STATE OF NEW YORK

Public Service Commission

Garry A. Brown, Chairman

Three Empire State Plaza, Albany, NY 12223
Further Details: James Denn, (518) 474-7080
http://www.dps.state.ny.us
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SMART GRID PROJECTS SEEK FEDERAL STIMULUS FUNDING

— Cutting-Edge Initiatives to Pave Way for the Electric Grid of the Future —

Albany, NY—07/24/09—The New York State Public Service Commission (Commission) today voted to approve a wide-range of advanced smart grid initiatives as proposed by six major electric utilities in New York. The Commission's approval of the cutting-edge projects is contingent upon the U.S. Department of Energy (DOE) awarding a 50 percent matching federal grant.

"These projects represent an opportunity to move New York's electricity system into the 21st century," said Commission Chairman Garry Brown. "The introduction of computer technology designed specifically for the electric grid will spark a revolution in the way we use electricity, much like the revolution that occurred in telecommunications and the Internet. With federal cost-sharing being offered, now is the perfect time to move forward because it will minimize the financial impact on ratepayers. In addition, we anticipate a greater likelihood of success in winning the federal grant if the utility has already secured non-federal funding sources for projects."

Since the federal stimulus funds available from the DOE will only cover up to 50 percent of the total costs of the proposed smart grid projects, the utilities filed requests with the Commission to recover the portion of the costs not covered by the DOE grant from ratepayers. Today the Commission approved a series of projects with a total cost of about $825 million and ratepayer matching funding of approximately $390 million.

The utilities seeking ratepayer recovery for matching funding of smart grid investments, and the amounts of such funding approved by the Commission today include: Consolidated Edison of New York, Inc. (Con Edison) for $175 million; National Grid $145 million; Rochester

Gas and Electric Corporation (RG&E) $36 million; New York State Electric and Gas Corporation (NYSEG) $20 million; Central Hudson Gas and Electric Corporation (Central Hudson) $10 million; and Orange and Rockland Utilities, Inc. (O&R) $5 million.

The ratepayer-matching funding will be provided through a temporary surcharge to be implemented upon completion of each project. Surcharge proposals by the affected utilities will be made after the DOE grants are announced and will be subject to comment by interested parties as to the manner and classes of ratepayers impacted by the surcharge. The impacts of the surcharge are expected to be moderate once implemented.

In approving proposed utility projects for ratepayer-matching funding, the Commission determined that projects provide a reasonable investment in technology that improves the efficient and intelligent operation of the electric grid in New York State. The Commission concluded that there are substantial benefits to be gained by beginning to invest in the use of advanced technology and communication to improve grid operations.

Projects that expand or extend existing projects that the Commission previously authorized for ratepayer recovery were approved today for additional ratepayer matching funding, contingent upon DOE approving substantially the same projects in Con Edison's service territory.

Also, smart grid projects that enhance power operator decision making to avoid events similar to the 2003 Northeast Blackout and 2006 Long Island City Outages were approved today, as well as projects designed to modernize and enhance existing electrical distribution systems for reliability.

Smart grid projects that will improve grid operations and potentially enable expansion of demand response resources and opportunities for residential customers to manage energy costs were approved in all of the electric service territories. See Attachment A for list of projects approved by the Commission for matching ratepayer funding.

A smart grid uses advanced/enhanced technology and two-way communications to improve operations and efficiency of the entire electric grid from the generation source to end-use consumption. Among other benefits, a smart grid will allow operators to more effectively operate the power grid, and will potentially enable consumers to actively monitor energy

consumption and better control their bills. A smart grid can also enable the accommodation of all generation sources, including renewables, and storage options.

Several non-smart grid projects for Con Edison were also approved today totaling approximately $2.5 million in ratepayer funds. Ratepayer contribution to these projects represents less than 50 percent of the projects costs because the utilities recruited partners for the projects. The projects include deployment of 2,250 solar panels at its Astoria complex to test the company's system for the integration of solar resources and battery storage; a study conducted with other partners to assess off-shore wind resources; and a partnership with Chrysler and the U.S. Postal Service to test new technologies for vehicle transportation that ultimately may promote the reduction of greenhouse gases.

Approval of all the smart grid projects by the Commission is conditioned upon the utilities filing with the Commission their applications, and any amendments, submitted to DOE for any competitive grant opportunity in order to ensure the utility has applied to the Commission for the same projects filed with the Commission for cost recovery.

The utilities are also required to submit quarterly reports detailing the project milestone, including which milestones have been reached, the associated costs for each project milestone along with supportive documentation of the associated costs.

The Commission's written order, when available, may be accessed by visiting the Commission Documents section of the Commission's Web site at www.dps.state.ny.us and entering Case 09-E-0310 in the input box labeled "Search for Case/Matter Number." Many libraries offer free Internet access. Commission orders may also be obtained from the Commission's Files Office, 14th floor, Three Empire State Plaza, Albany, NY 12223.

Background

The American Recovery and Reinvestment Act of 2009 (ARRA) includes a DOE administered program for Electricity Delivery and Energy Reliability (EDER). The sum of $4.5 billion is appropriated by ARRA for the EDER program, to be dispersed by DOE through competitive grant opportunities for the EDER program—a Smart Grid Investment Grant Program (Investment Program) and a Smart Grid Demonstrations Program (Demonstration Program). Applications to the Investment Program are due on August 6, 2009 and on August 26, 2009 for the Demonstrations Program.

ATTACHMENT A

SUMMARY OF UTILITY PROJECTS

Below is a summary, by utility, by project type of the projects that were submitted on April 17, 2009 and updated on July 2, 2009.[1] These project summaries pertain to the smart grid funding opportunities for investment and demonstration available through the U.S. Department of Energy. There are also several non smart grid projects submitted by Con Edison on June 24, 2009 that the company intends to submit under different funding opportunity announcements.

Con Edison / Orange & Rockland

Grid Enhancement – Distribution

A. **Dynamic Secondary Network Modeling and Visualization** – This project proposal includes integrated development and operation of distributed secondary network load flow models; provides near real-time load profiles for customer locations; validates model load flows from secondary models, provided by installation of new remote devices at strategic customer locations; helps Control Center Operators develop, maintain, and sharpen their situational awareness skills. Additionally, it will improve secondary modeling and load flows to better target grid reinforcement in the networks, minimizing secondary cable failures during peak loading conditions and network outages due to secondary events in the summer. It will also improve the accuracy of the calculated coincident demand for peak summer days. The project will provide a state of the art training tool for the operators for system contingency planning which will help to improve emergency response. This project is a combination of newly proposed projects along with other advancements of ongoing projects that will create additional 14-20 new jobs and cost an estimated $19.0 million.

B. **Overhead (OH) Distribution Sectionalizing Switches** – This project includes the installation of SCADA controlled primary underground sectionalizing switches on targeted network feeders, replacing old motor operated three phase SF6(sulfur hexafluoride) gas insulated switches to improve the reliability of the overhead distribution systems. The benefits of the project include enhanced reliability by enabling rapid isolation of faulted segments of primary feeders and re-energizing the non-faulted portion of the feeder. It also includes advanced distribution automation and enhances system reliability by creating a more adaptive, integrated/flexible, interactive and optimized grid. The OH Distribution Sectionalizing Switches project is advancement to the existing OH sectionalizing efforts that will create additional 21 to 24 new jobs and cost an estimated $46.0 million.

C. **Underground (UG) Distribution Sectionalizing Switches** – This project includes installing a combination of automatic and manual sectionalizing overhead switches, to improve the reliability of the overhead distribution systems. The benefits of the project include enhanced reliability by enabling rapid isolation of faulted segments of primary feeders and re-energizing the non-faulted portion of the feeder. It also includes advanced distribution automation and enhances system reliability by creating a more adaptive, integrated/flexible, interactive and optimized grid. The UG Distribution Sectionalizing Switches project is advancement to the existing UG sectionalizing efforts that will create additional 14 to 16 new jobs and cost an estimated $40.0 million.

D. **Intelligent Underground (UG) Automatic Loop** - This project will provide a demonstration of an underground automatic loop design in a large distribution network using remotely controlled and automated switches to reduce the risk of a large network outage and improve reliability. This reduces the size of a large network and thereby reduces risk of major network outage, also improving the reliability of the grid. This is a new project that will create additional 18 to 20 new jobs and cost an estimated $72.0 million.

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[1] All numbers contained herein are total numbers, and thus, the proposed ratepayer portion of project costs would be one-half the total project cost unless otherwise specified.

E. **4 kV Grid Modernization** – This project modernizes the 4kV grid, which is the backbone of supply to the majority of non-network customers in the Con Edison system. It will include additional distribution capacitor banks, installation of central load tap change (LTC) controller software for all 4kV grids, installation of SCADA equipment for all 4KV grids, and the development of 4kV grid modeling software. Upgrading the 4kV Grids will increase efficiency by reducing losses and reliability by mitigating grid cascades through automated load shedding. This is a new project that will create additional 10-12 new jobs and cost an estimated $21 million.

F. **Remote Monitoring System (RMS)** – This project provides an upgrade to the RMS system that includes installation of RMS transmitters on network transformer vault locations throughout all service territories to allow operators and engineers to dynamically monitor transformer tank pressure, oil temperature and the oil level. This would enhance the reliability of the Remote Monitoring System and enables rapid operator response to changes in system conditions. This is an advancement of an ongoing project that will create additional 16 to 18 new jobs and cost an estimated $48 million.

G. **High Tension (HT) Monitoring** – This project upgrades the existing meters associated with High Tension feeders on the system, with an RF communication module. This enables improved system planning thereby improving the reliability and operation of the distribution grid. Supports remote metering of HT customers and critical load data during contingency situations. This is an advancement of an ongoing project that will create additional 1 to 2 new jobs and cost an estimated $2.0 million.

H. **O&R Capacitor Installation and Phase Balancing** – This project includes the installation of new area substation capacitor banks and the relocation of existing capacitor banks to optimize distribution system VAR support for both on peak and off peak conditions. Benefits include reducing system losses by correcting the power factor and thereby reducing the flow of reactive power through transmission lines, cables, and transformers. This is an advancement of an ongoing project that will create additional 4 new jobs and cost an estimated $1.8 million.

<u>Grid Enhancement – Transmission</u>

A. **Phasor Measurement Units (PMU)** – In collaboration with all the New York State utilities and the New York Independent System Operator (NYISO), this project includes the deployment of a significant number of Phasors throughout the state, offering precise measurements of the electricity grid. Installation of phasors would improve the ability to assess condition of the bulk power system on a real-time basis thereby improving system reliability and enabling creation of on and off line applications. For Con Ed, this is an advancement of an ongoing project that will create one additional new job and cost an estimated $6.5 million.

B. **O&R Capacitor Bank Installation for Losses Reduction** – This project includes the installation of transmission capacitor banks at strategic O&R locations as identified in a NYISO report on the benefits of additional capacitors. These capacitor installations would reduce system losses by correcting the power factor and thereby reducing the flow of reactive power through transmission lines, cables, and transformers. This is a new project that will cost an estimated $1.9 million.

<u>Customer Enablement / Grid Enhancement</u>

A. **Advanced Metering Infrastructure (AMI)** – Con Edison and Orange and Rockland have proposed four AMI pilot projects throughout its service territory. Three of which are in Con Edison's Westchester, Manhattan, and Long Island City (LIC) operating areas. The last is in Orange and Rockland's (O&R) Eastern operating division. The pilot projects will include approximately 58,000 electric and gas meters. This includes approximately 20,000 electric meters in Westchester; 7,500 electric meters in Manhattan; 10,000 electric meters in LIC; and 4,300 electric meters in O&R. These AMI pilot projects are proposed to evaluate in actual field conditions technologies from different vendors of AMI equipment and communications and home area network providers. Demand response and energy Efficiency programs in the pilot will be used to evaluate the responses of mass market customers to price sensitive rates and their

acceptance of AMI technologies. The AMI pilot project will enhance information sharing and communications between the utility and its customers. All four AMI projects will create approximately 4 to 6 new jobs and cost an estimated $44 million.

B. **Demand Response Initiatives** – This program includes the implementation of a Demand Response (DR) monitoring system and deployment of innovative controllable technologies. The DR monitoring system will be a comprehensive software deployment that will aggregate all DR participation in real time during events. The second component of the DR program will incent the purchase and installation of innovative utility controllable technologies. This will include such technologies as controllable room A/Cs, controllable rooftop A/Cs, HAN systems and Auto-DR enabled building management systems. Increase the reliability, utility and scope of Con Edison's DR programs: the DR monitoring system will enhance the use of DR as a true dispatchable resource. Incenting new technologies will allow penetration of New York City residential markets that have previously been unable to participate in DR. Additionally, it will provide DR resources to the utility that are extremely reliable and verifiable. This is an advancement of an ongoing project that will create additional 56 to 62 new jobs and cost an estimated $9.0 million.

C. **Monitoring Based Commissioning** – This project utilizes a combination of commissioning activities, coupled with ongoing, technology-based monitoring to create benchmarks for optimal building operations and ensure the persistence of savings. Monitoring building operations will allow the system to alert building managers of deviance from optimal performance, ensuring achievement of energy savings, and achieving benefits normally associated with energy efficiency and demand response (lower energy costs, lower peak demands, and reduced emissions). This is a new project that will create additional 46 to 52 new jobs and cost an estimated $6.0 million.

D. **Distributed Generation (DG) Interconnection** – This project will include smart communications between the network protectors and distributed generation such that the Network Protector (NWP) would not operate when sensing back feed from exporting customer owned DG. This allows Con Edison to accommodate large deployment of Distributed Generation into its networks. This is a new project that will create additional 1 to 2 new jobs and cost an estimated $4.0 million.

E. **Command and Control** – In partnership with Boeing, Columbia University, and The Prosser Group, Con Edison proposes to design and deploy intelligent network centric command and control system-of-systems (C2SOS) in conjunction with demand management, distributed generation, and energy efficiency projects. This project will provide real time situational awareness and transparency via an Integrated System Model of the electric transmission grid enables targeted management and intervention to resolve issues as they arise. Accommodated effective, plug-and-play compatibility amongst new, green technologies that have the potential to disrupt grid function. This is a new project that will create 90 to 100 new jobs and cost an estimated $61.7 million. Due to additional funding from the associated partners listed above, Con Edison is only asking for 25% (approximately $15.4 million) funding for the project.

F. **Grid Support** - This project will facilitate the integration of renewable resources by developing storage capabilities. Includes demonstration of customer on-site energy storage and other distributed energy resources (DER). It will demonstrate the capability of Con Ed to control and dispatch disparate customer energy storage and other DER assets to the grid for load leveling / peak shaving. This is a new project that will create additional 8 to 10 new jobs and cost an estimated $2.0 million.

NON SMART GRID PROJECTS

A. **Smart Solar** – This project will demonstrate the integration of PV and battery storage into Smart Grid applications. It will demonstrate how large scale resources can be integrated with battery technology into a robust Smart Grid project including a substantial number of AMI meters. This is a new project that will create additional 36 new jobs and cost an estimated $4.7 million. Due to additional funding from a partner institution, Con Edison is only asking for 25% (approximately $1.2 million) funding for the project.

B. **Off-Shore Wind Study** – This project will validate off-shore wind resource study tools and develop models and parallel algorithm organization tools for operational generation planning and scheduling of distributed energy resources into the electric power systems. This is a new project that will create additional 97 new jobs and cost an estimated $12.0 million. Due to additional funding from associated partners, Con Edison is only asking for 10% (approximately $1.2 million) funding for the project.

C. **Electric Vehicle Demonstration** – Con Edison joined with Chrysler for a large scale transportation electrification program demonstration in its service area. The program will demonstrate the use of plug-in electric delivery vehicles for the US Post Office. The Company will provide charging infrastructure and related metering for these vehicles, at various Post Office locations in Queens and the Bronx. This is a new project that will create one additional new job and cost an estimated $546 thousand. Due to additional funding from associated partners, Con Edison is only asking for 25% (approximately $123 thousand) funding for the project.

National Grid

Customer Enablement/Grid Enhancement

Smart Grid/AMI -- The Company proposes to deploy Smart Grid technology at two locations in New York, one in the Syracuse area and one in the Capital District area, located north of Albany. The Syracuse Smart Program area will include approximately 40,000 customers, while the Capital District Smart Program area will include approximately 42,000 customers. The Company states that these customers and associated meters, feeders, and substations represent a cross-section of the Company's customers and electric grid equipment, which is an essential element for any test to be both statistically valuable and procedurally useful in informing its broader strategic decision related to smart grid and clean energy. The Smart Program is broken down as follows:

A. **Communications Backbone** –National Grid proposes to implement a robust, two-way communications platform as the backbone of the Smart Program. The stated objective is to deploy a communications backbone capable of moving both data and commands at sufficient bandwidth and speed to enable an integrated, interactive approach to smart energy technologies in the home, at the meter, along the electric grid, in the substation and potentially beyond. The Company is investigating a variety of wireless technologies to support this approach, but promises to leverage existing National Grid assets, new wireless technologies, and public networks.

B. **Advanced Digital Meters** – National Grid proposes to use advanced digital meters that can support interval measurements, remote disconnects and remote firmware upgrades, track both voltage and power factors, and serve as a gateway for communications into the home. The Company views smart meters as a critical component of the system in order to provide timely data for use by the customer, the grid operator, and possibly, third party service providers.

C. **In-Home Energy Management** – Three levels of in-home energy management technology are proposed to be provided to customers based upon the service offerings in which they elect to participate. At each level of participation, customers will be provided with energy consumption and pricing data to inform their decision making processes. As customers elect to become more engaged, the information and tools available to them to actively manage their energy consumption and usage will become increasingly detailed, timely and interactive, with more options and greater flexibility for the customer.

D. **Technology Deployment** – Six categories of technology are proposed for deployment on the grid as part of the Smart Program: (1) new monitoring devices mounted directly on feeders; (2) retrofit communication devices installed on existing grid control and switching equipment to enable his equipment to be monitored and controlled remotely; (3) new grid control and switching equipment added to feeders in the Program area; (4) software applications that provide distribution grid operators with improved visibility and operational flexibility; (5) new substation monitoring and control that will provide a broader view of the entire operational system; and (6) digitally controlled sub-transmission breakers to extend the smart system beyond the substation.

The total projected cost of National Grid Smart Grid/AMI Initiative is $189.9 million.

Clean Energy Modules – In addition to deploying the Smart Grid/AMI technology "spine", National Grid proposes to demonstrate the effects of combining Smart and Green by integrating a robust set of clean energy modules into its Smart Program. The Smart Program will demonstrate the integration of a number of clean energy technology modules with the Smart Grid spine. Each technology is summarized along with the rationale for its inclusion below:

Photovoltaic systems convert solar energy from the sun directly into electricity. Key barriers to photovoltaic deployment include high installation cost and the intermittent and variable nature of the output. This module will focus on demonstrating how the Smart Grid can manage high concentrations of photovoltaic on the grid and how the Smart Grid can help unlock additional value by having photovoltaic on the grid.

Plug-In Hybrid Electric Vehicle (PHEV) is a hybrid vehicle which has additional battery capacity and the ability to be recharged from an external electrical outlet. Electric vehicles are likely to play a major role in achieving greenhouse gas reductions and reducing dependence on foreign oil. The objective of this project is to understand the interface between PHEVs and the Smart Grid. Combining PHEV with the Smart Grid will allow for system optimization and create opportunities to take advantage of significant distributed energy storage on the grid.

Energy Storage has many different applications and benefits, but the most promising applications require close integration with utility operations and assets. Energy Storage coupled with Smart Grid sensing and controls can provide asset deferral, peak shaving, voltage support, and improve reliability for the distribution system. It would also be important for managing increased penetration of intermittent renewable generation and charging of PHEV.

Wind Power taps wind energy and converts it to mechanical energy for driving electric power generators. The Smart Grid can help optimize the integration of distributed wind power, and provide asset deferral, load management, voltage support, and improved reliability.

Micro Combined Heat and Power (Micro-CHP) is the simultaneous production of useful heat and electric power within the home. Utilizing Micro-CHP may result in a more than 30% reduction in fuel required for residential electricity generation and produce enough electricity in a thermal load following configuration to reduce a homeowner's annual electric consumption by about half. Micro-CHP may also reduce emissions associated with global warming by 60% and help electric utilities meet mandates requiring them to meet emission reduction targets.

Micro-Grids are self-sufficient power systems that do not need to be connected to a larger utility grid, but often are connected. This module is different in that it will combine all the preceding modules into a single locally operated system. Opportunities exist to demonstrate that this local energy network can disconnect and operate independently from the rest of the distribution system and can resynchronize with the grid.

Holistic Homes This module seeks to integrate the individual technologies described in the preceding modules into an existing home. A holistic building will lead ultimately to a zero-net carbon building as renewable energy technology continues to develop. This evaluation will lead directly to economically framing the possibilities and costs for utility customers.

The total projected cost of National Grid Clean Energy Modules is $80.7 million.

Statewide Phasor Measurement Units Program

National Grid proposes to participate in a statewide program, developed in coordination with the NYISO and other New York utilities, to install Phasor Measurement Units (PMUs) at locations across New York in an effort to provide appropriate visibility for the transmission network. As part of this program, National Grid anticipates installing approximately twelve PMUs, primarily at the major 345 kV and 230 kV stations on the Company's transmission system that already have data fault recorders which can be easily upgraded to provide PMU capabilities. A location list for the PMUs will not be finalized until the NYISO and transmission owners complete a comprehensive review of the New York State transmission system. The cost of the PMU project as $2 million, including initial engineering design, procurement and installation costs and the ongoing cost of operations and maintenance.

Statewide Capacitor Bank Program

National Grid states that the installation of capacitors on both the transmission and distribution system for increased reactive power support and improvement of voltage profile is an approach that it has adopted for a number of years. National Grid says that it is working in collaboration with the NYISO and the New York transmission owners to understand the needs, costs and benefits of a statewide capacitor bank investment program. The Company explains that the NYISO recently completed a "Benefits of Reducing System Losses" study (the Study) to update the optimal power flow assessment they performed earlier in the year. Based on a preliminary review of the Study, National Grid estimates that its project costs for participation in the Capacitor Bank program would total $17 million, of which $4.5 million would be for equipment installed on the Company's transmission system, and $12.5 million for equipment installed on its distribution system.

Central Hudson Gas & Electric

Smart Grid Initiative

The Smart Grid Initiative project encompasses many Smart Grid/AMI elements and technology applications. It creates ten "intelligent" circuits from source to end user combining AMI technologies, distribution equipment upgrades and automation, and data system modernization to enhance operational efficiency in the distribution grid, and, when coupled with dynamic rate offerings, allow greater energy consumption control by consumers.

CHG&E's Smart Grid Initiative project seeks to deploy systems that are cost-effective, scalable, adaptable, open to technology and vendor neutrality, and which provide reliable and secure transmission of data. Technology applications of the CHG&E Smart Grid Initiative include:

A. **Advanced Meter Infrastructure (AMI):** Installation of meters (both electric and gas) and associated communications technology to accommodate data collection for approximately 13,500 "smart" endpoints and facilitate demand response programs. The two-way communication system will incorporate a two-tiered radio frequency (RF) mesh design. For meter data communication, the system will incorporate a 900 MHz platform to allow for "hopping" of data among meters to a collection point for backhaul to the utility. A higher priority tier (at 2.4 GHz) will be established for electric distribution equipment applications that have higher bandwidth and speed requirements.

B. **Home Area Networks (HAN):** Creation of 2,000 HANs to gauge customer response to electric usage. Installation of display devices which can communicate meter data, and other devices that can control appliances to aid in demand response. Conduct surveys and focus group activities to study an evaluate customer reaction to HANs and explore the possibility of creating new services.

C. **Meter Data Management System (MDMS):** Adoption of a Meter Data Management System (MDMS) and near real-time load flow data analysis tool. The MDMS will integrate with the existing legacy Customer Information System as well as the Outage Management System and provide real time data from endpoints on the grid to the load flow program for circuit modeling and

analysis functions. The analysis tool will be used to perform load flow scenarios as well as provide both engineering and system operations with timely and accurate simulation capabilities for improved operation of the electric system. In conjunction with smart meter and the HAN deployment, the MDMS will facilitate consumer-friendly interfaces for access to usage and rate information allowing for educated choices in terms of rate offerings and energy usage.

D. **Electric Distribution Automation, Data Monitoring and Engineering Analysis Software Tool:** Installation of substation relaying equipment, switched capacitor banks (SCBs), and electronic reclosers. Also includes integration of communication modules into existing equipment control panels such as automatic load transfer switches (ALTs), SCBs, and voltage regulators. The project will create ten "smart "distribution circuits. The communication modules will allow for real-time voltage and current readings and control of equipment, which will aid in reducing system loss by utilizing installed SCBs. Data will be collected and integrated into an engineering analysis tool to determine overall health of the circuit, predict overload conditions, high and low voltage conditions, and power factor discrepancies

E. **Distributed Resources:** Installation of sensors and communication equipment on Distributed Generation (DG) circuits, as well as the integration of collected data into systems, to monitor and control the impact of distributed generation interconnection on the overall system and protect against undesirable events. In one area with a high concentration of DG interconnection, CHG&E proposes the installation of SCBs to compensate the system to enhance reliability and optimize the voltage profile of the feeder circuit. The Investment Program also includes the installation of a PHEV charging station.

F. **Natural Gas Equipment Monitoring:** Installation of communication modules to investigate the feasibility and applicability of transferring gas pressure and flow data from electronic monitors at regulator station and low points through the mesh network.

G. **Customer Programs:** Development of education and outreach initiatives to guide consumers through the transition to Smart Grid and how to control energy consumption. Establishment of voluntary dynamic rate offerings and introduction of demand response and load control initiatives, which include the installation of energy usage displays, customer web access to usage information and energy saving techniques designed to reduce energy demand.

CHG&E intends to deploy technologies in multiple areas of its serving territory, representing two percent of its total customers and approximately five percent of its electric distribution circuits. The areas were chosen incorporate the diversity of its customer population, as well as the various geographic characteristics of its service area, which includes densely treed areas, mountainous, and sparsely populated regions. Specific areas for deployment include the Knapps Corners Substation (Duchess County), the Saugerties Substation (Northern Ulster County), and the Modena Substation (Southern Ulster County).

The CHG&E Smart Grid Initiative envisions a two-year deployment timeline and an additional two-year period for system integration, data evaluation and study of customer behavior. The projected cost of CHG&E Smart Grid Initiative is $17.3 million.

Statewide Capacitor Bank Installation

Deployment of additional reactive resources, i.e., capacitor banks, in the CHG&E service territory, as recommended in the recent study by the NYISO (pursuant to requirements of Case 08-E-0751) to reduce system losses, improve reliability by improving system voltage profile, increase generator reserve, and improve interface transfer capability. CHG&E proposes installations in North Catskill, Lawrenceville, Reynolds Hill and West Balmville at an estimated cost of $3.1 million.

Statewide Phasor Monitoring Unit Deployment

In collaboration with the NYISO and other transmission operators, CHG&E has been working on the deployment of additional PMU resources within its service territory to improve monitoring and situational awareness of the transmission network. Benefits of a PMU network include enhancements to: network situation alarming; oscillation detection; power plant integration, monitoring and control; planned system separation, reclosing and restoration; and, post-event analysis. CHG&E's Roseton 345kV Switchtyard as a possible location for PMU deployment and estimates the cost to be $185 thousand.

NYSEG

Grid Enhancement

A. **SmartGrid – MHP metering** ($0.25 M, O&M – $0.011 M/yr) – This project compliments the Mandatory Hourly Pricing initiative ordered by the PSC. By providing large C&I customers (>300KW) with access to real-time energy prices the expectation is that they will shave their peak loads and reduce costs. NYSEG is scheduled to install 500 more MHP customers in 2009. NYSEG estimates that this project would retain 2 jobs.

B. **Bulk Transformer Replacement Initiative** ($70.0 M, O&M - $3.15 M/yr) - Purchase spare transformers for the bulk power system; purchase replacements for transformers near end of life. NYSEG estimates that 2 jobs would be retained and an unknown number of transformer manufacturing jobs would be created.

C. **Efficient Transformers Distribution Projects** ($31.5 M, O&M – $1.42 M/yr) - Purchasing core efficient transformers will reduce losses and associated system costs. Loss reductions range from 25-50% depending on transformer characteristics and loading. New transformers will contain environmentally friendly, non-oil based dielectric fluid to reduce impacts in the event of fluid spill. NYSEG estimates that 2 jobs would be retained and an unknown number of transformer manufacturing jobs would be created.

D. **Transmission and Distribution Infrastructure Replacement Program** (TDIRP) ($ 10.0 M, O&M - $0.45 M/yr) - Program started in 2005 and is intended to replace distribution, transmission, and substation equipment to sustain reliability through targeted replacement of aged or unreliable equipment. NYSEG estimates that 25 jobs will be retained and an unknown number of wire and pole manufacturing jobs created.

Statewide Capacitor Bank Installations

Statewide Capacitor Bank Installations ($9 M, O&M - $0.41 M/yr) – Install capacitor banks at locations as determined by the NYISO system losses study (pursuant to requirements of Case 08-E-0751) to reduce system losses, improve reliability by improving system voltage profile, increase generator reserve, and improve interface transfer capability. NYSEG proposes installation of a total of 320 MVARs at 121 locations.

Statewide Phasor Monitoring Unit

Statewide Phasor Monitoring Unit ($2.1 M, O&M - $0.35 M/yr) - In collaboration with the NYISO and other transmission operators, NYSEG has been working on the deployment of 5 additional PMU resources within its service territory to improve monitoring and situational awareness of the transmission network.

Customer Enablement

SmartGrid/AMI Demonstration and Technology Comparison ($28.4 M, O&M - $1.2 M/yr) – Horseheads/Cooperstown.

A. **Phase I - Expand WIMAX** – Expand the existing WIMAX communications system to provide smart metering with electric and gas meters and upgrade selected control points for the electric and gas system

within the WIMAX communications "cloud." Communicate all the data on a real time basis to the Elmira Service Center. Compare the performance and cost of a WIMAX system to an upgrade of the existing digital radio system that would allow data transmittal from the same smart meters and system control points.

B. Phase 2 – Evaluation – Consisting of 4 parts: 1) Evaluate the potential use of SmartGrid with WIMAX to optimize transmission grid performance by integrating real-time wind turbine information with the proposed compressed air energy storage facility near Watkins Glen, NY. 2) Evaluate the use of DG on selected circuit in the Horseheads area versus upgrading to respond to peak loading. 3) SmartGrid/AMI Demonstration of the Cooperative Use of Broadband WIMAX in Cooperstown for Community and Utility Services. This would provide a comparative demonstration to the proposed installation in the Horseheads area, expand on the number and type of meters and devices as well as compliment the interests that exists in many upstate communities to have broadband capability where it currently does not exist. 4) A dynamic pricing rate option evaluation that will include control and test groups. The pilot pricing program will randomly select a statistically valid number of customers who will be charged at either real-time pricing, critical peak pricing, time-of-use rates, or peak-time rebates in conjunction with the deployment of smart meters. NYSEG estimates that this project would create or retain 31 jobs.

RG&E

Grid Enhancement

A. **Smart Grid - MHP Metering** ($0.1875 M, O&M - $0.0084 M/yr) and Reactive Metering ($0.1875 M, O&M - $0.0084 M/yr) - RG&E proposes to integrate the Reactive Metering project with the MHP project. The MHP project at RG&E will consist of 250 new meters in estimated for 2010 and 250 more estimated in 2011. The costs include the installation of a new recording meter, but the customer also has to provide a phone line to the meter. These meters will be capable of measuring reactive power as well as recording the active kwhs for the MHP program. RG&E estimates that 4 jobs will be retained by these projects.

B. **Bulk Transformer Replacement Initiative** ($22.0 M, O&M - $0.99 M/yr) - Purchase spare transformers for the bulk power system; purchase replacements for transformers near end of life. RG&E estimates that 2 jobs would be retained and an unknown number of transformer manufacturing jobs would be created.

C. **Efficient Transformers Distribution Projects** ($10.7 M, O&M - $0.482 M/yr) - Purchasing core efficient transformers will reduce losses and associated system costs. Loss reductions range from 25-50% depending on transformer characteristics and loading. New transformers will contain environmentally friendly, non-oil based dielectric fluid to reduce impacts in the event of fluid spill. RG&E estimates that 2 jobs would be retained and an unknown number of transformer manufacturing jobs would be created.

D. **Transmission and Distribution Infrastructure Replacement Program** (TDIRP) ($5.0 M, O&M - $0.225 M/yr) – Program provides for the replacement of distribution, transmission, and substation equipment to maintain reliability through targeted replacement of aged or unreliable equipment. RG&E estimates that 25 jobs will be retained and an unknown number of wire and pole manufacturing jobs created.

Capacitor Bank Projects:

A. **Station 42 Capacitor Banks** ($2.1 M, O&M - $0.095 M/yr) - Add four (4) 20MVAR capacitor banks at Station 42. One capacitor bank will be located on each of the four 34.5kV buses. Station 42 uses approximately 60MVAR of reactive supply. Presently this reactive capability must be brought through the two (2) 115kV cables and 115/34.5kV transformer that supply the station. This heavy VAR flow uses the limited capacity of the cable and the transformers especially under contingency conditions of loss of one of the cables or one of the transformers. Adding the reactive support will provide significant voltage benefits to Station 42 which will ripple back to Station 13A which supplies Station 42. This area is very sensitive to the 115kV source voltage which is most predominate during high loads and most notably if Ginna Station trips off line. The capacitor bank additions should increase post-contingency voltages at Station 13A by

approximately 2%. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

B. **Station 42 115kV SVC** ($ 17.5 M, O&M - $0.788 M/yr) - Add a +/- 150MVAR SVC on the 115kV system near Station 42. Station 42 uses approximately 60MVAR of reactive supply and is a low-point for voltage in the Rochester area. Dynamic voltage support is required for voltage transient stability for large contingencies which include the tripping of Ginna. Adding the dynamic support where it is needed will provide significant voltage stability to the entire Rochester area. RG&E estimates that 4 jobs will be retained and an unknown number of SVC/capacitor and associated equipment manufacturing jobs created.

C. **Station 56 Capacitor Banks** ($ 0.8 M, O&M - $0.036 M/yr) - Add an additional 9MVAR to both 34.5kV 9MVAR capacitor banks at Station 56. Station 56 serves approximately 92MW of load which is 4,427 customers. During high load periods, loss of one of 115/34.5kV transformers results in significant MVAR through the transformer and overloading the transformers. This would result in shedding approximately 40MW of load to relieve the over load. The period of exposure is approximately 90 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

D. **Station 48 Capacitor Banks** ($0.5 M, O&M - $0.0225 M/yr) - Add an additional 16MVAR capacitor bank to the 34.5kV at Station 48. Station 48 serves approximately 100MW of load which is 2327 customers which includes Rochester Products. During high load periods, loss of one of 115/34.5kV transformers results in significant MVAR through the transformer and overloading the transformers. This would result in shedding approximately 10MW of load to relieve the overload. The period of exposure is approximately 30 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

E. **Station 198, 218, 194, and 181 Capacitor Banks** ($ 2.7 M, O&M - $0.122 M/yr) - Add 34.5kV (2) - 1.5MVAR capacitor bank at Wolcott (181), (1) - 1.5MVAR capacitor bank at Station 198, a (1) - 4.0MVAR capacitor bank at Station 218, and a (1) - 1.5MVAR capacitor bank at Station 194. All would be voltage controlled. Clyde 34.5kV substation serves approximately 25MW of load which is 9217 customers. During high load periods, the region served by Clyde substation will have low-voltages. This would result in shedding approximately 10MW of load to relieve the low-voltage. The period of exposure is approximately 175 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

F. **Station 180 and 128 Capacitor Banks** ($ 2.2 M, O&M - $0.1 M/yr) - Add a 115kV capacitor bank at Station 180 and a 115kV 20MVAR capacitor bank at Station 128. The Genesee region services approximately 55MW of load which is 13,188 customers which includes Angelica municipal. During high load periods and with local generation off, the Genesee region will have low-voltages. This would result in shedding approximately 10MW of load to relieve the low-voltage. The period of exposure is approximately 300 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

G. **Station 168 Capacitor Banks** ($ 1.0 M, O&M - $0.045 M/yr) - Add a 12MVAR capacitor bank to both 34.5kV buses at Station 168. Station 168 serves approximately 70MW of load. During high load periods, loss of one of 115/34.5kV transformers results in significant MVAR through the transformer and overloading the transformers. This would result in shedding approximately 10MW of load to relieve the overload. The period of exposure is approximately 90 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

H. **Station 127 and 125 and 120 Capacitor Banks** ($2.5 M, O&M - $0.1125 M/yr) - Add 34.5kV (2) - 3.0MVAR capacitor bank at Station 127, (2) - 3.5MVAR capacitor bank at Station 125, and a (1) - 7.2MVAR capacitor bank at Station 120. All would be voltage controlled. Station 121 serves approximately 48MW of load which is 8321 customers. During high load periods, Station 121 and surrounding substations will have low-voltages. This would result in shedding approximately 15MW of load to relieve the low-voltage. The period of exposure is approximately 175 hours per year. RG&E

estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

I. **Station 121 Capacitor Banks** ($ 1.2 M, O&M - $0.054 M/yr) - Add a 115kV 75MVAR capacitor bank at Station 121. Station 121 serves approximately 38MW of load which is 8300 customers and several key 115kV transmission lines. During high load periods, loss of Ginna results in instantaneous low-voltages at Station 121 and adjacent substations including Station 13A. The period of exposure is approximately 90 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

J. **Station 71 Capacitor Banks** ($ 1.2 M, O&M - $0.054 M/yr) - Add a 115kV 50MVAR capacitor bank at Station 71. Station 71 serves approximately 38MW of load which is 6779 customers. During high load periods, loss of the 917 line source from Station 7 results in low-voltages at Station 71 and adjacent substations. This would result in shedding approximately 20MW of load to relieve the low-voltage. The period of exposure is approximately 90 hours per year. RG&E estimates that 2 jobs will be retained and an unknown number of capacitor and associated equipment manufacturing jobs created.

Statewide Capacitor Bank Installation

Statewide Capacitor Bank Installations ($2.8 M, O&M - $0.126 M/yr) – Install capacitor banks at locations as determined by the NYISO system losses study (pursuant to requirements of Case 08-E-0751) to reduce system losses, improve reliability by improving system voltage profile, increase generator reserve, and improve interface transfer capability. RG&E proposes installation of a total of 98 MVARs at 35 locations.

Statewide Phasor Monitoring Unit Deployment

Statewide Phasor Monitoring Unit ($0.82 M, O&M - $0.07 M/yr) - In collaboration with the NYISO and other transmission operators, RG&E has been working on the deployment of 1 additional PMU resources within its service territory to improve monitoring and situational awareness of the transmission network.

Customer Enablement

SmartGrid/AMI Demonstration and Technology Comparison ($37 M, O&M - $1.67 M/yr) – Canandaigua/Bloomfield.

A. **Phase I - Expand WIMAX** – Expand the existing WIMAX communications system operated by NYSEG and located in Horseheads, NY to provide smart metering with electric and gas meters and upgrade selected control points for the electric and gas system within the WIMAX communications "cloud". Communicate all the data on a real time basis to the Canandaigua Service Center. Compare the performance and cost of a WIMAX system to an upgrade of the existing digital radio system used by the NYSEG natural gas operations group that would allow data transmittal from the same smart meters and system control points.

B. **Phase 2 – Evaluation** – Consisting of 4 parts: 1) Evaluate the potential use of SmartGrid with WIMAX to optimize transmission grid performance by integrating real-time wind turbine information with the proposed compressed air energy storage facility near Watkins Glen, NY. 2) Evaluate the use of DG on selected circuit in the Canandaigua area versus upgrading to respond to peak loading. 3) SmartGrid/AMI Demonstration of the Cooperative Use of Broadband WIMAX in Canandaigua for Community and Utility Services. This compliments the interest that exists in many upstate communities to have broadband capability where it currently does not exist. 4) A dynamic pricing rate option evaluation that will include control and test groups. The pilot pricing program will randomly select a statistically valid number of customers who will be charged at either real-time pricing, critical peak pricing, time-of-use rates, or peak-time rebates in conjunction with the deployment of smart meters. RG&E estimates that this project would create or retain 29 jobs.