

# Approach to Smart Grid

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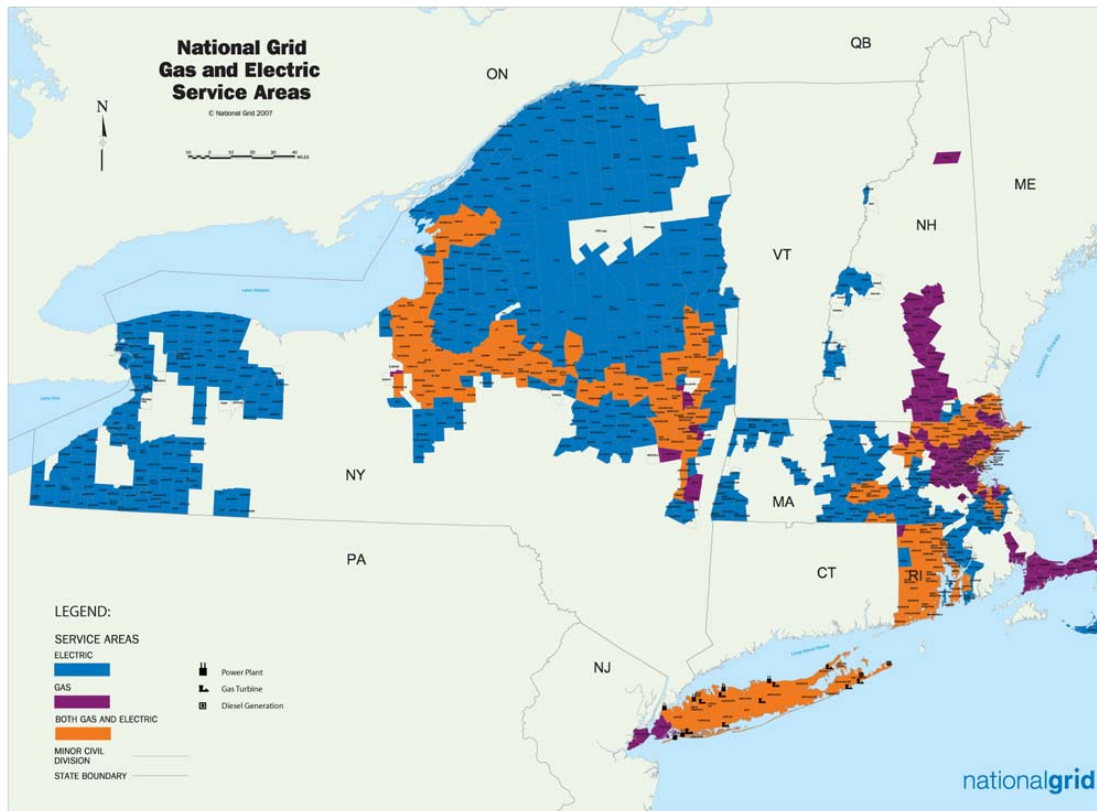
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# National Grid: an international electricity and gas company

## National Grid Electricity and Gas Service Areas - US



Largest utility in UK; second largest in US\*

- ◆ 50% UK, 50% US
- ◆ 50% Electricity, 50% Gas
- ◆ 50% Transmission, 50% Distribution
- ◆ 27,000-plus employees
- ◆ Almost 18 million customers

### Northeast US

- ◆ Distributes electricity to 3.3 million customers
- ◆ Services 1.1 million customers of Long Island Power Authority (LIPA)
- ◆ Provides natural gas to 3.5 million customers
- ◆ Currently owns over 4,000MW of generation

\*Based on customer numbers; includes the servicing of LIPA's 1.1 million customers

# Aspects of Smart Grid Changes

- Significant Pilot of Metering Based Equipment (> 100K meters)
- Distribution Equipment
  - Reclosers, sectionalizers, switches
- Control Room Changes
  - How do you deal with this new information?

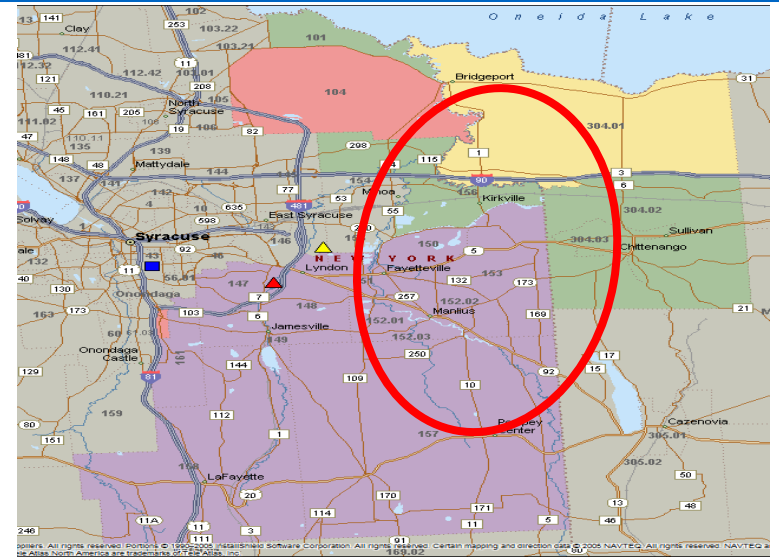
# Proposed Smart Grid Pilots

- Three States
  - Massachusetts
    - 15,000 meters plus potentially 100,000 more
  - Rhode Island
    - 10,000 meters
  - New York
    - 80,000 meters in two locations
- Regulatory Filings made in Three States
- DOE Filings made
- Next Steps
  - DOE indications Dec. 2009
  - NY PSC prioritization August 2009
  - MA Approval October 2009
  - Rhode Island ?

# Smart Grid Distribution System – New York Pilot

## Objectives

- ✓ Integrated Grid / Network Communications
- ✓ Advanced Smart Meters (real time measurement and communication of consumption)
- ✓ Automated Load Management imbedded in existing DSM Programs
- ✓ Remote status detection and operation of Distribution Equipment
- ✓ TOU or Hourly Pricing
- ✓ Coverage of .25% of service territory
- ✓ Reductions of 5% in peak and average load consumption of participants



## Selection Criteria

- Mix of Urban and Suburban
- Mix of Commercial and Residential
- Existing Reliability Challenges
- Potential to interconnect feeders
- Mix of existing and potential Distributed Generation, Wind, Solar, PHEV

## Syracuse

- ✓ East Syracuse
- ✓ 3 complete substations in a contiguous area (Syracuse University is an add on option)
- ✓ Existing Distribution Automation project
- ✓ 17,100 customers – sub-urban, rural mix
- ✓ Opportunities to improve reliability
- ✓ Opportunities to interconnect feeders

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# Control Room Changes

- New common EMS for Transmission
- Replace Outage Management System (OMS)
- New Distribution Management System (DMS)
  - Enhanced capabilities needed to manage data from Smart Grid
  - Eliminate paper maps
  - Automated load calculations
  - On-line switching orders
  - Self healing grid technologies
  - Fault isolation and restoration switching
  - Volt/VAR management

## Significant Challenges to Overcome

- DOE acceptance of proposals and findings
- State Regulators acceptance and approval of non-DOE funding for utilities
- Information storage and analysis issues
- Significant new sources of Distribution data for Control Room Operators