
Smart Building Technologies

Opening the Door to New Opportunities for ESCOs

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Learning Objectives

- What are the key technologies that enable a smart building strategy for facilities management?
- How has the smart building market evolved over the last ten years?
- What is the competitive landscape for smart building technologies and solutions?
- How are -as-a-Service trends potentially impacting the ESCO market?

Introduction

Technology Convergence and Business Transformation

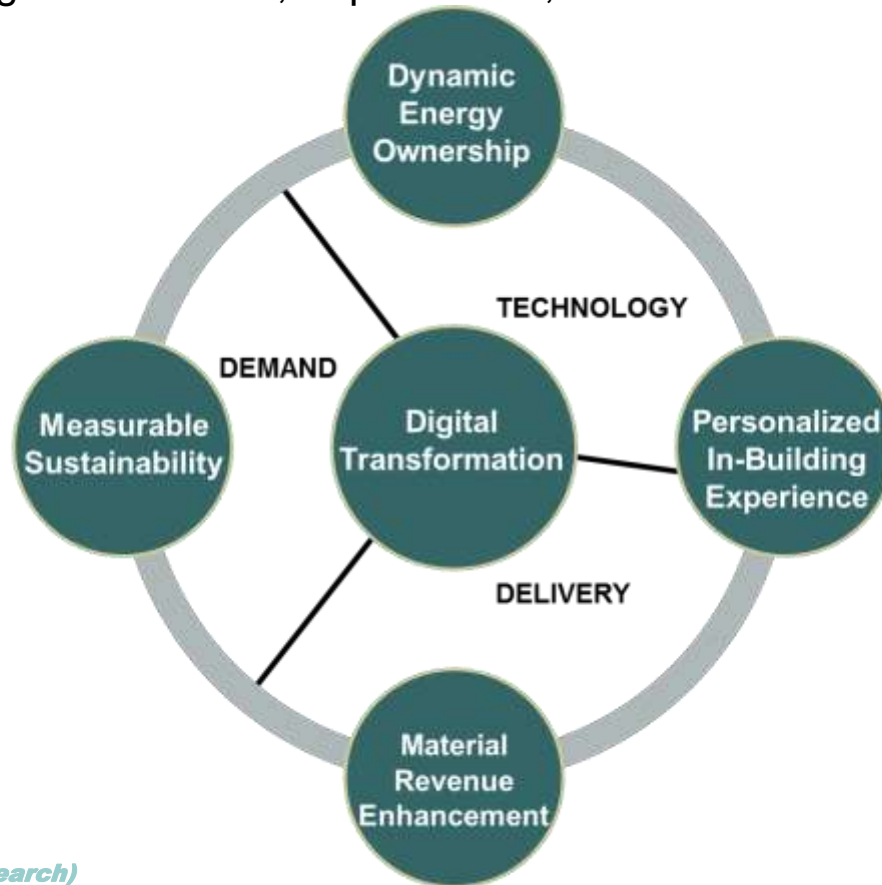


1. Shifting occupant expectations
2. Evolving roles and responsibilities
3. New partnerships
4. Converging systems
5. Emerging business opportunities

(Source: Navigant Research)

Market Driving Forces

Aligned Solutions, Expectations, and Business Models



(Source: Navigant Research)

Enabling Technologies

Data, Information, and Automated Equipment Improvement

Sensors, Gateways,
and Wireless
Communication

**Enabling hardware and
communications**

Energy Management
Software / Smart
Building Analytics

**Decision support for the C-
Suite, Enterprise, and
Operations**

Building
Automation and
Control Systems

**Frontend interface for
Operations**

**HVAC, Lighting, Fire &
Safety Controls for
Engineering**

(Source: Navigant Research)

Market Evolution

Data, Information, and Automated Equipment Improvement

Pre-2005

On-premise, frontend applications for equipment operators.

= **Building Management Systems (BMS)** for the largest commercial buildings

2005-2012

Introduction of *Energy Management Software (EMS)*, primarily cloud-based, focused on visualization and business metrics - i.e. economic impacts of energy savings

2012-2018

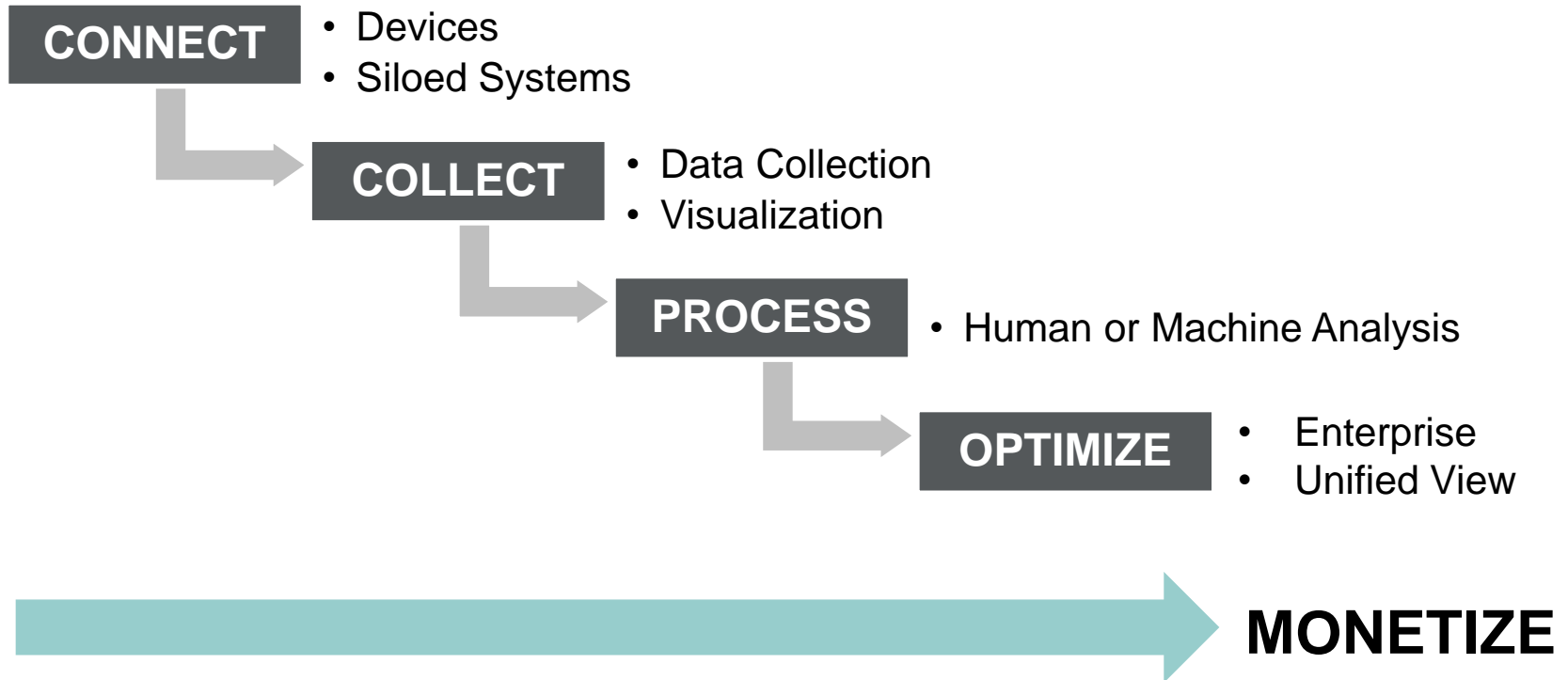
Cloud-based **software and analytics**, growing acceptance of the SaaS delivery model, and integration *capabilities* for deeper datasets and non-energy business metrics

Innovation Landscape: X-as-a-Service, seamless analysis of energy and nonenergy business metrics, systems integration of facility systems, edge devices, and occupant technologies

(Source: Navigant Research)

Smart Building Transformation

Creating an Infrastructure for Optimization and Opportunity



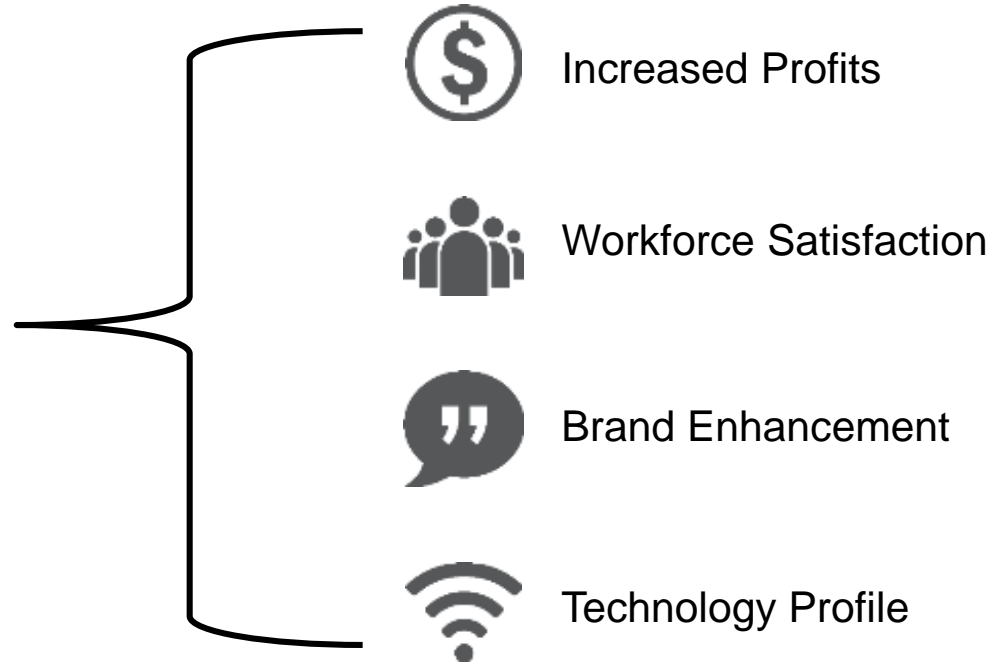
(Source: Navigant Research)

Expansive Data for Action

Smart Building Data Streams



Business Impacts



(Source: Navigant Research)

Redefining Competition

Illustrative Players in the Smart Buildings Market

Utilities/Energy Providers



Tech



Building Incumbents



HVAC



Startups



Professional Services



Lighting



Investment



(Source: Navigant Research)

IoT Changing the Landscape

Navigant Research Leaderboard: IoT for Lighting



(Source: Navigant Research)

Supply-Side Competition



DATA

"Watson makes building management as a service possible" - IBM



INFORMATION

"The Lucid acquisition supports our strategy of further unlocking the value of Internet of Things (IoT) capabilities within buildings by connecting advanced sensory network solutions with the broader integrated building data required to drive better operational and business performance." – Acuity Brands



INSIGHT



ACTION



IMPACT

"We're pleased to be partnering with Canada in using our proven smart buildings platform to support the government's sustainability commitment." - JLL

(Source: Navigant Research)

Ecosystem of Partners

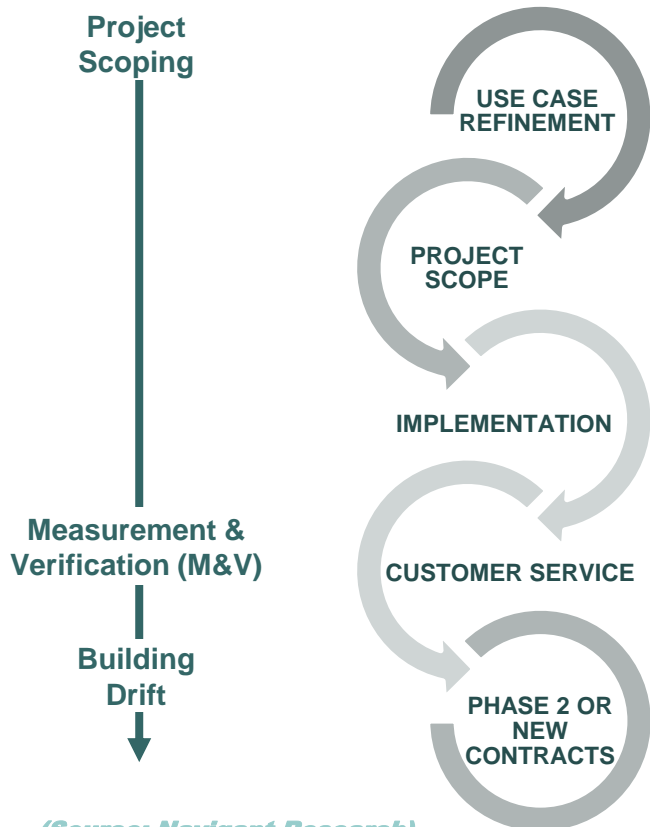
Mapping Activities and Solution Providers



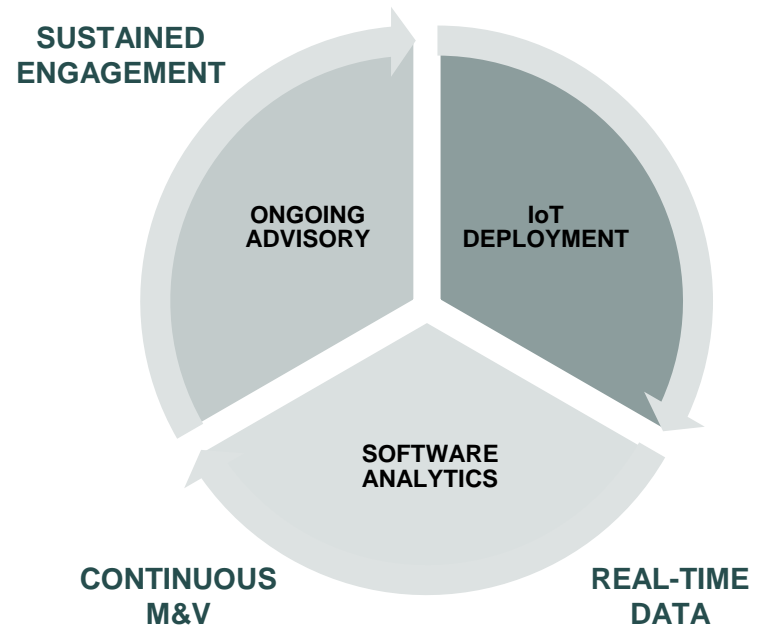
(Source: Navigant Research)

Sustained Partnership and Revenue

Traditional Energy Management Approach



Smart Building Approach

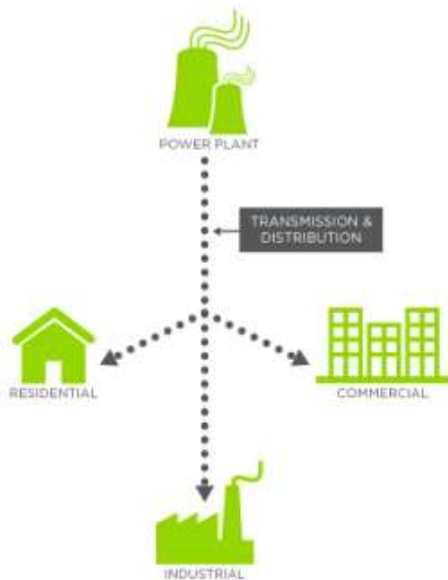


(Source: Navigant Research)

The Energy Cloud

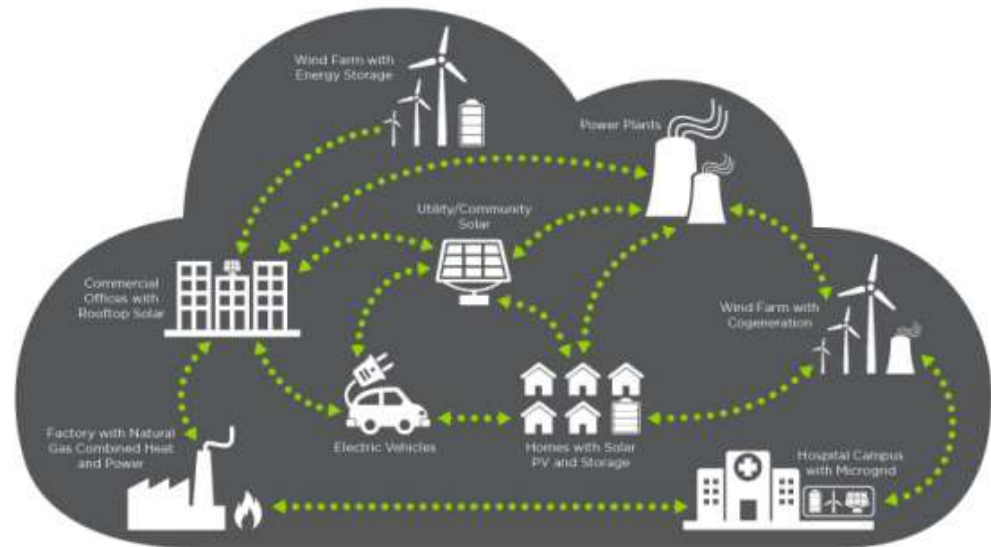
Energy Industry Transformation, Redefining the Building as an Asset

TODAY: ONE-WAY POWER SYSTEM



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EMERGING: THE ENERGY CLOUD



(Source: Navigant Consulting)

(Source: Navigant Research)

Digital Business Opportunity

Smart Building as a Platform

Building-to-Grid

Vehicle-to-Building

Rapid Energy Modeling

Energy Procurement

Ongoing Commissioning

Operations and Facility Management

Demand Response and Automated Demand Response

Energy Analytics

Energy Visualization

Past

Present

Future

(Source: Navigant Research)

Wide-Reaching Benefits

Data, Information, and Automated Equipment Improvement

DELIVER COST REDUCTIONS

C&I customers are under pressure to reduce total energy expenditures with minimal capital expenditures (i.e. financing flexibility)

IMPROVE SUPPLY QUALITY

An increased focus on resiliency and redundancy of supply requires dependable solutions

IMPROVE SUSTAINABILITY

An increased focus on sustainability and regulatory compliance (e.g. renewables, GHG) requires a comprehensive energy strategy

DRIVE SCALABLE SOLUTIONS

Large customers seek scalable enterprise-wide solutions to monitor, benchmark, and optimize energy costs

SIMPLIFY OPERATIONS

Corporate energy management functions have become complex and customers seek to simplify operations and refocus on core business

(Source: Navigant Research)

Thank you!

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BUILDING INNOVATIONS

Navigant Research's Building Innovations program focuses on the design, construction, and maintenance of highly efficient commercial and residential buildings. Research areas include intelligent building management systems, energy efficient lighting technologies, innovations in new construction and retrofits, and green building technologies and practices.

The Building Innovations program covers key market opportunities for each area, including a detailed assessment of key industry players, emerging business models, and the public policy and regulatory environment related to smart buildings.