Supporting technologies – the key to smart lighting

Smart street lighting infrastructure acting as service gateway for other street level devices is the backbone of the smart cities.

The smart city starts with smart lighting

- **Integrated control and communication infrastructure** enable to connect major elements of city infrastructure at every level at which utilities have control, and new areas of potential growth.

- **Flexibility to add new applications** like electrical vehicle charging stations, sensors to assess air quality, public Wi-Fi or smart parking.

- **Ability to add smart sensors** helps monitor everything from the weather and air quality to traffic.

- **Availability of new data** enables to provide new services for citizens and increase their safety.

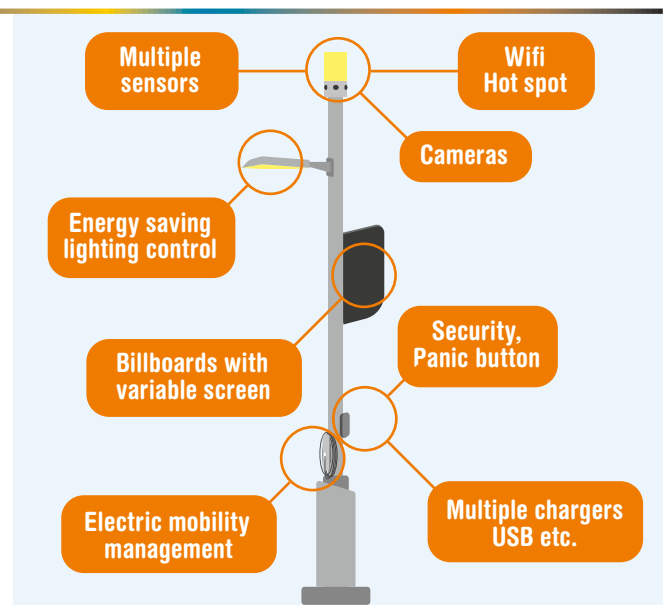- **Integrated renewables** enable to implement zero-energy and environmentally friendly solutions.

Multiple sensors

Wifi Hot spot

Cameras

Energy saving lighting control

Billboards with variable screen

Security, Panic button

Electric mobility management

Multiple chargers USB etc.

Main supporting technologies

- **Renewable sources**, like solar or wind power, meaning Lighting system can be entirely self-powered, and even send excess power back to the utility, helping balance demand and make the grid more resilient.

- **IoT-enabled Smart Sensors** on the streetlights allow the monitoring of city environmental data, like air or noise pollution, weather, seismic activity, and other conditions.

- **Cameras** integrated to streetlight system could improve public safety, reduce vandalism and enable to develop novel image processing applications.

Photo: Shutterstock

The internet of things (IoT) relies on the fact that communication technologies enable all electronic devices to have data exchange with other assets, or utility or municipal management and take actions without human interactions.

Pros & Cons of self-powering with renewable sources

Applications

- Locations with higher electricity costs.
- Locations with costly investment.
- Eco-sensitive landscapes.
- Temporary or emergency installations.

ADVANTAGES

- Lower operation/maintenance costs because of no wiring between lighting points/grid, long life components, and no connection fees.
- Reduced planning and installation costs, when used on remote/rural/off-grid areas.
- Reduced carbon footprint compared to conventional lighting systems.
- Reduced probability of overheating.

DISADVANTAGES

- Higher investment costs.
- Higher risk for theft.
- Risk of Cyber-attacks and data security.
- Extreme weather conditions stop or reduce the energy production.

Benefits of networked lighting controls (NLC)

- Peak energy management.
- An additional 22% lifetime energy savings on average.
- NLCs can boost the energy efficiency of stand-alone LED commercial lighting projects by up to 47%.
- Improved public safety, based on research showing that 50% of automobile accidents happen within a 3 hour time period at dusk.
- Energy optimisation, allowing cities to add more lights at the same energy consumption.
- Street NLC can control advertising panels, parking spot availability notification, and other new city services.
- Electric vehicle charging can be incorporated into NLC, making the charging process more convenient.

User

Single Light Controller

Servers

Internet

Base Station

Base Station
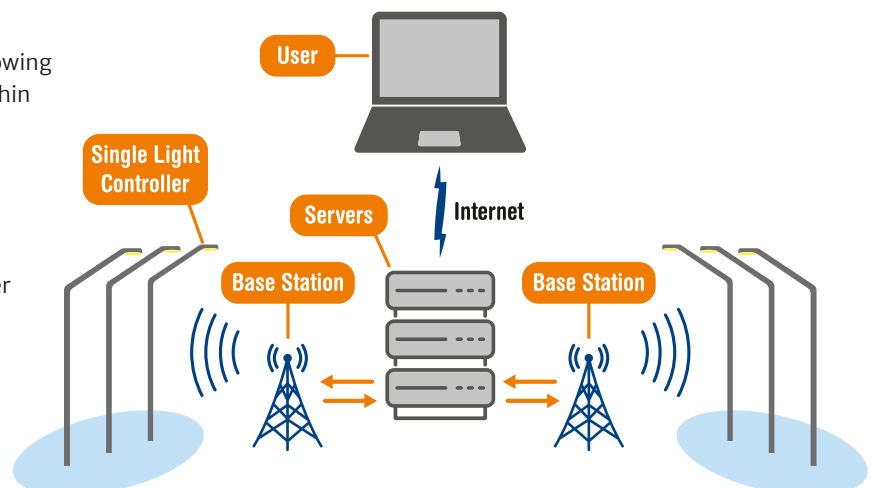
See also:

1 New Report: Potential for Energy Efficiency Programs to Deliver More Savings by Properly Valuing Lighting Systems. DesignLights Consortium. Nov 5th, 2019. LEDs Magazine.

2 www.ase.org/lighting-savings-report
3 www.echelon.co

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