

National Grid – Services Overview



Brooklyn, New York

December 2, 2009

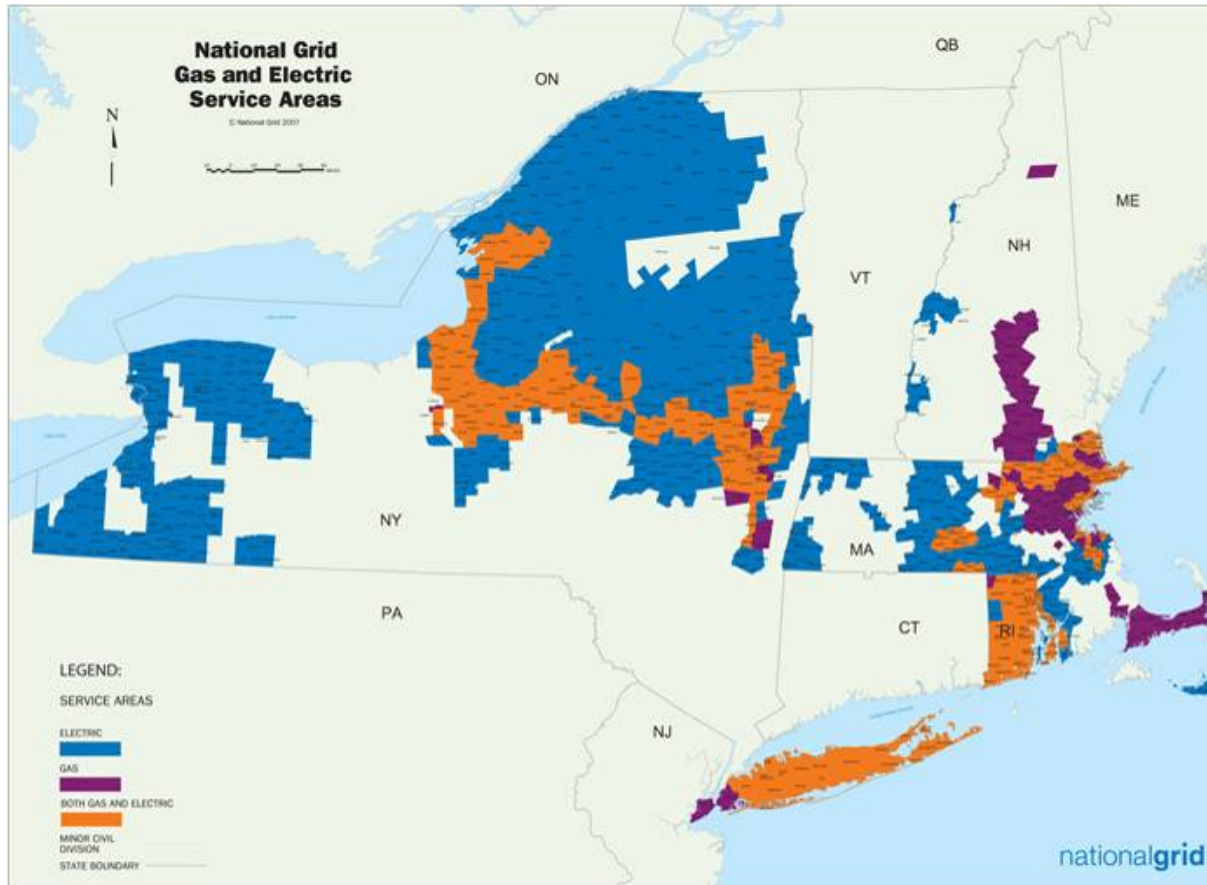
Welcome & Introduction



Christopher A. Cavanagh, P.E.

Director New Products & Services, National Grid

Electricity and Gas Service Areas



- ◆ 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
- Blue – Electric
- Purple – Gas
- Orange – Gas & Electric

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

Who are we to the Public Service Commissions?

One Company with 13 Sets of Local Rates Plus LIPA

- ◆ **Boston Gas Company**
d/b/a KeySpan Energy Delivery New England
- ◆ **The Brooklyn Union Gas Company**
d/b/a KeySpan Energy Delivery New York
- ◆ **KeySpan Gas East Corporation**
d/b/a KeySpan Energy Delivery Long Island
- ◆ **Niagara Mohawk Power Corporation d/b/a National Grid**
- ◆ **Colonial Gas Company (Lowell & Cape)**
d/b/a KeySpan Energy Delivery New England
- ◆ **Essex Gas Company**
d/b/a KeySpan Energy Delivery New England
- ◆ **Massachusetts Electric Company d/b/a National Grid**
- ◆ **Nantucket Electric Company d/b/a National Grid**
- ◆ **The Narragansett Electric Company d/b/a National Grid**
- ◆ **Granite State Electric Company d/b/a National Grid**
- ◆ **Energynorth Natural Gas, Inc.**
d/b/a KeySpan Energy Delivery New England

 Gas Only

 Electr.Only

 Both

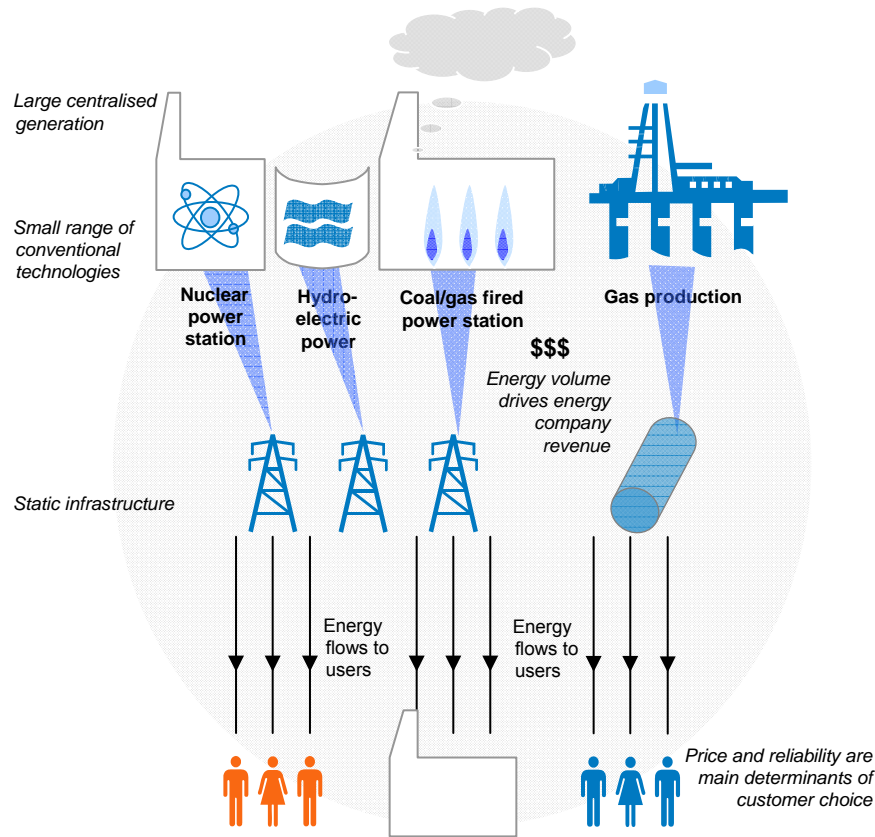
National Grid's UESC Objectives

- ◆ National Grid's goal is only to facilitate energy-related projects for Federal agencies, including but not limited to:
 - ◆ Energy Conservation (electric & gas)
 - ◆ Infrastructure
 - Gas Distribution and Gas Heating (oil-to-gas conversion)
 - Electric & Lighting
 - District Energy (Steam, hot water, chilled water etc.)
 - ◆ Distributed Generation
 - Small renewables
 - Solar, wind & tidal
 - Bio-fuel production
 - Combined Heat & Power & Fuel Cells(1 kW – MW's)
 - ◆ Renewable Gas – Pipeline and direct-use
 - ◆ Alternative Fuel Transportation
 - Compressed Natural Gas
 - Plug-in Hybrid & Battery Electric
 - Hydrogen
- ◆ Harmonize our Approach in All Regions
- ◆ Utility Account Executive is the Prime Contact
- ◆ No Energy Commodity Sales (electric or gas)

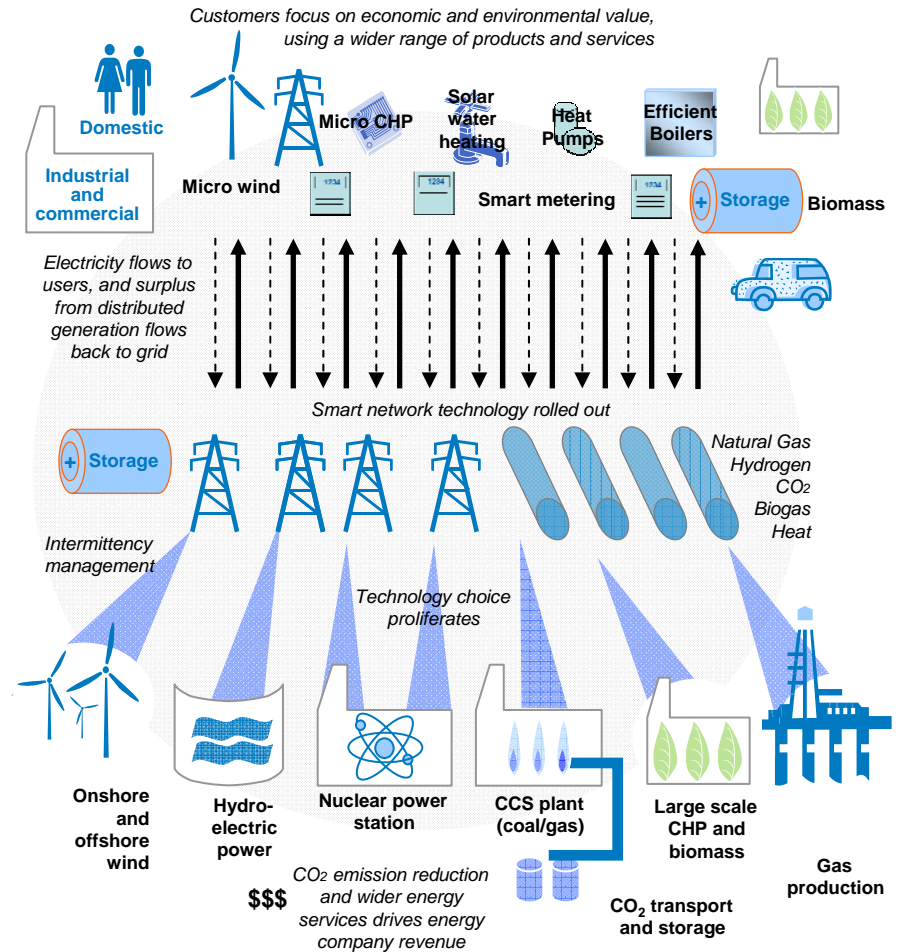


Energy Services are Transforming

Traditional Energy Market - supply driven

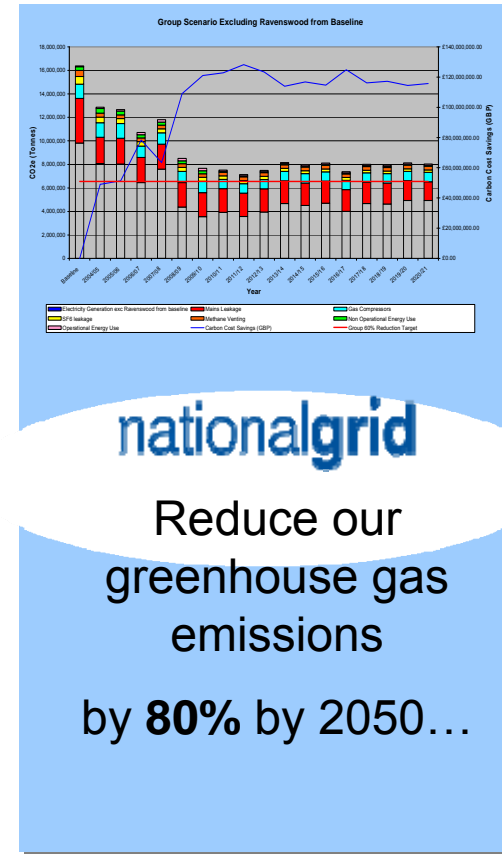
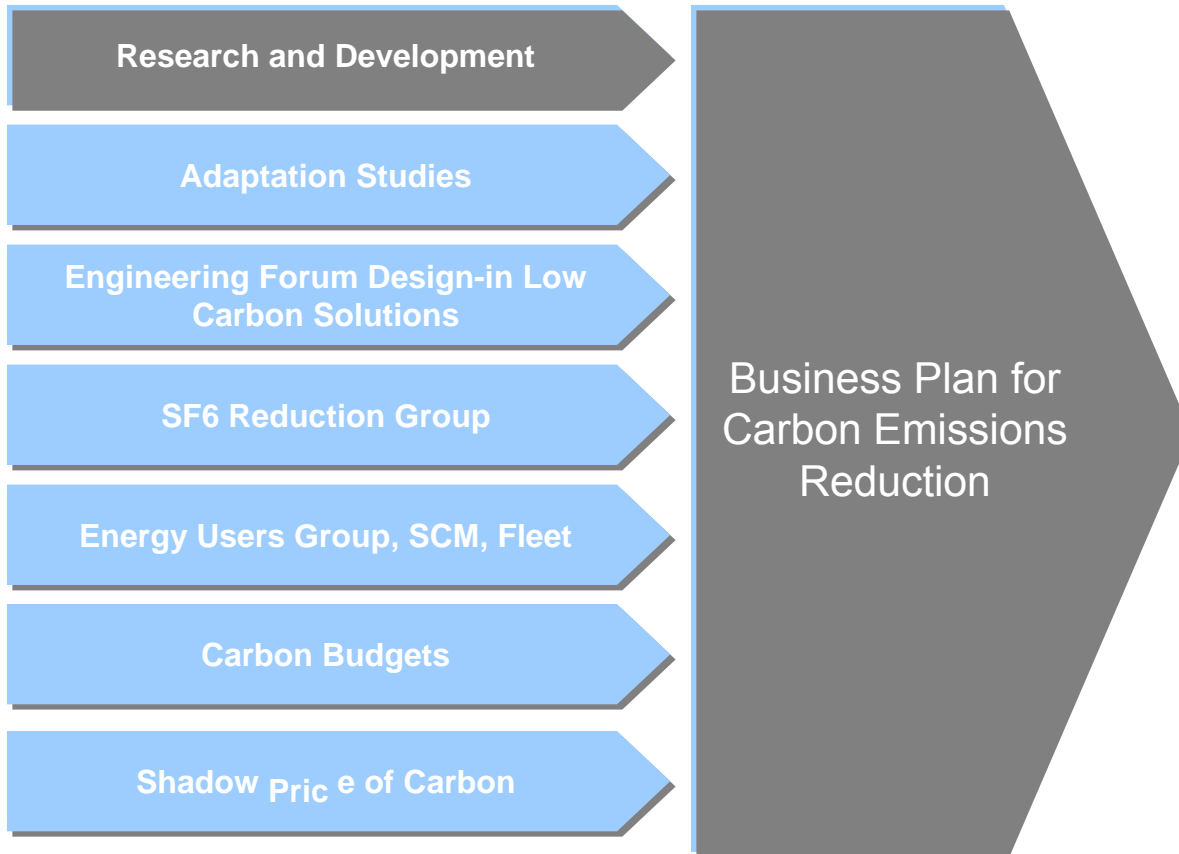


Today's Evolving Market - customer driven



Creating a Climate for Change at National Grid

Delivering a low carbon future



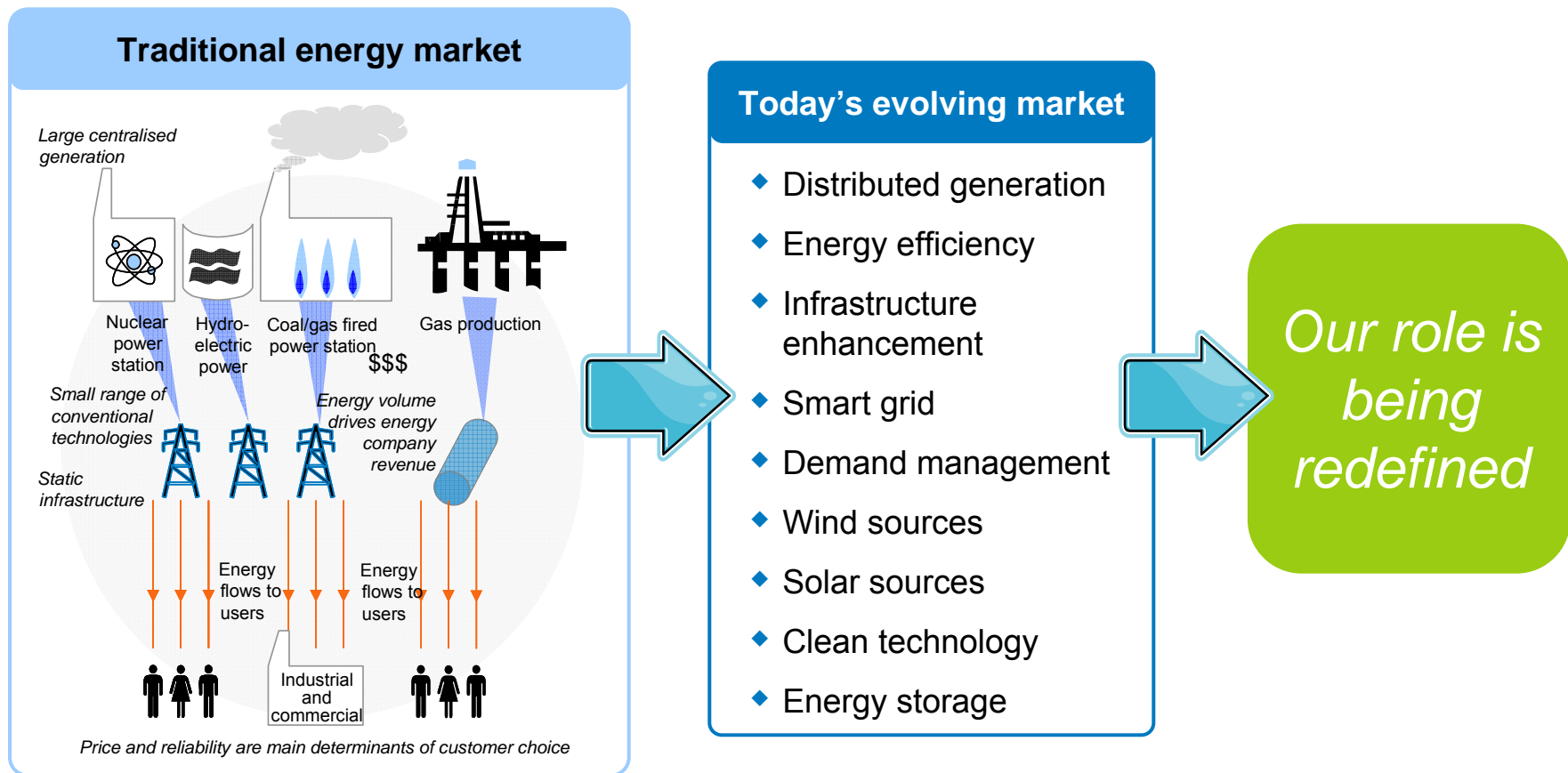
We combat climate change through energy efficiency, efficient technologies and natural gas conversion

- ◆ **April 18, 2008: National Grid will reduce GHG emissions 80% by 2050**
 - ◆ Helping customers reach their goals
 - ◆ Reducing National Grid's own impact
- ◆ **Greenhouse gas emissions already reduced 20% in U.S. through:***
 - ◆ Gas and electric efficiency programs
 - ◆ Promoting development and deployment of efficient technologies (CHP, high-efficiency heating & water heating, fuel cells, solar thermal, envelope improvements, thermostats and boiler resets)
 - ◆ Oil-to-gas conversions (reduce GHG emissions by 27% to 40%)

“Minimising our impact on the environment while delivering safe, secure and economic supplies of energy to customers is not an option, it is a must.”

– Steve Holliday,
National Grid CEO

Utilities must play a critical role in creating a sustainable future



Recent Legislation is Stimulating the Investment in Smart and Renewable Technologies

- ◆ **Massachusetts Green Communities Act** required that each utility establish a “smart grid” pilot program, “whereby customers will receive automated information related to their energy demands in order to make more efficient choices regarding energy use”.
- ◆ **RI Least Cost Procurement** has a requirement for a **System Reliability Procurement Plan** to determine cost effectiveness of customer-side resources beyond energy efficiency (i.e. CHP, renewables, demand response, etc.) as they pertain to T&D investments
- ◆ **The American Recovery and Reinvestment Act of 2009 (ARRA)** designates \$ 3B in stimulus funds to modernize the electric grid.
- ◆ **Renewable Portfolio Standards**
- ◆ **Regional Greenhouse Gas Initiative (RGGI)**
- ◆ **LIPA Clean Energy Initiative**
- ◆ **NYSERDA**

National Grid's Solar Program

- National Grid is working to implement the renewable provisions in all of our States
- National Grid Solar Program to consist of:
 - Solar on Company sites
 - Solar on state, municipal, school, commercial, low-income multifamily property
 - Solar program offering financial assistance and industry training/education

Potential exists for NG ownership of larger scale renewable investments provided it is part of the regulated utility



MA Project Highlights

- 5 National Grid owned sites
- 4 of the sites were historically manufactured gas plants
- 1 site is an active materials distribution center
- Once approved by DPU - construction expected to begin Fall/Winter 2009

Location	Site Description	Capacity (MW)	Estimated Annual Output (kWh)	Installed Cost
Dorchester	Former MGP	1.3	1,557,549	\$9,374,286
Everett	Former MGP	0.62	837,032	\$3,902,902
Haverhill	Former MGP	1	1,327,604	\$5,881,440
NEDC	Warehouse Roof	1.2	1,247,425	\$6,513,183
Revere	Former MGP	0.75	886,319	\$5,406,492
	Total	4.88	5,855,929	\$31,078,303

Conceptual Designs

Dorchester, MA
1,320 kW



Everett, MA
620 kW

Conceptual Designs

Haverhill, MA
1,000 kW



Revere, MA
750 kW



Sutton, MA
1,200 kW



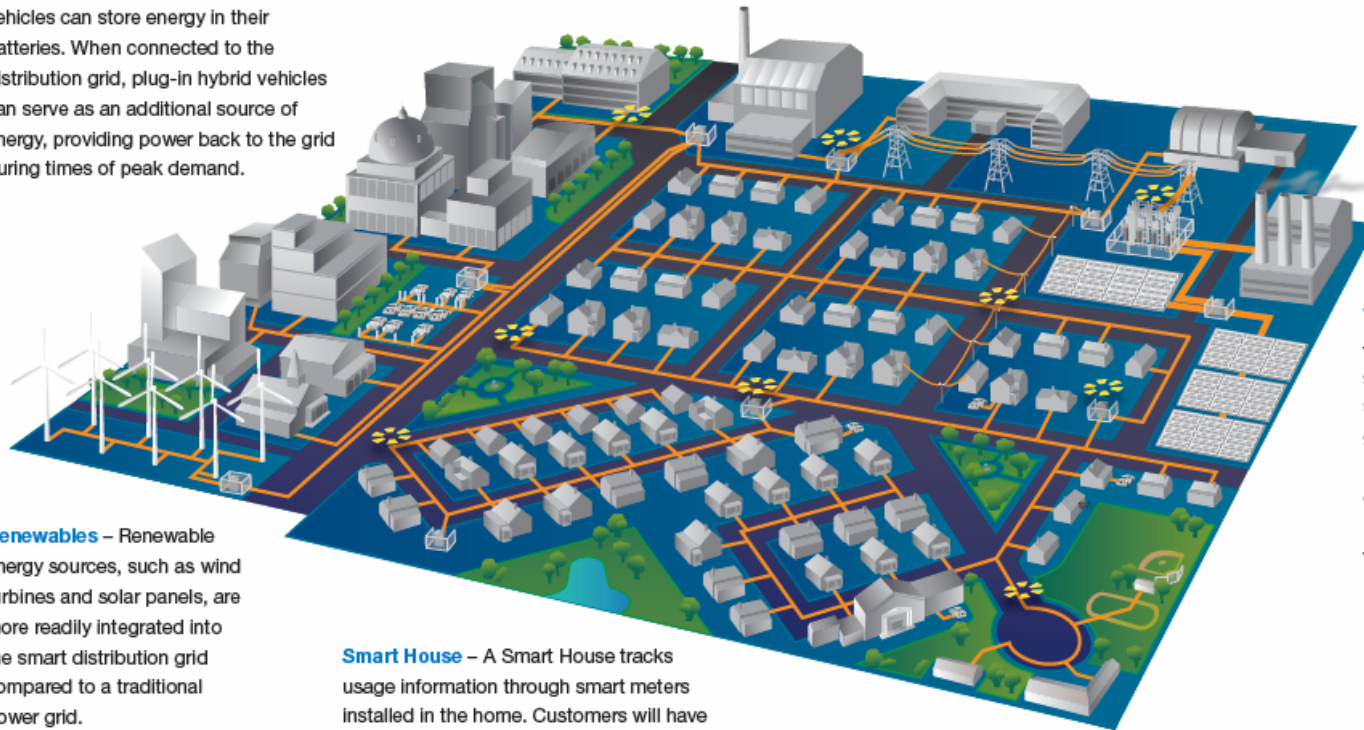
What is a Smart Grid?

Plug-in Hybrid Vehicles – Plug-in hybrid vehicles can store energy in their batteries. When connected to the distribution grid, plug-in hybrid vehicles can serve as an additional source of energy, providing power back to the grid during times of peak demand.

Renewables – Renewable energy sources, such as wind turbines and solar panels, are more readily integrated into the smart distribution grid compared to a traditional power grid.

Smart House – A Smart House tracks usage information through smart meters installed in the home. Customers will have a variety of options through which they can interface with to learn about the most cost-efficient energy usage patterns. Increased information empowers consumers to reduce their energy use.

Sensors – Advanced communication equipment on the grid, including sensors, enable utilities to monitor, identify and quickly correct problems. Increased reliability of power is the result.



Traditional Generation – Over time, traditional generation assets such as coal-fired generation plants will be offset by renewable energy sources in providing energy to the distribution grid.

National Grid Smart Grid Pilot Proposal
Worcester, Massachusetts

Smart Grid; Technology Modules

- ◆ **Holistic Homes**
 - ◆ Home Automation- Maximizes the benefit of the Smart Grid
- ◆ **Vehicle to Grid**
 - ◆ Smart charging will be necessary to prevent distribution system overloads when plug-in and all electric cars become more commonplace
 - ◆ Even more critical when battery manufacturers allow vehicle discharging
- ◆ **Micro-CHP**
 - ◆ Availability and reliability
- ◆ **Small Renewables**
 - ◆ Availability and reliability
- ◆ **Energy Storage**



REMOTE USER INTERFACE



DOE Smart Grid Demonstration \$16 M award titled "Distributed Energy Storage System Demonstration",

- ◆ **Syracuse Fleet Demonstration.** A fleet of three energy storage units will be installed in Syracuse, New York. Two of the storage units will be installed at National Grid's Rock Cut Road Substation and one unit will be installed nearby at Syracuse University, mid-point on a feeder which is served by the Rock Cut Road Substation. Premium Power and National Grid intend to control these multiple energy storage units as a fleet from the substation to explore substation-feeder storage control methods.
- ◆ **Everett PV Integration Demonstration.** Two energy storage units will be installed at the Everett, Massachusetts site, which is located at National Grid's Thorndike Substation. National Grid plans to install approximately 650 kW of PV capacity at this site, and an energy storage system will assist in the firming of intermittent resources.
- ◆ **Sacramento Fleet Demonstration.** A fleet of two energy storage systems will be installed in Sacramento, California, one at the SMUD Headquarters (East City Substation) serving the SMUD campus micro-grid, and one at a substation serving the nearby Anatolia III SolarSmart Homes community development.

What's in it for the Customer?

- ◆ For smart grid to be successful, customers must have the opportunity to save money
 - ◆ Large scale reduction of peak loads should lower forward commodity costs
 - ◆ May need 25+% of total customers participating to accomplish this
 - ◆ Customer need extensive education as to the options they have
 - ◆ Dynamic pricing
 - ◆ Critical peak pricing, time-of-use, hourly pricing
 - ◆ Tools to manage energy use
 - ◆ In many cases, default load management techniques would be used
 - ◆ Continuous Information on energy efficiency measures
 - ◆ For sustained reductions over time, need to keep customers involved
- ◆ For utilities, customer-side resources could provide reserve capacity
 - ◆ If it is dependable, this could lower forward distribution system costs
 - ◆ Smart grid technology and communication infrastructure will have its own costs

Energy Efficiency opportunities

- ◆ Home display units and/or web portals will provide real-time information on usage and control
 - ◆ Need to be simple to use and repair
 - ◆ Need to accommodate new tools as they become available
- ◆ Community net-working to promote competition amongst similar type customer and/or friends, neighbors, and relatives
 - ◆ Continuous reminders of opportunities to be sustainable
- ◆ Working with retailers to promote energy efficient appliances/measures thru web portals above
 - ◆ Show customers where sales are taking place, offer rebates, etc.
- ◆ Huge need for system integration people
 - ◆ Customers will need help getting components to work together – if the system hiccups, many times it will not get successfully restarted.

Transportation Initiatives

◆ Compressed Natural Gas

- ◆ Vehicles
- ◆ Fueling Stations

◆ Hydrogen

- ◆ Vehicles
- ◆ Hydrogen Production
- ◆ Blending & Fueling

◆ Electricity

- ◆ Vehicles (PHEV & BEV)
- ◆ Charging Level I, II & III



A landscape photograph featuring a vibrant green field in the foreground, a single large tree in the middle ground, and a bright blue sky filled with scattered white clouds. The text is centered in the upper half of the image.

With your help we can lead the way in creating the
climate for change

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National Grid Energy Efficiency Programs



Save Energy. Save Money.



nationalgrid

The power of action.™

Program Topics Today.....

Energy Efficiency Overview

Who Qualifies?

Residential Programs

C&I and Multifamily Programs

National Grid's Energy Efficiency Experience

Long, uninterrupted history of program delivery in the US – 20+ years

- ◆ More than 4.7 million National Grid customer projects completed in New England, saving more than \$3.6 billion in energy costs
- ◆ Programs saved customers over \$250 million on an annual basis
- ◆ Over \$1 billion invested in efficiency

Programs have served as models for many programs across the US

Current budget of \$134 Million* (electric and gas) in New York, Massachusetts, New Hampshire and Rhode Island

* Excludes LIPA's \$46 Million Efficiency Program Budget

Energy Efficiency Overview

- ◆ Energy Efficiency programs - NY & LI
 - ◆ **Started August 2007**

High Efficiency? What is your Awareness?

Participation?

Customer Interest?

Who Qualifies

- ◆ Existing Residential Heating Customers
- ◆ C&I and Multi-Family Customers on Firm Gas Tariffs (no T.C. /Interruptible customers)

- Gas to Gas Replacements
- New Construction
- Electric and Propane Conversions

Oil to Gas conversions – Discounted boiler pricing incentive

Saving Energy at Home

When it comes to energy efficiency, it's helpful to think of your home as a three-part system:

Shell of home – windows, doors, walls, insulation, air sealing

Heating and cooling systems – boilers, furnaces, HVAC, water heating

Appliances & Lighting

When all three parts work together, you'll be on your way to a money saving efficient home!



Residential Gas Efficiency Programs in New York and Long Island

Online Home Energy Analyzer – Learn about your home’s energy use and find ways to save

Weatherization Services – Incentives for insulation and air sealing

Multi-family dwellings – Special services for more than four units of housing

Income eligible customers– Help to weatherize and upgrade to energy-efficient equipment

New Home Construction with ENERGY STAR – Assistance with design review and certification.

In-home Energy Audits – For customers ready to make investments for long-term savings

** Check for program terms and conditions. May not be available in all areas.*



***ENERGY STAR homes use about 20-30%
less energy than those built to code.***

Residential High-Efficiency Heating Equipment

Residential Heating Rebates



- **\$100** rebate on Furnaces (forced hot air) 90%+ AFUE* Rating.
- **\$400** rebate on Furnaces (forced hot air) 92%+ AFUE* Rating and ECM motor.
- **\$200** rebate on Steam Boilers (steam with electronic ignition) 82%+ AFUE* Rating
- **\$500** rebate on Hydronic Boilers (forced hot water) 85%+ AFUE* Rating.
- **\$800** rebate on Hydronic Boilers (forced hot water) 90%+ AFUE* Rating.

High-Efficiency furnaces and boilers can save 25 to 40% on annual fuel bills in addition to reducing air pollution.

*Annual Fuel Utilization Efficiency

High-Efficiency Water Heating Indirect and Tankless / On-Demand

Indirect

- Program: **\$300** rebate for installation of an indirect water heater attached to an ENERGY STAR® FHW boiler



On-Demand/Tankless

- Program: **\$300** rebate for residential customers installing an on-demand/tankless water heater with an Energy Factor of .82 or greater and electronic ignition



Weatherization

When you install any or all of the following qualifying measures, the Company will provide a 20% incentive up to \$750 per residential heating account:

- Attic / Wall insulation
- Basement or crawl space insulation
- Heating system / duct pipe insulation
- Ductwork leakage testing and sealing
- Infrared inspection
- Air infiltration testing and sealing

Weatherization measures, such as insulation and air sealing, save up to 20% a year on heating and cooling costs



Incentives for High Efficiency Products

High-Efficiency Heating Equipment

Gas-fired furnaces or Boilers
Rebates of up to \$1,000

High-Efficiency furnaces and boilers can save 25% to 35% on annual fuel bills and fuel consumption.

High-Efficiency Gas Water Heating Equipment

Indirect or On-Demand Systems – \$300 rebate

Programmable Thermostats – automatically adjusts according to your schedule, allowing you to save energy and money without sacrificing comfort

\$25 rebate/ per thermostat

Outdoor Boiler Reset Controls – Signal the boiler to operate at a higher level of efficiency by differentiating between colder and milder weather.

\$100 rebate

ENERGY STAR Windows

\$10 rebate/ per window



Solar Thermal Systems (Tech Demo)

Residential customers are eligible for a rebate of 15% of solar thermal project costs, with a maximum of rebate of \$1,500. Pre-Approval required.

Tech Demo project - limit 25 to 30 installation project per year.

Call or email for terms and conditions.

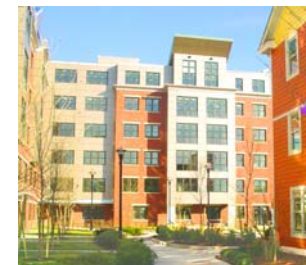
Residential Projects: 800-292-2032

E-mail us: solar@us.ngrid.com



Commercial & Industrial Programs

- High Efficiency Heating Equipment
- High Efficiency Water Heating Equipment
- Boiler Reset Controls
- Steam Traps
- ENERGY STAR® Thermostats
- ENERGY STAR® Replacement Windows
- Economic Redevelopment Program
- Custom Audits
- Solar Water Heating
- Engineering Grants
- Other Energy Efficiency Programs



Commercial High Efficiency Heating Equipment Program

Heating Rebate (per unit installed):

- **FURNACES** - 92% AFUE* or greater \$100 (up to 150 MBH)
92% AFUE or greater with ECM \$400 (up to 150 MBH)
- **STEAM BOILERS** - 82% AFUE or greater \$200 (up to 300 MBH)¹
- **HYDRONIC BOILERS** - 85% AFUE or greater \$500 to \$4,000 (up to 2000 MBH)
- **CONDENSING BOILERS** - 90% Thermal Efficiency or greater - \$ 1,000 to \$6,000 (up to 2000 MBH)
- **DIRECT FIRED HEATERS, CONDENSING UNIT HEATERS, & INFRARED HEATERS**



Available for all commercially metered applications.
No pre-approval or energy audits required.

High-Efficiency Water Heating Units and Boiler Reset Controls

Water Heaters Rebates

INDIRECT FIRED WATER HEATERS

- \$100 (up to 50 gallon storage)
- \$300 (over to 50 gallon storage)

- ### ON DEMAND TANKLESS WATER HEATERS With Energy Factor of .82 or higher \$300 and electronic ignition



Boiler Reset Controls Rebate

Single stage units \$150

Multi stage units \$250



Commercial Prescriptive Improvements

- Steam Traps \$25 (Limit 100)
- Programmable Thermostats \$25 (Limit five)
- Pipe/Duct Insulation \$1.50/lin ft
- Windows (with U-value of 0.35 or less) \$1/sf
- Building Shell Insulation (Roof/Wall/Floor) 20% of installed costs
- and others...

Custom Commercial Rebates

Customer Energy Saving Program:

- Rebate based on therm savings and type of measures installed
- Max rebate of 50% of project cost or \$100K per project
- Requires Pre-Approval



Project include:

- ✓ Most Heat Recovery Applications
- ✓ Advanced Technology and/or Burner Controls
- ✓ Natural gas absorption cooling
- ✓ Natural gas fuel cells and more.....

Steam Program

Steam Survey

Purpose of the steam survey is to uncover failed or non-operating traps, leaks in the system, missing insulation and condensate line / tank problems

Program will fund 25% of the steam survey to a max of \$2,500

If at least 50% of recommended repairs are completed, an additional 25% of the survey will be reimbursed, up to \$2,500 with a max of \$5,000.

In return for funding, a comprehensive steam trap management procedure in accordance with the Department of Energy will be followed.

Steam Trap and Pipe Insulation replacement will be incented through the Prescriptive Program

Multifamily Energy Efficiency Program



Offers technical and financial assistance to our multi-family business market. By participating in an audit, customers receive energy efficiency recommendations to help reduce overall operating cost.

- ◆ ***Up to 50% matching funds***
- ◆ ***Maximum \$100K incentive per project***
- ◆ ***Offers rebates for heating, water heating, weatherization and associated controls***

New York City Housing Authority – *Brownsville, Brooklyn*

- 1337 Residential Units
- Installation of 27 PVI instantaneous water heaters
- Award Amount: \$100,000
- Therms Saved: 67,672

Custom Projects – New York & Long Island



Kurt Weiss Greenhouses – Center Moriches, Long Island

- Thermal Shield installed in both greenhouses
- Building “1” - 87,780 Square feet
- Building “2” - 24,200 Square feet
- Total Square feet – 111,981
- Incentive Amount: \$100,000
- Therms Saved: 50,556



Aviator Sports Complex – Brooklyn, NY

- 75 KW Co-Gen
- Radiant Heating
- High Efficiency Water Heating
- High Efficiency Boiler
- Incentive Amount: \$100,000
- Therms Saved: 150,000
- 2009 NEEP Award Recipient (Northeast Energy Efficiency Partnership)



New York City Housing Authority – Brownsville, Brooklyn

- 1337 Residential Units
- Installation of 27 PVI instantaneous water heaters
- Incentive Amount: \$100,000
- Therms Saved: 67,672

Commercial and Industrial Solar Thermal


- ◆ Domestic Hot Water
 - Multi Family, Condos, Hotels
- ◆ Pool Heating
 - Schools, Community Centers
- ◆ Space Heating (radiant, pre heat)
 - Facilities, Labs
 - Office Space
- ◆ Process Hot Water
 - Industrial
 - Food Processing
- ◆ Solar assisted Cooling
 - Absorption Cooling



Space Heating and Other Projects - Engineering Grants available up to \$10,000
Solar Thermal - \$3/therm first year savings; LIMIT 50% project cost or \$100,000

Economic Redevelopment

nationalgrid Economic Redevelopment Application
Energy Efficiency Projects



Improve your community and save energy with economic redevelopment.
Funding is provided for projects designated to create strong economic or community impacts. Participants are eligible for rebates, which a project would be entitled to under the standard rebate program plus additional funding based on project scores involving innovative use of natural gas energy saving technologies, community and economic impact and creation of affordable housing.

Efficiency Experts 

Rhode Island

- Customized rebates based on therm savings and type of measures installed
- Up to 50% of the cost of measures (Max \$100K per project).
- Available only in qualifying Empire Zones
- Requires Pre-Approval

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Other Custom Energy Efficiency Programs

- Custom Energy Savings Program
Energy Audits
Engineering Grants /
Technical Assistance
- Building Practices & Demonstration Program
- Business Analyzer Internet Audit Service



Residential & Commercial Customer and Contractor Support Hotline

The environment is important to all of us we can help
to save energy, money and the environment

Residential & Commercial Heating Programs:

1-800-292-2032

Commercial Custom Programs:

1-800-843-3636

www.powerofaction.com

Contact Information

Ken Camilleri

Energy Efficiency Department

Sr. Engineer /Program Manager

Office: 631 755-6751

Cell: 516 319-5733

Make the difference, here to stay!!!!

A landscape photograph featuring a vibrant green field in the foreground, a single large tree in the middle ground, and a bright blue sky with scattered white clouds. The text "Thank You" is centered in the upper half of the image.

Thank You

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