

Enhancing State Energy Efficiency Efforts Through Information and Outreach to Consumers

Executive Summary

Energy efficiency and conservation offer states a low-cost approach for meeting energy demand, with savings available in all states and across homes, businesses, farms, and industry. Governors have supported a variety of policy mechanisms to encourage energy efficiency—among them, creating dedicated funding and financing streams, establishing standards and procurement requirements, and providing utilities incentives to invest in energy efficiency. Despite such efforts, states' ability to realize the full potential of cost-effective energy efficiency is limited by gaps in consumer information and motivation to use energy more efficiently.

Policymakers in some states are responding by using an emerging body of social science research to redesign the outreach, marketing and feedback elements of their programs to use behavior-based strategies that motivate consumers to reduce their energy consumption. Such approaches offer states a new way for improving efforts to engage consumers' participation in energy efficiency programs that lower energy costs and improve the competitiveness of businesses in the state.

Increasing energy efficiency is often a less costly way of meeting the demand for electricity than adding new generation capacity. In a sense, energy efficiency can be considered a lower cost "resource" that avoids the environmental impacts associated with electricity generation. Moreover, the strategic use of energy efficiency at times of peak electricity use, either daily

or seasonally, can help relieve congestion on the electric grid, thereby improving reliability and lowering the cost of electricity delivery. The potential amount of cost-effective energy efficiency varies among states and sectors but may exceed current projections for annual growth in the demand for energy.

Several barriers limit the more efficient use of electricity. One barrier to more efficient use of electricity is the high up-front costs of some energy efficiency investments. In addition, the party that pays for an energy efficiency investment may not be the party that benefits—for example, in some landlord/tenant arrangements, the landlord makes the investment but the tenant enjoys the benefits of lower energy bills. Moreover, the traditional utility business model does not give utilities incentives to encourage their customers to reduce their power use, and utilities do not always consider energy efficiency the same way they consider generation resources in their planning processes. Finally, the full cost to society of producing electricity—notably, the cost of environmental impacts—is not covered in electricity prices, and that situation affects the relative value of efficiency.

Many states have adopted policies intended to overcome the barriers that limit the more efficient use of electricity. Yet because such efforts have not addressed the lack of consumer information and motivation to improve efficiency, many opportunities for energy efficiency remain untapped. To help address that problem, states, utilities, and other energy efficiency service providers have begun to develop new

approaches to informing and motivating customers based on behavioral economics and psychology research. Three broad strategies that can be used to engage consumers' participation in energy efficiency programs are providing direct consumer information and feedback on energy use, influencing social norms, and carefully matching messages and messengers to target audiences. Recommendations for actions that governors can take within the context of each of those three strategies are provided below.

- **Strategy 1 – Provide Greater Consumer Feedback on Energy Use: Governors should consider how programs that provide consumers with greater feedback on energy use could enhance existing energy efficiency programs.** Making consumers more aware of their energy consumption in an easily-understood format can spur more investment in energy-saving technologies and reduce consumption. States such as **California, Massachusetts, and Minnesota** have taken steps to allow, encourage, or require utilities to develop feedback-based pilot programs. Those pilot feedback programs are designed to provide consumers with both more detail and new types of information than contained in a typical energy bill—for example, information on daily or hourly energy data, a way to compare the consumer's household's energy use with that of similar households, or a rating system to clarify that comparison. The services offered by companies such as Opower and Efficiency 2.0, for example, allow consumers to compare their energy use to other households, and evaluations of those programs indicate that consumers have reduced their energy consumption when provided such information: an Opower pilot in Sacramento, California recorded reductions in consumers' energy bills of between 1.5 and 3.5 percent, and customers in an Efficiency 2.0 program in Evanston, **Illinois**, reduced their electricity bills by an average of 5.5 percent. Feedback programs also may use

in-home energy monitors and software applications to supply consumers with more information about how their energy consumption habits affect their bills.

- **Strategy 2 – Leverage Social Norms to Reduce Energy Use: Governors should identify and promote opportunities for using in-state or interstate competition to help motivate customers to participate in energy efficiency programs.** Incorporating responses to social norms—including encouraging public commitments or fostering competition—is another way to motivate customers to reduce energy consumption. For the past two years, the **Kansas** state energy office teamed with a nonprofit organization to promote a community-based energy savings challenge. As part of the TakeCharge! Challenge, communities in four regions of Kansas competed for a \$100,000 grant to fund a renewable energy or energy efficiency project. The program in Kansas encouraged consumers to adopt a variety of energy efficiency measures, including replacing light bulbs, receiving a home energy audit, and using the state's on-bill energy efficiency financing program. Towns and cities also received points for holding community events. The outreach campaign included a kickoff message from Governor Sam Brownback. Year two of the challenge capitalized on the existing rivalry between the communities surrounding the University of Kansas and Kansas State University, helping to stimulate an unprecedented statewide interest in energy efficiency. As a result of that competitive dynamic, participants reduced their energy use by 110.2 billion British Thermal Units (BTUs), saving more than \$2.3 million.
- **Strategy 3 – Match Both the Message and Messenger to the Audience: Governors should encourage state utility regulators and utilities to prioritize sectors, customer class-**

es, or communities that could be targeted for energy efficiency marketing and identify messengers that can appeal to one or more market segments. Using trusted messengers with a tailored message to repeat and reinforce the value proposition of energy efficiency can improve the effectiveness of energy efficiency outreach. **New York** recruited the host of the television series “This Old House” to provide potential customers with a trusted voice that could make energy efficiency improvements more appealing to homeowners. The series of advertisements with Mr. Thomas ran from 2001 to 2005, and the state continues to research how best to reach target market segments. Since 2001, the state’s Home Performance with ENERGY STAR® program has retrofitted more than 27,000 homes statewide, with 36 percent of retrofits occurring in the Syracuse area, where the marketing campaign was being targeted. In **Oregon**, the Clean Energy Works program provides consumers with a specially trained Energy Advisor to guide them through the process of making a home energy efficiency improvement, stressing the simplicity of the program. The program has also adopted new language to describe the measures they offer, such as replacing the word “audit” with “assessment” and “retrofit” with “improvement.”

Using behavior-based techniques to advance energy efficiency programs is an innovative way to increase the adoption of energy efficiency. States can continue to learn from existing pilot programs and scale up efforts where they are successful. Combined with other policy efforts, such measures can help states get closer to achieving their energy efficiency goals.

Why Are States Pursuing Energy Efficiency?

States are pursuing increased energy efficiency because it offers several benefits.¹ First, increasing energy efficiency is often a less expensive way to meet new electricity demand than constructing new generation capacity. Recent studies have estimated the average cost for utilities to supply energy efficiency between 2.5 and 4.3 cents per kilowatt hour (kWh), less than the levelized cost of new generation regardless of fuel source, as illustrated in Table 1.¹ Including customer costs pushes the total for energy efficiency higher, potentially beyond the current cost of new natural gas generation but not more than the current average marginal cost of electricity, although there are limited data on what this cost is.²

Second, energy efficiency can reduce the cost of deliv-

¹ This paper uses the term “energy efficiency” to cover conservation efforts that entail willfully reducing energy use, as well as measures that use new technologies or techniques to lower consumption.

Table 1: Average Cost of Energy³

Resource	Average or Levelized Costs (cents/KWh)
Energy efficiency	2.5-4.3
Natural Gas (conventional combined cycle)	6.6
Coal (conventional)	9.5
Onshore wind	9.7
Nuclear	11.4
Solar photovoltaic	21.1
Offshore wind	24.3

Ways of Measuring Energy Efficiency Potential and Cost-Effectiveness

One type of energy efficiency potential is the potential for cost-effective energy efficiency savings, also known as economic potential. In addition, there is a larger reservoir of technical potential (which does not consider costs) and a smaller reservoir of achievable potential (which considers potential policy measures and incentives along with the status of established program and funding levels). The 2008 meta-analysis of 13 state and regional studies cited here estimated potential savings from cost-effective energy efficiency. It measured cost-effectiveness by comparing the consumer's cost of an energy efficiency upgrade with the projected savings of the upgrade. Baseline energy consumption and the price of electricity determine whether an energy efficiency measure passes that type of cost-effectiveness test.

Another approach for measuring the cost-effectiveness of energy efficiency is to measure the cost of energy efficiency to a utility by comparing the levelized cost of power generated with new capacity with the cost of energy efficiency measures and then determine which is less costly. (Levelized cost is a per-unit cost of generating power over the life of facility accounting for all of its costs including those for plant and equipment, labor, and fuel discounted at an appropriate interest rate.) The data in Table 1 are levelized costs.

ering energy to consumers. It can particularly reduce the cost during peak hours, when the marginal cost of electricity generation is higher and extra capacity is needed exclusively to meet peak demand. One study estimates that a five percent reduction in nationwide peak demand for electricity could save \$35 billion over the next 20 years through the avoided construction and operation of additional generation, transmission, and distribution capacity, including fuel costs.⁴ Lowering the demand for electricity also can help reduce congestion on the electric transmission grid, thus maintaining the reliability of the grid while potentially reducing wholesale electricity costs.⁵ Moreover, energy efficiency can support state economic development strategies by reducing direct energy costs to residents and enhancing the competitiveness of industry.

Third, energy efficiency avoids the environmental impacts associated with many forms of electricity generation that emit smog-forming pollutants, mercury and other toxins, and greenhouse gases. Demand reductions during peak hours have a larger marginal impact on emissions, because peak load power plants are likely to be less efficient and have higher emissions rates than baseload generation. Energy efficiency can also reduce direct emissions from homes or businesses that rely on fuel consumption for heating or industrial processes. The Institute for Electric Efficiency estimates that electric efficiency programs in 2010 avoided the generation of 78 million metric tons of carbon dioxide, equal to the annual emissions from more than 15 million cars.⁶

Energy efficiency also offsets the need for water used in power plant cooling.

How Much Energy Efficiency Is Available?

Estimates of the potential for energy efficiency vary because of different assumptions about the rate of technology adoption, future electricity prices, and discount rates. The potential for energy efficiency also may vary across states and between different sectors and fuels within a state or region.⁷ Historical levels of energy savings, which have been lower than estimates of the achievable efficiency potential, reflect the year-to-year

variations in utility spending, as well as the effectiveness of that spending.

A 2008 meta-analysis of energy efficiency potential studies estimated that, in the 13 state and regional studies reviewed, the potential savings from cost-effective energy efficiency measures were between 13 and 30 percent, with a median savings of 20 percent.⁸ Annual potential savings estimated in those studies exceed the projected annual growth in demand for electricity, recently estimated at 0.8 percent per year through 2035.⁹

What Is Standing in the Way of More Energy Efficiency?

Economic research on energy efficiency often explores the following conundrum: because consumers and firms acting rationally would always adopt cost-effective energy efficiency measures when available, the amount of cost-effective energy efficiency available should theoretically always be zero. The existence of potential energy efficiency savings in light of that argument is commonly referred to as the “energy efficiency gap,” although studies differ on the size and implications of that gap.¹⁰

One of the explanations for the existence of an energy efficiency gap is that the market for energy efficiency is not perfect and features several barriers that have prevented customers and utilities from investing in the full range of cost-effective energy efficiency measures. Those barriers include high up-front costs, perverse incentives for consumers and utilities, and the separation of energy efficiency from other resources or business areas. Even where such barriers have been addressed, inadequate consumer information presents a market failure that may dampen consumer motivation.¹¹ As an example, the uptake of energy efficiency can vary considerably across programs, even if the financial incentives are the same, and studies have shown that consumers and businesses often unconsciously apply steep discount rates to energy efficiency, making the financial incentives seem less attractive.¹² Inertia and procrastination present additional barriers to consumer action.

States have adopted a variety of policies to overcome the barriers to achieving greater energy efficiency including the creation of funding and financing programs, energy savings mandates for utilities, priority procurement rules, and utility rate realignment mechanisms.ⁱⁱ Those efforts have focused far more on providing incentives or removing disincentives to the adoption of energy efficiency than on increasing consumer demand for efficiency or fostering behavioral changes related to energy efficiency. In part for that reason, many opportunities to adopt efficiency are not acted upon: according to one study, less than 1/10th of 1 percent of eligible customers participate in many energy efficiency programs.¹³

How Can States Attract Greater Consumer Participation in Energy Efficiency Programs?

In an effort to better address gaps in consumer information and motivation, states, utilities, and other energy efficiency service providers have turned to research from the social psychology, behavioral economics, and consumer marketing fields to redesign their programs. Three broad strategies that can be used to attract greater consumer participation in energy efficiency programs include providing direct consumer feedback on energy use, influencing social norms, and using tailored messages and messengers. Each of these strategies is discussed below. Also presented below are recommendations for governors within the context of each strategy.

Strategy 1: Provide Greater Consumer Feedback on Energy Use

Making consumers more aware of their energy consumption in an easily-understood format can spur consumers to invest in energy-saving technologies and reduce their energy consumption. The information provided on monthly utility bills, which for all utilities includes the amount of energy used and the total cost,

ii Please see the National Governors Association report *Clean State Energy Actions: 2011 Update* (<http://www.nga.org/files/live/sites/NGA/files/pdf/1201CLEANENERGY.PDF>) for more information on recent state actions to promote energy efficiency.

is itself a simple form of feedback. Beyond providing standard utility bills, there are other potential opportunities for giving consumers feedback on their energy consumption.

Programs that use consumer feedback to induce energy-saving behavior rely on two principles: (1) better-informed customers will make different choices regarding their energy use; and (2) consumers will respond differently to feedback depending on the amount, format and frequency of information. Evaluations of feedback programs have shown a variety of results: programs that incorporate feedback generally have shown average changes in energy use ranging from a 21 percent decrease to a 6 percent increase in one longer-duration program.¹⁴ Initial studies have shown that feedback is likely more effective at fostering behavior change the more often it is given.¹⁵

Some utilities and their partners have sought to make it easier for customers to interpret and use their own energy data by adding information to customers' standard utility bills. One approach to adding data to utility bills allows customers to compare their own energy use against a benchmark such as the energy use of their neighbors or of similarly sized houses. Comparative data on energy use such as this also can be used to rate customers on a scale that they can more easily understand—for example, a numerical score, letter grade, or positive imagery such as a smiling face.

In addition to the inclusion of comparative information in customers' utility bills, in-home energy monitors or software applications can help consumers access detailed information about their energy use more frequently and exert more control over how and when they consume energy. Real-time or near real-time feedback (also known as direct feedback) can also help consumers see the benefits of energy efficiency investments and how individual measures and habits impact their overall energy consumption.¹⁶ The ability of in-home energy monitors to induce energy savings, and the persistence of those savings over time, will vary depending on the technology and the feedback

it is able to provide as well as individual customers' responses to the feedback.¹⁴ Recent meta-analyses of programs that provide feedback on energy use in or near real-time show a range of average energy savings: one study found results between 3 and 13 percent with a mean savings of 7 percent, while another found average savings between 0 and 19.5 percent, with a mean savings of 3.8 percent.¹⁸

States are beginning to explore how direct feedback to customers on their energy use can affect customers' behavior by allowing or requiring utilities to incorporate feedback into their energy efficiency programs.¹⁹ **California** requires utilities to provide residential customers with online access to their energy usage and to implement “comparative energy usage disclosure” programs that allow consumers to compare their energy use to nearby or similar households. Utilities may count energy savings associated with those programs towards energy savings goals established by the state if they meet rigorous evaluation criteria. **Massachusetts** requires investor-owned utilities to develop pilot programs for smart meters that include a direct feedback element, taking advantage of the new meter's capabilities to share data. In **Minnesota**, utilities can count the energy savings attributable to “behavior modification programs” as they would the savings from energy efficiency programs that focus on physical or technological improvements like appliance upgrades or insulation. That approach allows utilities to recover the cost of implementing a program that would otherwise reduce electricity sales, removing one of the disincentives to utility adoption of feedback programs.

Utilities in many states have partnered with private companies that specialize in feedback programs intended to reduce energy use. Utilities in 28 states have partnered with Opower to give customers data they can use to inform their energy decision-making. Opower provides consumers home energy reports that offer advice for conserving energy, compare energy use to nearby households, and associate their relative energy use with smiling face icons.ⁱⁱⁱ Assessments of Opower's programs have shown a measurable effect

on energy use, with overall reductions of approximately 2 percent of energy use. A pilot in the Sacramento Municipal Utility District produced an average reduction in electricity use of close to 3 percent in higher consumption households and 1.7 percent in lower consumption households, with trends indicating that the savings will persist or increase going forward.²⁰ Another study that included utilities in multiple states found that customers that received feedback from Opower were as much as 59 percent more likely to participate in existing energy efficiency programs.²¹

The service from a company similar to Opower, Efficiency 2.0, provides data that compares energy use among household and offers additional incentives to capitalize on financial motivators. Those include giving “rewards points” for saving energy that consumer can then use at national and local stores, providing a more tangible and immediate financial incentive than other energy efficiency programs where reduced monthly bills provide the only financial incentive. An evaluation of an Efficiency 2.0 program in **Illinois** found that residents reduced their electric bills an average of 5.5 percent.

- **Recommendation for governors:** Governors should consider how programs that provide consumers with greater feedback on energy use could enhance existing energy efficiency programs. Governors should work with their utility regulators to ensure that energy efficiency and feedback programs can be integrated with one another and with other relevant policies, programs, and technologies.

Strategy 2: Leverage Social Norms to Reduce Energy Use

States can use people’s responses to social norms to motivate consumers to reduce their energy consumption, for example, by encouraging public commitments or fostering competition among consumers to reduce energy use. A 2005 study found that consumers who made a public commitment to reduce their en-

ergy use conserved more energy than participants who made no commitment or those who made a non-public commitment.²² Programs that broadcast steps that other consumers are taking or feature direct competition can also spur participation, especially if participants are recognized or rewarded for the energy savings they achieve. Such programs demonstrate research findings which show that consumers can be very sensitive to the behavior of their peers. One study found that guests at a hotel were more likely to reuse their towels when told that other guests were doing so compared to only receiving information on the environmental benefits of not receiving fresh towels each day.²³

One way states can use social norms to reduce energy use is by sponsoring community-based competitions. The **Kansas** TakeCharge! Challenge uses competition to promote energy conservation and to encourage participation in a program sponsored by the state that helps customers finance energy efficiency improvements. The TakeCharge! Challenge encourages residents to take simple actions that reduce their energy use, such as installing compact fluorescent light bulbs or receiving home energy audits. It also promotes Efficiency Kansas, an on-bill repayment program for energy efficiency improvements. Moreover, competitors in the TakeCharge! Challenge receive credit for participating in community events that discussed the benefits of energy efficiency and encouraged participation in the challenge.

In 2010, one community from each of the four participating regions competed in Kansas’ TakeCharge! Challenge statewide. In the 2011 TakeCharge! Challenge, communities competed against other communities in the same region. That change was designed

iii Opower’s home energy reports use a three-tiered scale to let consumers know how they compare to their neighbors. Homeowners who use less energy than their most efficient neighbors see two smiling faces and the word “Great” on their bills. Homeowners who use less energy than their average neighbor but more than their most efficient ones see one smiling face and the word “Good.” Homeowners who use more energy than the average nearby household are notified that they consume “More than Average” but do *not* see an associated negative image (like a frowning face).

to increase participation by leveraging existing competitions, such as local high school sports rivalries, where possible.²⁴ The changed approach in 2011 led to a competition between Lawrence and Manhattan, home to the University of Kansas and Kansas State University, respectively, where the rivalry between the two schools pushed the competition to its very last day. Also contributing to the program's success was visible support from a trusted messenger^{iv}: Governor Sam Brownback, who held an event at the governor's mansion to formally kick off the challenge.²⁵ Over the nine-month period of the 2011 TakeCharge! Challenge, participating communities reduced energy use by 110.2 billion BTUs and saved residents more than \$2.3 million in both gas and electricity costs.²⁶

- **Recommendation for governors:** Governors should identify and promote opportunities for using in-state or interstate competition to help motivate citizens to participate in energy efficiency programs and commit to energy efficiency at the community- or state-wide level.

Strategy 3: Match Both the Message and Messenger to the Audience

Recent studies and programs have demonstrated the importance of messaging in the marketing of energy efficiency. Using trusted messengers with a tailored message to repeat and reinforce the value proposition of energy efficiency can improve the effectiveness of outreach. Programs that engage community leaders or trusted professionals are more likely to draw participation, and the specific language that is used to market programs to customers can have an effect as well. There are several messages to promote energy efficiency, such as lower energy bills, environmental benefits, or comfort, and consumers respond differently to each one. Illustrating that point, a survey of contractors that regularly performed energy efficiency improvements found that only 10 percent believed that customer decisions were based on environmental motivators, even though the program was largely being marketed to customers based on its positive environ-

mental impacts, suggesting that other factors such as comfort or cost savings were more important.²⁷ Messaging for energy efficiency can be more effective when it emphasizes the value and simplicity of energy efficiency since it can encourage consumers to follow through on initial outreach efforts.

The **New York** State Energy Research and Development Authority (NYSERDA) sought out a reliable messenger to help market their Home Performance with ENERGY STAR® program to specific customers. As part of their overall outreach program, NYSEDA recruited Steve Thomas, host of the television series “This Old House”, to appear in advertisements and serve as the face of the program. From 2001 to 2005, Mr. Thomas provided customers with a familiar public figure who was seen as an expert in home renovation, particularly older homes. NYSEDA also focused on customers in Syracuse and the surrounding county, an area that features a large proportion of middle-income residents, pre-1960 homes, and cold winters. That specific market segment may not have the up-front capital to make energy efficiency improvements, especially since the economic recession of the past few years, but has a high level of efficiency potential due to the age of the housing stock and the adverse climate. The combination of an outreach program and messenger that appealed to customers in the area, a supportive financing program, and the ready supply of potential customers helped create a robust market for retrofits in the Syracuse area. Thirty-six percent of Home Performance retrofits performed in New York since 2001 have occurred in that area, and the \$55 million in public and private money invested in retrofits in the area is the most of any county in the state.²⁸

In 2011, NYSEDA conducted segmentation research to better understand the nuances of target audiences' attitudes and behaviors around energy efficiency as the market for energy efficiency has changed over time. Results indicated the appeal of energy efficien-

iv See “Strategy 3: Tailor Messaging and Messengers” for more information on the importance of messengers in energy efficiency outreach.

cy in homes is widespread, with financial savings the primary motivator and generally considered a prerequisite to action across all segments. Environmental benefits were widely viewed as “nice to have” but not motivating. Three behavioral and values-aligned segments stood out as more inclined to undertake home energy upgrades: difference-makers, moved to help the planet and/or secure greater energy independence; controllers, with a strong aversion to wasting energy and money; and comfort creatures, who placed comfort above savings. NYSERDA has since launched a statewide integrated marketing campaign focused on savings and values-centric benefits: the ability to make a difference for you, your family, your community, and in venues with support for environmental messaging, your world. In fall of 2012, the agency will roll out a web-based, sitcom-style series of short videos as part of that campaign. Since January 2011, marketing activities have driven more than 310,000 unique page views to the Home Performance promotional website where visitors learn additional program information and how to participate.

The Clean Energy Works **Oregon** (CEWO) program relies on a network of messengers to help relay the benefits of energy efficiency and make participation in the program easier. One of the trademarks of the program is the assignment of a building science professional to help guide customers through the contracting process, known to each customer as the Energy Advisor. Each advisor is familiar with the installation of the types of efficiency measures covered under the program, such as heating and cooling systems, insulation, and high-efficiency windows. CEWO also changed the language it uses to describe its services. Terms such as “audit” or “retrofit”, that have a negative connotation (“audit” is often associated with tax audits) or no meaning at all are being replaced: the CEWO website instead advertises energy “assessments” and “remodels.” The program, which began in the Portland area in 2010, is now available in communities throughout the state. In the first three months of the statewide program, more than 2,000 homeowners ap-

plied for energy audits.

- **Recommendation for governors:** Governors should encourage state utility regulators and utilities to prioritize sectors, customer classes, or communities that could be targeted for energy efficiency marketing and identify, or serve as, messengers that can appeal to targeted populations.

Emerging Considerations for Energy Efficiency Programs

Using behavior-based techniques to advance energy efficiency programs is an innovative way to increase the adoption of energy efficiency. As illustrated in the examples above, consumer demand for the more efficient use of energy can be increased using those methods. States can continue to learn from existing pilot programs and scale up efforts where they are successful. Combined with other policy efforts, such measures can help states get closer to achieving their energy efficiency goals. States will have to determine where opportunities exist for using such strategies, how those techniques can augment one another, and how they can be integrated with complementary policies or technologies.

Moving forward, state policymakers also should address three issues that are critical to designing and implementing effective behavior-based energy efficiency programs but do not themselves specifically address the lack of consumer information or motivation to conserve energy:

1. **The interaction between smart grid technology and energy efficiency.** The increased deployment of smart grid technologies that allow customers to access real-time and increasingly specific data about their energy consumption provides a new platform for programs that incorporate feedback. That can include the adoption of dynamic pricing policies, which are facilitated by smart grid technologies and

have the potential to introduce price signals into feedback programs.

2. *Consumer energy data access and privacy.*

The adoption of smart grid technology creates new concerns around data access and privacy. That can include determining how much access individual consumers have to data currently collected by the utility, the amount and type of data to which third-party efficiency providers or feedback programs have access, and how to prevent and address data security issues.

- 3. *The evaluation, measurement, and verification (EM&V) of energy savings.*** Protocols for EM&V are essential for ensuring that expected energy savings are being realized and that energy efficiency funds are used wisely. States need to establish rules to determine if savings due to feedback-based programs count within utility energy efficiency requirements and develop methods for distinguishing energy savings due to energy-efficient technologies from those due to behavior-based program, avoiding a “double-counting” of energy savings in their assessment.

*Contact: Andrew Kambour
Environment, Energy and Transportation Division
202/624-3628
akambour@nga.org*

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