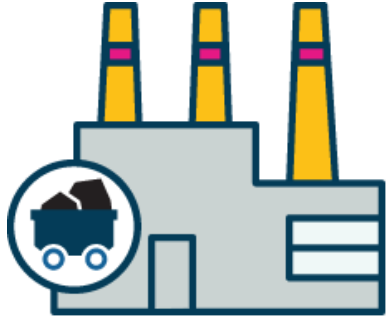




2017 Year in Review

Report on Operations, Markets and Planning

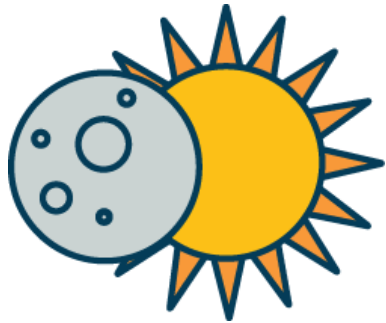
Stu Bresler
Senior Vice President
Operations and Markets



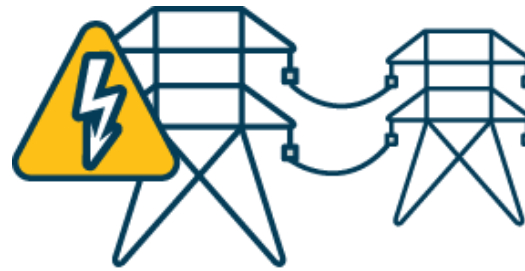
DOE order to run coal-fired Yorktown 1 and 2 units for reliability during Skiffes Creek system upgrades



Cable leaks Hudson-Farragut B-3402 345 kV and Marion-Farragut C-3403 345 kV



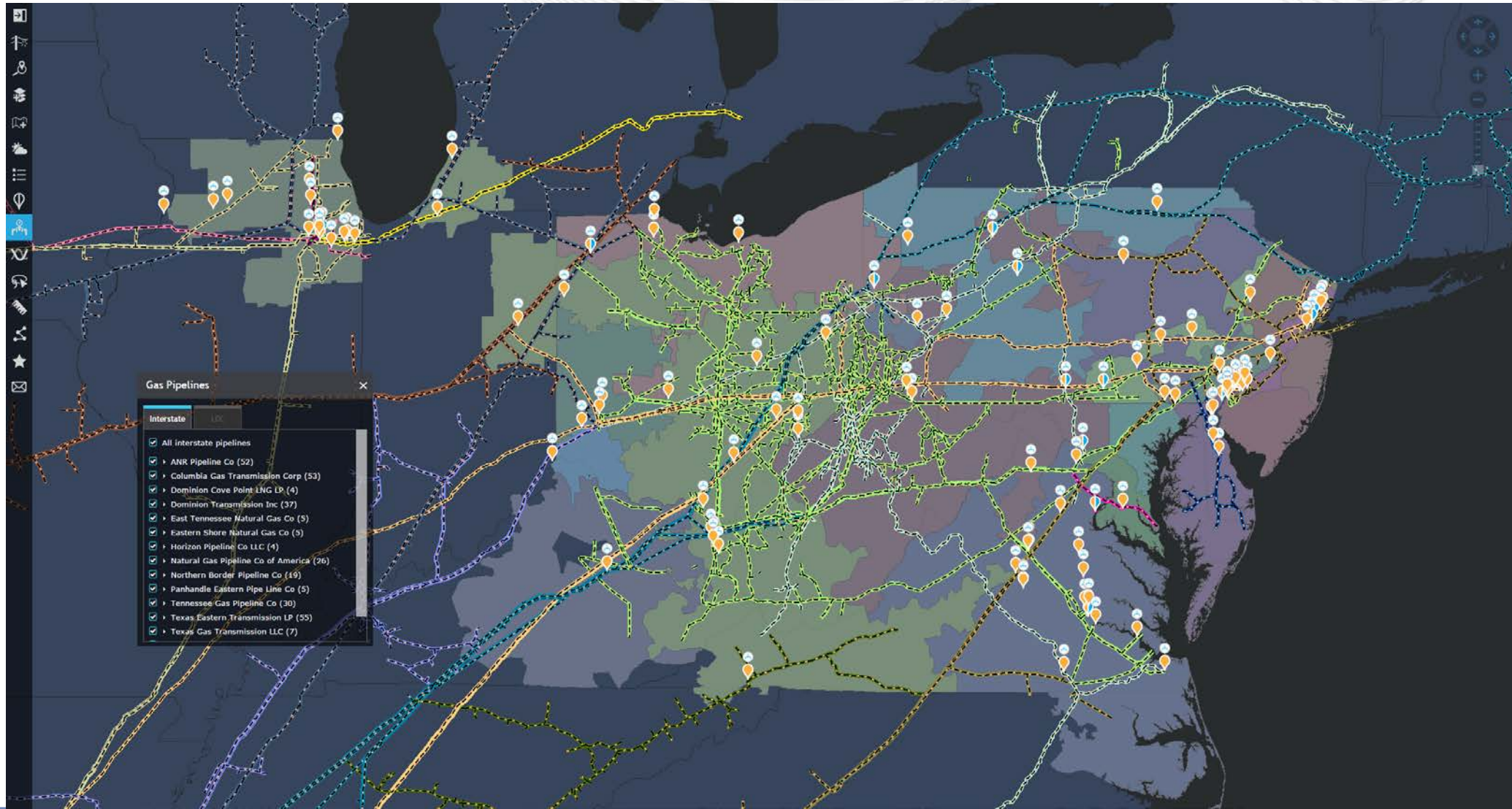
August 21 solar eclipse



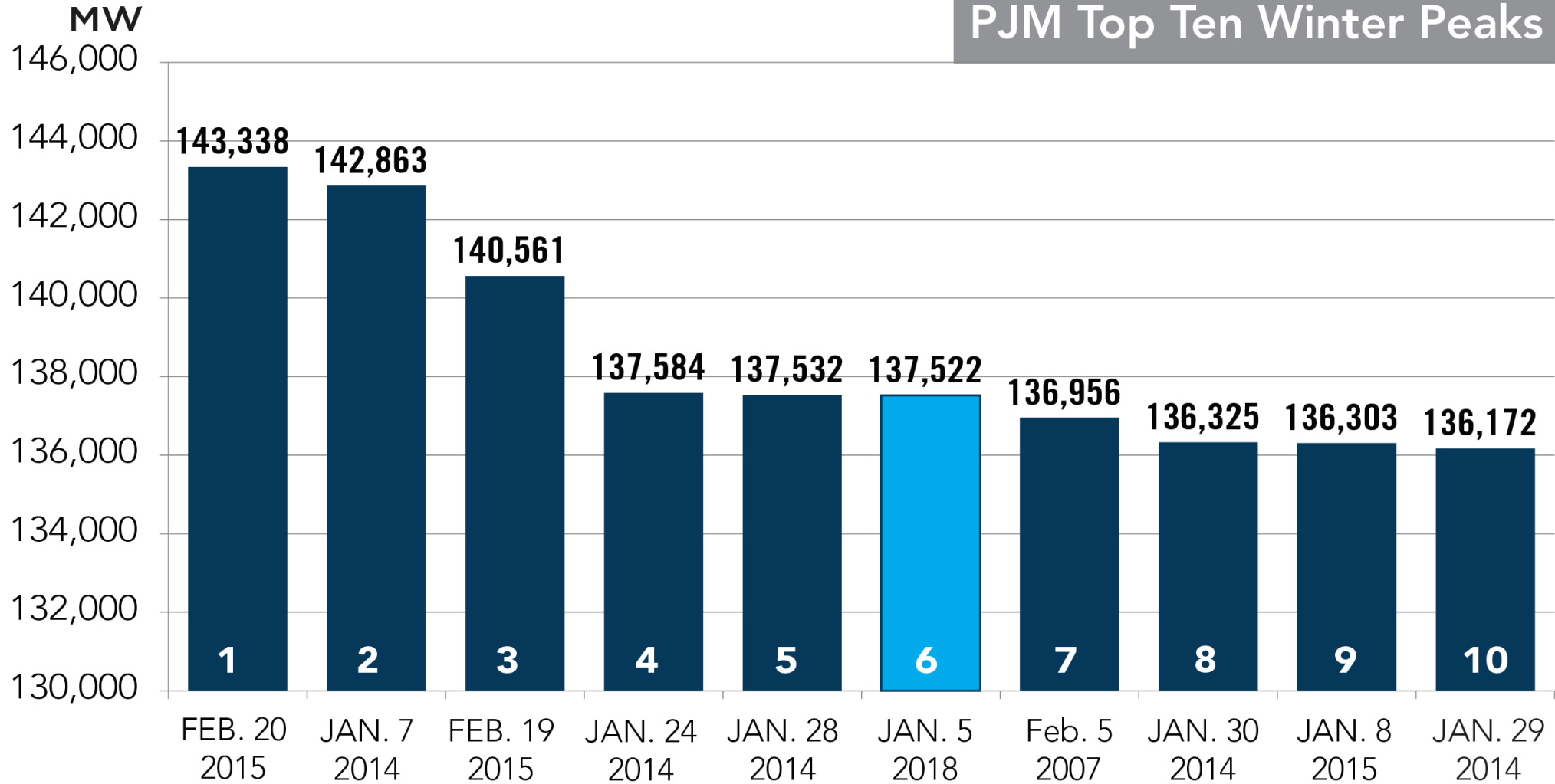
Transient Shortage Pricing for several intervals on September 21



Gas pipeline contingency analysis/operation



PJM Top Ten Winter Peaks



Preliminary data, as of Jan. 31, 2018. This data should not be used as the basis for decision-making.

Total RTO Load with coincident peaks and demand response; 2018 info. is preliminary

Nor'easter #1

March 2, 2018, Storm

- 6–12 inches of snow
- 60 mph sustained winds
- Lost one of the two fiber connections between Valley Forge and Milford
- ~ 1.5 million customers outages
- No transmission system impacts

Nor'easter #2

March 7, 2018, Storm

- 6–12 inches of snow
- Moderate winds
- ~200,000 customer outages (Most in NJ)

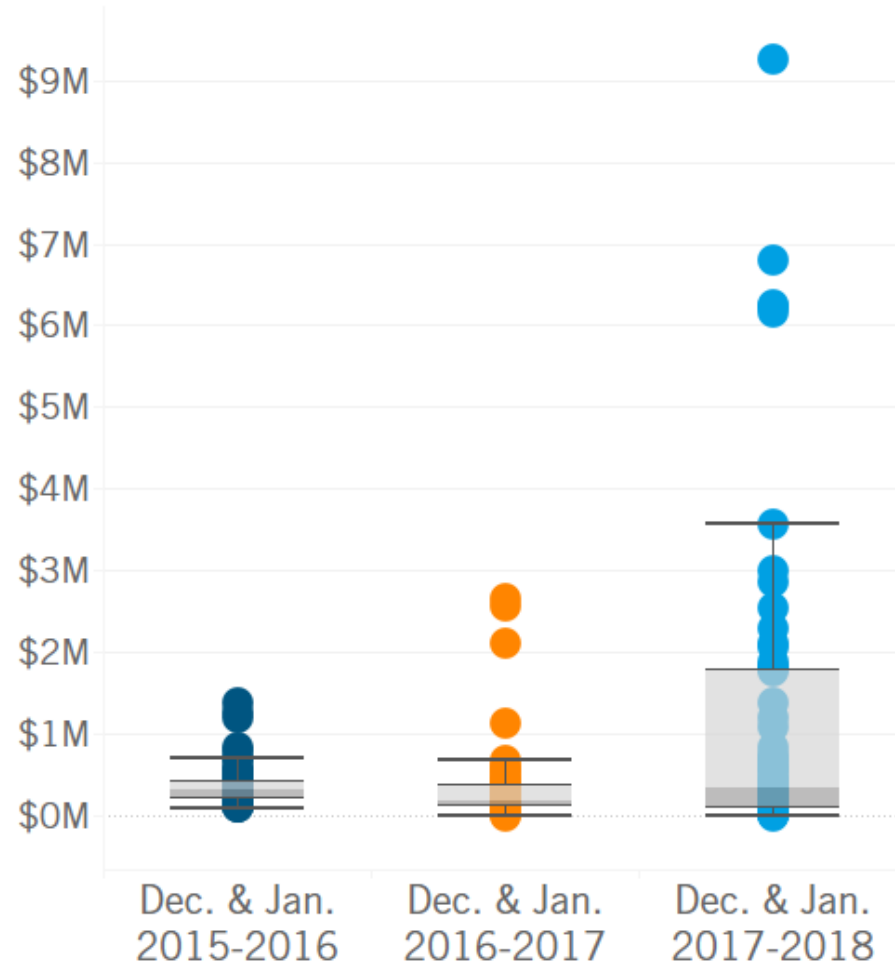
Nor'easter #4

March 21, 2018, Storm

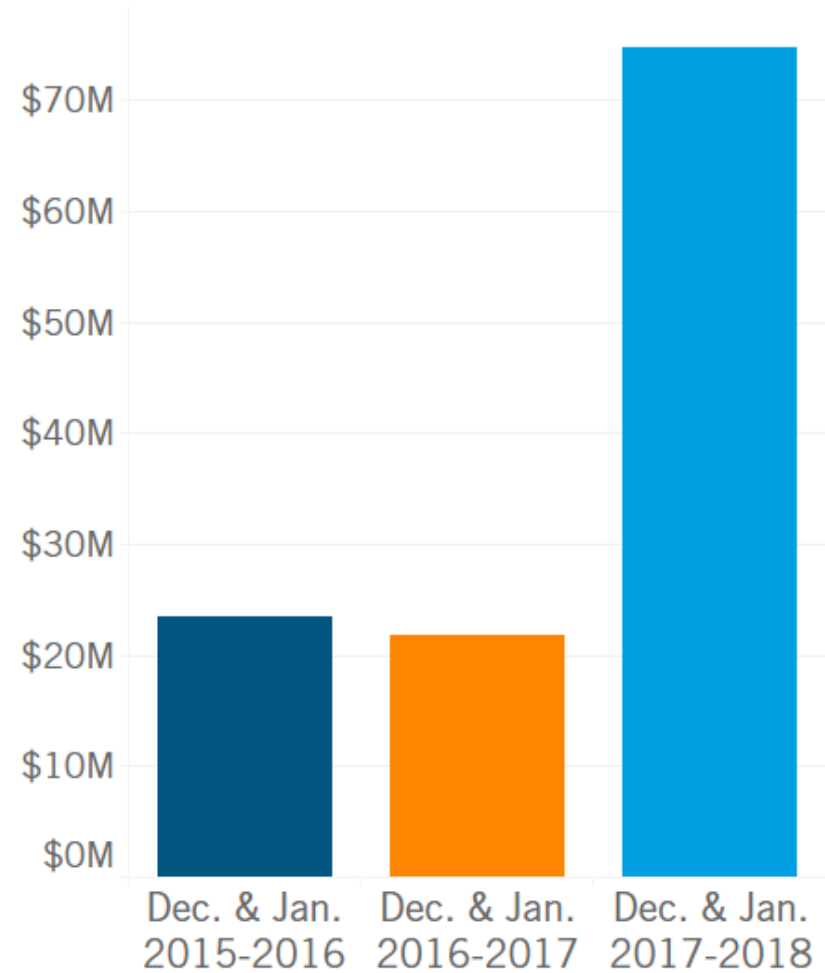
- 6–12 inches of snow
- 80,000 customer outages
 - 71,000 in NJ
- No transmission system impacts

Uplift Distributions and Total Uplift Comparison

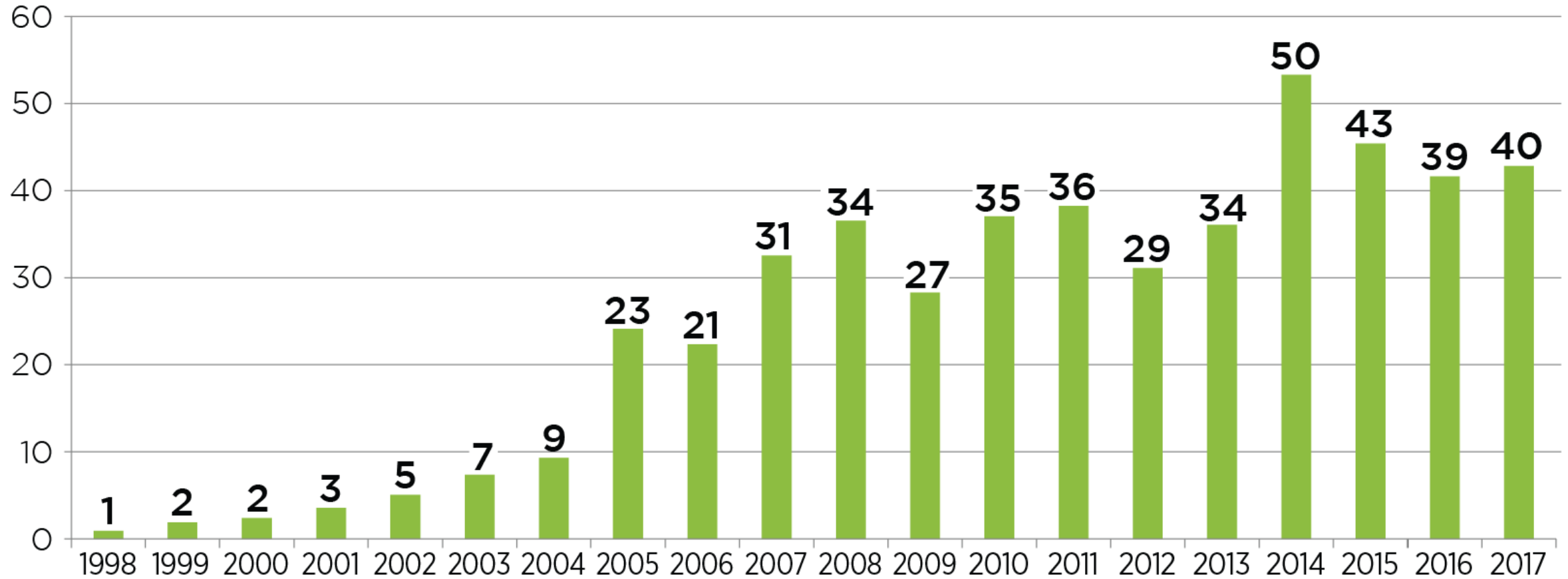
Total Daily Uplift Distributions



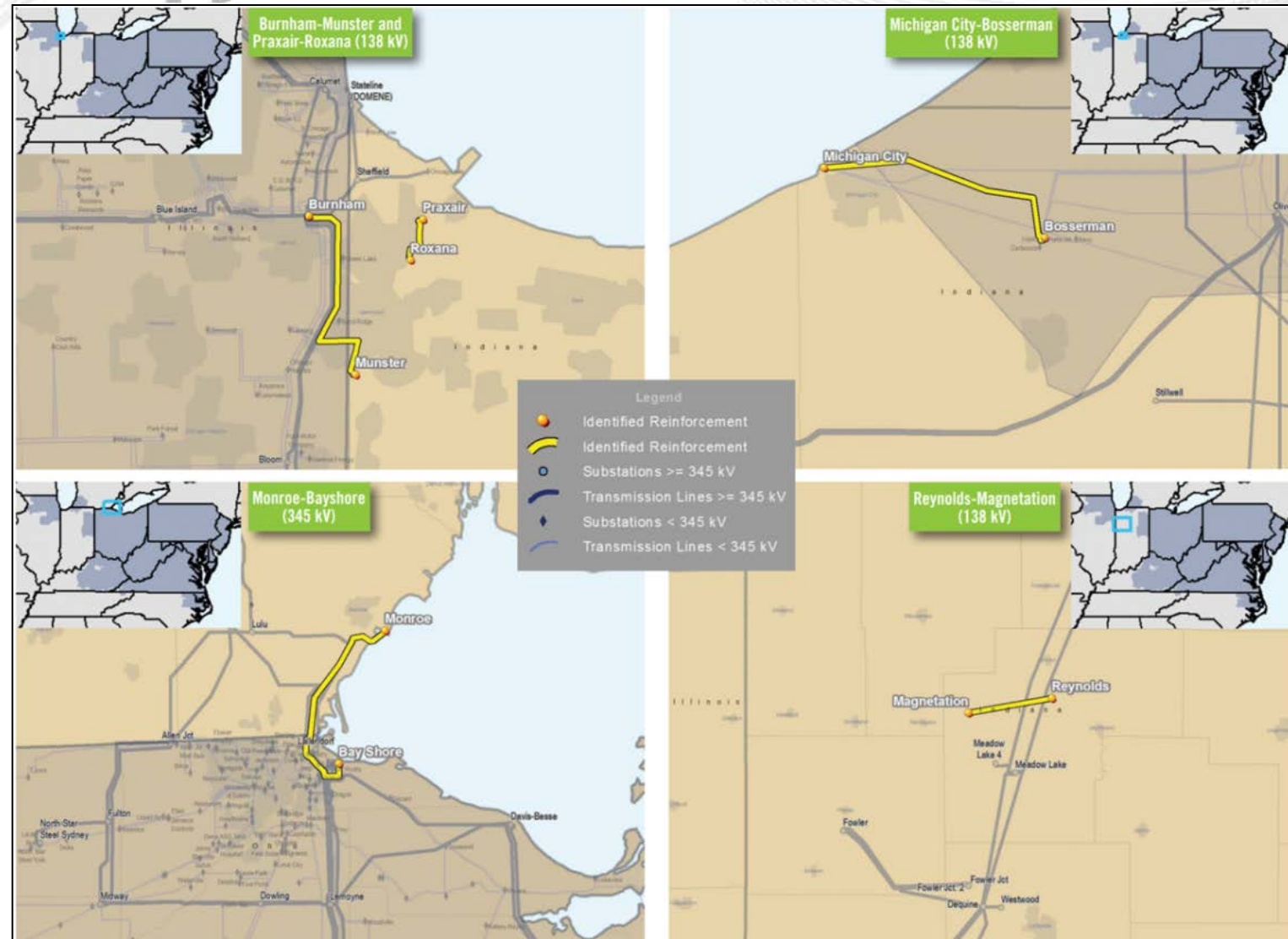
Total Uplift



\$ Billions

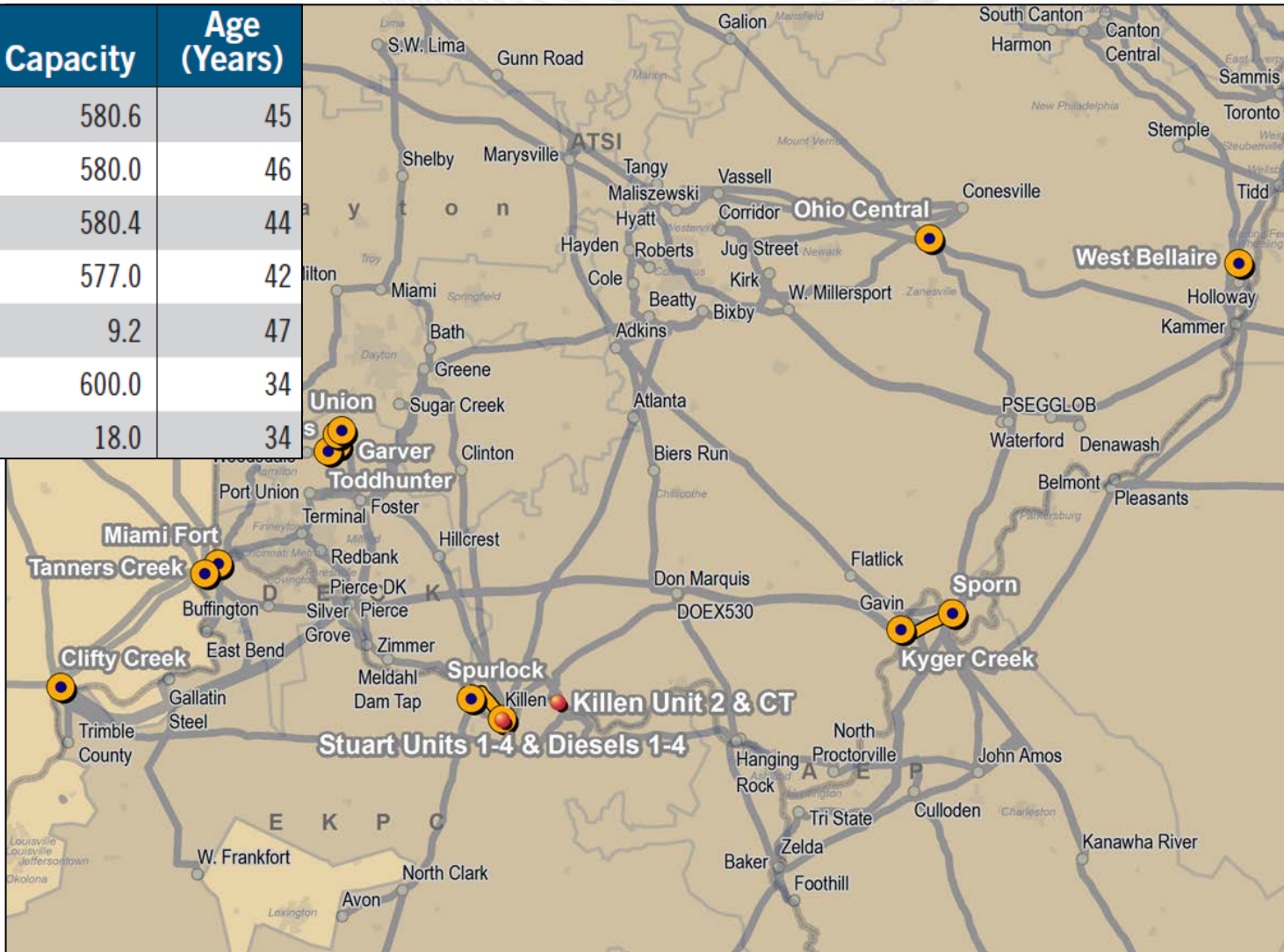


- Evaluated **99 long-term window** proposals addressing market efficiency
 - Four approved projects
 - \$26.2 million of congestion relief
 - \$7.11 million in total project cost
- Evaluated **56 near-term** proposals
 - 190 flowgates; 50 were excluded (immediate need, <200 kV, etc.)
 - Nine approved projects
- 15 generation deactivation studies



- Five TMEPs approved by Board
- First interregional projects approved by PJM and MISO boards
- \$100 million of market-to-market congestion savings over first four years
- Total project cost = \$20.42 million

Unit	Capacity	Age (Years)
Stuart No. 1	580.6	45
Stuart No. 2	580.0	46
Stuart No.3	580.4	44
Stuart No. 4	577.0	42
Stuart Diesels Nos. 1-4	9.2	47
Killen No. 2	600.0	34
Killen Combustion Turbine	18.0	34



Notifications	MW
2017	4,588
2016	2,273
2015	1,626
2014	4,291
2013	7,745
2012	14,444
2011	11,000

Western PJM, 2017

- 2,900 MW
- \$58.3 million in upgrades

- Completed **250+ system** impact studies
- **\$3 billion of new network upgrades**; net \$2.4 billion increase
- 51 queued generation projects – 33 new and 18 uprates: **4,465 MW**
- 12 MISO generation retirement screening studies for PJM impacts

OPERATIONS

- Synchrophasor Enhancements
- PS ConEd Wheel Retirement
- External Resource Pseudo Ties
- Gas/Electric Coordination
- Compliance

MARKETS

- Fuel Cost Policy Reviews
- Hourly Offers
- Voluntary Market Certification
- Decreased Day-Ahead Market Clearing Time
- Demand Response Roadmap
- Shortage Pricing
- Uplift Allocation

PLANNING

- PJM/MISO TMEP Projects
- Queue Point Tool
- New Order 1000 Process Manual
- DEDSTF Minimum Design Standards
- Transmission Cost Information Center
- Solar/Wind Capacity Calculator

POLICY

- Stated Rate Approved
- Mitigated Federal Tax Impacts
- Proposal in PA State Legislature to Tax Virtual Transactions



PJM CONNEXT

- Transpower New Zealand
- Zhejiang, China

OPERATIONS

- Changing Dynamics of the System
- Physical and Cybersecurity Threats
- Three Nor'easters

MARKETS

- Intersection of Public Policy and Markets
- Energy Price Formation
- Gas/Electric Coordination

PLANNING

- Transmission End of Life
- Cost Containment in Competitive Transmission Process
- Distributed Energy Resources in RTEP Process

