

Smart Grid: Presidential Candidates' Platforms

Barack Obama

Invest in a Digital Smart Grid: Like other pieces of infrastructure, such as roads and bridges our energy grid is outdated and inefficient, resulting in \$50-100 billion dollar losses to the U.S. economy each year. The 2003 East Coast blackout alone resulted in a \$10 billion economic loss. Like President Eisenhower did with the interstate highway system, Barack Obama will pursue a major investment in our national utility grid to enable a tremendous increase in renewable generation and accommodate 21st century energy requirements, such as reliability, smart metering, and distributed storage. Obama will invest federal money to leverage additional state and private sector funds to help create a digitally connected power grid. Creating a smart grid will also help insulate against terrorism concerns because our grid today is virtually unprotected from terrorists. Installing a smart grid will help consumers produce electricity at home through **solar panels or wind turbines**, and be able to sell electricity back through the grid for other consumers, and help consumers reduce their energy use during peak hours when electricity is more expensive. Obama will direct federal resources to the most vulnerable and congested areas and rural areas where significant renewable energy sources are located, as well as work toward national transformation of our energy grid in partnership with states and utilities.

<http://www.barackobama.com/issues/pdf/EnergyFactSheet.pdf>

John McCain

Thank you. I appreciate the invitation to talk with you about a great and urgent challenge - breaking our nation's critical dependence on foreign sources of oil, and making America safer, stronger and more prosperous by modernizing the way we generate and employ energy. . . . Energy efficiency by using improved technology and practicing sensible habits in our homes, businesses and automobiles is a big part of the answer, and is something we can achieve right now. And new advances will make conservation an ever more important part of the solution. Improved light bulbs can use much less energy; **smart grid technology** can help homeowners and businesses lower their energy use, and breakthroughs in high tech materials can greatly improve fuel efficiency in the transportation sector. We need to dispel the image of conservation that entails shivering in cold rooms, reading by candlelight, and lower productivity. Americans have it in their power today to contribute to our national security, prosperity and a cleaner environment. They understand the dangers we face, and are prepared to respond to appeals to patriotism that explain how we can free ourselves from them.

<http://www.johnmccain.com/Informing/News/NewsReleases/5097be0c-e4db-4c6d-9949-21d8d177947f.htm>

Hillary Clinton: “Our electricity grid is antiquated, resulting in costly blackouts, the overbuilding of generation capacity, and large losses in energy during transmission. We need to move aggressively toward **a smart grid -- a web-enabled, digitally controlled, intelligent power delivery system that efficiently distributes electricity and protects against blackouts, brown-outs and excess energy use.** With smarter two-way communications, utilities and consumers can get more control over consumption and save money. A recent study found that using demand reduction programs, which would be greatly facilitated by **an interactive smart grid, can reduce "peak demand" by 5 percent and save \$35 billion in energy costs over a 10-year period.** Other potential "smart grid" benefits include: more efficient power plants; smaller transmission infrastructure needs; more control and better incentives for consumers to save energy; net metering for solar and other distributed renewables; and the ability for consumers to sell power back into the grid.”

.... **“Funding 10 ‘Smart Grid Cities.’** These public-private partnerships between states, cities, utilities, automakers and battery makers will deploy smart grid technology and plug-in hybrid vehicles on a large scale, as well as encourage other technological options to discourage consumption during peak cost periods like time of use meters and pricing, real time demand response, visual price meters, and "prepaid" service models. The projects will enable testing and refinement of advanced capabilities, such as the ability of plug-in hybrid vehicles to communicate with the smart grid to sell power back to utilities when utilities most need the power. **Some experts believe that providing such "vehicle to grid" power at times when the utilities need it most could be worth \$2,000-4,000 dollars per vehicle per year, slashing the cost of owning a plug-in hybrid...**”

Source: <http://www.hillaryclinton.com/files/pdf/poweringamericasfuture.pdf>

Energy Independence and Security Act of 2007: Smart Grid Provisions

On December 19, 2007, the President signed the Energy Independence and Security Act of 2007 (“the Act”), which contains a Title devoted entirely to Smart Grid. The smart grid provisions give the Department of Energy (DOE) the lead on all but two issues (Interoperability & State Consideration), but DOE must coordinate with the Federal Energy Regulatory Commission (FERC), the National Institute of Standards and Technology (NIST), the Department of Homeland Security, other federal agencies and the States.

Overview of the Act’s provisions on Smart Grid:

- Statement of Policy. The Smart Grid title begins with a “Statement of Policy on Modernization of the Electricity Grid” that lists 10 achievement goals “which together characterize a Smart Grid.” As DOE and the States interpret what this indirect definition of Smart Grid means, focus will likely shift to the core smart grid functionality that can be provided: a two-way, real-time, data-producing digital network that reaches behind the meter into the premises and in front of the meter onto the distribution network to provide many times more value than meter-focused approaches.
- Report to Congress. DOE must report in 1 year to Congress on smart grid deployment, and barriers to deployment, and to form both a DOE-Task Force and a Smart Grid Advisory Committee to advance develop and deploy smart grid and smart grid technologies. The Task Force and Committee must be formed by April 19, 2008.
- Demonstration Projects (\$500M). The Act provides **\$100M annually** from 2008 to 2012 for 5 smart grid regional “demonstration” projects that should seek to leverage existing deployments, and DOE may provide up to 50% of tech investment costs by a utility made to carry out demo projects. The 5 demos are to include rural areas, including at least one area where the majority of generation and transmission assets are controlled by a tax-exempt entity (e.g., public power systems).
- Matching Grants. The Act authorizes matching grants to reimburse up to **20% of the cost** of smart grid investments and directs DOE to issue rules for the grant program within 1 year of enactment.
- Interoperability (NIST-led process). One area where DOE does not have the lead is in coordinating the development of a smart grid “interoperability framework.” Here NIST must coordinate with DOE and stakeholders and start work within 60 days of enactment, with an initial progress report on interoperability due to Congress within 1 year of enactment. NIST is given authority to institute rules once there is “sufficient consensus.” The Act devotes \$5M toward this purpose from 2008 through 2012.
- State Consideration. The Act amends the Public Utility Regulatory Policies Act (PURPA) of 1978 to direct the States to consider requiring that electric utilities, before investing in “non-advanced grid technologies,” consider investments in a “qualified smart grid system.” The term “qualified smart grid system” will have to be defined by DOE. States are also directed to consider smart grid incentives such as legislation or regulations on rate recovery and obsolete equipment. Consideration by each State regulatory authority (with respect to each electric utility for which it has ratemaking authority) and each non-regulated electric utility must start within 1 year of enactment (or a hearing date must be set by then) and the consideration must be completed within 2 years of enactment.
- Smart Grid Information Mandates. The Act also amends PURPA to give electricity purchasers direct access over the Internet to prices and customer usage in kWh offered at least daily (and hourly info and day-ahead projection info where available). Consumers must also be told the source of their power, including greenhouse gas emissions associated with the generation type.
- Private Wires Laws impact on Combined Heat & Power. The Act requires DOE to study and report to Congress within 1 year on laws affecting the siting of privately owned electric distribution wires on and across public rights-of-way.
- Smart Grid Security. The Act directs DOE to report to Congress within 18 months on security attributes of smart grid systems: how smart grid helps make the grid less vulnerable to attack; how smart grid helps in restoring grid integrity after disruptions; how smart grid facilitates “nationwide, interoperable emergency communications and control of the Nation’s electricity system” during emergencies.

NOTE: The new federal energy policy law authorizes hundreds of millions of dollars for Smart Grid projects around the Nation, beginning in 2008. The law envisions a Smart Grid that is much more than just "smart" meters, which are just a component of a Smart Grid. (see Title XIII excerpt below, page 3).

H. R. 6

One Hundred Tenth Congress of the United States of America

AT THE FIRST SESSION

*Begun and held at the City of Washington on Thursday,
the fourth day of January, two thousand and seven*

An Act

To move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and for other purposes.

*Be it enacted by the Senate and House of Representatives of
the United States of America in Congress assembled,*

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the “Energy Independence and Security Act of 2007”.

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

- Sec. 1. Short title; table of contents.
- Sec. 2. Definitions.
- Sec. 3. Relationship to other law.

TITLE I—ENERGY SECURITY THROUGH IMPROVED VEHICLE FUEL ECONOMY

Subtitle A—Increased Corporate Average Fuel Economy Standards

- Sec. 101. Short title.
- Sec. 102. Average fuel economy standards for automobiles and certain other vehicles.
- Sec. 103. Definitions.
- Sec. 104. Credit trading program.
- Sec. 105. Consumer information.
- Sec. 106. Continued applicability of existing standards.
- Sec. 107. National Academy of Sciences studies.
- Sec. 108. National Academy of Sciences study of medium-duty and heavy-duty truck fuel economy.
- Sec. 109. Extension of flexible fuel vehicle credit program.
- Sec. 110. Periodic review of accuracy of fuel economy labeling procedures.
- Sec. 111. Consumer tire information.
- Sec. 112. Use of civil penalties for research and development.
- Sec. 113. Exemption from separate calculation requirement.

Subtitle B—Improved Vehicle Technology

- Sec. 131. Transportation electrification.
- Sec. 132. Domestic manufacturing conversion grant program.
- Sec. 133. Inclusion of electric drive in Energy Policy Act of 1992.
- Sec. 134. Loan guarantees for fuel-efficient automobile parts manufacturers.
- Sec. 135. Advanced battery loan guarantee program.
- Sec. 136. Advanced technology vehicles manufacturing incentive program.

Subtitle C—Federal Vehicle Fleets

- Sec. 141. Federal vehicle fleets.
- Sec. 142. Federal fleet conservation requirements.

Smart Grid is Title XIII of the Act.

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- Sec. 922. Establishment and management of Foundation.
- Sec. 923. Duties of Foundation.
- Sec. 924. Annual report.
- Sec. 925. Powers of the Foundation; related provisions.
- Sec. 926. General personnel authorities.
- Sec. 927. Authorization of appropriations.

Subtitle C—Miscellaneous Provisions

- Sec. 931. Energy diplomacy and security within the Department of State.
- Sec. 932. National Security Council reorganization.
- Sec. 933. Annual national energy security strategy report.
- Sec. 934. Convention on Supplementary Compensation for Nuclear Damage contingent cost allocation.
- Sec. 935. Transparency in extractive industries resource payments.

TITLE X—GREEN JOBS

- Sec. 1001. Short title.
- Sec. 1002. Energy efficiency and renewable energy worker training program.

TITLE XI—ENERGY TRANSPORTATION AND INFRASTRUCTURE

Subtitle A—Department of Transportation

- Sec. 1101. Office of Climate Change and Environment.

Subtitle B—Railroads

- Sec. 1111. Advanced technology locomotive grant pilot program.
- Sec. 1112. Capital grants for class II and class III railroads.

Subtitle C—Marine Transportation

- Sec. 1121. Short sea transportation initiative.
- Sec. 1122. Short sea shipping eligibility for capital construction fund.
- Sec. 1123. Short sea transportation report.

Subtitle D—Highways

- Sec. 1131. Increased Federal share for CMAQ projects.
- Sec. 1132. Distribution of rescissions.
- Sec. 1133. Sense of Congress regarding use of complete streets design techniques.

TITLE XII—SMALL BUSINESS ENERGY PROGRAMS

- Sec. 1201. Express loans for renewable energy and energy efficiency.
- Sec. 1202. Pilot program for reduced 7(a) fees for purchase of energy efficient technologies.
- Sec. 1203. Small business energy efficiency.
- Sec. 1204. Larger 504 loan limits to help business develop energy efficient technologies and purchases.
- Sec. 1205. Energy saving debentures.
- Sec. 1206. Investments in energy saving small businesses.
- Sec. 1207. Renewable fuel capital investment company.
- Sec. 1208. Study and report.

TITLE XIII—SMART GRID

- Sec. 1301. Statement of policy on modernization of electricity grid.
- Sec. 1302. Smart grid system report.
- Sec. 1303. Smart grid advisory committee and smart grid task force.
- Sec. 1304. Smart grid technology research, development, and demonstration.
- Sec. 1305. Smart grid interoperability framework.
- Sec. 1306. Federal matching fund for smart grid investment costs.
- Sec. 1307. State consideration of smart grid.
- Sec. 1308. Study of the effect of private wire laws on the development of combined heat and power facilities.
- Sec. 1309. DOE study of security attributes of smart grid systems.

TITLE XIV—POOL AND SPA SAFETY

- Sec. 1401. Short title.
- Sec. 1402. Findings.
- Sec. 1403. Definitions.
- Sec. 1404. Federal swimming pool and spa drain cover standard.
- Sec. 1405. State swimming pool safety grant program.
- Sec. 1406. Minimum State law requirements.
- Sec. 1407. Education program.

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“(B) PAYMENT.—Any company against which the Administrator assesses costs under this paragraph shall pay such costs.

“(2) DEPOSIT OF FUNDS.—Funds collected under this section shall be deposited in the account for salaries and expenses of the Administration.

“SEC. 394. MISCELLANEOUS.

“To the extent such procedures are not inconsistent with the requirements of this part, the Administrator may take such action as set forth in sections 309, 311, 312, and 314 and an officer, director, employee, agent, or other participant in the management or conduct of the affairs of a Renewable Fuel Capital Investment company shall be subject to the requirements of such sections.

“SEC. 395. REMOVAL OR SUSPENSION OF DIRECTORS OR OFFICERS.

“Using the procedures for removing or suspending a director or an officer of a licensee set forth in section 313 (to the extent such procedures are not inconsistent with the requirements of this part), the Administrator may remove or suspend any director or officer of any Renewable Fuel Capital Investment company.

“SEC. 396. REGULATIONS.

“The Administrator may issue such regulations as the Administrator determines necessary to carry out the provisions of this part in accordance with its purposes.

“SEC. 397. AUTHORIZATIONS OF APPROPRIATIONS.

“(a) IN GENERAL.—Subject to the availability of appropriations, the Administrator is authorized to make \$15,000,000 in operational assistance grants under section 389 for each of fiscal years 2008 and 2009.

“(b) FUNDS COLLECTED FOR EXAMINATIONS.—Funds deposited under section 393(c)(2) are authorized to be appropriated only for the costs of examinations under section 393 and for the costs of other oversight activities with respect to the program established under this part.

“SEC. 398. TERMINATION.

“The program under this part shall terminate at the end of the second full fiscal year after the date that the Administrator establishes the program under this part.”.

SEC. 1208. STUDY AND REPORT.

The Administrator of the Small Business Administration shall conduct a study of the Renewable Fuel Capital Investment Program under part C of title III of the Small Business Investment Act of 1958, as added by this Act. Not later than 3 years after the date of enactment of this Act, the Administrator shall complete the study under this section and submit to Congress a report regarding the results of the study.

TITLE XIII—SMART GRID

SEC. 1301. STATEMENT OF POLICY ON MODERNIZATION OF ELECTRICITY GRID.

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 to adoption of smart grid technologies, practices, and services.

SEC. 1302. SMART GRID SYSTEM REPORT.

The Secretary, acting through the Assistant Secretary of the Office of Electricity Delivery and Energy Reliability (referred to in this section as the “OEDER”) and through the Smart Grid Task Force established in section 1303, shall, after consulting with any interested individual or entity as appropriate, no later than 1 year after enactment, and every 2 years thereafter, report to Congress concerning the status of smart grid deployments nationwide and any regulatory or government barriers to continued deployment. The report shall provide the current status and prospects of smart grid development, including information on technology penetration, communications network capabilities, costs, and obstacles. It may include recommendations for State and Federal policies or actions helpful to facilitate the transition to a smart grid. To the extent appropriate, it should take a regional perspective. In preparing this report, the Secretary shall solicit advice and contributions from the Smart Grid Advisory Committee created in section 1303; from other involved Federal agencies including but not limited to the Federal Energy Regulatory Commission (“Commission”), the National Institute of Standards and Technology (“Institute”), and the Department of Homeland Security; and from other stakeholder groups not already represented on the Smart Grid Advisory Committee.

SEC. 1303. SMART GRID ADVISORY COMMITTEE AND SMART GRID TASK FORCE.

(a) SMART GRID ADVISORY COMMITTEE.—

(1) ESTABLISHMENT.—The Secretary shall establish, within 90 days of enactment of this Part, a Smart Grid Advisory Committee (either as an independent entity or as a designated sub-part of a larger advisory committee on electricity matters). The Smart Grid Advisory Committee shall include eight or more members appointed by the Secretary who have sufficient experience and expertise to represent the full range of smart grid technologies and services, to represent both private and non-Federal public sector stakeholders. One member shall be appointed by the Secretary to Chair the Smart Grid Advisory Committee.

(2) MISSION.—The mission of the Smart Grid Advisory Committee shall be to advise the Secretary, the Assistant Secretary, and other relevant Federal officials concerning the development of smart grid technologies, the progress of a national transition to the use of smart-grid technologies and services, the evolution of widely-accepted technical and practical standards and protocols to allow interoperability and inter-communication among smart-grid capable devices, and the optimum means of using Federal incentive authority to encourage such progress.

(3) APPLICABILITY OF FEDERAL ADVISORY COMMITTEE ACT.—The Federal Advisory Committee Act (5 U.S.C. App.) shall apply to the Smart Grid Advisory Committee.

(b) SMART GRID TASK FORCE.—

(1) ESTABLISHMENT.—The Assistant Secretary of the Office of Electricity Delivery and Energy Reliability shall establish, within 90 days of enactment of this Part, a Smart Grid Task Force composed of designated employees from the various divisions of that office who have responsibilities related to the transition to smart-grid technologies and practices. The Assistant Secretary or his designee shall be identified as the Director of the Smart Grid Task Force. The Chairman of the Federal Energy Regulatory Commission and the Director of the National Institute of Standards and Technology shall each designate at least one employee to participate on the Smart Grid Task Force. Other members may come from other agencies at the invitation of the Assistant Secretary or the nomination of the head of such other agency. The Smart Grid Task Force shall, without disrupting the work of the Divisions or Offices from which its members are drawn, provide an identifiable Federal entity to embody the Federal role in the national transition toward development and use of smart grid technologies.

(2) MISSION.—The mission of the Smart Grid Task Force shall be to insure awareness, coordination and integration of the diverse activities of the Office and elsewhere in the Federal Government related to smart-grid technologies and practices, including but not limited to: smart grid research and development; development of widely accepted smart-grid standards and protocols; the relationship of smart-grid technologies and practices to electric utility regulation; the relationship of smart-grid technologies and practices to infrastructure development, system reliability and security; and the relationship of smart-grid technologies and practices to other facets of electricity supply, demand, transmission, distribution, and policy. The Smart Grid Task Force shall collaborate with the Smart Grid Advisory Committee and other Federal agencies and offices.

The Smart Grid Task Force shall meet at the call of its Director as necessary to accomplish its mission.

(c) AUTHORIZATION.—There are authorized to be appropriated for the purposes of this section such sums as are necessary to the Secretary to support the operations of the Smart Grid Advisory Committee and Smart Grid Task Force for each of fiscal years 2008 through 2020.

SEC. 1304. SMART GRID TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) POWER GRID DIGITAL INFORMATION TECHNOLOGY.—The Secretary, in consultation with the Federal Energy Regulatory Commission and other appropriate agencies, electric utilities, the States, and other stakeholders, shall carry out a program—

(1) to develop advanced techniques for measuring peak load reductions and energy-efficiency savings from smart metering, demand response, distributed generation, and electricity storage systems;

(2) to investigate means for demand response, distributed generation, and storage to provide ancillary services;

(3) to conduct research to advance the use of wide-area measurement and control networks, including data mining, visualization, advanced computing, and secure and dependable communications in a highly-distributed environment;

(4) to test new reliability technologies, including those concerning communications network capabilities, in a grid control room environment against a representative set of local outage and wide area blackout scenarios;

(5) to identify communications network capacity needed to implement advanced technologies.

(6) to investigate the feasibility of a transition to time-of-use and real-time electricity pricing;

(7) to develop algorithms for use in electric transmission system software applications;

(8) to promote the use of underutilized electricity generation capacity in any substitution of electricity for liquid fuels in the transportation system of the United States; and

(9) in consultation with the Federal Energy Regulatory Commission, to propose interconnection protocols to enable electric utilities to access electricity stored in vehicles to help meet peak demand loads.

(b) SMART GRID REGIONAL DEMONSTRATION INITIATIVE.—

(1) IN GENERAL.—The Secretary shall establish a smart grid regional demonstration initiative (referred to in this subsection as the “Initiative”) composed of demonstration projects specifically focused on advanced technologies for use in power grid sensing, communications, analysis, and power flow control. The Secretary shall seek to leverage existing smart grid deployments.

(2) GOALS.—The goals of the Initiative shall be—

(A) to demonstrate the potential benefits of concentrated investments in advanced grid technologies on a regional grid;

(B) to facilitate the commercial transition from the current power transmission and distribution system technologies to advanced technologies;

(C) to facilitate the integration of advanced technologies in existing electric networks to improve system performance, power flow control, and reliability;

(D) to demonstrate protocols and standards that allow for the measurement and validation of the energy savings and fossil fuel emission reductions associated with the installation and use of energy efficiency and demand response technologies and practices; and

(E) to investigate differences in each region and regulatory environment regarding best practices in implementing smart grid technologies.

(3) DEMONSTRATION PROJECTS.—

(A) IN GENERAL.—In carrying out the initiative, the Secretary shall carry out smart grid demonstration projects in up to 5 electricity control areas, including rural areas and at least 1 area in which the majority of generation and transmission assets are controlled by a tax-exempt entity.

(B) COOPERATION.—A demonstration project under subparagraph (A) shall be carried out in cooperation with the electric utility that owns the grid facilities in the electricity control area in which the demonstration project is carried out.

(C) FEDERAL SHARE OF COST OF TECHNOLOGY INVESTMENTS.—The Secretary shall provide to an electric utility described in subparagraph (B) financial assistance for use in paying an amount equal to not more than 50 percent of the cost of qualifying advanced grid technology investments made by the electric utility to carry out a demonstration project.

(D) INELIGIBILITY FOR GRANTS.—No person or entity participating in any demonstration project conducted under this subsection shall be eligible for grants under section 1306 for otherwise qualifying investments made as part of that demonstration project.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated—

(1) to carry out subsection (a), such sums as are necessary for each of fiscal years 2008 through 2012; and

(2) to carry out subsection (b), \$100,000,000 for each of fiscal years 2008 through 2012.

SEC. 1305. SMART GRID INTEROPERABILITY FRAMEWORK.

(a) INTEROPERABILITY FRAMEWORK.—The Director of the National Institute of Standards and Technology shall have primary responsibility to coordinate the development of a framework that includes protocols and model standards for information management to achieve interoperability of smart grid devices and systems. Such protocols and standards shall further align policy, business, and technology approaches in a manner that would enable all electric resources, including demand-side resources, to contribute to an efficient, reliable electricity network. In developing such protocols and standards—

(1) the Director shall seek input and cooperation from the Commission, OEDER and its Smart Grid Task Force, the Smart Grid Advisory Committee, other relevant Federal and State agencies; and

(2) the Director shall also solicit input and cooperation from private entities interested in such protocols and standards, including but not limited to the Gridwise Architecture Council, the International Electrical and Electronics Engineers, the National Electric Reliability Organization recognized by the Federal Energy Regulatory Commission, and National Electrical Manufacturer's Association.

(b) SCOPE OF FRAMEWORK.—The framework developed under subsection (a) shall be flexible, uniform and technology neutral, including but not limited to technologies for managing smart grid information, and designed—

(1) to accommodate traditional, centralized generation and transmission resources and consumer distributed resources, including distributed generation, renewable generation, energy storage, energy efficiency, and demand response and enabling devices and systems;

(2) to be flexible to incorporate—

(A) regional and organizational differences; and

(B) technological innovations;

(3) to consider the use of voluntary uniform standards for certain classes of mass-produced electric appliances and equipment for homes and businesses that enable customers, at their election and consistent with applicable State and Federal laws, and are manufactured with the ability to respond to electric grid emergencies and demand response signals by curtailing all, or a portion of, the electrical power consumed by the appliances or equipment in response to an emergency or demand response signal, including through—

(A) load reduction to reduce total electrical demand;

(B) adjustment of load to provide grid ancillary services; and

(C) in the event of a reliability crisis that threatens an outage, short-term load shedding to help preserve the stability of the grid; and

(4) such voluntary standards should incorporate appropriate manufacturer lead time.

(c) TIMING OF FRAMEWORK DEVELOPMENT.—The Institute shall begin work pursuant to this section within 60 days of enactment. The Institute shall provide and publish an initial report on progress toward recommended or consensus standards and protocols within 1 year after enactment, further reports at such times as developments warrant in the judgment of the Institute, and a final report when the Institute determines that the work is completed or that a Federal role is no longer necessary.

(d) STANDARDS FOR INTEROPERABILITY IN FEDERAL JURISDICTION.—At any time after the Institute's work has led to sufficient consensus in the Commission's judgment, the Commission shall institute a rulemaking proceeding to adopt such standards and protocols as may be necessary to insure smart-grid functionality and interoperability in interstate transmission of electric power, and regional and wholesale electricity markets.

(e) AUTHORIZATION.—There are authorized to be appropriated for the purposes of this section \$5,000,000 to the Institute to support the activities required by this subsection for each of fiscal years 2008 through 2012.

SEC. 1306. FEDERAL MATCHING FUND FOR SMART GRID INVESTMENT COSTS.

(a) **MATCHING FUND.**—The Secretary shall establish a Smart Grid Investment Matching Grant Program to provide reimbursement of one-fifth (20 percent) of qualifying Smart Grid investments.

(b) **QUALIFYING INVESTMENTS.**—Qualifying Smart Grid investments may include any of the following made on or after the date of enactment of this Act:

(1) In the case of appliances covered for purposes of establishing energy conservation standards under part B of title III of the Energy Policy and Conservation Act of 1975 (42 U.S.C. 6291 et seq.), the documented expenditures incurred by a manufacturer of such appliances associated with purchasing or designing, creating the ability to manufacture, and manufacturing and installing for one calendar year, internal devices that allow the appliance to engage in Smart Grid functions.

(2) In the case of specialized electricity-using equipment, including motors and drivers, installed in industrial or commercial applications, the documented expenditures incurred by its owner or its manufacturer of installing devices or modifying that equipment to engage in Smart Grid functions.

(3) In the case of transmission and distribution equipment fitted with monitoring and communications devices to enable smart grid functions, the documented expenditures incurred by the electric utility to purchase and install such monitoring and communications devices.

(4) In the case of metering devices, sensors, control devices, and other devices integrated with and attached to an electric utility system or retail distributor or marketer of electricity that are capable of engaging in Smart Grid functions, the documented expenditures incurred by the electric utility, distributor, or marketer and its customers to purchase and install such devices.

(5) In the case of software that enables devices or computers to engage in Smart Grid functions, the documented purchase costs of the software.

(6) In the case of entities that operate or coordinate operations of regional electric grids, the documented expenditures for purchasing and installing such equipment that allows Smart Grid functions to operate and be combined or coordinated among multiple electric utilities and between that region and other regions.

(7) In the case of persons or entities other than electric utilities owning and operating a distributed electricity generator, the documented expenditures of enabling that generator to be monitored, controlled, or otherwise integrated into grid operations and electricity flows on the grid utilizing Smart Grid functions.

(8) In the case of electric or hybrid-electric vehicles, the documented expenses for devices that allow the vehicle to engage in Smart Grid functions (but not the costs of electricity storage for the vehicle).

(9) The documented expenditures related to purchasing and implementing Smart Grid functions in such other cases as the Secretary shall identify. In making such grants, the Secretary shall seek to reward innovation and early adaptation,

even if success is not complete, rather than deployment of proven and commercially viable technologies.

(c) INVESTMENTS NOT INCLUDED.—Qualifying Smart Grid investments do not include any of the following:

(1) Investments or expenditures for Smart Grid technologies, devices, or equipment that are eligible for specific tax credits or deductions under the Internal Revenue Code, as amended.

(2) Expenditures for electricity generation, transmission, or distribution infrastructure or equipment not directly related to enabling Smart Grid functions.

(3) After the final date for State consideration of the Smart Grid Information Standard under section 1307 (paragraph (17) of section 111(d) of the Public Utility Regulatory Policies Act of 1978), an investment that is not in compliance with such standard.

(4) After the development and publication by the Institute of protocols and model standards for interoperability of smart grid devices and technologies, an investment that fails to incorporate any of such protocols or model standards.

(5) Expenditures for physical interconnection of generators or other devices to the grid except those that are directly related to enabling Smart Grid functions.

(6) Expenditures for ongoing salaries, benefits, or personnel costs not incurred in the initial installation, training, or start up of smart grid functions.

(7) Expenditures for travel, lodging, meals or other personal costs.

(8) Ongoing or routine operation, billing, customer relations, security, and maintenance expenditures.

(9) Such other expenditures that the Secretary determines not to be Qualifying Smart Grid Investments by reason of the lack of the ability to perform Smart Grid functions or lack of direct relationship to Smart Grid functions.

(d) SMART GRID FUNCTIONS.—The term “smart grid functions” means any of the following:

(1) The ability to develop, store, send and receive digital information concerning electricity use, costs, prices, time of use, nature of use, storage, or other information relevant to device, grid, or utility operations, to or from or by means of the electric utility system, through one or a combination of devices and technologies.

(2) The ability to develop, store, send and receive digital information concerning electricity use, costs, prices, time of use, nature of use, storage, or other information relevant to device, grid, or utility operations to or from a computer or other control device.

(3) The ability to measure or monitor electricity use as a function of time of day, power quality characteristics such as voltage level, current, cycles per second, or source or type of generation and to store, synthesize or report that information by digital means.

(4) The ability to sense and localize disruptions or changes in power flows on the grid and communicate such information instantaneously and automatically for purposes of enabling automatic protective responses to sustain reliability and security of grid operations.

(5) The ability to detect, prevent, communicate with regard to, respond to, or recover from system security threats, including cyber-security threats and terrorism, using digital information, media, and devices.

(6) The ability of any appliance or machine to respond to such signals, measurements, or communications automatically or in a manner programmed by its owner or operator without independent human intervention.

(7) The ability to use digital information to operate functionalities on the electric utility grid that were previously electro-mechanical or manual.

(8) The ability to use digital controls to manage and modify electricity demand, enable congestion management, assist in voltage control, provide operating reserves, and provide frequency regulation.

(9) Such other functions as the Secretary may identify as being necessary or useful to the operation of a Smart Grid.

(e) The Secretary shall—

(1) establish and publish in the Federal Register, within 1 year after the enactment of this Act procedures by which applicants who have made qualifying Smart Grid investments can seek and obtain reimbursement of one-fifth of their documented expenditures;

(2) establish procedures to ensure that there is no duplication or multiple reimbursement for the same investment or costs, that the reimbursement goes to the party making the actual expenditures for Qualifying Smart Grid Investments, and that the grants made have significant effect in encouraging and facilitating the development of a smart grid;

(3) maintain public records of reimbursements made, recipients, and qualifying Smart Grid investments which have received reimbursements;

(4) establish procedures to provide, in cases deemed by the Secretary to be warranted, advance payment of moneys up to the full amount of the projected eventual reimbursement, to creditworthy applicants whose ability to make Qualifying Smart Grid Investments may be hindered by lack of initial capital, in lieu of any later reimbursement for which that applicant qualifies, and subject to full return of the advance payment in the event that the Qualifying Smart Grid investment is not made; and

(5) have and exercise the discretion to deny grants for investments that do not qualify in the reasonable judgment of the Secretary.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary for the administration of this section and the grants to be made pursuant to this section for fiscal years 2008 through 2012.

SEC. 1307. STATE CONSIDERATION OF SMART GRID.

(a) Section 111(d) of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2621(d)) is amended by adding at the end the following:

“(16) CONSIDERATION OF SMART GRID INVESTMENTS.—

“(A) IN GENERAL.—Each State shall consider requiring that, prior to undertaking investments in nonadvanced grid technologies, an electric utility of the State demonstrate

to the State that the electric utility considered an investment in a qualified smart grid system based on appropriate factors, including—

- “(i) total costs;
- “(ii) cost-effectiveness;
- “(iii) improved reliability;
- “(iv) security;
- “(v) system performance; and
- “(vi) societal benefit.

“(B) RATE RECOVERY.—Each State shall consider authorizing each electric utility of the State to recover from ratepayers any capital, operating expenditure, or other costs of the electric utility relating to the deployment of a qualified smart grid system, including a reasonable rate of return on the capital expenditures of the electric utility for the deployment of the qualified smart grid system.

“(C) OBSOLETE EQUIPMENT.—Each State shall consider authorizing any electric utility or other party of the State to deploy a qualified smart grid system to recover in a timely manner the remaining book-value costs of any equipment rendered obsolete by the deployment of the qualified smart grid system, based on the remaining depreciable life of the obsolete equipment.

“(17) SMART GRID INFORMATION.—

“(A) STANDARD.—All electricity purchasers shall be provided direct access, in written or electronic machine-readable form as appropriate, to information from their electricity provider as provided in subparagraph (B).

“(B) INFORMATION.—Information provided under this section, to the extent practicable, shall include:

“(i) PRICES.—Purchasers and other interested persons shall be provided with information on—

“(I) time-based electricity prices in the wholesale electricity market; and

“(II) time-based electricity retail prices or rates that are available to the purchasers.

“(ii) USAGE.—Purchasers shall be provided with the number of electricity units, expressed in kwh, purchased by them.

“(iii) INTERVALS AND PROJECTIONS.—Updates of information on prices and usage shall be offered on not less than a daily basis, shall include hourly price and use information, where available, and shall include a day-ahead projection of such price information to the extent available.

“(iv) SOURCES.—Purchasers and other interested persons shall be provided annually with written information on the sources of the power provided by the utility, to the extent it can be determined, by type of generation, including greenhouse gas emissions associated with each type of generation, for intervals during which such information is available on a cost-effective basis.

“(C) ACCESS.—Purchasers shall be able to access their own information at any time through the Internet and on other means of communication elected by that utility

for Smart Grid applications. Other interested persons shall be able to access information not specific to any purchaser through the Internet. Information specific to any purchaser shall be provided solely to that purchaser.”

(b) COMPLIANCE.—

(1) TIME LIMITATIONS.—Section 112(b) of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2622(b)) is amended by adding the following at the end thereof:

“(6)(A) Not later than 1 year after the enactment of this paragraph, each State regulatory authority (with respect to each electric utility for which it has ratemaking authority) and each nonregulated utility shall commence the consideration referred to in section 111, or set a hearing date for consideration, with respect to the standards established by paragraphs (17) through (18) of section 111(d).

“(B) Not later than 2 years after the date of the enactment of this paragraph, each State regulatory authority (with respect to each electric utility for which it has ratemaking authority), and each nonregulated electric utility, shall complete the consideration, and shall make the determination, referred to in section 111 with respect to each standard established by paragraphs (17) through (18) of section 111(d).”

(2) FAILURE TO COMPLY.—Section 112(c) of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2622(c)) is amended by adding the following at the end:

“In the case of the standards established by paragraphs (16) through (19) of section 111(d), the reference contained in this subsection to the date of enactment of this Act shall be deemed to be a reference to the date of enactment of such paragraphs.”

(3) PRIOR STATE ACTIONS.—Section 112(d) of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2622(d)) is amended by inserting “and paragraphs (17) through (18)” before “of section 111(d)”.

SEC. 1308. STUDY OF THE EFFECT OF PRIVATE WIRE LAWS ON THE DEVELOPMENT OF COMBINED HEAT AND POWER FACILITIES.

(a) STUDY.—

(1) IN GENERAL.—The Secretary, in consultation with the States and other appropriate entities, shall conduct a study of the laws (including regulations) affecting the siting of privately owned electric distribution wires on and across public rights-of-way.

(2) REQUIREMENTS.—The study under paragraph (1) shall include—

(A) an evaluation of—

(i) the purposes of the laws; and

(ii) the effect the laws have on the development of combined heat and power facilities;

(B) a determination of whether a change in the laws would have any operating, reliability, cost, or other impacts on electric utilities and the customers of the electric utilities; and

(C) an assessment of—

(i) whether privately owned electric distribution wires would result in duplicative facilities; and

(ii) whether duplicative facilities are necessary or desirable.

(b) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to Congress a report that describes the results of the study conducted under subsection (a).

SEC. 1309. DOE STUDY OF SECURITY ATTRIBUTES OF SMART GRID SYSTEMS.

(a) DOE STUDY.—The Secretary shall, within 18 months after the date of enactment of this Act, submit a report to Congress that provides a quantitative assessment and determination of the existing and potential impacts of the deployment of Smart Grid systems on improving the security of the Nation’s electricity infrastructure and operating capability. The report shall include but not be limited to specific recommendations on each of the following:

(1) How smart grid systems can help in making the Nation’s electricity system less vulnerable to disruptions due to intentional acts against the system.

(2) How smart grid systems can help in restoring the integrity of the Nation’s electricity system subsequent to disruptions.

(3) How smart grid systems can facilitate nationwide, interoperable emergency communications and control of the Nation’s electricity system during times of localized, regional, or nationwide emergency.

(4) What risks must be taken into account that smart grid systems may, if not carefully created and managed, create vulnerability to security threats of any sort, and how such risks may be mitigated.

(b) CONSULTATION.—The Secretary shall consult with other Federal agencies in the development of the report under this section, including but not limited to the Secretary of Homeland Security, the Federal Energy Regulatory Commission, and the Electric Reliability Organization certified by the Commission under section 215(c) of the Federal Power Act (16 U.S.C. 824o) as added by section 1211 of the Energy Policy Act of 2005 (Public Law 109–58; 119 Stat. 941).

TITLE XIV—POOL AND SPA SAFETY

SEC. 1401. SHORT TITLE.

This title may be cited as the “Virginia Graeme Baker Pool and Spa Safety Act”.

SEC. 1402. FINDINGS.

Congress finds the following:

(1) Of injury-related deaths, drowning is the second leading cause of death in children aged 1 to 14 in the United States.

(2) In 2004, 761 children aged 14 and under died as a result of unintentional drowning.

(3) Adult supervision at all aquatic venues is a critical safety factor in preventing children from drowning.

(4) Research studies show that the installation and proper use of barriers or fencing, as well as additional layers of protection, could substantially reduce the number of childhood residential swimming pool drownings and near drownings.