

Accelerating the Use of Demand Response and Smart Grid Technologies is an Essential Part of the Solution to America's Energy, Economic and Environmental Problems

Policy Recommendations for the Obama Administration and 111th Congress

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Energy and climate change will be top priorities for the Obama Administration and Congress in 2009. Modernizing the U.S. electric power system – both the way that it is operated and the way that consumers interact with it - is essential to help meet key energy, economic and environmental goals such as:

- Reduce or hold down overall electricity costs for consumers, both small and large;
- Provide consumers with new information, technologies and tools to control their electricity bills and increase their energy efficiency;
- Improve the reliability and security of the nation's power grid infrastructure;
- Increase the ability for rapidly restoring the power grid after black-outs and weather-induced outages
- Increase energy independence;
- Nurture American ingenuity and innovation in the energy sector of the economy
- Create new skilled "green" jobs; and
- Reduce CO₂ emissions and mitigate climate change

This document outlines policy recommendations developed by the Demand Response and Smart Grid Coalition (DRSG).¹ Many parties are urging the advancement of a smart grid, and the issue is expected to be among the first areas taken up by the incoming Administration and 111th Congress. Accordingly, DRSG's recommendations were developed to be effective, practical and specific. Many, but not all, of the proposals require legislation. This document first provides some background on demand response and smart grid and then proceeds to describe the proposals.

¹ DRSG Coalition is the trade association for companies that provide products and services in the areas of demand response, smart meters and smart grid technologies; more information is available at www.drsgcoalition.org.

Demand Response and the Smart Grid: Background

What are Demand Response and the Smart Grid?

Demand response is the policy and business area whereby electricity customers reduce or shift their peak demand usage in response to price signals or other types of incentives. At present the vast majority of electricity customers are on flat, average rates that do not vary by time of day or season, no matter how much the cost to generate or deliver electricity fluctuates as demands on the system rise and fall. That, combined with the growth in the use of air conditioning – one of the highest demands during peak periods – has led to peak power demand growing faster than overall growth in electricity consumption. Rising peak demand is straining the electricity system and threatening the reliability of the power grid. It also is adding costs that all customers pay one way or the other, while leading to increased emissions.

The Smart Grid is the concept of having all supply and demand resources dynamically managed via a combination of data, communications and controls, whereby the operation of the grid for reasons of economics, security, reliability, emissions, etc., can be optimized in real time. Key to making the grid “smarter” is to fully and dynamically integrate customers, their loads, and information about their usage into the operation of the grid. Thus, demand response is one of the primary components of the smart grid. As such, the technologies that enable demand response, such as smart meters, communication and control systems, storage systems and other demand control technologies, are foundational elements which allow a smart grid to take shape.

Federal Action is Necessary for Demand Response and Smart Grid Technologies

Market forces and state policies alone, while key enablers, have not been sufficient to date to drive mass deployment of these new technologies. With additional federal guidance and support, demand response and the smart grid can develop in a more cost-effective and holistic fashion, greatly accelerating and increasing the benefits that would be achieved by individual state actions.

Congress and the federal government have begun to recognize the importance of demand response and smart meters. The Energy Policy Act of 2005 included a provision which states that demand response is officially part of U.S. energy policy. The Energy Independence and Security Act of 2007 had a similar provision for smart grid. Both Acts had provisions to direct states to expand their efforts in each of these areas. But more is needed for these new technologies to develop to the extent and speed necessary. It is essential that the new Congress and Administration work to immediately put policies in place to support demand response and smart grid technologies. Some of these actions need to be done on a permanent basis, while others (such as providing economic incentives) may be done on a temporary basis to provide early-stage stimulus to these areas.

Demand Response and Smart Grid Technologies Can Help Meet the U.S.’s Energy Goals

Demand response and smart grid technologies can be a major contributor to meeting many of the acknowledged goals that policy makers are presently focused on. Some of those goals and the way that these areas will contribute to addressing them are as follows:

1. *Reduce or hold down overall electricity costs for consumers, both small and large*

Electricity costs are rising across all consumer sectors of the economy, especially for what is already the costliest electricity to produce – that used at times of peak demand. It is important to address reductions in peak electricity demand in addition to promoting traditional energy efficiency (which aims for overall reductions, whether or not on-peak).

2. *Provide electricity customers with new information, technologies and tools to control their electricity bills and increase their energy efficiency practices*

With electricity prices rising and consumer budgets being stretched, it is essential to provide customers with new energy saving tools, including new pricing structures and rates, as well as better information and feedback about how they use electricity. This will give them new ability to lower their electricity bills.

3. *Improve the reliability and security of the nation's power grid and the ability to restore it after outages*

A smart grid is one that is less susceptible to adverse impacts from terrorism, cyber attack or Mother Nature, and one that is flexible and self-healing in ways that not only protect against disruptions in service, but allow for more rapid restoration of the grid after an outage.

4. *Increase energy independence*

A key to achieving energy independence for the U.S. is greater use of domestic renewable resources such as wind and solar. But these resources can be intermittent in their ability to provide power to the grid. Demand response has been demonstrated to be a resource that can be quickly dispatched to replace renewable energy generation when the latter becomes unavailable, ensuring that there are no interruptions or outages. Demand response, when coupled with renewable energy generation, can make the combined domestic resource mix more reliable and viable and lead to its accelerated adoption.

5. *Reduce CO₂ emissions and support climate change mitigation*

Demand response reduces emissions during the peak period, when the oldest and dirtiest power plants are being used to meet the high demand. Additionally, it also leads to overall net reductions in electricity consumption by customers. Smart Grid technologies also have been shown to provide information to customers that they have never had before. Sometimes referred to as the “Prius effect”, such informational feedback on their electricity use has been shown to make customers more energy efficient overall – even if they are not on time-based pricing. This means a smart meter is a green meter and that providing customers with smart grid technologies may lead to energy efficiency finally becoming sustainable and institutionalized. Additionally, the use of smart meters and other smart grid technologies will allow more precise measurement and verification of electricity reductions for which carbon credits are sought under a cap and trade regime.

6. Nurture American ingenuity and innovation in the energy sector of the economy

Demand response and smart grid technologies represent areas where American companies and entrepreneurs can apply the same creativity and innovation that led to America being the world leader in information technology. Demand response and smart grid technologies are both key to the concept of a new energy economy.

7. Create new skilled "green" jobs

Whether it be manufacturing and installing smart meters, smart thermostats, etc., or the business of directly delivering demand response services and products, pursuit of a smart electricity economy will lead to the creation of new, skilled "green" jobs. Additionally, by reducing electric bills for businesses, more money is available for other company investments and job creation.

Policy Recommendations

Tax Policy

Tax policy needs to be used to reduce the costs of, and increase the speed of, the deployment of the technologies and practices in these new areas while in their early stages of growth. For example, energy efficiency and renewable energy are as large and robust as they are today in part because the federal tax system encouraged development of these areas while they were in their early stages, and continues to encourage them because of their environmental and energy independence benefits. The same use of tax policy is now required for demand response and smart grid technologies. Specifically:

1. Establish an Investment Tax Credit (ITC)

If an ITC for qualifying demand response and smart grid technologies is put in place for even a short period of time it will act to not only reduce the cost of such investments, but to accelerate their deployment into the marketplace. Qualifying technologies should include smart metering systems, communications and control technologies, meter data management systems, smart thermostats and other smart grid technologies.

2. Establish Accelerated Depreciation

In the past, metering and other technologies employed in the electric utility industry were not subject to rapid change and could be depreciated over very long periods – in some cases 20 years or more. However, new smart metering, communications and control technologies represent modern combinations of high tech hardware and software that will continue to rapidly evolve and improve over time. They have become just like other high tech items and thus federal tax law should provide equivalent tax treatment. While Congress did shorten the depreciation period for some technologies from 20 to 10 years in the recent Emergency Economic Stabilization Act, the

list of eligible technologies should be broadened and the depreciation period further reduced to 5 years, a level enjoyed by other high-tech equipment and products. Congress should also create temporary incentives using depreciation policy, whereby special accelerated depreciation rules are available for targeted investments made during a short window following enactment. The first step on this would be to renew and extend the bonus depreciation for capital investments that was part of the Economic Stimulus Act of 2008.

3. Create a Reduction Tax Credit (RTC)

The growth of the renewable energy industry has been fostered by the availability of a Production Tax Credit (PTC), which is awarded for each unit of electricity (kWh) produced from a qualifying renewable resource. In a similar way, a Reduction Tax Credit (RTC) awarded for kWh reductions precisely verified to have been reduced during the peak period would greatly assist in the development of demand response and the smart grid.

Energy Policy

4. Provide Funding for Implementation of EPACT and EISA

Both EPACT and EISA contain multiple provisions on demand response and smart grid technologies, including many that require action on and implementation by state regulatory commissions. States play a significant role in the development and deployment of demand response and its enabling technologies due to their jurisdiction over utility investments and rates. Yet states are faced with challenges in doing so because of both lack of funding and expertise in these new areas. Federal funding should be increased to states in these specific areas as part of the federal government's overall smart grid and green jobs initiatives.

At the federal level, EISA authorized a matching grant program to offset the costs of smart grid investments. Consideration should be given as to whether such a program offers an immediate vehicle for some of the "green" economic stimulus that is under consideration. There has been no appropriation to date.

5. Create a Smart Grid Infrastructure Fund

Significant investment in modernization of the electricity industry infrastructure is hampered by the size of the investment required, and a national smart grid fund would help address this. Establishing a nationwide smart grid "benefits charge" of less than a fraction of a cent at the wholesale transmission level would create significant amounts of funding that would be dedicated directly to demand response and smart grid infrastructure activities. This kind of systematic funding and administrative mechanism has been used successfully at the state level to raise dedicated funds for energy efficiency without undue burden on the consumer or the use of tax dollars. Grid modernization requires the same technique to be put into place at the federal level.

6. Establish a Demand Response Resource Requirement

Many states have chosen to foster the development of renewable energy by requiring utilities to derive a certain percentage of their power portfolio from renewable resources; several states have done something similar with energy efficiency. Demand response would similarly benefit from institution of a requirement for a given amount of demand response resources or peak reduction. Alternatively, some states (e.g. Nevada) have allowed DR to be used in part to meet the utilities' renewable portfolio standard requirement. In the case of either approach, utilities and other electricity providers would have to be provided with maximum flexibility and support in implementation.

7. Include Demand Response in a Renewable Energy Portfolio Standard

If a federal Renewable Energy Standard is enacted, it should allow the standard to be met in part through energy efficiency and demand response. Moreover, in recognition of their higher value, kWh that are reduced during peak periods should earn multiple credits (e.g. three-for-one) to be used to meet the Standard. There is state precedent for the use of multiple credits for peak reductions.

8. Decouple Utility Profits from Sales Volume

Current utility regulation typically encourages utilities to increase sales to earn greater profits. Some state regulators, however, have “decoupled” profits from sales volumes as a key step in reducing the utilities' disincentive to encourage more efficient use of the electricity they sell. The federal government should take steps to ensure that such decoupling takes place – not only on energy (kWh), but also on a capacity basis (kW), where the latter specifically promotes demand response and smart grid activities – so as to unleash utilities to do greater amounts of demand side management. The result would be more help for customers who want to reduce their monthly energy bills and allowing utilities to avoid erosion of their earnings when they promote smarter electricity use.

9. Establish Regulatory Incentives for Utilities

Congress and the federal Government should encourage and direct state regulators and other utility regulatory bodies to provide incentives for qualifying demand response and smart grid investments, such as a preferential rate of return or state-level accelerated depreciation. The goal should be to provide “upside” financial benefit to utilities that pursue and deploy cost-effective demand response and smart grid technologies.

10. Develop State Demand Response/Smart Grid “Action Plans”

State-level (or multi-state) Action Plans would result in more tactical and tangible actions aimed at deploying demand response and its enabling technologies. The federal government can provide funding to states to develop and implement such Plans and direct states to develop and implement such plans.

11. Include Smart Grid Technologies in Appliance Standards and Building Codes

Numerous appliances, lighting and small equipment are federally regulated for minimum energy efficiency performance; some of these should be required to be capable of certain communication and control connectivity such that they could be readily deployed in demand response and smart grid activities. Similarly, development of building codes and standards should begin to incorporate demand response and smart grid technologies as well as design methodologies that account for the time-differentiated cost and value of energy.

12. Establish a Smart Grid Commission

Creating the Smart Grid and fully realizing the potential for demand response and the smart grid requires a major high-level effort by the federal government. Such an effort would benefit from the creation of an independent, blue-ribbon Smart Grid Commission, answerable both to Congress and the President, which would provide guidance and assurance that demand response and the smart grid would be put in place as soon as possible. The Commission would have a highly visible leadership role with a mandate to accelerate the development of demand response and the smart grid. The Commission could also serve as the implementing and management authority for smart grid infrastructure funding and support efforts.

13. Ensure a Fair Playing Field in Contracting for Demand Response Resources

Making demand response equivalent to conventional supply side resources is important for the growth of demand response as a resource. Policies should be established that require states and other parties to ensure that contracting for demand response is done on terms, conditions and length of contract equivalent to generation resources.

Federal Agency Actions

The federal government building sector is a major user of electricity and thus should seek to take advantage of demand response programs and smart grid technologies. But the federal government also has a role to play in demonstrating leadership on these fronts by being an early adopter of certain practices and technologies. This will accelerate the deployment of demand response, smart meters and other smart grid technologies in the general marketplace.

14. Include Demand Response and Smart Grid in Energy Star

The federal Energy Star brand for energy efficient appliances and equipment has been a major contributing factor to the nation's energy efficiency achievements to date. New products for both consumers and businesses are now emerging that enable demand response and smart grid activities. The Energy Star brand should begin to incorporate demand response and smart grid technologies to help inform consumers regarding their availability and performance.

15. Develop Support for Intertwinement of Demand Response and Renewables

There is considerable indication that demand response and its enabling technologies support greater development of intermittent renewable energy resources and also lead to increased energy efficiency by electricity customers. Further investigation and development of the role of demand response in supporting renewable energy and efficiency would be beneficial, particularly in the context of climate change policy. Policy recommendations should be made for Congressional action.

16. Organize DOE for Support of Demand Response and Customers

Demand response and energy efficiency are split in the current organizational structure of the U.S. Department of Energy. Also, the Department overall has very little focus on, and assistance for, the energy consumer. DOE should establish an internal entity focused on combining technologies and programs on demand response and customer-oriented smart grid technologies with those on energy efficiency. It should also create a consumer-oriented component of this new entity.

17. Require Federal Agency Participation in Demand Response Programs

Federal Energy Management Program (FEMP) requirements for federal agencies should be modified to require that agencies participate in demand response programs. The Administration should institute demand response targets in addition to those for energy efficiency, and create and fund demonstration projects at select DOD bases and/or other federal agency sites.

18. Establish Federal Peak Reduction Standard

Require federal agencies to meet a new “federal peak reduction standard” that would require them to lower peak power demand at their facilities; this would be a firm quantitative goal that would increase over time but also be flexible enough to allow trading among facilities.

Climate Change

19. Use Smart Metering and Smart Grid Technologies to Verify CO₂ Reductions

Once CO₂ reductions are federally capped or otherwise limited, reductions in electricity usage will become monetized. This will in turn begin to focus on the need to increase the quality and precision of the verification process used for efficiency and demand response reductions. Advanced metering and smart grid technologies should be increasingly required to verify the energy savings and CO₂ reductions resulting from energy efficiency activities. Congress should incorporate in climate legislation an incentive for electricity reductions that are precisely verified, such as by using smart metering and smart grid technologies.

20. Use Smart Meters/Smart Grid Technologies to Support a Climate Change Registry

It will be important that the official registry for documenting greenhouse gas reductions is based on solid measurement and verification. In terms of CO₂ reductions that are based on electricity

reductions, smart metering and other new smart grid technologies should be considered for use in supporting high levels of integrity and validity in the registry.

21. Provide Additional Credit for Peak-Time CO₂ Reductions

To meet rising demands during peak periods, often the oldest, least efficient, most expensive and highest emissions generating plants are brought on line. To help prevent these unnecessary additional CO₂ emissions, Congress should provide additional “multiple” allowances under a CO₂ cap and trade regime for electricity reductions that occur during the peak demand period (and are verified via smart metering).