

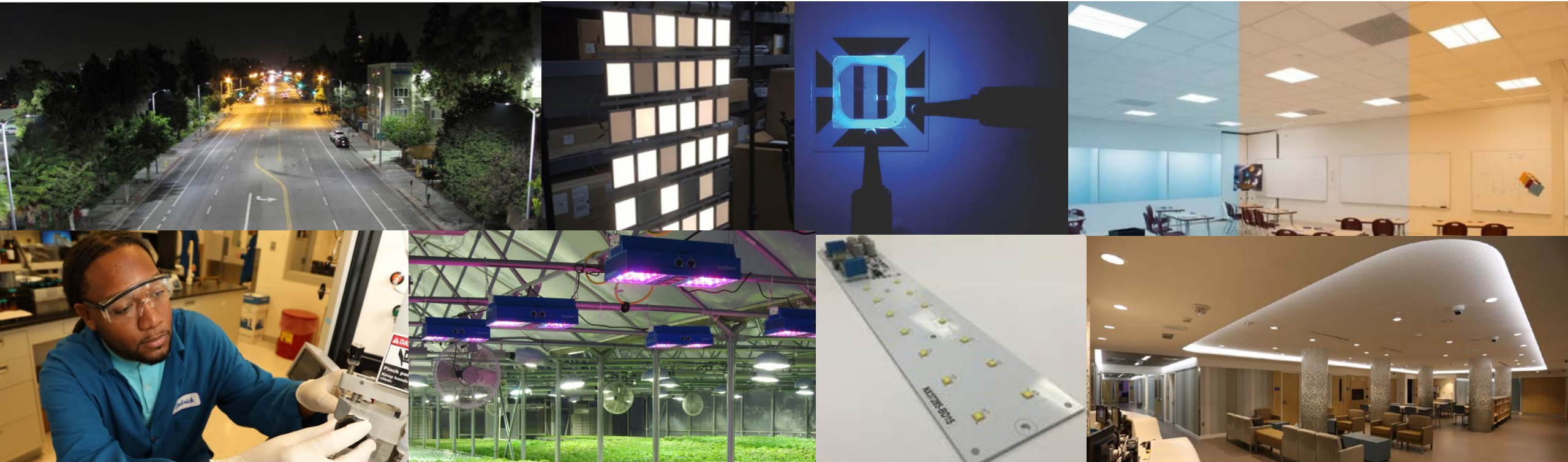
U.S. DEPARTMENT OF
ENERGY

Office of
ENERGY EFFICIENCY &
RENEWABLE ENERGY

SSL Technology R&D Workshop Welcome

James R. Brodrick, Ph.D., Lighting Program Manager

November 8, 2017



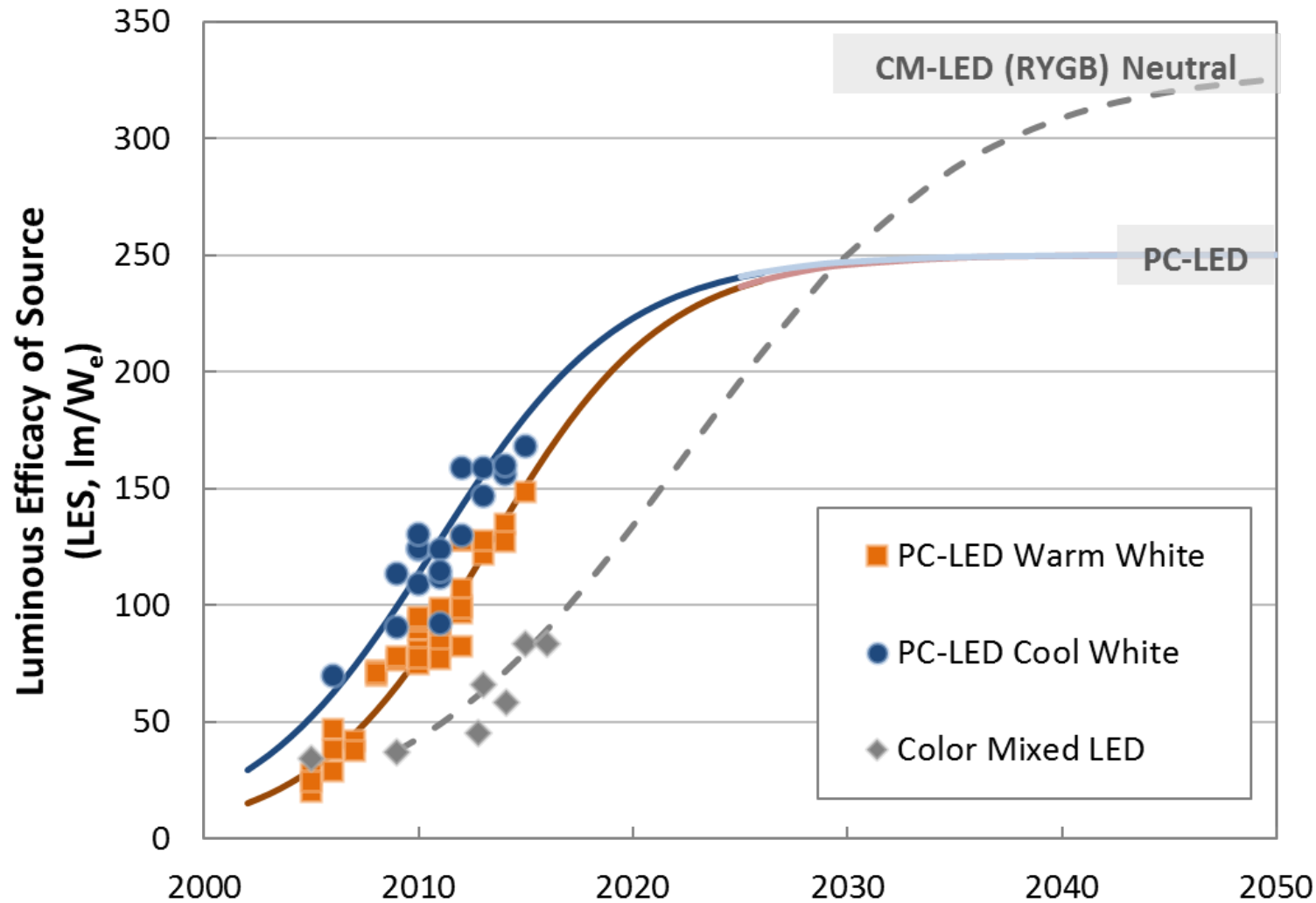
A Look Back: 2007



Kevin Dowling, at the inaugural DOE SSL Technology Development Workshop in 2007

- Key questions in 2007:
- Is this LED thing a fad?
 - Where might LED R&D take us?

A Look Ahead: 2017 DOE Targets



**Researchers believe
250–350 lm/W
is possible**

Top Performers from LED Lighting Facts® Database



Orion Ison High Bay Fixture
209 lm/W

Cree ZR22 Troffer
153 lm/W

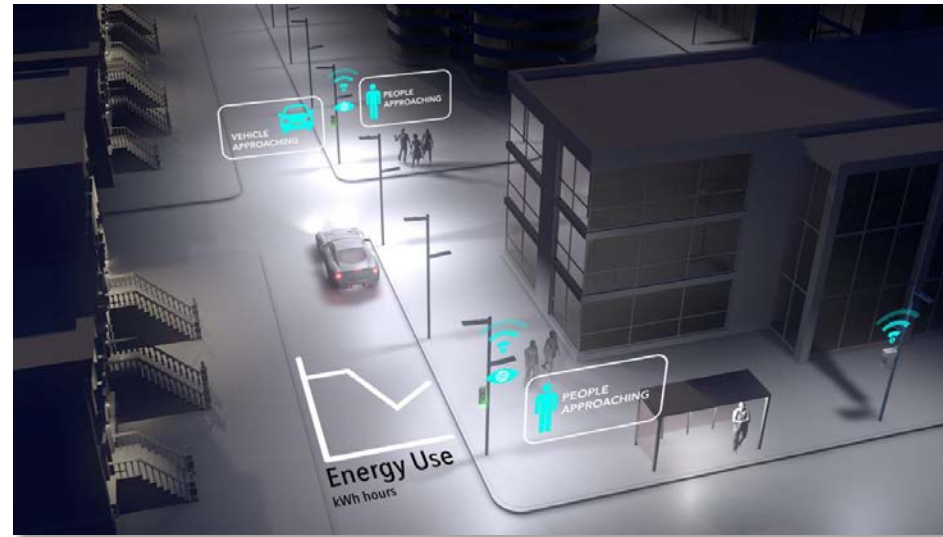


Teslights Smart LED Streetlight
158 lm/W



Orion Apollo Multipurpose Linear
177 lm/W

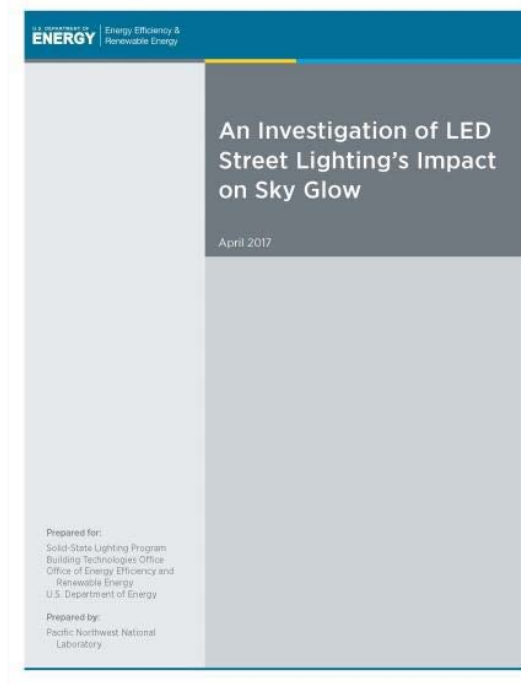
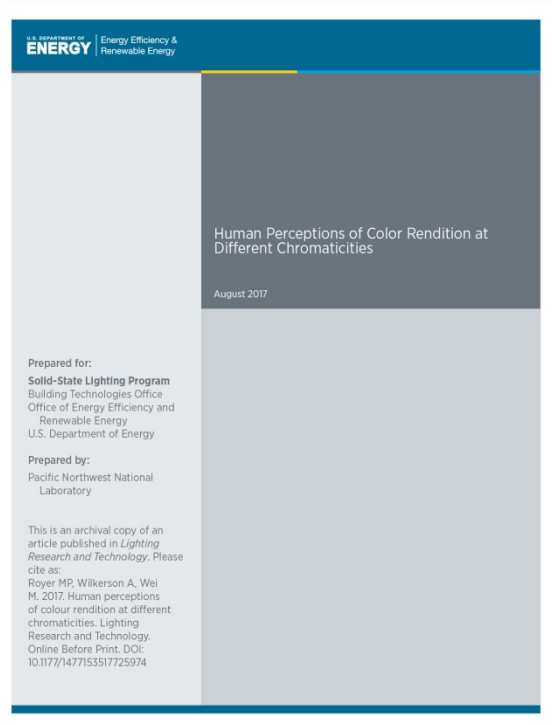
New Opportunities Challenge Old Thinking



**Will new applications
save energy, or use more?
Does that matter?**

New Studies Challenge Old Thinking

What have we learned about the effect of street lighting on sky glow?



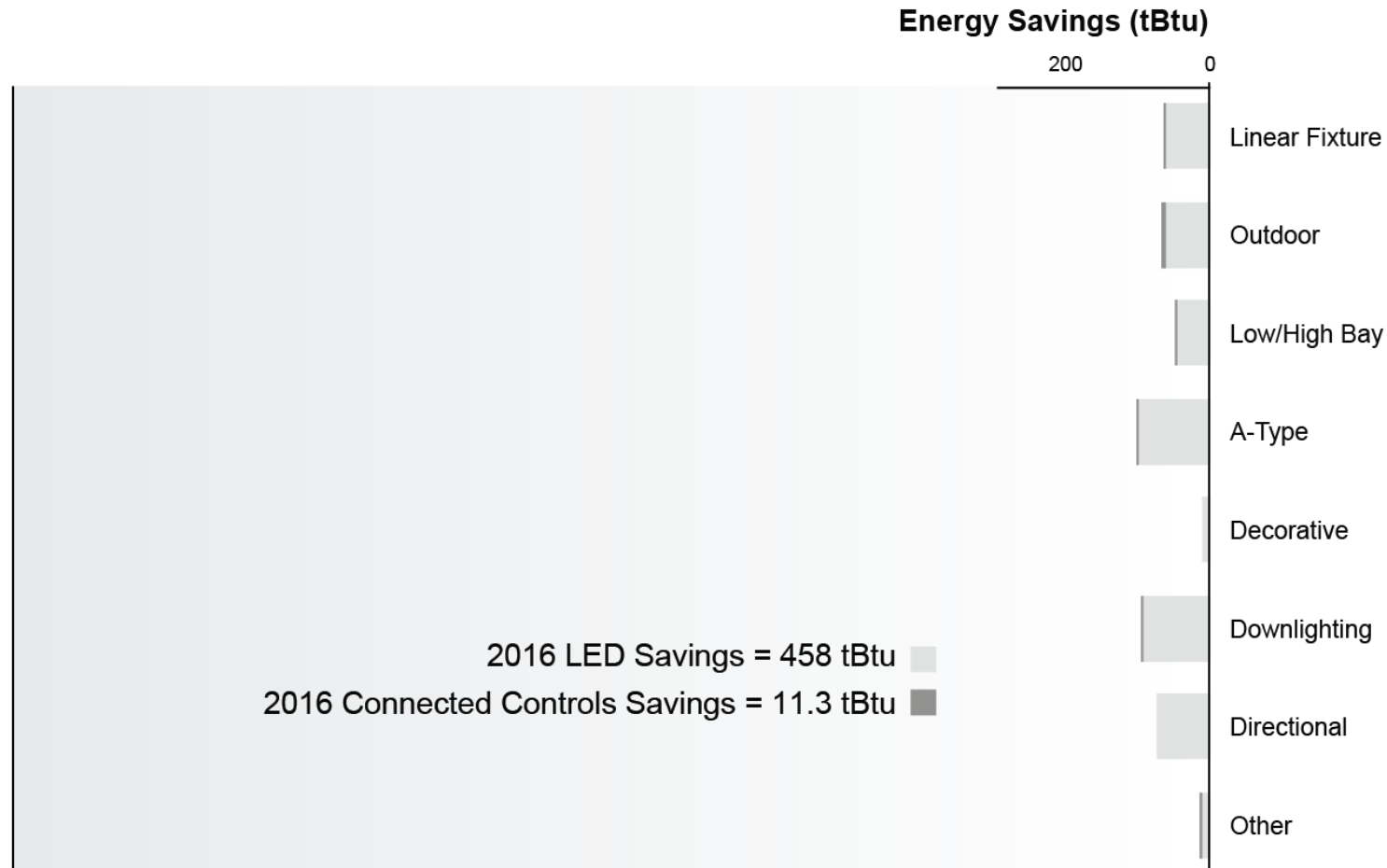
What are we learning about human perceptions of color rendition?



What do we know about the effect of lighting on human health?

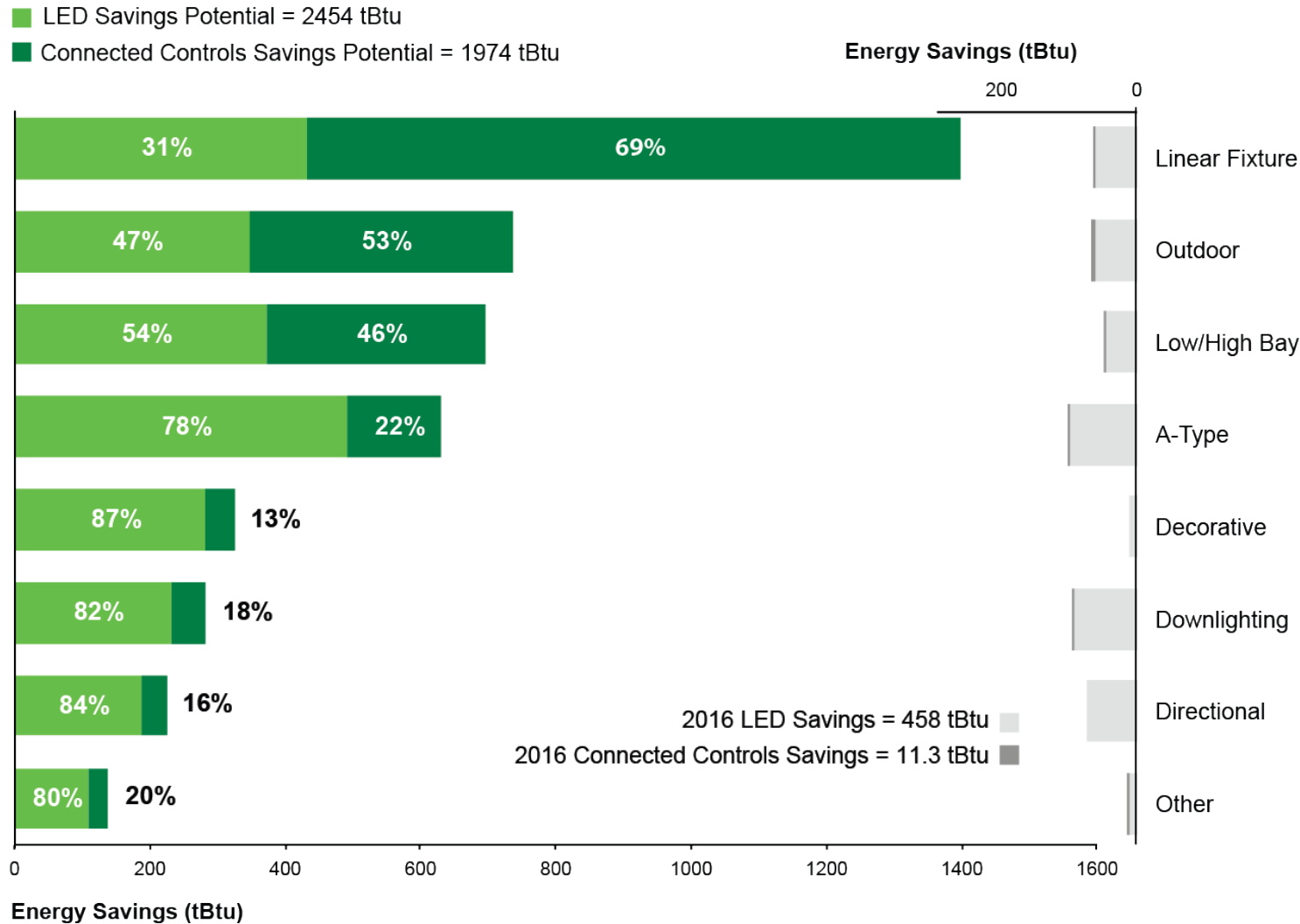
https://energy.gov/sites/prod/files/2017/08/f36/RoyerWilkersonWei_SageJournals_August2017.pdf; <https://energy.gov/eere/ssl/downloads/investigation-led-street-lighting-s-impact-sky-glow>; <https://energy.gov/eere/ssl/downloads/tuning-light-classrooms>; <https://energy.gov/eere/ssl/downloads/tunable-lighting-medical-behavioral-health-unit>

Why It Matters: Actual vs Potential



**LED products
deliver 469 tBtu
in source energy
savings in 2016**

Why It Matters: Actual vs Potential



Savings could be nearly 10X greater (4428 tBtu) if all applications completely switch to top-tier LED technologies in 2016

Adoption of Light-Emitting Diodes in Common Lighting Applications, <https://energy.gov/eere/ssl/downloads/led-adoption-report>

Two Packed Days

DOE SSL Technology R&D Workshop	NGLIA SSL Technology Trends Workshop
The latest on horticultural lighting science	Lessons learned about connected lighting, from the Windy City to the Big Apple
Building the evidence on light and human health	What can we learn in a connected lighting test bed?
The latest on LED street lighting, blue light, and sky glow	Lighting market trends
Technology tradeoffs with LED lighting	Lighting as a service
Why keep pushing on efficacy?	The impact of LED lighting on daylighting design