



Managing an Evolving Portfolio

Kim Hanemann – Senior Vice President, PSE&G



Agenda

- PSEG / PSE&G Overview
- Electric Transmission & Distribution capital program
- Our evolving portfolio (A view in three phases)
 - Phase 1 (Linear Projects)
 - Phase 2 (Energy Strong 1/System Reinforcement/Transmission Hardening)
 - Phase 3 (Energy Strong 2/Resiliency/End-of-Life Projects/Clean Energy Future)
- Meeting the challenges of an evolving portfolio

A 116 year Newark-based business investing in critical energy infrastructure, providing safe and increasingly clean energy through two strong businesses



Electric & Gas Distribution and Transmission

Strategy: Investments support reliability and customer expectations and are aligned with public policy

Value Proposition: A \$12 Billion - \$14.5 Billion infrastructure program expected to produce 7.5% - 8.5% annual compound rate base growth through 2023

2018

Assets \$31B
Net Income \$1,067M



Regional Competitive Generation

Strategy: Reliable, highly efficient, carbon-advantaged fleet based on nuclear & new combined cycle gas turbines (CCGTs)

Value Proposition: Provides substantial free cash flow and potential market rule improvements

2018

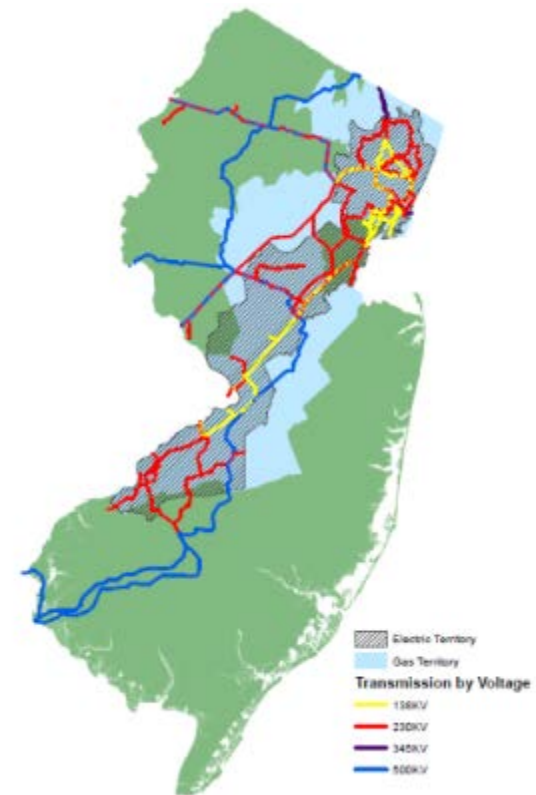
Assets \$13B
Net Income \$365M

PSE&G – New Jersey’s largest:

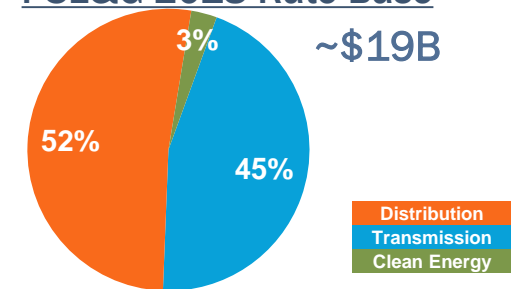
- Electric and Gas Distribution utility
- Transmission business
- Investor in renewables and energy efficiency
- Appliance service provider

	Electric	Gas
Customers	2.3 Million	1.8 Million
5-Year Annual Growth	0.7%	0.6%
2018 Electric and Gas Sales	41,889 GWh	2,630M Therms*
Sales Mix (2018)		
Residential	33%	58%
Commercial	58%	38%
Industrial	9%	4%

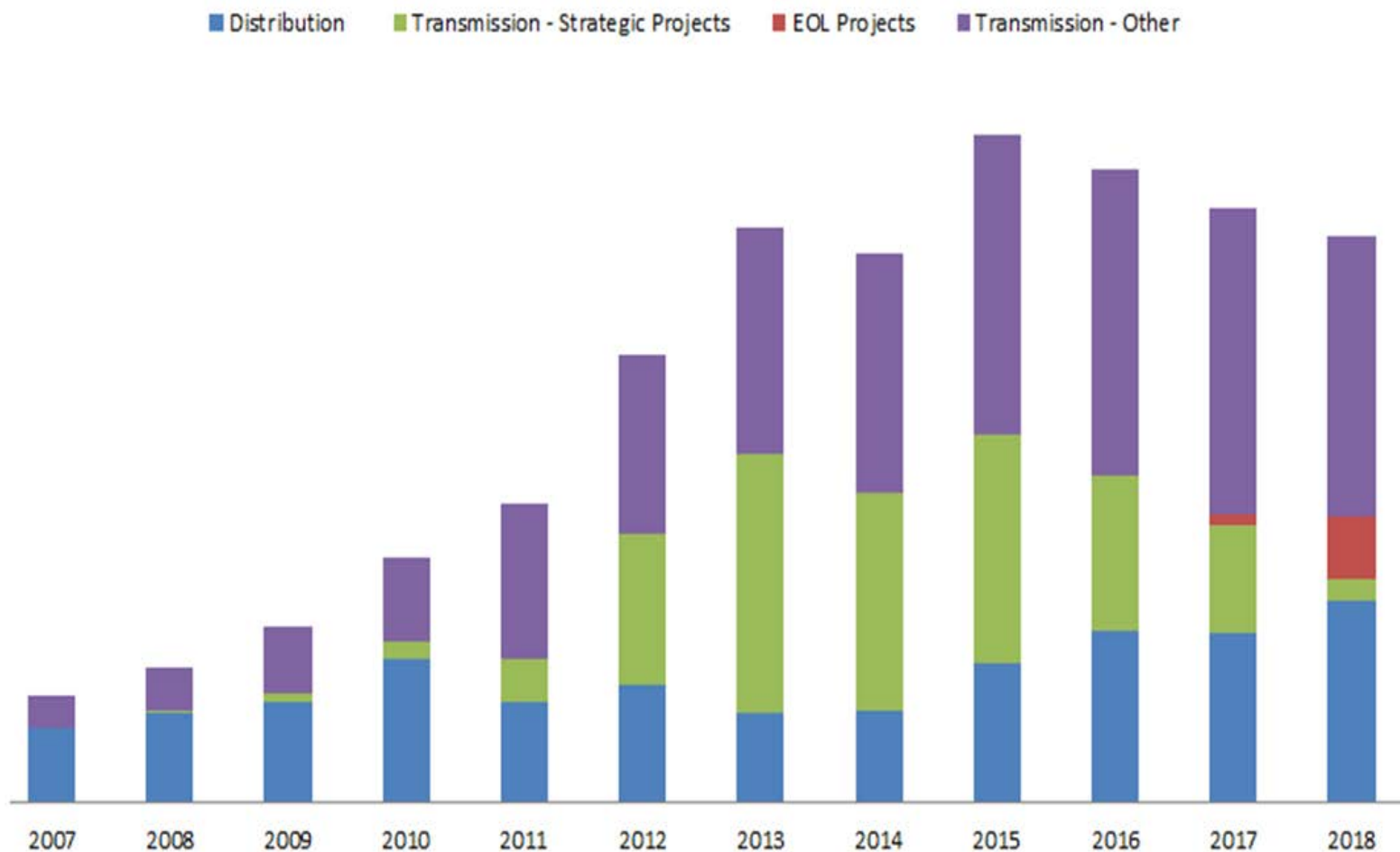
* GAS FIRM SALES ONLY.



PSE&G 2018 Rate Base ~\$19B



Electric Transmission & Distribution's Capital Spending (in \$M)

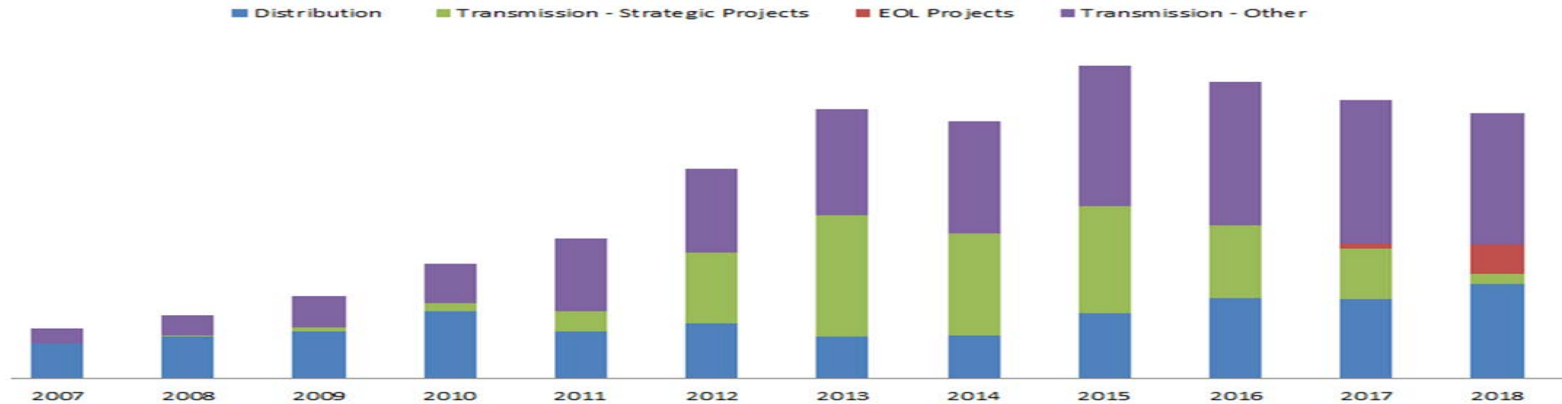


Phase 1 (2007-2014)

Phase 2 (2014-2018)

Phase 1 – Our Forming Years

Electric Transmission & Distribution's Capital Spending (in \$M)



Phase 1 (2007-2014)

- Program management for Large projects
- Augment contractors to help address rapid growth
- Introduction of Project Employee Model to reduce churn
- Two team organizational model
 - Large Strategic Projects
 - Remainder of Portfolio
- Developing core capabilities:
 - Project Management, Construction & Commissioning
 - Outage and Contingency Planning
 - Licensing and Permitting
 - Project Outreach
 - Project Controls & Contract Administration

PSE&G's major Transmission projects were completed on schedule and on budget



North Central Reliability
Completed April 2014



Burlington-Camden
Completed April 2014



Susquehanna-Roseland
Completed May 2015



Mickleton-Gloucester-Camden
Completed June 2015



Northeast Grid Reliability
Completed July 2016

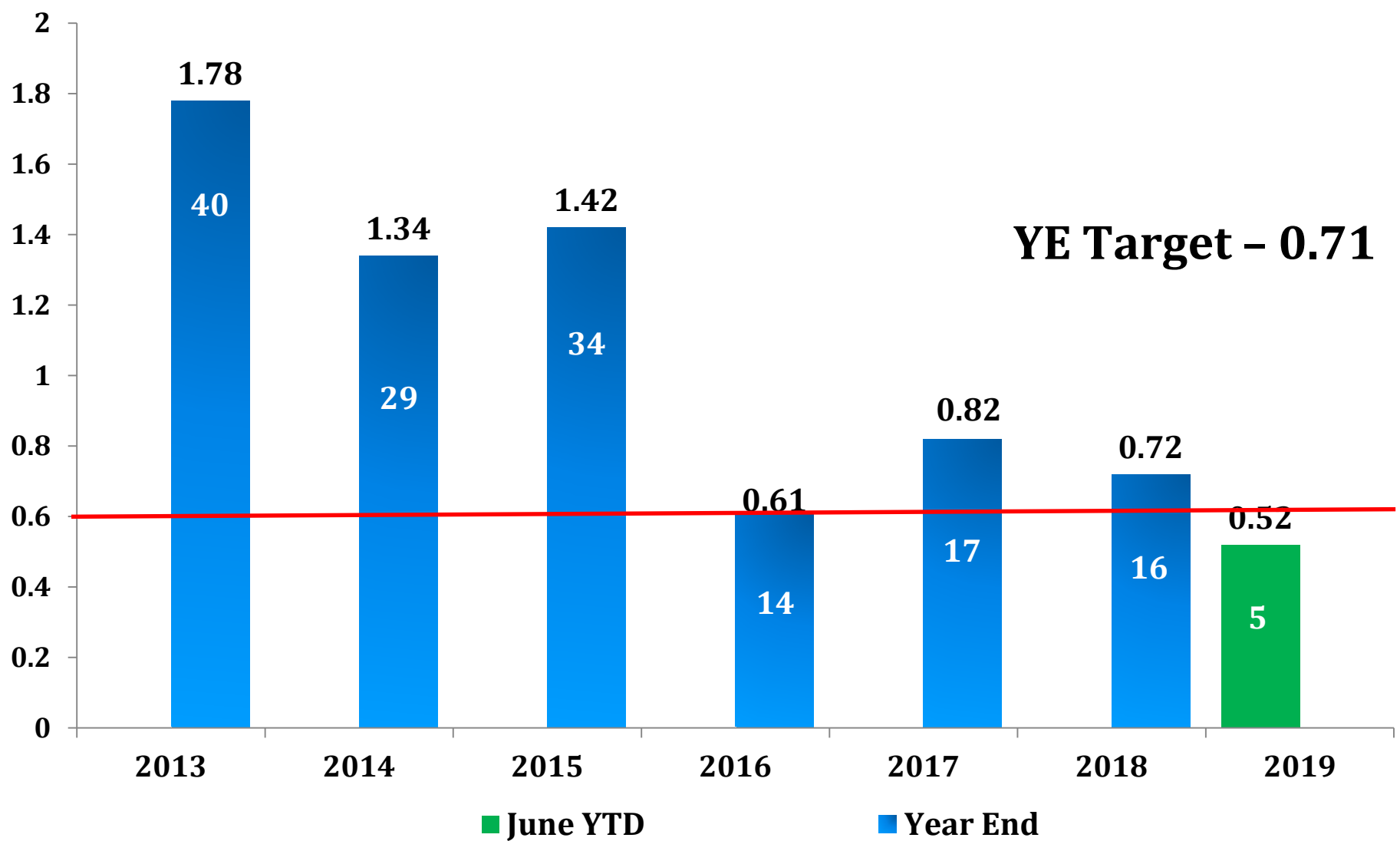


Bergen-Linden Corridor
Completed June 2018

Meeting the challenge of Contractor Safety

- Portfolio is supported by a significant volume of contractor labor
- Safety and reliability-impacting incidents in early years created serious safety, service and reputational impacts
- Multifaceted response to address:
 - State of the Station program
 - Established dedicated contractor safety organization
 - Safety, Reliability & Environmental Assessments
 - Owners' Meetings
 - Quarterly Contractor Meetings
 - Incident Alerts / Lesson Learned reports
 - Supplier Management program

Programs resulted in significant improvement in Electric T&D Contractor TRIR



Phase 2 – The “Mixing Bowl Years”

Electric Transmission & Distribution's Capital Spending (in \$M)



Phase 2 (2014-2018)

- Portfolio transitioning from large linear to smaller resiliency Projects (Energy Strong 1 & Transmission Hardening), 69 kV Program, Large End of Life
- Internal team (Perm & Project) / Contractor Augment
- Mature Mobile Construction Workforce
- Move to geographical organization
- Hone capabilities in
 - Design, Construction Management & Commissioning
 - Construction Sequencing and Contingency Planning
 - Cost and Schedule Control
 - Financial Acumen
 - Governance & Oversight

Improving Resiliency

Physical & Cyber Security

- NERC CIP compliance
- Station security
- Rigorous Cyber Security program
- Building in redundancies to reduce the criticality of key assets



Weather

- Raising/rebuilding stations in flood-prone areas
- Hardening Transmission Assets
- Added enhanced SCADA and Relays to network
- Contingency reconfiguration for critical customers



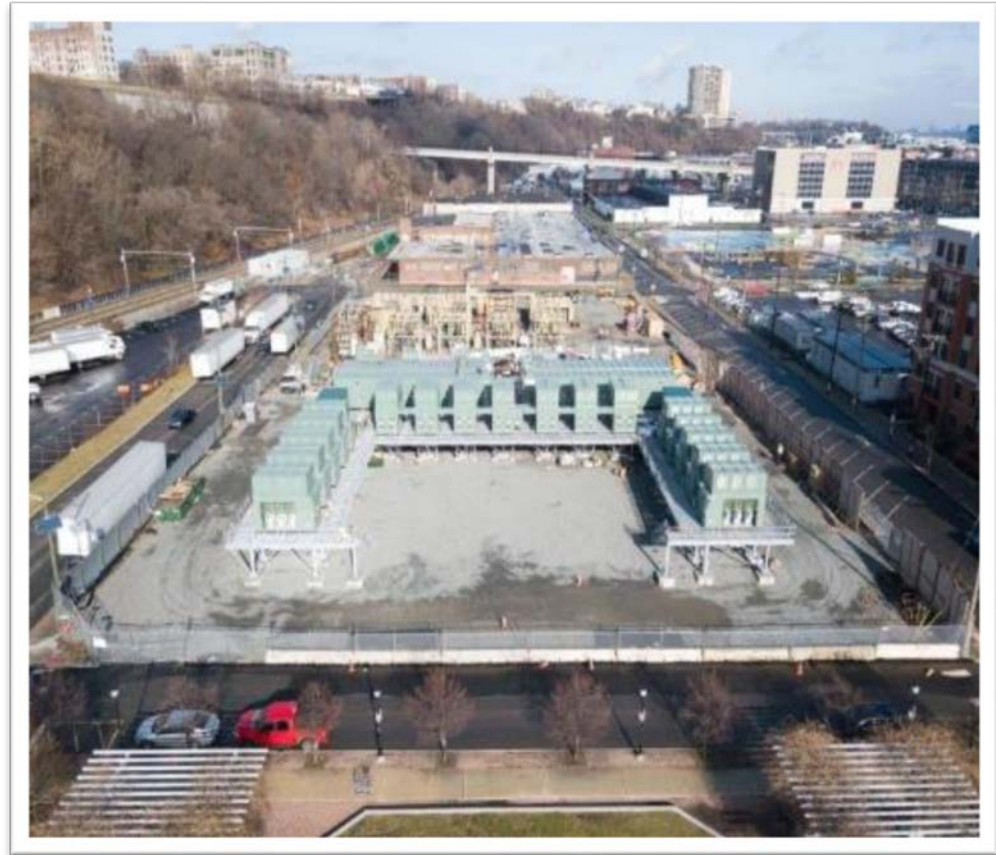
Energy Strong I Program & Transmission Hardening



Sewaren



South Waterfront



Madison

69kV Program

- Conversion from legacy 26kV system to 69kV network to enhance reliability and resiliency while increasing capacity
- 69kV poles are stronger and more resilient
- GIS stations help address space constrained locations



69kV Outside Plant

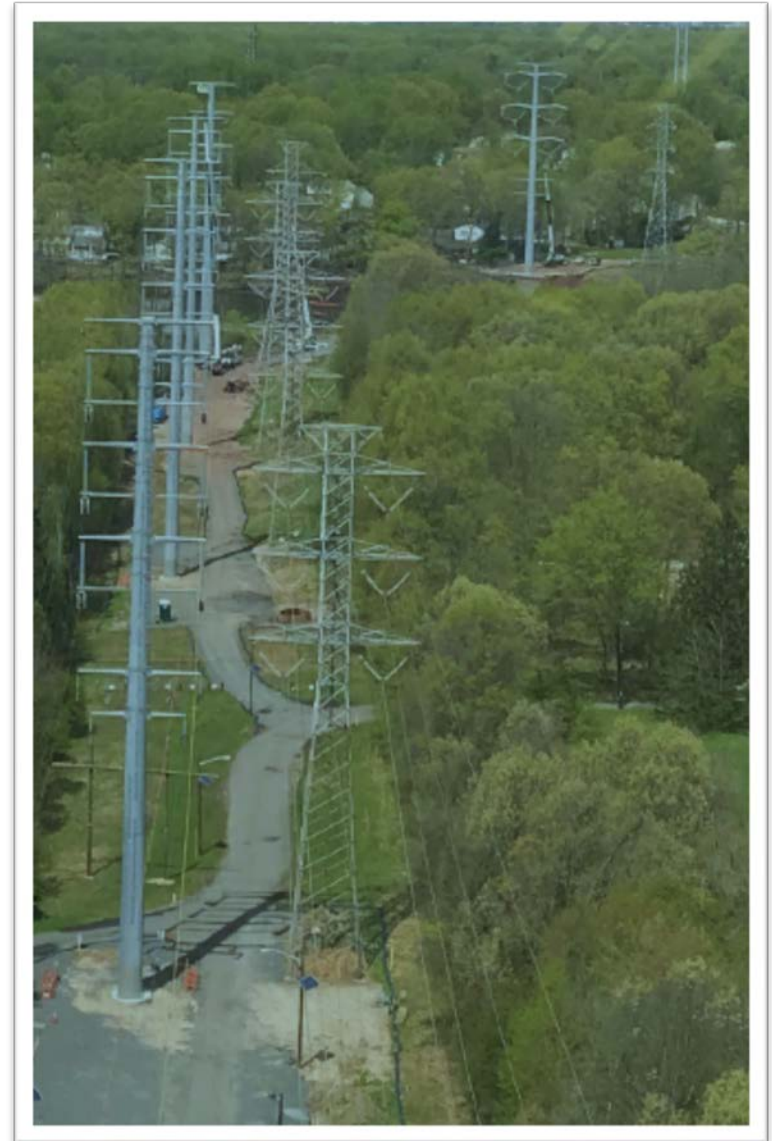


Metuchen-Trenton-Burlington (MTB) Overview

Replace 52 miles of 1920s vintage towers with steel pole line and upgrade line from 138kV to 230kV steel pole line serving 13 stations.

Challenges:

- Narrow ROW
- Construction access
- Property constraints
- Customer/community impacts
- Significant amount of overhead and underground utilities on the ROW
- Encroachments on ROW



PHASE 3 - Transition to Utility of the Future

Phase 3 (2019-2023)

- Mixed Portfolio (69 kV Program, Large End of Life, Energy Strong 2, Clean Energy Future)
- Internal Team (Perm & Project) with Contract Augment
- Mature Mobile Construction Organization supplemented with division workforce
- Dedicated large project team and geographic team for balance of the portfolio
- Further sharpen skills/capabilities in:
 - New Technologies
 - Distribution
- Increased emphasis on employee retention and workforce flexibility

Newark Switch Rebuild Project

Replace vintage 1950's multi story switch station with new building, state of the art 345kV (operated at 138kV) and 26kV GIS, 13kV metal clad switchgear, control room, transformers and enclosure wall.

Challenges:

- Construction in busy urban area serving large customers
- Required property acquisitions including sensitive customers that needed to be 're-homed'
- Zoning Board demanded aesthetically pleasing enclosure wall.
- Sensitive neighbors, including schools, shelter for at-risk teen and DOH
- Construction sequence requires energization of new station then deconstruction of existing stations once cutovers in basement are complete



Future Newark Switch

Energy Strong II

Substation Program



Rebuilding or raising equipment in 16 station located below the local flood elevations
Replacing assets in 4-5 stations that are nearing end-of life

Contingency Reconfiguration Program



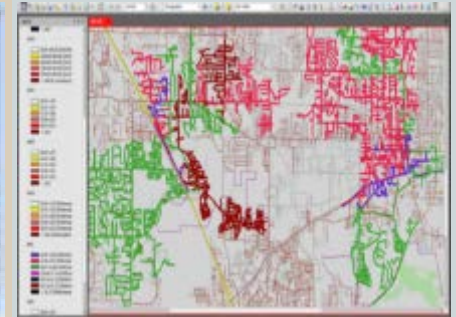
Enhance resiliency via circuit improvements:
Increased automation and sectionalizing
Added automation (Reclosers) on 4kV
Reclosing devices to replace fuses

Stipulated Base



Outside plant spacer cable on poor performing circuits.
Station Life Cycle —
Replacing assets that are nearing their end-of-life.





Grid Modernization



Advanced Distribution Management System (Storm Damage Assessment & Work Prioritization)

Fiber & Wireless Communication

Clean Energy Future Filing

Energy Efficiency (EE)	Electric Vehicles (EV)	Energy Storage (ES)	Energy Cloud (EC)
			
Programs for Residential and C&I Customers including low-income, multi-family, small business and local government	Residential Smart Charging, Level 2 Mixed-Use Charging, Public DC Fast Charging, Vehicle Innovation	Solar Smoothing, Distribution Deferral, Outage Management, Microgrids, Peak Reduction for Municipal Facilities	Provides new software and product solutions to improve PSE&G processes and better manage the electric grid

Meeting the Challenges of a Changing Portfolio

- Community engagement to overcome opposition
- Addressing Real Estate constraints
- Navigate PJM's rigorous review and approval process
- Address Workforce Challenges

Community Engagement to Mitigate Resistance

Stakeholder Concerns

- 69kV stations and pole lines often located in or near residential areas or busy commercial districts
- Work is disruptive and causes temporary traffic challenges
- Taller poles/higher voltages raise concerns about health and neighborhood aesthetics

NO MONSTER POWER LINES



Stakeholder Engagement

- Proactive outreach early in project timeline
- Comprehensive advanced communication with stakeholders (municipal officials & affected customers)
- Coordinated response (project team, outreach, media relations, etc.) to negative publicity
- Involve community and other stakeholders in enhancing station aesthetics

McCarter Switch at Fairmount Heights

Stakeholder resistance led City of Newark to deny initial site plan

PSE&G appealed to the BPU

BPU encouraged negotiated settlement

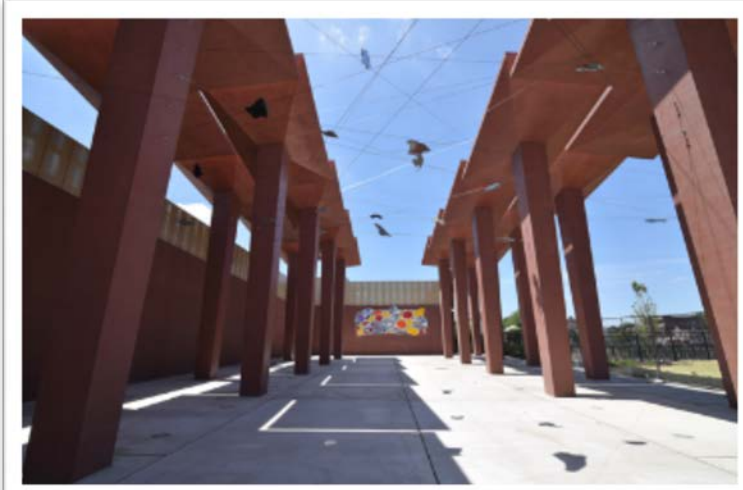
PSE&G reached settlement with City of Newark, the Fairmount Heights Neighborhood Association (FHNA) and other stakeholders

As part of the settlement, PSE&G:

- Agreed to design, procure and construct an architectural screening wall
- Engaged renowned architect to design the wall.
- Hired 14 local and international artists to provide artwork for the wall
- Deeded property not needed for the station to the city



McCarter Switch at Fairmount Heights



Newark Switch





Ironbound



Madison

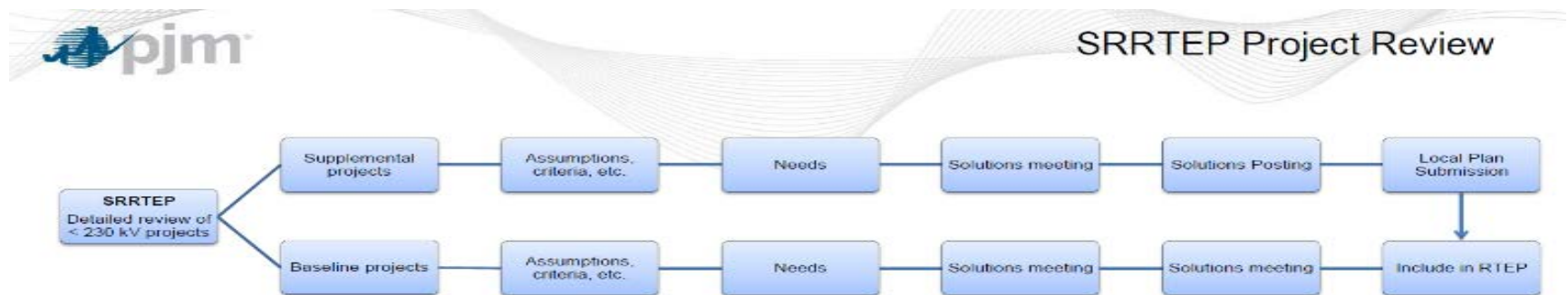
Managing Real Estate Challenges

- New Jersey is a challenging Real Estate market
 - Property is hard to find and expensive
 - Acquiring property much further in advance
 - Condemnation process is lengthy and poses challenges
- Space constraints drive need for more compact designs
- Contingency Requirements (station around a station)



Navigating the PJM Project Review Process

- FERC ruled PJM's review process did not provide meaningful input to stakeholders
- PJM instituted more rigorous process to comply with FERC
 - Annual Assumptions meeting
 - Three-step development process
 - Meeting Conduct requirements



PSE&G's Response

- Refine approach to project origination to address increased stakeholder scrutiny
- More robust alternative solutions review process
- More detailed estimates far earlier in the process

Workforce Challenges

Balancing Resources

- Five year plan varies workload around the state
- Need to deploy resources to where the work is

Workforce Mobility

- Increased turnover (attrition/retirements/resignations) requires focus on retention, on-boarding and position playbooks
- Flexible Work Options to meet changing workforce requirements
- Enhanced Employee development to foster retention

Workplace culture

- Foster culture that embraces diversity & fosters inclusion
- Maintain focus on appropriate workplace behaviors
- Enlist Employee Business Resource Groups (EBRGs) to help solve business challenges (i.e. Flexible Work Options)
- Promote employee volunteerism/community involvement



Questions?