Preparing for the Sunset of Incandescent Bulbs

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ABSTRACT

In 2007, Australia and Canada announced plans to phase out the incandescent light bulb as we know it, and numerous national and state governments began considering similar policies. How can energy efficiency program administrators begin preparing for a future where today's incandescents will be unavailable?

The concept of an "incandescent ban" is providing additional momentum for the adoption of CFLs and LEDs. This paper will review several ideas to help efficiency programs prepare for the transition to more efficient lighting. Discussion will cover risks and opportunities presented by new light bulb standards and rapidly changing markets. ENERGY STAR and other efficient lighting has a good chance to gain further market share and acceptance in this transition. Authors will provide new insights into barriers to CFL adoption such as light color, availability, cost, mercury concerns, and customers' preference to wait until their current bulbs burn out to buy more CFLs. Recommendations for program managers include emphasizing specialty CFLs, integrating CFLs into non-retail energy efficiency programs, and expanding efforts in the commercial sector. Case studies and results from Wisconsin will illustrate these developments.

Introduction

The U.S. screw-base light bulb market is poised to take a quantum leap from inefficient incandescent light bulbs to more efficient alternatives. This paper will examine the opportunities and risks in this exciting transition phase. For simplicity, the paper will focus primarily on the opportunity to replace traditional incandescent light bulbs with screw-base CFLs. Other important alternatives will be examined in less depth: these include replacing fixtures or replacing pin-based halogens with pin-based alternatives.

First, the paper will examine the barriers to phasing out inefficient light bulbs. Next, there will be a discussion of how to address these barriers, illustrated with examples from Wisconsin. This discussion will be broad but not comprehensive. The object of this discussion is to highlight promising approaches that may stimulate additional analysis and innovation.

Importance of an Incandescent Phase Out

Energy efficiency programs have long had a goal of reducing inefficient incandescent light bulbs to niche use. In 2007, momentum toward this goal increased markedly. Several major industrial countries announced plans to phase out incandescent light bulbs, and passed laws to this effect. Australia, Canada, Italy, Ireland, China, and the Philippines are examples. In most cases these plans would bar the sale of today's typical incandescent light bulb in less than five years.

In the U.S., the Energy Independence and Security Act of 2007 established new efficiency requirements for light bulbs. The most significant requirement is a new minimum efficiency standard for the most common types of general service incandescent bulbs (100w, 75w, 60w and 40w), as shown in Table 1.

Table 1. New U.S. Minimum Efficiency Standard for Incandescent Light Bulbs

	New Incandescent Standard				ENERGY STAR effective 12/2/2008	
Approximate Incandescent Equivalent	Rated Lumen Ranges	Max. Rate Wattage	Standard Lumen per Watt Range	Standard Effective Date	Minimum Lumens	Lumens per Watt for bare bulbs
100w	1490-2600	72w	20.7 – 36.1	1/1/2012	1600	65
75w	1050-1489	53w	19.8 – 28.1	1/1/2013	1100	65
60w	750-1049	43w	17.4 – 24.4	1/1/2014	800	55-65
40w	310-749	29w	10.7 – 25.8	1/1/2014	450	55

The efficiency standards will require common light bulbs to use about 20-30% less energy than incandescent bulbs currently do. Also, the law requires a DOE rulemaking to set standards that will reduce energy use to no more than about 65% of current lamp use by 2020 (45 lumens per watt levels). The Act mandates one more additional rulemaking to determine whether even more stringent standards, and broader application of standards to other bulb classes, are needed, to go into effect in 2025.

To provide an alternative for customers to meet initial minimum standards for 2012-14, the major light bulb manufacturers are promising to debut new types of high efficiency incandescent (HEI) light bulbs. For example, GE has announced a bulb that will provide 30 lumens per watt by 2010. However, if these revamped incandescents just meet the government's minimum standards, the resulting energy savings will fall far short of what could be achieved by compact fluorescents available today. For example, ENERGY STAR guidelines are already several times more efficient than the new minimum standards, in terms of lumens per watt. The 2020 and 2025 standard will likely be met by CFLs, LEDs, and other technologies now in development. HEIs are likely the new floor for light bulb efficiency performance. If consumers embrace HEI's that are near the new minimum standard, a great opportunity to leapfrog to ENERGY STAR bulbs in this transition will be lost.

There is undoubtedly now a clear direction for lighting markets, away from traditional incandescent lamps. This will be a significant change, as about 80% of the U.S. light bulb market is currently comprised of incandescents. ENERGY STAR estimates that qualified light bulbs (almost exclusively compact fluorescents) account for 20% of the light bulb market in 2007, up from 8% in 2006 (Ryan 2008).

Risks and Opportunities in the Transition

Many uncertainties about the transition remain, but there is certainly an important role for voluntary programs still. For the particular categories regulated, programs can play the "good cop" with incentives until the "bad cop" of federal standards steps in. Meanwhile, programs can also leverage the opportunity by promoting efficient lighting in categories not explicitly covered by the standard.

A Successful Transition

What will a successful transition look like? The key reason for the new standard is to improve the energy efficiency of lighting. Success would include rapid and comprehensive consumer acceptance of efficient alternatives to traditional incandescent lighting before the standard, and consumer embrace of efficient lighting outside the regulated categories as well.

On a practical level, the new standards kick off a race for socket-filling. Between now and when new light bulb standards are firmly established - over the next six to eight years - many sockets will be "in play" and likely to see a light bulb replacement, either because of burnout, remodeling, or other reasons. Energy efficiency programs would like to make sure as many of these replacement light bulbs meet ENERGY STAR level efficiencies as possible, rather than minimum standards. Because of the rapid change in the market, these "in play" sockets are a historic opportunity, perhaps a once in a decade opportunity.

Sockets with incandescents installed now present particular opportunities for savings. Many residential sockets once transitioned to a CFL will never go back. CFLs last a long time, especially in residential settings. Also if a CFL is already in a socket, it is likely to be replaced by a CFL. According to research in the Northwest, about three-quarters of CFL purchasers say they are very likely to replace CFLs with CFLs (KEMA 2007). With the new standard, inefficient, incandescents will be unavailable in five years, so the risk of slip-back will be very low after that. Programs may be able to achieve additional savings by bringing sockets into play earlier, by convincing consumers to remove working incandescents before they burn out. For customers who refuse to discard working incandescents, programs can encourage relegating these bulbs to low-use sockets in the house. This will help suppress the purchase of new incandescents.

A Less Successful Transition

Energy efficiency professionals can anticipate and plan for possible pitfalls in a transition. The first step is awareness of the risks. Program managers have a number of scenarios that they can address directly. A leading risk is that the transition will lead to only minimally more efficient incandescents (HEIs) that meet the minimum standard, with no leapfrogging to more efficient options. For screwbase applications, more efficient alternatives include CFLs, induction or cold cathode-type CFLs, ceramic metal halide with integrated ballasts, or LEDs. The broad category of CFLs is most important in the near term. Promoting CFLs over HEIs will be a key strategy to harvesting the energy savings associated with the transition. Promoting CFLs will also suppress the market for more short-lived options. The new minimum standard will require bulbs to last only 1,000 hours, while ENERGY STAR requires a 6,000-8,000 hour life minimum.

Another risk is that consumers could attach some negative feelings to CFLs and efficient lighting in general because of the mandate. Consumers may perceive the change as heavy-handed government interference in their lives. Some consumers will resent losing the low priced incandescent light bulb, and being forced to pay more (assuming that the new products will be more expensive). Consumers' doubts about CFL performance will be magnified in light of the mandate. Consumers may also lose belief in the environmental soundness of CFLs, especially as the fact that they contain mercury is amplified in the media. If consumer resistance to CFLs is

widespread, it could limit the cooperation of both residential and institutional buyers. This could limit the energy saving realized in the transition. Also, manufacturers, distributors, and retailers need to buy in to the transition and indeed perceive a profit opportunity because they are responsible for managing the product mix and have the ability to bring products with different efficiency levels to market.

More extreme possible reactions to the mandate include consumer hoarding or black markets in inefficient incandescents. Examples of this phenomenon include smuggling of banned refrigerants that took place in the wake of the Montreal Protocol and consumer hoarding of "high flush" toilets. If consumers or industry are resistant enough on a large scale, the government may find it difficult to enforce the minimum standard consistently. The government could rescind rules on light bulb efficiency, as happened with zero emission vehicles in California.

Barriers to the Transition

To support a successful transition, programs can plan proactively to address known weaknesses in the market for ENERGY STAR light bulbs. Efficient lighting technologies that do not gain a foothold in this transition could fall into the "valley of death" described in adoption-of-innovation curves. The earlier and more aggressively programs address these weaknesses, the less likely the transition is to fall afoul of the pitfalls described above. First, let us examine some of the known barriers to phasing out inefficient incandescent lighting (CEE 2006).[1]

- Consumers don't recognize the full value of CFLs due to long-term subsidies
- General dislike of fluorescent lighting
- Light color
- Product availability
- Cost
- Mercury
- Consumers want to wait until bulbs burn out

Consumers don't recognize the full value of CFLs due to long-term subsidies. Program managers are concerned that market gains cannot be sustained if consumers are not willing to pay full price when subsidies are withdrawn. However, standards are now present that will protect market gains in the core CFL offerings. This may also help to raise the performance of light bulbs outside the classifications explicitly regulated. Also, customers may perceive highly efficient CFLs as more favorably priced when compared to other alternatives. If consumers replace most of their incandescents with CFLs in the near term, the risk of future sticker shock will be lowered. When incentives are withdrawn from these bulbs, sales should remain robust.

Tremendously fast changes in the light bulb market could further reduce the importance of this concern. Already, consumers are relying less on incentives to convince them to buy CFLs. The biggest CFL sellers are also not very reliant on program incentives. For example in Wisconsin, Wal-Mart has 30% of the CFL market, with almost no use of efficiency program incentives. Wisconsin's home improvement retail channel has about 54% of the market, although its customers get incentives on only 22% of their CFL purchases, as shown in Table 2.

[1] First four barriers come from the Consortium for Energy Efficiency.

Table 2. 2006 Wisconsin CFL Sales

	# Stores	Rewards Paid (a)	Not Rewarded (b)	Total (a+b)
Participants				
Hardware	294	552,619	29,761	582,380
Home Improvement	133	556,834	1,845,196	2,402,030
Grocery & Other	45	42,225	18,468	60,693
Drug & Mass	0	0	0	0
Sub-Total	472	1,151,678	1,893,425	3,045,103
Non-Participants				
Hardware	106	540	6,328	6,868
Home Improvement	228	225	91,677	91,902
Grocery	1,099	143	13,578	13,721
Drug	564	25	10,650	10,675
Mass Merchant	703	1,288	74,288	75,576
Other	36	1,872	0	1,872
Wal-Mart	89	18,000	1,385,975	1,403,975
Sub-Total	2,825	22,093	1,582,495	1,604,588
Grand Total	3,297	1,173,771	3,475,920	**4,649,691**

Source: Comprehensive CFL Market Effects Study 2007.

General dislike of fluorescent lighting and light color. Some consumers feel fluorescent lighting is not aesthetically pleasing (Scelfo 2007). However, consumers are not always able to articulate clearly their lighting preferences and dislikes. Change can itself be disturbing. Since the most common "twist" style CFL is visually easy to identify (unless obscured by a shade), consumers may be reacting to the perception of change, more than a difference in bulb performance. Also, dissatisfaction could result from a poor match between the CFL type and application, rather than the CFL per se.

Consumers may also dislike fluorescent lighting because they perceive the products to be lower quality. Early burnout is a particular annoyance with CFLs, since consumers are told they will last longer. For reflector bulbs, the Pacific Northwest National Laboratory's downlight initiative addressed reflector bulb lifetime issues. CFL smoking at end of life can also lead to lasting bad consumer impressions. ENERGY STAR has addressed this issue in its new specification, with new requirements and testing.

Consumer light color preference is a more complex subject than it may appear at first. Recently *Popular Mechanics* did a test that reported subjects prefer the light from CFLs over that from incandescents (Miramitsu 2007). Furthermore, some consumers are becoming more sophisticated about their aesthetic lighting preferences. Consumers are demanding CFLs in a wider range of color temperatures to suit particular applications, or personal preference.

Consumers may easily confuse dissatisfaction with CFLs over light color and brightness. To some extent, higher color temperature CFLs can satisfy demands for brighter light. In addition, higher wattage CFLs (32w and above) have become more available in retail stores. Both these changes can help eliminate the concerns about color and brightness. They also provide additional consumer choice, more comparable to the choices available in incandescent lighting.

Product availability. CFLs are still not as widely available as incandescent light bulbs. Even though Americans traditionally buy light bulbs at the grocery store, CFLs are not available in many grocery stores (Sandahl et al. 2006). For example, in Wisconsin, most grocery stores do

not carry CFLs. However, most Wisconsin hardware stores do participate in the statewide Focus on Energy program and carry CFLs. A typical Wisconsin hardware store's average CFL stocking is 120 CFLs on the shelf. Participating home improvement stores have 2,457 on the shelf (Winch & Talerico 2007b).

Even where CFLs are available, selection remains limited. Soft white spirals tend to dominate all the offerings still. In Wisconsin during the fall promotion period, 82% of the CFLs on the shelves were spiral, and 9% were floods. The remaining 9% were A-line, candle, decorative, globe, post, and other styles. Of these same bulbs, 91% were soft white, and 6% were daylight. Program designers need market research to more precisely quantify the need for specialty CFLs in homes and businesses, in order to gauge whether this retail selection is sufficient. Wisconsin evaluators recommended expanding the selection of specialty CFLs promoted in Focus on Energy promotions (Winch & Talerico 2007b).

Cost. First cost is a barrier to consumer purchase of CFLs. Just under one-half of rebate recipients in Wisconsin mentioned cost as a reason for not previously purchasing CFLs. Efficiency program subsidies in the form of rebates, buy-downs, and tax holidays are several approaches to reducing consumer price. Programs seeking to close the gap between CFL and incandescent prices have a moving target. Often hardware stores promote cut-price incandescents alongside rebated CFLs. Wisconsin evaluators have recommended that programs require retailers to gradually transition to multi-packs in order to use their incentive funds more effectively (Winch & Talerico 2007b). Programs can expand promotions to encourage small retailers to order in greater quantities, reducing their prices, savings that they can pass on to customers.

After the standard is implemented, consumers' cost barrier will be low if the price discrepancy is small between minimum standard bulbs (HEIs) and CFLs. It may be instructive to speculate on the eventual stable price of a CFL in order to identify the program incentive needed to induce consumers to leapfrog to CFLs at that time. Home improvement stores and mass merchandisers in Wisconsin have been recently selling CFLs at an unsubsidized price of $1.50 per 15 watt bulb (60 watt equivalent), in multipacks (Winch & Talerico 2007a). A 2008 institutional purchase of 20,000 CFLs confirms a similar per-unit price (Rezabek 2008). Programs should evaluate this type of information, along with other data, to set incentive levels that are appropriate locally.

Mercury. For many programs and consumers, environmental gains are the main reason for the nation to switch away from traditional incandescents. Environmentalism is one strong motivation that can help consumers accept the inconvenience of adjusting to new technology, higher first cost, and new mandates. Voluntary programs should keep sight of this environmental motivation and build on it.

Unfortunately, consumers have been getting a message that CFLs are an environmental hazard recently. Consumers hear the message that CFLs contain toxic mercury, and breaking bulbs create a hazardous waste zone in their home. It is difficult to gauge the strength of this influence on consumer behavior, even though the media has highlighted the issue a great deal in the last year. Consumers need to know that using CFLs reduces the release of mercury into the environment overall. The old mantra "Reduce, Reuse, Recycle" describes some recent approaches to addressing the mercury in CFLs.

- Reduce - ENERGY STAR has incorporated new caps on mercury levels into their guideline for 2008. Lamps less than 25 watts can contain no more than 5 milligrams. Bulbs up to 40 watts can contain 6 mg. At least one brand reports mercury levels of less than 2 mg. Advocates are also calling for better manufacturing techniques that release less mercury into the environment at the factory level.
- Reuse - Using longer-lived CFLs reduces the amount of mercury in CFL manufacture and disposal. Programs can encourage 12,000-15,000 hour CFLs, or cold cathode CFLs for appropriate applications.[2] Cold cathode CFLs can last 24,000 hours. Furthermore, some lighting companies are pledging to use only recycled mercury in their new lighting products.
- Recycle - Increasing recycling opportunities is important to emphasize the environmental value of CFLs. Programs have been ramping up recycling options, but manufacturers and retailers have been reluctant to contribute. EPA's Change-a-Light promotion has begun to address mercury directly through their messaging. As their resources allow, government agencies and individual programs have also taken aggressive action to improve consumer information, options, and clean-up guidelines.[3] Many Change-a-Light programs have stipulated low mercury and recycling services in their bid requests for CFLs.

In Wisconsin, Focus on Energy has offered all its participating ENERGY STAR retailer partners the opportunity to host a CFL recycling bin for no charge. About half (250+) have joined this program so far. Also, several counties in the state have banned CFLs from the landfill, requiring retailers to post this information and to take back CFLs for recycling. The result is that consumers in Wisconsin have options, including many no cost options, to conveniently turn in CFLs for recycling. States can lead in another way. The State of Wisconsin has a contract for recycling fluorescent tubes, CFLs, incandescent bulbs, and broken bulbs. This effort has allowed recycling of CFLs at much more favorable prices. Any local unit of government, municipal utility, or school district can participate in this contract.

Consumers want to wait until bulbs burn out. Many consumers decline to purchase additional CFLs because they say they are waiting for their current light bulbs to burn out. (KEMA 2007; Webber 2007). Consumers believe that using products to their end is thrifty. Their stated reason may also obscure other motivations not to use more CFLs. In any case, convincing consumers to jettison extra incandescent inventory or stockpile CFLs (so they have them on hand when an incandescent burns out) could remove one more reason for them to postpone more CFL use.

To assist consumers in transitioning more quickly, program managers could try new marketing messages or programs aimed at this barrier. Some consumers find it easier to part with unneeded household items by donating them to charity. This same concept might work for incandescents. A community group could host a "Bulb Orphanage" to help consumers move their incandescents to non-profits or charities, into sockets where CFLs are not acceptable, such as dimming applications. There is a risk of mixed messages with this approach, because it could signal to consumers that it might be OK to continue to use incandescent bulbs, a message programs want to deemphasize.

[2] For example, Philips sells a 20w CFL rated at 15,000 that contains 2.53 mg of mercury.
[3] For example, Maine released a study on CFL breakage and cleanup effectiveness in 2008 (MDER).

Possible Program Approaches

Below are some possible program approaches to promote ENERGY STAR light bulbs.

Promote Specialty CFLs

The new standards will only directly affect CFLs in the core wattage classes of 40w, 60w, 75w and 100w equivalents. Programs can direct additional effort – and re-focus their existing efforts -- to promoting CFLs that fall outside these categories. For example in Wisconsin, evaluators have suggested that the program include a wider selection of CFL types in its fall promotion. ENERGY STAR's new guidelines recognize candelabra bases and R20s, opening more opportunities. In other regions, efficiency programs have already begun offering higher incentives for specialty CFLs, to offset their higher cost. Free ridership is less of an issue with these CFL types than with the core bare-spiral classes as well.

Consumers are often unaware of or reluctant to try specialty CFLs. In a California study, 59 households with incandescent lamps installed in their specialty fixtures, 24 were unaware that specialty CFLs existed (Webber 2007).[4] While some customers may indeed be disappointed with performance, others may find the performance acceptable. Rapid evolution of technology has addressed some problems. For example, cold cathode CFLs provide a new alternative for some dimming applications. Reflector-style lighting is a significant opportunity, in both residential and commercial settings. Consumers may not be aware that there are now 3-way CFLs with lumen output equivalent to 150w, rather than 100w, and reduced bulb base size. For cold weather, CFL packages now usually specify temperature ranges, often down to 0 F or -5 F, and sometimes even - 20 F.

Programs can stay true to their mission and optimize resources by promoting CFL types the big retailers are not promoting. Efficiency programs can play a unique role in building up the market for extra long life (12,000-15,000 hour) CFLs, cold cathode CFLs, decorative models, niche LED bulbs, and others that are currently available only through mail order. These products may take the same market trajectory as core CFL models. This may involve programs going back to small-time retailers to partner on these innovative products. Programs can do research to identify the true size of the consumer need for specialty CFLs and barriers to their use -- both in the residential and commercial sectors -- and then design promotions to address these barriers.

Launch Even More New, Innovative Promotions

Marketing CFLs only through in-store promotions, and mass media is not enough. Pushing the technology through additional methods is important to achieve the efficiency gains desired. For example, since 2001 Wisconsin has periodically used workplace sales (called "lobby sales" elsewhere) to promote CFLs more actively, using participating local retailers. This is a way to produce thousands of CFL sales on an average workday, and potentially to reach more women and lower-income consumers. Sites for the workplace sales typically include large public buildings, factories, or major employers. In these settings, customers discuss the technology with

[4] Households had at least one CFL installed in the rooms studied.

their peers and gain familiarity with the new styles of lighting, without the distractions of a store. The sales also function as press events and help convince retailers to partner with the program for the long term.

New promotions can also be geared to overcoming consumers' desire to wait to buy new CFLs until their existing incandescent bulbs burn out. Turn-in programs appeal to the consumer's understanding of cradle-to-grave product management. They also provide evaluators with some assurance that inefficient products were removed from the grid. Turn-in programs now often include night lights, holiday lights, certain table lamps, and most notably light bulbs (D&R 2008).

Demonstration projects can be powerful. Visible public buildings are good sites for demonstrations. For retail customers, demonstrations in retail businesses can provide powerful peer-to-peer testimonials about the performance of CFLs or similarly efficient ceramic metal halide with integrated base. Recently the authors viewed an effective demonstration at an upscale senior building in downtown Madison. The building manager had installed clear flame-tip cold cathode CFLs into lobby chandeliers and wall sconces, providing a striking demonstration of the beauty of this new efficient lighting option.

Fund raiser CFL sales are an innovative way to partner with schools and community groups, and drive CFLs into smaller communities and social networks. For example, in Wisconsin the "Bright Ideas" fundraiser program partners with 50 school clubs per year. Many of these efforts are expanding each year to include more types of specialty CFLs, as well as LED night lights and holiday lights.

Alternative Approaches to Distribution

Methods such as direct install and giveaways can be important to diffuse the technology into specific customer groups, such as low income or first time users. These interventions can produce significant energy savings in the near term and suppress future demand for inefficient incandescent bulbs. Advantages of a direct install program are the additional certainty about savings, timeframe of savings, removal of incandescents to limit future slipback, and reduced costs through bulk purchase of light bulbs. The higher cost of labor to install the bulbs is a drawback. The popularity of giveaway programs through some energy efficiency programs, especially smaller ones, suggests that aggressive effort to reach first-time CFL users is still necessary. Furthermore, the simplicity and low cost of CFL giveways make them attractive programs.

It would be useful to establish guidelines for when these programs are most effective. Giveaways in the low income sector seem particularly useful. There is a lower risk of free riders since this income group is less likely to purchase CFLs even with an incentive. Total savings from the low income sector could be sizable. Furthermore, existing programs such as LIHEAP, Meals on Wheels, and Head Start provide a basis for distribution. Outside the low income sector, giveaways focusing on specialty CFLs could still play a valuable technology awareness and familiarization role.

Wisconsin's low income weatherization program has a successful CFL direct install component that still has room for improvement. The program has a goal of reaching 10,000 residences homes a year, and funds direct install of CFLs for all sockets in all the homes they weatherize. Lighting installed includes ENERGY STAR spiral CFLs, 3-ways, exterior lights, and torchieres. Currently the program is reaching about half the sockets in each home, 20 sockets for

a single family home and 13 for multi-family. In the future, the program will offer more styles of specialty CFLs to reach a goal of CFLs in more sockets per home.

Direct installation projects often are designed to reach low income constituencies that are price sensitive and less likely to respond to other marketing approaches. However, it is an approach that can reach other demographics as well, both residential and commercial. In 2006 Venezuela announced a plan to install 52 million CFLs. It was a direct install program, using CFLs from Vietnam, and labor from Cuba.

Giveaways are an even simpler approach. The University of Wisconsin has recently committed to give away a CFL to each of the 20,000 first year students at each of its campuses this fall. Still, the U.S. is not using giveaways as extensively as other countries. Recently, a newspaper promotion in the UK gave away 2 million CFLs in one weekend. Another London "amnesty" weekend promotion allowed two new CFLs for every resident who brought in two incandescent bulbs. South Africa's utility Eskom announced on April 10th that it will distribute 20 million light bulbs over the next five years.

Whole House Lighting Changes

In light of the new standards, programs may want to consider how to encourage whole-house transformations to CFLs. It is a challenge to move more advanced consumers to a full transition away from incandescents, at the same time running programs addressing first time CFL users. "Change five" has been a slogan of the Change-a-Light program recently, but next year it could be "Change them all." Within a few years, consumers will need to consider replacing nearly every light bulb in their home. It's a big change in perspective.

Currently many programs limit the number of incentives that can go to a particular household. Although single family homes average about 45 sockets, many lighting programs limit households to ten or fewer ENERGY STAR light bulbs. Unfortunately, this may tend to limit consumers from attaining full conversion. Programs may consider raising customer unit limits on promotions, or piloting some type of "whole house" promotion, for those willing to make a big change. Modest consumer stockpiling of CFLs may be considered evidence of success. Stockpiling will reduce consumer demand for incandescents in the future.

Increase CFL Promotion through Other Existing Energy Efficiency Programs

Often CFL promotions are segregated from other energy efficiency programs. Conversely, efficiency programs are often committed to running programs focusing on specific sectors such as existing homes or a certain business sector, but fail to adequately promote CFLs to these customers. In Wisconsin for example, most builders involved with the ENERGY STAR homes program do not install any CFLs in their program homes. Programs for multi-family dwellings often do not achieve lighting gains inside the living units, but in common areas only. By making inefficient incandescent replacement a more prominent feature of these programs, energy savings will increase rapidly. Furthermore, efficiency programs based on building audits and targeted to commercial businesses and industrial facilities should promote ENERGY STAR lighting. With their attention focused on large, complicated measures, decision makers and program representatives may become distracted or consider CFLs a minor savings opportunity and have not pushed them hard enough in the past.

Expand CFL Promotions in the Commercial Sector

There is tremendous potential to expand programs further into business and institutional sectors. Commercial buyers can have a disproportionate effect on markets because of their large bulk purchase decisions and because they have shorter relamping cycles due to longer burn times. They also produce more substantial annual energy and demand savings per bulb.

Examples below illustrate the role of business customers in the CFL market, although it is difficult to identify the true scope because so much is happening outside of energy efficiency programs. Business customers already make up a significant share of retail CFL sales. In Wisconsin in 2006, researchers found that 7% of retail CFL incentives go to commercial customers and 2% to farms (Winch & Talerico 2007b).[5] Evaluators estimate that CFLs account for almost 18% of the programs' total business sector electric savings in the second half of 2007. Furthermore, evaluators estimate that this savings may be as much as 11.5% higher, if CFLs that did not receive an incentive are included (PA Government Services 2008).

Involving more lighting distributors in promoting CFLs through innovative programs geared to the business sector could be helpful. Furthermore, there may be an opportunity to involve non-traditional distributors in promoting CFLs, building on their ongoing contact with customers. For example, restaurant distributors could promote CFLs to restaurants, etc.

Facilitate Institutional Guidelines to Support Market Gains

Large purchasers and specifiers, state agencies, and other organizations can help shore up CFL market gains by adopting internal agency guidelines encouraging CFL use, initiating bulk buys and establishing contracts. For example, Wisconsin state government facility guidelines forbid use of incandescent bulbs in new construction or major retrofit building projects. Some government housing programs require developers to use ENERGY STAR lighting as a condition of receiving tax credits.

Conclusions

Great opportunities exist to promoting ENERGY STAR light bulbs over the next few years. Programs should promote specialty CFLs more actively. Keeping promotions fresh, and going beyond passive in-store sales, may increase energy saving success. Programs should continue efforts to reach new retail sectors and consumer segments with lower participation, and seek partnerships with organizational allies. Programs should further increase CFL promotion through new types of residential programs, and should also look to the business sector for opportunities.

[5] However, only one-quarter of CFLs sold through retail channels received an incentive, so this limits the confidence in this market share estimate.

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