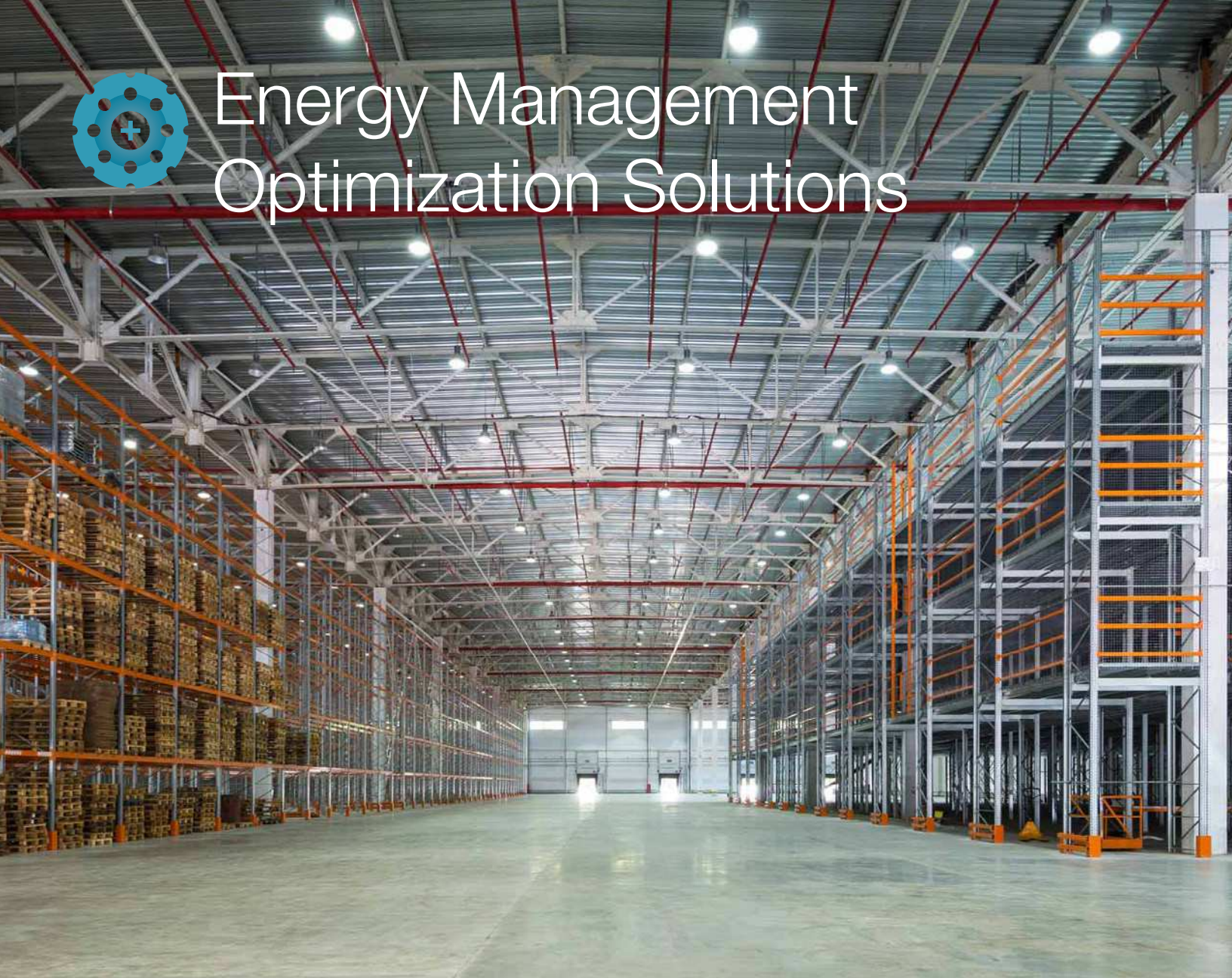




Energy Management Optimization Solutions



Warehouses

Warehouses are in the direct path to revenue for a business. Their 24x7 operation demands efficiency at all levels, but many are just outdated shells that do little more than keep goods secure and dry.

Lunera's Energy Management Optimization solutions transform warehouses, enabling dramatic energy savings and empowering facility directors to optimize the warehouse operations based on real-time usage patterns.

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

LUNERA®

In this warehouse example, we've deployed HID LED Sensor Lamps to replace 400W Metal Halides.



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 for massive data throughput to track Bluetooth or RFID beacons in real time enabling inventory to be located within 1 meter.

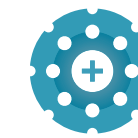


A fully deployed Energy Management Optimization (EMO) solution will include networked LED Sensor Lamps, the cloud-based Facilities Director EMO platform and the Energy Manager application.



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 optimal energy savings.

Optimizing energy management in your warehouse

In this warehouse example, 100 metal halide 400W 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 HID 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	Warehouse
Facility Size	50K Sq Ft
Equiv. Lamp Type	400W Metal Halide
# of Lamps/Sensors	100
Utilization	16 hrs/day, 365 days/year
Occupancy	\$0.14 kWh
HVAC	Heat: 5 mo, Air Con: 5 mo

Upfront Cost*	Material Cost	\$30K
	Installation Time	50 hrs
	Labor Cost	\$1K
Annual Savings	Energy kWh	187 kWh
	Energy Cost	\$26K
	Maintenance Cost	\$1.4K
ROI*	Time to Payback	13 mo

* 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 warehouse, contact Lunera at www.lunera.com/contact.



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