Halving Residential Lighting Energy Use by 2020: What a Multi-Stakeholder Target and Approach Means for Efficiency Programs

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ABSTRACT

Residential lighting accounts for approximately 15% of home energy use, and is widely acknowledged as a large, important, and achievable efficiency opportunity. Three main product options are currently seen to address this opportunity: screw-based compact fluorescent lamps (CFLs), pin-based fluorescent fixtures, and solid state lighting fixtures. Additional options include enhanced daylighting and lighting design. There is effort to advance each of these solutions by many stakeholders, with both voluntary and regulatory approaches. However, these stakeholders have different assumptions and levels of understanding (some accurate, some not so accurate). These varying assumptions lead to program efforts that are inconsistent and uncoordinated; they are not achieving the gains they otherwise could in these North American markets.

This paper reviews the efforts of a third-party, multi-stakeholder organization to identify a long-term energy savings goal and the activities and approaches needed to achieve it (encompassing all of the options identified above). The paper provides an update on the group's current efforts and describes the next steps necessary to achieve significant energy savings in this important end use. In so doing, it provides the basis for efficiency programs to be more consistent in deploying best solutions for like circumstances and to leverage the activities of other stakeholder groups, resulting in improved energy savings impacts.

Purpose of Lighting Vision Work

At the September 2006 Consortium for Energy Efficiency (CEE) Industry Partners Meeting, attendees agreed that the opportunities and challenges for increasing the efficiency in the residential lighting market have changed significantly since they were last reviewed in a comprehensive manner. Increases in consumer awareness of compact fluorescent lamps (CFLs), increases in availability of decorative, efficient light fixtures, and advances in solid state lighting (SSL) technology were all cited during the discussion. Another important driver was the increasing awareness of climate change among residential customers and a desire to leverage that by effectively communicating the role lighting choices can play in decreasing home energy use.

It is within this context that CEE gathered a Working Group of interested stakeholders to develop a "Vision" of efficiency in the residential lighting market. Those participating in the process engage in valuable information exchange and learn from expert lighting industry representatives and leaders among energy efficiency programming. Once the Vision statement was developed, all CEE members were expected to benefit by using it to inform program decisions. Manufacturers and retailers were expected to benefit because they would have information about where lighting program investments are likely to be made in the future.

At the outset, important aspects that were expected to be included in the discussion were: planning time horizon, metrics for success, assumptions, guiding principles, scope of program activity, and research needs.

In essence, the purpose of the Visioning effort is to fulfill stakeholders' need to have a common basis upon which each can voluntarily pursue their individual contributions and interests. The Visioning exercise builds upon each participant's current efforts and future plans to address CFLs, fixtures, SSL, and potentially other technologies.

The benefit of creating a common focal point through the Visioning effort is that it enables the efficiency community to join in discussion with other market players such as manufacturers and retailers. This engagement yields key market intelligence, which allows CEE members to form consistent and informed assumptions. The desired outcomes of the work are:

- An understanding of the current baseline residential lighting electricity use
- An all-stakeholder shared goal for achieving a specific level of efficiency and associated energy savings by a particular date in residential lighting
- A shared Vision of the roles of various efficient lighting sources to achieve that goal
- Consensus on efficiency program strategies needed to achieve the goal

Structure of Vision Working Group

The Lighting Vision Working Group is an inclusive attempt to bring together experts from each of the key industries involved in bringing efficient lighting to market. Since the first meeting in October 2006, a total of 158 participants from 78 different organizations have participated in the discussions, as shown in Table 1.

Table 1. Participants

Stakeholder Type	Participating Organization	
CEE Members	BC Hydro	Northwest Energy Efficiency Alliance
	Bonneville Power Administration	New York State Energy Research & Development Authority
	Cape Light Compact	
	California Energy Commission	Oncor Electric Delivery
	City Utilities of Springfield, MO	Ontario Power Authority
	Commonwealth Edison	Pacific Gas & Electric
	Efficiency Maine	Pacific Northwest National Laboratory
	Efficiency Vermont	Salt River Project
	Hydro Quebec	Southern California Edison
	Idaho Power Company	San Diego Gas & Electric
	Long Island Power Authority	Seattle City Light
	Midwest Energy Efficiency Alliance	Sacramento Municipal Utility District
	MidAmerican	Tacoma Power
	National Grid	United Illuminating
	Northeast Energy Efficiency Partnerships	Wisconsin Department of Energy Resources
	Natural Resources Defense Council	Wisconsin Focus on Energy
	NSTAR	Xcel Energy
Government	US Department of Energy	Federal Energy Management Program
	US Environmental Protection Agency	Natural Resources Canada
Manufacturers	Acuity Brands	Hunter Lighting
	Blackman Designs	Kichler Lighting
	Buffalo Lite	Litex
	Cooper Lighting	Lithonia Lighting
	Earthtronics	Maxlite
	Finelite	Osram Sylvania

	GE Lighting	Phillips Lighting
	Genlyte	Progress Lighting
	Globe Electric	Quoizel Lighting
	Greenlite	Satco/Nuvo Lighting
	Halco Lighting Technologies	Savoy House
	Heath & Zenith	Sea Gull Lighting
	Howard Lighting	Sunpark
	Hubbardton Forge	TCP
	Hunter Fan	Thomas Lighting
Retailers	Home Depot	Metro Lighting
	Lighting Design by Wettsteins	Wal-Mart
	Lowe's	
Other	American Lighting Association	National Electrical Manufacturers Association
	Integrated Building and Construction Solutions	Underwriters Laboratories

To accomplish their work, participants meet primarily through a series of monthly conference calls. These calls are augmented by one annual in-person meeting, which is held as part of the CEE Industry Partners Meeting. Between conference calls, participants are often asked to review documents electronically and provide input to CEE in advance of the next meeting. All meetings are facilitated by CEE.

Further work has been accomplished through a series of Subgroups, which were established in October 2007 to address several key issues. The Subgroups, which are discussed below, have been led by CEE staff in concert with volunteers from the Working Group.

Results to Date

A Shared Goal for Energy Reduction

To date, the Vision Working Group has identified a time frame in which to bound the Vision (2007-2020), developed a consensus estimate of the baseline electricity use of residential lighting, developed targets for energy savings, and identified a prioritized list of applications that could provide the desired energy savings.

In calculating the baseline, the Working Group reviewed multiple studies on lighting electricity use. One key input was the Building Energy Data Book, which presents the aggregate amount of the national residential lighting electricity use (DOE, 2006). This was divided by the amount of residential square footage, derived from the Census Bureau, to yield a "per square foot" number; residential lighting electricity use in the US was approximately 0.92 kWh/sq. ft. annually in 2006. To account for portable lighting electricity use, which wasn't included in the above estimate, the Working Group relied on the expertise of participants. Gathering data points from several industry and efficiency program representatives yielded a consensus that an additional 40% should be added to the hardwired fixture energy consumption number to account for portable lighting electricity use. As a result of these decisions, the baseline established by the Working Group was 1.29 kWh/sq. ft. annual electricity use (This is very similar to the estimate of 1.4 kWh/sq. ft. annual use provided in the 2002 U.S. Lighting Market Characterization, produced by DOE.)

The Working Group then turned its focus to establishing an electricity savings target. In addition to residential lighting efficiency potential studies from CEE members, participants relied on a report showing 35% lighting energy savings from switching the five most frequently-used lamps to CFLs (EIA, 1993). The Working Group paired this information with DOE data showing the technical potential and projected market penetration of SSL and set the energy savings target in the Vision Statement at 50% (DOE, 2002).

To assess progress toward the goal over time, the Working Group established the energy savings targets provided in Table 2.

Table 2. Energy Savings Targets

Target Date (beginning of year)	Short Term 2011	Medium Term 2015	Long Term 2020
Target % decrease in kWh use	15%	25%	22%
Resulting kWh/sq. ft.	1.097	0.822	0.641

A Prioritized List of Opportunities to Pursue Over Time

After setting the energy savings targets, the Working Group identified three broad approaches to achieving them: 1) promote ENERGY STAR-qualified products (including SSL once it is labeled), 2) increase the use of daylighting, and 3) promote enhanced lighting design. Recognizing that its expertise is in ENERGY STAR products, the Group chose to prioritize the first approach in the Vision. They discussed important considerations in promoting ENERGY STAR-qualified products, including the need to address concerns about mercury by creating and distributing fact sheets and assisting in the development of a national recycling infrastructure.

To provide a common focus over time, the Working Group decided to prioritize lighting applications for promotion and support in the short-, medium-, and long-term, separately. This prioritization was based on the technologies and applications that are most likely to deliver significant energy savings in each time frame. These time periods were aligned with the interim energy savings goals listed above to provide the Working Group with an opportunity to check on progress over time.

In the short term (2008-2010), the following goals were set. First, the market penetration of ENERGY STAR screw-based CFLs would increase from their 2006 baseline of 5%. This goal was considered reasonable even with the recent specification revision, which will become effective in December 2008. The Working Group assumed that the ENERGY STAR program would continue to attract large numbers of qualified screw-based CFLs. Participants assumed their activities could spur this increase in market penetration by focusing on promoting spiral lamps, covered lamps, R-lamps, 3-way lamps, and dimming lamps. Second, the Working Group wanted to impact the market penetration of ENERGY STAR CFL fixtures and affect an increase from the 2005 baseline of 5%. They articulated a desire to focus on recessed downlights, linear fluorescent, and outdoor applications (in warm climates) to achieve this increase. Lastly, the Working Group expressed a desire to monitor SSL in the short term. They expected that as SSL became included under the ENERGY STAR program, manufacturers would seek out technical expertise about incorporating this light source in their products.

In the medium term (2011-2014), it was assumed that ENERGY STAR screw-based CFLs would continue to achieve increased market penetration and that minimum efficiency performance standards for lamps would take effect during the medium term, further boosting

adoption of CFLs. ENERGY STAR fluorescent fixtures (using both linear lamps and CFLs) were also assumed to achieve increased market penetration. The Working Group believed that a focus on outdoor fluorescent fixtures (in all climates) and on decorative fluorescent fixtures would help to achieve this. Again, the penetration of SSL fixtures was projected to increase, particularly in under-cabinet and over-cabinet applications and in recessed downlights. New to the medium term priority forecast was a projection that high-efficacy incandescent, halogen, and HID sources would be introduced to the market, which would lead to energy savings options for new applications.

In the long term (2015-2019), the Working Group forecast that SSL fixtures would be a top priority and would generate significant energy savings. Participants expected that SSL would eventually become a widespread, efficient light source in many general illumination applications currently served by incandescent and fluorescent.

A Coordinated Response on Key Issues

The Working Group identified consistency in communication as an important factor in achieving their shared energy savings targets. As such, there was significant interest in developing coordinated messaging for use locally on topics of relevance to the goal. To make the most of this interest, CEE organized Subgroups on several important topics in October 2007. Three of these Subgroups were involved in crafting common messaging (e.g. talking points, FAQs, etc.).

Features, benefits, and applications subgroup. This Subgroup was convened to develop a common approach to talking about the features and benefits of CFLs, as well as to identify the best applications in which they should be used. After a review of existing educational materials, the Subgroup quickly identified the top three features and benefits of CFLs: they save money on energy bills, they have longer lives than traditional light bulbs, and they benefit the environment. The Subgroup also uncovered valuable resources on the ENERGY STAR web site that provide guidance on where consumers should use CFLs, and they incorporated this guidance into their recommendations to the larger Working Group.

This Subgroup also discussed the need for a more easily understandable name for CFLs that could be used with consumers. Several participants had noted consumer confusion about the term “CFL” and argued that consumer education efforts could be more effective if a different term were used that was easier to understand.

The Subgroup considered this question and recommended the term “ENERGY STAR Light Bulb” for several reasons. First, it is a technology neutral term. The Subgroup believed this would be important in the future as higher-efficiency incandescent lamps and SSL lamps are brought to market. Second, the Subgroup felt that consumers are comfortable with the term Light Bulb; when they hear the word lamp, most think of a portable light fixture. Third, this terminology brings CFLs into line with other ENERGY STAR categories, where there are ENERGY STAR-qualified and non-qualified options. Fourth, it is manufacturer-neutral and leverages past efficiency program investments in the ENERGY STAR brand. Lastly, the terminology shows that not all CFLs are ENERGY STAR qualified and that consumers need to look for the ENERGY STAR label to achieve energy savings and performance.

The Subgroup's discussions on the new term took place from November 2007-March 2008. When the Subgroup brought this recommendation to the Vision Working Group in May 2008, several participants noted that the term "CFL" had gained traction over the previous six months and that new retailers, such as Target, had begun promoting efficient lighting under the banner of "CFLs." Some participants feared that introducing a new term to the market would increase, not decrease, confusion. At the time of writing this paper, it is uncertain whether the Working Group will embrace the term "ENERGY STAR Light Bulb" or not. This experience demonstrated to the entire Working Group the need to move quickly in these rapidly changing times.

Mercury and recycling subgroup. While past energy efficiency conversations had not typically included mention of mercury and recycling, participants feared that the increasing (sometimes inaccurate) press coverage of mercury in fluorescent lighting could jeopardize their efforts to increase market penetration of CFLs and fluorescent fixtures. The Subgroup's specific task was to engage experts and build on existing resources to identify common messaging for all stakeholders to use on mercury content and recycling of fluorescent lighting. Further, the Subgroup was tasked to explore national efforts to develop an infrastructure for recycling.

To start, the Subgroup investigated the issue and found that that mercury content of CFLs is continuing to decline. In fact, voluntary NEMA standards and new ENERGY STAR specifications allow a ceiling of 5 mg for lamps less than 25W. In addition, the Subgroup learned that recycling capabilities are being established across the country and that some manufacturers are using recycled mercury in new lamps. In other words, the three R's of Reduce, Reuse, and Recycle were already being pursued by various stakeholders. Based on this evaluation, the Subgroup believed their contribution would be most helpful if it focused on consumer education. They developed a two-page, tri-fold brochure that covers the following questions:

- What is mercury?
- Where can mercury be found in the environment?
- Where can mercury be found at home?
- Why is mercury in compact fluorescent light bulbs?
- What should I do if a compact fluorescent light bulb breaks?
- Why is it important to recycle?
- Why use an ENERGY STAR-qualified light bulb?
- How do I install a compact fluorescent light bulb?

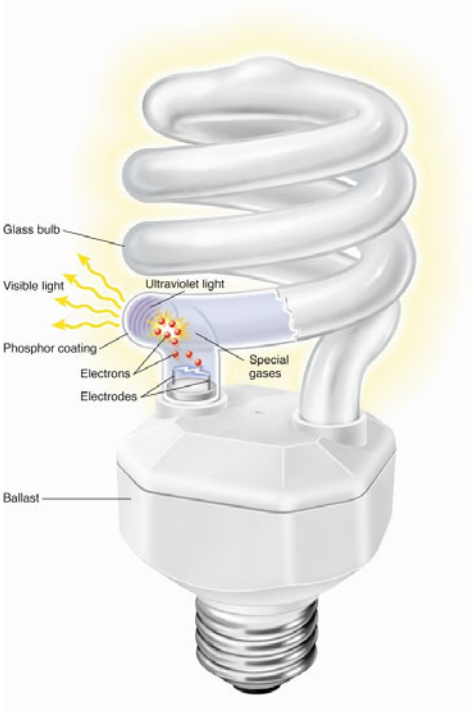
Information to answer these questions was gathered from many sources, including a NEMA white paper on manufacturer take-back of CFLs, a Maine study on CFL breakage, the US Environmental Protection Agency, and Natural Resources Canada. References to each source are provided below.

To make the information presented easier to understand, the Subgroup used several graphics, two of which are provided below. In the brochure, text describes the interaction between electrons and the gas that contains mercury vapor (named "special gases" in the figure).

The finalized brochure on mercury was distributed to Working Group participants in Spring 2008. Each participating organization is responsible for reviewing the material and deciding whether to use it locally to educate consumers. CEE has heard from participants that

they are considering using this brochure in several ways, including printing it and distributing it in hard copy, posting it on their web sites, or using it internally to train staff and answer consumer questions.

Figure 1. Mercury in a CFL



Source: Cadmus Group, 2002.

Table 3. Mercury Use in the Home

Product	Average Amount of Mercury
Best Available CFL	1.5 mg
Most CFLs (Including ENERGY STAR Light Bulbs)	Less than 5 mg
Button Cell Battery (Used in watches, hearing aids, some toys, and calculators)	9 mg
Fever Thermometer	500 mg
Old-style Residential Thermostat	4,500 mg
Blood Pressure Monitor	110,000 mg
Barometer	500,000 mg

LED subgroup. This Subgroup was convened to review existing materials and develop common messaging for stakeholders to use in answering common questions about the most near-term type of SSL: Light Emitting Diodes (LEDs). The Subgroup focused on refining existing educational resources for the trade audience (lighting designers, retailers, manufacturers, etc.).

The Subgroup evaluated existing resources and found that the Department of Energy's LED Basics Fact Sheet focused on the key questions that were important to address. Participants then suggested several changes to the Fact Sheet that would make it easier to use and understand. The final version of this document is now available for download on the DOE website (www.netl.doe.gov/ssl) and can be co-branded by energy efficiency programs. It has also been distributed at several venues, including the Dallas International Lighting Market, the ENERGY STAR Lighting Partner Meeting, and LightFair.

To reach a wider audience, the Subgroup discussed other ways to educate the lighting industry about the unique characteristics of LEDs. The Subgroup is in the process of approaching trade publications to pitch a monthly column on LEDs. This column would serve as an ongoing resource that could provide new information as the technology and the market conditions change. The Subgroup's role will be to provide the magazine with a list important topics and a list of LED experts whom a reporter could interview. Leading residential lighting trade publication Home Lighting & Accessories has already expressed interest in this concept.

A More Complete Understanding of Industry Efforts

Another Subgroup was convened to discuss the issue of End of Life in CFLs. This Subgroup was asked to engage with UL, CSA, ANCE, and other industry standards organizations to understand their activities to help avoid "inappropriate" failure in CFLs (smoking, melting, etc.), and if deemed necessary, to develop consumer messaging on the topic.

In its discussions, this Subgroup learned that the relevant tri-national standard, UL 1993, was being revised to take into account additional failure modes. Connecting with UL on this topic provided participants with excellent information about the revision and its potential impacts, which reassured them that the issue was being addressed through standards and testing. In addition, the Subgroup learned that both the ENERGY STAR CFL and fixture specifications would reference the revised UL standard, so products being promoted through efficiency programs would need to pass the more stringent testing. With this information, the Subgroup decided that consumer messaging was not needed.

Though consumer education was unnecessary given the testing enhancements, participants did indicate a need to educate efficiency program staff so that they could respond to questions accurately. NEMA informed the Subgroup that they were developing a white paper on End of Life, which would meet this need. CEE circulated this White Paper to the Working Group participants in spring 2008.

A Better Way to Communicate Program Details

The Outdoor Fixtures Subgroup was tasked to consider existing program models and identify a best practice approach to promoting ENERGY STAR outdoor light fixtures that could be adopted by a large number of efficiency programs. As part of its discussions, the Subgroup made significant progress in the issue of communication. Manufacturers and retailers communicated the difficulty they have in keeping up to date on the various lighting fixture programs that are offered around the US and Canada. They offered to help promote the available incentives through their own communications and sales channels, if only they could understand them easily and quickly.

As a result of this work, EPA is exploring modifying their Database for Incentives and Marketing Exchange (DIME, available at www.energystar.gov/dime) to provide more useful program details. This will encompass all fixture program types, not only those focused on outdoor fixtures. In addition, they are considering expanding the tool to provide one-page handouts with key program information that manufacturers could print off and easily share with manufacturers' reps and retailers.

A Way to Measure Success

The Data and Tracking Subgroup was tasked to develop a cost-effective methodology to measure and track residential lighting energy use over time that would enable the Vision Working Group to understand the impacts of its efforts and modify them. In addition, the Subgroup was tasked to reassess the baseline energy calculations and to revise them as new information is uncovered. This Subgroup engaged the CEE Evaluation Committee, a group of energy efficiency evaluators, to provide feedback and support to the Visioning effort. The evaluators provided insights about the difficulty measuring changes in actual lighting energy use

in the absence of large-scale field studies. They recommended tracking installed wattage for lighting in residences, a number that could be translated into kWh/sq.ft. to match the energy savings goals through the use of common assumptions. This Subgroup's work is continuing and its next steps are to collect information to form those assumptions and lay out a plan for monitoring changes in installed wattage over time.

Lessons Learned

Cast the Net Broadly, Lead with your Strengths

While the Working Group's area of expertise is in the realm of ENERGY STAR-qualified products, they recognized that there are significant energy savings opportunities to be achieved through the increased use of daylighting, enhanced lighting design, and the use of lighting controls. If others' work in these areas can be harnessed and coordinated with their own efforts to promote ENERGY STAR qualified products, it would help achieve the energy savings goal of the Vision.

To help connect efficiency program efforts with these areas, the Working Group researched and referenced several important resources. Their recommendation is that builders, architects, and designers make use of information published by the following organizations:

- Lighting Research Center: Information on Daylighting http://www.lrc.rpi.edu/programs/daylighting/index.asp
- California Lighting Technology Center: Title 24 Residential Lighting Design Guide http://cltc.ucdavis.edu/title-24-residential-lighting-design-guide-files
- Lighting Controls Association http://www.aboutlightingcontrols.org/education/index.shtml
- MIT Department of Architecture: Building Technology Program http://web.mit.edu/daylighting
- California Energy Commission Public Interest Energy Research (PIER) Program http://www.energy.ca.gov/pier/index.html

Implications for Efficiency Programs

CEE members have explained the benefits they gain from working together on this effort. One example was provided at the January 2008 CEE Program Meeting in Long Beach, where the New York State Energy Research & Development Authority (NYSERDA) described how its residential lighting program has been modified based on information gained during the Vision Working Group meetings. Their program duration was lengthened from six months to one year; as a result more manufacturers are participating and NYSERDA is achieving increased energy savings.

To determine how other efficiency programs are making use of the resources developed by the Vision Working Group, CEE fielded a short survey in April 2008. In response to questions about how they would use the talking points and FAQ documents, the most common efficiency program response was to use them when talking to consumers and the media. Posting the information on efficiency program websites was also a very popular response.

One of the functions provided by the Vision Working Group was—and is—information exchange on topics that impact all stakeholders. For example, in early 2007 the Working Group devoted time at the beginning of each call to review relevant news items. The news included updates on state and federal lighting efficiency codes and standards and developments in the area of SSL. This activity, which engaged a powerful network of individuals with wide-ranging lighting expertise, saved participants the time required to do research independently. Efficiency programs that are tied into that kind of information network are more likely to be aware of, and respond quickly to, developments that will impact their programs.

Next Steps to Achieve Greater Energy Savings

Vision Working Group participants are asked to incorporate the recommendations and materials developed through this effort into their individual activities on a voluntarily basis. For efficiency programs, specific next steps include making use of the talking points that have been developed and participating in the data and tracking effort.

The Vision Working Group will continue meeting periodically throughout 2008 and beyond. One of its first challenges is to revisit the energy savings goals laid out in the Vision document given the minimum efficiency performance standards for general service lamps adopted as part of the Energy Independence and Security Act of 2007.

Another task of the Working Group will be to pursue greater collaboration with Canadian efforts to advance residential lighting efficiency. Natural Resources Canada has been leading a similar working group of efficiency programs under the moniker "Strategic Lighting Initiative Committee" (SLIC). This group encompasses both voluntary and regulatory (e.g. minimum standards) approaches to efficiency and has established subcommittees for marketing, labeling, technology, and data collection. Due to the differences in scope, the Vision Working Group and SLIC agreed to pursue separate but parallel paths. Once SLIC completes its work on minimum performance standards, it will be mutually beneficial for the groups to align more closely.

A Successful Model?

CEE's facilitation of this multi-stakeholder Working Group has yielded real benefits to all participants in a time of uncertainty and rapid change in the field of residential lighting efficiency. Should this model of working collaboratively with manufacturers, retailers, and other stakeholders be extended to other areas of energy efficiency? There are several trends that argue for this approach.

First, the rate of technology deployment is increasing as evidenced in the nearly-monthly advances in SSL announced by LED manufacturers. Further, an infusion of new venture capital funding energy efficiency projects presents the potential for technical innovations on a faster timeline than has been seen in the past. For example, in February 2008 the Department of Energy announced its plans to accelerate adoption of energy efficiency through partnerships with venture capitalists (DOE, 2008b). In order to assess the fruits of these partnerships and uncover opportunities for savings, efficiency programs must engage with the industry experts who are involved.

Second, markets for energy-efficient goods and services are changing fast. For example, the past few years have seen an increasing emphasis on using the internet sales channel for consumer goods. Over the past two years, Wal-Mart has embraced energy efficiency, which has

opened up new possibilities to reach price-conscious consumers, a change which was chronicled by Fast Company in its September 2006 issue. Programs aren't positioned well to deal with changes of this magnitude on their own – information exchange and collaboration are required.

Across the world of energy efficiency, new codes and standards are another important aspect of the changing landscape. In late 2007, the President Bush signed the Energy Independence and Security Act, which will regulate several types of general service incandescent lamps for the first time. This change will have significant implications for energy efficiency programs, and it's just one of many codes and standards revisions underway. As DOE ramps up its standard-setting activities to catch up on delayed rulemakings of the past few years and the activity on the state level increases, energy efficiency programs will need to be tied in to a network of experts to understand not only what the new rules are, but how their programs will be impacted.

Another critical aspect of the changing environment for efficiency is the growing recognition of the issue of global climate change. To respond to climate change, many states are faced with new, more stringent energy savings targets that will impact their program offerings across all sectors. For example, former New York Governor Spitzer instituted the 15 by 15 challenge, which aims to reduce electricity use by 15% below projected levels by 2015. Across the country, the California Public Utilities Commission has begun a project seeking "Big Bold" energy savings. In this new environment, business as usual efficiency program practices will not be sufficient and greater communication among stakeholders will be needed.

Lastly, efficiency programs aren't the only organizations responding to climate change and increased energy prices. The number of organizations, businesses, media outlets, and individuals providing information to consumers about efficiency is increasing. For example, sources as varied as Treehugger.com, National Geographic, the New York Times, and Popular Mechanics all have featured articles on CFLs over the past year. If energy efficiency programs do not build connections with these other actors, they face several program challenges. These challenges include lost opportunities to collaborate, inconsistent messages that confuse the marketplace, and a population that is skeptical and desensitized to energy efficiency appeals. A new way of working—in concert with others—is necessary to overcome these challenges.

Conclusion

The challenges and opportunities facing residential lighting program managers today require a new approach that is long-term, well-informed, and leveraged. Working together with other efficiency program managers, manufacturers, and retailers to lay out an energy savings goal—and a path to achieve it—has been an important step toward an efficiently lighted future.

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