

PJM Winter Preparedness



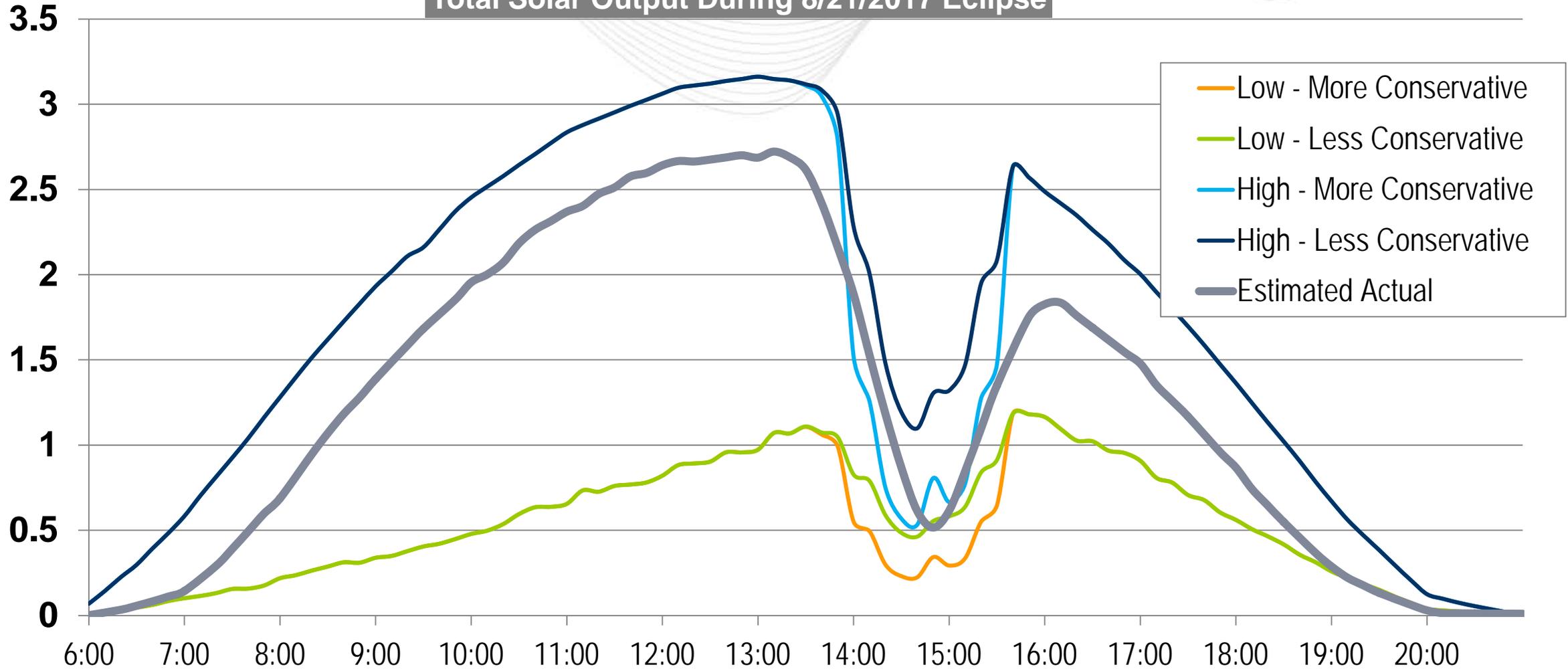
Illinois Commerce Commission
October 25, 2017
Kenneth S. Seiler, Executive Director
System Operations
Rich Mathias, Manager State
Government Policy

Preparedness for August 21, 2017 Solar Eclipse

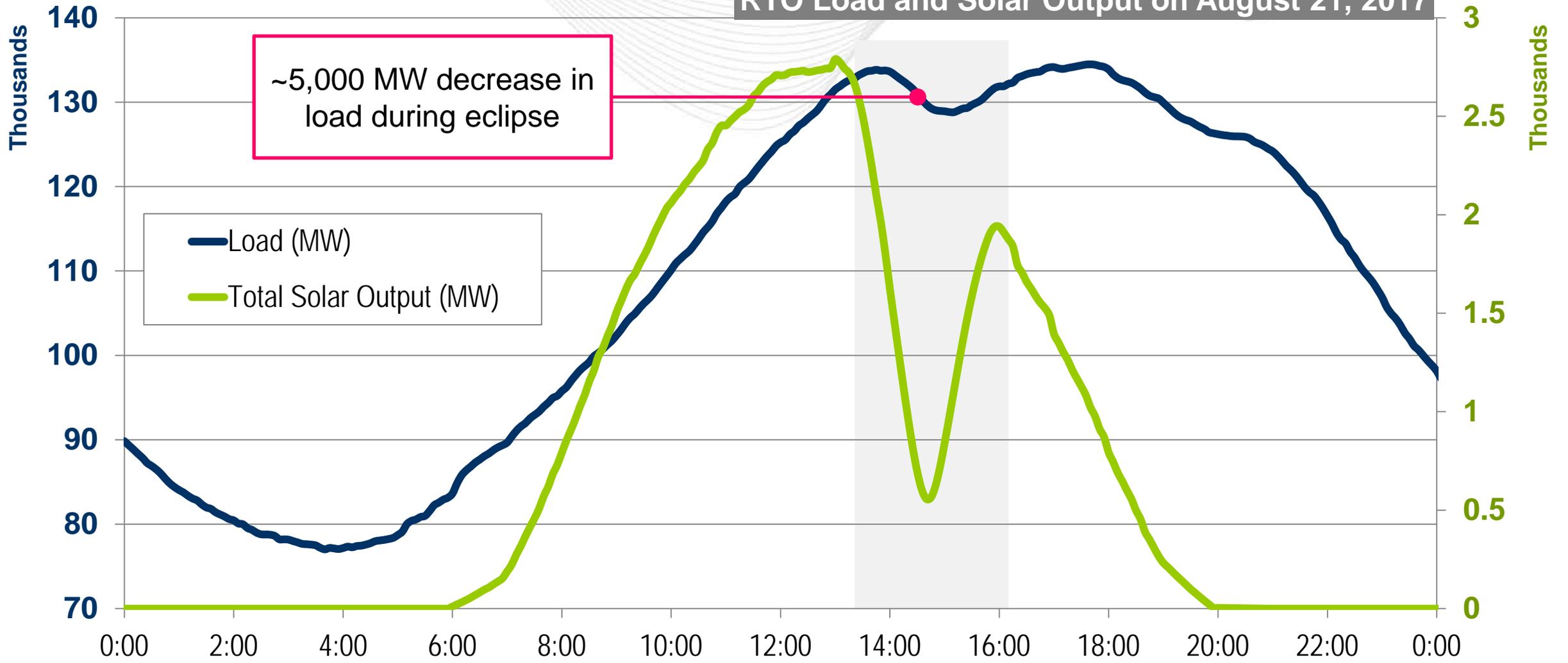


Thousands

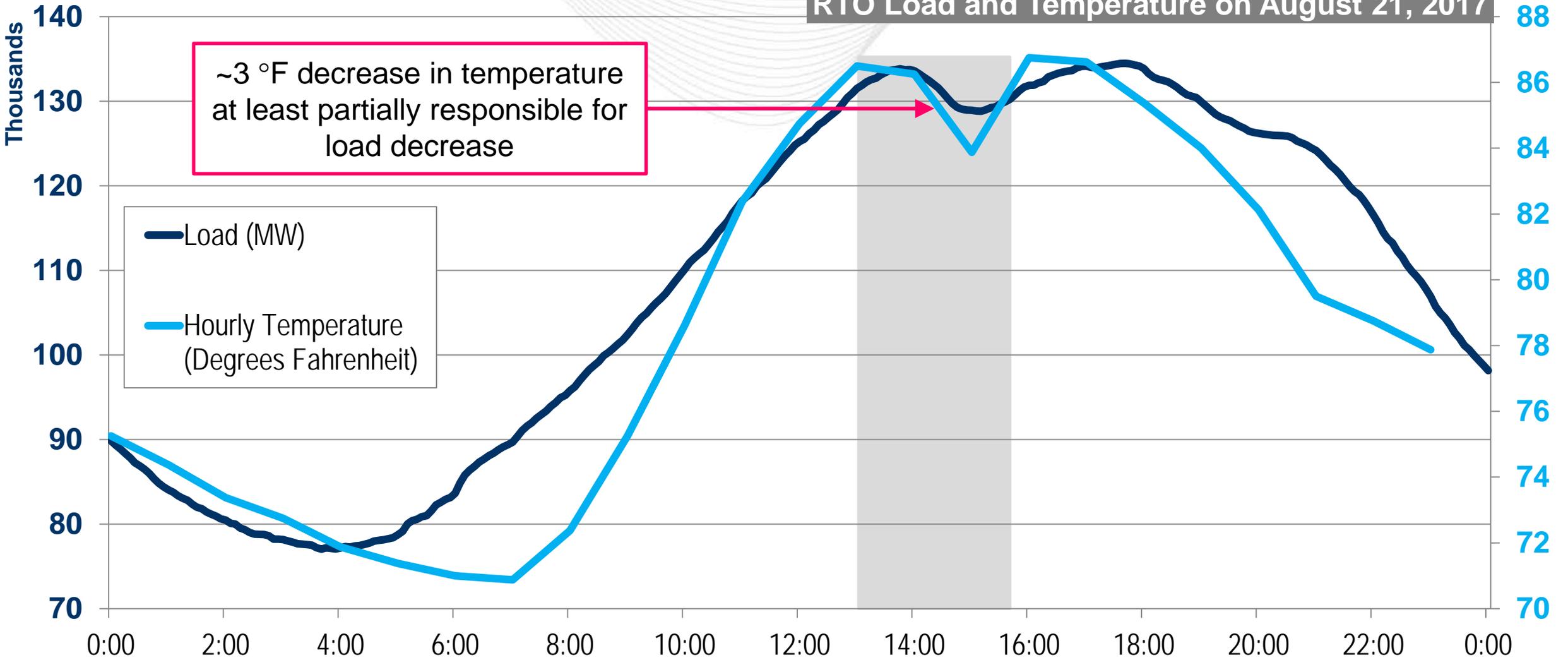
Total Solar Output During 8/21/2017 Eclipse



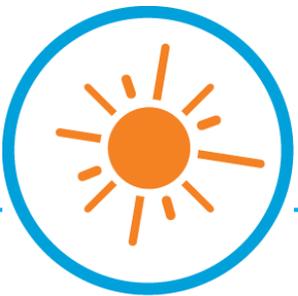
RTO Load and Solar Output on August 21, 2017



RTO Load and Temperature on August 21, 2017

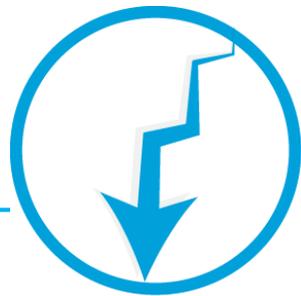


Projections of solar output during eclipse were largely accurate

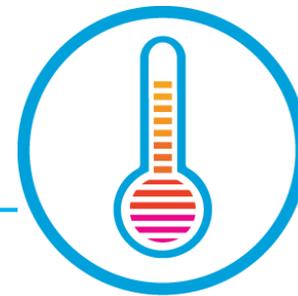


Load decreased by twice amount that solar output decreased

- May be different in 2024 with additional installed solar
- Human behavior is important factor that is not well understood
- Behind-the-meter assumptions will be difficult to verify



Current load forecast models are not trained to reflect significant intra-hour temperature changes



Coordination with forecast vendors is critical





PJM Winter Preparations

PJM Studies, Data Requests & Drills	Reliability Coordinator Winter Preparation Meetings	Gas / Electric Coordination
PJM Operating Analysis Task Force (OATF) Winter Operations Study (Nov. 2017)	PJM / DEP / VACAR (Nov./Dec., 2017)	Joint INGAA – Inter-RTO Council Meeting (Oct. 19, 2017)
Resource Winter Testing Exercise (Dec. 2017)	SERC Operating Committee / SERC RCS / VACAR (Oct. 3-4, 2017)	Daily, Weekly, Monthly, and Seasonal Communications with Pipelines in PJM footprint
PJM Emergency Procedures Drill (Nov. 7, 2017)	Reliability First (Sep. 20, 2017)	Data Sharing Agreements and Communication Protocols with key local distribution companies
Fuel Inventory Survey (Oct. 13, 2017)	Joint NPCC/PJM/MISO (Nov. 9, 2017)	Resilience efforts to: <ul style="list-style-type: none"> Operationalize Gas Infrastructure Contingencies Develop gas pipeline model in conjunction with Argonne Labs
Generation owner Cold Weather Resource Preparedness Checklist (Nov. 1 - Dec. 15, 2017)	NYISO / PJM (Oct. 24, 2017) TVA / PJM (Nov., 2017)	
Increase transparency through enhancements to tools / visualization		

- A weak La Niña is expected to develop, which should lead to a colder winter than last two (2) years.
- Southward shifts in the polar vortex, cause unusually cool weather this past August. If this trend continues, the risk of periods of arctic cold will be greater.
- Precipitation above average for the Great Lakes region and below average to the south.

50/50 Non-diversified Peak Load Base Case

LAS Load Forecast	135,526 MW
RTO Net Interchange	3,950 MW (Importing)
PJM RTO Installed Capacity	184,926 MW
Discrete Generator Outages	16,586 MW

PEAK LOAD ANALYSIS

- No reliability issues identified.
- Re-dispatch and switching required to control local thermal or voltage violations in some areas.
- All networked transmission voltage violations were controlled by capacitors. All other voltage violations were caused by radial load.

IN PROGRESS

- Sensitivity Studies – All results expected October