

November 24, 2014

A Special Note of Thanks

As we approach a holiday that's all about gratitude, I'd like to take this opportunity to express my personal gratitude to Shuji Nakamura, Isamu Akasaki, and Hiroshi Amano. In awarding the three of you the 2014 Nobel Prize in Physics, the Nobel committee acknowledged not just your brilliant and singular achievements in developing the efficient blue LED—which paved the way for the development of the white LED—but also the profound impact this technology will have on the world. And it's also important to acknowledge your many predecessors and successors, whose R&D efforts laid the groundwork for your invention and have carried forth the technology's rapid subsequent development.

Even at this very early stage, the technology development you set in motion is already having a significant impact. LEDs in general lighting applications saved the U.S. 188 tBtu in 2013—enough to power more than 1.5 million homes during that same period, and worth \$1.8 billion. That's just a drop in the bucket compared to what could be saved with full market penetration, but the numbers are staggering nonetheless. In my entire tenure at DOE, there has not been any other technology that has had anywhere near that level of impact, particularly in such a short span of time.

But it's clear that the impact of LED lighting will extend well beyond energy efficiency. There will also be benefits to productivity, health, the environment, agriculture, animal husbandry, automobile safety and efficiency, quality of life—and much more. How lighting is perceived, used, and valued will also change dramatically. By the time they become adults, today's children will expect much more from lighting than we do now, yet the cost and environmental impact of this greatly increased value will be less than it is today.

Thanks to the efforts of Shuji, Isamu, Hiroshi, and many other researchers worldwide, LED lighting technology has come a long way—light-years, you might say—since DOE launched its SSL Program in 2002. So long a way, in fact, that even if all SSL research were to stop right now, we would still enjoy many of the benefits described above. But that doesn't mean we should take our foot off the accelerator, because there remain many scientific challenges still to be met before we can unlock the technology's full potential.

Understanding, mitigating, and solving current droop can improve lighting performance, simplify luminaire structures, and reduce costs. Unraveling the mystery of the “green gap” can enable efficient, color-tunable lighting with the maximum theoretical efficacy. Quantum dots offer the potential of improved control, resolution, and efficacy of the emitted spectrum. But less-dramatic refinements are also critical. For example, LED luminaires can be reconsidered “beyond the bulb” for improved integration, delivery of light, and building integration. LED packages and arrays can be engineered with power supply electronics into compact, easy-to-use modules. Flexible manufacturing can be developed to maximize the range of lighting products with the minimum number of building blocks.

In short, there’s still much more R&D work that can be done to maximize the impact of the invention of the blue LED. That's why DOE has selected Shuji to give the opening remarks at our [12th annual SSL R&D Workshop](#), which will be held in San Francisco January 27–29, 2015. I can’t think of anyone more qualified to inspire the industry to think about what’s next for SSL R&D, and what it will take to make that next leap forward.

I hope to see many of you in San Francisco. Meanwhile, a very Happy Thanksgiving to all!

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