March 26, 2018

Daniel R. Simmons
Principal Deputy Assistant Secretary
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
1000 Independence Avenue, SW
Washington, District of Columbia 20585

Re: EERE-2017-BT-STD-0059—"Energy Conservation Standards Program Design"

Dear Mr. Simmons:

Introduction

Thank you for the opportunity to submit comments in response to the U.S. Department of Energy (DOE's) November 28, 2017, request for information (RFI) about energy conservation standards program design (Docket No. EERE-2017-BT-STD-0059). The Alliance to Save Energy is a nonprofit, bipartisan coalition of business, government, civil society and academic leaders that work together to drive greater U.S. energy productivity to achieve economic growth; a cleaner environment; and greater energy security, affordability and reliability. Since the Alliance was founded in the wake of the oil crises of the 1970s, the United States has made huge strides in driving energy efficiency throughout our economy through research, development, and deployment of new technologies; significant public- and private-sector investment; and sound policies. Thanks in part to federal energy efficiency policy, the U.S. today extracts twice as much gross domestic product from each unit of energy we consume when compared to 1980. One of the most successful policies that has advanced energy efficiency—and currently delivers annual savings worth more than $60 billion—is the implementation of energy conservation standards for appliances, equipment, and lighting.

"Market-Based" Regulatory Mechanisms and Approaches

The November RFI presents an overview of "market-based" regulatory mechanisms of interest to DOE and requested comments and feedback on these "or other approaches that may reduce compliance costs or increase consumer choice while preserving or enhancing appliance efficiency." The RFI does not include a precise definition of "market-based" approaches, so it cannot be determined whether it applies to the structure of the current program. But it helpfully provides a lengthy discussion of some of the programmatic challenges DOE would face if it attempts to move forward.[1] The most important consideration for DOE to consider, however, is

[1] The RFI also does not address the synergies between the energy conservation standards program and ENERGY STAR®, a voluntary program administered by the U.S. Environmental Protection Agency and DOE that provides important information to consumers about high-efficiency products (as well as many other benefits), or the U.S. Federal Trade Commission's EnergyGuide labeling program, which helps consumers compare the energy efficiency

the state of current law, which precludes the use of averaging, credit-trading, or providing feebates as an alternative to minimum energy-efficiency requirements.

The most significant barrier to the application of "market-based" approaches to standards is Sec. 325(o)(1) of the Energy Policy and Conservation Act (EPCA), which prohibits increases in maximum allowable energy consumption or decreases in minimum required energy efficiency for a covered product.[2] The RFI acknowledges that it might be incumbent on DOE to retain "a minimum standard…as one way to comply with the anti-backsliding provision in current law." The RFI then suggests that a dual minimum- and average-level standard could "reduce the potential cost savings," which should be a deterrent to taking that approach. Any attempt to explore the effects of alternative "market-based" mechanisms and approaches on the energy conservation standards program would have to take the form of a pilot program and be limited to products not covered by EPCA. A pilot program so limited in scope could generate some insights, but not enough to justify the diversion of scarce resources away from DOE's statutory obligations to set and update standards. **Therefore, the Alliance cannot recommend a pilot program unless it can be carried out without impairing DOE's on-going responsibilities.**

Systems Efficiency and Other Options for Program Flexibility

In addition to "market-based" regulatory mechanisms and approaches, the RFI seeks feedback on other opportunities for program flexibility and "program design, possible economic gains, impacts on consumer and manufacturer costs and energy savings, and potential challenges…." We appreciate DOE's open-mindedness and willingness to hear new ideas. One area worthy of investigation is systems efficiency, which has the potential to build on DOE's current efforts and lead to greater efficiency and energy productivity and provide new opportunities for federal leadership.[3]

The Alliance convened dozens of businesses and organizations in 2015 in a multi-year Systems Efficiency Initiative (SEI).[4] Before SEI, there was recognition among industry and energy efficiency stakeholders that improving building energy performance is dependent to an increasing degree on enabling effective interactions of components within and among various building systems (e.g., heating, ventilation, and air conditioning (HVAC) equipment, lighting, building envelope measures, etc.). The continued advancement of communications and information technology make systems-efficient buildings increasingly more viable and could lead to flexibilities in the energy conservation standards program.

---

of similar products. These two programs support the market for energy-efficient products and might also meet a definition of "market-based" approaches.

[2] Sec. 325(o)(1) is straightforward: "The [Energy] Secretary may not prescribe any amended standard which increases the maximum allowable energy use, or, in the case of showerheads, faucets, water closets, or urinals, water use, or decreases the minimum required energy efficiency, of a covered product." 42 U.S.C. § 6295(o)(1).

[3] The term "systems efficiency" refers to, with respect to the built environment, the co-optimization of multiple energy-consuming or -producing technologies and structures to maximize energy efficiency, conservation, and productivity at the building system, building subsystem, multi-building system, whole-building, neighborhood, microgrid, or electricity distribution grid level.

[4] Alliance to Save Energy, "Greater than the Sum of Its Parts: The Case for a Systems Approach to Energy Efficiency" and "Going Beyond Zero: A Systems Efficiency Blueprint for Building Energy Optimization and Resilience," http://www.ase.org/systemsefficiency. Last accessed February 13, 2018.

High-efficiency products, including those covered by standards, are a critical building block in systems efficiency. But even when those products and components are properly installed and connected, that combination might not yield an optimally-efficient building. Systems efficiency is an approach to take into account complete building systems and the interactions among systems components (including controls), the building envelope, occupants, and the environment. Opportunities to enhance the current energy conservation program design exist at the points where covered products are included in these interactions.

Miscellaneous Electric Loads.

The Alliance encourages DOE to continue developing and updating energy conservation standards for new and existing products that contribute to miscellaneous electric loads (MELs) in buildings. MELs—sometimes referred to as "plug" or "process loads"—are produced by hard-wired and plug-in electrical products not directly related to HVAC or lighting and can account for between 10% and 60% of building energy consumption.[5] DOE has already promulgated standards aimed at reducing energy use by some MELs (e.g., vending machines (January 2016 final rule) and battery chargers (June 2016 final rule)) and others are coming due (e.g., microwave ovens and televisions).[6,7,8] Delayed action on pending standards for MEL products, which are steadily proliferating, will have a negative effect on building sector energy efficiency. The U.S. Energy Information Administration estimates residential and commercial building sector energy consumption from MELs could increase from 30% to 34% and from 36% to 43%, respectively, by 2030.[9]

The Alliance also recommends the development of improved end-use data and energy models to enable more reliable predictions of systems-level energy savings potential from MELs. These models should take into account various levels of MEL aggregation in buildings, including single product, multiple products, and building-system integration. These models will likely identify additional benefits for systems involving other covered products, such as HVAC equipment, which is affected by the increasing heat loads from MELs. This model development

[5] McKenney, K., M. Guernsey, R. Ponoum, and J. Rosenfield, TIAX LLC; "Commercial Miscellaneous Electric Loads: Energy Consumption Characterization and Savings Potential in 2008 by Building Type;" May 2010; https://energy.gov/sites/prod/files/2016/07/f33/2010-05-26%20TIAX%20CMELs%20Final%20Report_0.pdf. Last accessed February 13, 2018.
[6] Appliance Standards Awareness Project, "DOE Appliance Standards Rulemakings Schedule," November 8, 2017, https://appliance-standards.org/sites/default/files/DOE_Schedule_by_Product_3.pdf. Last accessed February 13, 2018.
[7] U.S. Department of Energy, "Draft 5-Year Appliance Standards Rulemaking Schedule," https://energy.gov/sites/prod/files/2017/01/f34/5-year_current_and_future_rulemakings_asrac_01.18.2017.pdf. Last accessed February 13, 2018.
[8] Office of Management and Budget, "Fall 2017 Regulatory Plan and the Unified Agenda of Federal Regulatory and Deregulatory Actions – Agency Rule List – Fall 2017 – Department of Energy," https://www.reginfo.gov/public/do/eAgendaMain?operation=OPERATION_GET_AGENCY_RULE_LIST&currentPubId=201710&showStage=longterm&agencyCd=1900&Image58.x=58&Image58.y=15&Image58=Submit. Last accessed February 13, 2018.
[9] U.S. Energy Information Administration, "Annual Energy Outlook 2015 with Projections to 2040," Rep. No. DOE/EIA-0383(2015), April 2015, https://www.eia.gov/outlooks/aeo/pdf/0383(2015).pdf. Last accessed February 21, 2018.

should be led by DOE and the national labs but conducted in close consultation with codes- and standards-setting bodies, manufacturers and design professionals, and efficiency advocates.

Finally, DOE should undertake research and development (R&D) in collaboration with industry, to identify energy-efficient ways to improve the connectivity of MELs within a building, so that they can be controlled as a system rather than individually, device-by-device. Connectivity features, of course, have their own energy requirements to maintain communications and implement control signals, so this added energy use, for the large and growing number of small MEL devices in a home or commercial building—some estimate over 20 billion "Internet of Things" devices in use by 2020—must be balanced against the potential energy savings from integrated, systems-level control of MELs.[10]

Direct Current, Device Connectivity, and Buildings-to-Grid Integration.

The Alliance encourages DOE to take steps to reduce barriers for whole-building-level and subsystem use of direct current (DC) power to increase energy efficiency by reducing conversion and wiring losses and to promote innovation. Many common products, including home and office electronics, light-emitting diode (LED) lighting, and controls are already powered by DC power. But these devices each require a small power supply to convert mains-voltage AC power to lower-voltage DC. Every time power is converted, some is lost and energy efficiency is reduced.[11]

DOE has considered DC power a research priority, at least in some applications, and a 2014 consultant report identified DC-powered HVAC systems as a top priority recommendation, but little progress has been made.[12] **One way for DOE to take action would be to issue a report summarizing current assessments of potential savings and other advantages of DC power in covered products when combined with building-level DC power distribution, microgrids, on-site solar PV power, and battery storage, as well as any on-going demonstrations of DC-powered end-use-product consumption. DOE should also encourage manufacturers and other stakeholders to help identify current technical and market barriers to widespread adoption of DC power.**

DOE should then work with codes- and standards-setting bodies, manufacturers and design professionals, and efficiency advocates to create a roadmap of the R&D needed to fully exploit the potential for DC power to promote innovation and improve covered product and systems efficiency. Opportunities exist in both the commercial and residential

[10] Gartner, Inc., "Gartner Says 8.4 Billion Connected "Things" Will Be in Use in 2017, Up 31 Percent From 2016," February 7, 2017, https://www.gartner.com/newsroom/id/3598917. Last accessed February 21, 2018.
[11] There are justifications for DOE to lower barriers to DC power beyond energy efficiency: the growing markets for on-site renewable energy generation from solar photovoltaic (PV) panels, localized battery storage, and electric vehicle charging stations. The same DC distribution system that could be leveraged for greater energy efficiency would also facilitate connections to PV power, battery storage, and end-use DC products all while minimizing DC-AC-DC conversion losses.
[12] Goetzler, W. et al., Navigant Consulting, Inc.; "Research & Development Roadmap for Emerging HVAC Technologies;" October 2014; http://energy.gov/sites/prod/files/2014/12/f19/Research%20and%20Development%20Roadmap%20for%20Emerging%20HVAC%20Technologies.pdf. Last accessed February 13, 2018.

building sectors. The eventual savings realized could be significant: Lawrence Berkeley National Laboratory researchers in one study cited by SEI estimated savings from DC power distribution in residential buildings at more than 33%.[13]

There are specific near-term steps that DOE should take to permit flexibility and promote innovation in covered products capable of being powered by DC. **The Alliance encourages DOE, when reviewing and updating energy conservation test methods, to accommodate the use of DC power (exclusively or as part of hybrid AC/DC products that can use either type of input power).** An alternative approach to modifying test methods individually for each covered product for DOE to consider is to adopt a horizontal standard to permit the use of DC power in any existing AC power test method.[14] **DOE could undertake a pilot program in response to this recommendation and explore the use of DC power in covered products. The Alliance also encourages DOE to exercise its existing authority to define new covered products for inclusion in the energy conservation standards program to allow for products that use directly-distributed DC power.**

Another area for DOE to explore on a pilot basis involves the evaluation of connectivity and load controllability as added features of building systems and individual products.[15] DC power could be applicable here, as digital power management becomes increasingly prevalent. Currently, energy conservation standards are concerned only with minimum efficiency and annual kilowatt-hours (and in some cases, peak kilowatt) savings. There could be other valuable features of connectivity and load controllability, however, including improved overall energy system reliability; reduced needs for costly new generation, transmission, and distribution assets; and lower utility bills for consumers.[16] **DOE should also continue its efforts to work with industry to develop common communications protocols and otherwise encourage interoperability building systems, subsystems, and products.**

Metrics and Methodologies.

Another important opportunity for DOE involves working with codes- and standards-setting bodies, manufacturers and design professionals, and efficiency advocates to develop new metrics and methodologies for evaluating and advancing systems efficiency. New systems metrics are needed to estimate and evaluate savings from fully implementing systems efficiency, achieving next-level efficiency performance of covered products, and encouraging innovation and creative approaches to systems efficiency. **As metrics emerge that gain acceptance, DOE should**

[13] Vossos, V., K. Garbesi, and H. Shen; "Energy Savings from Direct-DC in U.S. Residential Buildings," Energy and Buildings 68, Part A (January 2014); pgs. 223–31.
[14] For reference, consider the cross-cutting approach in International Electrotechnical Commission (IEC) Standard 62301 for measuring standby power across a range of products.
[15] While not the subject of the RFI, which is focused on the energy conservation standards program, DOE has other policies and programs at its disposal to encourage systems efficiency, including the Building Energy Codes Program and ENERGY STAR®. DOE can also encourage states and local governments to pursue market-transformational policies such as benchmarking and disclosure. DOE should partner with states, local governments, utility companies, manufactures, and other stakeholders on pilot programs to advance systems efficiency.
[16] DOE is currently exploring these benefits with R&D on grid-interactive efficient buildings, as one component of the Grid Modernization Initiative.

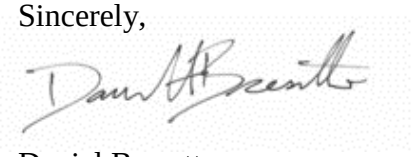
calculate and report them through its modeling tools, and encourage third-party tool developers to do the same.

Conclusion

Thank you for the opportunity to comment on DOE's energy conservation standards program design RFI. Within the confines of current statute, there are several approaches available to DOE to allow greater flexibility and encourage innovation. The energy conservation standards program is a pillar of federal energy policy and should remain a top priority. The evolution of systems efficiency, enabled by the communications and technology revolution of the past few decades, presents a new opportunity for DOE to achieve many of the stated goals of the RFI.

The Alliance looks forward to the results of this work and stands ready to support DOE's efforts to continue to advance energy efficiency and improve U.S. energy productivity.

Sincerely,



Daniel Bresette
Vice President, Policy and Research