This Danish Neighborhood Is A Giant Experiment For Smart Cities

In a suburb of Copenhagen, every lamp post has its own IP address.

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By day, the Hersted neighborhood in a Copenhagen suburb looks like a typical business district, filled with large office buildings and warehouses. But when the sun went down on September 18, it transformed into a massive experiment. Each block, on a 10-kilometer stretch of road, demonstrates the future of city lighting—and offers a glimpse into how smart technology will transform urban infrastructure.

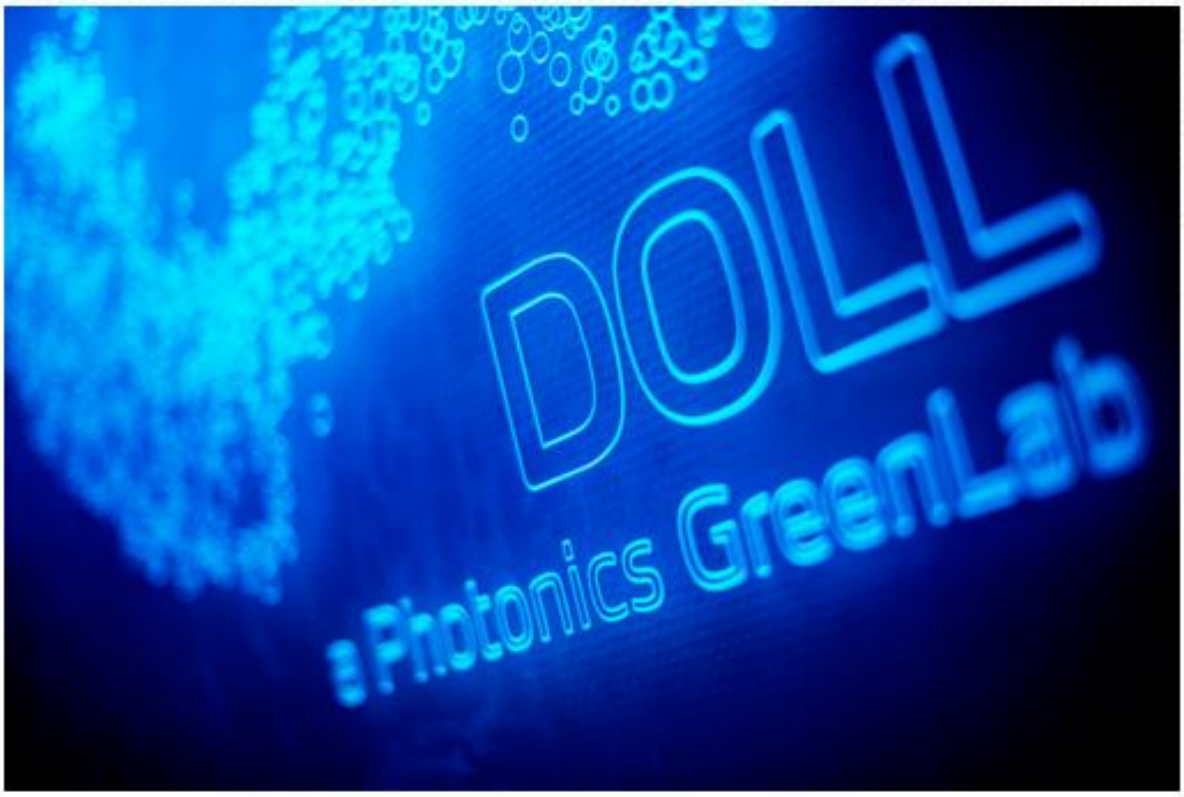
As much as half of a city's electricity use can come just from traditional streetlights. Switching to LED lights makes a major difference. L.A., for example, will save around $10 million a year on electric bills after it finishes paying for a massive upgrade to new lighting. But the latest smart lights, like those that demoed in the new Danish experiment, can go even farther.

"With LED technology, lighting has become a piece of electronics," says Flemming Madsen, who is managing the project, called the Danish Outdoor Lighting Lab. "So you can suddenly communicate with it, you can control it, you can expose it to sensors, and you can manage it in milliseconds—in real time and very precisely, which you couldn't with the old bulbs. That's really a giant leap of technology."

The new lab includes tech like the Tvilight system, which uses sensors to automatically brighten in a halo around a pedestrian, bike, or car, leaving the rest of the street dim to save energy.

In total, 25 different companies are participating in the experiment, which provides side-by-side trials of each technology, from lights to different sensor systems and power supplies. Everything is continuously monitored and displayed in a control room. "Every lamp and lamp post has own IP and can report to us, and we to them," Madsen says.

As the simple streetlight evolves, it will also do more than just provide light. "Lighting system is a central part of the infrastructure in a smart city," Madsen explains. "It's everywhere, it's distributed widely, it has power, and it's hanging high. So whatever kind of data you want to collect—place it in the lighting. And if you need new access points for a GSM network, you could place them in the lamp post."



The project, which Madsen says is "unique in the world of urban laboratories by its size and bandwidth," is already expecting visitors from around the world.

"We've got two tasks," he explains. "One is to support the green transition of society, meaning we'll enable decision makers in Denmark and around the world to make better decisions and facilitate a faster implementation and uptake of new technology."

The other role, he says, is to help startups in the growing field of smart lighting test and improve their technology using state-of-the-art equipment, so the market can grow more quickly.

"There's a lot of potential," Madsen says. "Decision makers have been reluctant because the LED technology has been developed quite fast, which means that you've had many solutions that weren't tested, and you had a lack of standards. But now the technology has really arrived, and it's competitive."

Soon, visitors will be able to see an even larger demonstration of one of the new technologies. Copenhagen will install 21,000 new smart street lights next year, as part of its goal to become carbon neutral by 2025. It will be the first smart city network of its size in the world.