Postings: from the desk of Jim Brodrick

If I had to choose one word to summarize what I took away from the U.S. Department of Energy's (DOE) third annual Solid-State Lighting (SSL) Manufacturing R&D Workshop, which was held last week in Boston, it would be "optimism." Why? Because optimism was a recurrent theme that ran through many of the panels and presentations, and it was contagious. It was ignited by two plenary talks that opened the workshop – one by Ross Young of IMS Research, and the other by B.J. Lee, chairman of Epistar, one of the world's largest LED manufacturers.

Ross noted the healthy growth we're seeing in packaged high-brightness (HB) LEDs, sales of which rose 55% in 2010 to approach $10 billion – with lighting overtaking mobile phones to become the number-two application for HB LEDs, behind only TVs. He added that LEDs are projected to grow to serve one-third of the North American lighting market by 2015 in terms of units sold, and three-fourths of that market in terms of revenue.

B.J's overarching message was that LED lighting is well on its way and will soon be here in full force. He identified general lighting as a key driver of the LED market in the long-term, predicting that it will account for about one-fourth of the HB-LED market in 2015, and cited an industry forecast that LED replacement lamps will become mainstream by that year and comprise three-quarters of the market by 2018.

B.J. singled out price and performance as the keys to consumer acceptance of SSL, observing that $40 for a 60W replacement lamp

– the current retail price point – is simply too expensive and needs to come down to around $8 to achieve 25% market penetration in the US. He said that to get that penetration, lumens per dollar is just as important a metric as lumens per watt, and cited 500 lumens per dollar as a key milestone in that regard, which he said could be achieved as early as 2013.

Along those lines, a workshop panel took a close look at SSL manufacturing costs – diving deep down into the nitty-gritty to analyze where those costs are coming from and how they can be lowered. Gerry Negley of Cree LED Lighting Solutions described how design improvements enabled his company to decrease the manufacturing cost of one of its products by 30%. He noted that in an LED luminaire, the LEDs represent less than 30% of the total cost, with metals and electronics accounting for about 50%.

Fred Maxik of Lighting Science Group made the point that while the industry's current focus is primarily on retrofitting, the greatest opportunity to reduce SSL costs will be to create a completely new form that's optimally suited to take maximum advantage of the technology. He said instead of trying to shoehorn LEDs into form factors that were developed for incumbent technologies, the industry should think beyond that, and cited hybridization and integration, as well as simplification, as other keys to cost reduction.

Eric Haugaard of BetaLED identified the light engine as accounting for the most significant portion of the material costs, and discussed rethinking its design to minimize the layers – for example, by making the chip package and circuit board integrated – as one way of bringing those costs down. He also observed that portions of the SSL manufacturing process are much better suited to automation than are traditional lighting technologies. Automating those portions would not only reduce costs, but would also beef up the case for manufacturing domestically.

The case for U.S. manufacturing was eloquently presented by a

separate panel of representatives whose companies are doing a significant portion of their manufacturing here. For example, Cherian Jacob of GE Lighting Solutions said one reason his company manufactures LED outdoor lighting products primarily in the U.S. is because being close to the market enables them to make their products to order by shortening lead time.

Ralph Tuttle of Cree, which has added more than 800 fulltime jobs at its North Carolina headquarters since 2009, acknowledged that many foreign countries offer manufacturers very attractive incentives to locate there. But he cited a host of overriding factors that have led Cree to remain largely in the U.S. – among them intellectual property concerns, proximity to R&D, and a reliable, educated, and stable workforce.

As I mentioned last week, DOE sponsors these workshops to help shape its SSL Manufacturing Roadmap, which is revised each year and guides our manufacturing R&D initiative and funding solicitations. But just as the Roadmap also serves as an important resource for the SSL industry as a whole, so do the workshops, by facilitating cooperation, sharing, and an ongoing dialog that helps put everyone on the same page. That sense of cooperation, sharing, and open dialog was stronger than ever last week in Boston, and left us all feeling that firm footing has already been established and that now SSL is ready to move into general lighting in earnest.

As always, if you have questions or comments, you can reach me at postings@lightingfacts.com.