



Non-wholesale DER Observability

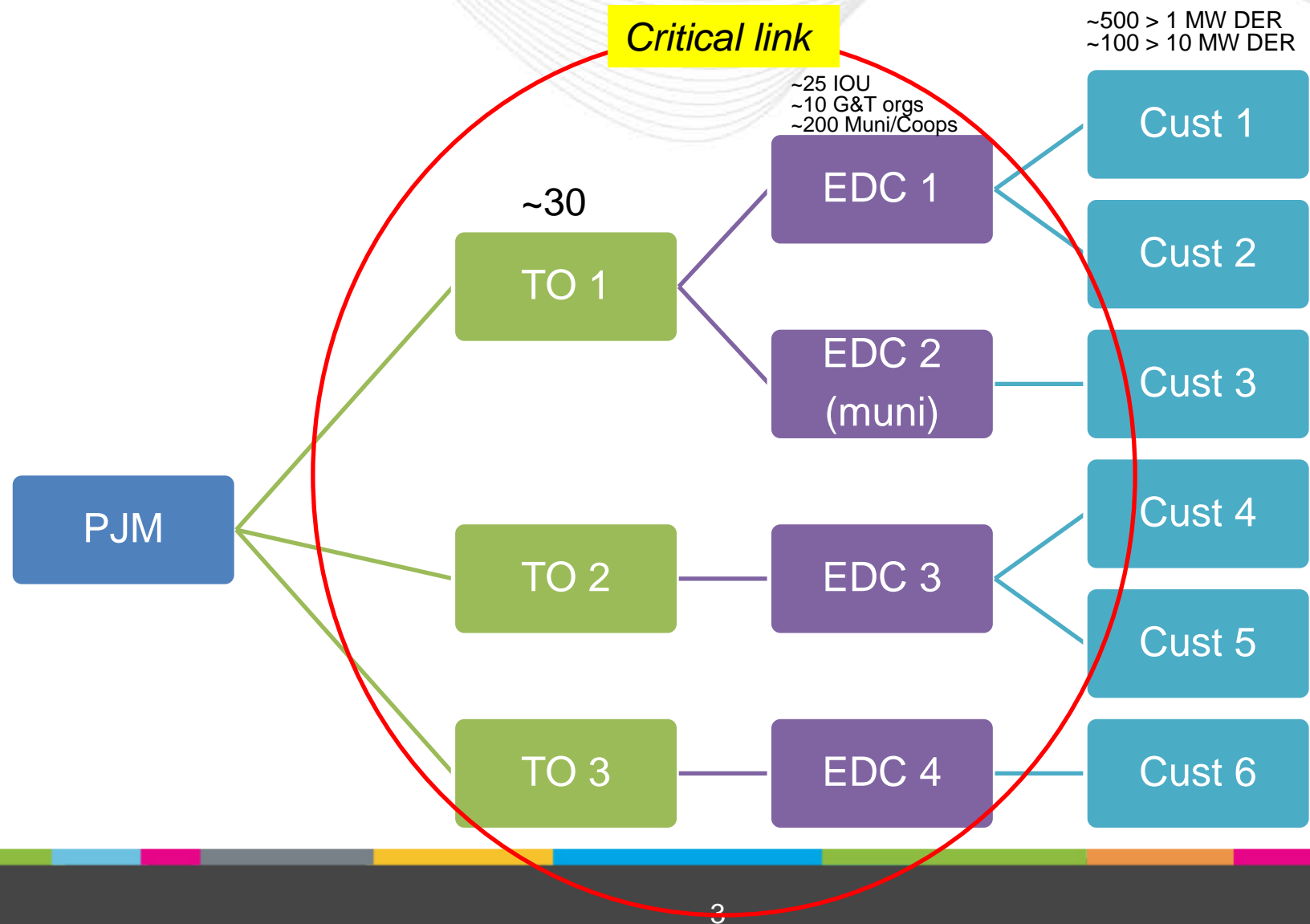
DER Subcommittee

4/25/18



- Review Non-wholesale DER data collection/verification process
 - Data elements
- Non-wholesale DER communication process

DER data collection/validation and communication channel



- Verify and maintain Zone|TO|EDC(IOU) and/or EDC(muni/coop) cross reference.

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 – under development at PJM

- 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 and muni/coop.

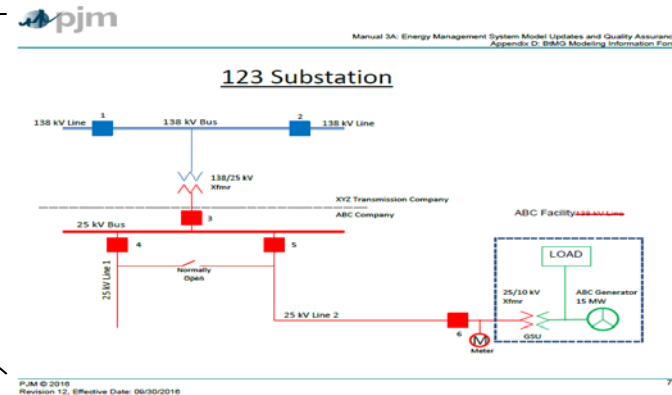
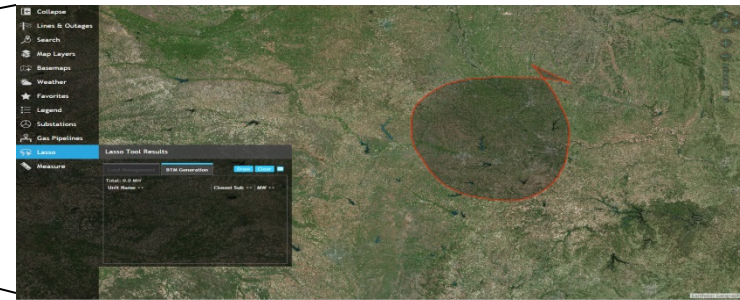
A blue callout bubble with a tail pointing towards the first bullet point of the list. It contains the text "Help simplify process for TOs." in white, sans-serif font.

Help
simplify
process for
TOs.

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.
 - If telemetered, it may improve state estimator process and improve situational awareness



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



Field	Data Source	TO Update/Verify	Definition	Required? (Y/N)			
				Large NRBTMG >= 10 MW	Small NRBTMG < 10 MW	Large Retail BTMG >= 10 MW	Small Retail BTMG < 10 MW
Plant Name	EIA860	no	Name of Plant	Y	Y	Y	Y
Category	PJM	no	NRBTMG, RBTMG(large), RBTMG(small), DR	Y	Y	Y	Y
EIA860 (Plant Code)	EIA860	no	Unique ID to help reconcile information	Y	Y	Y	Y
GATS ID	PJM GATS	no	Unique ID to help reconcile information	Y or N/A	Y or N/A	Y or N/A	Y or N/A
DR Hub LocationID	PJM DR Hub	no	Unique ID to help reconcile information	Y if DR	Y if DR	Y if DR	Y if DR
EMS Plant ID	PJM EMS	no	Unique ID to help reconcile information				
DIMA Plant ID	PJM DIMA	no	Unique ID to help reconcile information				
EIA860 Gen ID	EIA860	no	Unique ID to help reconcile information	Y if PJM Gen	Y if PJM Gen	Y if PJM Gen	Y if PJM Gen
Address	EIA860	yes	Mailing address for the plant				
City	EIA860	yes	Mailing city for the plant				
State	EIA860	yes	Mailing State for the plant				
Zip	EIA860	yes	Mailing zip for the plant	Y	Y	Y	Y
County	EIA860	yes	County where plant is located	Y	Y	Y	Y
Latitude	EIA860	yes	Angular distance of arc or portion of earth's equator expressed in Decimal format using six decimal places, consistent with NERC EIA-860 report	Y	Y	Y	Y
Longitude	EIA860	yes	Angular distance north or south from the earth's equator expressed in Decimal format using six decimal places, consistent with NERC EIA-860 report				
Start Date	EIA860	yes	Date unit went operational. Source 860 operational month and year	Y	Y	Y	Y
Retire Date	EIA860	yes	Date unit was retired. Source "Retired and Canceled" tab of 860 workbook for "Retirement Month" and "Retirement Year"	Y	Y	Y	Y
GenType	PJM	yes	Wind, Solar, Battery – CT, RICE (GADS?)	Y	Y	Y	Y
Energy Source 1	EIA860	yes	primary full source code - get EIA	Y	Y	Y	Y

Field	Data Source	TO Update/Verify	Definition	Required? (Y/N)			
				Large NRBtMG >= 10 MW	Small NRBtMG < 10 MW	Large Retail BtMG >= 10 MW	Small Retail BtMG < 10 MW
Nameplate Capacity (MW)	EIA860	yes		Y	Y	Y	Y
Summer Capacity (MW)	EIA860	yes	Summer Net Dependable Rating	Y	Y	Y	Y
OperationalMode	Customer	yes	Emergency/Backup, Cogen/CHP, Peak shave, Economic	Y	Y	Y	Y
Notification + Time-to-Start	Customer	yes	<1 hr, 1-4 hrs, 4-12 hrs, >12 hrs	N	N	N	N
EDC	PJM	yes	Electric Distribution Company	Y	Y	Y	Y
Utility	EIA860	no	EIA860 definition - this will help to actually define the EDC which is what is needed	N	N	N	N
LSE	Customer	yes	LSE that is receiving benefit of netting the Non-Retail BTMG against load in the calculation of PJM charges.	Y	Y	N	N
Transmission Zone	PJM	yes	PJM defined trans zones	Y	Y	Y	Y
TO	PJM	yes	TOA	Y	Y	Y	Y
Contact Name	Customer	yes	Operational info can share with TO	Y	Y	Y	Y
Contact Phone Number	Customer	yes	Phone number for contact	Y	Y	Y	Y
Contact Email	Customer	yes	email for contact	Y	Y	Y	Y
Phone Number for All Call	Customer	yes	Phone number to be added to PJM All Call List.	Y	Y	N	N

Field	Data Source	TO Update/Verify	Definition	Required? (Y/N)			
				Large NRBtMG >= 10 MW	Small NRBtMG < 10 MW	Large Retail BtMG >= 10 MW	Small Retail BtMG < 10 MW
Number of Units:	Customer	yes	Total number of individual generation units at location	Y	N	Y	N
Grid Voltage (kV)	EIA860	yes	Expressed in Kilovolts of the high side point of interconnection, consistent with NERC EIA-860 report	Y	Y	Y	Y
GSU Generator Step UP xformer	Customer	yes	Units 20 MW and greater, under PJM control (in PJM footprint) and connected to the BES, need the GSU modeled. Yes / No Field	Y	N	Y	N
Transmission Substation Short Name	TO	yes	Nearest electrically connected Transmission Substation PJM 8 char EMS name	Y	Y	Y	Y
Transmission Substation Long Name	TO	yes	Nearest electrically connected Transmission Substation - long name	Y	Y	Y	Y
Generator single-line diagram	Customer	yes	yes/no	Y	N	Y	N
Transmission Substation single-line diagram	TO	yes	yes/no	Y	N	Y	N
ICCP status of circuit breakers and switches	Customer	yes	if available will be used for state estimator solution	Y	N	Y	N
ICCP MW and MVAr measurements	Customer	yes	if available will be used for state estimator solution	Y	N	Y	N
ICCP Voltage	Customer	yes	if available will be used for state estimator solution	Y	N	Y	N

Plant Name	Category	EIA860 (Plant Code)	GATS ID	DR Hub Location ID	EMS Plant ID	DIMA Plant ID	EIA860 Gen ID	Address	City	State	Zip	County	Latitude	Longitude	Start Date	Retire Date	GenType	Energy Source 1	Nameplate Capacity (MW)	Summer Capacity (MW)	Operational Mode	Notification + Time-to-Start
Applewood City Diesel Plant	NRBTMG	1855	NON12345	12345	BTM	XXXX	6	505 W. Maple Road	Applewood	MI	49091	St Joseph	43.799200	-81.425600	12/1981		Natural Gas Internal Combustion Engine	NG	6.0	6.0	Economic	<1 hr

Plant Name	EDC	Utility	LSE	Transmission Zone	TO	Contact Name	Contact Phone Number	Contact Email	Phone Number for All Call	Number of Units	Grid Voltage (kV)	GSU Generator Step UP xformer	Transmission Substation Short Name	Transmission Substation Long Name	Generator single-line diagram	Transmission Substation single-line diagram	ICCP status of circuit breakers and switches	ICCP MW and MVar measurements	ICCP Voltage
Applewood City Diesel Plant	City of Applewood	Indiana Michigan Power	AEP	AEP	AEP	John Doe	212-555-5555	jd@abc.com	212-555-5555	1	4.16	No	APPLEWD	City of Applewood	Yes	Yes	SW12345	MW12345	KV12345

	EIA860
	PJM
	Customer
	TO

M#	Method	UC#	Use Case	Data collection & verification	Emergency Communication
1	PJM>TO>EDC>DER	1	PJM>PECO(TO)>PECO(EDC)>DER		
		2	PJM>AEP (TO) >APCO (EDC)>DER		
		3	PJM>Comed (TO) >City of(EDC)>DER		
		4	PJM>AEP (TO)>City of(EDC)>DER		
2	PJM>TO>EDC>Muni>DER	1	same as method 1		
		2	same as method 1		
		3	PJM>Comed (TO) >Comed (EDC)> City of (EDC)>DER		
		4	PJM>AEP (TO)>APCO(EDC)>City of(EDC)>DER		
3	PJM>EDC>DER	1	PJM>PECO(EDC)>DER		
		2	PJM >APCO (EDC)>DER		
		3	PJM>City of(EDC)>DER		
		4	PJM>City of(EDC)>DER		

Expected emergency communication prior to Manual Load Dump

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

- 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

- 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 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) <input type="checkbox"/> Transmission (>100 kV) <input type="checkbox"/>		Generator Code:	
GIS Data (latitude, longitude):			

Modeling Information	
Generator Model Update (required section):	
<ul style="list-style-type: none"> ➤ Commercial name: ➤ Attach Generator single-line diagram ➤ Generator Information: <ul style="list-style-type: none"> ◆ Unit Type (see below): ◆ Fuel Type: ◆ Maximum Output P_{Max} (total): MW ◆ Number of Units: ◆ Operating Voltage: (kV) 	
Transmission Model Details (can be supplied by TO in Network Model Request):	
<ul style="list-style-type: none"> ➤ Nearest Transmission Substation name: ➤ Attach Transmission Substation single-line diagram 	
Telemetry (see Manual 14D, Appendix A (9) to determine applicability):	
<ul style="list-style-type: none"> ➤ From TO via ICCP <ul style="list-style-type: none"> ◆ Provide status of circuit breakers and switches ◆ Provide MW and MVAR measurements ◆ Provide Voltage 	

<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.

Please complete and attach to eDART Network Model Application