Thomas R. Teehan
Senior Counsel

May 15, 2009

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02889

RE: Docket No. 4052 – Commission's Review into Smart Grid Pursuant to the Public Utility Regulatory Policies Act of 1978 (PURPA), as amended by the federal Energy Independence and Security Act of 2007 (EISA)

Dear Ms. Massaro:

On behalf of National Grid[1] enclosed please find ten (10) copies of the Company's initial comments in the above docket. The Commission opened this docket in response to the provisions to 16 U.S.C. 2621(d). That federal statute provides that each state consider requiring that, prior to undertaking investments in non-advanced grid technologies, electric utilities demonstrate that they considered an investment in a qualified Smart Grid system based on appropriate factors including the following: (1) total cost, (2) cost-effectiveness, (3) improved reliability, (4) security, (5) system performance, and (6) societal benefit.

These comments are offered to provide a description of the Company's activities relating to Smart Grid systems in other states as well as a description of the Smart Grid aspects of the Aquidneck Island pilot program in Rhode Island. It is expected that those programs will provide data relative to the appropriateness of investing in a qualified smart grid system prior to investing in a nonadvanced grid system. These comments also include a description of possible augmentations to overlay onto the current Aquidneck Island pilot program, as well as an outline of the filing deadlines for applications for American Reinvestment and Recovery Act ("ARRA") matching funds, which will be available for Smart Grid pilot programs.

A. The Company's Smart Grid Activities in Other Jurisdictions

The Company has made filings proposing Smart Grid pilot programs in both New York and Massachusetts. These pilot programs will allow the Company to evaluate and implement smart grid technology. The Massachusetts filing was made in compliance with the Massachusetts Green Communities Act while the New York filing was made in response to a request from the New York PUC. Attachment 1 to this letter is a summary of the Massachusetts pilot program; attachment 2 is a summary describing the pilot programs proposed for New York. The pilot programs that have been proposed in New York and Massachusetts are full Smart Grid projects and should be expected to provide the data to conduct the type of

[1] The Narragansett Electric Company d/b/a National Grid ("National Grid" or "Company").

analysis that is described in the federal statute. These summaries give the Company's Smart Grid vision and also describe specific business activities that each pilot will include and objectives for these pilot programs.

This filing contains a Motion for Protective Treatment in accordance with Rule 1.2(g) of the Commission's Rules of Practice and Procedure and R.I.G.L. §38-2-2(4)(B). The Company seeks protection from public disclosure of certain confidential, commercially sensitive, and proprietary aspects of the Smart Grid pilot programs that it has proposed in Massachusetts and New York. Specifically there are certain terms of the programs that the Company has not negotiated with vendors yet, and consequently the Company seeks confidential treatment for that limited information. To that end and pursuant to Commission rules, the Company has provided the Commission with one copy of the confidential materials for its review, and has otherwise included redacted copies of the plan.

B. Aquidneck Island Pilot Program

On March 31, 2009, the Rhode Island Commission approved the Company's System Reliability Plan, which had been submitted as part of the Company's overall Least Cost Procurement Plan in Docket No. 3931. The System Reliability Plan includes a pilot program targeted for Aquidneck Island. As part of that program, the Company intends to provide a subset of Smart Grid technology to some of the customers located within the Pilot area. Although specification of pilot equipment is currently in progress, that equipment will most likely include a device located within the premises that can read the existing "drive-by" meter and provide hourly usage information to the customer in real time and to the Company via the customer's broadband connection. The Company also intends to implement some form of optional hourly pricing to those customers from whom hourly usage information is obtainable, although this is currently expected to be a manual or vendor-provided system that would likely not be integrated with existing or scalable billing systems. The pilot also envisions that hourly prices would be delivered to the customer over their existing internet connection. Additionally, the pilot will include wireless control devices for customer loads such as smart thermostats, smart power outlets, and possibly hard wired controls for pool pumps, water heaters, and/or other large dispatchable loads. Control of these devices is planned to be available to customers as well as to the Company (subject to customer over-ride capabilities) during peak loading conditions.

The Aquidneck Island pilot program could be expanded to include a more long-term and scalable smart grid deployment with additional funding, and such a project may qualify in total for matching ARRA funding from the United States Department of Energy. There are several advantages of such a deployment over the currently approved pilot. The difference between the Aquidneck Island pilot project as approved and a full Smart Grid deployment is one of scale, technology, and integration with utility systems. These differences are described in more detail below:

- **Scalability:** The approved pilot contemplates that approximately 20% of residential and small commercial customers, or approximately 1,000 customers, would receive the technology described above, while a full Smart Grid deployment would provide at a minimum the advanced metering infrastructure to 100% of these customers. A Smart Grid deployment would be truly scalable to all customers in all locations.

- **Technology:** The approved pilot assumes a means of obtaining meter data via customer-supplied broadband, and thus will be limited to those customers. In addition, the approved pilot does not contemplate integration or enhancement of existing billing and/or meter reading systems. A Smart Grid deployment would provide advanced meters, communications to and from the meters, as well

as distribution automation that can reduce the duration of service interruptions. Additionally, a robust Smart Grid approach includes the installation of monitoring and control capability that will enable National Grid to assess how to safely introduce and control a significant quantity of distributed generation supply and storage (including intermittent sources) onto the distribution grid. This may be particularly beneficial on Aquidneck Island where a number of renewable energy projects - particularly wind - are under consideration.

- **Integration:** The approved pilot does not contemplate the very significant "back office" requirements of changing meter data, meter reading, billing, dispatching, and other systems to coordinate with the pilot technologies. In a Smart Grid deployment, these significant investments would be made, allowing full integration with these work processes as well as making future expansion of Smart Grid infrastructure significantly less expensive than the initial build-out of these systems.

If there is support from the state, the Company could propose expansion of the currently approved Aquidneck Island pilot to a full Smart Grid deployment. Such an expansion could be contingent upon approval of either the Massachusetts or New York filings as well as matching ARRA funding as described below.

C. American Reinvestment and Recovery Act

As discussed during the recent Pre-Hearing Conference in the instant docket, the Company is providing this brief review of the availability of federal funding for Smart Grid pilot projects. Under the American Reinvestment and Recovery Act ("ARRA"), $4.5B is allotted to the Department of Energy's Office of Electricity Delivery and Energy Reliability ("DOE") to support implementation of the Smart Grid programs authorized by the Energy Independence and Security Act. These include Smart Grid technology research, development and demonstration projects authorized in section 1304, and the federal matching fund for Smart Grid technologies in section 1306. In April, DOE released their proposed guidelines for application for these funds. After a discussion period, we anticipate a final list of guidelines will be issued on June 17, 2009.

These guidelines will provide a structure in which interested parties can participate in a competitive solicitation for fifty/fifty matching program funds. National Grid intends to file for matching funds for the Demonstration Programs proposed in the Company's above-referenced Massachusetts and New York Smart Grid filings and would welcome the opportunity to do so in Rhode Island. It is important to recognize that prior state regulatory approval will improve the Company's and the host state's chances of obtaining those funds.

DOE will permit applicants to submit applications on or before three separate due dates with the complete obligation of funds to awards accomplished by September 30, 2010. The three anticipated application due dates are: July 29, 2009; December 2, 2009; and March 31, 2010. However, DOE cannot predict at this time that funds will remain available beyond awards provided after the first due date. It is therefore imperative that interested states expedite consideration and approval of Smart Grid plans in order to have the opportunity to successfully bid for these stimulus funds.

National Grid welcomes the dialogue that this docket opens on the topic of Smart Grid technology. Thank you for your attention to this transmittal. If you have any questions, please feel free to contact me at (401) 784-7667.

Very truly yours,

Thomas R. Teehan

Enclosure

cc: Paul Roberti, Esq.
Steve Scialabba, Division

Certificate of Service

I hereby certify that a copy of the cover letter and / or any materials accompanying this certificate was electronically submitted and/or sent via US Mail to the individuals listed below.

Joanne M. Scanlon
National Grid

May 15, 2009
Date

Docket No. 4052 Commission's Review into Smart Grid Pursuant to PURPA as amended by the federal Energy Independence and Security Act of 2007 (EISA)
Service List Updated 5/15/09

Name/Address	E-mail Distribution	Phone/FAX
Thomas R. Teehan, Esq. National Grid. 280 Melrose St. Providence, RI 02907	Thomas.teehan@us.ngrid.com Joanne.scanlon@us.ngrid.com	401-784-7667 401-784-4321
Leo Wold, Esq. Dept. of Attorney General 150 South Main St. Providence, RI 02903	Lwold@riag.ri.gov Dstearns@ripuc.state.ri.us Sscialabba@ripuc.state.ri.us Mtobin@riag.ri.gov dmacrae@riag.ri.gov	401-222-2424 401-222-3016
Theodore Garille, General Manager Pascoag Utility District 253 Pascoag Main St. PO Box 107 Pascoag, RI 02859	Tgarille@pud-ri.org Jallaire@pud-ri.org	401-568-6222 401-568-0066
File an original & nine (9) copies w/: Luly E. Massaro, Commission Clerk Public Utilities Commission 89 Jefferson Blvd. Warwick RI 02889	Lmassaro@puc.state.ri.us Cwilson@puc.state.ri.us Nucci@puc.state.ri.us Anault@puc.state.ri.us	401-780-2017 401-941-1691
Michael McElroy, Esq. (for BIPCO) Schacht & McElroy	McElroyMik@aol.com	401-351-4100
Alicia Peterson, Alstra Integrated Solutions Scott H. DeBroff, Esq.	apetersen@rhoads-sinon.com sdebroff@rhoads-sinon.com miino@rhoads-sinon.com	717-237-6774

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

RHODE ISLAND PUBLIC UTILITIES COMMISSION

Commission's Review into Smart Grid Pursuant to the Public Utility Regulatory Policies Act of 1978 (PURPA), as amended by the federal Energy Independence and Security Act of 2007 (EISA)

Docket No. 4052

NATIONAL GRID'S REQUEST FOR PROTECTIVE TREATMENT OF CONFIDENTIAL INFORMATION

National Grid [1] hereby requests that the Rhode Island Public Utilities Commission ("Commission") provide confidential treatment and grant protection from public disclosure of certain confidential, competitively sensitive, and proprietary information submitted in this proceeding, as permitted by Commission Rule 1.2(g) and R.I.G.L. § 38-2-2(4)(i)(B). National Grid also hereby requests that, pending entry of that finding, the Commission preliminarily grant National Grid's request for confidential treatment pursuant to Rule 1.2 (g)(2).

I. BACKGROUND

On May 15, 2009, National Grid filed with the Commission its comments relative to the matters raised in this docket. These responses included as attachments summaries of Smart Grid pilot programs the Company has proposed in Massachusetts and in New York. Because the Company has yet to negotiate aspects of those programs with

[1] The Narragansett Electric Company d/b/a National Grid ("National Grid or "the Company").

vendors, it is requesting confidential treatment as to certain information relative to those plans and is requesting that these terms be protected from public disclosure.

II. LEGAL STANDARD

The Commission's Rule 1.2(g) provides that access to public records shall be granted in accordance with the Access to Public Records Act ("APRA"), R.I.G.L. §38-2-1, *et seq.* Under APRA, all documents and materials submitted in connection with the transaction of official business by an agency is deemed to be a "public record," unless the information contained in such documents and materials falls within one of the exceptions specifically identified in R.I.G.L. §38-2-2(4). Therefore, to the extent that information provided to the Commission falls within one of the designated exceptions to the public records law, the Commission has the authority under the terms of APRA to deem such information to be confidential and to protect that information from public disclosure.

In that regard, R.I.G.L. §38-2-2(4)(i)(B) provides that the following types of records shall not be deemed public:

> Trade secrets and commercial or financial information obtained from a person, firm, or corporation which is of a privileged or confidential nature.

The Rhode Island Supreme Court has held that this confidential information exemption applies where disclosure of information would be likely either (1) to impair the Government's ability to obtain necessary information in the future; or (2) to cause substantial harm to the competitive position of the person from whom the information was obtained. Providence Journal Company v. Convention Center Authority, 774 A.2d 40 (R.I.2001).

The first prong of the test is satisfied when information is voluntarily provided to the governmental agency and that information is of a kind that would customarily not be released to the public by the person from whom it was obtained. Providence Journal, 774 A.2d at 47.

In addition, the Court has held that the agencies making determinations as to the disclosure of information under APRA may apply the balancing test established in Providence Journal v. Kane, 577 A.2d 661 (R.I.1990). Under that balancing test, the Commission may protect information from public disclosure if the benefit of such protection outweighs the public interest inherent in disclosure of information pending before regulatory agencies.

II. BASIS FOR CONFIDENTIALITY

With respect to the pricing information contained in the executive summaries that the Company has submitted, the Company seeks protection from public disclosure since disclosure of the Company's valuation and strategy for contract negotiation with vendors

III. CONCLUSION

Accordingly, the Company requests that the Commission protect the Company's pricing strategy with respect to the pilot programs and grant protective treatment to those portions of the program summaries.

WHEREFORE, the Company respectfully requests that the Commission grant its Motion for Protective Treatment as stated herein.

Respectfully submitted,

NATIONAL GRID

By its attorney,

_____

Thomas R. Teehan, Esq. (RI Bar #4698)
National Grid
280 Melrose Street
Providence, RI 02907
(401) 784-7667

Dated: May 15, 2009

REDACTED VERSION

I. EXECUTIVE SUMMARY

Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid ("National Grid" or "Company") believe that the U.S. electricity industry will face significant change over the coming years. There will be a shift from a model in which electricity is generated and controlled centrally, to one in which energy is more dispersed and integrated at a local level taking advantage of renewable energy sources. Additionally, environmental awareness and rising prices will require the energy industry to become increasingly responsive to the need for more timely energy usage and pricing information, more tailored energy options, and greater individual customer control.

National Grid recognizes the challenges and opportunities that the new energy market will pose to its existing network and service platform and in response has undertaken an extensive strategic analysis effort and developed a Smart Grid Vision.

NATIONAL GRID'S SMART GRID VISION

> *National Grid's vision is to deploy Smart Grid technology in order to optimize the flow of clean energy resources, enhance the performance of the electric distribution grid, and provide customers with the ability to make informed decisions about how they use energy.*
>
> *A Smart Grid will be the fundamental service platform for future years. It will help towards reducing energy consumption and greenhouse gas emissions while enhancing the reliability of National Grid's aging infrastructure.*
>
> *This service platform will provide and act as a catalyst for current clean technologies (e.g., energy efficiency, demand response) and the emerging next generation of clean technologies (e.g., photovoltaics, energy storage, plug-in hybrid electric vehicles) that National Grid believes are essential to meet societal and customers' future needs.*
>
> *A Smart Grid will provide customers with <u>choice</u> over how the electricity they use is generated and <u>control</u> over how and when they use energy in their homes and businesses. Through this redefined relationship with the National Grid, customers will be able to participate in the power of action and contribute to a sustainable future.*

A. Background

The Massachusetts Green Communities Act ("Act") has created a structure within which National Grid can continue to address the integration of many complex technologies in a coordinated and strategic manner. Further, the objectives of the Act might well be accelerated by the impact of the American Recovery and Reinvestment Act of 2009

REDACTED VERSION

("ARRA"). The Company's proposed Smart Grid Pilot Program ("Pilot") will meet the requirements of the Act and the Company's approach creates a range of deployment scenarios that could position Massachusetts to take full advantage of the opportunities presented by the ARRA.

B. Pilot Objectives

The Pilot's objective is built around the requirements of § 85 of the Act. The Act's mandates include "advanced ('smart') meters that provide near real time measurement and communication of energy consumption, automated load management systems embedded within current demand-side management programs and remote status detection and operation of distribution system equipment." The Pilot will achieve all of these objectives.

In addition to these technical and functional objectives, the Act requires Smart Grid pilots (1) to include time of use or hourly pricing for commodity service for at least 0.25 per cent of a company's customers, and (2) requires that peak and average loads be reduced by a minimum of five per cent for those customers who actively participate in the pilot. The Company's proposed Pilot will achieve this scale and enable a thorough test of load reduction potentials for a variety of demographic and load profiles.

The Act expressly recognizes that Smart Grid pilots can and should include further objectives in addition to those expressly listed in the statute, mandating that each pilot "shall include, but not be limited to" the enumerated requirements. National Grid's Pilot is designed to demonstrate that a large scale Smart Grid deployment may provide significant benefits to customers and society by enabling more efficient energy consumption that results in reduced energy usage, better energy quality, improved reliability, and a general reduction in the carbon emissions required to produce and deliver electricity to customers.

The development and execution of the envisioned Smart Grid and this Pilot are a collaborative effort between National Grid, its customers, and market participants. National Grid hopes that each will participate fully to reach the goals envisioned by the Act and demonstrate in action the opportunity and value of Smart Grid.

The Pilot is designed to accomplish the following:

1. Determine whether large scale regulated investments in Smart Grid infrastructure can deliver significant benefits to customers and society.
    - Customer benefit will be measured by a reduction in load and associated cost, improvement in power quality and reliability.
    - Societal benefits are measured in reduction in load and associated carbon reduction.
2. Determine whether customer energy consumption and peak demand can be reduced by a minimum of five percent on average through the

REDACTED VERSION

implementation of technologies that provide timely energy usage information, diverse rate plans, and automation to incent and enable customers to reduce load or otherwise alter their consumption patterns.

- We will establish a baseline usage for the deployment area and then use control sets of customers with differing solution sets to determine the effectiveness of each approach.

3. Determine whether electric distribution grid operating efficiency can be improved measurably by improved monitoring and control.
   - This benefit is measured in terms of potential future reductions in line losses.

4. Identify opportunities to optimize transmission network performance through enhanced distribution network information and control, and changes to customer behavior.
   - This benefit is measured through reductions in critical peak loads with the combination of technology and rate mechanisms. These lower critical peak loads reduce the overall stress on the system. Stress degrades equipment and causes reliability challenges.

5. Determine whether distribution feeder reliability can be improved through the implementation of improved monitoring and control of the distribution grid and the integration of automated meter outage detection and restoration into the existing outage management systems and processes.
   - This benefit is measured by reductions in customer minute interruptions.

6. Determine whether distributed resources (both generation and storage) could be safely and reliably incorporated onto the electric distribution grid through the implementation of improved monitoring, protection and control capabilities.
   - The measurement will be the quality and usefulness of near real-time information and controls and the benefit will be a reduction in carbon-based load and an increase in availability of renewable generation.

7. Determine whether Smart Grid technologies (including advanced meters) improve customer satisfaction by providing timely consumption and conservation options, automated load control and alternative rate plans, and improved monitoring and control of the distribution grid.
   - The measurement will be greater customer satisfaction as measured by improvement in energy savings (5% +) and customer satisfaction as measured through surveys.

REDACTED VERSION

8. Determine whether Smart Grid technologies can be deployed in configurations that are interoperable with both existing technologies and anticipated future technology enhancements.
    - The measurement will be a solution that is open and interoperable in accordance with existing industry standards. The benefit will be lower initial costs and long-term technical flexibility to comply with emerging standards.

9. The overlay of the electric grid with communications and millions of endpoint command and control devices has resulted in an intense focus on physical and cyber security. Accordingly, a key component of our Pilot will be security.
    - National Grid has engaged one of the foremost authorities in Smart Grid Security, Doug Houseman, Capgemini CTO, to oversee security compliance. Mr. Houseman will make every effort to ensure that National Grid is aligned with appropriate industry guidelines, including those existing or being adapted by the National Institute of Standards and Technology (NIST).

C. Pilot Approach

National Grid has reviewed the results of numerous Smart Grid pilots conducted by other utilities and has found that most focused on testing the functional characteristics of various technologies. These pilots made important contributions to the maturation of Smart Grid technology, especially as they relate to the viability of various communications technologies and methods. National Grid seeks to build on that work, not repeat it. While the Company's proposed Pilot will confirm that the selected technologies offer a robust mix of capabilities to support Smart Grid functions today and will be capable of meeting the developing demands of the smart***er*** grid in the future, National Grid is also seeking to achieve a much broader understanding of the impact of a Smart Grid on its customers and business.

The proposed Pilot is designed to meet the specific requirements of the Act's Smart Grid pilot program in a manner, and at a scale, that will provide strong evidence to support the future development of a much larger Smart Grid. With Smart Grid, customers can exercise greater choices about, and control of, their energy use. At the same time, managers of the electric distribution and transmission grid will have a powerful new set of tools to improve efficiency, reliability, and security. The existing performance of the network will be "base lined" (system performance data collected) before the Pilot is mobilized to enable a comparison of performance data before and after the Company's Pilot infrastructure is deployed.

D. Customer Aspects

REDACTED VERSION

The Act envisions more informed customers who have new energy options and technology tools that empower them to act. The proposed Pilot will empower participants to reduce their energy consumption by first allowing them to understand their energy usage at a level of detail, timeliness, and ease that was previously impossible, and by providing new tools and services that will help them better manage energy usage. National Grid's Smart Grid enables new interfaces with customers such as web tools, text messaging, and home display units (in addition to improving information richness in traditional billing). These interfaces provide an essential link which will help to tailor solutions to individual customer needs and preferences, thus encouraging a dialog with customers on energy and its management.

National Grid believes customers will respond to the heightened awareness that the Pilot can provide, but also believes that behavior shifts can be best optimized if incentives are also available through innovative rates. Customers will be given the opportunity to choose among three potential new Basic Service rate alternatives ("Smart Grid Pricing"), i.e., Critical Peak Pricing Program, Peak Time Rebate, and Hourly Pricing Program. This approach, together with a choice of interface channels, enables customers to choose pricing options, as well as their method and time of communications with National Grid, resulting in greater customer choice, convenience, and a higher quality interaction.

The data and knowledge created by the Company's Pilot can also be combined with technologies that empower customers and electric distribution grid managers in other new and powerful ways, such as enabling a home area network and home automation tools that can monitor and optimize appliance performance and enable embedded demand response in a manner that is transparent to customers but sensitive to their needs as well as grid requirements.

National Grid's Pilot will also be an enabling technology for exciting new customer options such as plug-in hybrid electric vehicles ("PHEV"). For the proposed Pilot, National Grid has obtained the use of a Ford PHEV. National Grid will be developing a program for demonstration and testing in anticipation of the arrival of the PHEV in the third calendar quarter of 2009.

E. Utility Aspects

Electric utilities are at a transformational juncture. Restructuring and other changes have affected the industry's structure in recent years in sometimes radical fashion, but those transitions left essentially unchanged the roughly century-old manner in which electricity is generated, delivered, and consumed. National Grid's Smart Grid will enable significant changes in these areas by overlaying communications capability along the grid and inside the customer's home or business, enabling the rapid flow of information (much of it never before available) and near real-time control. For National Grid and others, these changes will require a variety of new approaches to service delivery, pricing and operational processes.

REDACTED VERSION

The proposed Pilot will allow National Grid to develop an understanding of the operational changes that can occur along its electric distribution system and within its business processes in order to better plan the transition to a smarter grid. This crucial expertise cannot be developed simply by reading reports of the results of other utilities' Smart Grid pilots. The systems and processes at each utility are sufficiently distinct, and the transition to a Smart Grid is so significant and affects so many fundamental processes, that learning by doing is the only way to transition to this new paradigm of energy delivery.. The Company's Pilot creates a process through which National Grid can achieve this knowledge.

F. Technical and Functional Guiding Principles

The design principle National Grid has adopted is to think of the Company's Smart Grid as a spine or backbone of core functionality to which elements can be added in a modular fashion. These modules form part of the Company's vision for the future, e.g., PHEV, Storage, and Renewable Energy. The Company's Pilot proposal focuses on the "spine," but the flexibility of this approach would enable any or all of the modules to be added to the deployment over the same or an expanded geographical area.

National Grid's approach to designing its Smart Grid also recognizes that the Company is at the beginning of a broad change to the electric industry. The Company must continue seamless electric delivery operations during this transition. We must integrate legacy systems, business and operational processes, while we are adding new smart technologies and changing key business operational functions. Our planning reflects this reality.

National Grid's design approach focuses on standards and interoperability so that technology decisions are consistent with the industry, including the International Electrotechnical Commission's interoperable communications and nomenclature standards for substation automation and Common Information Model design principles; National Electrical Manufacturers Association standards for plugs, Reclosers and wiring, the Institute of Electrical and Electronics Engineers (IEEE 802.x) for various Internet Protocol standards. National Grid believes that open, interoperable systems are the most cost-effective approach.

National Grid has conducted broad market testing via a request for information ("RFI") process for Smart Grid, which involved over eighty vendors of equipment and services. The design of the process invited maximum competition as vendors could bid on any combination of twenty-two categories covering Grid Automation, Communications (Home, Local and Wide Area Networks), Systems, Advanced Meters, and Home Automation solutions.

G. Smart Grid Functional Strategy

REDACTED VERSION

National Grid's strategy overlays the electric grid with a two-way communications network with speed and capacity sufficient to enable advanced metering, home energy automation and management, and distribution automation and management; and to support distributed generation and storage functions. National Grid already has components of the solution in terms of existing network assets that can be converted to Smart Grid components and communications infrastructure. These include fiber and microwave facilities that can be used as part of the Smart Grid Pilot. Wherever possible, National Grid incorporated these existing assets and systems into the Pilot design.

The specific business activities that the Pilot will enable include:

Customer Facing Functions

- Provide interval metering for residential and commercial customers in the Pilot footprint.
- Provide alternative rate plans including event-based critical peak pricing, event-based peak time rebate, and hourly pricing.
- Provide National Grid customer service representatives with meter status, consumption and appropriate home automation related information.
- Provide energy consumption and pricing information to customers in their home or business through a choice of media that they can select including:
    - Web
    - Home Display Unit
    - PDA/Text
    - Telephone
- Provide customers who choose the ability to control thermostats and energy consuming devices in their home or business manually or programmatically (and via wireless mobile devices for those customers participating in certain remote automation technology programs).
    - Enable (with customer agreement) remote control by National Grid of thermostats and energy consuming devices in customer homes and businesses.

Distribution Grid-Facing Functions

- Enable monitoring and remote control of distribution equipment, including monitoring feeders and transformers; and monitoring and control of capacitors, reclosers, voltage regulators and switches.
- Incorporate automated meter outage and restoration events into outage management systems and processes.
- Enable distribution operators to query remotely the outage / restoration status of individual meters and groups of meters to confirm outage scale and restoration status.
- Provide distribution grid operational data to grid operators in a much shorter timeframe and at a level of granularity sufficient for engineering analysis and asset management applications.

REDACTED VERSION

- Install monitoring and control capability that will enable National Grid to assess how to safely introduce and control a significant quantity of distributed generation supply and storage (including intermittent sources) onto the distribution grid.
- Enable remote reconfiguration of loop or interconnected distribution network assets to isolate and minimize outage impact.

H. Pilot Scale

The Act requires that the Pilot include a minimum of 0.25 percent of a company's customers. National Grid currently serves approximately 1.3 million customers in the Commonwealth. Accordingly, the Act requires a minimum Pilot sample size of roughly 3,250 customers. National Grid is, however, proposing a larger sample size of just over one percent of its customer base, approximately 15,000 homes and businesses and 45,000 residents. This sample size will support decision making for a scaled roll out, as it is a valid sampling of a range of customer segments (urban, suburban, rural), customer types (single family, multiple dwelling, small business), relevant and available third-party demographics (such as income, education, and technology adoptions) and load profiles (low to high, average, peak and seasonal). This larger customer base will also allow the Company to include a sufficient number of distribution substations to test a broad variety of network infrastructure models. This will include radial and loop or interconnected feeders, a large number of transmission and distribution system control devices, and offer a greater potential for introducing and testing distributed generation and storage options.

The Pilot area is geographically contiguous, enabling extremely comprehensive and thorough testing of Smart Grid. It simplifies communication with external stakeholders, such as a single mayor and city government, and reduces marketing cost because National Grid will only have to target a single media market. This approach will also (1) allow National Grid to focus internal resources in a single geographic area, reducing deployment time and cost; (2) enable automated switching along or between feeders to test the potential of smart grid automation to limit outage impact; and (3) permit testing of mission-critical communications by providing redundant communication technology for substation operations.

I. Proposed Pilot Site

National Grid proposes to run the Pilot in the northwest section of Worcester based on the objectives and scope of the pilot outlined above as well as the following advantages:

1. Size: Worcester has the largest customer population of any city in National Grid's service territory, approximately 67,000. This large customer base allowed National Grid to choose a wide variety of customer types and grid equipment for the Pilot.

REDACTED VERSION

2. Diverse Customer Demographics: Because of Worcester's relatively large size, it offers the opportunity to test the value proposition of Smart Technology over a varied mix of customers. Worcester is home to a diverse population of residential and business customers. The behavioral characteristics of different customer groups and differing rates and levels of automation will aid in understanding the implications and benefits of implementing Smart Grid technology more broadly.

3. Diverse Distribution System Conditions: The Company's distribution assets in Worcester are a representative mix of overhead and underground distribution infrastructure as well as a variety of substation types and network configurations (loop and radial). Because of this variety, National Grid can extrapolate Pilot data across National Grid's entire service territory to better understand its potential operational impact and benefits.

4. Proximity to Existing and Proposed Distributed Generation: A key objective of the pilot is to provide the backbone for potential distributed generation and storage resources, in order to determine whether or how these resources can be safely and reliably incorporated onto the distribution grid through the implementation of improved monitoring, protection, and control of the distribution grid. Worcester has a number of existing and potential distributed generation project sites, including a large wind turbine at Holy Name School, a potential solar project at Worcester airport, and gas fired co-generation at Clark University. In addition, National Grid hopes to pursue multiple solar power, PHEV and storage initiatives in the future, and Worcester is a promising potential location for these projects.

5. Access to Institutions of Higher Learning. Worcester is home to a number of colleges and universities, including but not limited to Clark University, Assumption College, Holy Cross, Worcester Polytechnical Institute, and Holy Name School. National Grid believes that as a responsible corporate citizen and an advocate for the smarter grid of the future, National Grid can take advantage of opportunities to help the staff and students of these and other institutions gain exposure to and knowledge of the developing green industry. We have already contacted Clark University and Worcester Polytechnical Institute to gauge their interest in participation in equipment testing, facility participation in energy efficiency and conservation programs, testing of energy management systems, distributed generation, community outreach and education, marketing and analysis.

6. Central Location: Worcester is centrally located in the state with easy access from every direction.

REDACTED VERSION

J. Site Characteristics

The Pilot's area includes five substations, the feeders supplied by these substations, and the customers supplied by the feeders. These substations are:

- Webster Substation
- Vernon Hill Substation
- Cooks Pond Substation
- Salisbury Street Substation
- Greendale Substation

Maps of the area covered by each substation, including overlaying GIS coordinates, are included in Attachment 1. Based on the areas served by the substations listed above and the associated feeders, the total number of active customers to be covered by the Pilot as of March 1, 2009 would be 14,821. The number of Pilot customers in each rate class is outlined in Attachment 2. A complete list of feeders together with number of customers and equipment on each feeder is included in Attachment 3.

K. Pilot Cost

The overall cost of the Pilot is estimated at $56.4 million. The cost of the Pilot is disproportionate to a volume deployment as the fixed costs are borne over a small number of installations. The cost of the Pilot will be shared across National Grid's Massachusetts Basic Service customers as discussed below. This cost includes the following key categories:

- Hardware
- Software
- Services

[redacted]

The cost of the pilot on a per meter basis is $3,760. This number is not representative of the costs of an overall deployment, which would be closer to [redacted] per meter. The cost of equipment and associate software will be much lower when acquired at mass deployment scale. The integration and services required to enable this small pilot will lay the groundwork for the mass deployment, but cannot reflect that broader value in a pilot cost analysis. While National Grid anticipates that the benefits of a smart grid will outweigh the costs in a mass deployment, not all potential benefits can be realized in a pilot. One benefit that can be realized is the direct benefit of load reduction. The five per cent load reduction targets in the Act, if met, will provide an overall customer bill reduction for customers in the Pilot of approximately $5 per month.

REDACTED VERSION

The indicative cost analysis below illustrates how the cost per home decreases as the scale increases from the Pilot volume of 15,000 to the full customer base of 1.3 million:

Volume	Cost ($M)	Cost per Customer ($)
15,000	$56	$3,760
1,300,000	[redacted]	[redacted]

With regard to a full deployment, as the graph below indicates, the first four columns of potential benefits together equal [redacted] billion, while the last two columns of estimated costs equal [redacted] million. The projections suggest a positive business case for the full deployment, but a key objective of the pilot will be to determine if the benefits can be actualized and the costs confirmed.

L. Stimulus

Under ARRA, $4.5B is allotted to the Department of Energy's Office of Electricity Delivery and Energy Reliability ("DOE") to support implementation of the smart grid programs authorized by the Energy Independence and Security Act of 2007 ("EISA"). These include smart grid technology research, development and demonstration projects authorized in section 1304, and the federal matching fund for Smart Grid technologies in section 1306. DOE will likely administer the funds by competitive solicitation and require a fifty/fifty cost share. The application guidelines, including the scope of these solicitations and the funding allocations, are still in development.

REDACTED VERSION

National Grid is extremely interested in applying for federal funds in cooperation with the Commonwealth to expand the Pilot for the benefit of Massachusetts customers. The Pilot is consistent with DOE's definition of Smart Grid except that it does not currently have the capability to accommodate all generation and storage options. This function (which includes photovoltaics, distributed generation, energy storage and plug-in hybrid electric vehicles/electric vehicles) is the most complicated and most advanced smart grid function. National Grid believes the best approach to ARRA related smart grid funds is to increase the scale of the Pilot to include more customers and/or increase the scope of the Pilot to accommodate all generation and storage options. To that end, National Grid plans to seek ARRA funding through the DOE Smart Grid solicitations process to demonstrate the additional scope by adding a series of "Smart Modules". A Smart Module can include any of the technologies required to demonstrate:

- how the Smart Grid can accommodate, accelerate, or increase the penetration of all generation and storage options (e.g., smart charging of PHEVs/EVs), and
- how the Smart Grid can use or exploit generation or storage technologies for the benefit of the overall system and for all rate payers e.g., customer-side PV that reduces peak system demand thereby reducing the need for additional generation capacity.

Attachment 4 contains additional detail on approach and estimated costs. National Grid proposes to apply for matching funds for the expanded scale of the Pilot and additional modules once the guidelines have been published in coordination with the commonwealth.

M. Proposal for Incentives

National Grid proposes to be provided the opportunity to earn an incentive for achieving levels of customer participation, demand savings and energy savings associated with the successful operation of the Pilot that exceed the minimum levels required in the Act. Specifically, the Company proposes the incentive to be based on actual basic service bill savings for the year in which those savings are earned.

The Company proposes two tiers for the proposed incentive. First, National Grid proposes the first tier of incentive be calculated should there be reductions in peak and average loads in excess of the 5% target required in the Act for the target level of customers for National Grid (approximately 3,200 customers). Should this target be reached, the incentive would equal 50% of the average incremental basic service savings on the 3,200 customers' bills based upon the average annual load reduction per customer multiplied by 3,200 customers and valued at the difference between what customers would have been billed during each Critical Peak Period for basic service under standard basic service rates and the alternative basic service pricing under which the customers were billed. National Grid would earn this incentive through effective education and

communication to customers of the benefits they can realize by maximizing conservation and energy efficiency as well as the provision of technology.

Second, National Grid proposes a second tier of incentive based upon the number of customers on the alternative basic service pricing structure beyond the 3,200 customers targeted by the statute. National Grid proposes an incentive equal to 50% of the basic service bill savings received by these incremental customers. This incentive would equal 50% of the average incremental basic service savings on these incremental customers' bills based upon the average annual load reduction per customer multiplied by the number of customers in excess of 3,200 and valued at the difference between what customers would have been billed during each Critical Peak Period for basic service under standard basic service rates and the alternative basic service pricing under which the customers were billed. National Grid would earn this incentive by maximizing the number of active participants in the Pilot and educating the customers on the benefits realized from maximum use of the prices and technology to create savings on their bill. Thus, the Company's incentive would tie directly to actual bill savings by customers in the Pilot.

N. Next Steps

While National Grid's Smart Grid proposal is pending before the Department, National Grid intends to prepare for implementation by undertaking design, testing, training and furthering the commercial negotiations with vendors. That way, if and when the Department approves this proposal, National Grid's lead time for implementation will be shortened. A mobilization plan is included in Section IX of the filing showing the sequential steps. National Grid anticipates that delivery lead times for certain critical Smart Grid equipment will begin to slip as the impact of ARRA funding begins to create greater demand. Therefore, an expedited approval is essential to meet the planned timeline. In addition, the Pilot is also subject to National Grid's internal review and approval process, which will occur concurrently with the Department's review.

REDACTED VERSION

I. EXECUTIVE SUMMARY – New York

National Grid ("National Grid" or "Company") believes that the U.S. electricity industry will face significant change over the coming years. There will be a shift from a model in which electricity is generated and controlled centrally, to one in which energy is more dispersed and integrated at a local level taking advantage of renewable energy sources. Additionally, environmental awareness and rising prices will require the energy industry to become increasingly responsive to the need for more timely energy usage and pricing information, more tailored energy options, and greater individual customer control.

National Grid recognizes the challenges and opportunities that the new energy market will pose to its existing network and service platform and in response has undertaken an extensive strategic analysis effort and developed a Smart Grid Vision.

NATIONAL GRID'S SMART GRID VISION

National Grid's vision is to deploy Smart Grid technology in order to optimize the flow of green energy resources, enhance the performance of the electric distribution grid, and provide customers with the ability to make informed decisions about how they use energy.

A Smart Grid will be the fundamental service platform for future years. It will help towards reducing energy consumption and greenhouse gas emissions while enhancing the reliability of National Grid's infrastructure.

This service platform will provide and act as a catalyst for current green technologies (e.g., energy efficiency, demand response) and the emerging next generation of green technologies (e.g., photovoltaic, energy storage, plug-in hybrid electric vehicles) that National Grid believes are essential to meet societal and customers' future needs.

A Smart Grid will provide customers with <u>choice</u> over how the electricity they use is generated and <u>control</u> over how and when they use energy in their homes and businesses. Through this redefined relationship with the National Grid, customers will be able to participate in the power of action and contribute to a sustainable future.

A. Background

The New York Public Service Commission (PSC) letter dated April 2, 2009, RE: U.S. Department of Energy – Electricity Delivery and Energy Reliability Program, instructed utilities planning to apply to DOE under the Electric Delivery and Energy Reliability

REDACTED VERSION

(EDER) program in the American Recovery and Reinvestment Act of 2009 (ARRA) to file their plans with the Secretary to the Commission as soon as practicable due to the added advantage applicants may have by securing non-federal funding sources. The letter requested that this filing should include a list of all projects under consideration that require funding by ratepayers, in a summary format, in priority order using the spreadsheet format that has been used to facilitate discussions about potential projects. The table below lists the Smart Grid Demonstration Programs that we are proposing in this Filing.

DEMONSTRATION PROGRAM SUMMARY

SMART GRID-SPINE

Site	Customers	Components	Jobs	Cost
NY Smart Grid Demonstration	81,821	Meters, WAN, LAN, HAN, DA PV, Energy Storage, PHEV, Wind, Micro-CHP, Holistic Homes, Microgrid	300-500	$249.1M

The letter further advised that such filings with the Secretary should provide to the Commission all known and relevant detail regarding the projects that the utility may include in its DOE applications for the EDER program. The following details were suggested as relevant:

1. The rationale/justification for the project, given all known and anticipated criteria for project selection, including but not limited to the FERC-NARUC smart grid criteria, the smart grid criteria from the Energy Independence and Security Act of 2007 (Title XIII, Sec. 1301), and the smart grid criteria of the policy statement from the Federal Energy Regulatory Commission or the industry standard for smart grid).; and
2. A detailed project description, including location, equipment list, and associated supporting facilities;
3. A project milestone schedule, including an assessment of the readiness for undertaking the project and when any construction could begin;
4. Detailed cost estimates, including a breakdown for various phases where applicable;

REDACTED VERSION

5. The number of jobs created by the project;
6. A statement as to the availability of OE funds, any non-ratepayer, non-federal funds that may be applied, an estimate of the net costs that must be recovered from ratepayers, and a proposed method for recovering those costs.

It is important to note that since National Grid has US service areas in four States, we have either filed or expect to soon file Smart Grid Demonstration Programs in each. The Programs, which we propose here, are part of a larger effort to analyze all aspects of the intelligent grid including those green components such as renewable, storage, PHEVs, micro-grids that together represent what we believe will be the energy environment of the future. In each Program, we have attempted to include sufficient scale to ensure that we learn the appropriate lessons so that we can quickly expand to a wider segment of our customers.

B. Demonstration Program Rational

We are proposing this NY Smart Grid Demonstration Program (the Program), because we believe the Smart Grid and the addition of green energy technologies to make a "Green Grid" represent the future of the energy industry. While we may be one of the first utilities to propose this type of Program, ours is a shared vision. Our approach is consistent with the vision developed within the Office of Electric Delivery and Energy Reliability (OE) by the Electric Advisory Committee (EAC), which describes the Smart Grid as an enabler of the new energy economy[1]. Our vision and our proposed Programs are consistent with the New York vision of the Smart Grid as a catalyst of a green energy future[2]. We understand and are aligned with the Smart Grid guiding principles articulated in the EISA 2007 legislation[3] and our approach is consistent with DOE ARRA funding guidelines as recommended by the FERC-NARUC Smart Grid Collaborative[4]. Our approach to security and standards is consistent with the recently released FERC Smart Grid Policy Statement[5]. We recognize that digitizing the grid and adding millions of new control points along that grid will require a robust and ongoing

---

[1] http://www.oe.energy.gov/DocumentsandMedia/final-smart-grid-report.pdf

[2] http://www.nysenergyplan.com/index.html

[3] http://www.google.com/search?hl=en&q=eisa+2007+public+law&aq=1&oq=EISA+2007

[4] http://www.naruc.org/News/default.cfm?pr=137

[5] http://www.ferc.gov/news/news-releases/2009/2009-1/03-19-09-E-22-factsheet.pdf

REDACTED VERSION

focus on security. We will rapidly create smart and green jobs for small and medium size companies as part of this Demonstration Project that may well result in significant new long term job creation as we move from the demonstration phase to full deployment. What follows is a brief description of the principles and/or guidelines from each of these organizations that collectively informs and influences our proposed Demonstration Program.

i. Electricity Advisory Committee (EAC)

The EAC is part of the DOE Office of Electricity Delivery and Energy Reliability. Their mission is to provide advice to the U.S. Department of Energy in implementing the Energy Policy Act of 2005, executing the Energy Independence and Security Act of 2007, and modernizing the nation's electricity delivery infrastructure. National Grid is a member of the Committee and the Smart Grid Subcommittee. In this capacity, we participated in development of the December 2008 report, "Smart Grid: The Enabler of the New Energy Economy".

We believe the EAC Smart Grid Report is a complete vision of why a Smart Grid is an enabler of the Green Grid and the new energy economy. As they suggest, "*studies have shown that the potential economic and environmental payoffs of transforming the current electric power delivery system into a Smart Grid are numerous. From an economic perspective, a Smart Grid can enable reduced overall energy consumption through consumer education and participation in energy efficiency and demand response / load management programs. Shifting electricity usage to less expensive off-peak hours can allow for better utilization of equipment and better use of capacity. From an environmental standpoint, a Smart Grid can reduce carbon emissions by maximizing demand response / load management, minimizing use of peak generation, and replacing traditional forms of generation with renewable sources of generation. A Smart Grid also holds the promise of enhanced reliability and security of the nation's power system.*"

We believe the NY PSC recognizes the challenges that must be addressed to enable the Smart Grid and the potential of the Green Grid. The Demonstration Programs that we propose are designed to address these smart grid challenges while including sufficient Green Grid components to determine exactly how all of the pieces will work together from a business, technical and regulatory perspective. As the EAC report suggests, "*the challenges faced by the energy sector emanate from transitioning an existing and operational energy model toward a Smart Grid. These challenges include increasing customer awareness and participation, allocating costs appropriately and fairly among stakeholders, developing and executing business case models, identifying and implementing best practices and standards throughout the industry, and establishing a coordinated strategy that capitalizes on using smarter technology to evolve to a Smart Grid.*"

REDACTED VERSION

Our vision is to use the lessons learned during the Demonstration Programs to answer many of these questions and in the process, develop a strategy for a full deployment of Smart and Green.

ii. New York Green Energy Vision

New York State is conducting an extensive review of the current and future energy market for the state and will publish its final report in October 2009. Progress to date has been significant and an initial report was made available on March 31, 2009. This initial report outlines findings and provides market participants with the strategic vision and priorities for New York. Governor Paterson has called for 45 percent of the State's electricity needs to be met through improved energy efficiency and green renewable energy by the year 2015. This aggressive plan expands upon the existing programs and will act as a catalyst for developing the New York green energy industries.

We believe the vision of the leadership team in New York is to create an energy infrastructure that enables a new market evolution. Specific aspects of that vision include:

- Security of supply through a diversity of green technology electricity generation and sophisticated customer behaviors cognizant of cost and carbon impacts.
- A catalyst to new transportation choices, Plug in Hybrid Electric Vehicles that challenge the reliance on gasoline and its associated 36% of carbon dioxide make up of New York pollution.
- Further growth in New York of Energy Efficiency and sustainability.
- Economic development in the competitiveness of attracting industry to New York in general and the specific jobs and skills created for the New York workforce who would provide the Smart Grid components, construct, operate and maintain the Smart Grid.
- Customers with choice and control over how and when they utilize energy to their best advantage both from a cost and carbon perspective.

Our Demonstration Program will enable us to demonstrate in action both the Smart and the Green aspects of the New York Green Energy Vision.

iii. Energy Independence and Security Act (EISA) 2007

This legislation was an update and expansion of the Energy Policy Act of 2005. While it contains many specifics related to the Smart Grid, until the passage of the American Recovery and Reinvestment Act of 2009 (ARRA), there was little actual funding for the Smart Grid initiatives. The Smart Grid Section of the legislation included the following statement of policy:

REDACTED VERSION

It is the policy of the United States to support the modernization of the Nation's electricity transmission and distribution system to maintain a reliable and secure electricity infrastructure that can meet future demand growth and to achieve each of the following, which together characterize a Smart Grid:

1. Increased use of digital information and controls technology to improve reliability, security, and efficiency of the electric grid.
2. Dynamic optimization of grid operations and resources, with full cyber-security.
3. Deployment and integration of distributed resources and generation, including renewable resources.
4. Development and incorporation of demand response, demand-side resources, and energy-efficiency resources.
5. Deployment of ''smart'' technologies (real-time, automated, interactive technologies that optimize the physical operation of appliances and consumer devices) for metering, communications concerning grid operations and status, and distribution automation.
6. Integration of ''smart'' appliances and consumer devices.
7. Deployment and integration of advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning.
8. Provision to consumers of timely information and control options.
9. Development of standards for communication and interoperability of appliances and equipment connected to the electric grid, including the infrastructure serving the grid.
10. Identification and lowering of unreasonable or unnecessary barriers

As our filing will demonstrate, our approach includes the functionality outlined in the first eight items above, while our approach is mindful of the developing standards listed in Item 9. With regards to Item 10, our expectation is that our Program will allow us to understand what works and what does not, and allow us to expose potential barriers preventing the development of the Smart Grid.

iv. FERC-NARUC Smart Grid Collaborative

The FERC-NARUC Smart Grid Collaborative was formed in March 2008 as a forum for a collective education of regulators (state and federal) on Smart Grid technology and a forum for developing a consistent approach to Smart Grid costs and benefits. While it is too early in the process for the Collaborative to develop a Smart Grid policy guideline, they have recently issued a set of recommendations to DOE regarding Smart Grid Program Funding under the EDER section of ARRA. The proposed Funding Criteria includes the following areas:

- Interoperability
- Security

REDACTED VERSION

- Standards
- Minimizing Stranded Investment
- Information Sharing
- Grid Reliability

In addition to these specific funding criteria, the Collaborative provided an extensive list of what they call, Overarching Criteria. We have included the list below and our filing will demonstrate our compliance with each.

- Grid-wide projects (transmission, distribution and in-home)
- Variety of Technologies
- Broad reaching projects with broad application
- Statistically valid Scale
- Geographic and demographic diversity
- Customer and System Benefits

v. FERC Smart Grid Policy Statement and Action Plan

EISA 2007 requires FERC to adopt interoperability standards and protocols necessary to ensure Smart Grid functionality and interoperability in the interstate transmission of electric power and in regional and wholesale electricity markets. The introduction of two-way communications and millions of new control points along the Smart Grid creates a potential Critical Infrastructure Security issue requiring greater FERC involvement and potential oversight beyond the bulk transmission system.

FERC issued a Policy Statement on March 19, 2009[6] requesting comments on their plan to prioritize the development of key interoperability standards, provide guidance to the electric industry regarding the need for full cyber security for Smart Grid projects, and provide an interim rate policy under which jurisdictional public utilities may seek to recover the costs of Smart Grid deployments before relevant standards are adopted through a Commission rulemaking. The following is a summary of the key areas of consideration:

- Cyber Security - Advise National Institute of Standards and Technology (NIST) to assure each standard and protocol is consistent with the overarching cyber security and reliability requirements of EISA and FERC Reliability Standards.
- Inter-System Communications - Identify standards for common information models for communication among all elements of the bulk power system – regional market operators, utilities, demand response aggregators and customers.

[6] http://www.ferc.gov/whats-new/comm-meet/2009/031909/E-22.pdf

REDACTED VERSION

- Wide-Area Situational Awareness - Ensure that operators of the nation's bulk power system have the equipment that gives them a complete view of their systems so they can monitor and operate their systems.
- Coordination of the bulk power systems with new and emerging technologies - Identify standards development that would help accommodate the introduction and expansion of renewable resources, demand response and electricity storage to help address several bulk power system challenges. Also identify standards development that could help accommodate another emerging technology, electric transportation.

We will continue to monitor their efforts and ensure that our selected technologies and our business processes are consistent with standards where they exist and we are fully engaged in the standards development process where existing standards must be updated or where new standards are required.

We will also follow FERC guidelines for avoiding stranded Smart Grid investments by attempting to adhere to the principles of the Gridwise Architecture Council Decision-Maker's Interoperability Checklist[7] and by adherence to the following principles: (1) reliance to the greatest extent practical on existing, widely adopted and open interoperability standards; and (2) where feasible, reliance on systems and firmware that can be securely upgraded readily and quickly. Adherence to these two key principles should minimize the possibility of stranded smart grid investment by making it less likely that equipment replacement will be required once final standards are approved.

C. Program Objectives

National Grid's Program is designed to demonstrate that a large scale Smart Grid deployment may provide significant benefits to customers and society by enabling more efficient energy consumption that results in reduced energy usage, better energy quality, improved reliability, and a general reduction in the carbon emissions required to produce and deliver electricity to customers. Additionally, we hope to demonstrate in action how significant Green enabling technologies can be included, such as large scale storage, PV, PHEV and selected Micro Grids and Micro CHPs. The development and execution of the envisioned Smart Grid and these Demonstration Programs will be a collaborative effort between National Grid, the leadership of New York State, its customers, and market participants. National Grid hopes that each will participate fully

[7] http://www.gridwiseac.org/pdfs/gwac_decisionmakerchecklist.pdf (Interoperability Checklist).

REDACTED VERSION

to reach the goals envisioned and we will be able to demonstrate in action the opportunity and value of Smart Grid.

The Demonstration Programs are designed to accomplish the following:

1. Demonstrate how large scale regulated investments in Smart Grid infrastructure can deliver significant benefits to customers and society.
    - Customer benefit will be measured by a reduction in load and associated cost, improvement in power quality and reliability.
    - Societal benefits are measured in reduction in load and associated carbon reduction.
2. Demonstrate how customer energy consumption and peak demand can be consistently and significantly reduced through the implementation of technologies that provide timely energy usage information, diverse rate plans, and automation to incent and enable customers to reduce load or otherwise alter their consumption patterns.
    - We will establish a baseline usage for the deployment area and then use control sets of customers with differing solution sets to determine the effectiveness of each approach.

3. Demonstrate how electric distribution grid operating efficiency can be improved measurably by improved monitoring and control.
    - This benefit is measured in terms of potential future reductions in line losses.

4. Demonstrate how opportunities to optimize transmission network performance through enhanced distribution network information and control, and changes to customer behavior.
    - This benefit is measured through reductions in critical peak loads with the combination of technology and rate mechanisms. These lower critical peak loads reduce the overall stress on the system. Stress degrades equipment and causes reliability challenges.

5. Demonstrate how distribution feeder reliability can be improved through the implementation of improved monitoring and control of the distribution grid and the integration of automated meter outage detection and restoration into the existing outage management systems and processes.
    - This benefit is measured by reductions in customer minute interruptions.

6. Demonstrate how distributed resources (both generation and storage) could be safely and reliably incorporated onto the electric distribution

REDACTED VERSION

grid through the implementation of improved monitoring, protection and control capabilities.

- The measurement will be the quality and usefulness of near real-time information and controls and the benefit will be a reduction in carbon-based load and an increase in availability of renewable generation.

7. Demonstrate how whether Smart Grid technologies (including advanced meters) improve customer satisfaction by providing timely consumption and conservation options, automated load control and alternative rate plans, and improved monitoring and control of the distribution grid.
   - The measurement will be greater customer satisfaction as measured by improvement in energy savings and customer satisfaction as measured through surveys.

8. Demonstrate how Smart Grid technologies can be deployed in configurations that are interoperable with both existing technologies and anticipated future technology enhancements.
   - The measurement will be a solution that is open and interoperable in accordance with existing industry standards and NIST/NERC/FERC guidelines. The benefit will be lower initial costs and long-term technical flexibility to comply with emerging standards.

D. Smart Grid Security

The advent of the Smart Grid, smart homes and smart metering all require communications and the ability to control devices that provide electricity to customers and manage the grid. Communications security for the distribution grid has not been an issue in the past, since there were almost no automated controls or remote sensors in the distribution grid. Over the last few years, the issue has been explored by a number of industry working groups resulting in an extensive list of security standards, borrowed from the telecommunications community and other industries, to address Smart Grid security. With the rapid pace of Smart Grid development, the Senate has proposed in pending legislation that the National Institute of Standards and Technology take control of the process and develop standards for the Smart Grid.

While we recognize that Smart Grid security will eventually be guided by specific standards, many of these standards either do not exist today or will need to be modified to address the unique aspects of the Smart Grid. We find ourselves in the midst of this transition and must, therefore, engage with the organizations developing these

REDACTED VERSION

standards. Additionally, standards by themselves do not ensure a secure grid, so we are developing a set of policies and procedures to implement the standards and govern the day-to-day operations of a secure Smart Grid.

National Grid is also monitoring the activities of FERC under the authority granted the agency in ESIA. In the legislation, FERC was tasked to approve Smart Grid interoperability and Security Standards. Accordingly, they have advised NIST to undertake the necessary steps to ensure that each standard and protocol that is developed as part of the Institute's interoperability framework is consistent with the overarching cyber-security and reliability mandates of the EISA as well as existing reliability standards approved by the Commission pursuant to Section 215 of the Federal Powers Act. The Commission proposes to make consistency with cyber security and reliability standards a precondition to its adoption of Smart Grid standards. While additional legislation may alter some of the roles for key agencies, we recognize that NIST will likely remain the focal point for Smart Grid Standards. In the interim, the recent efforts by FERC to add some degree of clarity to the standards discuss so the industry can move forward, provides National Grid with a set of guidelines within which we can confidently develop a Smart Grid Security approach. We will, therefore, include the following activities in our Program:

- National Grid will endeavor to comply with the eight Critical Infrastructure Protection (CIP) Reliability Standards of the North American Electric Reliability Corporation (NERC).
- National Grid will ensure that our selected vendor partners are participants on the appropriate standards development groups and compliant with the NERC CIP Reliability Standards.
- National Grid has engaged one of the foremost authorities in Smart Grid Security, Doug Houseman, Capgemini CTO, to oversee security compliance. Mr. Houseman will make every effort to ensure that National Grid is aligned with appropriate industry guidelines.
- National Grid will not simply assume that compliance with standards is adequate, we will test our systems using outside security experts to identify vulnerabilities and adjust our approach to fill any gaps.
- National Grid will also Program the processes and procedures required to provide a long-term secure environment.
- National Grid will feedback to the various industry working groups lessons learned to help accelerate the completion of good standards.

A general description of the overall scope of the National Grid Smart Grid Security Approach can be found in Attachment 1. Information System Security has been

addressed in greater detail in the Section III with applicable security details listed in an associated attachment.

E. Program Approach

National Grid has reviewed the results of numerous Smart Grid Programs conducted by other utilities and has found that most focused on testing the functional characteristics of various technologies. These Programs made important contributions to the maturation of Smart Grid technology, especially as they relate to the viability of various communications technologies and methods. National Grid seeks to build on that work, not repeat it. While the Company's proposed Demonstration Programs will confirm that the selected technologies offer a robust mix of capabilities to support Smart Grid and Green Grid functions, National Grid is also seeking to achieve a much broader understanding of the impact of both on its customers and business.

The proposed Demonstration Programs are designed to demonstrate in action the Smart and Green Grid in a manner, and at a scale, that will provide strong evidence to support the future deployment of technologies that enable a more interactive and greener energy system to all of our customers. With a Smart Grid, customers can exercise greater choices about, and control of, their energy use. At the same time, managers of the electric distribution and transmission grid will have a powerful new set of tools to improve efficiency, reliability, and security. The existing performance of the network will be "base lined" (system performance data collected) before the Program is mobilized to enable a comparison of performance data before and after the Company's Demonstration infrastructure is deployed.

Adding focused, but significant levels of green components to this Smart Grid will enable customers to experiment with PHEVs/EVs, PV, Micro-CHP, and Micro-Grids, while our grid managers can study the impact to the grid and the business caused by these and other green or green-enabling technologies. The Program will enable the scalable testing of the balancing potential of storage on intermittent green generation as a deployable source of energy in location and during periods of congestion.

Similarly, the scale and embedded testing of smart and green will enable manufacturers of both technologies to improve their understanding of each and create a collaborative environment where both can be enhanced and more easily integrated. The need for a green car to talk to a smart meter and to communicate to the utility via a smart grid network to ensure proper identification and billing for remote recharging and potentially discharging will require each of the providers to interoperate. Our Programs will advance that dialogue.

F. Customer Aspects

REDACTED VERSION

The proposed Demonstration Programs will empower participants to reduce their energy consumption by first allowing them to understand their energy usage at a level of detail, timeliness, and ease that was previously impossible, and by providing new tools and services that will help them better manage energy usage. National Grid's Smart Grid enables new interfaces with customers such as web tools, text messaging, and home display units (in addition to improving information richness in traditional billing). These interfaces provide an essential link which will help to tailor solutions to individual customer needs and preferences, thus encouraging a dialog with customers on energy and its management.

National Grid believes customers will respond to the heightened awareness that the Demonstration Programs can provide, but also believes that behavioral shifts can be best optimized if incentives are also available through innovative rates. Customers will be given the opportunity to choose among three potential new Basic Service rate alternatives ("Smart Grid Pricing"), i.e., Critical Peak Pricing, Peak Time Rebate, and Hourly Pricing Programs. This approach, together with a choice of interface channels, enables customers to choose pricing options, as well as their method and time of communications with National Grid, resulting in greater customer choice, convenience, and a higher quality interaction.

The data and knowledge created by the Company's Demonstration Programs can also be combined with technologies that empower customers and electric distribution grid managers in other new and powerful ways, such as enabling a home area network and home automation tools that can monitor and optimize appliance performance and enable embedded demand response in a manner that is transparent to customers but sensitive to their needs as well as grid requirements.

National Grid's Program will also be an enabling technology for exciting new customer options such as plug-in hybrid electric vehicles ("PHEV"). For the Demonstration Programs, we propose the introduction of 100 PHEVs/EVs. We will focus the deployment of these vehicles to enable a true test of their acceptance, use and usefulness in reducing emissions, changing behavior and potential as a storage and supply resource. We will also introduce new storage options to help balance the intermittent nature of certain distributed renewable resources, such as localized and distributed PV. We also propose to test several customer-sited Micro-Grids.

We also propose to coordinate with NYSERDA to blend their energy efficiency programs with our existing and proposed programs. Incorporate existing and proposed Energy Efficiency and Demand Response programs presents a great opportunity to blend our award winning initiatives with the Smart and Green Grid to expand their effectiveness through the use of smart technologies. We are especially interested in incorporating the seven (7) electric and eight (8) gas efficiency programs that we proposed in September 2008. Including these programs in the Smart Grid Demonstration areas offers a means to more directly measure the effectiveness of the efficiency programs

and a chance to incorporate efficiency, smart and renewable on the same circuits. We believe the information gained from the combination will be extremely important in developing increasingly effective efficiency programs. Relevant Energy Efficiency programs can be found in Attachment 2.

If adopted, we believe the combination of The New York Energy Vision, National Grid's Smart Grid, Green Energy Technologies and our Energy Efficiency Programs will create, in combination, a true leadership position that enables New York to provide as a blueprint for the wider US markets and a coherent integrated approach for future market evolution.

G. Utility Aspects

Electric utilities are at a transformational point in time. Restructuring and other changes have affected the industry's structure in recent years in sometimes radical fashion, but those transitions left essentially unchanged the roughly century-old manner in which electricity is generated, delivered, and consumed. National Grid's Smart Grid will enable significant changes in these areas by overlaying communications capability along the grid and inside the customer's home or business, enabling the rapid flow of information (much of it never before available) and near real-time control. These new tools when combined with distributed generation and storage will require a variety of new approaches to service delivery, pricing and operational processes.

The proposed Demonstration Programs will allow National Grid to develop an understanding of the operational changes that can occur along its electric distribution system and within its business processes in order to better plan the transition to a smart and green grid. This would include understanding how some green grid technologies (such as energy storage, Smart PV inverters, and PHEVs/EVs) can be used by utilities to reduce peak demand, provide voltage support, and improve reliability. This crucial expertise cannot be developed simply by reading reports of the results of other utilities' Smart Grid Programs. In fact, we believe no other utility has included both the scope and the scale of our proposed Programs, particularly as it relates to green grid technologies. The systems and processes at each utility are sufficiently distinct, and the transition to a Smarter Grid is so significant and affects so many fundamental processes, that learning by doing is the only way to transition to this new paradigm of energy delivery. The Company's Program creates a process through which National Grid can achieve this knowledge.

H. Technical and Functional Guiding Principles

The design principle National Grid has adopted is to think of the Company's Smart Grid as a spine or backbone of core smart functionality to which we will add elements in a modular fashion. These elements or modules form part of the Company's vision for the future, e.g., PHEV, Storage, and Renewable Energy, etc. While our

REDACTED VERSION

Program begins with the development of the spine, we also believe we can begin in parallel or even in advance of the smart grid deployment to manufacture and possibly deploy some of the modules, at least those, such as PHEVs, that may not require the full deployment of the spine to be useful. The flexibility of this approach enables some of the proposed modules to be added quickly and expanded if desired making them more "shovel ready".

National Grid's approach to designing its Smart Grid also recognizes that the Company is at the beginning of a broad change to the electric industry. The Company must continue seamless electric delivery operations during this transition. We must integrate legacy systems, business and operational processes, while we are adding new smart and green technologies and changing key business operational functions. Our planning reflects this reality.

National Grid's design approach considers both existing and developing standards and guidelines for interoperability. This approach minimizes the risk of stranded investments, while ensuring that we are aligned with leading industry organizations. Beyond those mentioned earlier, this includes the International Electrotechnical Commission's interoperable communications and nomenclature standards for substation automation; and Common Information Model design principles under consideration by the National Institute of Standards and Technology; National Electrical Manufacturers Association standards for plugs, Reclosers and wiring; and the Institute of Electrical and Electronics Engineers (IEEE 802.x) for various Internet Protocol standards. National Grid believes that open, interoperable systems are the most cost-effective approach and we recognize the key role that this approach will support in an industry that will rapidly evolve.

National Grid has recently conducted broad market testing via a request for information ("RFI") process for Smart Grid, which involved over eighty vendors of equipment and services. The design of the process encouraged competition as vendors could bid on any combination of twenty-two categories covering Grid Automation, Communications (Home, Local and Wide Area Networks), Systems, Advanced Meters, and Home Automation solutions. We have also conducted a thorough review of the market for green technologies and include a variety of these in our proposed Programs.

I. Smart Grid Functional Strategy

National Grid's strategy overlays the electric grid with a two-way communications network with speed and capacity sufficient to enable advanced metering, home energy automation and management, and distribution automation and management; and to support distributed generation and storage functions. National Grid already has components of the solution in terms of existing network assets that can be converted to Smart Grid components and communications infrastructure. These include fiber and microwave facilities that can be used as part of the Smart Grid

REDACTED VERSION

Program. Wherever possible, National Grid incorporated these existing assets and systems into the Program design.

The specific business activities that the Program will enable include:

Customer Facing Functions

- Provide interval metering for residential and commercial customers in the Program footprint.
- Provide alternative rate plans including event-based critical peak pricing, event-based peak time rebate, and hourly pricing.
- Provide National Grid customer service representatives with meter status, consumption and appropriate home automation related information.
- Provide energy consumption and pricing information to customers in their home or business through a choice of media that they can select including:
    - Web
    - Home Display Unit
    - PDA/Text
    - Telephone
- Provide customers who choose the ability to control thermostats and energy consuming devices in their home or business manually or programmatically (and via wireless mobile devices for those customers participating in certain remote automation technology programs).
    - Enable (with customer agreement) remote control by National Grid of thermostats and energy consuming devices in customer homes and businesses.

Distribution Grid-Facing Functions

- Enable monitoring and remote control of distribution equipment, including monitoring feeders and transformers; and monitoring and control of capacitors, reclosers, voltage regulators and switches.
- Enable distribution grid operators to use grid operational data to evaluate switching alternatives in near real time, develop automated switching orders and remotely initiate automated switching orders.
- Incorporate automated meter outage and restoration events into outage management systems and processes.
- Enable distribution operators to query remotely the outage / restoration status of individual meters and groups of meters to confirm outage scale and restoration status.
- Provide distribution grid operational data to grid operators in a much shorter timeframe and at a level of granularity sufficient for engineering analysis and asset management applications.

REDACTED VERSION

- Install monitoring and control capability that will enable National Grid to assess how to safely introduce and control a significant quantity of distributed generation supply and storage (including intermittent sources) onto the distribution grid.
- Enable remote reconfiguration of loop or interconnected distribution network assets to isolate and minimize outage impact.

Green Functions

- Provide customers with different PHEV/EV charging options, such as smart charging and green charging
- Control PV smart inverters and integrated energy storage to provide voltage support and to manage PV ramping and intermittency
- Integrate micro-CHP into the electric distribution system to enable grid isolated operation and peak demand reduction
- Dispatch energy storage to reduce peak demand and improve reliability
- Manage a group of distributed resources to reduce peak demand and reduce customer costs

J. Program Scale

National Grid is not proposing a technology Program. We are proposing the first phase of a program that will ultimately transition our company and our relationship with our customers. Accordingly, we are proposing to deploy in two areas in significantly large volumes to enable a validation of our assumptions and to inform the larger transition. National Grid proposes to include a total of approximately 81,821 customers in this phase of our Program. This total will be equally divided between two geographic areas. This sample size will support decision making for a scaled roll out, as it is a valid sampling of a range of customer segments (urban, suburban, rural), customer types (single family, multiple dwelling, small business), relevant and available third-party demographics (such as income, education, and technology adoptions) and load profiles (low to high, average, peak and seasonal). This larger customer base will also allow the Company to include a sufficient number of distribution substations to test a broad variety of network infrastructure models. This will include radial and loop or interconnected feeders, a large number of distribution system control devices, and offer a greater potential for introducing and testing distributed generation and storage options. This approach will also provide sufficient scale to test a variety of renewable and storage options, a significant number of PHEVs and associated remote charging stations and a number of micro-grid concepts.

The two areas are unique, but we have ensured geographical continuity in each to enable extremely comprehensive and thorough testing of Smart Grid and Green Grid. This approach simplifies communications with external stakeholders, such as two

mayors and city governments, and reduces marketing cost because we can focus in a limited media market. This approach will also (1) allow National Grid to focus internal resources in two geographic areas, reducing deployment time and costs; (2) enable automated switching along or between feeders to test the potential of smart grid automation to limit outage impact; (3) permit testing of mission-critical communications by providing an additional communications path for substation operations; and enable a home-to-work testing of PHEVs within a single control area.

K. Proposed Program Sites

National Grid proposes two Program sites in NY, one in Syracuse and one in the Capital District north of Albany based on the objectives and scope of the Program outlined above as well as the following advantages:

1. Size: The Syracuse Program will include approximately 39,523 customers. The Capital District Program will include 42,298 customers. This combined total of over 81,821 customers allows National Grid to choose a wide variety of customer types and grid equipment for the overall Demonstration Program.

2. Diverse Customer Demographics: Because the two sites are relatively large, they offer the opportunity to test the value proposition of Smart and Green over a varied mix of customers. Syracuse, Clifton Park and Saratoga Springs are home to a diverse population of residential and business customers. The behavioral characteristics of different customer groups and differing rates and levels of automation will aid in understanding the implications and benefits of a smarter, greener grid.

3. Diverse Distribution System Conditions: The Company's distribution assets in these program sites are a representative mix of overhead and underground distribution infrastructure as well as a variety of substation types and network configurations (loop and radial). Because of this variety, National Grid can extrapolate Program data across National Grid's entire service area to better understand its potential operational impact and benefits.

4. Proximity to Existing and Proposed Distributed Generation: A key objective of the Program is to provide the backbone for potential distributed generation and storage resources, in order to determine whether or how these resources can be safely and reliably incorporated onto the distribution grid through the implementation of improved monitoring, protection, and control of the distribution grid. Both sites have a number of existing and potential distributed generation project sites, including a large PV project at SUNY Environmental Sciences and

REDACTED VERSION

Forestry Center in Syracuse and PV projects at Curtis Lumber Yard in Malta, NY and BJ's Wholesale Club in Wilton, NY.

5. Access to Institutions of Higher Learning. Syracuse is home to Syracuse University and the Syracuse Center of Excellence in Environmental and Energy Systems. The University's entire campus will be included in the Program area. The Center of Excellence provides National Grid with a network of researchers and innovators throughout the state. Albany is home to a number of colleges and universities including Rensselaer Polytechnic Institute. While the RPI Campus is not in the Program area, National Grid hopes to collaborate with RPI on this Program from an engineering and research perspective. Additionally, Skidmore College in Saratoga Springs is in the Program area. National Grid believes that as a responsible corporate citizen and an advocate for the smarter grid of the future, National Grid can take advantage of opportunities to help the staff and students of these and other institutions gain exposure to and knowledge of the developing green industry. We hope to partner with institutions such as Syracuse University, Stony Brook (AERTC), Skidmore College, Clarkson University, and RPI to participate in equipment testing, facility participation in energy efficiency and conservation programs, testing of energy management systems, distributed generation, community outreach and education, marketing and analysis.

L. Site Characteristics

The Syracuse Program area includes seven substations, the feeders supplied by these substations, and the customers supplied by the feeders. These substations are:

- Bridgeport Sub Substation
- Butternut Substation
- Duguid Substation
- Fly Road Substation
- Pebble Hill Substation
- Rock Cut Substation
- Southwood Substation

The Capital District Program area includes ten substations, some or all of the feeders supplied by these substations, and the customers supplied by the feeders. These substations are:

- Ballston Substation
- Brook Road Substation
- Elnora Substation

REDACTED VERSION

- Grooms Road Substation
- Saratoga Substation
- Shore Road Substation
- Smith Bridge Substation
- South Street Substation
- Weibel Avenue Substation
- Randall Road Substation

Maps of the area covered by each substation, including overlaying GIS coordinates, are included in Attachment 3. Based on the areas served by the substations listed above and the associated feeders, the total number of active customers to be covered by the Program as of April 1, 2009 would be 81,821. The number of Program customers in each rate class is outlined in Attachment 4. A complete list of feeders together with number of customers and equipment on each feeder is included in Attachment 5.

M. Program Cost

The overall cost of the Smart Grid Demonstration Program is estimated at [redacted] million for the Spine and [redacted] for the Clean Energy Modules for a total project cost of [redacted] The cost of the Program is disproportionate to a volume deployment as the fixed costs are borne over a smaller number of installations. The cost of the Program will be shared across National Grid's New York Basic Service customers as discussed below. This cost includes the following key categories:

Smart Grid Spine

- Hardware [redacted]
- Software [redacted]
- Services [redacted]

Green Grid Modules

- Hardware and Software [redacted]
- Services [redacted]

The cost of the Spine on a per meter basis is [redacted]. This number is not representative of the costs of an overall deployment, which would be closer to [redacted] per meter. The cost of equipment and associate software will be much lower when acquired at mass deployment scale. The integration and services required to enable this Demonstration Program will lay the groundwork for the mass deployment, but cannot reflect that broader value in the cost analysis for a much smaller Program. Additionally, while National Grid anticipates that the benefits of a Smart Grid will outweigh the costs in a mass deployment, not all potential benefits can be realized in a Program. One

REDACTED VERSION

benefit that can be realized is the direct benefit of load reduction. If we use the January 2009 EPRI Report[8] on achievable potential in Energy Efficiency and Demand Response, a five per cent reduction is considered a reasonable range. If we achieve this level of reduction in load, this benefit could provide an overall customer bill reduction for customers in the Program of approximately [redacted] per month.

The indicative cost analysis below illustrates how the cost per home decreases as the scale increases from the Program volume to the full customer base:

Volume	Cost ($M)	Cost per Customer ($)
81,821	[redacted]	[redacted]
1,666,638	[redacted]	[redacted]

With regard to a full deployment, as the graph below indicates, the first four columns of potential discounted benefits together equal [redacted] per meter, while the last two columns of estimated discounted costs equal [redacted] per meter. The projections suggest a positive business case for the full deployment, but a key objective of the Program will be to determine if the benefits can be actualized and the costs confirmed.

[8] Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S. (2010–2030)

REDACTED VERSION

N. American Recovery and Reinvestment Act of 2009 (ARRA)

Under ARRA, $4.5B is allotted to the Department of Energy's Office of Electricity Delivery and Energy Reliability to support implementation of the smart grid programs authorized by the EISA. These include smart grid technology research, development and demonstration projects authorized in section 1304, and the federal matching fund for Smart Grid technologies in section 1306. DOE is expected to release their proposed guidelines for application for these funds later this month. After a discussion period, we anticipate a final list of guidelines will be issued this summer. These guidelines will provide a structure in which interested parties can participate in a competitive solicitation for fifty/fifty matching program funds. We intend to file for matching funds for the Demonstration Programs proposed in this Filing and agree with the Commission that prior state regulatory approval will improve our chances of obtaining those funds.

O. Next Steps

While National Grid's Smart Grid Demonstration proposal is pending before the Commission, we intend to prepare for implementation by undertaking design, testing, training and furthering the commercial negotiations with vendors. That way, if and when the Department approves this proposal, National Grid's lead time for implementation will be shortened. A deployment plan is included in Section V of the

filing showing the sequential steps. National Grid anticipates that delivery lead times for certain critical Smart Grid equipment will begin to slip as the impact of ARRA funding begins to create greater demand. We also agree with the Commission that prior regulatory approval will significantly improve the potential for ARRA funding. Therefore, an expedited approval is essential to meeting the project timeline and improving the opportunity for matching funds. In addition, the Programs are also subject to National Grid's internal review and approval process, which will occur concurrently with the Commission's review.