

The Lights They Are A Changing: Early Results from EISA 2007

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ABSTRACT

The 2007 Energy Independence and Security Act (EISA) enacted a number of substantial energy efficiency codes and standards, perhaps the most notable of which was the requirement that most screw-based light bulbs become approximately 28% more energy efficient—as measured by the lumens per watt (LPW)—beginning in 2012. The legislation is phased-in, beginning with 100-watt equivalents in 2012, 75-watt equivalents in 2013, and 60/40-watt equivalents in 2014.

This paper gives a comprehensive update on how manufacturers, retailers, and consumers have reacted to the EISA requirements. Specifically, the paper addresses the manufacturer compliance with the legislation, retailer stocking and educational efforts, and consumer awareness and intended reaction. The paper presents data from a number of states, including California, where the EISA requirements were phased in one year in advance of the rest of the United States, and thus provide insight into how EISA might impact the lighting market for the entire country.

The findings indicate that, despite manufacturer preparation and support for the requirements, consumer awareness remains low, with potentially high dissatisfaction as consumers do learn about the law. In addition, supply of legacy 100 watt incandescent bulbs appears to be quite high in California, despite the intended one year acceleration of the requirements. In absence of consumer education there could be a large negative consumer backlash, and incandescent stockpiling. This could severely delay, and possibly undermine, the intent of the legislation and the potential for energy efficient lighting in the coming years.

Background

In December, 2007 George W. Bush signed the Energy Independence and Security Act (EISA). The law established energy management goals and requirements while also amending portions of the National Energy Conservation Policy Act (NECPA). The law includes a number of energy efficiency requirements, from federal energy use, to motor standards, to a number of lighting requirements.

Perhaps the most notable EISA requirement is Section 321, which sets, for the first time, efficiency standards for “general service” light bulbs. EISA requires that most screw-based light bulbs become approximately 28% more energy efficient—as measured by the lumens per watt (LPW)—beginning in 2012. The law is technology neutral, even stating that “The regulation is not a product ‘ban’, but a performance requirement for wattage, lumen output and life.”(EISA, 2007) In other words, EISA requires typical light bulbs to be more efficacious and the higher efficiency can be met by improving today’s typical light bulb and/or with other screw-in lighting products.

As shown in Table 1 the legislation is phased-in, beginning with 100-watt equivalents in 2012, 75-watt equivalents in 2013, and 60/40-watt equivalents in 2014. In addition, the law pertains to the manufacturing date (i.e., retailers can continue to sell legacy incandescent bulbs

until they deplete their stock), and does include a number of exemptions. More detail regarding common misconceptions regarding the EISA requirements are summarized below in Table 2.

Table 1. EISA General Service Lamp Requirements

Current Wattage	Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Effective Date (Manufactured On or After)
100	1490 – 2600	72	1,000 hours	January 1, 2012
75	1050 – 1489	53	1,000 hours	January 1, 2013
60	750 – 1049	43	1,000 hours	January 1, 2014
40	310 – 749	29	1,000 hours	January 1, 2014

Source: EISA 2007

Table 2. Common Misunderstandings Regarding EISA

Misunderstanding	EISA Requirements
EISA bans the incandescent light bulb and requires consumer to purchase CFLs.	The standards are technology neutral, which means the law does not ban the incandescent, nor require consumers to purchase CFLs (or LEDs).
Current incandescents are “illegal” after January 1 st of each year.	The law pertains to the manufacturing, not the sale date, and thus the standard does not affect the sale of light bulbs already on store shelves.
All light bulbs are included	The law includes a number of exemptions, including three-way bulbs, candelabras, and appliance lights.

Source: Apex Analytics and EISA 2007

Study Methodology

In order to understand the early impacts of EISA, this paper examined recent studies from around the United States, plus primary data collection and analysis through “mystery shopping” in California. California was chosen because the requirements were enacted one year earlier, and thus – although the borders are porous – may provide a “preview” of how the standards could impact other areas of the country. Lessons learned in California may provide insight in terms of future awareness, attitudes, and compliance for the rest of the country.

As shown in Table 3, a total of seven recent studies, plus the mystery shopping study, were included in the current analysis.

Table 3. Data Sources and Activities Included in Current Study

Primary Study & State	Sponsor	Year Conducted	Manufacturer Interviews	Retailer Interviews	Consumer Interviews	Other Activities
Consortium Massachusetts		2010	11	190*	503	Shelf Stocking
PacifiCorp Wyoming		2011	NA	23	254	NA
PacifiCorp Washington		2011	NA	12	251	NA
PacifiCorp Idaho		2011	NA	7	249	NA
PacifiCorp California		2011	NA	7	250	NA
Commonwealth Edison (ComEd, IL)		2011	NA	NA	400	NA
NEAA, OR, WA, MT, ID		2010	NA	NA	500	NA
Apex Analytics CA		2012	NA	NA	NA	Telephone Mystery Shopping (n=105)
Total			11	239	2,407	NA

Source: Apex Analytics (Study details included in bibliography). *The MA retailer surveys included 9 high level retail buyers and 181 store managers. The retailer surveys for the other studies were conducted with store managers.

The studies range from the East Coast to the West Coast, and include a wide range of data collection activities that explored issues regarding EISA, including:

- **Manufacturer interviews.** The evaluation of the Massachusetts 2010 ENERGY STAR Lighting Program included in-depth interviews with 11 participating manufacturers, including a battery of questions regarding EISA that would be applicable at a national level.
- **Retailer interviews.** The Massachusetts evaluation included in-depth interviews with nine high level (i.e., regional) retailer buyers, as well as 181 interviews with store managers. In addition, the PacifiCorp 2009-2010 Residential Home Energy Savings Evaluations across five states included a total of 49 retailer store manager interviews.
- **Customer surveys.** Seven of the studies included customer surveys, with a total of over 2,100 residential customer surveys. With a minimum of approximately 250 surveys per state, each study provides confidence/precision levels of at least 90/5 in terms of EISA awareness.
- **Telephone mystery shopping.** As part of this study Apex conducted telephone mystery shopping with 105 retail storefronts in CA. The caller pretended to be a shopper looking for legacy incandescent 100 watt or 75 watt bulbs, probing for their availability. The caller also inquired for availability and pricing of EISA compliant bulbs. The retailers were selected to represent a mix of distribution channels, including discount (dollar), drug stores, grocery, hardware, home improvement, mass merchandisers, and warehouse

(club) channels. In addition, the retailers were targeted proportionally across Northern California, Southern California, Central California, and the Central Valley/Desert communities to represent the entire state.

In total, the data provide a multilevel perspective – across national manufacturers and retailers, retail store managers, and consumers – of early responses and results of EISA.

Manufacturers Perspective

EISA was signed into law in December 2007, and the bill had support of both democrats and republicans. One of the more vocal proponents of the bill was the National Electrical Manufacturers Association (NEMA), a trade association that includes many of the major lighting manufacturers. NEMA representatives testified multiple times before the House and Senate in support of the bill (NEMA, 2007). The motivation of the lighting manufacturers may have been environmental, although economic factors may have also motivated NEMA to support EISA, as the lighting market was a relatively “stale” market with many low priced products that had not changed significantly in years. EISA, in other words, provided a way to invigorate a market and create new economic opportunity for lighting manufacturers.

Lighting manufacturers, largely through NEMA, have continued to demonstrate their support for EISA. This support has been critical, particularly when EISA was at risk of getting repealed, and most recently when the 2011 federal budget agreement included a rider that prohibited federal enforcement of all aspects of EISA. NEMA immediately issued a press release, stating, “NEMA...remains committed to and supportive of the lighting standards established in the Energy Independence and Security Act of 2007. NEMA did not support the inclusion of this rider, which imposes funding limitations on the Department of Energy (DOE) to enforce the light bulb standards for FY2012...American manufacturers have invested millions of dollars in transitioning to energy efficient lighting as a result of the EISA 2007 provision. Delay in enforcement undermines those investments and creates regulatory uncertainty (NEMA, 2011).” General Electric, as an example, has already closed down legacy incandescent manufacturing plans in Ohio, Kentucky, and Virginia.

EISA Compliant Bulbs

The lighting manufacturers have not only devoted millions of dollars in research and development, but have already introduced a number of new products that fully comply with EISA requirements. These EISA compliant bulbs mostly rely on halogen technology, and are marketed under such names as the Philips EcoVantage, Sylvania SuperSaver, GE Halogen, and the Bulbright Halogen.¹

Many of the EISA compliant bulbs are also marketed to explicitly address many of the consumer concerns regarding CFLs. For example, the Sylvania SuperSaver states right on the package that bulbs are fully dimmable, mercury free, and offer instant on.

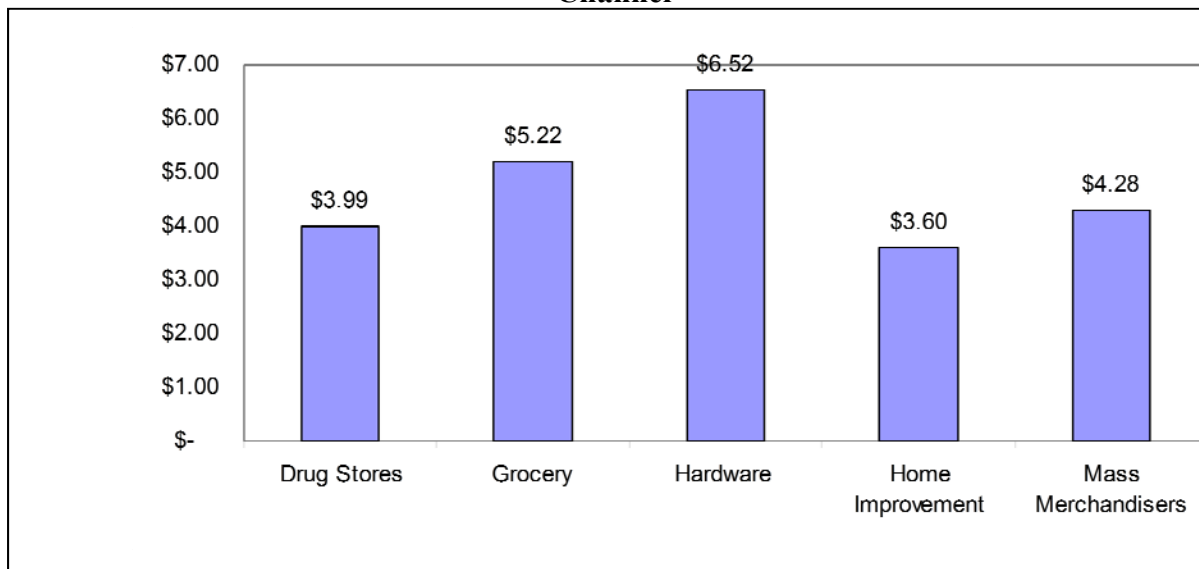
¹ Halogen light bulbs are merely incandescent light bulbs with a subtle modification: unlike incandescent light bulbs, halogen light bulbs contain traces of a halogen such as iodine in their construction.

In early 2012 EISA compliant bulbs in California typically sold in the \$5 range for a two-pack, or about \$2.50 per bulb². Prices, however, varied from less than \$4 for a two-pack at drug stores and home improvement stores, to more than \$6.50 at hardware stores (Figure 1).

Impact on CFL Sales

Few manufacturers responding to the Massachusetts study thought that CFL sales would increase in the period leading up to the phase out, largely due to continued availability of most incandescent wattages, consumer ignorance of EISA, and dissatisfaction with CFLs among some consumers. Manufacturers, however, did think that CFL sales would increase during 2012-2014, but would still be constrained by consumer dissatisfaction, “bin shifting” (purchasing lower wattage incandescents), availability of EISA compliant bulbs, and installation of stored/stockpiled incandescents.

Figure 1. Average Retail Price of EISA-Compliant 72 Watt 2-Packs by Distribution Channel



Source: Apex Analytics February-March 2012 California Telephone Mystery Shopping. Based on a total of 50 retailers that carried EISA-compliant bulbs and could provide pricing information.

² The result for all distribution channels was based on a straight average of all the retailers contacted. While representing a mix of distribution channels, the data were not weighted to account for the number of storefronts or sales by each of the channels.

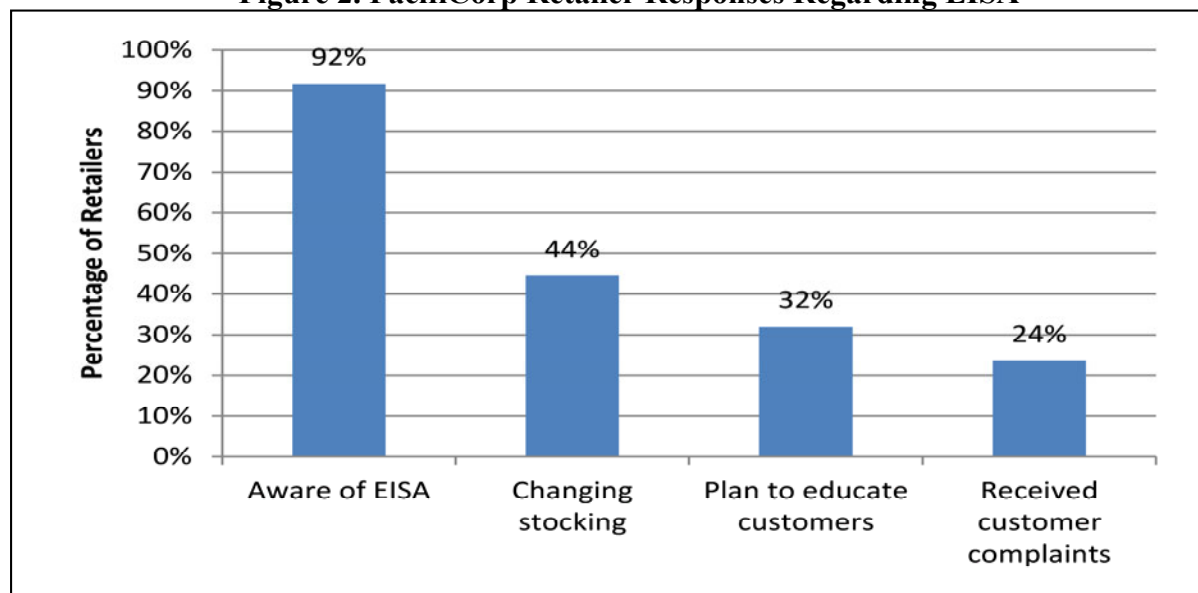
Retailer Perspective

Retailer awareness of EISA varies significantly from the 2010 study conducted in Massachusetts to the 2011 study conducted on behalf of PacifiCorp. The Massachusetts study found that only 48% of retail store managers were aware of EISA, compared to 92% of retail store managers in the PacifiCorp study. This difference may reflect some geographic differences, but likely reflects the difference from 2010 to late 2011, as the debate over EISA became more public and the initial EISA requirements became more imminent.

The PacifiCorp study also explored the extent to which retailers had already begun to change stocking practices, whether or not they were planning on educating customers, and if they had received any negative customer feedback regarding EISA. As shown in Figure 2, less than half (44%) had begun changing stocking as a result of EISA, including phasing out incandescent inventories and increasing stocks of energy-efficient bulbs, such as EISA compliant bulbs, CFLs, and LEDs. In addition, less than a third (32%) of the lighting retailers planned to educate customers about the new requirements using marketing materials, such as in-store displays, brochures, and flyers.³

When asked about customer reaction to EISA, 24% of the lighting retailers said they had received negative feedback from customers. The feedback included frustration at the government telling them what to do, as well as dissatisfaction with the CFLs' lighting quality and mercury content. There were also anecdotal reports of intent to stockpile, but retailers did not get the sense that there was a widespread movement to stockpile legacy incandescent bulbs.

Figure 2. PacifiCorp Retailer Responses Regarding EISA



Source: PacifiCorp Residential Lighting Program evaluations, based on a summary of lighting retailer responses in four states (n=72).

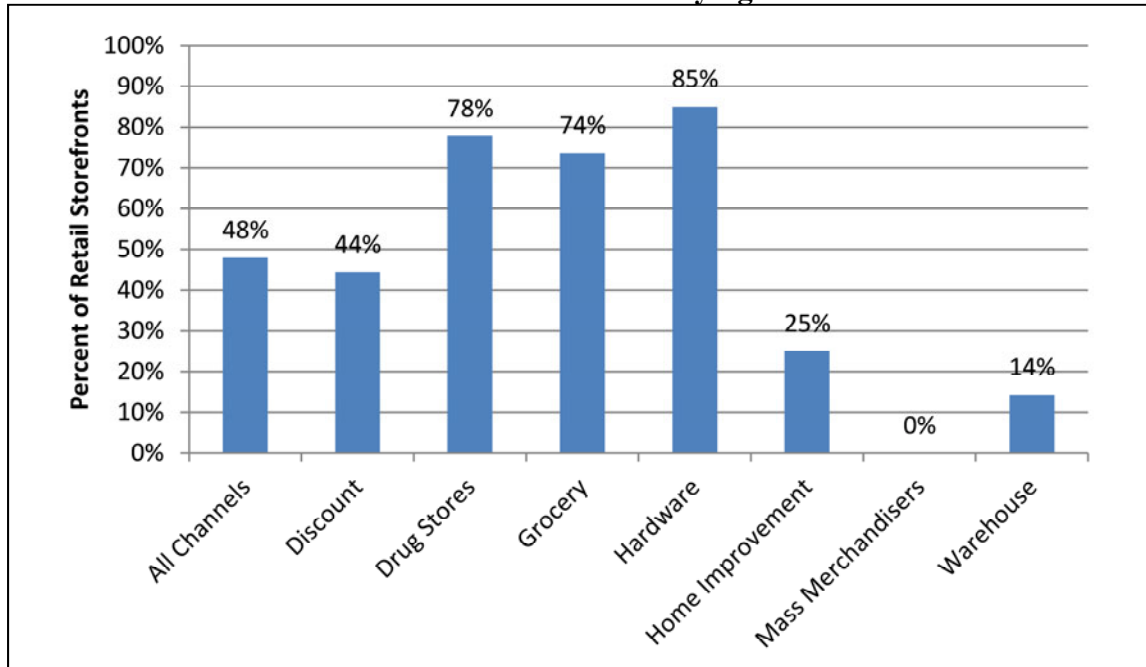
³ Note, however, there are some national retailers, such as Ikea and Target, that have publically stated they are phasing out legacy incandescent bulbs in advance of EISA.

CFL Availability

As noted above, California adopted the EISA regulations one year in advance of the rest of the United States. Therefore, beginning in 2011, retailers were expected to sell through their existing stock of 100 watt incandescent bulbs and not order additional bulbs. However, the telephone mystery shopping experiment, which was initiated 14 months (February 2012) after EISA was to have taken effect, found that almost half (48%) of retail storefronts indicated that they had legacy 100 watt bulbs available. Availability of 100 watt incandescents was highest for hardware stores such as Ace and True Value (85%), and lowest for mass merchandisers such as Walmart and Target (none of the stores carried 100 watt incandescent bulbs).

While these findings may indicate a long incandescent sell through period for the rest of the U.S., they may also indicate that EISA may not have been fully adopted throughout California, and thus California is realizing a more gradual adoption of the standards that may not be applicable for the rest of the U.S.

Figure 3. Percent of California Retail Storefronts Carrying 100 Watt Incandescent Bulbs



Source: Apex Analytics February-March 2012 California Telephone Mystery Shopping (n=98).

Effects on CFL Sales

Retail store managers in Massachusetts were asked about what effects they thought EISA would have on the lighting they sell. As shown in

Table 4 over half of the Massachusetts store managers who were aware of the phase out thought that it would increase their sales of CFLs. Only a small number thought that consumers would hoard incandescents (6%) or that EISA would lead to an increase in incandescent sales (6%).

Table 4. Lighting Retailer Responses for Effects of EISA Lamp Phase Out

Response	Percent of Store Managers Aware of EISA
It will increase sales of CFLs	53%
It will cause consumers to hoard incandescents	6%
It will increase sales of incandescents	6%
It will cause us to stop selling incandescents	13%
No significant effects	8%
Problems for seniors who do not like CFLs	6%
We'll change our variety/assortment	5%
People will have to buy what's available	5%
LEDs will become bigger	3%
We'll lose some sales	3%
Other effects*	24%

Source: Massachusetts ENERGY STAR Lighting Program 2010 Annual Report (n=87)

* Other effects include cutting out some of their products, CFL prices will go down, they'll sell more specialty CFLs, they're already phasing out their incandescent bulbs, consumers will panic, consumers will be angry, it will increase consumer knowledge of CFLs, we'll sell more CFL-ready fixtures, etc.

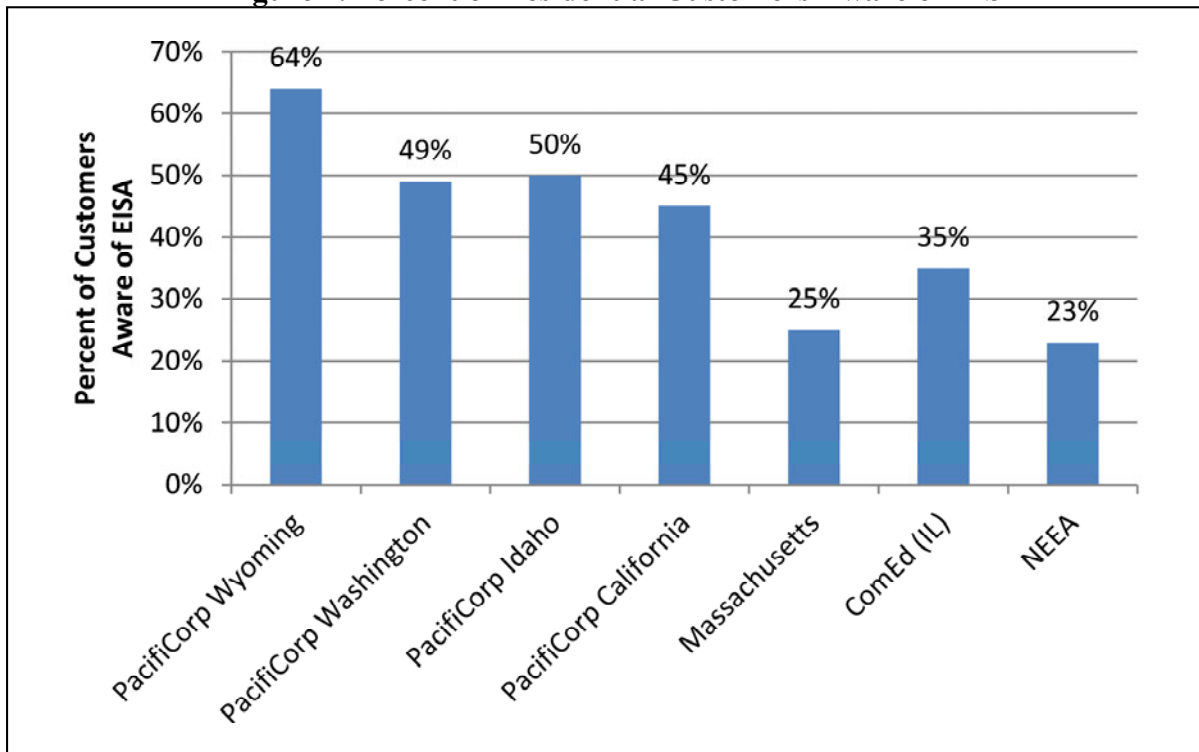
Consumer Perspective

Consumer Awareness of EISA

As shown in Figure 4, consumer awareness of EISA varies significantly across the country. Among the PacifiCorp customer surveys, which were all conducted in fall 2011 and used the exact same wording, awareness was highest in Wyoming (64%) and lowest in California (45%). The high awareness in Wyoming may reflect the conservative nature of the state, and the awareness of government regulations due to the influence of the extraction (oil and gas) industries. Interestingly, consumer awareness in the California service territory of PacifiCorp – although representing a small portion of the state – was not significantly different than a number of other service territories in states served by PacifiCorp, despite the earlier adoption of EISA in California.

Consumer awareness across the Northwest (23%), and in Massachusetts (25%) and ComEd (35%), were even lower. These may reflect the timing of the surveys, as the Northwest and Massachusetts studies were conducted in 2010 and the ComEd study in early 2011. In fact, Massachusetts reported a significant jump in EISA awareness in 2009 (only 18%) to 2010. The results of all these studies, however, show that consumer awareness of EISA, even in 2011, remains relatively low. Note that all of the studies used aided approaches to assess consumer awareness.

Figure 4. Percent of Residential Customers Aware of EISA



Source: PacifiCorp Residential Lighting Program evaluations (2011); Massachusetts ENERGY STAR Lighting Program 2010 Annual Report; ComEd PY3 (2010-2011) Residential Utility ENERGY STAR Lighting Program Evaluation; Northwest Energy Efficiency Alliance 2009-2010 Residential Lighting Market Research Study.

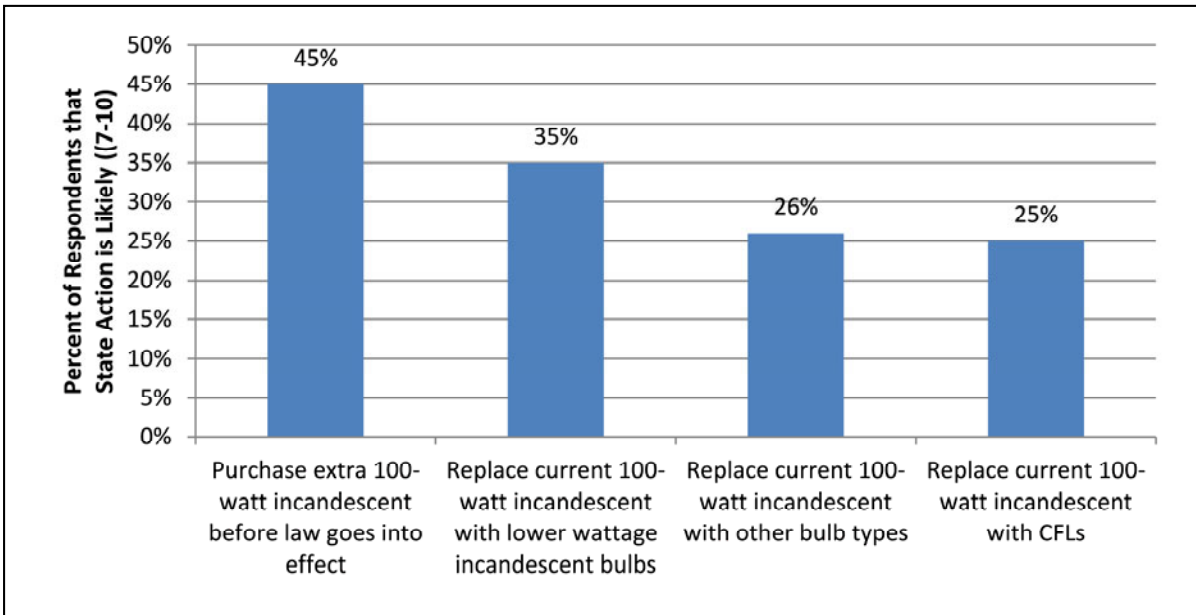
Potential Stockpiling

In the ComEd study consumers who were not aware of EISA were read a description of the legislation, and then all respondents were read four descriptions of possible actions they would take for light sockets where they have used 100-watt incandescent, and asked the likelihood of each action (see Figure 5). The most likely action is stockpiling existing 100-watt incandescent bulbs, as 45% of respondents gave a rating from 7 to 10 (on a 10-point scale) when asked if they would purchase extra 100-watt incandescent bulbs before the law goes into effect. Thirty-five percent said they would buy lower wattage incandescent bulbs, 26% would buy other bulb types such as LEDs or high-efficiency incandescent bulbs, while 25% would buy CFLs.

While these are hypothetical actions (i.e., asked in advanced of EISA), they do indicate that many consumers may be likely to do at least some stockpiling. In addition, these questions

were asked of all respondents, not just those that had previously been aware of EISA, and thus may indicate that stockpiling may become more common as a larger percentage of customers learn about EISA.

Figure 5. Likely Actions Following EISA Implementation of 100-watt Incandescent Standards



Source: ComEd PY3 (2010-2011) Residential Utility ENERGY STAR Lighting Program Evaluation

Summary and Conclusions

- Lighting manufacturers are committed to EISA.** Lighting manufacturers supported the adoption of the EISA standards, and have stated their commitment to EISA even when the federal government has debated repealing the law and eliminated enforcement of the law. The lighting manufacturers have invested millions of dollars into developing EISA compliant bulbs, most using halogen technologies, with the 72 watt bulbs (100 watt equivalent) selling for an average of about \$5 for a two-pack.
- Retailers in California continue to sell 100 watt bulbs.** Almost half (48%) of California lighting retailers contacted through a telephone mystery shopping study indicated they are still carrying legacy 100 watt incandescent bulbs, even 14 months after California adopted the EISA standards. This may indicate that there will be a long sell through period or attempted lack of compliance (if legacy incandescent bulbs are available) with the law in other regions as well.
- Consumer awareness remains extremely low.** Recent 2010 and 2011 studies in a number of areas in the U.S. have found that less than half of consumers are aware of EISA. Of the states polled, awareness was highest in Wyoming, a state with a large conservative base and antipathy of government regulation.

- ***As consumers learn about EISA there is the potential for misinformation, negative reactions, and stockpiling.*** Despite low consumer awareness, 24% of lighting retailers interviewed for one study reported that they have already had customers complain about the law, and anecdotally have seen evidence of stockpiling. In another study nearly half (45%) of respondents stated that they would purchase extra 100 watt bulbs in advance of EISA. Even for those who support EISA there is a large incremental cost of going from legacy incandescent bulbs to EISA compliant halogens, which may also cause consumer anger and stockpiling.

These findings, taken together, indicate that there is an ***urgent need for more consumer education*** about the law and product options. Although certain groups, like the LUMEN Coalition and the Alliance to Save Energy, have made efforts to education consumers, few retailers interviewed as part of the current studies indicated they planned on educating consumers, and based on the lack of awareness of EISA there is still much work to be done to educate consumers. The need for consumer education represents an opportunity for utilities, utility consortiums, and state and federal government. In absence of consumer education there could be a lack of compliance with the law, a large negative consumer backlash, and incandescent stockpiling. This could severely delay, and possibly undermine, the intent of the legislation and the potential for energy efficient lighting in the coming years.

In addition, future research will need to be conducted to assess compliance with the legislation, particularly since the lack of compliance in California may reflect greater availability of legacy bulbs than will be possible after phase-in of the law throughout the United States. Should a lack of compliance be detected, program efforts may want to focus on raising compliance among manufacturers and retailers.

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