Lighting for the 21st Century Home and New Program Approaches

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The Case of the ENERGY STAR Residential Lighting Retrofit:
One woman’s tale

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The Backstory

Location: Dunwoody, GA

• 2800 Square feet single
• Approx. 20 rooms (closets incl.)
• 20 years old
• 4BR/2.5BA
• Electric bill: Averaging 2100 kWh @12.6¢/kWh

Goal: Lighting retrofit with Energy Star products
The Backstory continued

• Incandescent and CFLs
• Interior lighting approx. 4600W
• Insufficient light levels
  • Master bath
  • Master bedroom
  • Family room
• Burned out lamps
The Lighting Survey

- 32 downlights
- 4 Table lamps
- 4 Pendants
- 12 Ceiling Mount
- 1 Bath vanity
- 1 Ceiling fan light kit
- 80 Medium base sockets
- 23 Candelabra base sockets
- 3 Intermediate base sockets
Procuring the goods
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Replacement and retrofitting

- Kitchen – downlights and pendant
- Family room – ceiling fan light kit
- Powder room – bath vanity
- Master Bath – downlights and new luminaire
- Upstairs Bath – downlights
- Various ceiling mount luminaires
Replacement and retrofitting

Most relamping completed:

- Using a step stool for low ceiling heights
- Using a small ladder for higher ceilings
- Without the use of tools

Insights:

- LED lamps noticeably heavier than incandescent
- Defective lamps encountered
Replacement and retrofitting

Installation of new luminaire:
• Junction box misalignment
• Hard to remove existing coverplate
• More time on ladder
The Financials

First Costs: $280 pre-tax

- LED candelabra: $6.50/lamp in 3-pack
- LED BR30: $10/lamp in 2-pack
- LED ceiling luminaire: $20
- CFLs bare spiral: $2/lamp in 4-pack

Reduced lighting wattage by 1600W (35%)  
Impact to utility bill – to be determined
Outcomes: The Expected and Unexpected

- 75% of sockets are medium base
- More than 80% of medium base sockets have horizontal orientation
- There is a market for LED ceiling mount luminaires with a brass finish
- Cost of Energy Star LED lamps still an obstacle
- CFLs chosen for non-dimmed sockets and luminaires with frosted glass
- Delayed retrofitting for rooms with minimal use, e.g. dining room, and hard to access areas, e.g. 2-story foyer
Outcomes: The Expected and Unexpected (more)

- Several lamps available at retail
  - Little variation in metrics, i.e. color temperature, CRI
- Multiple packs for lamps result in expensive lamps to store
- What to do with incumbent lamps that still work
- 2700K lamps look noticeably cooler than incandescent
- Dimmable LED lamps operated as expected on existing slider dimmer – no flicker or drop out
Helpful Resources for the Homeowner

- ENERGY STAR Website
- ENERGY STAR Twitter Chat Parties
- Electric Utility Websites
- Home Center displays and salespersons
- Lighting for Tomorrow
- Search Engines

LRC Lighting Pattern Book
Questions?

Thank you!