

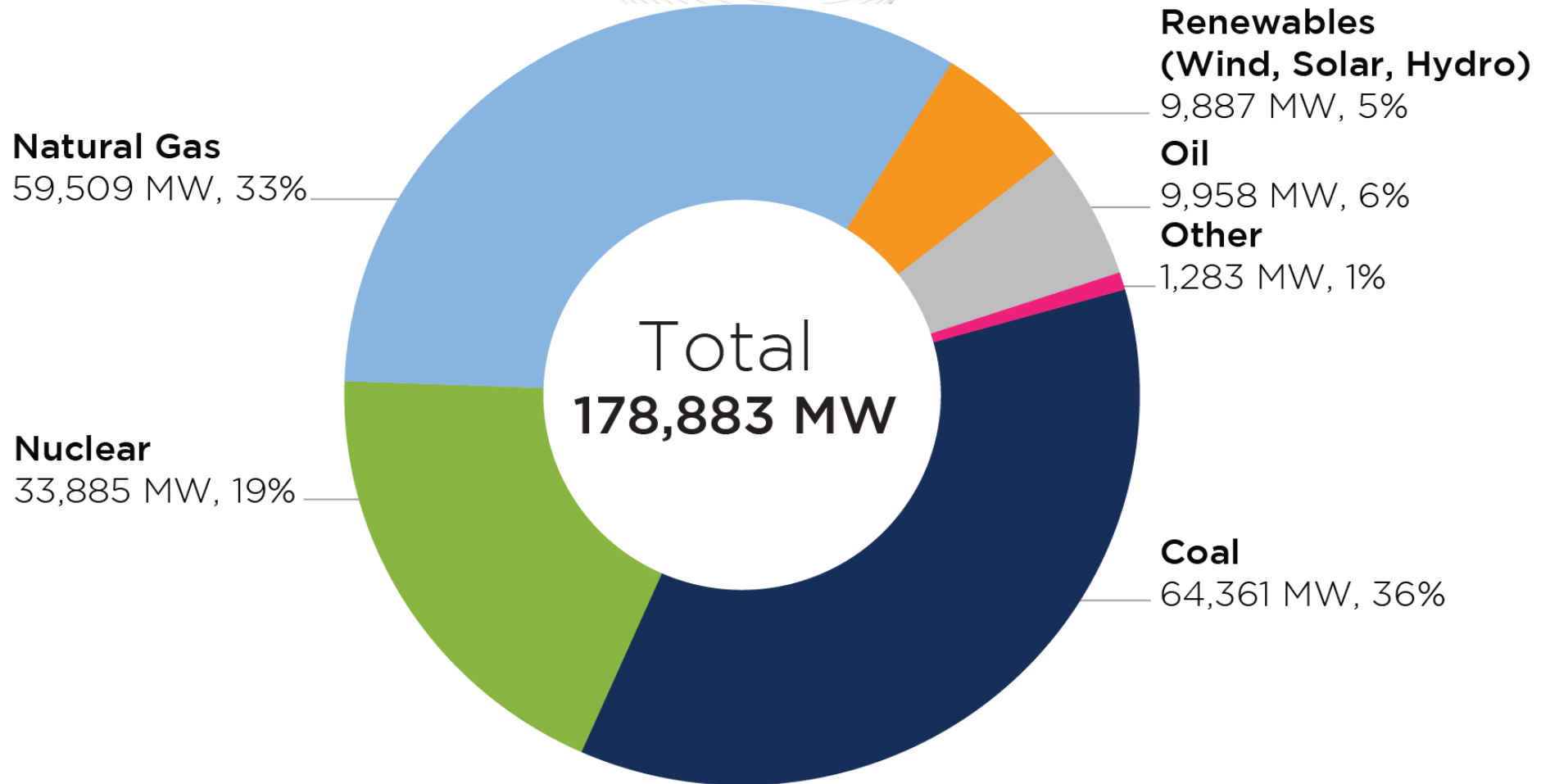
2015 / 2016 Winter Readiness

Pennsylvania Public Utility Commission Meeting
November 16, 2015

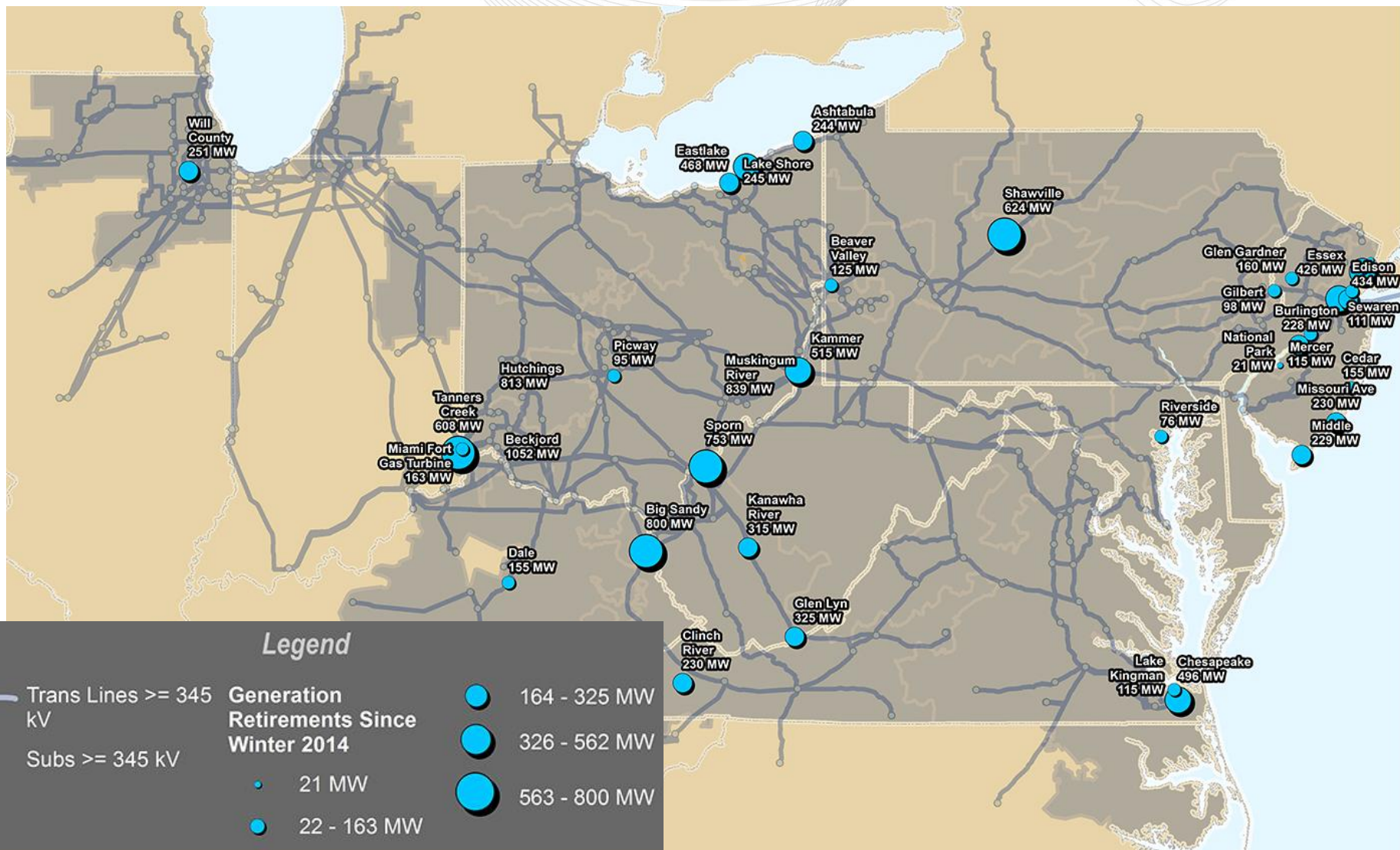
RTO	MW
2015 / 2016 Unrestricted Load Forecast*	131,720
2015 Total Installed Capacity (ICAP)**	177,628

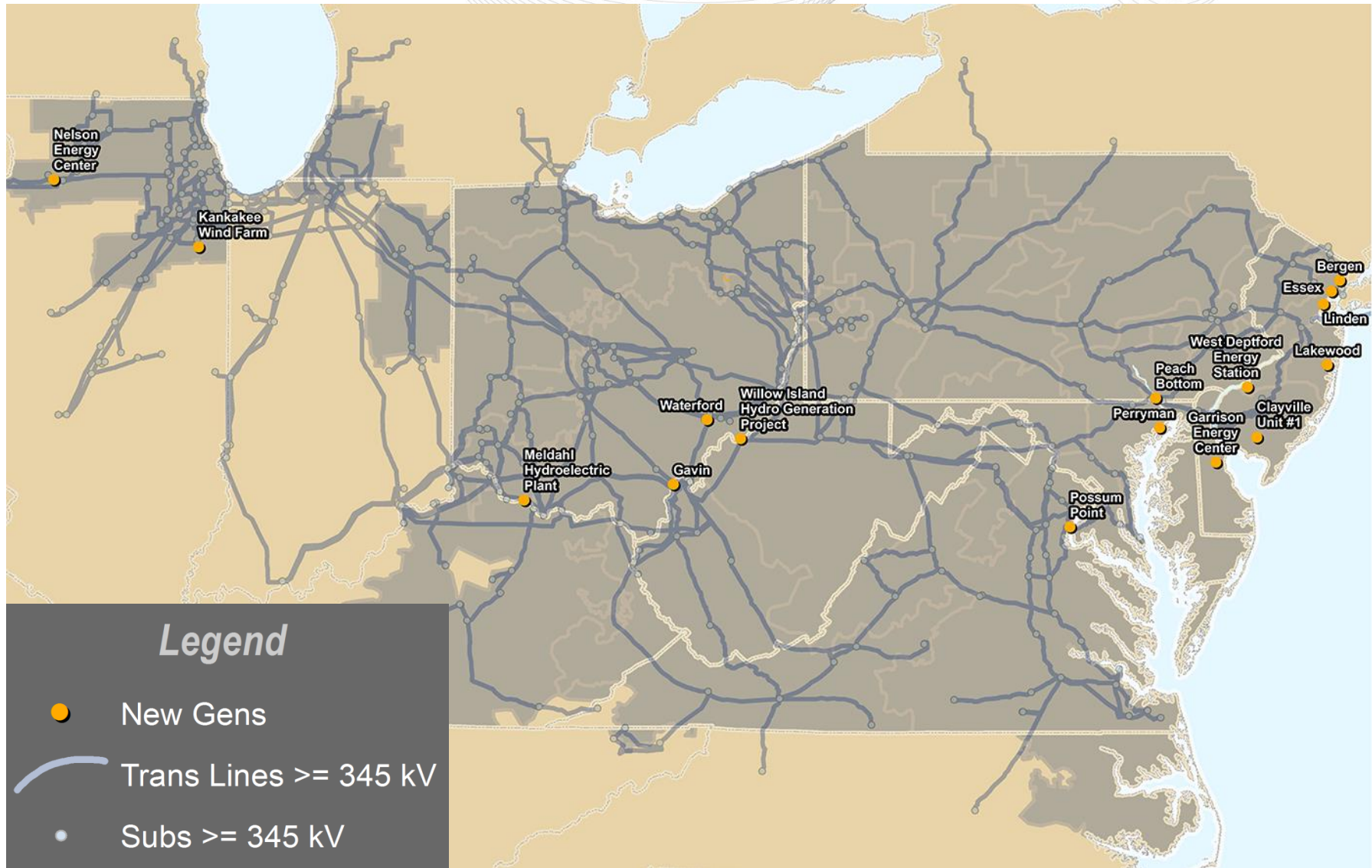
*50/50 PJM Coincident Peak Load. Unrestricted means Demand Response was not subtracted

**ICAP, includes generation internal to PJM (internal RPM / FRR and other internal iron in the ground), external imports to PJM, and Annual DR for 12/01/2015 as of 9/8/2015)



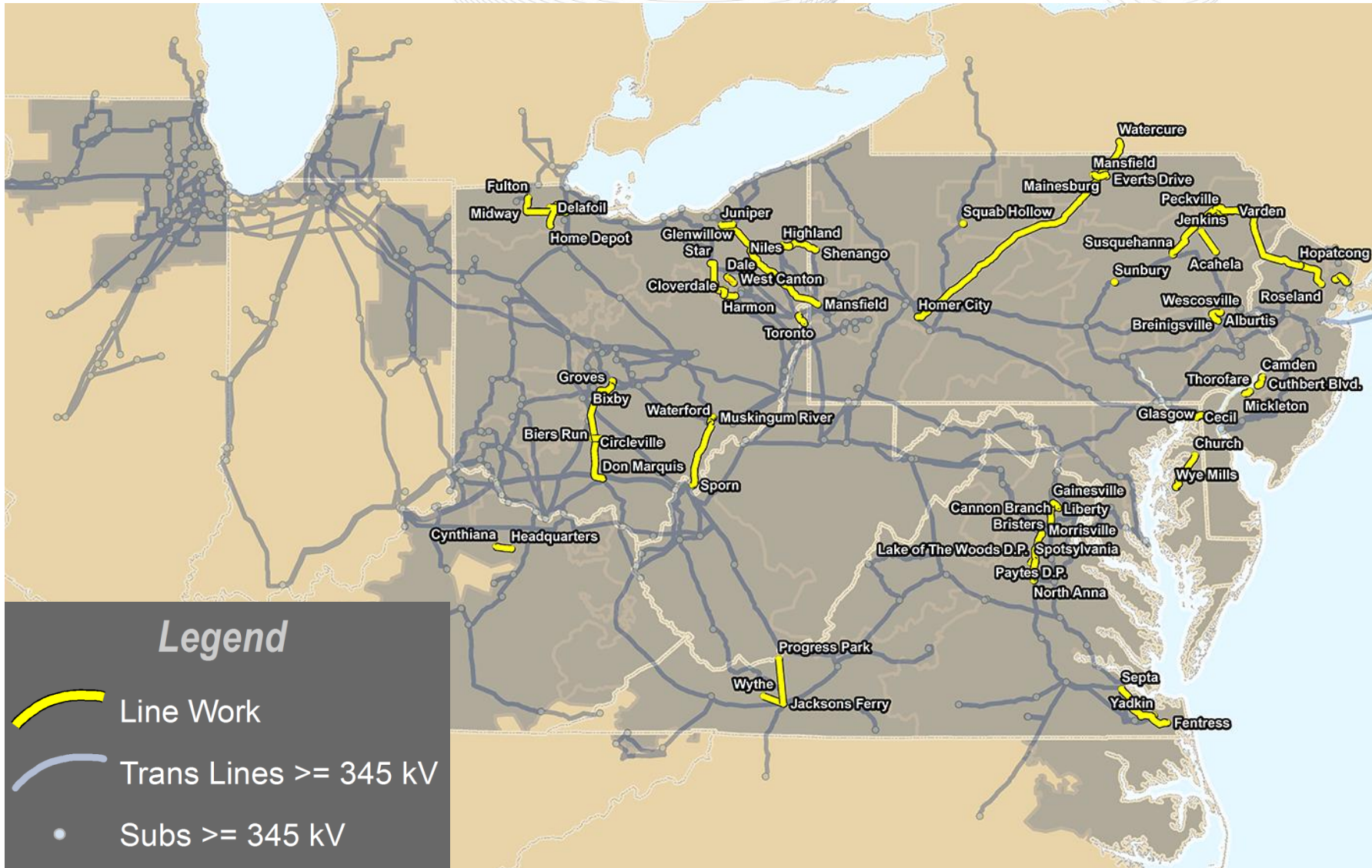
as of 9/2015





Legend

- New Gens
- Trans Lines ≥ 345 kV
- Subs ≥ 345 kV



Peak Load Base Case Study Results

- No reliability problems identified
- Off-cost and switching used to control local thermal and voltage violations in some TO zones
- PJM expects to be able to reliably serve peak load
- No emergency procedures needed to control for base case violations

Peak Load Base Case	
Case Load	135,350 MW* (subject to change as case is re-dispatched)
RTO Net Interchange	7,200 MW (Importing)
PJM RTO Installed Capacity	177, 628 MW* (preliminary as of 9/8/2015)
Discrete Outages	24,124 MW

*Does NOT include Demand Response

Sensitivity Studies

External contingencies that could impact PJM reliability

N-1-1 Relay trip conditions

Max-Cred Contingency Analysis

Transfer Interface Analysis

BGE/PEPCO Import Capability

90/10 Non-Coincident Load Forecast (143,371 MW)
(2014 / 2015 Winter peak was 143,295)

Higher outage amounts (~18% or 32,000 MW)
(7-10% is the average winter forced outage rate)

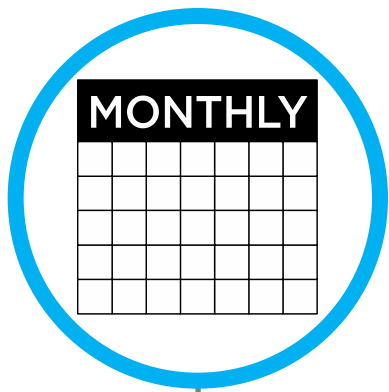
Gas Pipeline Contingency (LDC scenarios, Major Interstate Pipeline Outage)

Sensitivity Study	Impact
External contingencies that could impact PJM reliability	No reliability concerns
N-1-1 Relay trip conditions	No cascading outage concerns identified <ul style="list-style-type: none"> • Majority of the overloads created by radial load, only controlling action is post-contingency load shed • All networked transmission overloads were controlled pre-contingency
Transfer Interface Analysis	No reliability concerns
BGE/PEPCO Import Capability	No thermal limit reached this season
90/10 Load Forecast (143,371 MW)	No reliability issues were identified

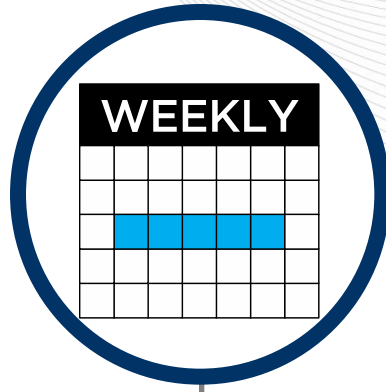
- Loss of each Local Distribution Unit (LDC)
 - No major reliability concerns

- Outage of three major interstate natural gas pipelines
 - Large number of thermal and voltage violations
 - Controllable pre-contingency
 - Post contingency local load relief (PCLLRW)

Pipeline	Generation	Area
Transcontinental Pipeline (Transco)	~ 13,252 MW	New Jersey, Delaware and the Philadelphia
Texas Eastern Pipeline (Tetco)	~ 13,714 MW	Eastern Pennsylvania and Northern New Jersey
Columbia Gas Transmission (Columbia)	~ 10,800 MW	Ohio, Pennsylvania and Virginia

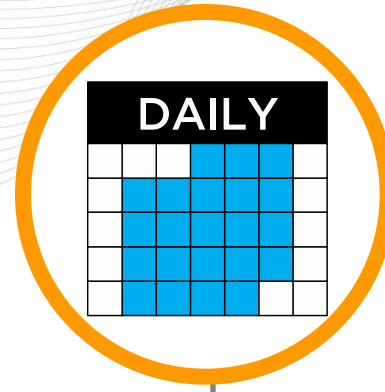


Monthly coordination of gas and generator planned maintenance between PJM and the pipelines



Weekly or as needed conference calls with interstate pipelines will commence starting Nov. 1 through Mar. 1

- Weekly peak load forecast
- Projected gas usage
- Forecasted system conditions
- Forecasted pipeline conditions



Daily review of gas nominations by PJM scheduled generators will start Nov. 1

Daily review of Gas Electronic Bulletin Boards (EBBs) for critical notices potentially impacting generation in the footprint



Ongoing PJM, MMU, and Pipeline MOU discussions

PJM Studies, Data Requests & Drills

PJM Operations Assessment Task Force (OATF) Winter Operations Study (Nov. 2015)

Resource Winter Testing Exercise (Nov. 2015- Jan. 2016)

PJM Emergency Procedures Drill (Nov. 10, 2015)

Fuel Inventory Survey (Nov. 2015)

Generation owner Cold Weather Resource Preparedness Checklist (Dec. 15, 2015)

Reliability Coordinator Winter Preparation Meetings

PJM / DEP / VACAR (Sept. 30, 2015)

SERC Operating Committee / SERC RCS / VACAR (Oct. 2015)

Reliability First (Nov. 2015)

Joint MISO/PJM/NPCC (Nov. 2015)

NYISO / PJM (Nov. 2015)

TVA / PJM (Nov. 2015)

Completion of EIPC study on Gas / Electric Infrastructure Adequacy

Gas / Electric Coordination

Joint INGAA – Inter-RTO Council Meeting (Oct. 2015)

PJM Winter gas preparation meeting (October 26 & 27, 2015)

MOU with PJM Pipelines signed July 2015

Daily, Weekly, Monthly, and Seasonal Coordination with Pipelines in PJM footprint

LDC outreach in progress