

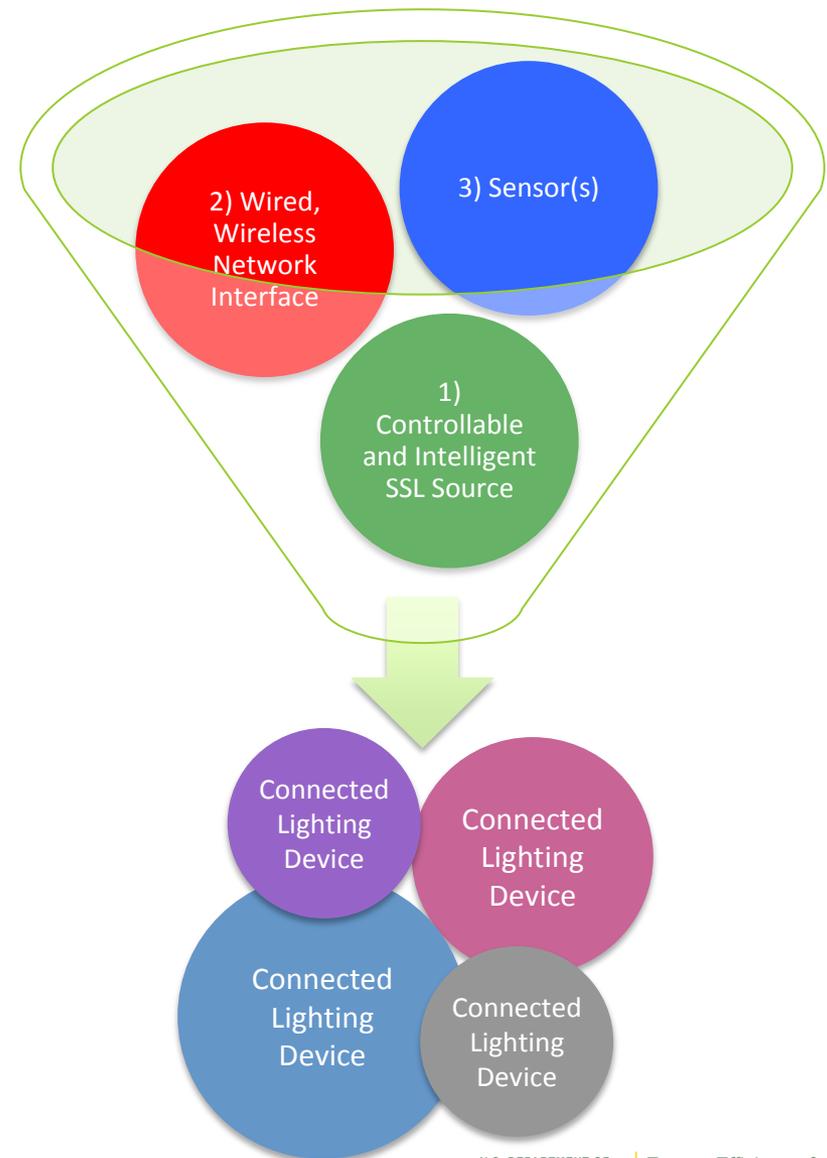
DOE Focus Areas and Panel Introduction

DOE SSL Program Connected Lighting Meeting
November 16, 2015

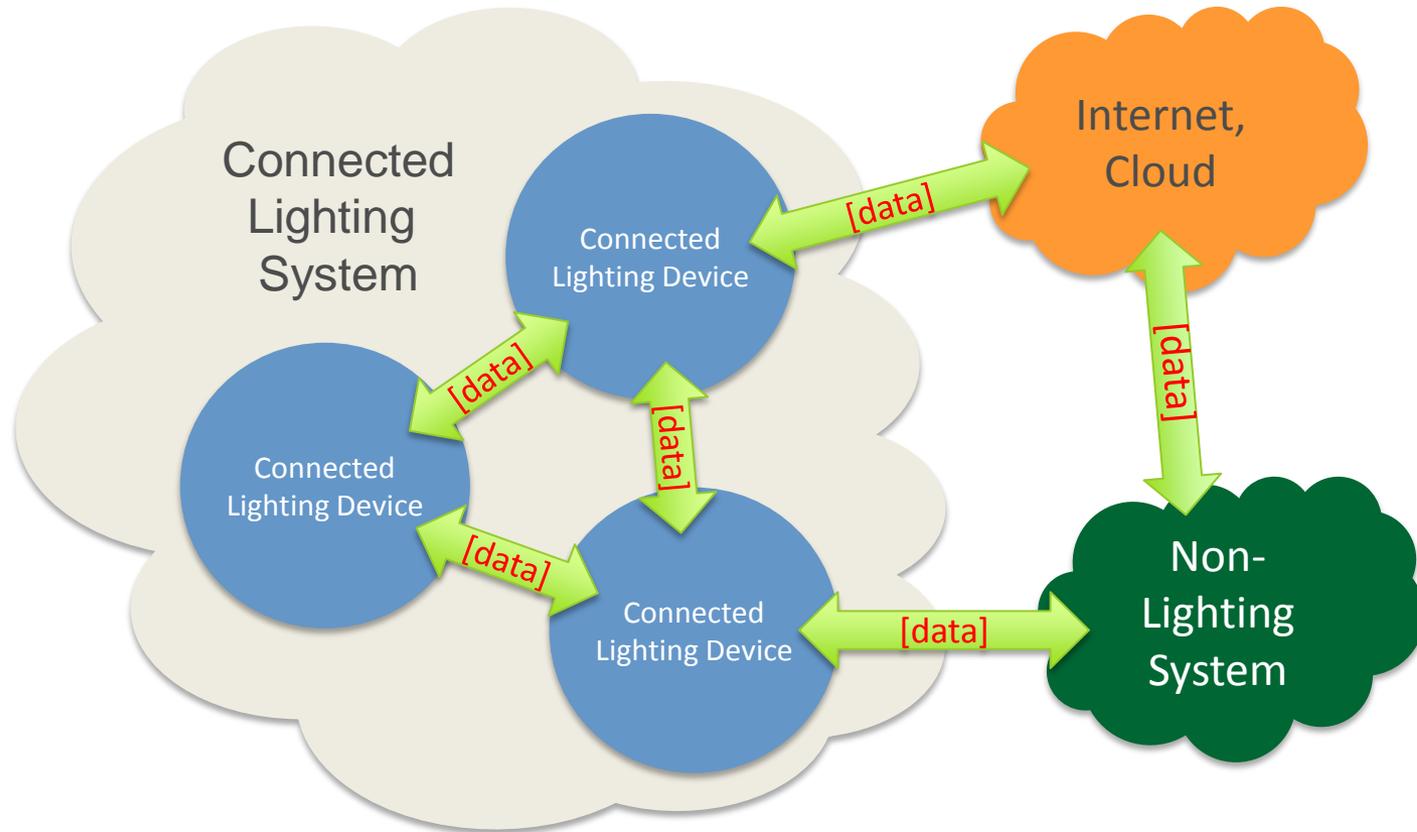
Michael Poplawski, PNNL

The emergence of Connected Lighting

- Solid-State Lighting
- Significant technology trends driving performance improvements and cost reductions
 - Computing
 - Mobile
 - Intelligence (i.e. microcontrollers), network interfaces, and sensors
- Cloud storage, computing, analytics as a service
- IoT focus on systems and data



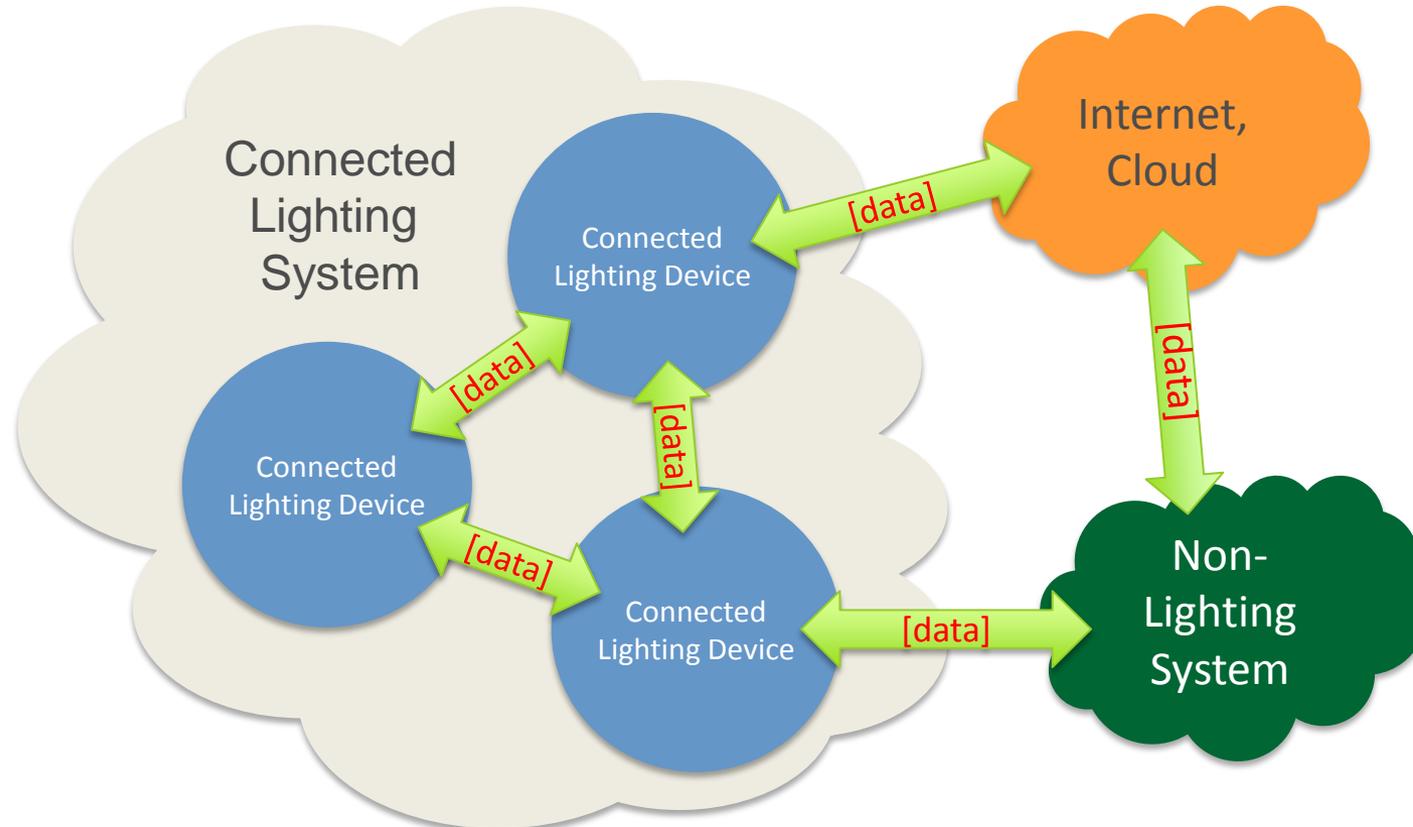
Connected Lighting Systems and the Internet-of-Things



Connected Lighting Systems impact

Opportunity

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



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

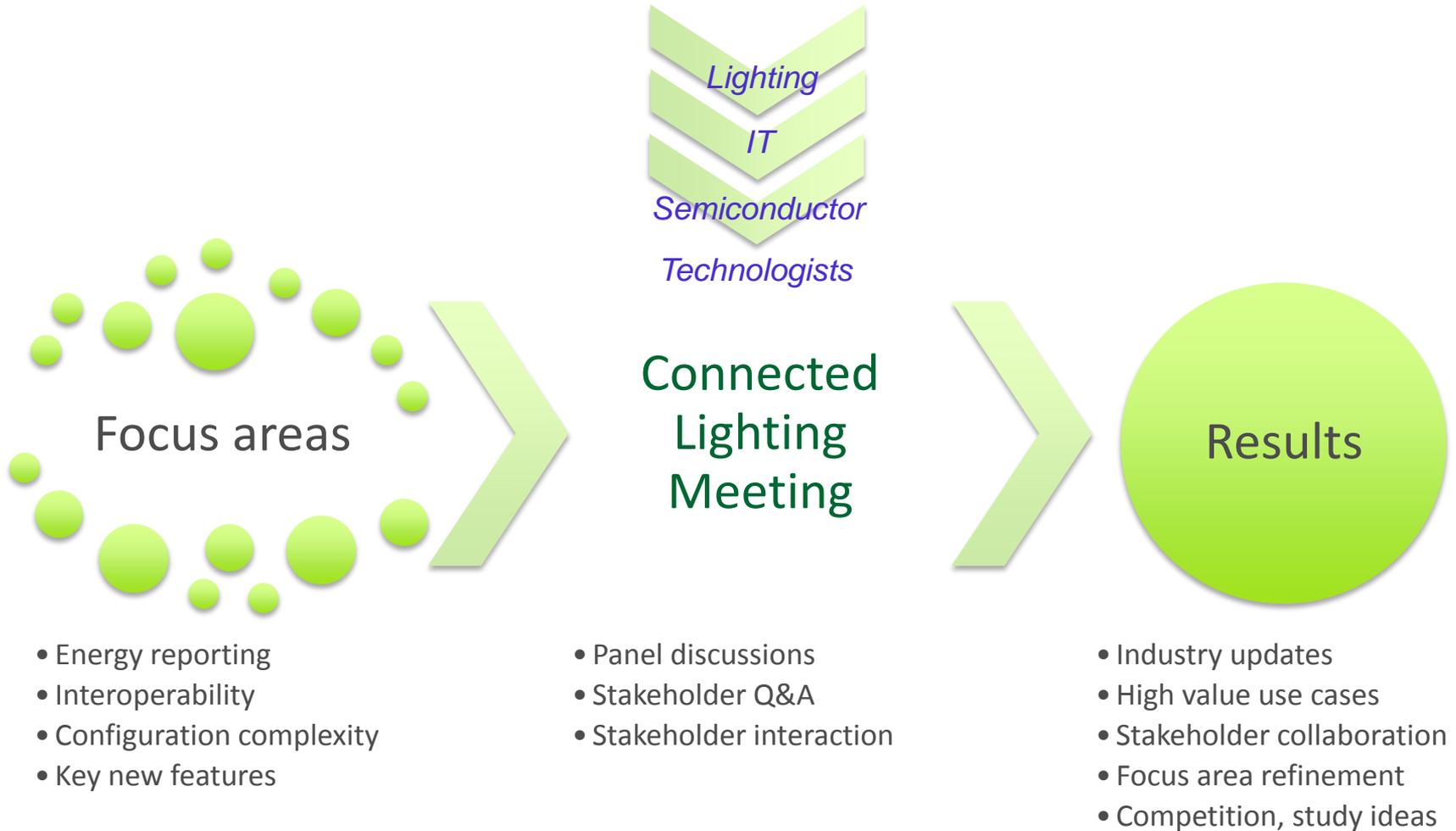
Threat

DOE SSL Program Connected Lighting Strategy



- Same for indoor and outdoor applications
- Ongoing dialogue with various stakeholder groups
- New emphasis on input from system integrators
- **Connected Lighting Meeting**

Strategy refinement



Why focus on energy reporting?

You can't
(effectively)
manage what you
can't **measure**



Enable New
Market
Opportunities

Transactive
Energy Markets

Data Driven
Energy
Management

Reduce
Energy
Consumption

Pay-for-
performance
energy efficiency
incentives

Energy billing for
devices currently
on flat-rate tariffs

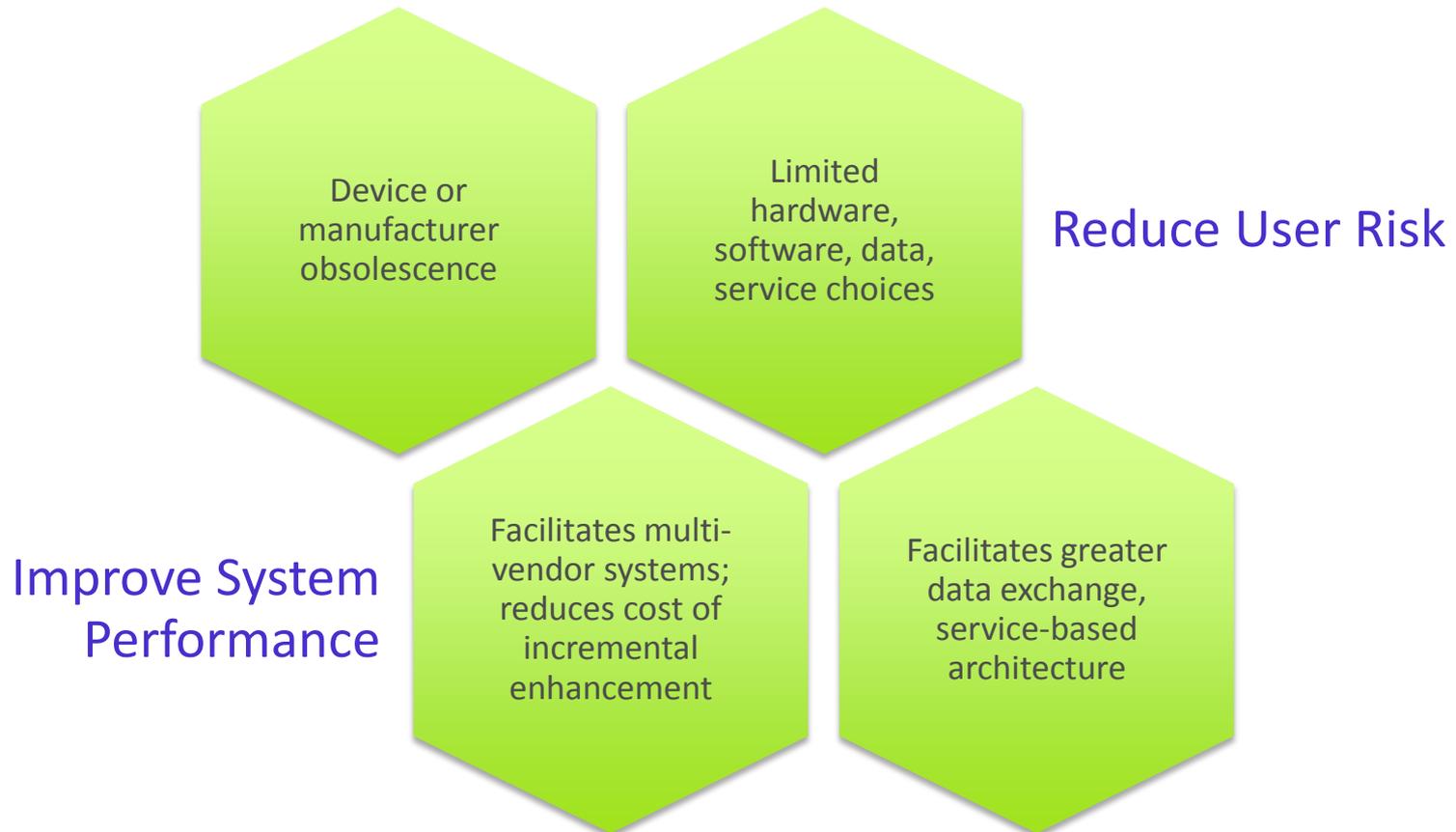
Verified delivery
of utility incented
energy
transactions e.g.
peak and other
demand
response

Lower cost, more
accurate energy
savings validation
for service-based
business models

Self-
characterization
of available (i.e.
marketable)
“building energy
services”

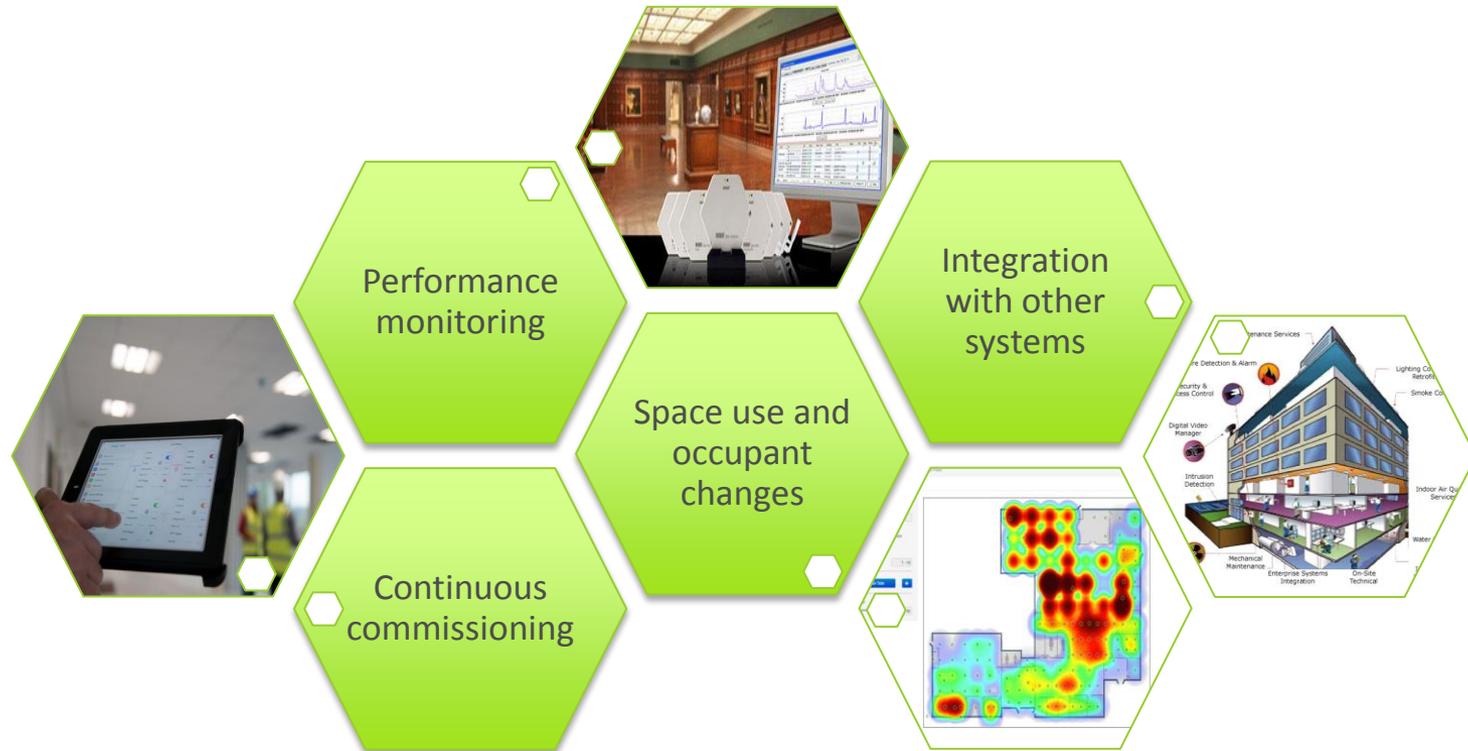
Why focus on interoperability?

System performance is dependent not just on constituent device capabilities, but also on the ability of those devices to **work together**.



Why focus on configuration complexity?

Systems that are overly complicated and time-consuming to configure have historically delivered **less than ideal performance**.



Broad deployment of connected lighting systems will require system configuration complexity to be **well-matched** to owner/occupant capabilities, or greatly **simplified**, or effectively **removed**.

Why focus on key new features?

Connected lighting systems hold the potential to deliver not only improved energy performance and lighting quality, but also a growing list of **other benefits**



On to the panels...

DOE SSL Program Connected Lighting Meeting
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Value of Session

- High = 73%
- Medium = 7%
- Low = 11%
- N/A = 9%

Energy Reporting



- High = 71%
- Medium = 12%
- Low = 7%
- N/A = 10%

Interoperability



- High = 63%
- Medium = 7%
- Low = 9%
- N/A = 21%

Configuration Complexity



Key to the development & impact of Connected Lighting

- Yes = 62%
- No = 38%

Energy Reporting



It is the first, most obvious step. But this is not forcing connected lighting.

- Yes = 90%
- No = 10%

Interoperability



Yes – need largest ecosystem possible to enable lowest cost production and max revenue potentials.

- Yes = 100%
- No = 0%

Configuration Complexity



Eventually yes. Now no. Interoperability comes first.

Can DOE have an impact?

- Yes = 75%
- No = 11%
- N/A = 14%

Energy Reporting



- Yes = 65%
- No = 9%
- N/A = 26%

Interoperability



- Yes = 54%
- No = 7%
- N/A = 39%

Configuration Complexity

