

Practical LED Applications and Transformational Lighting

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BENYA LIGHTING DESIGN

# NICHE TO MAINSTREAM

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## The North American Lighting Markets

<b>Residential</b>	<b>Commercial</b>
<ul style="list-style-type: none"><li>▪ Commodity – architectural</li><li>▪ Commodity - traditional</li><li>▪ Decorative</li><li>▪ Specialty and Niche</li></ul>	<ul style="list-style-type: none"><li>▪ Commodity – white goods + industrial</li><li>▪ Commodity – architectural</li><li>▪ Performance</li><li>▪ Decorative</li><li>▪ Niche</li></ul>

From Adversity Cometh Opportunity

### A New Record the Lighting Industry Could Do Without: Fourth-Quarter 2008 Lighting Systems Index Reaches Ten-Year Low

*National Lighting Bureau, February 18, 2009*

## Key Drivers for Change

- USGBC/LEED
- Architecture 2030
- ASHRAE/IES/USGBC 189.1
- California AB 1109 (25% reduction to indoor lighting energy by 2018/50% residential)
- California AB 32 (1997 Greenhouse gas rate by 2020)

## Sustainability Impacts to the Market

1. More daylight *integration*
2. Less *general* lighting
3. More *purposeful* lighting
4. Less *ornamental* lighting
5. More *system* efficacy
6. Less *gratuitous* lighting
7. More energy codes and *regulations*
8. Less wiggle room for *playful* lighting

## Transforming Lighting

### *Reasons to re-invent lighting as we know it*

1. Lighting is based on the bulb and tube.
2. Light bulbs fail and must be replaced
3. Lighting prefers to be room temperature
4. Lighting prefers voltage to current
5. Light sources are big
6. Light bulbs are hot
7. Lighting controls are either crude or \$\$\$

## Niche vs. Mainstream

### Niche product

- Excels at either or both
  - Appearance
  - Performance
- Cost is a consideration
- Small quantities, high price

### Mainstream product

- Good value at either or both
  - Appearance
  - Performance
- Cost is a deciding factor
- Large quantities, reasonable price

## Niche



## Mainstream




Transformational lighting moves new technology into the Mainstream

**OUT OF THE CAN AND OFF THE TRACK**

## Non transformational



### Transformational Niche



A collage of images showing various LED light fixtures. On the left, there are four circular and square recessed light fixtures. On the right, there is a close-up of a light fixture mounted on a wall, possibly a track lighting fixture.

### Transformational: Big Niche



A photograph of a large, multi-door commercial refrigerator or freezer unit with glass doors, filled with various products. The unit is illuminated from within, highlighting the contents.

### Transformational: the Downlight



In the can      Out of the can

A collage of images showing different types of downlights. On the left, there is a decorative, tiered downlight labeled "In the can". On the right, there is a modern, square downlight labeled "Out of the can".

### How SSL's Advantages Affect the Art of Luminaire Design

### Planar Luminaires



A collage of images showing various planar luminaire designs. On the left, there are several recessed ceiling lights. On the right, there are modern, flat, rectangular fixtures, some of which are illuminated.

### Ring Luminaires



A collage of images showing various ring luminaire designs. On the left, there are circular fixtures with glowing edges. On the right, there are rectangular fixtures with glowing edges, some of which are illuminated.

### Task Luminaires



### Portable Luminaires



### Outdoor Luminaires



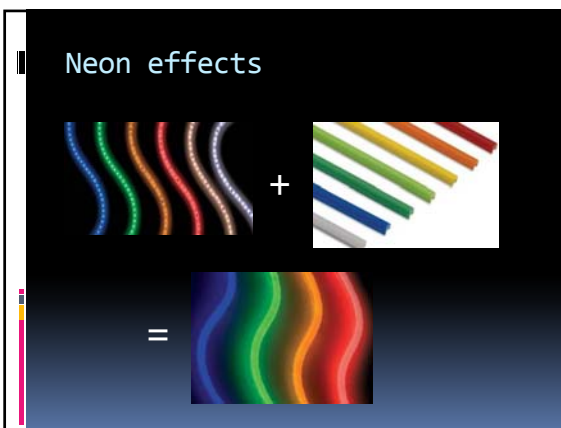
### Amazing Designs



### Superior Effects



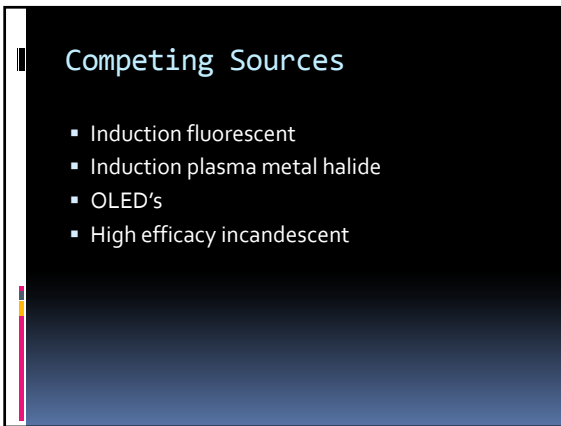
### How SSL's Advantages Affect Lighting System Design



- ### The Best Opportunities for SSL
- Smaller luminaires
  - No reflector needed
  - Small discrete luminaires
  - Not hot to touch
  - Optical control with individual aiming
  - Low voltage and low power
  - Easy to control and dim
  - Shape flexibility

- ### The Worst Opportunities for SSL
- Big lumen packages
  - Big fixtures
  - Large area lighting
  - Long throws
  - Distant mounting
  - Exposed high brightness lamps





Competing Sources

- Induction fluorescent
- Induction plasma metal halide
- OLED's
- High efficacy incandescent



Completely Changing the Lighting and Electrical Industry in the next decade

Posted at [www.benyalighting.com](http://www.benyalighting.com)

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