



City of Oslo to Cut Streetlight Energy by 50% Using LONWORKS Technology



The City of Oslo is using LONWORKS technology to remotely control and monitor streetlights in the city. This intelligent outdoor lighting system is the first large scale implementation of a control network in a street lighting application in a city in Europe, and is expected to reduce energy usage by 50 percent, improve roadway safety, and minimize maintenance costs.

The project calls for the installation over the next three years of 55,000 intelligent street light ballasts that communicate over existing power lines using Echelon's power line technology. The first 6,500 light poles have already been installed. In addition to using Echelon's power line technology in the ballasts, the light poles communicate with Echelon's iLON® 100 Internet Servers acting as segment controllers, which in turn communicate with the City of Oslo control center over a wireless wide-area network.

"The LONWORKS technology gives us total control of our street lighting system, and will lower energy, operations, and maintenance costs while ensuring proper

roadway illumination required for public safety. The significant energy and maintenance savings that will be achieved will pay for the new system, with an overall return on investment expected within five years," said Tom Kristoffersen, head of section operations and maintenance for the City of Oslo.

As part of the project the city of Oslo is replacing older, inefficient mechanical ballasts in the city's 55,000 street lights with electronic ballasts from SELC Ireland Limited that include Echelon's power line communication technology. Data from the streetlights will be collected by approximately 1,000 segment controllers, which manage the streetlights and use a wireless data network to communicate with the City of Oslo monitoring center. Echelon's iLON 100 Internet Servers are used as segment controllers to log and report energy consumption and running hours, collect information from traffic and weather sensors, and calculate the availability of natural light from the sun and the moon using an internal astronomical clock.

This data is used to automatically dim some or all of the streetlights based on the season, local weather, and traffic density. Significant energy savings result from this highly efficient method of controlling light levels, which has a secondary benefit of extending lamp life, thereby reducing replacement costs by avoiding unnecessary lamp operation.

The system is being integrated by Kongsberg Analogic AS, a technology company specializing in energy management solutions based on LONWORK technology. Enterprise monitoring software from streetlight solution partner DotVision provides the end-user with a Web portal through which the lamps can be remotely controlled, behavior analyzed, and failures identified. Both Philips' StarSense software and DotVision's Streetlight Suite software are used to measure and display energy consumption.

The City of Oslo project has generated significant interest from other cities in Europe, and is the basis for the

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recent E-Street initiative, a research group focused on solutions for reducing energy usage in outdoor lighting systems in the European Union (EU). The E-Street initiative will play a pivotal role in determining EU standards and legislation for intelligent outdoor lighting systems. For a typical European city, the energy used by the outdoor lighting system can consume up to as much as 38% of the total energy demand for lighting. The City of Oslo provides a good working template for the E-Street initiative because the project leverages existing power line infrastructure, both CENELEC and ANSI certified technology, and fieldproven, widely deployed components to minimize risk and ensure longevity.

The Norwegian utility, Hafslund, is the main contractor for the system and is also operating and maintaining the street lighting system in the City of Oslo as a full service provider. The new system may in the future be used as a blueprint for the other systems that Hafslund operates, totalling more than 100,000 streetlights under their ownership. Hafslund also supplies the energy for more than 250,000 streetlights in their grid that could also make use of the infrastructure being built today.

“The LONWORKS technology and products in the Oslo project have proven to provide a very stable infrastructure for street lighting management. The system gives us all the flexibility we need as a service provider to maximize energy savings and maintain safety while fulfilling all our customers’ needs,” says Eirik Bjelland, a senior advisor at Hafslund.

Bjelland continues, “Street lighting systems are expensive to maintain due, in part, to the large geographic size of the systems. The LONWORKS technology allows lamp failures to be identified remotely and, in many instances, fixed before being noticed by residents, where previously these failures had to be reported by residents or roving maintenance trucks on the lookout for failed lamps. The reduction in lamp downtime can have a significant impact on driver and pedestrian safety. It also allows repair crews to be more efficient by providing predictive failure analyses based on a comparison of actual running hours versus expected lamp life.”



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