COMMENTS ON QUADRENNIAL ENERGY REVIEW SECOND INSTALLMENT: AN INTEGRATED STUDY OF THE U.S. ELECTRICITY SYSTEM

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Background

Advanced Energy Management Association ("AEMA") is a trade association under Section 501(c)(6) of the Federal tax code whose members include national demand response ("DR") and advanced energy management service and technology providers, as well as some of the nation's largest demand response resources, who support advanced energy management solutions due to the electricity cost savings those solutions provide to their businesses. This filing represents the opinions of AEMA rather than those of individual association members.

Our alliance[1] of providers and supporters of demand response is united to overcome barriers to nationwide use of demand response for an environmentally preferable and more reliable grid. We advocate for policies that empower and compensate customers to manage their energy usage to make the electric grid more efficient, more reliable, more environmentally friendly, and less expensive. As such, we commend the U.S. Department of

[1] Please visit http://aem-alliance.org for additional information about AEMA.
[2] Reference to memo:
http://www.energy.gov/sites/prod/files/2016/02/f29/Second%20Installment%20Briefing%20Memorandum_0.pdf

Energy ("DOE" or "Department") for taking up the issues identified in this Quadrennial Energy Review 2.1 ("QER") and herein provide comments to the questions identified in the Stakeholder Briefing Memo[2] of February 14, 2016.

General Comments

AEMA commends the Department for taking on an effort to identify ways in which technology innovation is interacting with--and enhancing--our nation's electric grid. While our electric grid is considered an engineering marvel, new technologies, applications and business models are changing the way it operates and the manner in which consumers interact with the system. Given the increasing demand for electricity, public policy must allow for innovative applications and technologies to become part of the grid infrastructure in ways that do not compromise the system, but instead provide additional resources.

Federal leadership and public policy can assist in moving our electric grid into the future, spurring continued innovation to reduce cost, increasing reliability and resilience, and allowing for consumer engagement and choice. Including demand response and advanced energy management solutions as integral to a smarter grid will provide appropriate tools for local, state and regional entities to take full advantage of technologies and applications and help make that 21st century grid a reality.

We highlight herein attributes of demand response and provide recommendations for Federal government leadership to increase demand response applications that enhance reliability and resilience, save consumers money, and reduce environmental impact.

Demand Response Supports Multiple Goals.

Demand response programs in states, regional transmission organizations ("RTOs"), and Independent System Operators ("ISOs"), have historical and empirical evidence to indicate that these programs:

[2] Reference to memo: http://www.energy.gov/sites/prod/files/2016/02/f29/Second%20Installment%20Briefing%20Memorandum_0.pdf

•Reduce emissions from fossil-fueled EGUs by an estimated 2%, as detailed in the study by Navigant Consulting attached as Attachment A to AEMA's Comments on the Environmental Protection Agency's ("EPA") Draft Clean Power Plan;[3]

•Can be delivered at very low cost, especially relative to other grid technologies, in turn placing downward pressure on overall energy costs;

•Have proven technically feasible, as evidenced by the greater than 28,000 megawatts participating in wholesale electricity markets in 2012;[4]

•Facilitate the implementation of renewable energy technologies such as solar and wind energy, key to the Administration's goals of a lower carbon future; and

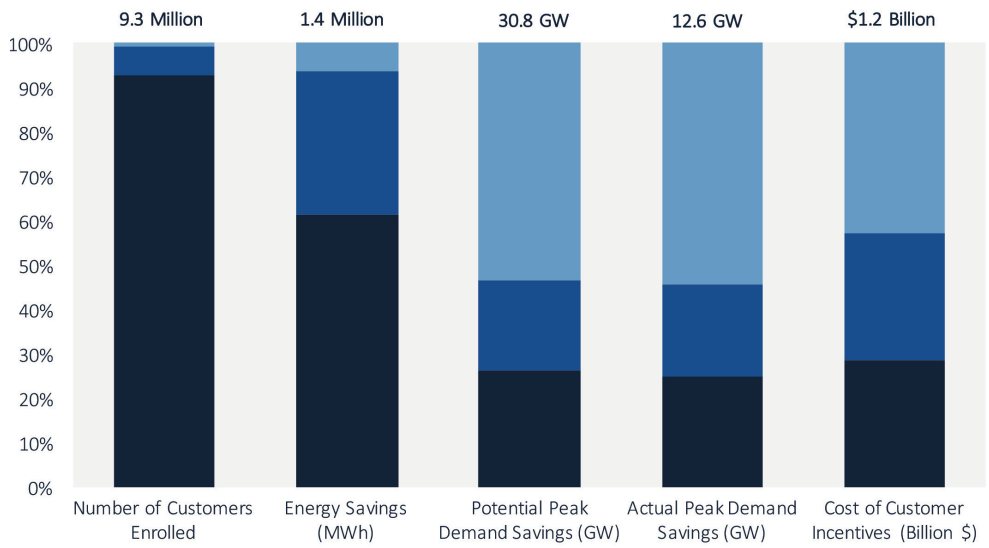
•Impact energy usage during periods when the electricity grid is most constrained, with evaluation, measurement and verification protocols for demand response that have tracked energy use reductions.

GTM Research recently published a report that included the below graph showing dollar and energy savings of demand response (darkest residential, medium commercial, lighter industrial), *Sectoral Composition and Breakdown of Demand Response. Source: GTM Research*[5]

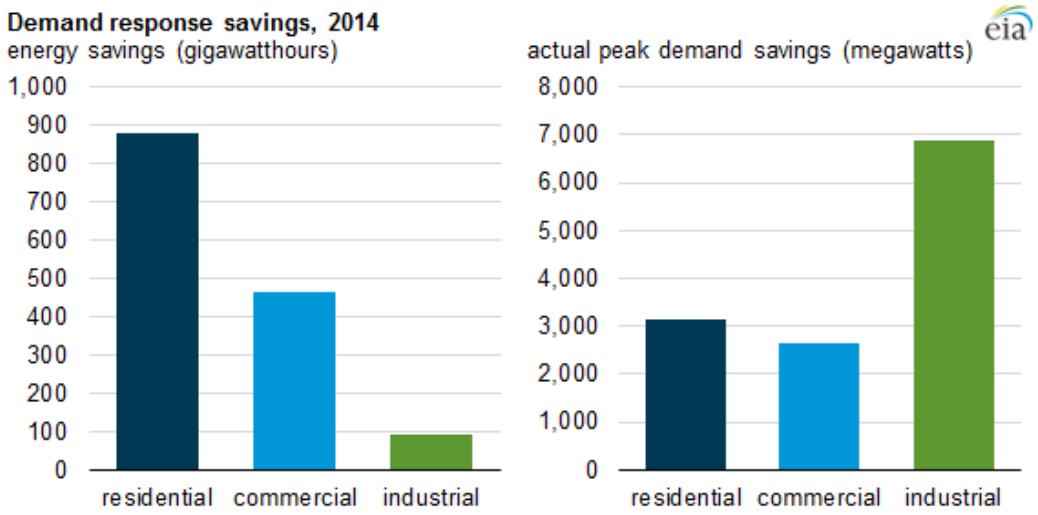
[3] Navigant Consulting Study of Carbon Dioxide Reductions from Demand Response ("Navigant Study"), Attachment A to the AEMA's Comments, at 17. http://aem-alliance.org/advanced-energy-management-alliance-touts-demand-response-as-tool-in-clean-power-plan/

[4] 2013 Assessment of Demand Response and Advanced Metering, Federal Energy Regulatory Commission, Staff Report, October 2013: http://www.ferc.gov/legal/staff-reports/2013/oct-demand-response.pdf.

[5] GTM Research Report, U.S. Wholesale DER Aggregation: Q1 2016. http://www.greentechmedia.com/research/report/us-wholesale-der-aggregation-q1-2016 and https://www.greentechmedia.com/articles/read/slideshow-demand-response-at-the-grid-edge



The Energy Information Administration also graphed and noted that demand response saves energy and reduces peak demand.[6] *Source: Energy Information Administration*



Demand Response Increases Grid Reliability.

Demand response resources have long provided reliable reduction of electricity load ("peak load reduction" or "load drop") when needed to help maintain system reliability. In wholesale markets alone, over 28,000 MW of demand response were available in 2012.[7]

[6] http://www.eia.gov/todayinenergy/detail.cfm?id=24872

[7] 2013 Assessment of Demand Response and Advanced Metering, Federal Energy Regulatory Commission, Staff Report, October 2013, at 11: http://www.ferc.gov/legal/staff-reports/2013/oct-demand-response.pdf.

Utilities have used demand response for decades, traditionally, as simple load drop, relieving stress on the electricity network during potential electricity system emergencies. Demand response has proven to be a reliable resource, providing service when called upon and thereby allowing the grid to stay in balance.[8] In recent years, demand response services have increased and those resources now provide not only load drop, but also sophisticated and flexible ancillary services such as spinning reserves and frequency regulation. These demand response ancillary services are used to balance the electricity grid at all times rather than being limited to emergency curtailment.

In addition to simple "curtailment services", as aggregators of resources, AEMA members bring myriad demand resources to the market, including rapid response load drop, slower response load drop, seasonal capabilities, annual capabilities, and back-up generation powered with different fuels. Depending on the resource needs of the grid operator, any combination of those resources might be called upon to meet the grid requirements. As demand response is considered in the context of grid modernization, these benefits should be taken into account and valued either through state programs or in the wholesale market.

Demand Response Reduces Overall Cost to Consumers.

AEMA members have consistently found that customers who participate in demand response programs are more satisfied with their utility, as they are empowered to take control of their energy costs. Demand response has proven itself to be a very effective way of engaging the active participation of customers in managing their energy bill. The Energy Information Administration collected data in the EIA annual survey of electric power sales, revenue, and energy efficiency (Form EIA-861)[9] that in 2014, 9.3 million consumers participated in demand response programs in the U.S., 93% in the residential sector, each saving on average about $40 annually. While commercial and industrial customers make up only 7% of the demand response participants, they delivered more than half of the peak demand savings and saved on average

[8] See, e.g., PJM Analysis of Operation Events and Market Impacts During the January 2014 Cold Weather Events, May 18, 2014, at 20: http://www.pjm.com/~/media/documents/reports/20140509-analysis-of-operational-events-and-market-impacts-during-the-jan-2014-cold-weather-events.ashx.

[9] https://www.eia.gov/electricity/data/eia861/

$600 annually for commercial and $9000 annually for industrial users. In PJM, in 2013 alone, demand response saved electricity users in the mid-Atlantic $11.8 billion, according to a report on the market effectiveness of the PJM Interconnection by that region's independent market monitor.[10]

In addition to lowering costs to those consumers who participate directly in demand response programs, demand response also reduces overall wholesale rates. Supreme Court Justice Kagan affirmed this in the majority opinion in defense of Order 745 in *FERC v EPSA*, stating "Wholesale demand response, in short, is all about reducing wholesale rates; so too, then, the rules and practices that determine how those programs operate." [11] Justice Kagan went on to state that demand response directly impacts wholesale prices, citing Order 745 as acknowledging several ways in which "demand response in organized wholesale energy markets can help improve the functioning and competitiveness of those markets": by replacing high-priced, inefficient generation; exerting "downward pressure" on "generator bidding strategies"; and "sup port[ing] system reliability."[12]

Demand Response Reduces Greenhouse Gas Emissions.

AEMA filed comments in December of 2014 to the draft Clean Power Plan rule. In the process, we commissioned a study by Navigant to assess the potential greenhouse gas emission reduction of demand response.[13] Overall, Navigant found in three regions studied—PJM, ERCOT, and MISO—that demand response could directly reduce carbon emissions by more than 1 percent through peak load reduction and ancillary services, and indirectly reduce emissions by more than 1 percent through accelerating fuel mix changes and increasing renewable energy integration. Even in the case where back-up generators are called upon to provide demand response, running these units is far less emitting than having to run peaker power plants. A Navigant analysis of greenhouse gas impact of backup demand response generators concludes

[10] http://www.pjm.com/~/media/committees-groups/subcommittees/drs/20150825/20150825-item-03-august-2015-dr-monthly-activity-report.ashx

[11] Supreme Court decision in *EPSA V. FERC*, page 16. http://www.supremecourt.gov/opinions/15pdf/14-840_k537.pdf

[12] 76 *id.*, at 16660, ¶10; see Notice of Proposed Rulemaking for Order No. 745, 75 *id.*, at 15363–15364, ¶4 (2010) (noting similar aims); http://www.ferc.gov/EventCalendar/Files/20110315105757-RM10-17-000.pdf

[13] *Carbon Dioxide Reductions from Demand Response*, http://aem-alliance.org/download/10674/

"the emissions impact of replacement capacity remaining in the market is orders of magnitude larger than the impact of substitute generation operating during system emergencies." [14] An example of a demand response program reducing emissions is the Maryland EmPOWER initative, which has reached its 2015 demand response goal of 15% per capita participation, avoiding construction of at least one coal fired power plant for peaking use, and is on target to meet the ongoing goals for 2025.[15]

Recommendations

AEMA finds that barriers to deployment of demand response are for the most part regulatory rather than financial or technical. Demand resources are asked to have characteristics of conventional generators that are built for the single purpose of electricity production, yet demand response might perform better or differently in ways that can in fact be more useful to grid operators. Given the benefits listed above, coupled with the regulatory barriers we face to deployment of these resources, AEMA recommends that DOE, in coordination with other agencies as listed, undertake the following actions:

1) Federal Energy Regulatory Commission ("FERC") and DOE should convene a series of discussions on flexible Distributed Energy Resources ("DER") to evaluate value streams—singularly, within larger systems, and on aggregate—to determine most effective market mechanisms for opening markets to increased competition and innovation. These discussions would include demand response, efficiency, storage, rooftop solar, and other edge of grid applications that could actively serve as resources to the grid. FERC has previously opened new markets for innovation by allowing that technologies and applications are able to provide services that previously had not been recognized or compensated. These activities could be expanded to additional services and applications.

[14] *Impact on Emission of Pollutants Resulting from the Elimination of Emergency Generators from Capacity Markets,* http://aem-alliance.org/download/119965/

[15] http://energy.maryland.gov/pages/facts/empower.aspx

2) Congress should reauthorize and update the provision in the Energy Independence and Security Act of 2007 P.L. 110-140 that called for a National Action Plan on Demand Response (Section 529, Part 5—PEAK DEMAND REDUCTION, page 173)[16]. This would provide a road map and guidance for FERC, DOE and states to develop additional policy pathways through which demand response can be deployed to greatest impact.
3) The Energy Information Administration should collect additional demand data—by balancing authority, for example, which would enable more accurate modeling and forecasting of locational electricity demand needs, critical to cost-effective and operationally efficient DER.
4) Congress should continue to fund DOE to include demand response in the cadre of smart grid applications and fund all of these programs, including pilot programs and studies and research, development and deployment, accordingly, following on efforts started in the American Recovery and Reinvestment Act of 2009 P.L. 111-5[17]
5) DOE should undertake, in conjunction with NARUC, an effort to assist state regulators to develop model rates and other state planning and procurement processes that include demand response as part of the DER portfolio. States such as New York with their "Reforming the Energy Vision" process and California with its Distributed Energy Resource Provider program could serve as case studies for other states.
6) DOE should update and enhance resource assessment activities using modeling tools at National Renewable Energy Laboratory and other national labs to inform ongoing planning processes, such as alternatives to transmission planning required in regional planning exercises in FERC Order 1000[18] or state Integrated Resource Planning processes that include all types of DER in their planning and procurement.
7) DOE should provide additional guidance and assurance that utilities should release consumer data to their consumers in understandable—and consistent—formats and that DOE convene additional stakeholder conversations on how to deploy Green

[16] https://www.gpo.gov/fdsys/pkg/BILLS-110hr6enr/pdf/BILLS-110hr6enr.pdf
[17] https://www.congress.gov/111/plaws/publ5/PLAW-111publ5.pdf
[18] http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp

Button[19] more widely. Transparent and open access to consumer data to critical to implementing DER, yet in many cases, utilities are neither utilizing their smart meter data (much of which was funded through ARRA) nor are following the intent of the DOE program.

8) Congress should amend the Public Utility Regulatory Policies Act (PURPA), Section 111(d)[20] to include a requirement for states to consider DER, including demand response, as a resource in rate design, planning and procurement. Several Senators offered amendments to the North American Energy Security and Infrastructure Act of 2016[21] that would have added such a provision, but those efforts failed to pass on the Senate floor.

Conclusion

Again, AEMA praises DOE for undertaking this thoughtful exercise to understand the evolution—and revolution—aspects of the electric grid, in particular pertaining to distributed energy resources. We are hopeful that, given stakeholder input, many of these recommendations will be brought forward by the Department, by FERC, and by Congress.

Thank you for consideration of these comments.

Respectfully submitted,

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[19] http://energy.gov/data/green-button
[20] See previous amendments to PURPA http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/other-regulatory-efforts/public
[21] North American Energy Security and Infrastructure Act of 2016, https://www.congress.gov/bill/114th-congress/senate-bill/2012/text