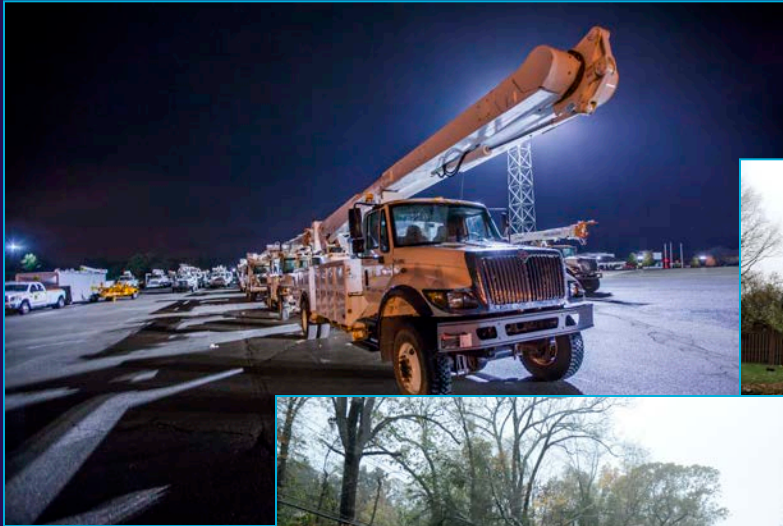


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Super Storm Sandy:

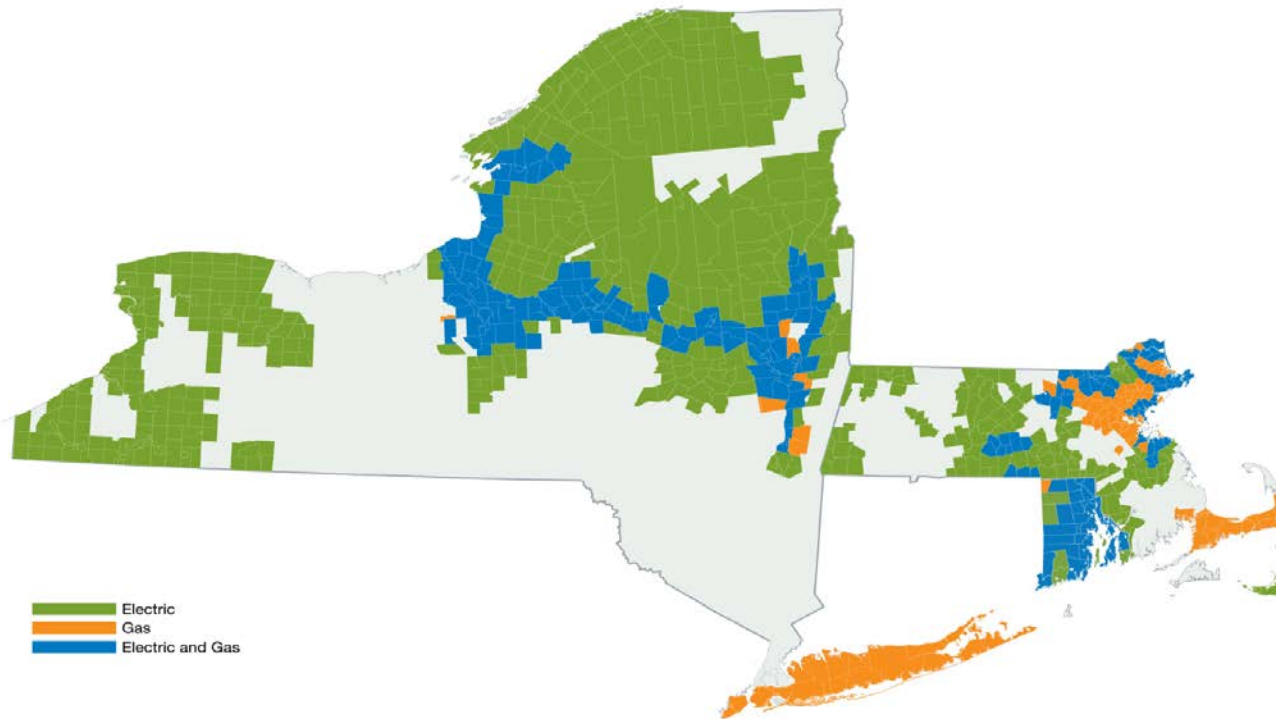
Preparing, Restoring, Reconnecting, Rebuilding, and Learning



National Grid US - Overview

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**3.4 million Electricity and 3.5 million Gas consumers
in New England and New York**



The Impact

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- ❑ Across our service territories
- ❑ Electric restoration – LIPA
- ❑ Gas restoration – downstate NY
- ❑ Reconnecting customers
- ❑ Rebuilding our communities
- ❑ Logistics
- ❑ Lessons Learned



Super Storm Sandy Impact Video



The impact – MA, RI and Upstate NY

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Massachusetts Electric

- Peak outages: **374,771**
- Total Resources: **1,836 FTE's** (Line 443; Tree 273; Support and Wire Down 404) (includes 490 external crews)
- Replacement Poles: 115
- Replacement Transformers: 48
- Electric Cable: 16,000 feet
- 90% Restored: Wednesday October 31
- 100% Restored: Saturday November 3



The impact – MA, RI and Upstate NY

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Rhode Island Electric

- Peak Outages: **119,629**
- Hardest hit: South Kingstown, Narragansett, Westerly, Charlestown, Warwick
- Total Resources: **1,382 FTE's** (Line 320, Tree 222, Wire Down and Support 298) (includes 500 external crews)
- 90% Restored: Thursday, November 1
- 100% Restored: Sunday November 4



The impact – MA, RI and Upstate NY

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New York Electric

- Peak outages: **37,645**
- Total Resources: **2,781 FTE's** (Line 517, Tree 306, Wire Down and Support 627) (includes 500 external crews)
- 100% Restored: Thursday November 1



The impact – LIPA Electric

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LIPA New York Electric

- Peak outages: **1,071,840** (123,000 from the **nor'easter**)
- Total Resources: **16,000 FTE's** (Line 6400, Tree 3700, Wire Down and Support 5900)
- 85% Restored: Wednesday, November 7
- 100% Restored: Wednesday, November 14



The unprecedented downstate NY electric restoration efforts

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- ~**11k** line workers and tree trimmers (normal: ~**390**)
- High demand for resources along east coast made it difficult to secure desired workforce
- Most off-Island resources secured through National Grid contractor network
- 85%+ restored in a week; just over two weeks to restore all LIPA electric customers who could safely accept power



The impact – downstate New York



- High sustained winds combined with extreme tidal surges
 - Severe flooding across LI's south shore / Rockaway Peninsula / Brooklyn / Staten Island, impacting LIPA electric customers and National Grid gas customers
- Homes and businesses destroyed, including many National Grid employees involved in restoration
 - Employee hotline established – direct pipeline to HR; counseling services to support employees



The unprecedented downstate NY gas restoration efforts

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- At peak, **~1,600 field staff**, including mutual aid crews / plus community liaisons
 - Crews from other National Grid regions; retirees brought in
 - Over **20k+** affected, 93% complete where service could be restored (12/4/12)
 - Safety of employees and customers paramount throughout effort



The unprecedented downstate NY gas restoration efforts

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- Flood zones along south shore of LI, Rockaway Peninsula, Brooklyn, Staten Island
- High and low pressure safety inspections, regulator replacements, relights, system rebuilding, mobilization of plumbers and other resources
 - As of 12/4/2012, reinstated over **270 miles** of distribution main
 - Rebuilding Breezy Point (13.1 miles) and Staten Island (2.5 miles)



National Grid gas system: by the numbers



Staten Island

- **~140k customers** touched as part of the process
- **Over 570** mutual assistance crews from **46 companies** – ***possibly the largest effort of its kind ever in the natural gas industry***
- Completed **over 72k** inspections on high and low pressure services that may be affected by the flooding
- **more than 40k** high pressure regulator replacements
- **more than 100k** gas meter replacements
- Network of **250 plumbers** to match with customers in need
- **~\$40 million invested** in rebuilding the gas system



Reconnecting customers



- **Community Outreach Centers established in hardest hit areas**
 - **8 centers** staffed by **100** National Grid employees
 - Worked together with multiple organizations, trade allies, townships, cities, municipalities
 - On the ground, door-to-door outreach
 - NYC Rapid Repair program
 - Replace all flood damaged gas and electric equipment in customers' homes
 - Connect gas and electric service in real time

Rebuilding – Community outreach



- **Our community liaisons provided operational and communication support in the most devastated areas of LI**
 - Distributed much needed supplies, blankets, batteries, water, CO detectors, electric heaters (FEMA / NYPD)
 - Pre-holiday turkey donation
 - Toy donation program for the holidays
 - Heart Share emergency customer assistance program



Rebuilding our communities

National Grid launches **\$30M Emergency Economic Development and Community Redevelopment Program**



- **\$30 million program targeted to gas customers, businesses, and communities most impacted by hurricane and flooding**
- **Three-tier program**
 1. Fund plumbing inspections for all impacted customers
 2. Fund new heating equipment for most vulnerable customers
 3. Support commercial redevelopment and rebuild communities

LIPA electric system: by the numbers

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■ Materials issued

- **4,900 poles** (*1,200 Hurricane Irene*)
- **2,900 transformers** (*1,300 Irene*)
- **7,600 cross arms** (*2,844 Irene*)
- **2.25 m ft. of wire** (*1.3M Irene*)
- **2.5 m gallons of fuel dispensed** (*250k+ Irene*)

Long Island: by the numbers



■ Lodging

- Single night peak number of beds required, 13,500; 14,500 available.
- Established (14) base camps including:
 - (6) *sleep trailer sites*
 - (3) *tent cities w/cots*
 - (5) *building sleep sites w/cots*
- Used (28) fire houses across LI for sleep accommodations.
- Secure reservations at more than (70) hotels with a nightly peak of over 3,400 hotel beds

Long Island: by the numbers

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■ Meals

- Total of 800,000+ meals (Breakfast, Boxed Lunches, & Dinners)
- Total of 100,000 + bottles of Gatorade, and water.



Long Island: by the numbers



■ Material Lay Down & Truck Staging Sites

- Established (1) crew processing truck staging site for all arriving off Island crews
- Established (8) Material lay down sites
- Performed multiple material drop offs at dozen of substations across LI
- Established (7) independent truck staging / busing sites



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Lessons Learned


Restoration Resources

- Sufficient **restoration crews** are essential to storm response and restoration.
- Widespread storms encompassing large areas and multiple service territories leads to increased **competition for resources**.
- The major element of securing enough crews in preparation for major storms is **advanced planning**. This includes adequate weather prediction paired with advanced acquisition of additional crews whether through mutual assistance or outside contractors.




Lessons Learned

Logistics

- Arrangements for equipment to be **on standby** (for example strategic alliances or material consignment).
 - Other **standby equipment** to be considered are mobile transformers, mobile substations and large generators that can enable temporary restoration of grid service, circumventing damaged infrastructure, to enable repair of grid components without extended interruptions to customers.
 - As part of storm response and restoration, **adequate back-up restoration supplies** such as poles, wires, transformers, regulators, meters, pipe and other system components should be on location in storage or are easily obtained through contracts with suppliers.
- 


Lessons Learned

Logistics

- **Pre-staging of resources.** As crews arrive from out of town and standby equipment and restoration materials are gathered, staging areas enable the organization for immediate response.
 - **Fuel shortages** were an important issue in the wake of Sandy, brought on by ship terminal damage, diminished truck capacity and highway access, and lack of electricity at gas stations.
 - Establish **contracts and relationships** with Logistics vendors that provide critical services during an emergency.
 - **Identify and assess** base camp / staging areas in advance. Have a layout plan.
 - Part of the **planning** includes securing shelter, food, first aid, shower and toilet facilities, parking and other essentials for crews working around the clock for days on end.
- 

Lessons Learned

Logistics

- **Transport** can be as important as supplies: it is essential for providing fast relief. Poor infrastructure such as roads, communication and transportation can hamper many aspects of relief and recovery work and must be **factored in as a major logistical consideration**
 - **Managing inventory** in the aftermath of a disaster. Received and distributed?
 - **Supply chain, Logistics and Security** support personnel during the event. Understand their capabilities.
 - Post event **invoice processing**.
 - Plan for facility **evacuations**.
- 

Communication, Planning and Coordination

- The response must be **scalable** so that restoration efforts run smoothly whether there are 10,000, 100,000 or 1,000,000 customer outages.
- **Coordination** and constant **communication** with restoration resources is vitally important to ensure accurate ETR's.
- Keeping the communities and customers **informed** at all times.
- **Monitoring** of customer feedback and **scripting** for customer service representatives, interactive voice response, text messaging, mobile application notifications, websites, Twitter, Facebook, and YouTube.



Emergency Response Plan & Preparedness Cycle

The Emergency Response Plan is the foundation for the Preparedness Cycle.



A well documented plan will:

- Provide clarity for employees and aid them in response
- Be an effective training tool
- Drive consistent approach and performance levels across a multi-state organization
- Document process triggers, inputs, outputs and communications channels
- Comply with applicable regulations
- Not be overly prescriptive to maintain flexibility
- Be built for continuous improvement

Questions

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When storms
come in,
we head out.



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Storm Updates [f](#) [t](#)

