Non-wholesale DER Observability

DER Subcommittee

1/31/18

"Non-wholesale" DER observability

- Non-wholesale DER – generation (including storage) that does not participate directly in the wholesale markets (either as "front of meter" generation or demand response) and is used to self-serve load
  - Behind the Meter Generation (BTMG)
    - Cogen/CHP, emergency diesel, CTs, batteries, solar, etc.
  - Non-retail Behind the Meter Generation (NRBTMG)
    - Primarily Muni/Coop generation

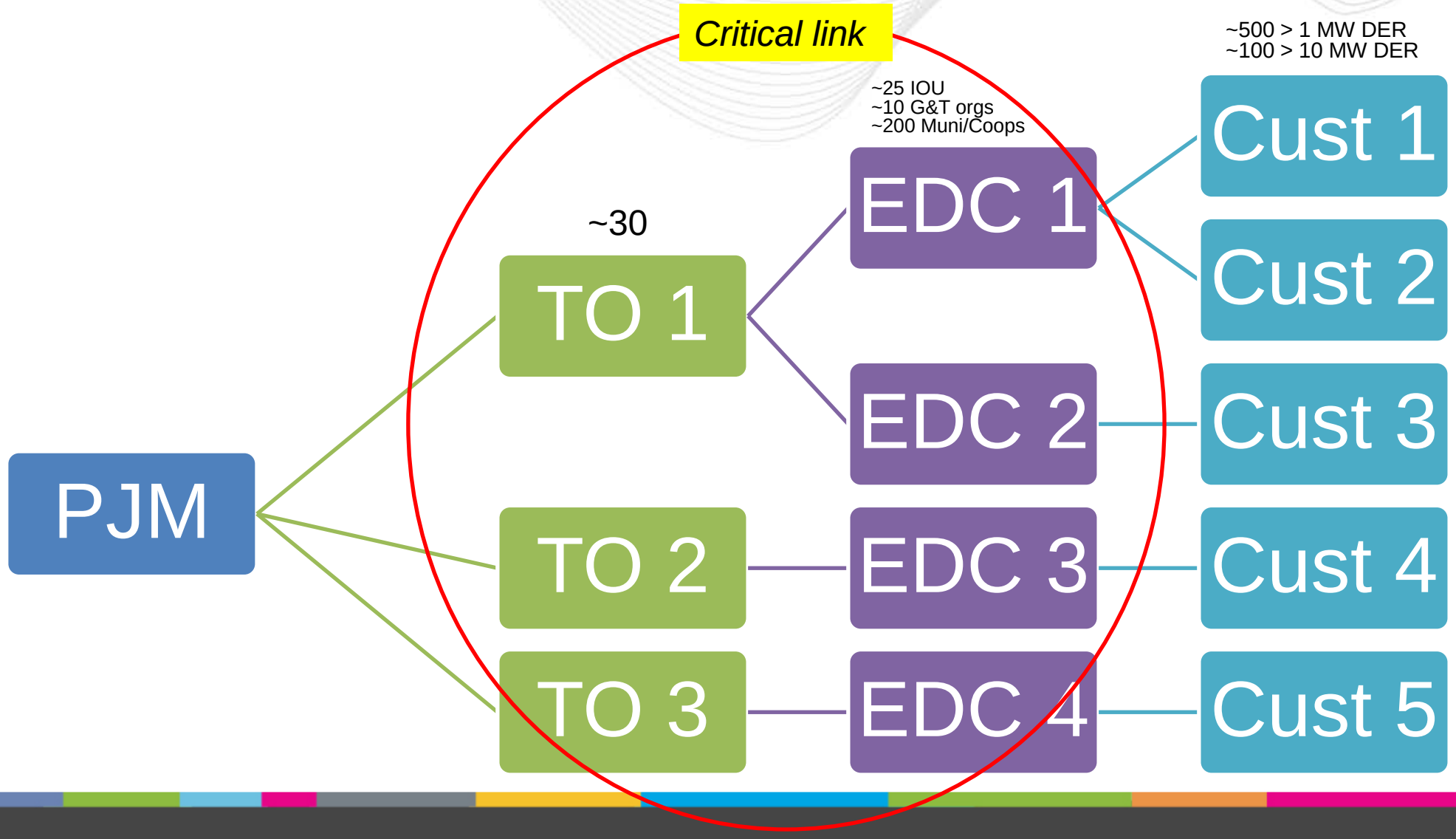
Recommendations

- PJM will work with TO as primary channel to identify, verify and communicate to non-wholesale DER resources
  - TO will coordinate and communicate through EDC (through muni/coop where necessary) to customer/non-wholesale DER
- PJM/TO annual process:
  - identify all DER >1 MW and associated information
    - PJM to leverage EIA 860 (publically reported generation) to help simplify effort for TO
      - >1 MW mapped in DIMA, >10 MW modelled in EMS
        - » EMS modeling alternatives include: station display updates, real-time telemetry, equipment modeled as equivalent loads, solar and/or wind forecast coordination.
  - verify TO>EDC>Muni/Coop communication chain
- PJM outreach regarding BTMG/NRBTMG metering and telemetry requirements
- Enhance NRBTMG administration process
- Consider DER forecast to help explain load forecast variances and possibly use as input to load forecast

Draft timeline

Goals	Notes	Status	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3	2019Q4
Communication channel to non-wholesale DER resources through TO to TO EDC (to Muni/Coop as applicable)	Cross reference list so TO knows which EDCs/munis to communicate through									
Stakeholder process for any rule changes needed to maintain non-wholesale DER resource information										
Collect and verify non-wholesale DER resource information with TOs	target late May through June, after DR resource are determined for DY									
Implement system for PJM/TO to manage DER resource information.										
PJM outreach to members regarding data availability										
Implement telemetry, as appropriate										
Develop and distribute NRBTMG training										
Member outreach regarding NRBTMG requirements										
Consider DER forecast to help better understand unexpected changes in the load forecast and determine integration with long term forecast										

Communication & DER data collection/validation channel



Recommendation: PJM/TO annual DER identification/verification process

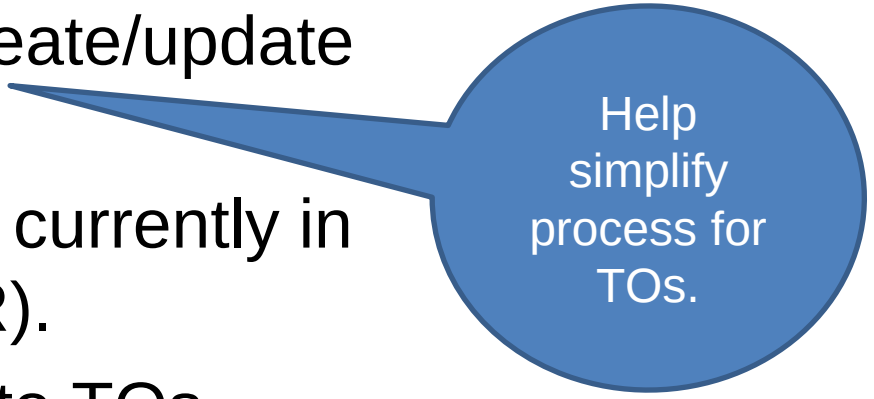
- Verify Zone|TO|EDC(IOU) and/or EDC(muni/coop) cross reference for communication process

ZONE	TO	EDC	Muni/Coop	G&T Company	STATE
AECO	PHI	Atlantic City Electric Company			NJ
AECO	PHI	Atlantic City Electric Company	Vineland Municipal Electric Utility		NJ
AEP	AEP	Allegheny Power (for West Virginia Power)			WV
AEP	AEP	Appalachian Power Company (AEP Transmn_APCO Transmn)			TN
AEP	AEP	Appalachian Power Company (AEP Transmn_APCO Transmn)			VA
AEP	AEP	Appalachian Power Company (AEP Transmn_APCO Transmn)			WV
AEP	AEP	Appalachian Power Company (AEP Transmn_I&M Power)			IN
AEP	AEP	Appalachian Power Company (AEP Transmn_I&M Power)			MI
AEP	AEP	Appalachian Power Company (AEP Transmn_KY Power)			KY
AEP	AEP	Appalachian Power Company (AEP Transmn_OH Power)			OH
AEP	AEP	Appalachian Power Company (AEP Transmn_OH Power)	XYZ	American Municipal Power, Inc.	OH
…	…	…	…	…	…

Illustrative Example

Recommendation: PJM/TO annual DER identification/verification process (continued)

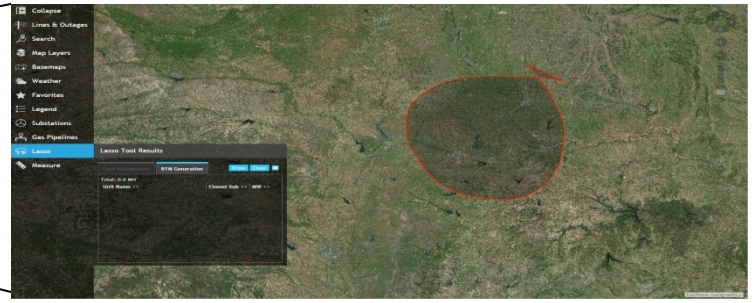
- Identify non-wholesale DER resources and associated information
  - PJM to start with public information and create/update list
  - PJM to reconcile list for resources that are currently in the wholesale market (front of meter or DR).
  - PJM to provide list of non-wholesale DER to TOs
  - TOs to verify/update information or add additional resources
    - TOs to coordinate with EDCs

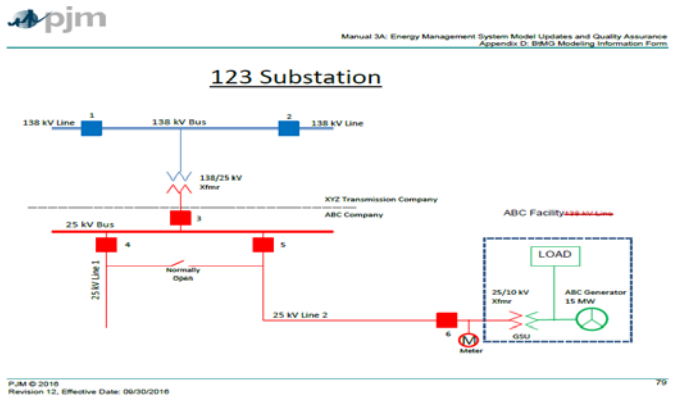


Recommendation: PJM/TO annual DER identification/verification process (continued)

TOs Information requirements

- >1 MW, focus on mapping
  - Location, size, type, operational mode, contacts
- >10 MW, focus on modelling (EMS)
  - Same as above plus
    - BES node, single line diagram, telemetry parameters, MW/Mvar, status of switching devices available, etc.





Will need to modify existing BTMG requirements in Manual 3A, Appendix D which were developed based on EIA 860 information already collected

Non-wholesale DER information

		Required? (Y/N)			
Field	Definition	Large NRBtMG >= 10 MW	Small NRBtMG < 10 MW	Large Retail BtMG >= 10 MW	Small Retail BtMG < 10 MW
Category	NRBTMG, RBTMG(large), RBTMG(small), DR	Y	Y	Y	Y
EIA860# (Plant Code)	Unique ID to help reconcile information across systems/lists	Y	Y	Y	Y
GATS#	Unique ID to help reconcile information across systems/lists	Y or N/A	Y or N/A	Y or N/A	Y or N/A
DR LocationID	Unique ID to help reconcile information across systems/lists	Y if DR	Y if DR	Y if DR	Y if DR
PJM Gen ID	Unique ID to help reconcile information across systems/lists	Y if PJM Gen	Y if PJM Gen	Y if PJM Gen	Y if PJM Gen
Plant Name	Name of Plant	Y	Y	Y	Y
Address, City , State, Zip	Address of plant	Y	Y	Y	Y
County	County where plant is located	Y	Y	Y	Y
GIS coordinate	Latitude/Longitude	Y	Y	Y	Y
Start Date	Date unit went operational	Y	Y	Y	Y
Retire Date	Date unit was retired	Y	Y	Y	Y
GenType	Wind, Solar, Battery – CT, RICE (GADS?)	Y	Y	Y	Y
Fuel Type	GADS?	Y	Y	Y	Y
Nameplate MW		Y	Y	Y	Y
Total Summer Capacity at Plant (MW)	Summer Net Dependable Rating	Y	Y	Y	Y
OperationalMode	Emergency/Backup, Cogen/CHP, Peak shave, Economic	Y	Y	Y	Y
Notification + Time-to-Start	<1 hr, 1-4 hrs, 4-12 hrs, >12 hrs	N	N	N	N

Non-wholesale DER information (continued)

		Required? (Y/N)			
Field	Definition	Large NRBtMG >= 10 MW	Small NRBtMG < 10 MW	Large Retail BtMG >= 10 MW	Small Retail BtMG < 10 MW
EDC	Electric Distribution Company	Y	Y	Y	Y
Utility	EIA860 definition	N	N	N	N
LSE	LSE that is receiving benefit of netting the Non-Retail BTMG against load in the calculation of PJM charges. (Required for NRBTMG only).	Y	N	N	N
Transmission Zone	PJM defined trans zones	Y	Y	Y	Y
TO	TOA	Y	Y	Y	Y
pNode	PJM defined price node	N	N	N	N
Contact Name	Operational info can share with TO	Y	Y	Y	Y
Contact Phone Number	Phone number for contact	Y	Y	Y	Y
Contact Email	email for contact	Y	Y	Y	Y
Phone Number for All Call	Phone number to be added to PJM All Call List.	Y	Y	N	N
System BES Interconnect node location		Y	N	Y	N
Attach Generator single-line diagram		Y	N	Y	N
Number of Units:		Y	N	Y	N
Operating Voltage:		Y	Y	Y	Y
GSU Generator Step UP xformer		Y	N	Y	N
Nearest electrically connected Transmission Substation 8 char name and long name:		Y	Y	Y	Y
Transmission Substation single-line diagram		Y	N	Y	N
ICCP status of circuit breakers and switches		Y	N	Y	N
ICCP MW and MVAr measurements		Y	N	Y	N
ICCP Voltage		Y	N	Y	N

Appendix

- PJM non-wholesale DER needs
- Current Btmg data collection form

Why does PJM need non-wholesale DER information?

- System Operations
  - Address System issues/mitigate manual load dump (i.e.: Sturgis)
    - Coordinate post-contingency load shed plan
  - Operational awareness for communication process
  - Improve short term load forecast and/or better understand load forecast variance
- Planning
  - RTEP load flow studies (may model explicitly as gen or implicitly through load forecast)
  - Improve long term load forecast or better understand load forecast variance
- Manage existing NRBTMG and BTMG requirements (including telemetry & metering)

BtMG Data Form

PJM Behind the Meter Generation Submission Form

BtMG Form Description

This form is to gather information on Behind the Meter Generators. PJM will use this information to update the EMS model. Refer to PJM Manual 3A Section 1.2.1 for more details regarding this form.

General Information

In Service Date:		Transmission Owner:	
Utility Company Name:		Generator Name:	
Utility Company Address:		Generator Address:	
Utility Company Phone:		BtM Generator Contact:	
Utility Company Email:		Generator Email:	
System Operating to (check one): Distribution (<100 kV) ☐ Transmission (>100 kV) ☐		Generator Code:	
GIS Data (latitude, longitude):			

Modeling Information

Generator Model Update (required section):

- Commercial name:
- Attach Generator single-line diagram
- Generator Information:
  - Unit Type (see below):
  - Fuel Type:
  - Maximum Output PMax (total): MW
  - Number of Units:
  - Operating Voltage: (kV)

Transmission Model Details (can be supplied by TO in Network Model Request):

- Nearest Transmission Substation name:
- Attach Transmission Substation single-line diagram

Telemetry (see Manual 14D, Appendix A (9) to determine applicability):

- From TO via ICCP
  - Provide status of circuit breakers and switches
  - Provide MW and MVAr measurements
  - Provide Voltage

Please complete and attach to eDART Network Model Application

http://www.pjm.com/~/media/committees-groups/subcommittees/dms/postings/btmg-submission-form.ashx

Description of each data entry field is given in PJM Manual 3A, Appendix D.