Emergency Preparedness & Resiliency in the Energy Industry

Matthew A. Waldrip, PWS, CESSSWI
Senior Environmental Specialist

Presentation Overview

- Overview of “The Electric Grid”
- Challenges Resulting from Climate Change
- Eversource Climate Adaptation Plan
- Specific Challenges & Project Solutions

Service Territory

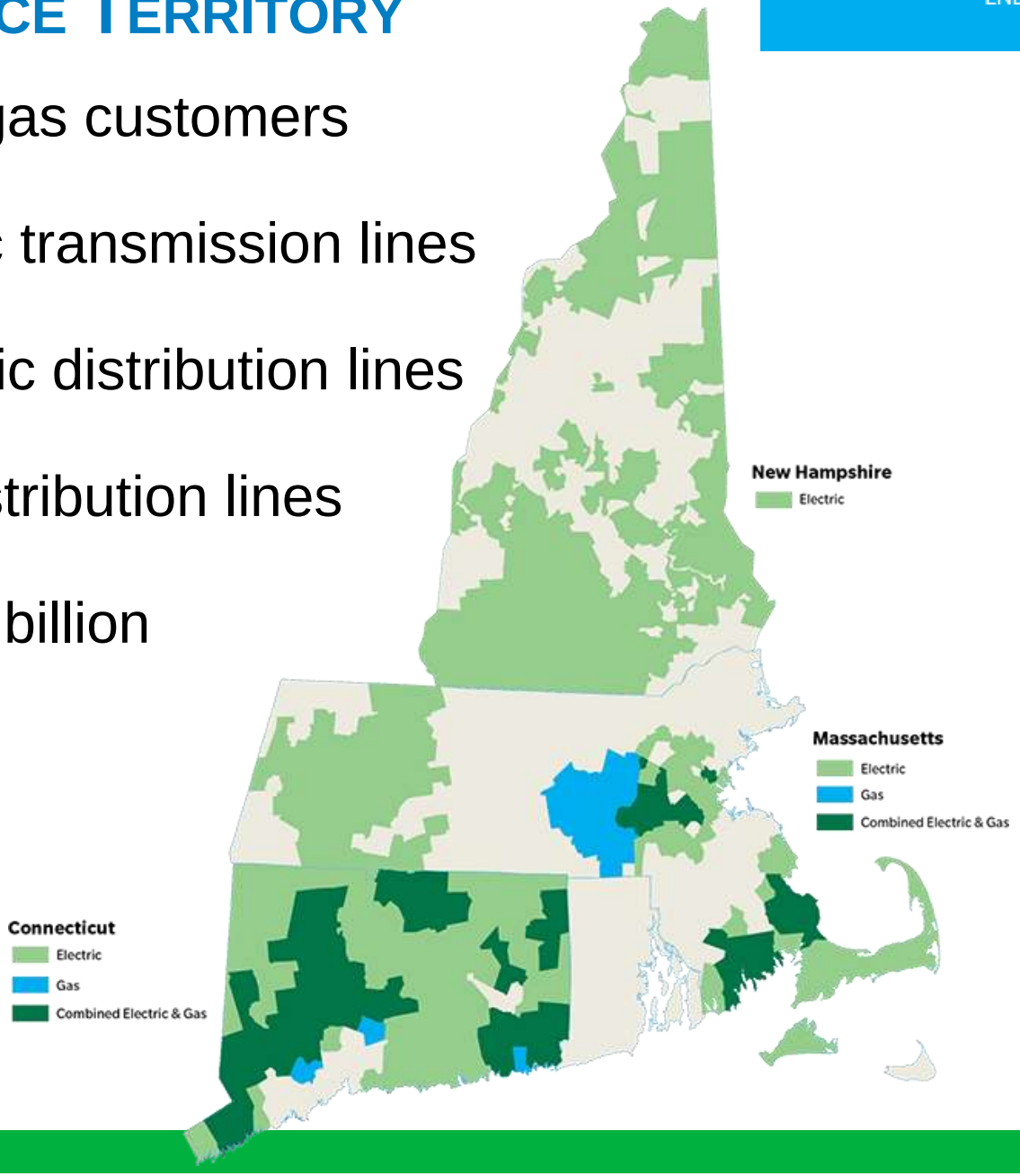
3.5 million electric & gas customers

4,500 miles of electric transmission lines

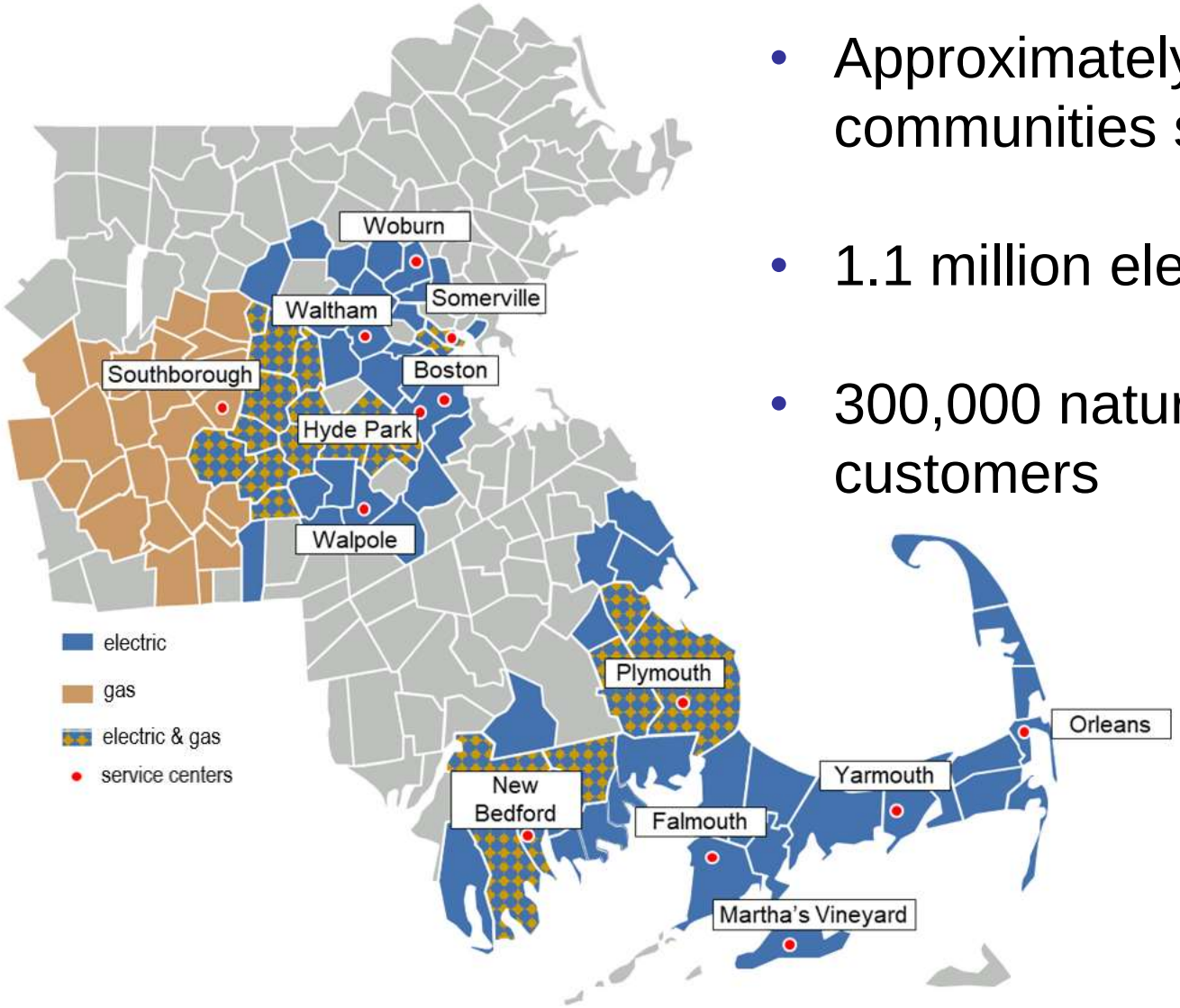
72,000 miles of electric distribution lines

6,000 miles of gas distribution lines

A value of over $16.5 billion

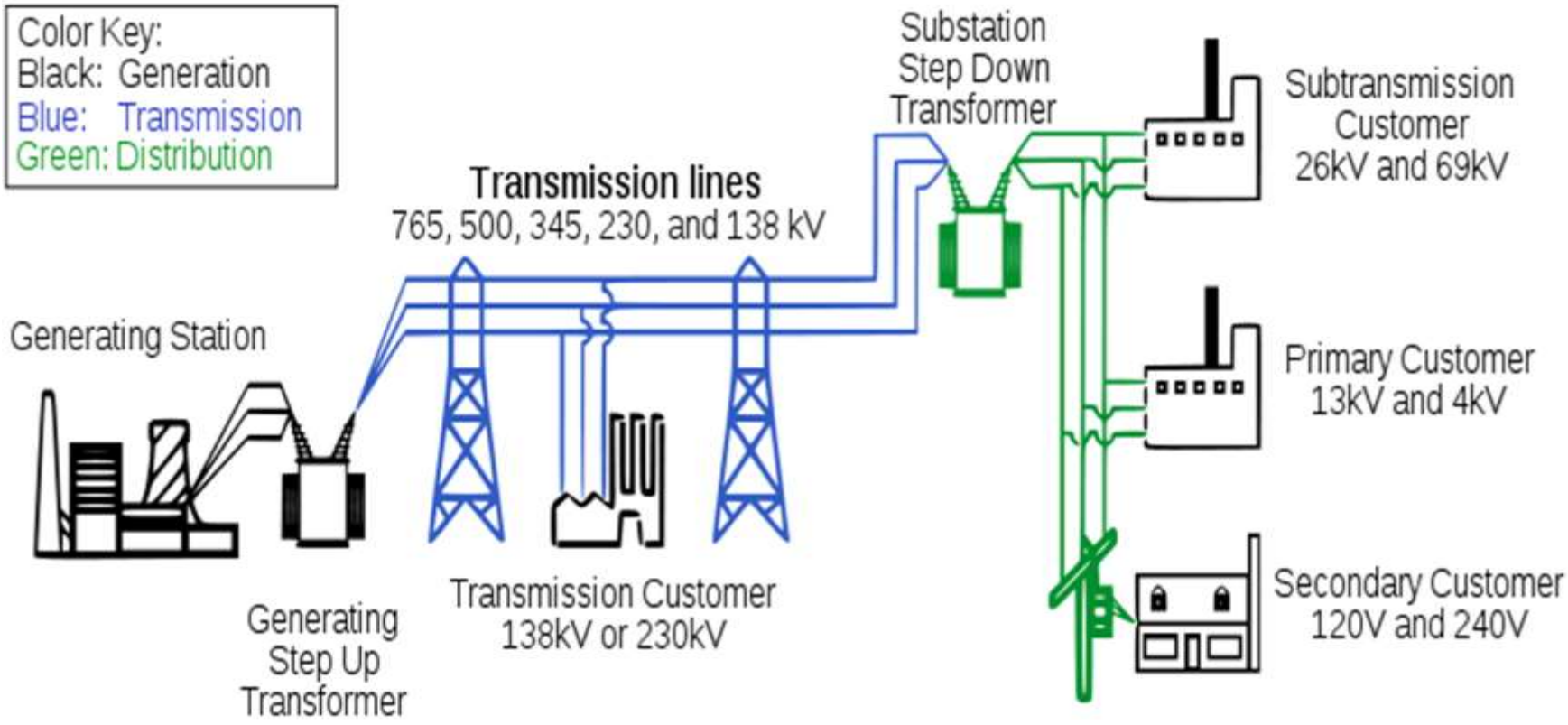


Eastern Massachusetts Territory



- Approximately 100 communities served
- 1.1 million electric customers
- 300,000 natural gas customers

Electric Power Transmission & Distribution



Challenges Resulting from Climate Change

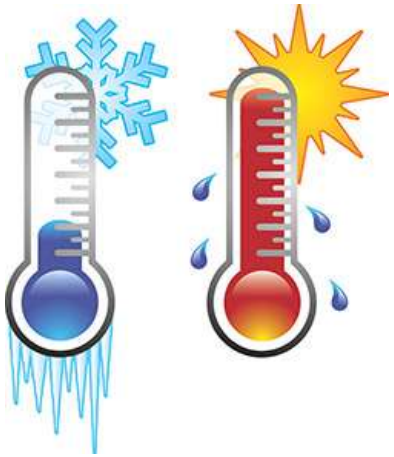
- Radical Variations in Temperature
- Sea Level Rise
  - Filled Tidelands
  - Floodplains
- More Frequent Severe Weather Events
  - Coastal Flooding

Overview of Climate Adaptation Plan

- Reducing the Company's carbon emissions
- Bring more renewable energy options to Massachusetts and New England
- Hardening the electric system to better withstand the impacts of climate change.

Temperature Variations

- Radical variations in temperature becoming more common due to increased Greenhouse Gas Emissions and Climate Change
- Results in increased energy demand by consumers
- Noticeable increases in summer and winter peak electricity demand in most of New England
- Requires investments in new energy transmission and distribution infrastructure
- Higher temperatures may reduce efficiency of generation

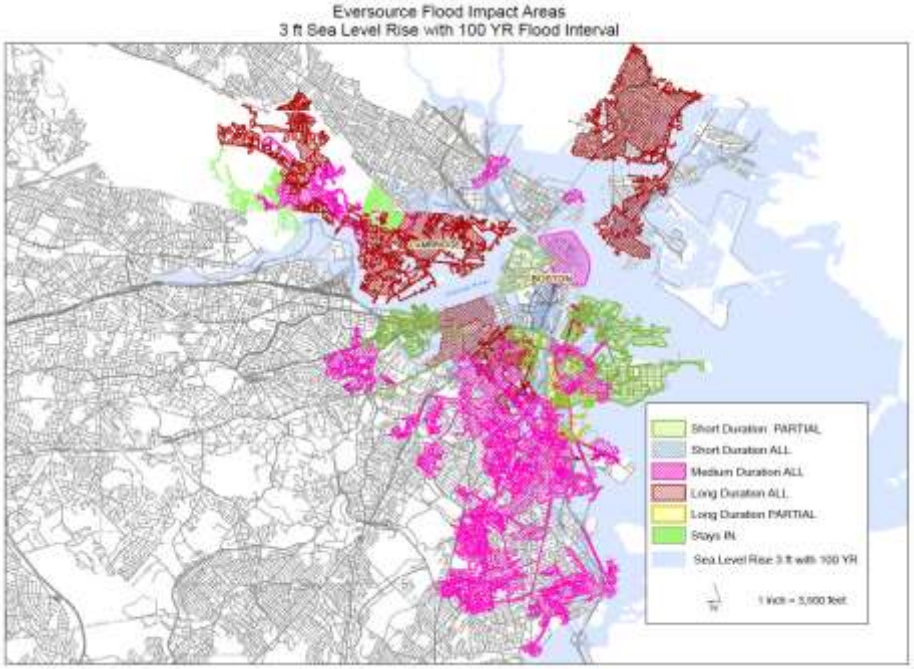


TEMPERATURE VARIATIONS - SOLUTIONS

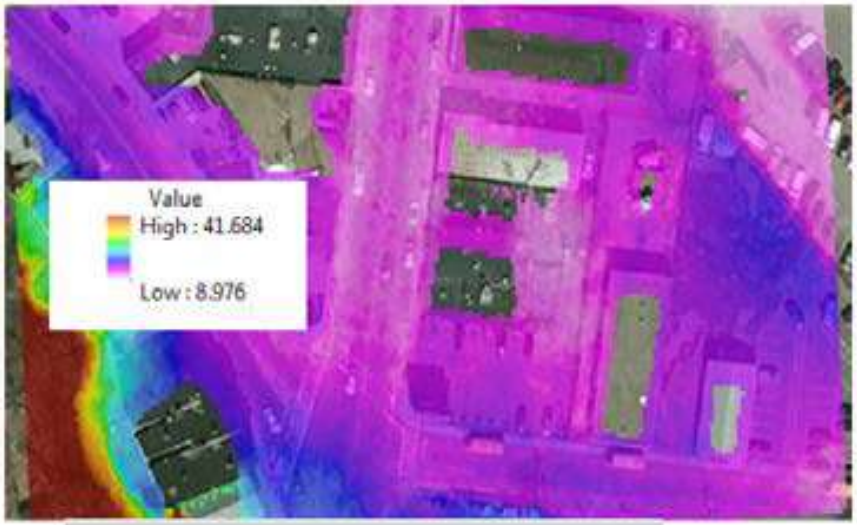
- Investing in Energy Efficiency Programs – MassSave
- Reducing the Company's Carbon Emissions –
  - Solar Farms
  - Solar Interconnects
  - Hydro Power
  - Electric Vehicles

COASTAL FLOODING

- Older electric infrastructure may have been built on filled tide lands
- Historically filled tidelands were slightly above the high tide line. Sea level rise increases the likelihood of flooding on filled tidelands.



Substation Flood Risk Prioritization



ELEVATING SUBSTATION CRITICAL ASSETS

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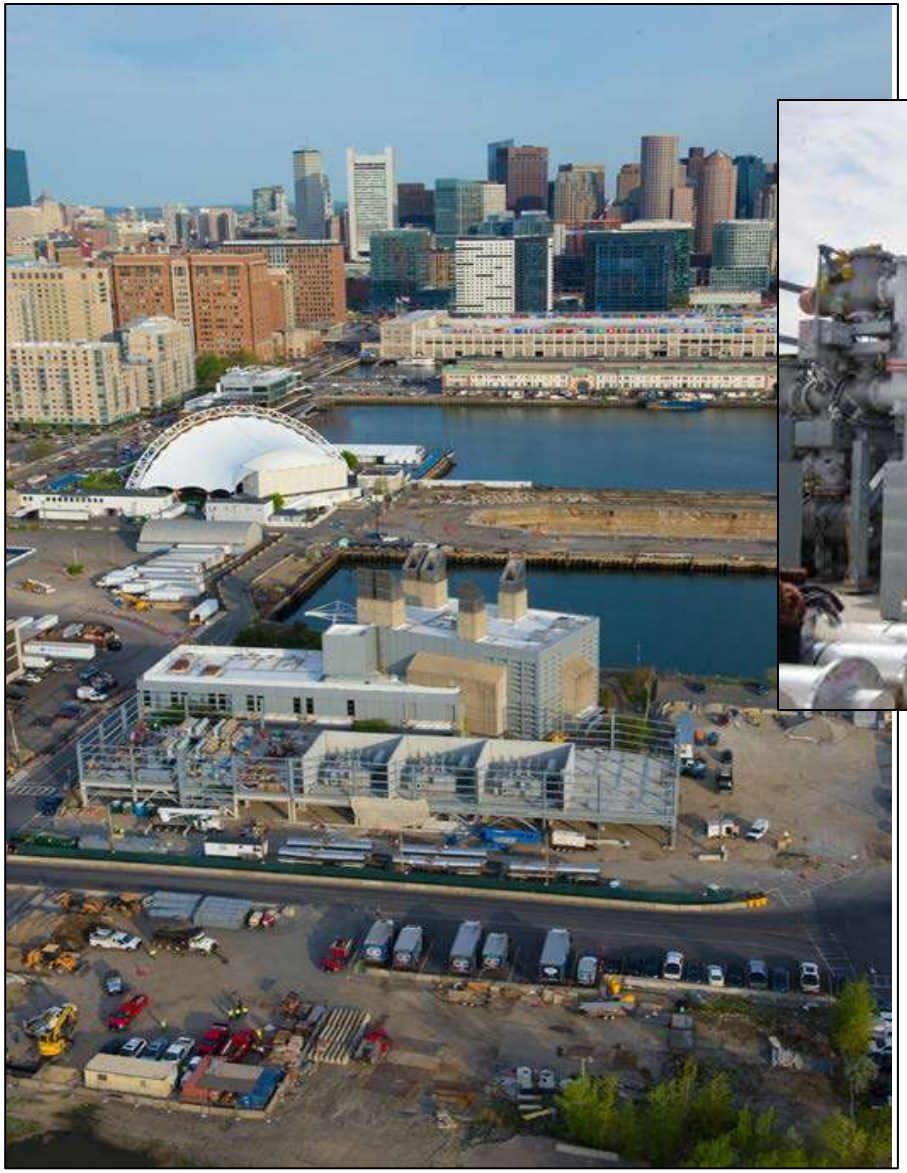
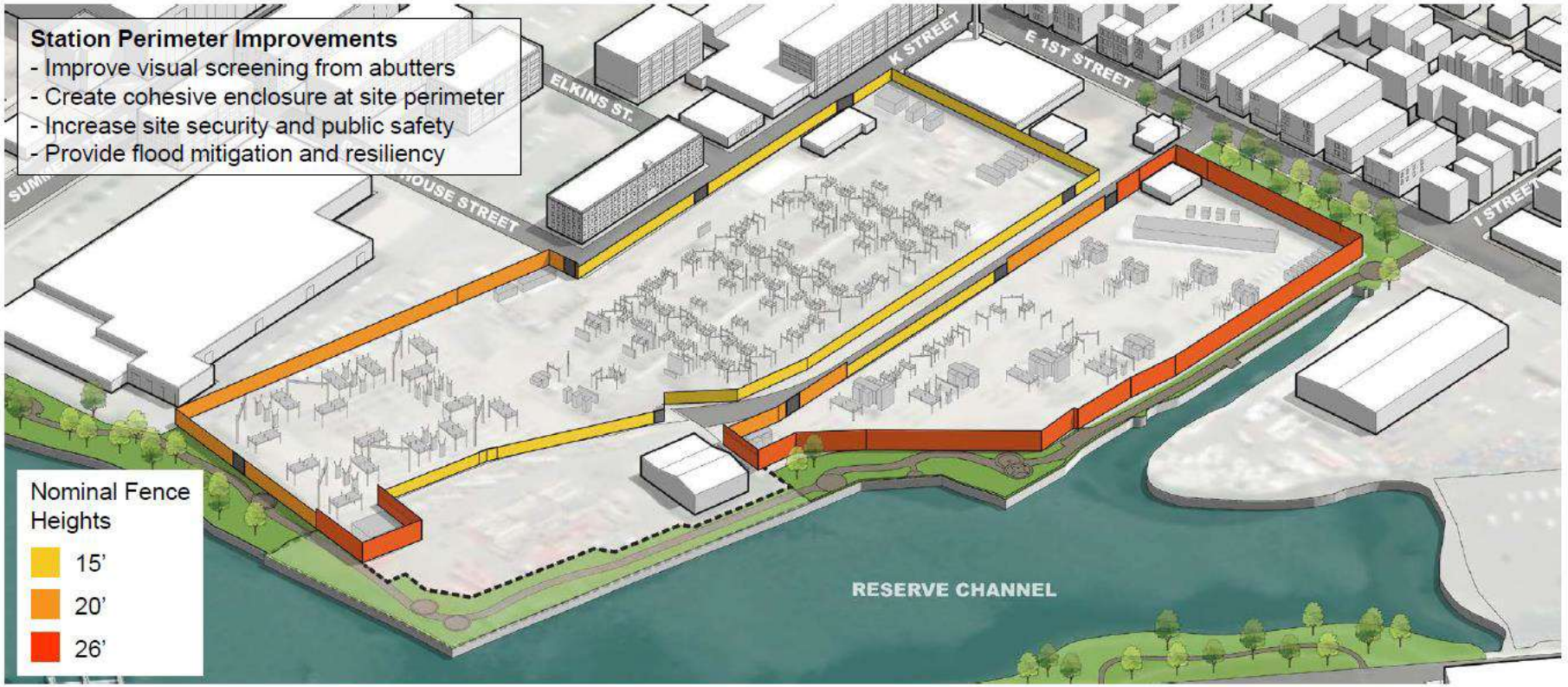


SUBSTATION PERIMETER PROTECTION

Site Enclosure



Substation Perimeter Protection

Severe Weather Events

Severe Weather Events

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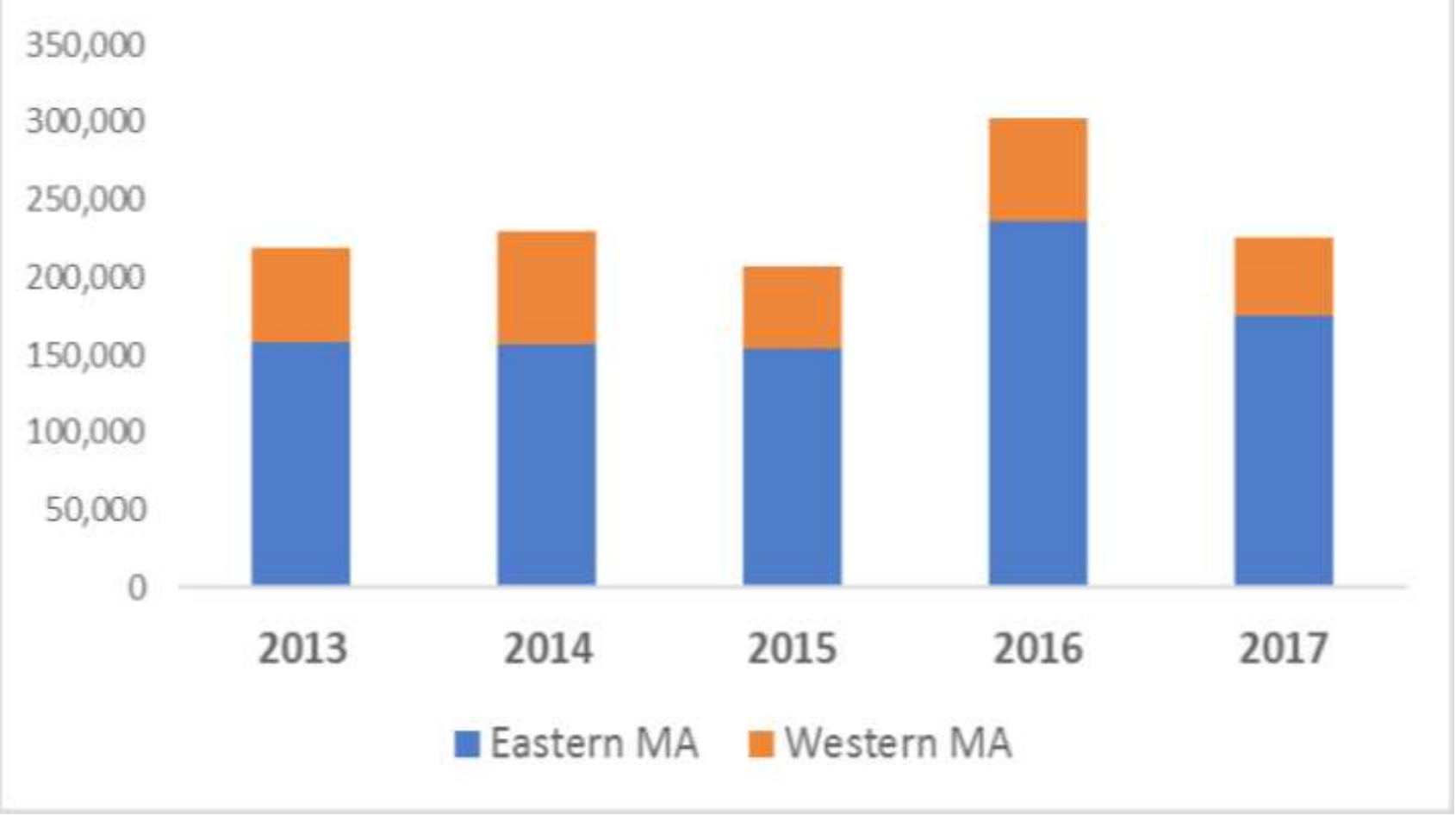
CUSTOMER OUTAGES DUE TO TREES



VEGETATION MANAGEMENT

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HAZARD TREE REMOVAL

Overhead Infrastructure Hardening

- Transitioning from wood crossarms to composite crossarms
- Utilizing Class 2 poles in all D-Line construction
- Transition from porcelain insulators to polymer vice-top insulators
- Increased ice loading criteria to 0.75 inches from 0.5 inches.

Underground Infrastructure Hardening

- New materials designed to be corrosion-inhibiting and capable of handling larger temperature swings
- Replace UG switches with new devices that are more resilient to salt
- Automatic fault location and isolation

Focus on System Automation

- Increase the number of overhead automated switches by 20%
- Bring additional circuit ties to areas of Western Massachusetts where currently no backup supply is available

Battery Storage Projects

- Eversource has commenced development of two battery storage projects in Massachusetts.
- **The Outer Cape Community Battery Project:** Will improve reliability by more than 50% for customers in Wellfleet, Truro, and Provincetown. The battery will provide 1.5 to 3 hours of backup power in summer “peak” conditions and up to 10 hours in the winter, spring and fall, when most of the major outages have historically occurred.
- **The Martha’s Vineyard Community Battery Project:** Martha’s Vineyard is served by four underground cables from Falmouth, Massachusetts. Due to continued development on the Island, the cables come under heavy use in summer peak conditions. The project will relieve loading on the underground cables.

QUESTIONS?

MATTHEW A. WALDRIP

781-441-8247

MATTHEW.WALDRIP@EVERSOURCE.COM