



2016

# STAKEHOLDER MEETING

# New Service-Based Business Models of Lighting

# Utility Perspective:

## Why Service-based Business Models?

- Improve short and long-term performance of advanced lighting systems
- Reduce or eliminate initial cost barriers of advanced lighting systems
- Expand market for advanced lighting systems to less sophisticated customer types



# Panelist

Benjamin Freas

Principal Research Analyst

Navigant Research



## Panelist

Virginia Hewitt

Senior Manager of Partnerships

Sparkfund



# Panelist

Benjamin Buchanan

Vice President, Channels

Daintree

A photograph of an industrial facility, likely a power plant or refinery, showing complex piping, metal structures, and walkways. The image is partially obscured by a dark grey diagonal shape that serves as a background for the text.

# NEW SERVICE-BASED BUSINESS MODELS OF LIGHTING

---

LIGHTING-AS-A-SERVICE

AUGUST 3, 2016

**BENJAMIN FREAS**  
PRINCIPAL RESEARCH ANALYST

NAVIGANT

# NAVIGANT RESEARCH INTRODUCTION

## NAVIGANT RESEARCH PROVIDES IN-DEPTH ANALYSIS OF GLOBAL CLEAN TECHNOLOGY MARKETS.

The team's research methodology combines supply-side industry analysis, end-user primary research and demand assessment, and deep examination of technology trends to provide a comprehensive view of the Energy Ecosystem.

### RESEARCH PROGRAMS:

Energy Technologies  
Utility Transformations  
Transportation Efficiencies  
Building Innovations

### RESEARCH OFFERINGS:

Research Reports  
Subscription Research Services  
Custom Market Research

- Custom Market Analysis
- Market Sizing and Forecasting
- Primary Research
- Go-to-Market Services
- Strategic Advisory Sessions
- Commercial Due Diligence
- Technology Evaluation

# RESEARCH SERVICES



## ENERGY TECHNOLOGIES

---

Wind Energy

Grid-Tied Energy Storage

Microgrids

Distributed Generation



## UTILITY TRANSFORMATIONS

---

Grid IT and Communications

Grid T&D

Residential Energy Innovations

Demand Response

Utility Innovations



## TRANSPORTATION EFFICIENCIES

---

Electric Vehicles

Advanced Transportation Technologies

Transportation Forecast

Natural Gas Vehicles and Infrastructure

Advanced Batteries



## BUILDING INNOVATIONS

---

Intelligent Building Management Systems

Energy Efficient Buildings

Lighting Innovations

Smart Cities

# TABLE OF CONTENTS

---

## **1. Lighting is going through transformative change**

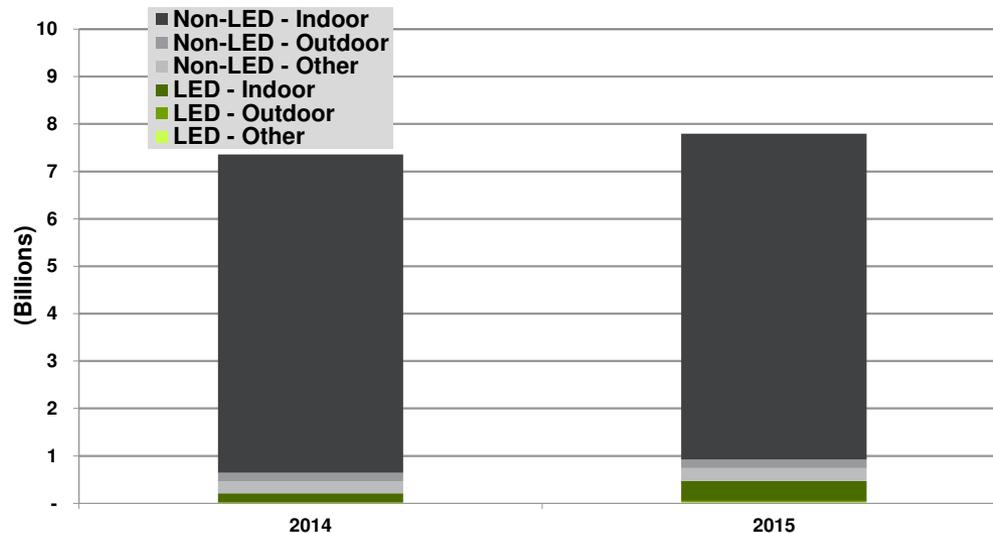
2. Lighting business models must also change

3. Market forecasts of LaaS deployments

# THE SHIFT TO LEDS IS DRAMATIC

- Due to their continual improvements in performance and decreases in cost, LEDs are transforming the commercial lighting market
- The installed base of LEDs increased 121% between 2014 and 2015
  - LEDs now represent 6.4% of the installed base in the United States
- LEDs accounted for about 23% of luminaire shipments in North America in 2015

**Installed Base by Lamp Type, United States: 2014-2015**

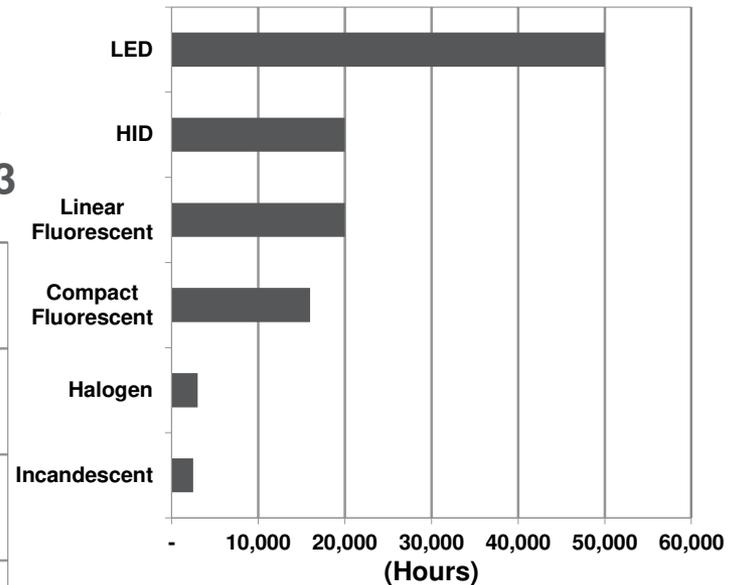


(Source: Department of Energy)

# LEDS ARE CHANGING THE NATURE OF LIGHTING

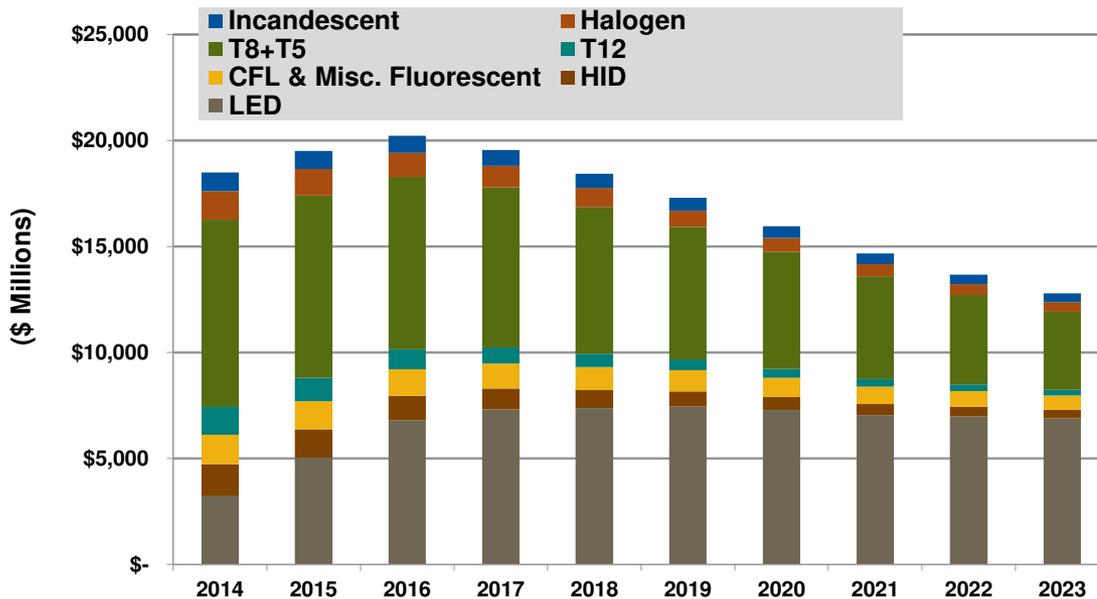
- Lamps sold as replacements for existing lamps that have reached the end of their life are a substantial portion of annual unit sales
- The longer lifespans of LEDs will lead to overall declines in the global lamp and luminaire markets

## Average Lamp Life by Technology



(Sources: Navigant Research, U.S. Department of Energy)

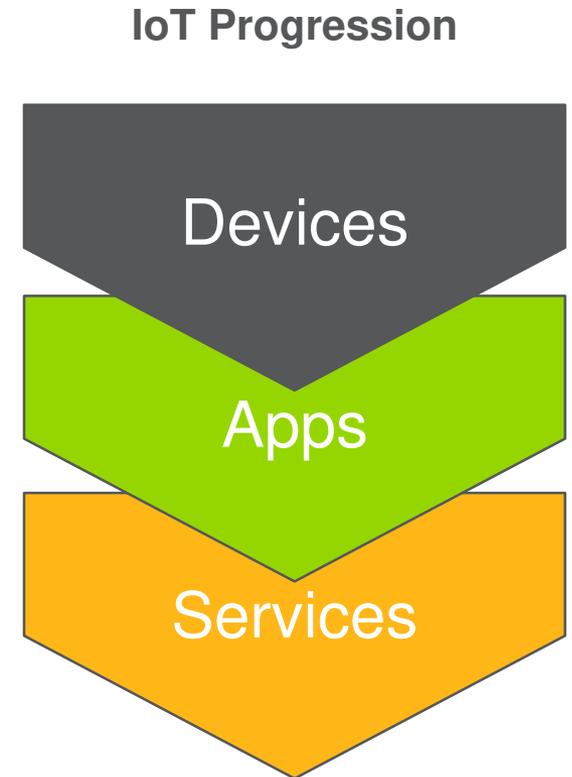
## Lamp Revenue by Lamp Type, World Markets: 2014-2023



(Source: Navigant Research)

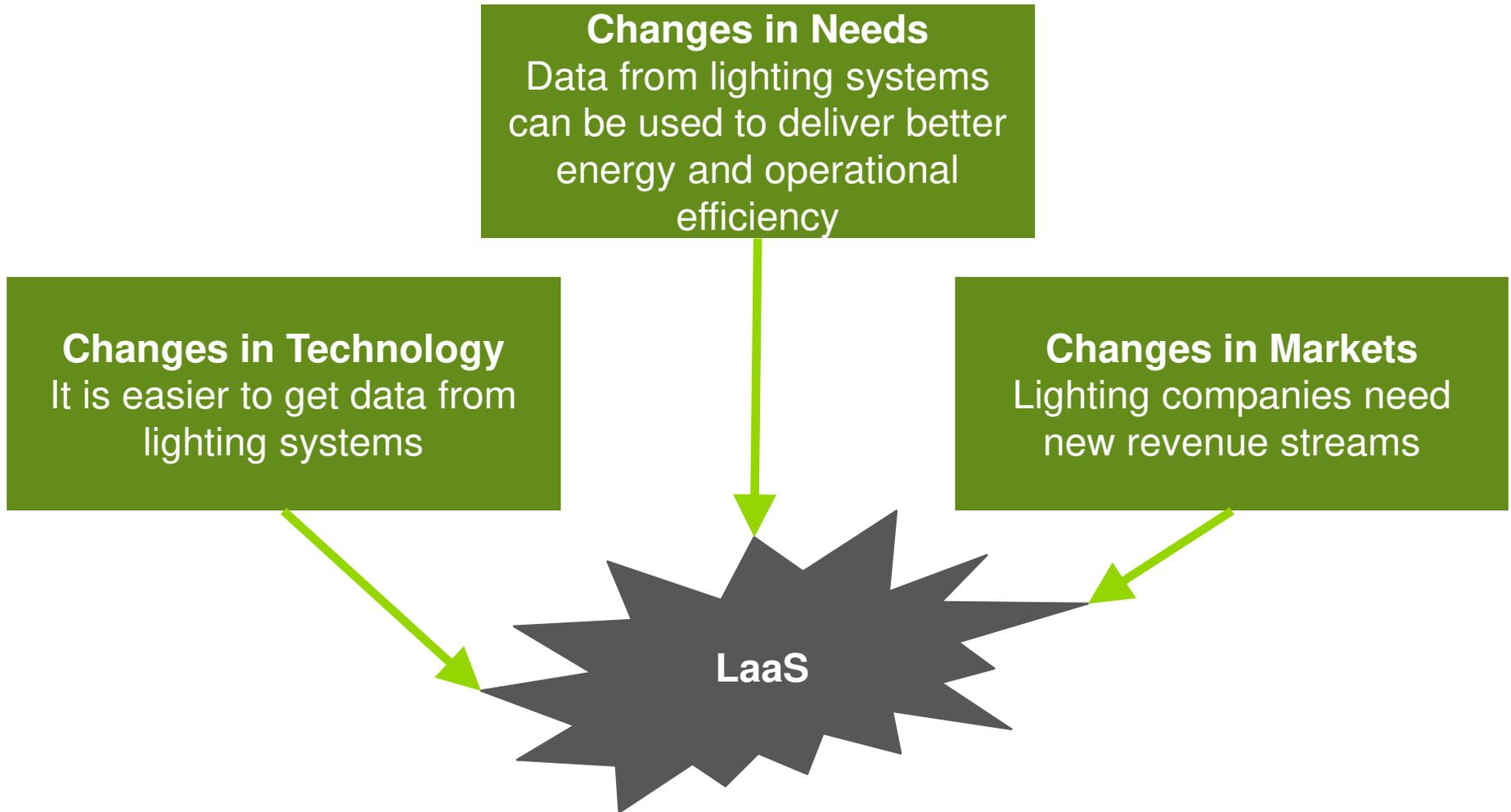
# TECHNOLOGY CHANGES

- Maturation of LED equipment, including long lamp lifetimes, light quality, and cost decreases
- IT advancements that provide increased access to intelligent sensors, network components that can integrate with luminaires, and cloud-based data management platforms
- Innovative thinking that merges IT with lighting, following the general trend of the information technology/operational technology (IT/OT) convergence



*(Source: Navigant Research)*

# THE PERFECT STORM FOR LIGHTING SERVICE



# MARKET BARRIERS

- Service providers and end-use customers each face their own set of barriers that limit growth a more rapid switch to service-based models

## Service Providers

- Lack of clarity about what customers want
- Lack of focus on the value of long-term service agreements

## End-Use Customers

- Uncertainty of when to enter the market
- Who to select as a provider
- Competing priorities

# TABLE OF CONTENTS

---

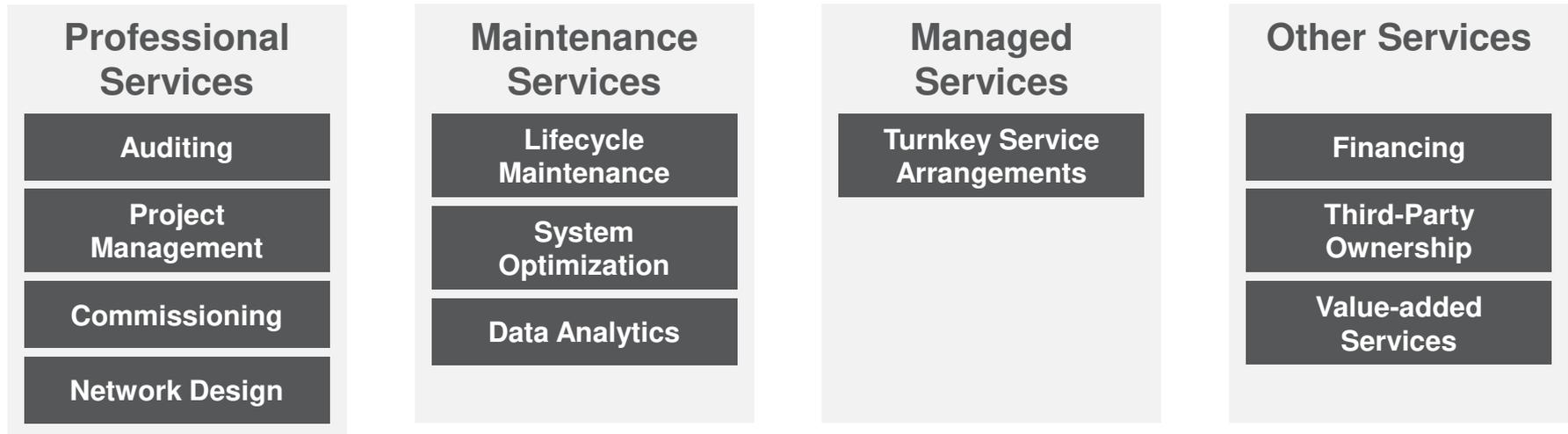
1. Lighting is going through transformative change

**2. Lighting business models must also change**

3. Market forecasts of LaaS deployments

# SERVICES IN LIGHTING ARE NOT NEW

- The range of services falling under the Lighting as a Service (LaaS) umbrella definition draw many models
  - ESCOs pioneered the business model of delivering energy efficiency upgrades as a service through performance contracts
  - The solar PV market uses power purchase agreements (PPAs) to sidestep upfront cost hurdles
- LaaS is charting new territory by leveraging the physical location of luminaires and networked lighting system features



# SO, WHAT EXACTLY IS LAAS?

- Service arrangements do not represent new business models or disruptive market developments
- Some companies provide a continuum of offerings, others simply layer additional services onto the equipment they sell
- The common thread among the definitions is that there is a long-term engagement and predictable flow of payments from end user to service provider

Some form of long-term third-party management relationship

Lasts between approximately 2 and 12 years

The vendor or a third party can own the equipment

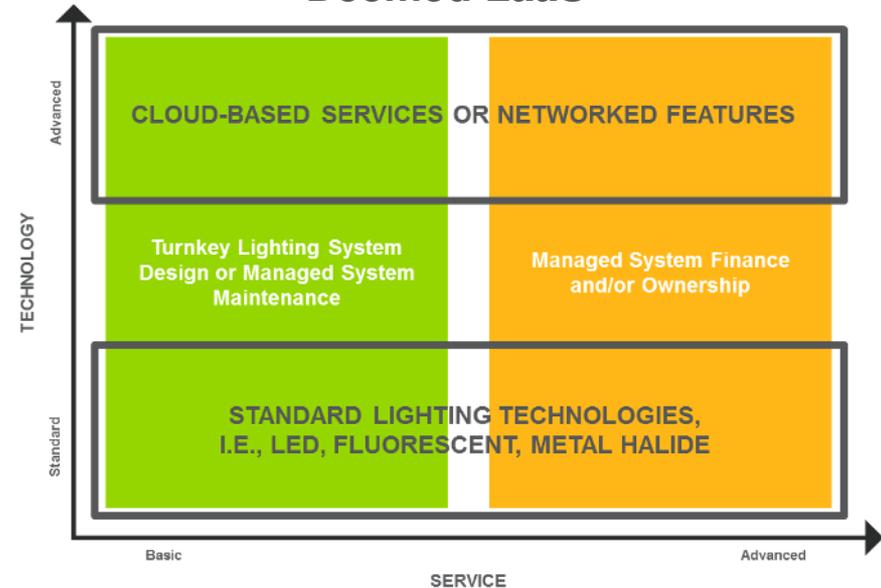
Lighting equipment gathers and manages data to inform decisions

May include technical, maintenance, or other services

# THE LAAS SPECTRUM

- Services falling under the LaaS definition span from relatively basic to highly sophisticated
  - Service agreements that address lighting upgrades alone and do not span into the realm of network-driven, cloud-based data services
  - Long-term lighting system management agreements can include financing
  - The advanced side of the spectrum captures service arrangements that expand into the new world where leveraging the position of networked lighting equipment to gather and manage data can inform actions or decisions

## Spectrum of Service Arrangements Deemed LaaS



(Source: Navigant Research)

# COMMERCIAL BUILDINGS

- The disruptive effect of LED advancements and networked LaaS applications could change the value chain within the commercial lighting market
- Medium-sized commercial buildings (100,000 to 1,000,000 square feet) present a robust opportunity: they are large enough to provide economies of scale, but too small to be the target of incumbent competitors

<b>Retail</b>	Currently the focus of the greatest amount of networked LaaS market activity
<b>Hospitals &amp; Universities</b>	Strong potential for LaaS because of their size and operational characteristics
<b>Hotels &amp; Restaurants</b>	Benefit from the improved ambiance and aesthetics
<b>Office</b>	Challenges due to the often complex decision-making structures

# OUTDOOR LIGHTING

- Street lighting in particular is more often managed by third parties than by municipalities themselves
- Other outdoor lighting opportunities for LaaS include universities, healthcare facilities, and parking garages
- Common areas and outdoor lighting at large-scale residential communities served by homeowners associations (HOAs) are often overlooked and could be particularly valuable for LaaS upgrades

## Before and After of a Parking Lot That Upgraded to LED Lighting



(Source: Oetlinger Precision Manufacturing Company)

# TABLE OF CONTENTS

---

1. Lighting is going through transformative change

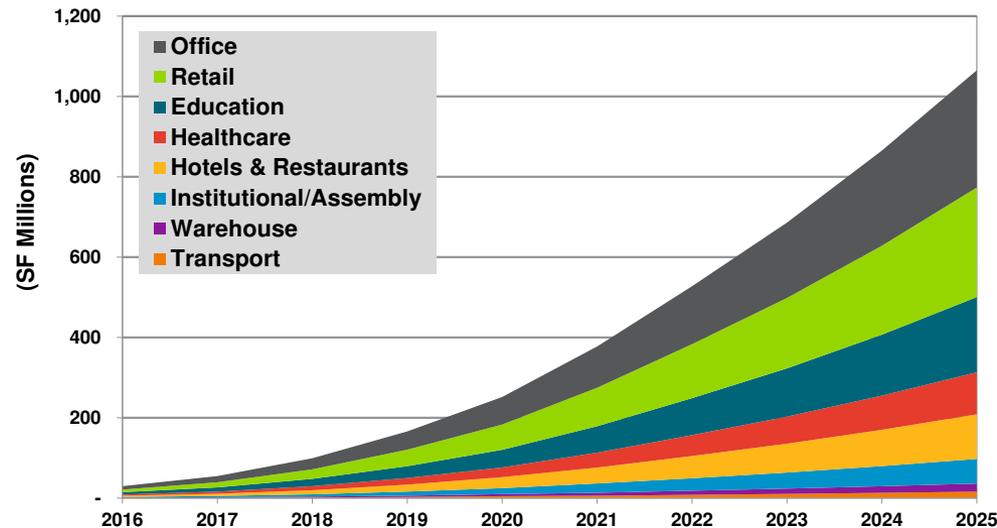
2. Lighting business models must also change

**3. Market forecasts of LaaS deployments**

# GLOBAL FORECAST

- Over the next 10 years, square footage under LaaS management is expected to grow at a CAGR of 49.0%
- As a point of comparison, the annual number of buildings with newly installed networked lighting controls is expected to increase annually by a CAGR of 25.7%

## Square Footage under Management by Building Type, World Markets: 2016-2025

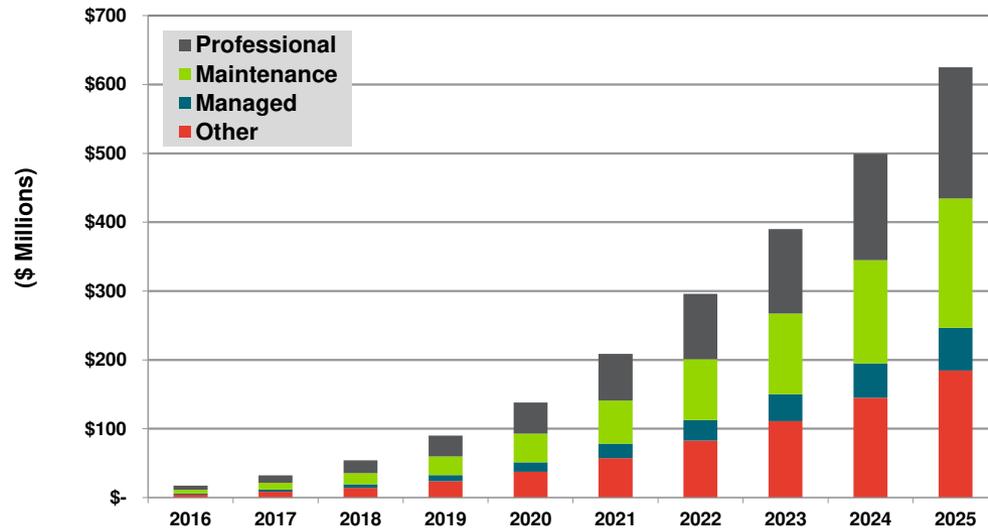


(Source: Navigant Research)

# MARKET FORECAST – BY SERVICE TYPE

- LaaS deployment is primarily driven by economic incentives to improve building performance
  - Professional and maintenance services account for the largest share of 2016 market revenue
- Other categories of service types that can boost the economic efficiency of lighting systems are forecast to eventually grow rapidly as well

**LaaS Revenue by Service Type, North America: 2016-2025**



(Source: Navigant Research)

# KEY TAKEAWAYS

- There are no standard definitions for LaaS but it is generally a long-term service engagement with a predictable flow of payments from end user to service provider
- LaaS **can be** the addition of services to hardware offerings but **should be** the evolution beyond lighting hardware
- The LaaS market is poised for significant growth in the next decade as intelligent building solutions gain deeper market penetration across customer segments and geographies



**BENJAMIN FREAS**

Principal Research Analyst

202.481.7304

[benjamin.freas@navigant.com](mailto:benjamin.freas@navigant.com)



# Spark Fund

Invest in efficiency

August 2016

# Agenda

---

- Overview
- As-a-Service Definition
- Comparison to Financing
- Benefits to Provider and Customer
- SparkFund's Experience in the Market
- Market Demand, Case Studies
- Moving Forward

# SparkFund Overview

---

- Domestic Partner Network
- Shift to a “pay over time” sale
- Infrastructure facilitating As-a-Service
- \$50,000 - \$3,000,000 project size
- Wide range of end-customers
- In-house fund warehouse, underwriting, credit services

# As-a-Service

---

Bundled package of equipment and service, third party ownership. Worry free upkeep, paid through simple monthly payments.

Transforming how goods are purchased across many industries - purchase to subscription.

Energy efficiency - Equipment bound, service component, paid through savings. Retire the simple payback idea

# Service Plan

---

- FASB-19 Service Plan
- Fully-designed efficiency system
- Bundled equipment and ongoing service
- Third-party ownership and control
- Verified savings and performance

# Service Plan -vs- Financing

---

## Service Plans

- Equipment-bound
- Service packaged, not a “rider”
- \*Possible Operating Expenditure
- \*Pay-for-Performance M&V

## Financed Deals

- Equipment bound
- Possible service “rider”
- Capital Expenditure
- Debt and Assets
- Buy-out or title transfer

# Simplified Proposals

## LED Project-Purchase

### Products:

LEDs	\$16,458
Lighting Controls	\$2,204
Building Controls	\$850

### Labor:

\$6,573

### Service:

\$1,200

### Ongoing M&V:

\$800

---

### Financing:

Rate	9.2%
Term ROI	3 Years

### Total Cost:

\$34,569

## LEDs As-a-Service

### Products:

#### T8 LEDs

224 Lighting fixtures to be installed

#### Lighting Controls

Central Panel and monitoring system`

### Services:

#### Ongoing M&V

Upkeep and monitoring every 3 months

#### Installation

Upkeep and monitoring every 3 months

### Monthly Payment:

\$2,200

### Monthly Savings:

\$2,800

# Service Provider Benefits

---

Maximize project profit

Long-term customer relationship

Faster sales cycles

Higher close rates



# Customer Benefits

---

Bundled monthly  
payment

Worry-free ownership

\*Possible expense  
payment

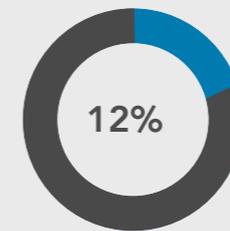
Increased value to  
facility



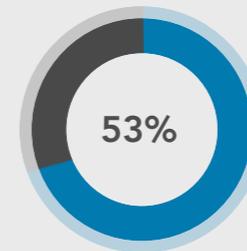
# Selling “As-a-Service” is Effective

**4.4X** Increase In Conversions

Traditional Financing



As a Service



Traditional Financing  
130 Days



As a Service  
27 Days

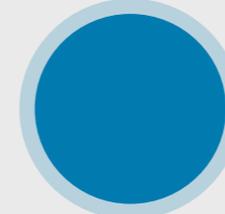


**4.8X** Faster Time to Close

**1.3X** Larger Projects

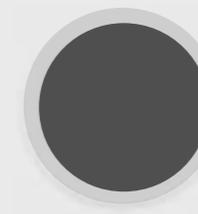
As a Service

\$172,000



Traditional Financing

\$128,000



# Market Demand

---

GE Current's MaryRose Sylvester calls Energy-as-a-Service **The Great Simplifyer** “reducing complexity, cutting costs, scaling quickly, and keeping adopters running on the best and latest solutions”.

**The Air Force** is pursuing Energy as a Service to **simplify** the complicated web of contractors and business arrangements that power its bases and support its energy resiliency.



## **Lighting as a Service**

**New York City**

**Mixed-Use Commercial and Industrial Redevelopment**

**Equipment: Lighting**

**Term: 72 Months**

**Total Cost: \$1,240,800**

**Annual Savings: \$266,000**

**Monthly Payment: \$21,363**



**Lighting as a  
Service**

**Olympia, WA**

**Parochial School**

**Equipment: Lighting**

**Term: 60 Months**

**Total Cost: \$35,000**

**Annual Savings: \$11,354**

**Monthly Payment: \$770**

# Moving Forward

---

Utility incentive structure - incentivise term, verify performance, claiming performance over a term

Technologies - new and different technologies expand the market. Long-livedness, customer control

Expand The Market - Customers of all sizes are demanding this mode of purchase,

Thank You

---

Virginia Hewitt

Senior Manager of Partnerships

[virginia@sparkfund.co](mailto:virginia@sparkfund.co)



# Daintree Networks DesignLights Consortium

Software as a Service:  
Commercial IoT

# Agenda

- Daintree Networks Overview
  - Internet of Things
- The End User
  - Pain Points
  - Goal of a Service Plan
- Software as a Service, the Vehicle
  - Software as a Service Overview
  - The Link to Lighting and all things IoT
- Project Details
  - Salk Institute

Facilities  
Maps

Energy  
Goals

Multi-  
measure  
control

Fault detection  
& diagnostics

# Daintree Networks, in the Current family, Powered by GE!

- 1200+ Daintree Smart Buildings across the U.S.
- Over 150 million square feet under management
- Industrial, retail, banks, office, education, parking
- Industries largest node network: 25K+ nodes/140 sites



# The Emerging IoT Market



## ***Daintree at the leading edge of the “Enterprise Internet of Things”***

- Connecting more commercial and industrial “things”\*
- 13 years wireless leadership, know-how and IP



## ***Internet of Things: Assessed as \$19 Trillion Market by Cisco***

- *“The Internet of everything will have five to 10 times the impact on society as the Internet itself” - Cisco CEO John Chambers*
- *“Smart buildings are poised to generate \$100B by lowering operating costs by reducing energy consumption” – Cisco Press Release, Jan 2014*

McKinsey&Company

## ***The Internet of Things picked by McKinsey as one of top three most valuable technology trends for the next decade (May 2013)***

- *50B to 1 trillion “things” connected with economic value of \$4 trillion/yr by 2025*



**Nest acquired for \$3.2B by Google in Jan 2014 – to jump into IoT**

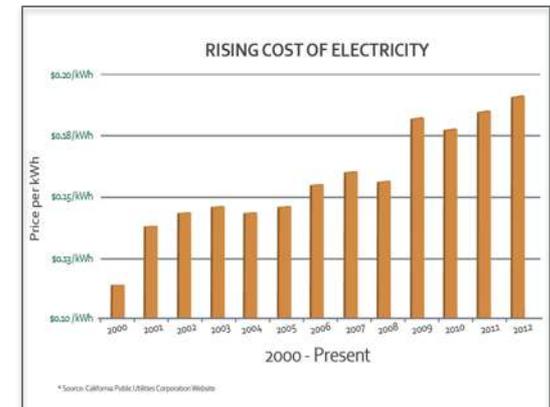
\* Daintree “things” include lights, sensors, thermostats, plug loads.

A close-up photograph of two hands shaking in a firm grip, symbolizing agreement or partnership. The hands are positioned in the center of the frame, with the fingers interlocked. The background is a blurred office environment with blue and white tones. The text "The End User" is overlaid in the center of the image in a bold, white, sans-serif font.

**The End User**

# Pain Points

- **Ever Increasing Utility Bills**
  - Increasing Peak Demand Charges hard to manage
- **Out of Control Maintenance**
  - Lacking enterprise management
  - Unperformed maintenance
- **Where is the Low Hanging Fruit?**
  - Solar, Lighting, HVAC, Analytics, Controls
  - Confusing Landscape of Solutions
- **Antiquated Systems**
  - Wired, Stand Alone, Panel Based, Proprietary, Failing, Engineer Required
- **Limited Budget**
  - Revenue Gen vs. Cost Reducing







Software as a Service: SaaS

# Software as a Service

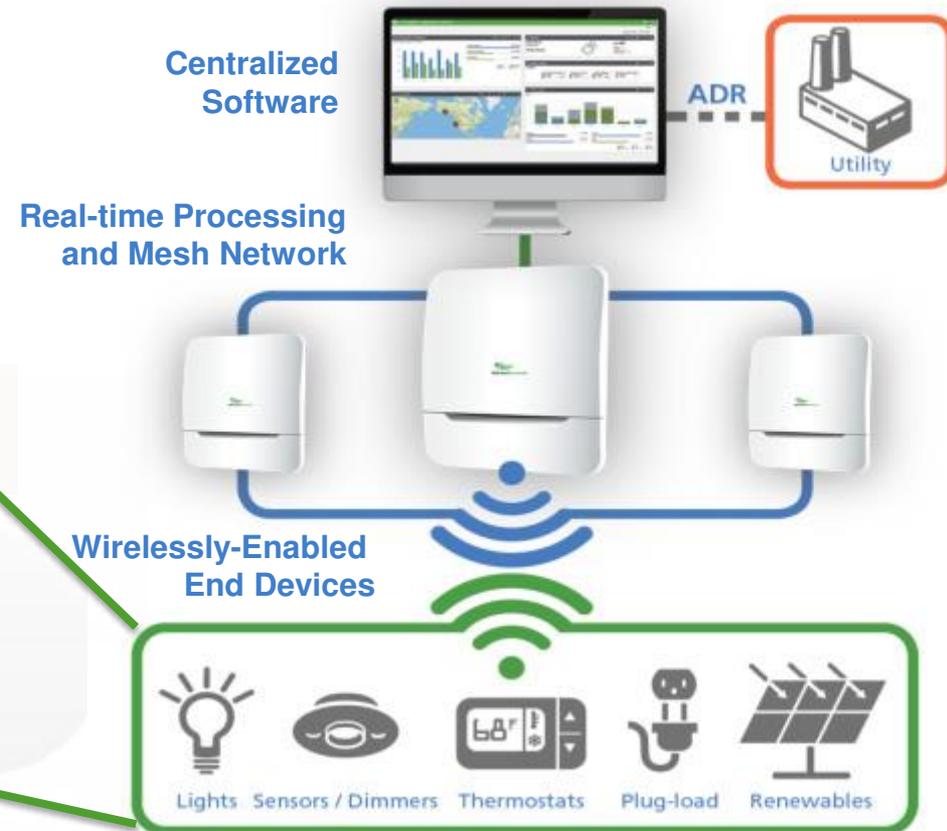
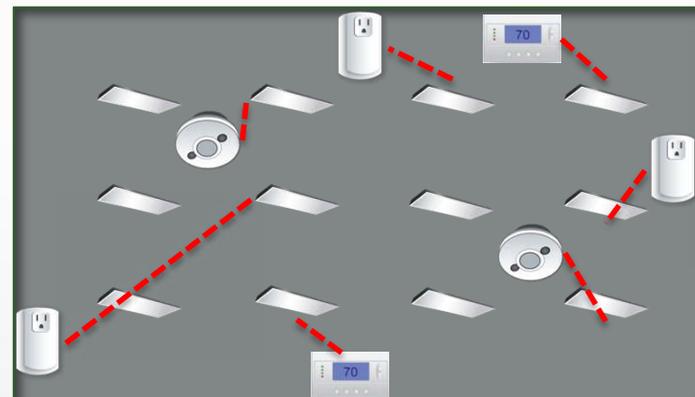


- **Reduced Startup Costs**
  - Moves software from CAPEX to OPEX
  - Infrastructure moves from facility to cloud
- **Painless Upgrades**
  - Upgrade and software maintenance rolled out by developer
  - Ensures performance
  - Regular security updates
- **Seamless Integration**
  - New technologies supported are with regular software updates
    - “We added thermostat control, sensor monitoring, power meter integration, with more applications on the roadmap”

# Lighting Based Platform

- Easily Manage Multiple Applications
  - Leverages ubiquitous lighting network
  - Use both 3<sup>rd</sup> Party and Daintree IoT Bridge Hardware to connect, monitor and

Delivered via on-site and hosted systems, with emerging SaaS deployments



# Analytics Comes from Good Data



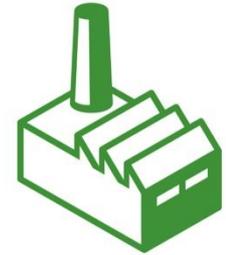
bank



retail



commercial



industrial



# Project Details



# Salk Institute

- Over 4000 Lighting Nodes
  - Granular Dimming Control
  - Occupancy/Daylight Harvesting
  - ADR
- Multi-Building Campus w/ Central Plant
  - Single Point of Access
- Vast IoT Potential, and Analytics
  - Environmental Data
  - Laboratory
- Future Proof Required
  - State of the Art Lab must be at cutting edge
- No Upfront Software Costs, built into Service Platform





Daintree**Networks**

**Thank You**