



LED WATCH

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SSL AND DOMESTIC MANUFACTURING

Market conditions point toward more opportunities for nimble U.S. players

While the U.S. has attracted SSL investments by major lighting multinationals as well as hundreds of small and medium-sized companies representing all parts of the value chain, early technology leadership doesn't necessarily translate into sustained manufacturing strength, as the histories of the semiconductor and solar panel industries illustrate.

But U.S. luminaire manufacturers are well positioned to benefit from the SSL revolution. Manufacturing plants are transitioning from conventional to LED lighting products, and increasing customization requires local suppliers and solutions. As new value propositions for lighting are developed, the question arises as to what can be done to maintain and grow U.S.-based manufacturing across the entire value chain, and to expand export opportunities for U.S. products.

WE ASKED THE EXPERTS

The U.S. Department of Energy's 14th annual SSL R&D Workshop, held a few months back in Long Beach, CA, included a panel of experts who considered that topic. One panelist was Mark Benguerel of Finelite, which designs and builds lighting systems for the office, educational, healthcare and retail markets and does all of its manufacturing in California. Benguerel noted that fluorescent lighting comprised 95 percent of Finelite's sales in 2011, whereas 95 percent of the company's sales are now SSL.



He explained that the transition from fluorescent to SSL has enabled Finelite to focus on producing "tailored lighting," which is defined by the customer's needs and architecture rather than by predetermined configurations and thus is free of traditional constraints on length, wattage and color. Benguerel related how adjusting the manufacturing process to the concept of tailored lighting (i.e., giving every luminaire a unique ID number that's central to the whole process) has shortened lead times, thus adding value and strengthening competitive advantage. Citing SSL as an opportunity to add jobs domestically, Benguerel noted that Finelite has added 700 U.S. jobs in the past five years and predicts that by the

year 2040, approximately 75 percent of the built environment will be either new or renovated, providing SSL manufacturers with a huge opportunity to leverage the technology's advantages.

Another panelist was Mark Hand of Acuity, which sells 98 percent of its products in the U.S. but manufactures both here and abroad. Hand explained that manufacturing overseas works with a limited number of SKUs and products that are small and light enough to minimize shipping costs, but he pointed out that the long lead times that result are unsuitable for many applications and also expose the manufacturer to being stuck with merchandise that's been rendered obsolete by sudden market shifts. Manufacturing in the U.S., Hand noted, not only reduces lead times and shipping costs, but also lends itself to complex designs and innovation. He cited lean manufacturing as the key to reducing labor costs here in the U.S.; e.g., where Acuity once had 28 people producing 280 units per hour in 5,000 sq ft of space, that production has increased to 300 units per hour using only 16 people in 2,200 sq ft of space.

HUMAN RESOURCES

Panelist Eric Haugaard of Cree cited the importance of optimizing manu-

SIX REASONS TO INVEST

Through roundtable meetings and workshops sponsored by DOE, industry representatives have identified six closely interrelated factors that would lead a company to invest in U.S.-based manufacturing or engineering facilities:

- **Access to Markets.** For smaller commodity-like products with low shipping costs, manufacturers can successfully serve global markets from virtually any location. For other products, manufacturing in close proximity to markets and customers is a competitive advantage.
- **Access to Supply Chains.** Most SSL manufacturers source from suppliers around the globe based on competitive pricing, quality and service. Locating in proximity to suppliers can speed adaptation to constantly evolving product designs and customer demands.
- **Access to Innovation.** Luminaire and light-engine producers seek solutions that are increasingly optimized for flexibility, materials efficiency, weight reduction, ease of assembly, and integration of sensors and controls, and that enhance product life as well as performance factors such as color stability over time.
- **Intellectual Property Protection.** Many executives cite intellectual property protection as an essential factor that favors U.S.-based manufacturing, one that is especially relevant for companies utilizing proprietary techniques.
- **Labor Costs, Productivity and Quality.** While labor rates are higher in the U.S. than in many other areas of the world, productivity and quality considerations can provide a competitive counterbalance. Data indicate that U.S. manufacturing productivity and output have been trending positive, keeping pace with or exceeding those of some key Asian and European competitors. Quality control is another factor that can favor U.S.-based manufacturing operations.
- **Government Incentives.** Many Asian countries have offered incentives to attract manufacturing investments, while U.S. federal, state and local taxes are relatively high, government support for manufacturing has been comparatively modest, and support for SSL has come primarily in the form of electric utility rebates and other incentives that indirectly benefit manufacturers by spurring demand. But some role reversal has been happening lately, with China deemphasizing incentives in favor of measures to stimulate demand, while some states and localities in the U.S. are instituting more high-profile tax incentive policies to attract manufacturing and R&D in targeted sectors such as SSL.

facturing space utilization, using flexible manufacturing technologies that support rapid innovation and keeping inventory in least-common-denominator form. Haugaard noted that the

Cree facility has more than doubled its number of employees over the past five years, and called human-resource management the biggest challenge for any kind of manufacturer. While Cree is using

robots in its manufacturing, those robots integrate well with humans—an essential characteristic. Haugaard predicted that SSL products will feature new form factors, be smaller and weigh less, offer more options for housing materials and offer many different SKUs created from a small bill of materials.

Panelist Warren Weeks of Hubbell Lighting noted that his company manufactures its “stock-and-flow” products—such as LED downlights—overseas, while its more-complex products that entail high numbers of SKUs are made in the U.S. Weeks observed that although Hubbell’s business model hasn’t changed much since the advent of SSL, the company itself has undergone drastic changes, such as retooling its factories and retraining its workforce. The technical skill sets of that workforce, he said, have shifted from mechanical to electromechanical, electronics and software. Although the number of Hubbell’s employees has increased along with revenue growth, “right-sizing” has resulted in a reduction in the number of manufacturing facilities.

As these panelists illustrate, solid-state lighting manufacturing in the U.S. is very much alive and well, and its future looks—if you’ll forgive my pun—bright indeed for those companies that are willing to keep pace with a rapidly changing market, and flexible enough to adapt to a similarly evolving manufacturing landscape.

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