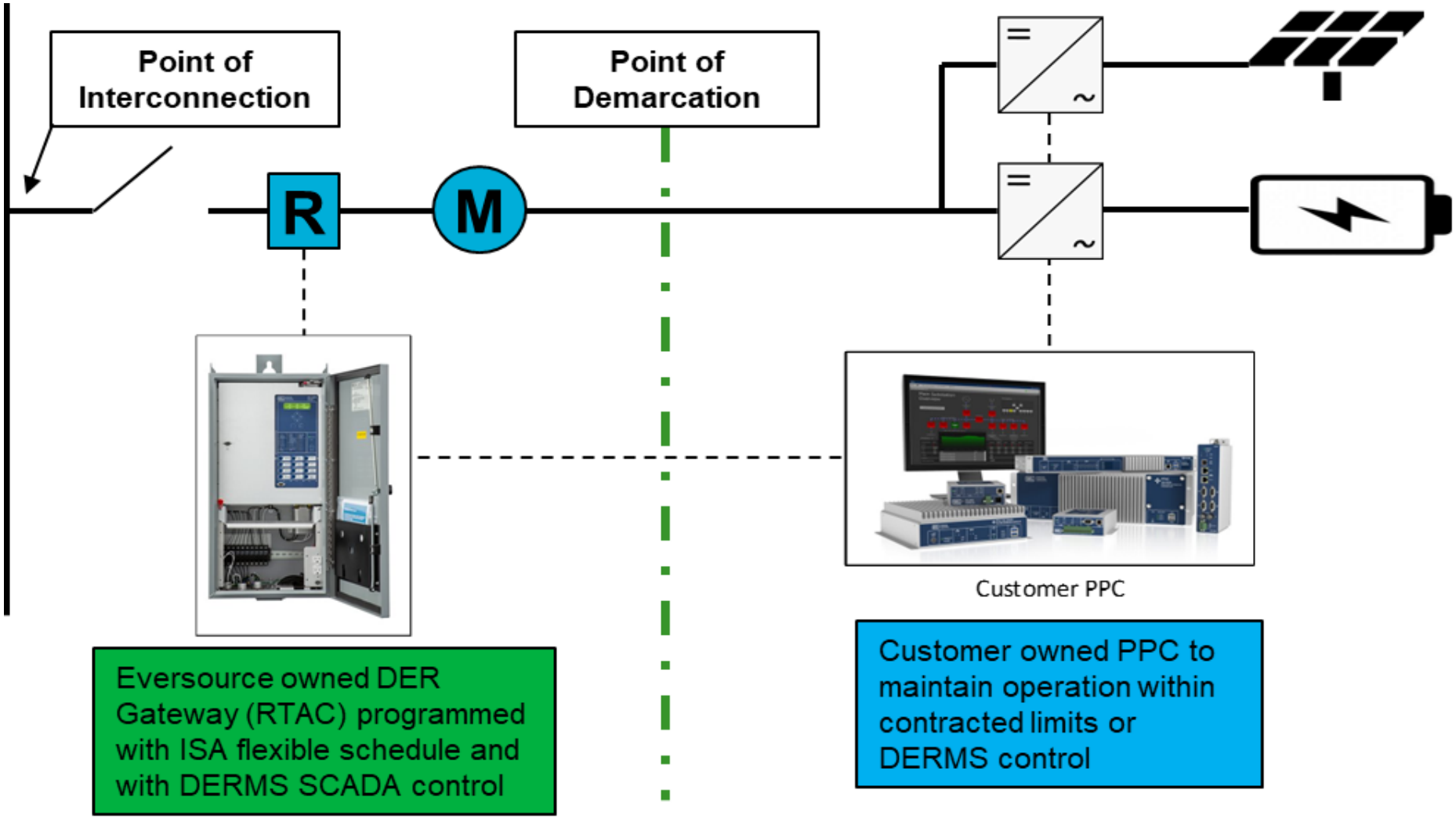
*See definition of Significant Adverse Impact in ISO-NE's *Transmission Planning Technical Guide*: https://www.iso-ne.com/static-assets/documents/2017/03/transmission_planning_techincal_guide_rev6.pdf

DER SCADA Monitoring & Control Requirement

- New standard DSEM 19.065 DER SCADA Visibility and Control
- Applicable to all DER facilities =>500 kW
- Based on DER Gateway to Power Plant Controller (PPC) design
- Supports Flexible Interconnection Operating Schedules
- Supports future real-time operating envelope dispatch and grid services using DERMS
- Eversource supplied DER Gateway (SEL-3350 RTAC)
- Customer provides PPC - May use SEL-3350 RTAC or similar controller for PPC
- Technical Support available from Schweitzer Engineering Laboratories (SEL)

https://www.iso-ne.com/static-assets/documents/2017/03/transmission_planning_techincal_guide_rev6.pdf

DER Gateway to PPC high level overview



Capital Investment Project (CIP)- Distribution Group Studies

Melanie Khederian

Capital Investment Project (CIP)- Distribution Group Studies

- Eversource is performing distribution group studies in Massachusetts to efficiently process and analyze distributed generation (DG) applications that allow complimentary group solutions to be shared by DG customers. The group study looks at the collective impact on the system to understand what system modifications would be required to support these DG projects when interconnected.

- Customer's that are connecting to stations associated with the group will be required to pay a cost per kW AC to interconnect.

- https://www.eversource.com/content/residential/about/doing-business-with-us/interconnections/massachusetts/distribution-group-studies

Distribution Group Studies Process and CIP Schedule

CIP Fee Approved Group Study Areas - Eastern Massachusetts

Group	Final SIS Date +/- 25% Cost Estimate	Customer Notification *10 business days after completion*	CIP Proposal Deadline *40 business days after completion*	CIP Fee (Dollars/kW)
Marion-Fairhaven 001	Completed on 3/29/2022	Completed on 3/28/2022	Approved 12/31/2022	$370/kW
Marion-Fairhaven 002	Completed on 4/2/2025	Completed on 4/2/2025	Approved 12/31/2022	$370/kW
Plymouth 001	Completed on 4/19/2022	Completed on 4/19/2022	Approved 6/4/2024	$224/kW
Cape 001	Completed on 4/25/2022	Completed on 4/25/2022	Approved 6/4/2024	$357/kW
Dartmouth Westport 001	Completed on 4/8/2022	Completed on 4/8/2022	Approved 6/4/2024	$387/kW

CIP Fee Approved Group Study Areas - Western Massachusetts

Group	Final SIS Date +/- 25% Cost Estimate	Customer Notification *10 business days after completion*	CIP Proposal Deadline *40 business days after completion*	CIP Fee (Dollars/kW)
Blandford 001	Completed on 4/4/2022	Completed on 4/4/2022	Approved 6/4/2024	$498/kW

In Process Group Study Areas - Eastern Massachusetts

Area	Date Group Opened	Total Projects Invited	Total Opt Ins	Opt in MW
New Bedford 001	Completed on 5/11/2022	14	9	30.2
Plymouth 002	Completed 1/24/2025	46	42	166
Cape 002	Completed on 1/27/2025	6	5	21

In Process Group Study Areas - Western Massachusetts

Area	Date Group Opened	Total Projects Invited	Total Opt Ins	Opt in MW
Southwick 001	Completed 5/9/2024	6	6	24
Whately-Deerfield 001	Completed 5/10/2024	11	9	34.9
Berkshire (Dalton-Hinsdale) 001	Completed 5/10/2024	4	3	15
Plainfield 001	Completed 1/31/25	6	5	18.8
Blandford 002	Completed 1/31/25	12	9	32.2

Capital Investment Project (CIP)- Distribution Group Studies- Continued

- To identify if a site is connecting to a station associated with the group study, please utilize our host capacity map. We have included the list of station for each group in the table to our right. This information is also posted on our website.

- https://www.eversource.com/content/ema-c/about/about-us/doing-business-with-us/builders-contractors/interconnections/massachusetts/hosting-capacity-ma

Group Study	Substation
Marion-Fairhaven	Arsene St 654
	Crystal Sprints 646
	Rochester 745
	Wing Lane 624
Dartmouth-Westport	Cross Rd 651
	Fisher Rd 657
Plymouth	Brook St 727
	Kingston 735
	Manomet 721
	Tremont 713
	Valley 715
	Wareham 714
	West Pond 737
Cape	Falmouth 933
	Harwich 968
	Hatchville 936
	Hyannis Jnc 961
	Sandwich 916
	Oak St 920
	Mashpee 946
	Otis 915
New Bedford	Industrial Park 636

Transmission ASO Studies Overview

Meiyan Li

Transmission ASO Studies Overview

- Volume of DER applications seeking to interconnect has resulted in the need to ensure that DER projects do not cause adverse impacts* to the network.

- Eversource in coordination with ISO-NE will now assess each DER application and perform a ASO Impact Screen to determine if the facility may result in adverse impact to the system and the correct path of study.

- Level 0 studies
  - At a minimum, generally consist of a transfer limit assessment to ensure no degradation of ISO-NE Interface Limits. If adverse impacts found, a Level 3 ASO study will be required.
  - Some Level 0 may require more detailed analysis

- Level 3 studies
  - Conduct thermal and voltage steady state, short circuit, stability analysis
  - PSCAD analysis will be required as per ISO-NE PP5-6 requirements
  - Technical data will be requested from projects and is required to start studies

*See definition of Significant Adverse Impact in ISO-NE's *Transmission Planning Technical Guide* https://www.iso-ne.com/static- assets/documents/2017/03/transmission_planning_techincal_guide_rev6.pdf

- On April 4, 2025, FERC issued a ruling regarding New England's Orders No. 2023 and 2023-A Compliance Proposal, approving a significant portion of ISO-NE's compliance filing for Order 2023.

- Presently, all serial FERC QP projects are paused, regardless of their feasibility or system impact study status. FERC QPs have the choice to either continue on to the Transitional Cluster Study (TCS) or withdraw from the process. Importantly, ISO-NE will not consider IRs submitted after June 13, 2024 for the ISO-NE TCS, which is positive news for our ongoing ASO studies, as they should remain largely unaffected.

- ISO-NE has suggested that the study timeline may be delayed by about a year compared to the original schedule proposed in the FERC 2023 filing from May of last year. ISO-NE stated at the NEPOOL Transmission Committee on April 17, 2025 "As long as the ASO studies are within 90 days of achieving I.3.9 approval by the beginning of the Transitional Cluster Study (October 10, 2025), the ASO studies can complete." All projects currently in the ongoing 2025 Level 3 ASO studies are expected to receive Section I.3.9 PPA approval from ISO-NE by December 31, 2025 to avoid being impacted by the ISO-NE's Transitional Cluster Study, provided no unforeseen delays that are beyond Eversource's control.

FERC Order 2023 info

Questions?

Additional Resources

Mass Distributed Generation, Interconnections & Net Metering
https://www.eversource.com/content/ema-c/about/about-us/doing-business-with-us/builders-contractors/interconnections/massachusetts

ASO Impact Screening Flow Diagram
https://www.eversource.com/content/docs/default-source/builders-contractors/aso-impact-screen-diagram.pdf?sfvrsn=551cdd62_2

Technical Data Request List for Level 3 ASO Transmission Studies
https://www.eversource.com/content/docs/default-source/builders-contractors/aso-technical-data-request.pdf?sfvrsn=2d53d562_0

DG Guidelines
https://www.eversource.com/content/docs/default-source/builders-contractors/distributed-generation-guidelines-interconnection.pdf?sfvrsn=5432d062_2

SMART Guidelines
https://www.eversource.com/ content/ema-c/about/about- us/doing-business-with- us/builders- contractors/interconnections/ massachusetts/smart-solar-program-installers

Distributed Energy Resource (DER) Projects Costs
www.eversource.com/content/residential/about/doing-business-with-us/interconnections/massachusetts/distributed-energy-resources-project-costs

TRSG Spreadsheet
https://www.eversource.com/content/residential/about/doing-business-with-us/interconnections/massachusetts/distribution-group-studies

Link to request equipment added to power clerk https://www.energy.ca.gov/programs-and-topics/programs/solar-equipment-lists

THANK YOU!!