DR and Smart Grid in the Stimulus Bill, Energy Bill & Climate Bill

NAESCO

Dan Delurey
Demand Response and Smart Grid Coalition
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DRSG Members

- Aclara
- Ambient
- CES
- Comverge
- CPower
- CSE
- Direct Energy
- Echelon
- Eka Systems
- eMeter
- EnergySolve
- EnerNOC
- Honeywell
- Itron
- IBM
- Ice Energy
- Itron
- Google
- Enspiria
- Landis + Gyr
- Oracle
- Orion Energy Systems
- Sensus
- Silver Spring Networks
- SmartSynch
- Steffes
- SureGrid
- Tendril
- Trilliant Networks
- Ziphany

Energy Independence Act
Title V – Efficiency and Demand Response

- Section 529

  Demand Response Assessment and National Action Plan
  - FERC has lead
  - Assessment of national potential in 5 and 10 year increments
  - Assessment completed within 18 months
  - $10M per year authorized in 2008 through 2010
  - Action Plan submitted to Congress within one year of completion of Assessment

Energy Independence Act
Title V – Efficiency and Demand Response

- Section 529

  Demand Response Assessment and National Action Plan
- Action Plan Components
  - Technical Assistance needed by States
  - National Communications Program
  - Development of analytical tools, model contracts and other support materials
- Action Plan Implementation
  - FERC, together with DOE, to seek state agreements and submit implementation plan to Congress

Energy Independence Act
Title XIII – Smart Grid

- Section 1301 – Statement of Policy
- Section 1302 – System Report
- Section 1303 – Advisory Committee and Task Force
- Section 1304 – Technology RD&D
- Section 1305 – Interoperability Framework
- Section 1306 – Federal Matching Fund
- Section 1307 – State Consideration
- Section 1308 – Study of Effect of Private Wires Laws on CHP
- Section 1309 – Study of Security Attributes

Section 1304 – Technology RD&D

- Power Grid Digital Information Technologies
  - Advanced techniques for measuring peak reductions and efficiency savings
  - Investigate means for DR, DG and storage to provide ancillary services
  - WAN measurement and control including
    - Data mining
    - Visualization
    - Advanced computing
    - Communications in a highly distributed environment
  - New reliability techniques, including
    - Communications network capabilities in a grid control room environment

Section 1304 – Technology RD&D

- Power Grid Digital Information Technologies
  - Identify communications networks capabilities needed to implement advanced technologies
  - Investigate feasibility of a transition to time-based and real-time pricing
  - Develop algorithms for use in transmission software applications
  - Promote use of underutilized electric generation capacity in replacement of liquid fuels in transportation
  - Interconnection protocols to enable electric vehicles to help meet peak demand

Section 1304 – Technology RD&D

- Regional Demonstration Initiative specifically focused on advanced technology for power grid sensing, communications and power flow control, including:
  - Demonstrate benefits of concentrated investments
  - Facilitate transition to advanced technologies
  - Facilitate integration of advanced technologies into existing networks
  - Demonstrate protocols and standards for measurement verification of energy and emissions savings from DR and EE
  - Investigate differences in regulation and best practices

Section 1304 – Technology RD&D

- Authorization
  - Digital Information
    - Such sums as necessary for 2008 through 2012
  - Regional Demonstration
    - $100M per year 2008 through 2012

Section 1306 – Matching Grants

- New DOE Program to provide reimbursement of 20% of smart grid investments
- Procedures published within one year
- Authorization of such sums as necessary

Section 1306 – Matching Grants

- Eligible Investments
  - Manufacture of Efficient Appliances
  - Modifying special electricity equipment, e.g. motors
  - Utility installment of Smart Grid-enabled T&D infrastructure
  - Purchase and installation of metering and control devices and equipment
  - Software to enable computers to engage in smart grid functions

Section 1306 – Matching Grants

- Qualifying Investments
  - Installation by regional system operator of equipment for coordination among utilities and regions
  - Non-utility owned DG
  - Devices to allow a vehicle to engage in smart grid functions (excluding storage costs)

Section 1306 – Matching Grants

- The term Smart Grid Functions shall include:
  - Ability to store, send and receive digital information through a combination of devices
  - Ability to do same to or from a computer or control device
  - Ability to measure and monitor as a function of time of day, power quality, source and type of generation, etc
  - Ability to sense disruptions in power flows and communicate on such instantaneously
  - Ability to detect, respond to, recover, etc relative to security threats
  - Ability of appliances and equipment to respond without human intervention
  - Ability to use digital information for grid operations that were previously electromechanical or manual
  - Ability to use digital controls to manage demand, congestion, and provide ancillary services

2009 Economic Recovery Act

- A Stimulus Bill with spending and tax breaks – not a policy bill
- Two Year Period for Desired Stimulus Impact
- Considerable Funding for Energy Efficiency and Smart Grid Spending
- Some tax benefits for Efficiency

Smart Grid Funding

- $11 Billion top line
  - $6.5 B each to WAPA and BPA for Transmission
  - $4.5 B to DOE for Smart Grid Grants
    - $100,000 for worker training
    - $ 80,000 for Regional Transmission Planning
    - $ 10,000 for NIST Interoperability work
    - $200,000 for Energy Storage
    - $4.180 B for other things, including Section 1304 and Section 1306 Grants and
      - Technical Assistance to NERC, States, Regional Transmission Organizations for activities relative to Eastern and Western Interconnections and ERCOT, including planning, modeling and policies

Smart Grid Grants – General Provisions

- No allocation between 1304 and 1306
- Money is available until September 30, 2010
- "Funds are available for expenses necessary for electricity delivery and energy reliability activities to modernize the electric grid, to include demand responsive equipment, enhance security and reliability of the energy infrastructure, energy storage research, development, demonstration and deployment, and facilitate recovery from disruptions to the energy supply, and for implementation of programs authorized under [Title 13 of EISA]"

Smart Grid Grants – Possible Transfer of Funds to Transmission

- "Secretary may use or transfer amounts provided under this heading to carry out new authority for transmission improvements, if such authority is enacted in any subsequent act, consistent with existing fiscal management practices and procedures."

Changes to Section 1304

- Before – Only utilities were eligible
  - **Now: Utilities and Other Parties**
- Before – No more than 5 grants
  - **Now: No limit on number of grants**

Changes to Section 1306

- Before – Up to 20% match
  - **Now: Up to 50%**
- Before – Funds via reimbursement
  - **Now: Money committed up front**
- Before – Program established in 1 yr
  - **Now: 60 days after enactment**
- Before – “anti-double dipping” based on eligiblity
  - **Now: Based on “utilize”**

Open Standards and Protocols – Evolution of the Language in the Bill

1. Chairman's mark for House Energy and Commerce mark-up includes the following:

"The Secretary shall require as a condition of receiving funding under this subsection that [demonstration/matching] projects utilize open internet-based protocols and standards, if available"

Open Protocols and Standards – Evolution of the Language in the Bill

2. Congressman Markey has amendment adopted by voice vote on House Floor to change language to:

   “.....utilize internet-based or other open protocols and standards if available and appropriate”

Open Protocols and Standards – Evolution of Language in the Bill

3. House-Senate Conference Committee agrees to final language:

   "…..utilize open protocols and standards (including internet-based open protocols and standards), if available and appropriate"

What is not in EISA & ARRA

- Allocation between EISA and ARRA
- Allocation within 1304 or 1306
- General Administrative and Process Criteria
- Specific Eligibility and Competitive Criteria for Awarding Grants
- Any new additions to the “lists” in 1304 and 1306
- Any change in the ability of the Secretary to add things to the “lists”

Smart Grid 1306 Grants - Timetable

- President signs the Stimulus Bill
- 60 Day Clock starts on 1306
- DOE issues Notice of Funding Opportunity
- 30-60 Days Comment Period
- DOE issue Final Opportunity Availability Notice

1306 Issues: Allocation Possibilities

- By List Items in Authorizing Language
- Geographically
- By company size
- By technology area
- By commercially available vs. new
- Demonstration vs Deployment
- R&D vs. Demonstration & Deployment

1306 Issue: Existing Projects & Additionality

- Existing projects – approved
- Existing projects – non-approved
- Projects underway
- Projects not yet begun
- Projects being started because of funds
- Projects being restarted because of funds
- Projects being done faster because of funds

1306 Issue: Criteria for Selecting Grants

- Job Creation
- Innovation
- Geography
- Technology Neutral
- Start Date
- End Date
- Energy Savings
- Percentage cost sharing sought
- Replicability
- Scalability
- Relation to other projects

DR, Smart Grid and the Energy Bill

- Peak Reduction Standards
- Multiple EERS Credits for Verified On-Peak Reductions
- DR and Smart Grid Technologies in Energy Star
- Federal Building Peak and DR Enrollment Standards
- Investment Tax Credit
- Reduction Tax Credit (RTC)

DR, Smart Grid and the Climate Bill

- Multiple Allowances for Verified On-Peak Reductions
- Phased in use of DR and Smart Grid technologies for M&V of Reductions
- Information to Consumers to Support the “Prius Effect”.

Thank You

Dan Delurey
Demand Response and Smart Grid Coalition
1615 M Street NW
Washington, DC 20036
dan.delurey@drsgcoalition.org
202.441.1420

Additional Slides on DR and Smart Grid Provisions of Energy Independence and Security Act of 2007

Energy Independence Act
Title V – Efficiency and Demand Response

- Two additional PURPA “Standards”
  - Integrated Resource Planning (IRP)
    - Integrate Efficiency into IRP
    - Adopt policy establishing efficiency as a priority resource
  - Rate Design to Promote Efficiency Investments (Decoupling)
    - Align utility incentives with energy efficiency (rate design)
    - Promote energy efficiency investment
    - Removing throughput incentive
    - Adopt rate designs to encourage efficiency
    - Offer customers info and services in energy efficiency and demand response

Section 1301 – Statement of Policy

- It is the policy….to support….which together characterize a smart grid:
  - Digital information and controls
  - Dynamic optimization with cyber-security
  - Distributed Resources and DG, including renwewable energy
  - Demand Response and Energy Efficiency
  - Smart technologies for metering, grid communications and distribution automation
  - Smart appliances and consumer devices
  - Advanced storage and peak-shaving technologies, including PHEVs and thermal-storage A/C
  - Information and control options to consumers
  - Standards for communication and interoperability
  - Identification and lowering of barriers

Section 1302 – Report to Congress on Deployments

- DOE shall report to Congress on status of Smart Grid deployments and barriers to such
  - 1 yr after enactment, then biannually
  - Shall include information on
    - Technology penetration
    - Communication networks capabilities
    - Costs
  - May include policy recommendations
  - Should take a regional perspective

Section 1303 – Advisory Committee and Task Force

- Within 90 days of enactment, DOE shall establish an interagency task force that
  - Provides an identifiable entity to embody the federal role in the transition to use of smart grid technologies
  - Shall meet at the call of the Director/Asst Secretary
  - Is Funded by authorization of such sums as necessary
  - Mission
    - Insure awareness, coordination and integration within DOE and elsewhere in the federal government, included but not limited to
      - R&D
      - Standards and protocols
      - Relationship of technologies to utility regulation
      - Relationship of technologies to
        - Infrastructure development
        - System reliability and security

Section 1303 – Advisory Committee and Task Force

- By 90 days post enactment, DOE creates Advisory Committee
  - Minimum of 8 members, representing full range of smart grid technologies, etc
  - Subject to Federal Advisory Act
  - Mission to advise DOE on
    - Development of technologies
    - Progress of transition to smart grid
    - Evolution of standards and protocols on interoperability and intercommunication
    - Optimum means of using federal incentive authority

Section 1305 – Interoperability

- Primary responsibility given to National Institute of Standards and Technology (NIST) of Department of Commerce
- Authorization of $5M per year from 2008 to 2012
- Purposes:
  - Develop framework that includes protocols and model standards for information management to achieve interoperability of devices and systems
  - Alignment of policy, business and technology approaches to enable all electric resources, including demand resources to contribute to an efficient reliable electricity network
- Input must be solicited from:
  - DOE
  - Smart Grid Task Force and Advisory Committee
  - Stakeholders such as GWAC, IEEE and NERO
- Framework Developed shall be technology-neutral, flexible, uniform and voluntary

Section 1305 - Interoperability

- Framework shall be designed
  - To incorporate all resources, both generation and demand response and energy efficiency
  - To be flexible to accommodate regional differences and technology innovations
  - To consider voluntary standards that accommodate appliances and equipment that are manufactured to respond to grid emergencies and price signals via curtailment or load shedding
- Framework shall accommodate appropriate manufacturer lead time

Section 1305 - Interoperability

- Timetable
  - NIST to begin work 60 days post enactment
  - Publish report on progress within 1 year
  - Further reports as warranted
  - Final report when work is judged to have been completed or that a federal role is no longer necessary
- FERC
  - If sufficient consensus reached, FERC shall proceed to rulemaking to apply standards to interstate transmission and regional and wholesale markets

Section 1307 – State Considerations

- The PURPA Construct
  - No direct mandate to do
  - Requirement is to consider
  - Not just State Commissions
  - Commence a proceeding or set a hearing date within 1 year
  - Complete consideration and make determination within 2 years

Section 1307 – State Considerations

- Two additional PURPA “Standards”
- Smart Grid Investments
  - Utilities must consider smart grid investments before proceeding with “traditional” investments
  - Utilities are authorized to recover costs of smart grid investments
  - Utilities are authorized to recover remaining book value of infrastructure made obsolete

Section 1307 – State Considerations

- Smart Grid Information
  - Purchasers shall be provided direct access, in writing or electronically, to information including:
    - Prices
    - Usage
    - Intervals and Projections
    - Sources and emissions

Section 1308 – Effect of Laws on CHP

- DOE Study of the laws and regulations affecting the siting of private distribution wires on and across public rights-of-way
- Report to Congress within 1 year

Section 1309 – Grid Security

- DOE Report to Congress including a quantitative assessment and determination of impacts of smart grid systems on increasing the security of nation's electricity infrastructure and operations
- Report to be completed within 18 months