U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Connected Lighting: What Is It, What Makes It Different, and Where Is It Going?

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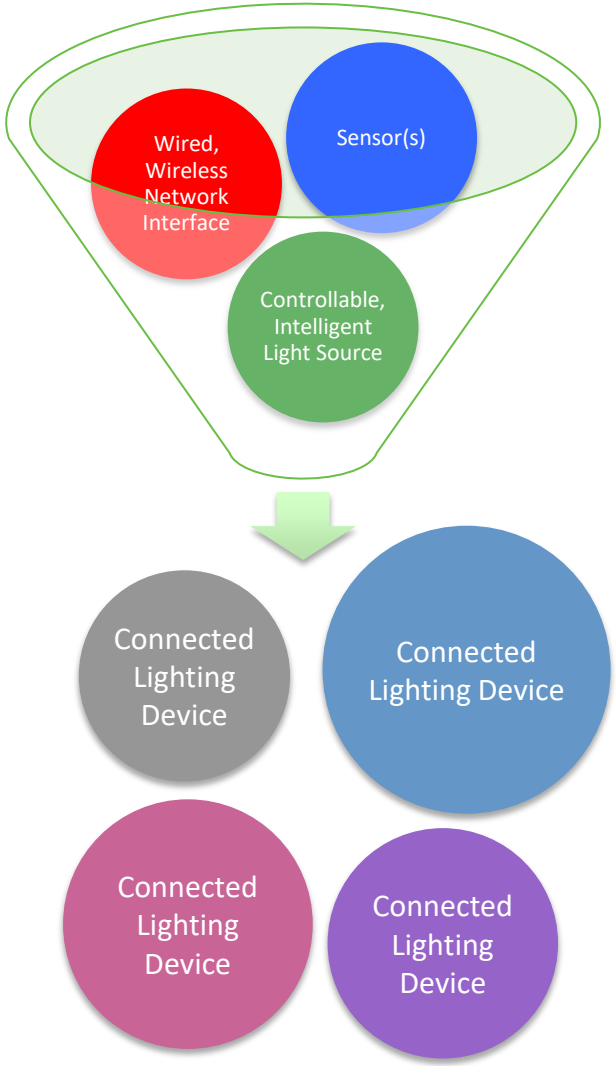
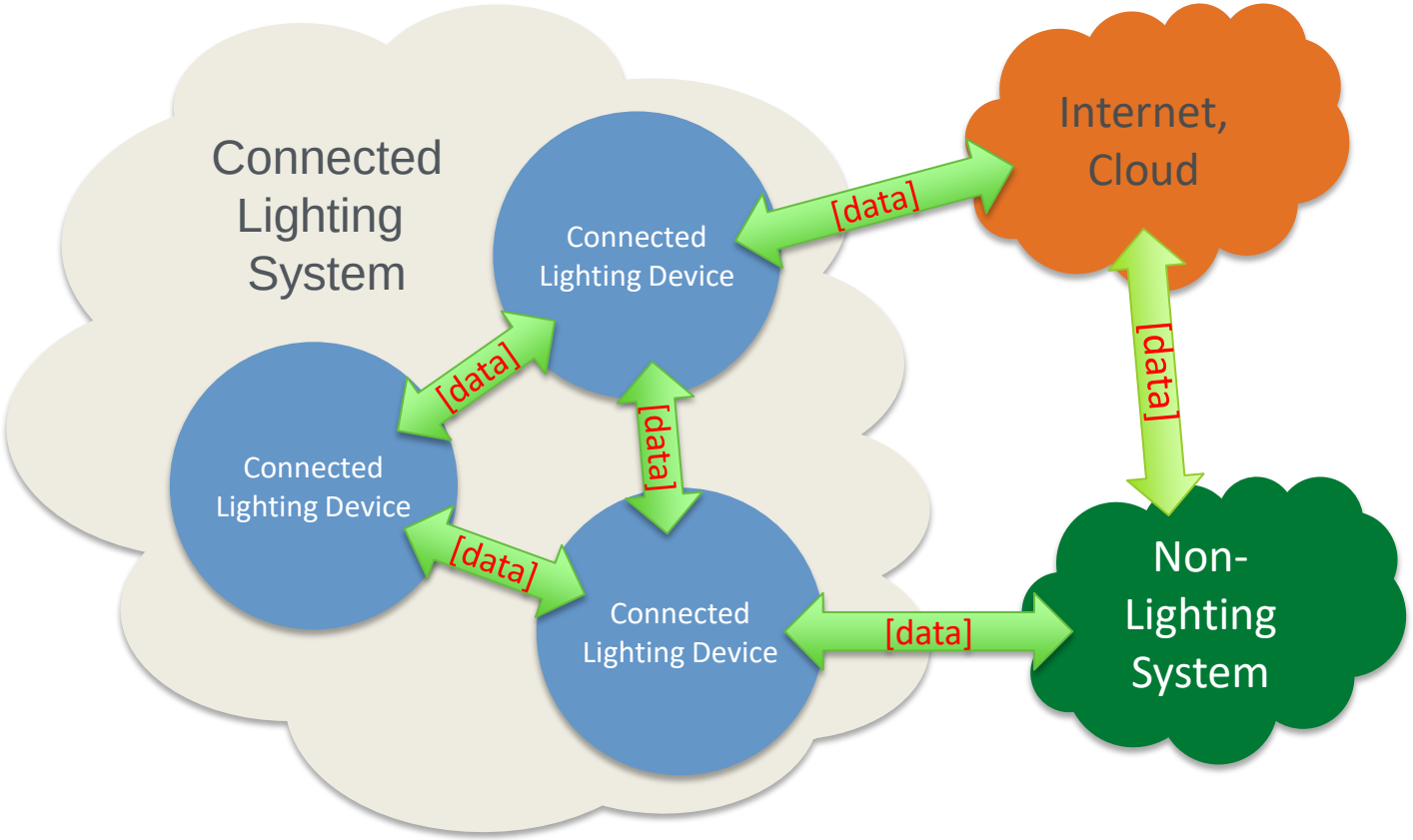
What is a connected lighting device?



- LED technology is the catalyst
  - Efficacy, Energy/Cost Savings
  - Electronic Platform
- Controllable: light output, CCT, chromaticity, SPD?
- Intelligent: integral data processor, memory, algorithms
- Network interface: wired, wireless, interoperability, standards
- Sensors: ambient light, traffic, occupancy, environmental, video, audio, air quality, radiation

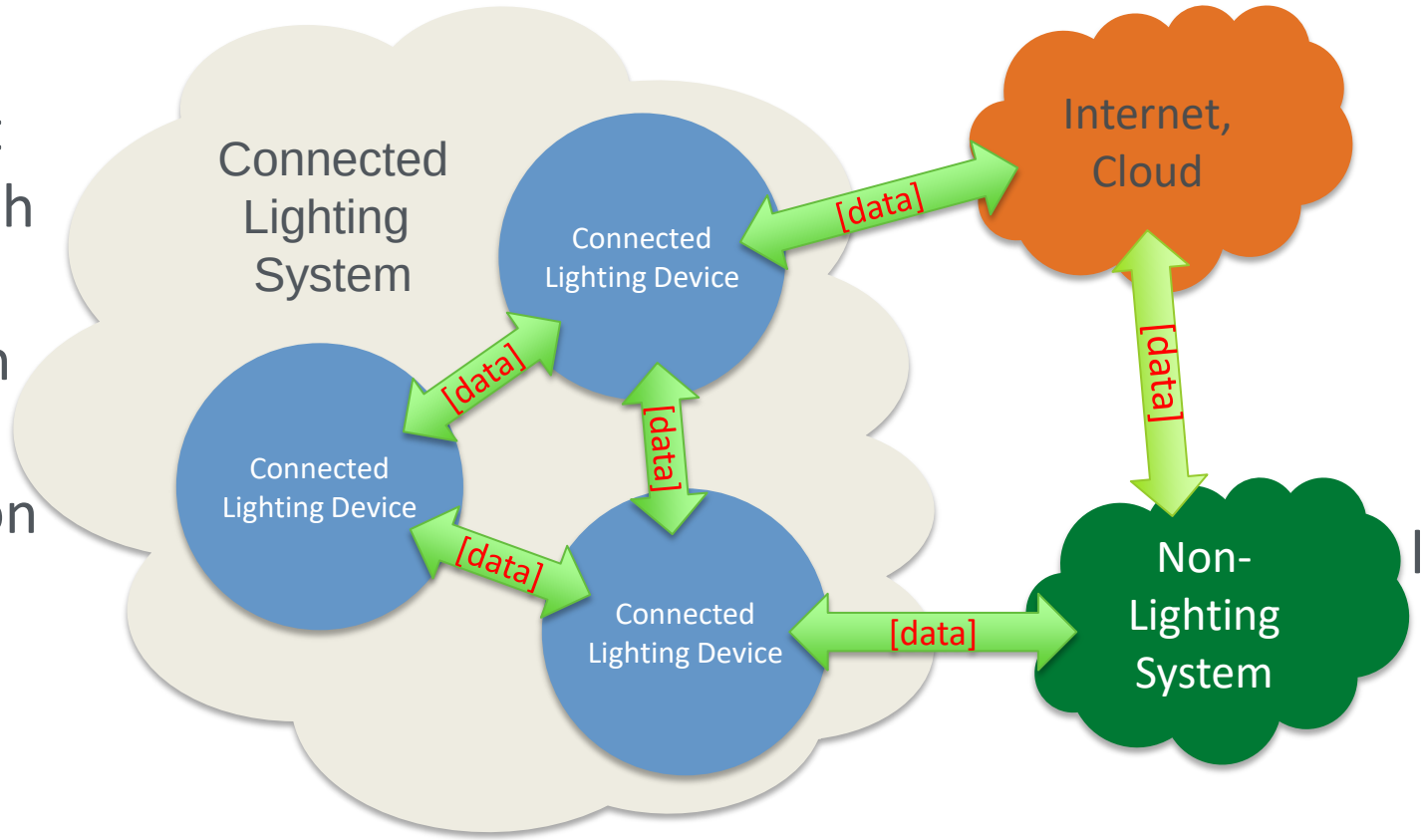
What makes connected lighting different?



Connected lighting is a data collection platform

Opportunity

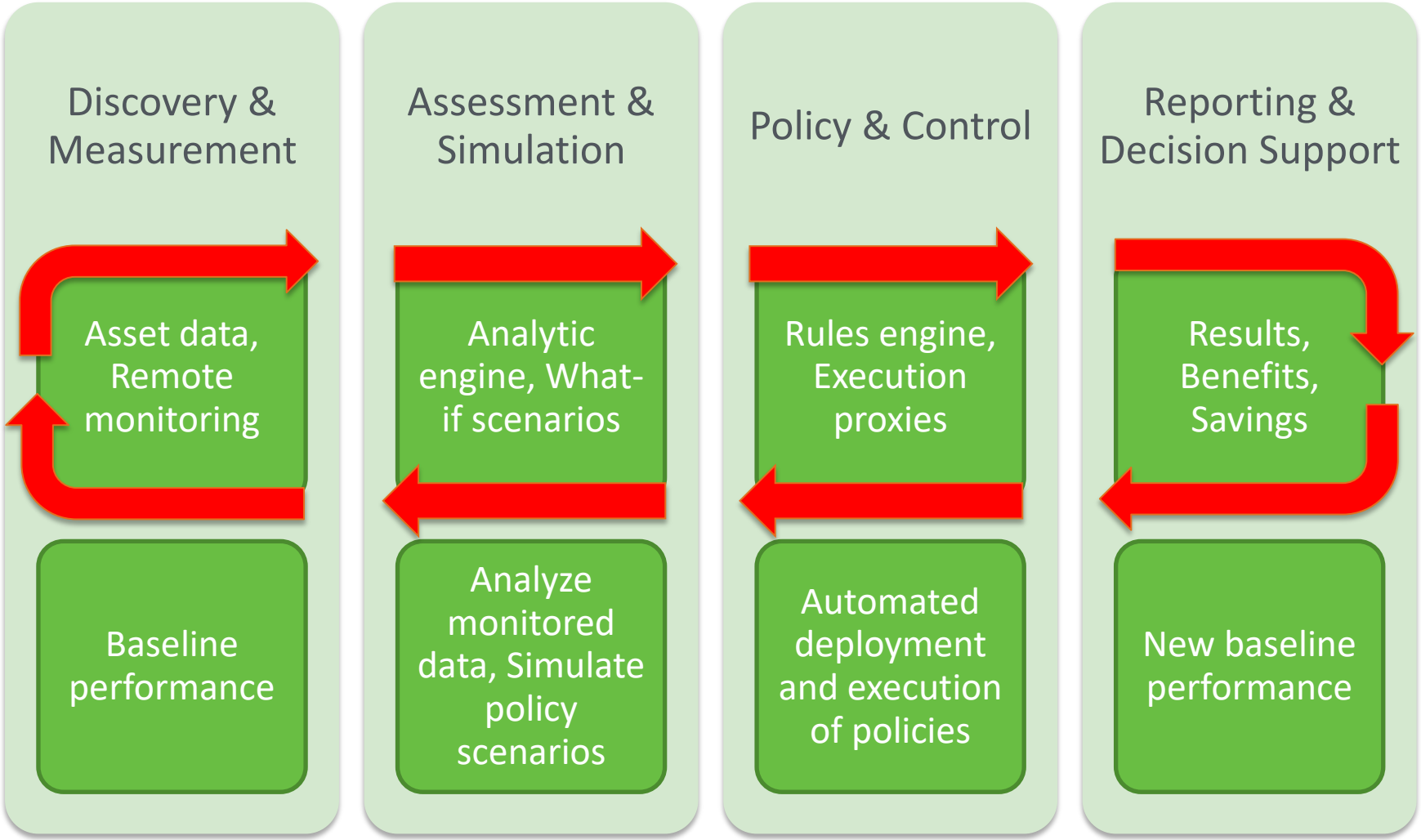
Enabling intelligent lighting devices with the right type and amount of data can result in reduced energy consumption and improved lighting performance



Threat

The collected data may enable other revenue streams that compete with lighting and energy performance.

What do we do will all that data?

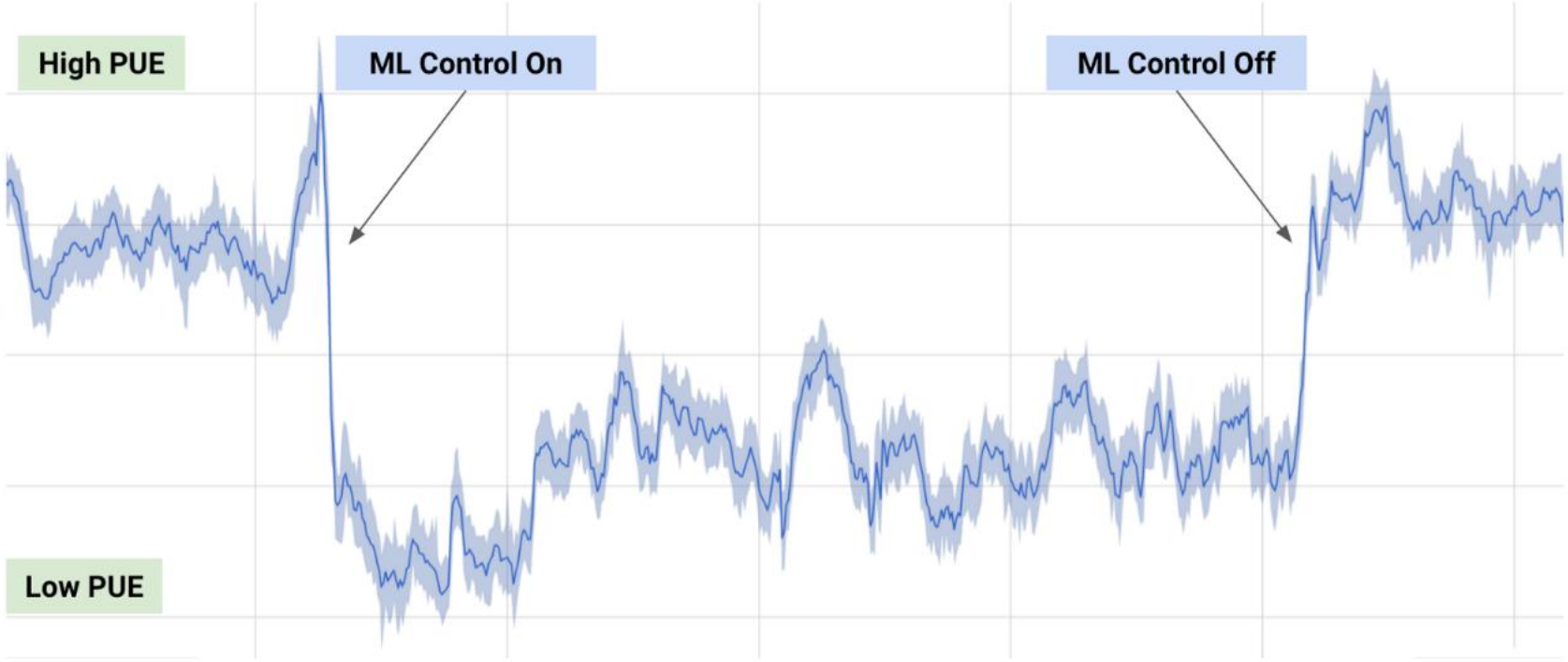


Data-driven performance management

- Energy
- Lighting Performance
- HVAC Performance
- … and more

Does this lead to energy savings?

According to the tech giant, which holds one of the world's largest data center footprints, the new AI software has already helped to cut energy use for cooling by 40%, and to improve overall data center efficiency by 15%.



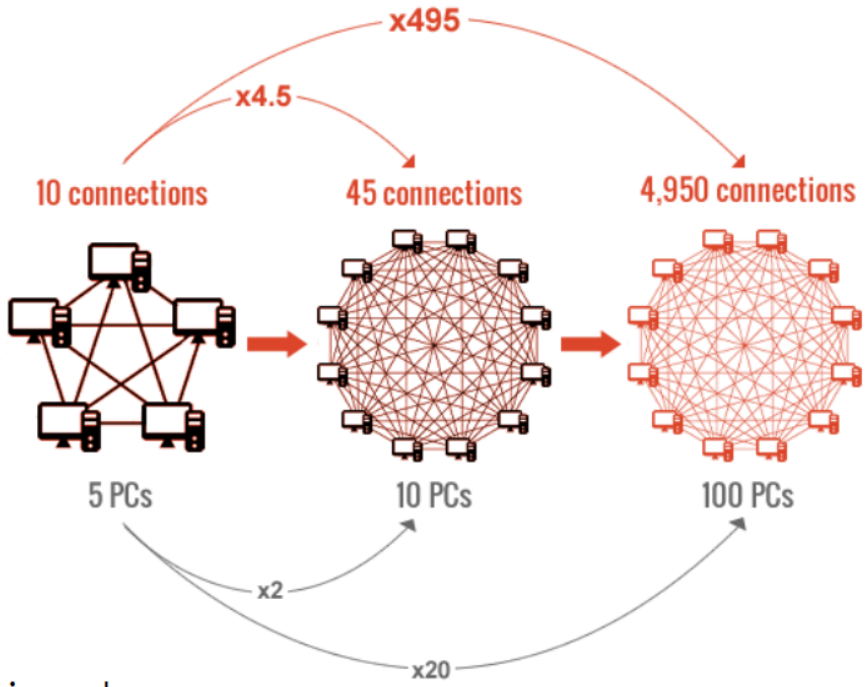
https://thestack.com/data-centre/2016/07/20/google-testing-ai-system-to-cool-data-centre-energy-bills/

Impact and value scale with connections

Metcalfe's Law Applies…

Number of Possible Connections
$C = n(n-1)/2$

Economic Value of the Network
$V = C^2$



McKinsey IOT report 2015 – total economic value to be generated by the IOT in 2025 - **$11.1 Trillion**

47% of the value - $5.2 Trillion - will be unlocked by Interoperability!

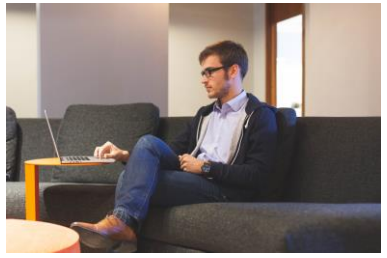
What is interoperability?

- Compatibility: The ability of two or more devices, applications, networks, or systems to coexist in the same physical environment – that is, operate without corrupting, interfering with, or hindering the operation of the other entity.
- Interoperability: The ability of two or more devices, applications, networks, or systems to work together, and (more specifically) to reliably and securely exchange and readily use data with a common shared meaning.
- Interchangeability: The ability of two or more devices, applications, networks, or systems to be physically exchanged for each other and provide a defined level of identical operation without additional configuration.

How is the reward/risk equitably shared?

"Lighting companies are dinosaurs. We own the building. If anybody's going to lead the convergence, it'll be us." – Building Automation Giant

"Lighting and building automation companies are both dinosaurs. Our products – routers, servers, and edge devices – are the real backbone of the modern building." – IT/Networking Giant



"All of these hardware companies are dinosaurs. We're going over the top with software and services." – IoT Pure Play

Panel focus questions

- Where is Connected Lighting at today?
- How is it more than and/or different from lighting control?
- How are those differences enabling better performance and/or greater deployment/adoption?
- When lighting (necessarily) collides with IT/Networking, how can opportunity be maximized, and risk be minimized?
- What learning curve should a building owner, manager, specifier be focused on today? IT integration? Interoperability? Cybersecurity? Other

Panelists: Three perspectives

- Lighting: Matthew Petti, Eaton
- Building automation: Matthew DeLoge, Johnson Controls
- IT/Networking: Mahadev Eakambaram, Intel