



Energy Management Optimization Solutions



Universities

A classroom is a demanding space. The comfort of the space for better learning is critical. What if you could ensure even, quality lighting from fixtures that know when it's too dark or too light and HVAC systems that optimize temperature based on weather, time of day and occupancy.

Energy savings, classroom utilization awareness and better quality light all from Lunera's Energy Management Optimization solutions. You do the math. It all adds up.

Now, when you update your lighting, you get real building intelligence.

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In this University example, we've deployed T8 LED Sensor Lamps to replace 4ft 32W T8 fluorescent tubes.



LED Sensor Lamps

Sensor Lamps are advanced LED lamps with integrated advanced sensors, controls and communications electronics that create a plug-and-play Energy Management IoT device. Traditionally discrete devices are eliminated:

Occupancy Sensor	Ambient Light Sensor	Energy Usage Measurement Microprocessor	Lighting Controller
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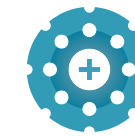
Sensor Lamps also have secure end-to-end encryption and physically separated networks with communications bandwidth with massive data throughput to track Bluetooth or RFID beacons in real time enabling classroom assets to be located within 1 meter.

A fully deployed Energy Management Optimization (EMO) solution will include networked LED Sensor Lamps, the cloud-based Facilities Director EMO platform and the Energy Manager application.



Facilities Director

- Integrates lighting, HVAC, plug loads and submeters
- Coordinates and routes input data from all sources
- Manages permissions, storage, and reporting



Energy Manager

- Analyzes environmental readings
- Optimizes systems settings
- Customize priorities, energy targets, override settings
- Learns over time to capitalize on patterns.

For installation flexibility, LED Sensor Lamps can also be deployed as stand-alone sensors. They will operate immediately out of the box without commissioning and can be connected at any time to the Facilities Director platform to realize the optimal energy savings.

Optimizing energy management in your classrooms

In this university example, 1,000 fluorescent T8 32W lamps were replaced with equivalent LED Sensor Lamps. When factoring in the additional energy savings derived from the ambient light and occupancy sensors, the LED Sensor Lamps will result in a 70% energy savings compared to a traditional T8 lamp. That's 40% more than standard LED lamps alone. Once networked to the Facilities Director Platform, we can anticipate an additional 25% energy savings as lighting, HVAC and plug load systems learn and react to varying conditions.



Facility Type	Classrooms / Offices
Facility Size	100K Sq Ft
Equiv. Lamp Type	32W 4Ft T8
# of Lamps/Sensors	1,000
Utilization	16 hr/day, 200 days/year
Occupancy	\$0.14 kWh
HVAC	Heat: 4mo, Air Con: 4mo

Upfront Cost*	Material Cost	\$25K
	Installation Time	100 hrs
	Labor Cost	\$2K
Annual Savings	Energy kWh	84 kWh
	Energy Cost	\$12K
	Maintenance Cost	\$15K
ROI*	Time to Payback	12mo

* By using Lunera's turnkey Lighting as a Service, all upfront costs can be eliminated and the upgrade can be cash flow positive from day one. Visit www.lunera.com/lighting-as-a-service for more information.

The smartest way to do smart buildings.

For a comprehensive Energy Management Optimization solution evaluation of your University classrooms, contact Lunera at www.lunera.com/contact.



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