

[<< Back](#) | [Print](#)

## Researchers estimate \$1.83T savings, massive CO2 emissions reductions from use of LEDs, smart lighting

By Suzanne Deffree, Managing Editor, News -- 12/22/2008  
Electronic News

Research from Troy, NY-based **Rensselaer Polytechnic Institute** (RPI) published today estimates that LEDs and smart lighting could lead to trillions of dollars in cost savings, as well as a massive reduction in the amount of energy required to light homes and businesses.

Saying LEDs and smart lighting could "spark global innovation" and a "revolution in the way we illuminate our world," RPI Professors E Fred Schubert and Jong Kyu Kim estimate that if all of the world's light bulbs were replaced with LEDs for a period of 10 years, total energy consumption would be reduced by 1,929.84 joules, electrical energy consumption would be reduced by terawatt hours, and the financial savings would total \$1.83 trillion.

Further, the two professor estimate carbon dioxide emissions would be reduced by 10.68 gigatons; crude oil consumption would be reduced by 962 million barrels; and the number of required global power plants would be reduced by 280.

*For more on LEDs, see EDN's [high-power LED Hot Topic page](#).*

Schubert and Kim made the estimates in a paper titled "Transcending the replacement paradigm of solid-state lighting," published in today's issue of **Optics Express**.

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"What the transistor meant to the development of electronics, the LED means to the field of photonics," wrote Schubert and Kim in the paper. "This core device has the potential to revolutionize how we use light."

According to the duo, LEDs will require 20 times less power than today's conventional light bulbs and five times less power than compact fluorescent bulbs.

"Deployed on a large scale, LEDs have the potential to tremendously reduce pollution, save energy, save financial resources, and add new and unprecedented functionalities to photonic devices," the researchers wrote. "These factors make photonics that could be termed a benevolent tsunami, an irresistible wave, a solution to many global challenges currently faced by humanity and will be facing even more in the years to come. Transcending the replacement paradigm will open up a new chapter in photonics: Smart lighting sources that are controllable, tunable, intelligent, and communicative."

The paper follows on an October announcement from RPI that it had established the **Smart Lighting Research Center**, the only National Science Foundation engineering research center based in New York.

RPI did so in partnership with Boston University and the University of New Mexico, and through an \$18.5 million, five-year award from the National Science Foundation's Generation Three Engineering Research Center Program. RPI expects the project to receive up to \$50 million in funding over the next 10 years as it works on developing novel materials, device technology, and systems applications to further the understanding and proliferation of smart lighting technologies.

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