



The IoT-Enabled Lighting Challenge: Help Catalyze Advanced Lighting/IoT-Compatible Systems!

Wednesday, July 10th, 2019
3:30 – 5:00 PM



Speakers



Cedar Blazek
Moderator,
DOE



Michael Myer
Speaker,
PNNL



Hakon Mattson
Speaker,
Anthem, Inc.

Michael Myer

Pacific Northwest National Laboratory (PNNL)

Hakon Mattson

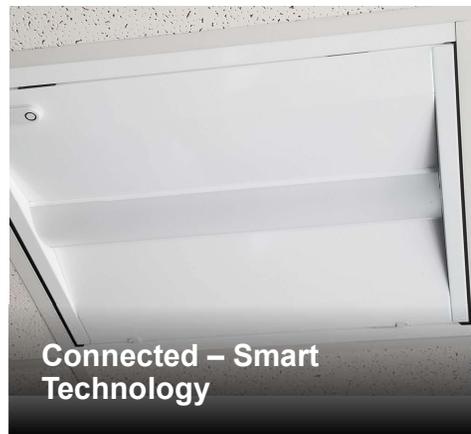
Anthem, Inc.

U.S. DEPARTMENT OF
ENERGY

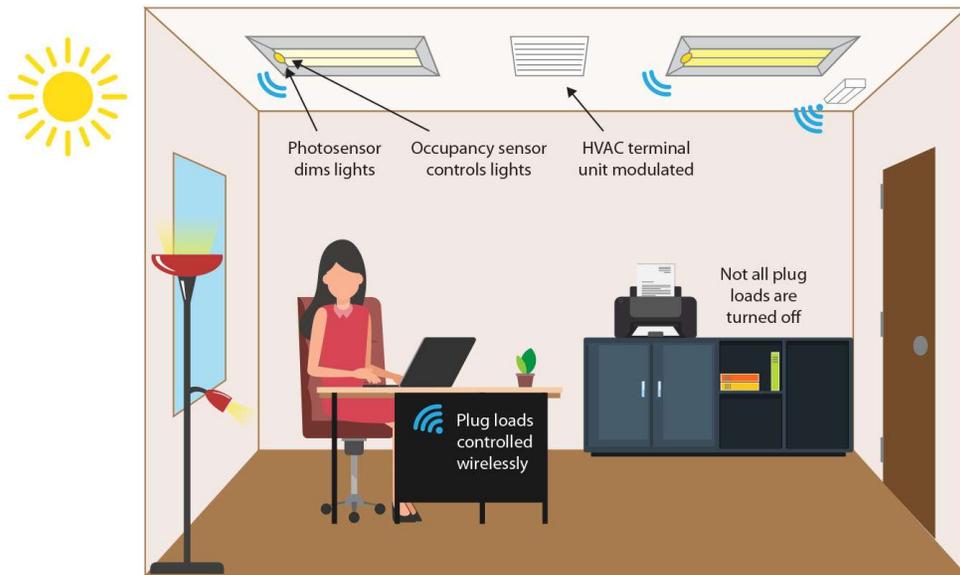
This will be a dynamic session where we will learn not only from Anthem's experience, but from everyone in attendance ... you are encouraged to share your experiences and insights

Types of Lighting

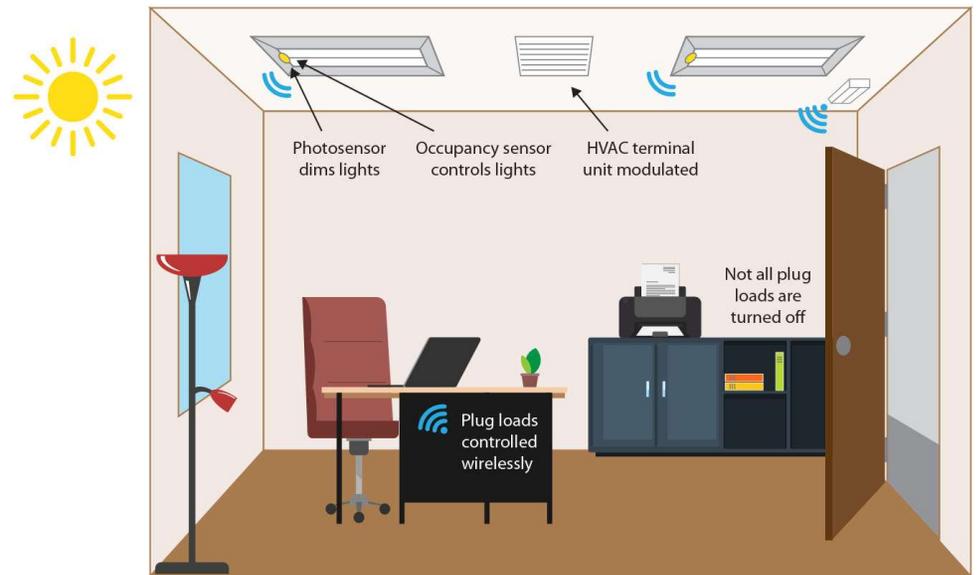
- Many different types of lighting exist
- Differing levels of intelligence in the lighting equipment



Connected Lighting



Space Occupied / Systems Operating



Space Unoccupied / Energy Savings

- What are organizations installing? TLEDs, Kits, Fixtures, Controls?
- What types of fixtures?
- What are the decision points?

IoT and You: Looking to the Future

- What applications of IoT are of immediate interest to your organization?
- How will you implement/install IoT sensors/devices? Is the labor required to install them (e.g., wiring, commissioning) a concern?
- Are lighting system sensors, fixture-level or stand-alone, currently providing insights (e.g., to other building systems, about operations)? Plan to use?
 - Would other types of sensors located in a lighting fixture be considered? What type(s)?
- Is future-proofing your building(s) a consideration when retrofitting/renovating?



Network connected lighting system benefits

- LED fixtures save energy and money
- Possibility for additional savings via advanced functionality options (i.e., advanced lighting sensors and IoT):
 - HVAC system (e.g., not heating/cooling unoccupied spaces)
 - Plug loads (e.g., turning off plugs in unoccupied spaces)
 - Energy monitoring and demand response
 - Building use efficiencies via heat mapping of space utilization
 - Reduce energy use, or
 - Improve use of space, or
 - Lease space
 - 3-30-300 ratio value-added benefits



Utilities
\$3
per sq. ft.



Rent
\$30
per sq. ft.



Salary
\$300
per sq. ft.

Challenge Approach

Similar to prior Challenges

- High Performance Rooftop Unit (RTU) Challenge
 - Outcome: Daikin McQuay's Rebel RTUs are expected to reduce energy use by as much as 50% over current standards
- Low-Cost Wireless Metering Challenge
 - Outcome: Meazon wireless submeter solution met the target equipment cost of under \$100

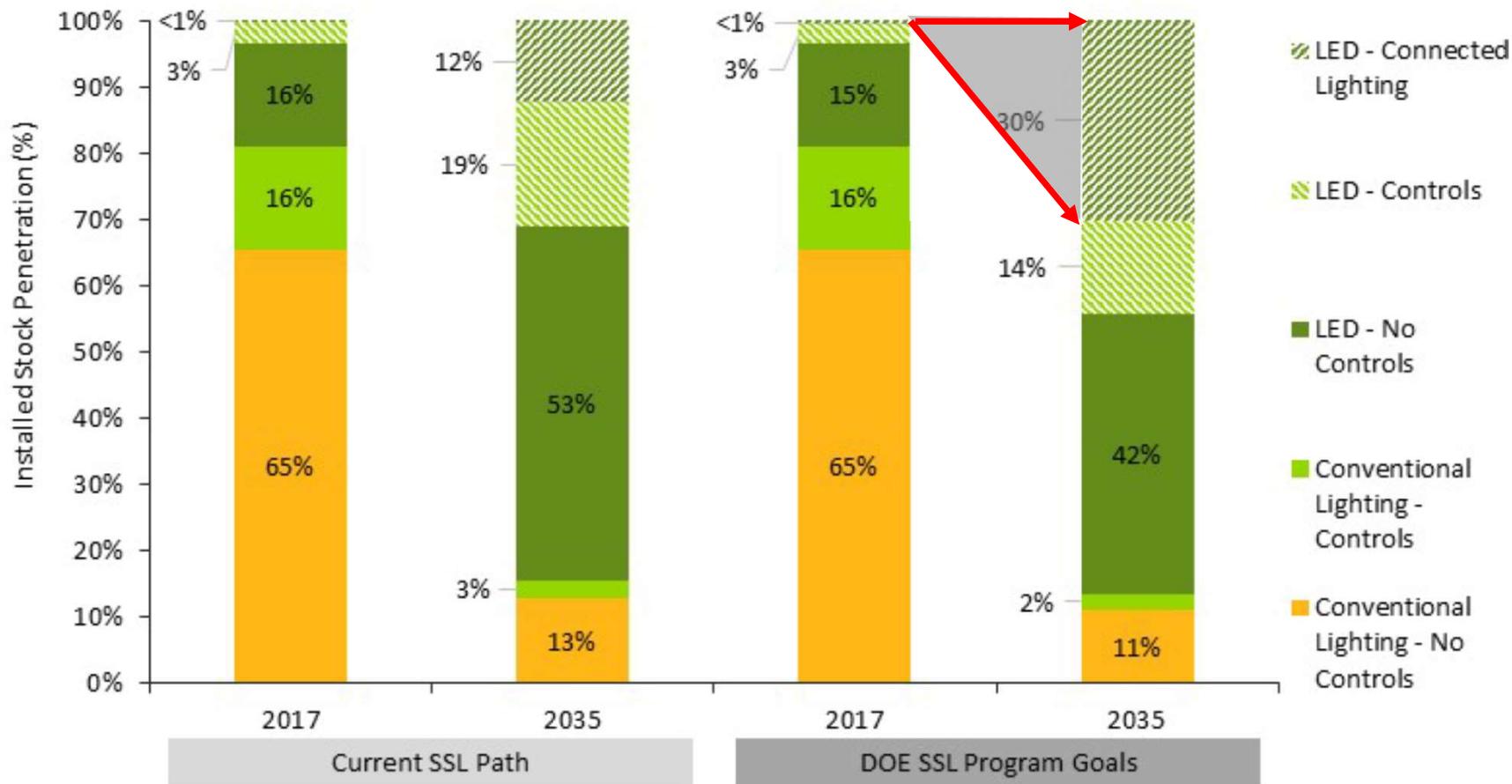


This Challenge uses a similar approach

- Desired outcome: Manufacturer meets the price target and demonstrates upgradeability, connectivity, and IoT functionality

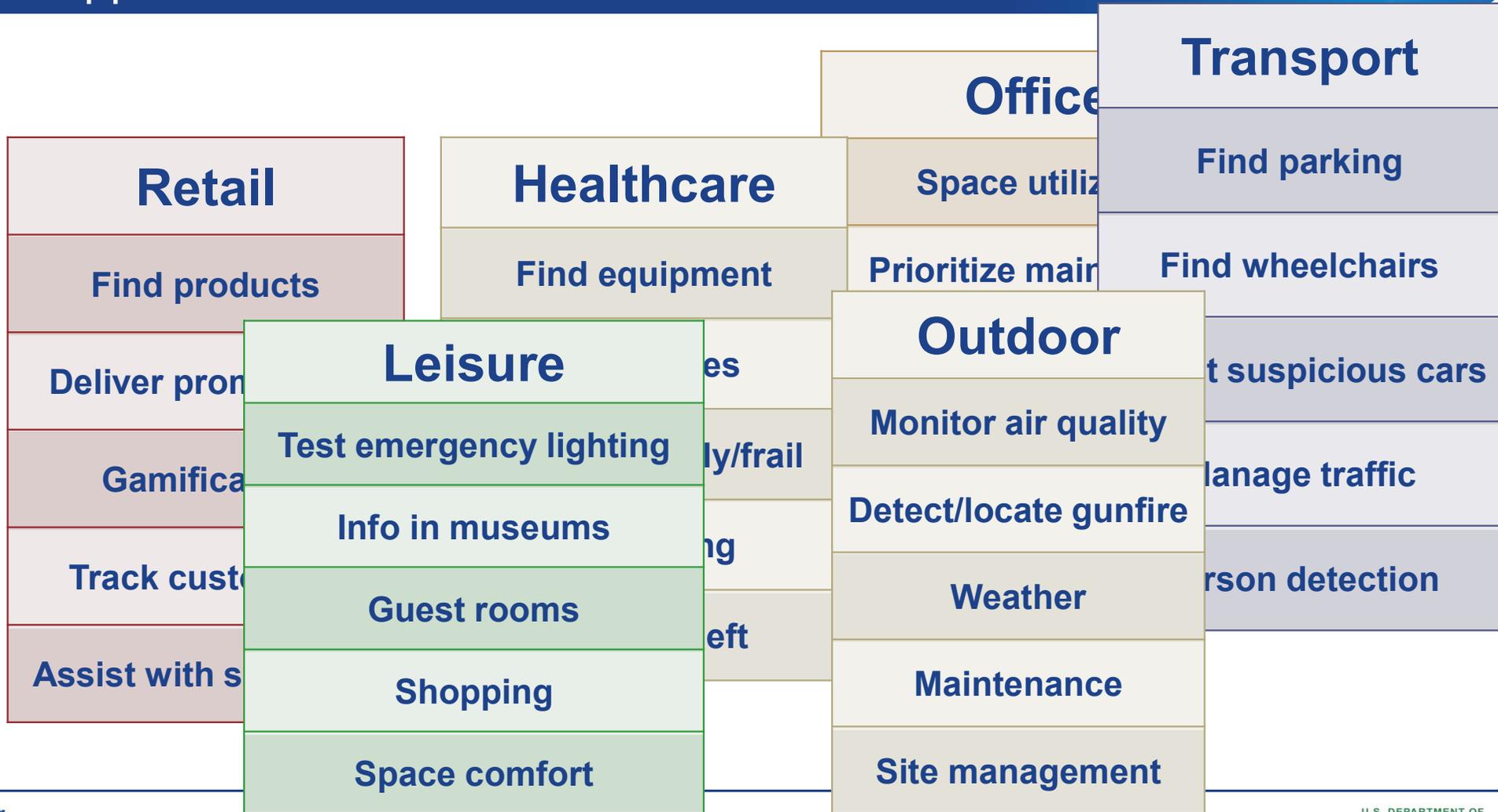


Connected Lighting



- Are you specifying controls?
- Integrated luminaire level controls or external controls?

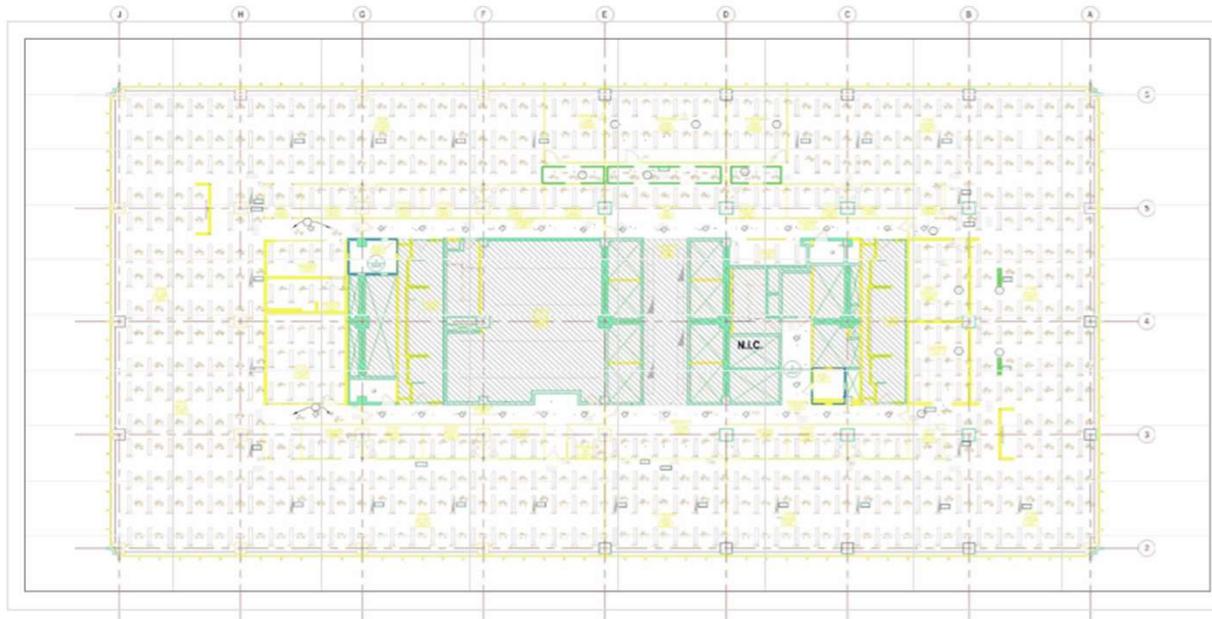
IoT Applications



IoT | Space Utilization

33rd Floor, average occupancy events per 5-minute interval, November-June

12:00:00 AM



Sunday

Monday

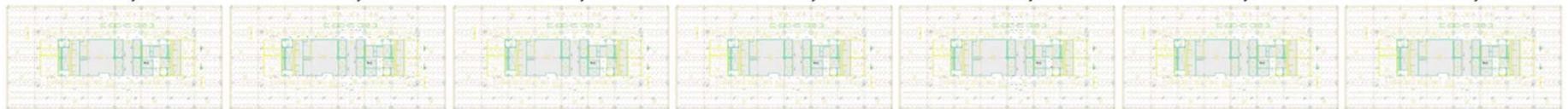
Tuesday

Wednesday

Thursday

Friday

Saturday



12:00:00 AM

Leveraging the World of IoT

- How has your organization leveraged IoT technology*?
- What energy benefits were observed?
- Were there any nonenergy benefits?



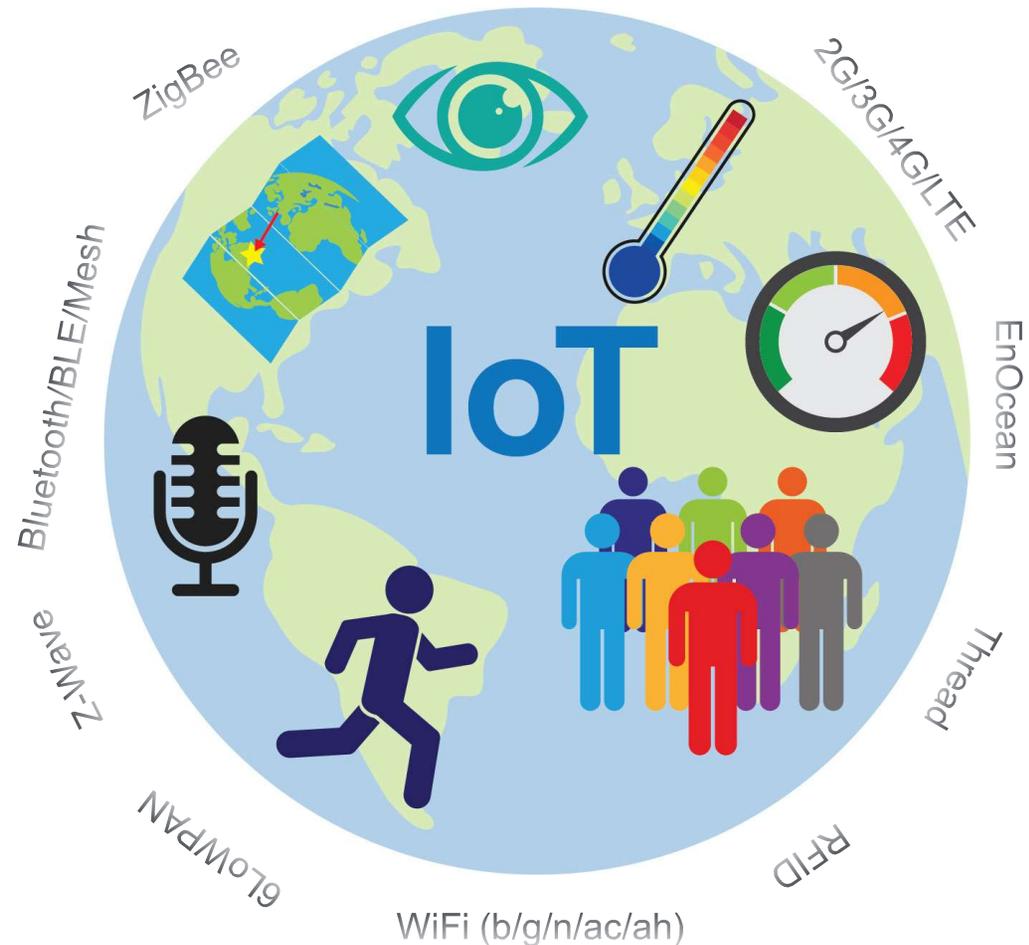
- IoT can bring new insights to business operations and provide benefits beyond energy savings (e.g. building/people costs).

QUESTIONS FOR AUDIENCE | IoT Applications

- Is your organization interested in:
 - Tracking people for business intelligence (e.g., understand customer, building/room utilization, manage maintenance needs of offices, etc.)
 - Counting people (e.g., in a conference room, waiting in line, etc.)
 - Tracking/locating of equipment/assets
 - Monitor equipment health (e.g., motor or HVAC unit)
 - Monitor room/building environment (e.g., temperature, air quality, etc.)
 - Monitoring sound (e.g., gunshot detection, voice commands to control ambient environment)
 - Transmitting information to building occupants or equipment (e.g., via Bluetooth or visible light communication)
 - Controlling/monitoring lighting energy use

QUESTIONS FOR AUDIENCE | Connect Productivity

- IoT devices can sense various aspects of our world and communicate data to a central server.
- Where do IoT devices reside?
- Are they wired/wireless?
- What protocol(s) were used/selected? Were any rejected?



Many communication protocol options exist:

- WiFi
- Cellular network (e.g., 4G LTE)
- Bluetooth
- Zigbee
- Power Over Ethernet / DC Low Voltage
- BACnet

Does your organization have communication protocol concerns or preferences?

Ease of upgradeability

- The following three options apply for installing a sensor on a luminaire after initial commissioning. Considering the aesthetics of the luminaire, labor cost, and any other implications, my preferred approach would be:



Wiring

- Wire sensor to driver
- Knock-out hole to install sensor



Hidden Plug

- Plug with connection to driver provided
- Hides behind knock-out hole



Receptacle

- Small receptacle
- Pre-wired to driver
- Dummy cover for aesthetics

QUESTIONS FOR AUDIENCE | Price points

- Which cost target seems most reasonable:
 - Keep within a 5-year payback
 - Keep within a 3-year payback
 - Would accept \$10 adder to the fixture
 - Would accept 5% increased cost

- What is an acceptable mark-up after any incentives (e.g., from utilities) have been applied?

- Should this feature be included in utility incentives?

Security

DOD, ISA, NEMA Announce Program To Help End-Users With Cyber Security

The proposed facility certification would be a natural extension of the ISASecure® program.

May 28, 2019

During a recent Industrial Control Systems Joint Working Group meeting representatives from the Department of Defense (DOD), International Society of Automation (ISA), and the National Electrical Manufacturers Association (NEMA) outlined a new program to address the growing risk of cyber security in unprotected and under-protected building control systems in the U.S. and abroad.

Building owners, users, and manufacturers of control systems continuously work to find [practical ways to create safe and more secure environments](#). Combining the expertise from ISA, NEMA, and DOD advisors, the working group has spent several months developing a proposed program in preparation for a roll-out to a wider audience of industry peers.



Lighting Systems and Cybersecurity - Are Your Systems Ready?

The Internet of Things (IoT) is enabling more sophisticated capabilities through network-connected products and systems. As a result, residential and commercial lighting systems are becoming more interconnected and networkable. According to many recent industry reports and the U.S. government, and as we have all observed in the news, there have been significant increases in attacks that penetrate connected products, systems and networks. This activity has highlighted that cybersecurity of software is becoming critically important for the safety, privacy and performance of these networked products and systems. Please join us to learn about how to ensure your connected lighting systems are fully protected.

QUESTIONS FOR AUDIENCE | Security

- A luminaire meeting the Challenge performance targets would have connectivity built-in – is this a concern?
 - This is not a concern. I am sure the manufacturer will ensure security at the luminaire level.
 - This concerns me slightly. I would want more information about the security of the luminaire.
 - I am seriously concerned about cyber/physical security and it would not be worth the potential benefit.
 - Other perspectives (i.e., you didn't vote)

Who is interested in providing a little more feedback related to the Challenge?

Seeking a few more end users

Questions

Contact Us

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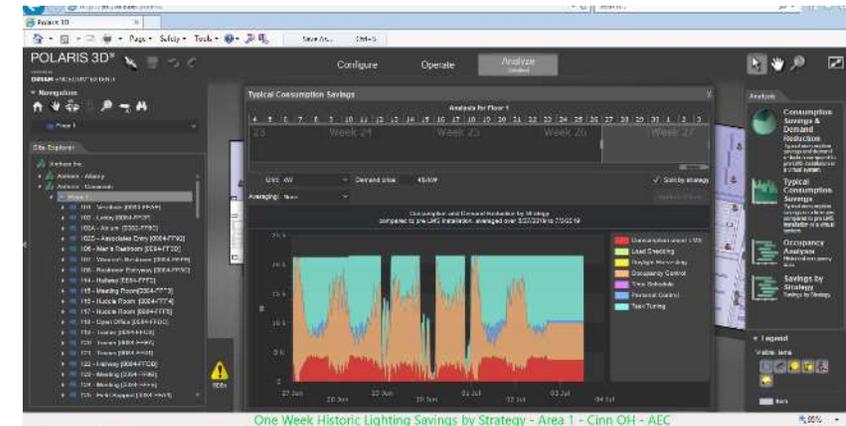
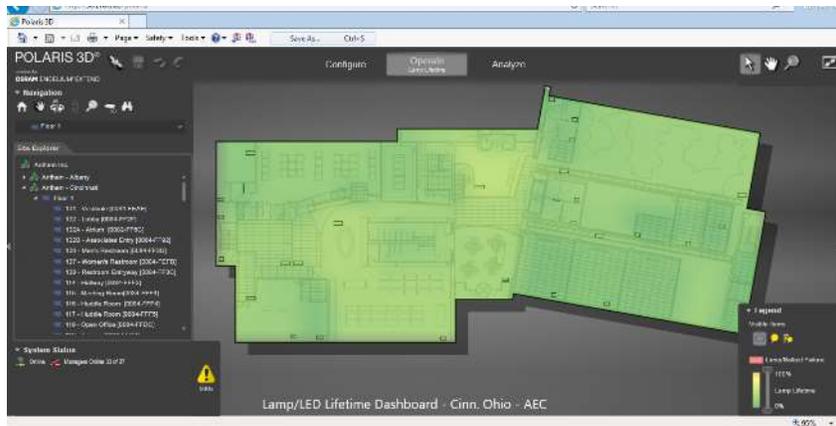
Thank You

Provide feedback on this session
in the Summit App!

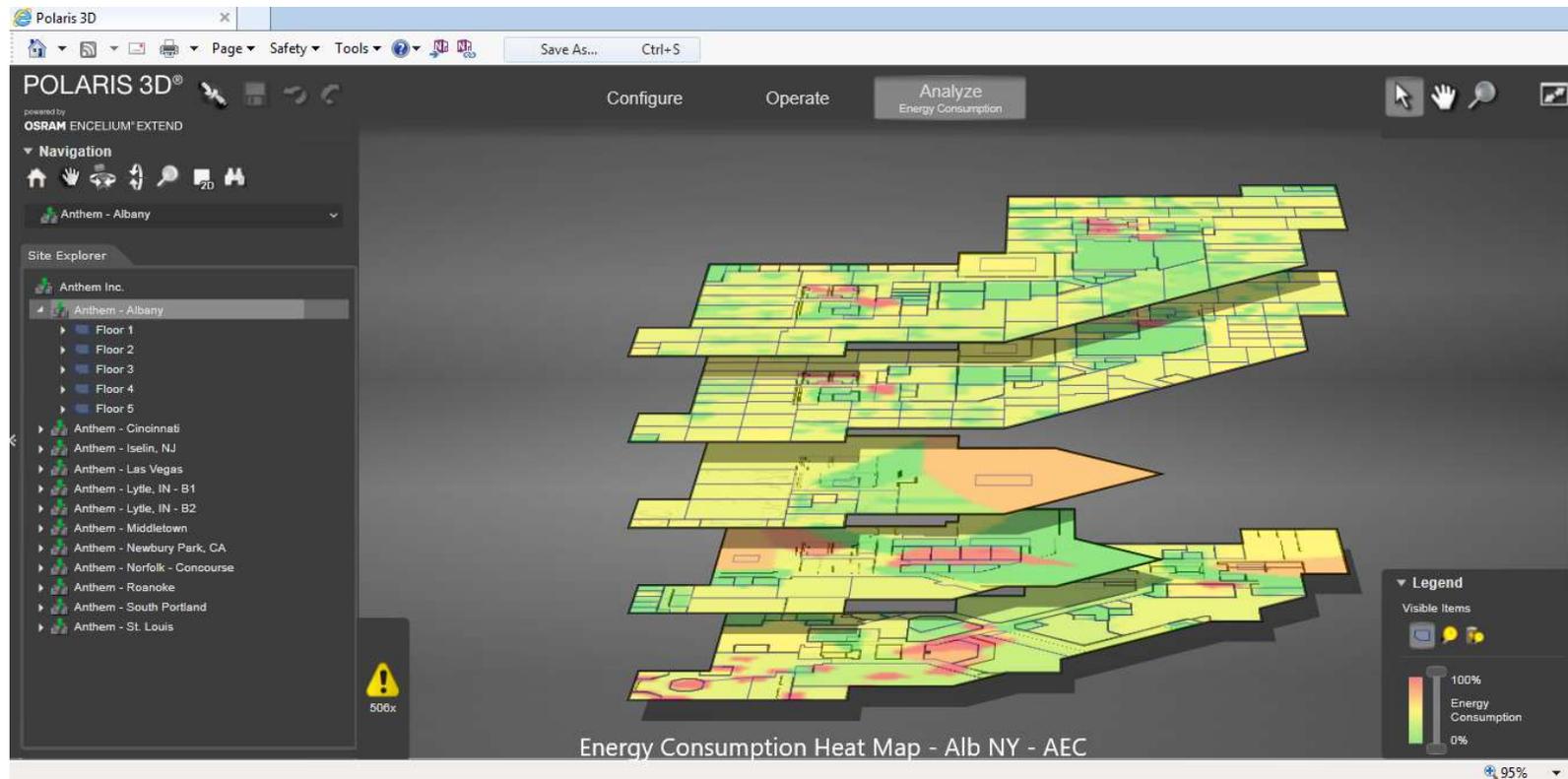
Download the app to your mobile device or go to
event.crowdcompass.com/bbsummit19



Appendix - Anthem Reporting Capabilities



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Analytics via dashboards and raw data

Appendix - Anthem Reporting Capabilities

