

Protecting Critical Infrastructure: Resiliency Planning & Investments

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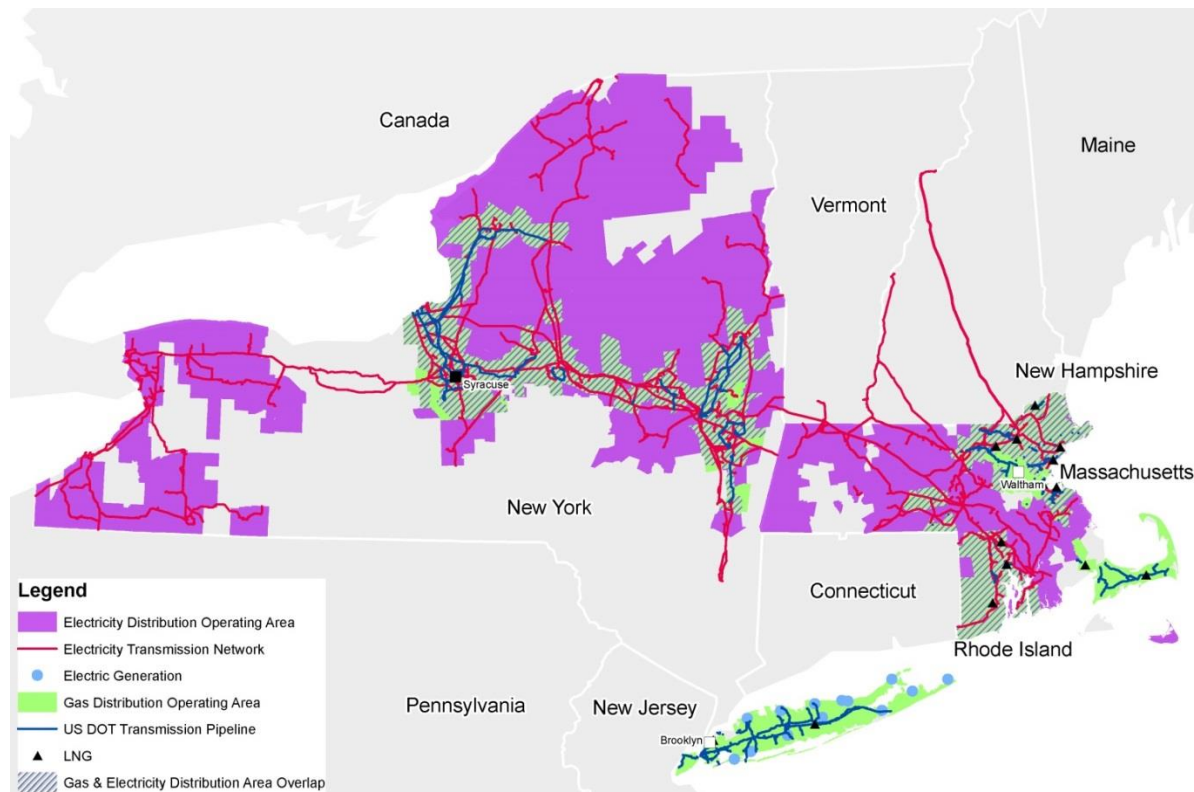
nationalgrid



National Grid – Who We Serve

Gas and electric distribution company providing energy to over 7 million customers in NY, MA, and RI

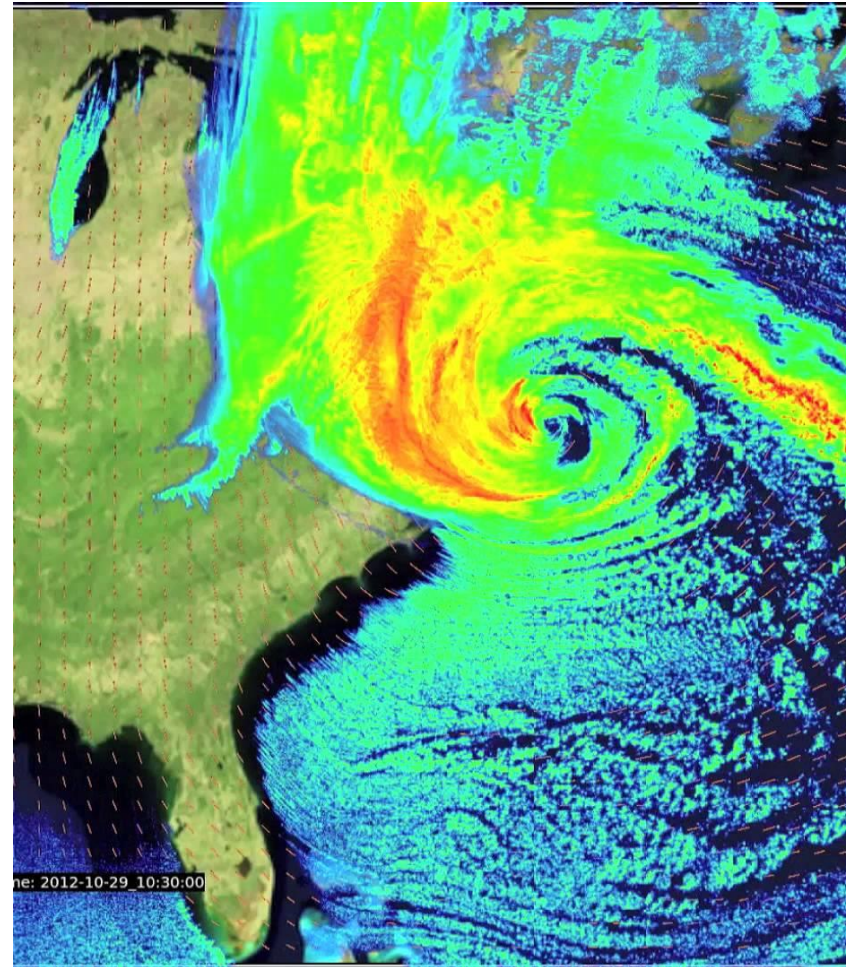
We service 3.6 million gas customers through 35,000 miles of gas pipeline



Challenges Resulting from Climate Change



- Flooding
- Variations in temperature
- More frequent and severe storms



Adaptation and Resilience

National Grid focuses on system hardening and resiliency in the following areas.

- Construction Standards
- System Planning
- Emergency Response Plan



Strategic Asset and System Planning

Single-Feed System Eliminations

Distribution systems supplied by a single district regulator are more vulnerable to customer outages in the event of regulator failure. These projects are designed to improve system reliability/resiliency by connecting these systems to larger distribution systems of the same operating pressure or by upgrading the operating pressure of the existing system and abandoning the district regulator.

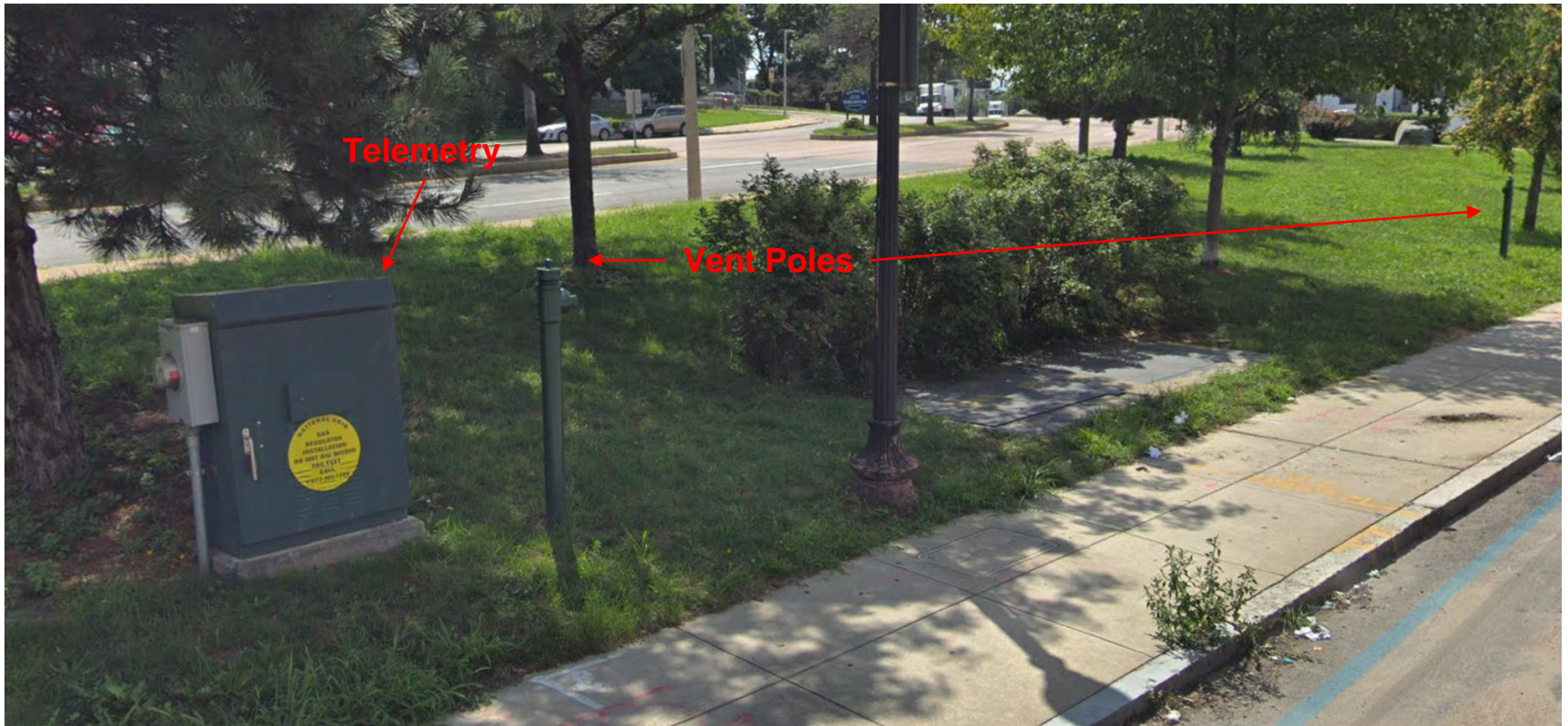
Regulator Station Installation/Replacement

Replaces obsolete regulator station designs with storm hardened prefabricated stations designed to meet or exceed future gas capacity requirements.

Low Pressure to High Pressure Upgrades (LP/HP)

These projects are designed to replace low pressure leak-prone main with high pressure plastic. This prevents ground water infiltration into the gas system that can lead to customer outages as well as reducing leaks (carbon emissions).

Regulator Station Installations



- Prefabricated vaults are designed to withstand extreme weather with redundant regulator runs, Roxtec seals, dry wells, vent poles, & real time telemetry with remote control
- Prefabs can operate when filled with water as pilot regulators are vented above grade
- National Grid has installed 52 prefabs since 2014 in MA

Heater Replacements & System Automation

- Water bath heaters have been installed with redundant burners and updated controls and burner management systems
- AC powered traffic boxes and pole mounted solar boxes have been installed to improve Gas Control's visibility and remote control capabilities
- Backup generators are installed at all take stations and other critical facilities
- These upgrades allow the system to react independently to adverse weather or allow Gas Control to react remotely



Emergency Response Plan

Regardless of hardening and resiliency efforts, National Grid must prepare to respond to extreme weather events.

- Simple, flexible, easily adaptable plan for emergency response
- Annual cycle for revision, training, drills, and exercises



National Grid's Climate Mitigation and Adaptation Plan

National Grid is already seeing the impact of climate change on our system.

We are committed to participating in the solution through the 80x50 pathway. Preparing for and responding to climate change is embedded in the way we plan, construct, and operate our system.



The National Grid Northeast 80x50 Pathway

Our 80x50 Pathway is ambitious and comprehensive, with implications for customers, communities, utilities, automakers, and policymakers.

40% x 2030

80% x 2050

Power

- Ramp up clean electricity generation deployment to achieve 67% zero-carbon electricity supply vs. 45% today

- Zero carbon electricity system
- Increase large-scale renewables
- Inter-seasonal energy storage
- New clean electricity options (gas + CCS, modular nuclear)

Transport

- Reach more than 10 million light-duty electric vehicles on Northeast roads (50% of all light-duty vehicles) vs. < 75,000 today

- More than 20 million light-duty vehicles (100% of the fleet)
- Low-carbon heavy duty, rail, and off-road transportation
- Reductions in vehicle miles traveled

Heat

- Double the rate of EE retrofits
- Triple the rate of oil-to-gas heating conversions
- Transform the oil-to-electric conversion market (10X scale up)

- Sustain thermal efficiency investment
- Decarbonize natural gas supply for heating
- Hybrid gas/electric heating

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