ENERGY-EFFICIENT LIGHTING IN RESIDENTIAL NEW CONSTRUCTION – OPPORTUNITIES, CHALLENGES AND SUCCESS STORIES

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Introduction

In 2003, there were 1,499,000 housing starts[1]. The National Association of Home Builders forecasts the 2004 single-family housing starts at 1,594,000 and 2005 single-family housing starts at 1,523,000[2]. With housing starts projected to stay at or above 2003 levels, the energy use per home is gaining serious attention. Energy-efficiency programs, and some builders, are looking for additional energy saving opportunities beyond the envelop and HVAC. Lighting is one area that is getting a lot of attention.

Due to increased fixture availability from major manufacturers, builder interest and success with energy efficient homes programs, advances in lighting technology, and consumer awareness of energy efficiency needs, the time is right for decorative energy-efficient lighting in new construction. However, just because there is growing demand and growing supply of fixtures, does not ensure success.

There are many marketplace challenges, simply promoting the use of energy-efficient lighting will not result in significant market adoption. Why? Because this technology is "new" to builders and distributors (requiring a new sales pitch and education on new product), it is more expensive, and builders are busy with the housing boom. This means that energy-efficiency programs need to work closely with the builder, manufacturer, distributor, architect, contractor and other influencers to make sure selection, installation and homebuyer acceptance is successful. EPA is currently working with these markets and overcoming the challenges.

The cornerstone of EPA's efforts is the ENERGY STAR Advanced Lighting Package, which sets minimum ENERGY STAR qualified fixture requirements for high, medium and outdoor applications. In addition, a number of marketing materials have been developed to educate, train, and support builders. Through the effective use of the Advanced Lighting Package, supporting materials, and direct market outreach, ENERGY STAR is finding solutions to tap the energy savings potential of the residential new construction lighting market.

The savings potential is significant. The average American home contains 20-30[3] hardwired lighting fixtures. If only five percent of these homes adopted the minimum requirements for an EPA ENERGY STAR Advanced Lighting Package, 56,137,550 kWh annually and 64,457 kW could be saved[a].

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[a] Created using typical fixtures that can be found in an average home. Fixture types and wattages for both the base line fixtures and ENERGY STAR qualified fixtures are based on professional experience and data from manufacturer catalogs and ENERGY STAR qualified residential light fixture data. Annual hours of use for high use rooms are 876; med/low use rooms are 657; and outdoor use are 1131.5. Hours of use sources: 1) US Lighting Market Characterization Volume One. DOE 9/02; 2) California Baseline. Heschong Mahone Group 9/99. 3) Tacoma Baseline Residential Lighting Energy Use Study. Final Report, 5/96; 4) LRC Lighting Pattern Book for Homes, 1996.

Energy-Efficient Residential Lighting Technologies,
Applications, and Savings

Products

Energy-efficient residential lighting opportunities have definitely gained the attention of major and niche residential lighting manufacturers. Leading manufacturers that supply the residential new construction market, such as Progress Lighting and Sea Gull Lighting, are increasing their ENERGY STAR qualified product offerings for the new construction market. As of October 15, 2004 there were 9,151 ENERGY STAR qualified fixtures from 62 manufacturers[4].

Once thought of as ugly utilitarian products for the garage and laundry rooms, energy-efficient lighting fixtures are now available in a variety of decorative and basic styles for every room in the home, including Air Tight (AT) recessed downlights that are rated for Insulation Contact (IC). Technological advances in lamp/ballast configurations, size, and quality have provided the fixture manufacturers with the platforms to use in chandeliers, ceiling flush mount fixtures, pendants, bath fixtures, wall sconces and more. Manufacturers have also responded with ENERGY STAR families of products and, manufacturers are beginning to create families that are designed as fluorescent, not simply incandescent fixtures retrofitted to be fluorescent. The results are better designed, aesthetically pleasing fixtures that use appropriate glass and finishes. Manufacturers are making ENERGY STAR qualified fixtures for a variety of markets including "showroom grade" decorative fixtures for the retail showroom and "builder grade" for the large tract home developments. This allows manufacturers to supply a number of markets with a number of options to meet various lighting market demands.

EPA also continually raises the bar on quality requirements for ENERGY STAR qualified fixtures. This continual improvement strengthens the ENERGY STAR mark and helps assure builders and homebuyers that the products they buy are high-quality as well as energy efficient. Recent enhancements to the ENERGY STAR specification include requirements that all indoor fixtures use electronic ballasts, improved lamp color specifications, lumen maintenance standards, maximum ballast temperature limit (to ensure long life), and additional third-party testing requirements. These enhancements are helping further differentiate ENERGY STAR qualified lighting from standard energy efficient lighting. However, not all energy-efficient products are created equal, and the builder will remember any negative experiences.

Applications

There are now energy-efficient lighting fixtures available for nearly every application of the home. But just because the product is "energy-efficient" does not ensure quality. In addition, the energy-efficient technology must be used in the right application, or the homeowner will be dissatisfied and may replace with a less efficient technology, resulting in lost energy savings. A first step in selecting the right products is knowing what is available, and the limitations of the products.

Multi-light chandeliers, with three or more arms, are the latest style of fixtures to earn the ENERGY STAR. Also available are pendant fixtures for hallways and dining areas; flush mounts for hallways, bedrooms, and more; decorative and standard wall brackets for the bath; sconces for living and hallway; downlights for all rooms; a variety for kitchen applications; ceiling fan light kits; and ventilation fans with lighting. Plus there are numerous styles for outdoor post and wall-mounted fixtures.

Although there are over 9,000 ENERGY STAR products available there are a few technical limitations. Dimming is the next major hurdle to overcome. Many portable ENERGY STAR qualified fixtures are

dimmable, however most hardwired fixtures are not. Manufacturers are currently developing fixtures that work on a standard two-wire dimmer (typical dimmers used with incandescent fixtures) but only one manufacturer, Lights of America, has made such a technology available that has also earned the ENERGY STAR.

Energy efficient fluorescent fixtures are also not applicable for spot lighting applications. This is because fluorescent technology is not a "point source" and can not be focused like incandescent products. This inherent fluorescent feature also limits their ability to create "sparkle" that is commonly found with crystal chandeliers. However, manufacturers are developing fixtures with different types of glass that do create some sparkle, mostly seen on "water-etched" glass for outdoor fixtures.

Energy savings potential in various applications

The following table illustrates the energy savings potential for various lighting applications throughout the home.

TABLE 1[b]:

Application	**Fixture Quantity**	**ENERGY STAR Fixture**	**kWh Savings**	**kW Savings**
Kitchen Recessed	6	Recessed	209	.23
Kitchen Breakfast Nook	1	Pendant Down-Light	85	.10
Dining Room Over Table	1	Pendant Up-Light	111	.13
Foyer	1	Pendant	143	.16
Hallways	2	2 – Flush Mount	143	.16
Powder Room	1	3 Light Vanity	144	.16
Main & Master Bathrooms	3	4 Light Vanity	663	.75
Great Room	1	Ceiling Fan Light Kit	71	.08
Living Room	1	Ceiling Fan Light Kit	71	.08
Master Bedroom	1	Ceiling Fan Light Kit	51	.08
Laundry Room, Storage, & Utility Closets	3	Flush Mount	160	.24
Unfinished Basement	3	1x4 2 Lamp Wrap – T8	466	.73
Garage	2	1x4 2 Lamp Wrap – T8	182	.28
Front & Back Doors	3	Wall Lantern	251	.22
Garage Light	1	Wall Lantern	68	.06
Total	**30**		**2,818**	**3.46**

[b] Created using typical fixtures that can be found in an average home. Fixture types and wattages for both the base line fixtures and ENERGY STAR qualified fixtures are based on professional experience and data from manufacturer catalogs and ENERGY STAR qualified residential light fixture data. Annual hours of use for high use rooms are 876; med/low use rooms are 657; and outdoor use are 1131.5. Sources for hours of use are the same as stated in previous foot note.

As part of EPA's efforts to increase the penetration of ENERGY STAR fixtures in new construction EPA developed the ENERGY STAR Advanced Lighting Package (ALP). The ALP sets minimum ENERGY STAR lighting fixture requirements for high-use, medium-use and outdoor lighting applications. The ALP technical requirements allow builders flexibility of ENERGY STAR fixture placement while capturing significant energy savings in important areas of the home. This not only leads to significant energy savings, but also provides motivation for manufacturers to develop decorative fixtures for high-use applications.

Table 2 below illustrates the technical requirements of the ENERGY STAR Advanced Lighting Package. Table 3 demonstrates the energy savings of an ENERGY STAR ALP in a typical American home[c].

TABLE 2:

Room Category	**Specific Rooms within Category**	**Minimum Percentage of Required ENERGY STAR Qualified Fixtures Per Room Category**
High-Use Rooms	Kitchen, Dining Room, Living Room, Family Room, Bathroom(s), Hall(s)/Stairway(s)	50% of Total Number of Fixtures
Med/Low-Use Rooms	Bedroom, Den, Office, Basement, Laundry Room, Garage, Closet(s), and All Other Rooms	25% of Total Number of Fixtures
Outdoor	Outdoor Lighting Affixed to the Home or Free-Standing Pole(s) except for landscape and solar lighting	50% of Total Number of Fixtures including **all** flood lighting

Note: To meet the Advanced Lighting Package guidelines, all installed ceiling fans must be ENERGY STAR qualified. ENERGY STAR qualified ventilation fans and ceiling fans with lighting can be counted as qualified fixtures.

TABLE 3

ALP Room Category	**Application**	**Fixture Quantity**	**Fixture Description**	**kWh Savings**	**kW Savings**
High Use	Kitchen Recessed	6	Recessed	209	.23
High Use	Kitchen Breakfast Nook	1	Pendant Down-Light	85	.10
High Use	Hallways	2	Flush Mount	143	.16
Med/Low Use	Laundry Room, Storage & Utility Closets	3	Flush Mount	160	.24
Outdoor	Back Door	1	Wall Lantern	84	.07
Outdoor	Garage	1	Flood Light	68	.06
	Total	**14**		**749**	**.86**

[c] This is one example of an ALP of many that could be created starting from a single baseline scenario as shown. This example meets the minimum ALP requirements and uses the same assumptions that are described in the previous footnote.

Simply installing an energy efficient product does not guarantee energy savings. The proper energy efficient fixture plus the correct design layout will yield maximum energy savings. Careful design is critical so the space is not over lit and an excessive number of fixtures avoided. There are multiple design solutions for each application, and a certified lighting design can help with the proper decisions.

Successes, Challenges, and Lessons Learned

Successes in the Field

During 2004, EPA developed five case studies showcasing builders that used the ENERGY STAR Advanced Lighting Package. These builders are early adopters in the market and clear leaders in the promotion and sales of the ENERGY STAR Advanced Lighting Package. Their efforts are to be commended and success to be applauded. The case studies, which are available from ENERGY STAR, clearly demonstrate the business opportunity for builders while promoting energy savings.

D.R. Horton, Sacramento, CA
The ENERGY STAR ALP is a standard feature in all 71 homes built in D.R. Horton's Sierra Valley Oaks, Sacramento development. Not only does D.R. Horton offer 100 percent ENERGY STAR qualified fixtures as standard in every home, they also offer three "luxury" ENERGY STAR qualified *upgrade* options. Most homebuyers select one of the higher-priced, ENERGY STAR qualified lighting packages. The three Sierra Valley Oaks model homes range in size from 2,190 square feet to 3,332 square feet and feature between 3-5 bedrooms and 2-3 baths. Each of the ENERGY STAR qualified lighting packages are displayed individually in the development's model homes. D.R. Horton representative, Rich Coyle, comments that for potential buyers, viewing the fixtures is "a very positive experience, people are pleasantly surprised to learn that the beautiful fixtures are also ENERGY STAR qualified." Rich also says that "selling these popular upgrades is a great profit opportunity" for D.R. Horton.

Kentco Builders and Casa Home Marketing, Worcester, MA
At the Indian Hills development in Worcester, MA, by Kentco Builders, an ENERGY STAR ALP was installed in the 1600 square foot, four bedroom, 2.5 bath, model home and offered as an upgrade to all homebuyers. Homebuyers liked the fixtures and responded favorably, purchasing an average of 7 to 10 ENERGY STAR qualified fixtures in over 95 percent of the homes. Fran Casanova, sales agent for the Indian Hills development, recognized the marketing value of a full ENERGY STAR qualified lighting package. According to Fran, "Selling ENERGY STAR as a whole package – the house, lights, and appliances – makes the ENERGY STAR program even better and sets Indian Hills apart from the competition." Throughout the model, marketing materials promote the energy-efficient features of the building shell, appliances and lighting. Fran tells the homebuyer, "Do not go out and buy [these products] separately, enjoy the benefits of ENERGY STAR as a whole." Selling as a package helps increase revenues for the builder, and the ENERGY STAR ALP alone could save an Indian Hills homebuyer up to $145 a year in energy bill and bulb replacement costs.

Ravenswood Homes, Hamden, CT
Choosing ENERGY STAR products, including the ALP, helped make Ravenswood's Whitney Park development a resounding success. The ALP is standard in all of the 56-units, which are 1,355-1,790 square foot townhomes. All of the units sold over two times faster than expected and, as a result, Ravenswood was able to gradually increase their asking price by 40 percent. According to Deb Quinn, Ravenswood Homes, "The upgraded and beautiful [ENERGY STAR qualified] light fixtures definitely helped us sell the Whitney Park units." The ENERGY STAR qualified fixtures were displayed in the

1,650 square foot, 2 bedroom, 2.5 bath model home. There are a total of 28 fixtures, all are ENERGY STAR qualified.

Reiss Building and Renovation, Hinesburg, VT
Chuck Reiss, of Reiss Building and Renovation, leverages the ENERGY STAR marketing power in all his projects to satisfy increasing demand for greener, more energy-efficient homes. This includes featuring the ENERGY STAR ALP. According to Chuck, the ALP "allows me to provide added value to my customers and provides me another way to differentiate my company by using *high quality* energy-efficient products." Reiss recently demonstrated the added value of an ALP when he renovated a 2,240 square foot 2.5 bath, 3-bedroom home in Burlington, VT. Fifty-three percent of the 43 fixtures in the home are ENERGY STAR qualified. The home-owners are thrilled with the results. "We love our ENERGY STAR lighting."

Madera Subdivision, Gainesville, FL
In Spring of 2003, four builders -- Carter Construction, Edinborough Development Corporation, Brooks Design Construction, and Martin McFall Builders — in cooperation with the University of Florida's Energy Extension Service, started constructing the first four homes in the 88 home Madera sub-division located in Gainesville. FL. Each of the homes feature sustainable design and construction and offer the latest energy-saving technology, including the ALP. The builders showcased their homes to approximately 1,400 potential buyers during the 2004 Spring Parade of Homes. All four homes were sold during or shortly after the Parade. In the Brooks Design Construction 1,892 square foot home, over 90 percent of the lighting fixtures are ENERGY STAR qualified, easily exceeding the ALP Requirements. According to Gary the ALP "differentiates me from other builders in the market; especially in the custom home and remodeling market. I believe the benefits for my clients are real and I believe that pin based fixtures are the way to go because savings are permanent and the life of the lamp and ballast are maximized. But what really convinced me, and will mean the most to my clients, was to see the actual design of the ENERGY STAR qualified fixtures – I was wowed by the technology and design of the fixtures." Gary Brooks now recommends the ENERGY STAR Advanced Lighting Package to all his clients.

From coast to coast, large and small builders are willing to test the ENERGY STAR Advanced Lighting Package. In addition to these five case studies, ENERGY STAR is currently working with over 50 builders across the country to install, promote and sell the ENERGY STAR Advanced Lighting Package.

Challenges

As with any energy-efficient program effort there are challenges. In addition to the technical limitations described earlier there are challenges within the market, as is to be expected. The current housing demand keeps new construction market actors very busy, and many builders have not installed energy efficient lighting let alone sell an energy efficient lighting package. Below is a brief overview of some of the challenges in dealing with these market actors. Surprisingly there is a fair amount of willing market actors, but they need hands-on support to help them avoid pitfalls that could turn them off to future endeavors with energy-efficient lighting.

Builders
The first challenge with builders is getting their attention. Builders are busy, and up until recently most builders have not had to actively "sell" their homes. However, there are builders that are looking to differentiate themselves. Gaining the builders' attention comes down to understanding the builder value

proposition. Each regional market is different, knowledge of the market and knowledge of other builders in the market is necessary to develop the value proposition. Experience and expertise is important to understand and deliver the message to builders and to keep the builder's attention.

After gaining the builder's attention the next challenge is the "one size fits all" approach does not work. Each builder, regardless of size, has a different approach and criteria for selecting lighting fixtures. Some builders are extremely price sensitive while others have more flexible budgets. There are also differences in who is responsible for selecting fixtures. Sometimes the builder's in-house designer is responsible for fixture selection, sometimes the entire lighting design is outsourced to a local lighting showroom or distributor, and sometimes the builder simply gives the homeowner a lighting allowance and sends them to a local showroom or Do-It-Yourself store to select their own lighting fixtures. In some instances the electrician is responsible for the entire lighting package, while in other cases the electrician is responsible for just the recessed downlights, or no lighting at all.

Getting involved as early as possible in the lighting selection process can help address some of these challenges. It is also important to make sure that the builders regular lighting suppliers are educated about the ENERGY STAR Advanced Lighting Package and empowered to help the builder make lighting fixture and design selections.

Once an ENERGY STAR ALP or ENERGY STAR qualified upgrade is installed in the model home, there is no guarantee the package will be actively sold. It is important that the sales agents/builder staff responsible for selling the homes can sell the ALP's benefits. Training and point-of-purchase materials used in the model home or design center can aid in training sales staff and help educate consumers.

Distributors and Showrooms

Regardless if the builder works directly with the manufacturer, or with a distributor/showroom to select the lighting, distributors and showrooms are critical market players in the process. A lighting package will always be distributed through a local distributor/showroom regardless of who helps the builder select the lighting. The showroom will be responsible for fulfilling the order, drop shipping, and servicing the order if there are damaged or broken fixtures.

Working with distributors/showrooms can be a challenge because they view themselves as merely supplying what the builder orders. But the showroom/distributor can influence decisions because they are viewed as lighting experts. In addition, they need to stand behind the product and replace broken bulbs with the correct color temperature and style bulbs, understand how the photocells work and other unique aspects to energy-efficient products. Ordering/shipping times may also vary for ENERGY STAR products and this needs to be anticipated.

Distributors/showrooms servicing builders are not always aware of how ENERGY STAR qualified products differ in quality and performance from non-ENERGY STAR standard fluorescent products, they believe all fluorescent energy-efficient products are created equal -- equally poor quality that is. They need to be educated and trained on ENERGY STAR, and how ENERGY STAR benefits them.

Showrooms servicing smaller builders and custom homes are more involved in the fixture selection. They sometimes pull together the lighting package or work with the homeowner to select the package. In this case the showroom is just as important, if not more important, than the builder. It is critical the showroom understands the features and benefits of energy-efficient lighting.

Unfortunately, lighting (and electrical) is viewed as a commodity that is not up-sold. This is one of the biggest challenges working with all the market actors. Builders try to take costs out of the home not add costs. Plus because of the high housing demand builders are generally not looking to up-sell fixtures, at least this is the distributors' perception[5].

Contractors
Electrical contractors usually install what they are told to install. In cases where they do select the lighting fixture (not the layout – that is the builder's job) they will choose the cheapest fixture available. This makes sense, especially if they get paid a set dollar amount per J-box or per recessed downlight to install[5]. Contractors are also the most difficult market actor to reach and have the least amount of time and interest.

It is no surprise that the electrical contractors are not interested. There is usually no good (profitable) reason for them to change. The builder specifies the lighting package and the contractor installs what the showroom/distributor ships. However, the contractor should be made aware of the difference between ENERGY STAR and standard fixtures. For example, the contractor should know the type of bulbs being installed. Although most ENERGY STAR qualified fixtures come with bulbs, if the contractor needs to replace the bulb they need to be aware of what color temperature, size, and type of bulb to replace. A little technical knowledge for the contractor can help avoid builder and consumer dissatisfaction.

Manufacturers
Manufacturers supply the fixtures to the builders, but are also important for homeowner sales. The corporate office will assist with the sale to the builder, but the local rep works with the builder and the builder's sales staff. Some reps will be champions. They will understand the features and benefits of ENERGY STAR and be willing to push ENERGY STAR over an easier sale. But the rep needs to be sold on ENERGY STAR first. Educating the sales rep can be a challenge, since they are busy making the sale (their first and foremost job) and determining and gaining access to the rep.

Another challenge is to have the reps push the complete ALP, not just a couple ENERGY STAR qualified fixtures. The ALP addresses high, medium and outdoor use fixtures; thus covering a range of usage patterns and applications. If the rep is only pushing a few ENERGY STAR qualified fixtures, these fixtures could end up in more utilitarian applications – laundry rooms, basement, garage, etc. The builders will then not learn of all the decorative ENERGY STAR qualified fixtures.

Four ENERGY STAR Partners – Brownlee Lighting, Progress Lighting, Sea Gull Lighting, Technical Consumer Products (TCP) – offer complete lines of fixtures to meet the ENERGY STAR Advanced Lighting Package requirements. This is a good start and a lot of progress for a year's worth of work. However, more full-line ENERGY STAR qualified fixture selections (from these manufacturers and others) must be made available. ENERGY STAR is currently working with several manufacturers on full-lines that will be launched in 2005.

Overcoming the Challenges

From 2003 to present, EPA ENERGY STAR and ICF Consulting have piloted and launched the ENERGY STAR Advanced Lighting Package to help increase the use of high-quality energy-efficient fixtures in the hard-to-penetrate residential new construction market. Through these efforts five main elements to overcome challenges were identified – 1) A lighting expert who knows the products and market is essential to help the builders, 2) proper tools are required for technical, marketing and sales

assistance, 3) training is a must for key market actors, 4) education of consumers is important, and 5) regular value-added interaction with all market actors is necessary to see the project through.

ENERGY STAR has found that having a lighting expert work directly with the manufacturers, local reps, distributors, contractors and other market actors is the key to achieving success. A lighting expert is one who is experienced working with builders and new construction, is able to identify and proactively address potential problems. Because installing and selling the ALP is uncharted territory for many of these market actors, they may become frustrated through the learning process. The experienced lighting expert helps make it easy for the market actors, and also acts as a coach to keep everything moving. Without this person it is easy for the builder, distributor or others to throw in the towel.

To help overcome challenges, you must first know the market. Who are the builders, distributors, contractors, manufacturers, and homebuyers? Each market is unique. National builders operate regionally, not all manufacturers have penetration in all markets or with all builders. A clear understanding of each market is critical for proper implementation and marketing.

The ENERGY STAR Advanced Lighting Package is coined as "a marketing platform accompanied by a technical specification." So far it appears it is a tool the builders need. Builders' response has been positive because the ALP is designed to help keep things easy for the builder, and provide them marketing assistance that will lead to sales. The ALP balances the application requirements with design flexibility for the builder, and is based on a metric that builders know – number of fixtures.

Training is also found to help overcome the challenges. EPA offers builder lighting training that covers technology, design, sales and marketing. Outlining the features and benefits of ENERGY STAR qualified lighting is a cornerstone of the training, which address common misconceptions. An outcome of the trainings conducted so far is that the builders are able to openly address their concerns and hear the business opportunity with the ENERGY STAR ALP. The value to the builders, manufacturers, distributors, and contractors is that they learn how to profit from the ALP. It is also important to convey to the reps and builders that they are no longer selling a fixture with decorative options – they are now selling a decorative fixture that offers performance benefits (something rarely seen in lighting). Attract the buyer on the aesthetics and sell on the performance.

A critical message to all builders, distributors, showrooms, contractors and homeowners is that ENERGY STAR products are higher quality and laboratory tested, which will help minimize customer dissatisfaction and call backs. Sending this message to all market actors is important. The best approach to address this challenge is through display fixtures in the model home. Some builders use an ENERGY STAR qualified pendant over the kitchen table. This is a high profile location with a lot of traffic, and by placing flowers under the fixture the excellent color properties can be seen.

The strict (and ever improving) quality requirements of ENERGY STAR qualified fixtures, sets ENERGY STAR apart from standard fluorescent and other energy-efficient products. State energy codes are starting to specify fluorescent lighting or energy-efficient lighting, but they usually do not include quality performance requirements such as life, color, instant-on, noise limits, etc. Although energy savings will be achieved, there is a possibility of consumer dissatisfaction if the fixture creates noise, the light is poor color, fails prematurely due to extreme heat, or other issues. This is a major concern for builders. ENERGY STAR is used to help overcome these concerns and provide confidence that the lighting is high quality and energy-efficient.

Education is needed to continue to overcome these obstacles. Point-of purchase materials help educate sales staff and consumers about the benefits, overcome misconceptions, and identify products that are higher quality and save money. Some point-of-purchase examples include: hang tags used on the model home fixtures, an electric meter that compares energy usage of an incandescent light bulb to a compact fluorescent bulb (also useful to demonstrate how fluorescent lighting generates less heat), the ENERGY STAR Advanced Lighting Package Consumer Brochure, and customized ENERGY STAR Advanced Lighting Package savings estimates.

As mentioned previously regular interaction with the builder, distributor, manufacturer representative, and others is critical to see the project through to completion. This is a significant investment. However, this investment will help avoid "bad experiences" the builder may have with energy-efficient lighting, and help provide expertise to the builder, distributor/showroom, and manufacturer representative they can use themselves on future projects. Thus the investment can pay multiple dividends.

Lessons Learned & Helpful Hints

Through the development and initial promotion of the ENERGY STAR Advanced Lighting Package many lessons were learned and many successes achieved. As mentioned earlier the main lesson is that an experienced expert is necessary to interact with the market actors and see the process through to successful completion. The development of point-of-purchase materials, training tools, savings calculators, and a builder brochure were definitely helpful. Not every builder will use every tool, but all builders will use some mix of the resources.

In addition to the lessons learned through the ENERGY STAR outreach, builders provided their insights as well. Below are some tips and insights from builders.

- Let the fixtures sell themselves by displaying them throughout the model home.
- Educate the homebuyers by using ENERGY STAR marketing materials that highlight the features and benefits.
- Use the ENERGY STAR mark to convey that the home contains a high-quality product.
- Publicize the ENERGY STAR partnership to establish credibility that the home is high quality and energy efficient.
- Meet with the builder's marketing, design, and site project managers at one time. During the meeting address all concerns at the same time, and gain buy-in from all the decision makers.
- Educate sales staff on how to explain and sell the benefits of the ENERGY STAR Advanced Lighting Package.
- Motivate the builder sales staff to be enthusiastic about the products, understand the intrinsic benefits of ENERGY STAR qualified lighting fixtures and use this knowledge to sell the package.

There are significant energy savings opportunities in the residential new construction lighting market. With the advent of new technologies and a tested ENERGY STAR Advanced Lighting Package, the

tools are now available to help penetrate this often difficult market sector. Builders are still very cautious about energy-efficient lighting, primarily because of misconceptions, but the abundance of low-quality energy efficient product in the market could lead to bad experiences for builders. The ENERGY STAR Advanced Lighting Package provides builders the necessary tools and the proper outreach can help guide the builders to success.

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