

# SSL Postings

U.S. DEPARTMENT OF ENERGY

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## The Outlook for SSL Manufacturing in the U.S.

As our [“SSL in America” series of Postings](#) attests, the U.S. has quietly but surely been growing a solid-state lighting manufacturing base. Some of this growth is due to “on-shoring,” but a fair amount of SSL manufacturing has originated here. That’s not surprising, considering that the U.S. has been at the epicenter of SSL innovation, with U.S.-based researchers and product developers playing instrumental roles in toppling cost and performance barriers, and in positioning SSL for rapid market growth.

But early technology leadership doesn’t necessarily translate into sustained manufacturing and employment strength. The future of SSL remains to be written, and decisions being made today will influence the shape of the industry for decades to come. Through DOE-sponsored roundtables and workshops, industry executives have offered valuable insights on the question of what would lead a company to invest in U.S. manufacturing or engineering facilities. These insights, and much more on the topic, are discussed in a new white paper, [“Prospects for U.S.-Based Manufacturing in the SSL Industry,”](#) which considers just how much our economy will benefit from the robust business and job creation that’s emerging as solid-state lighting continues to develop. The executives identified six closely interrelated factors that generally weigh in location decisions:

- **Access to markets.** For smaller, commoditized products with low shipping costs, manufacturers can successfully serve global markets from virtually anywhere; but for other products, such as commercial luminaires, manufacturing in close proximity to markets and customers confers a competitive advantage by minimizing turnaround time, inventories, and shipping costs. The need to localize will likely intensify with the integration of increasingly customized systems for monitoring and control, color tuning, and smart communications into SSL luminaires. Because the U.S. is a rapidly growing and potentially enormous market for SSL luminaires, the case for manufacturing and engineering here is compelling for many companies.
- **Access to supply chains.** Most SSL manufacturers source from global suppliers, and being located near them can speed adaptation to constantly evolving product designs and customer demands. Sometimes supplier considerations weigh against a U.S. location. For example, Digital Lumens,

which makes intelligent LED lighting for commercial and industrial applications, does all its manufacturing in Asia except for final assembly, because its supply chain for custom power supplies, optics, and sensors is there. In contrast, the material supply chain for luminaire manufacturer Finelite is centered in California, which was a factor in the company's recent on-shoring of its desk lamp and undercabinet lamp production back to the U.S. from China.

- **Access to innovation.** Constant innovation is a competitive necessity in SSL manufacturing, and this often means collaborating with the right partners. Since proximity to a critical mass of expertise can be a powerful advantage, companies continually monitor “where the action is” in terms of innovation, and regional levels of R&D investment are a significant indicator. SSL R&D is funded predominantly by industry in the U.S., Europe, Taiwan, South Korea, and Japan, augmented by government co-funding of strategically selected precompetitive technologies.
- **Intellectual property protection.** Many executives cite this as an essential factor that favors U.S.-based manufacturing, one that's especially relevant for companies utilizing proprietary techniques. Phosphor manufacturer Intematix, for example, maintains a Chinese presence in order to obtain the Chinese-mined rare-earth materials used in its products, yet does the majority of its manufacturing in California to enhance protection of its proprietary formulas as well as to access specialized materials science skill sets. Likewise, the necessity of protecting MOCVD growth technologies has led companies such as Philips Lumileds and Cree to focus their epitaxial wafer production in the U.S.
- **Labor costs, productivity, quality.** While U.S. labor rates are higher than in many other areas of the world, productivity and quality considerations can provide a competitive counterbalance. Recent data indicate that U.S. manufacturing productivity and output have been keeping pace with, or exceeding, those of some key Asian and European competitors. The competitiveness of the U.S. labor force, particularly in highly skilled and automated operations, is borne out by a number of instances of companies deciding to onshore SSL manufacturing — e.g., Carclo moved its optic molding operations here from the U.K. in 2008 and has since added considerable capacity to its U.S. operations; and TOGGLED, which initially manufactured commercial-grade LED replacements for fluorescent tubes in China, automated and relocated its manufacturing to the U.S. in 2012.
- **Government incentives.** While many Asian countries offer substantial incentives to attract manufacturing investments, U.S. support for SSL has come primarily in the form of market-side rebates and other incentives that indirectly benefit manufacturers by spurring demand. Nevertheless, state and local tax incentives have been a factor in attracting such companies as Cree and OLED developer Universal Display Corporation to make significant investments in U.S.-based infrastructure and R&D. Some U.S.

states and localities are instituting more high-profile tax incentive policies to attract manufacturing and R&D in targeted sectors such as SSL. For example, Sora, a California-based LED lamp manufacturer, announced plans to open a new plant next year in Buffalo, NY, with support from that state's Buffalo Billion initiative.

Despite the positive indicators for U.S.-based SSL manufacturing, industry leaders cite a host of challenges — from a thinning out of the domestic supply chain to diminishing technical support from university and government laboratories — and many advocate active roles for federal, state, and local governments in increasing U.S. competitiveness. Regardless of the challenges, though, it's clear that the U.S. is well positioned to attract SSL engineering and manufacturing investments — at least some of the time, in some circumstances. But keeping U.S. SSL manufacturing competitive will require efficiency, flexibility, and innovation.

For more on this important topic, see the white paper, which is available on the [DOE SSL website](#).

As always, if you have questions or comments, you can reach us at [postings@akoyaonline.com](mailto:postings@akoyaonline.com).