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A Look Back at 2015

Looking back at the year 2015, there's been a clear recognition that SSL is in the process of redefining lighting on multiple levels — not just in terms of how it's delivered and powered, but also with regard to how we conceive of it and what we expect from it. It's also clear that SSL science and engineering still have quite a ways to go to fulfill the technology's promise and potential — despite all the dazzling progress that's been made to date. The [DOE SSL Program](#) works hard on multiple fronts to help make sure this happens. Below are some highlights of what we did in 2015:

- **DOE starts crosscutting dialogue on connected lighting.** In November 2015, DOE convened the inaugural [Connected Lighting Systems Meeting](#), which drew more than 260 participants from the semiconductor, IT, and lighting industries. The intent was to start a dialogue about how best to harness lighting systems with the rapidly emerging Internet of Things. That dialogue has continued and is spreading to include new players and efforts all the time. More details are available on the [DOE SSL website](#), where we added an informative [section devoted to connected lighting](#). Our goal is to make sure that energy savings don't get lost in the shuffle as new lighting benefits and values are enabled by SSL technology
- **Report estimates LED lighting adoption and impact.** In July 2015, DOE published a report, [Adoption of Light-Emitting Diodes in Common Lighting Applications](#), that estimated the energy saved due to current levels of LED penetration as of 2014, as well as the potential energy savings if each of the applications considered switched completely to the best available LEDs. From 2012 to 2014, LED installations more than quadrupled to 215 million units overall. That may sound like a lot, but overall market penetration was only 3% (versus less than 1% in 2012). So although LED installations saved 143 trillion British thermal units (tBtu) of primary energy in 2014 (saving about \$1.4 billion), that figure would have been 4,896 tBtu if each application had switched completely to LED — which means we're only saving about 3% of the energy today's LED products could be saving. Of those 4,896 tBtu, linear and low-bay/high-bay products account for more than 60%, indicating that those two applications hold the greatest potential for future energy savings from SSL.
- **LED Lighting Facts[®] database offers market snapshot.** The magnitude of SSL's remaining potential is borne out by the [LED Lighting Facts](#) database. With more than 35,000 registered products by the end of 2015, that database provides

up-to-date insights into the performance of market-available LED lighting products, and a look at their efficacies shows that the average is 88 lm/W — far short of DOE’s 2020 target of 200 lm/W, as set forth in our [SSL R&D Plan](#).

- **DOE funds 19 new SSL R&D projects** to help the technology reach its potential. In 2015 we awarded 10 new projects through the funding opportunity announcement process, for a total value of \$13 million. These projects include applied research in LED droop and downconverters, product development in novel luminaire systems, and research into OLED emitter materials and manufacturable light-extraction approaches. On top of this, nine new SSL Small Business Innovation Research (SBIR) projects were awarded, working on topics ranging from advanced controls to new emitter and downconverter materials.
- **CALiPER study examines color-tunable LED products.** In August 2015, DOE issued the [first report](#) in a [CALiPER](#) series on color-tunable luminaires. Report 23: *Photometric Testing of White-Tunable LED Luminaires* raised a number of questions about existing test methodology and its application to this category of products, which will require further discussion and consideration in the near future. To complement the report, we added related [web content](#) to provide preliminary guidance on testing, specifying, and controlling color-tunable luminaires. Four such luminaires were among those recognized as outstanding by the 2015 Indoor [Next Generation Luminaires](#)[™] (NGL) Solid-State Lighting Design Competition.
- **CALiPER and GATEWAY take deep dives into key issues.** In 2015, the [CALiPER](#) and [GATEWAY](#) programs continued to examine issues central to solid-state lighting’s continued advancement, issuing in-depth reports on [MR16](#) lamps, challenging applications ([high-flux/high-temperature](#) and [airport apron](#)), university lighting ([exterior](#) and [interior](#)), and extensive streetlight conversions in [Portland](#) and [Detroit](#).
- **Clarifying color rendition.** In August 2015, the Illuminating Engineering Society (IES) published an important technical memorandum, TM-30-15, which outlines a new system for evaluating the color rendition of light sources. TM-30 remedies flaws and limitations of the widely used CRI method, while providing additional as well as more detailed information. DOE hosted two [webcasts](#) on the topic in September 2015 — which together were attended by more than 1,600 viewers — and the following month published a [Technology Fact Sheet](#), with more related resources [still to come](#).
- **Accelerating OLED development.** In September 2015, DOE hosted a meeting that brought OLED stakeholders to Pittsburgh from across the country. The goal was to build on discussions from previous DOE-hosted OLED meetings and provide a forum for open dialogue on OLED technology advances, R&D needs, opportunities for increased collaboration, and efforts to advance OLED market viability. One topic discussed was DOE’s [testing opportunity for OLEDs](#), which was initiated in 2014 and picked up steam in 2015, providing companies with quick feedback on various R&D approaches, compared to the two-year timeline for traditional DOE R&D projects.

So you can see that in 2015, solid-state lighting continued to advance, and yet much remains to be done to ensure that we realize its full potential. To that end, I invite you to join us next month in Raleigh, NC, at the 13th annual [DOE SSL R&D Workshop](#), so that together we can work toward creating the “brightest” possible future.

Best regards,
Jim Brodrick

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