Projects Summary

Adoption Campaign Timeline:
Start date: October 2015
Planned end date: October 2020

Key Milestones
• Recruiting launch, Q3 2016
• Campaign design and metrics, Q4 2016
• Technical assistance to participants, ongoing
• Quarterly and annual reporting, tracking, awards, ongoing
• New application guidance, Q2-Q4 2017

Key Partners:
- Building Owners and Managers Association International (BOMA)
- International Facility Management Association (IFMA)
- Commonwealth Edison
- Building Commissioning Association
- California Commissioning Collaborative

Project Outcome:
1. Provide EMIS technology cost, benefit, and market information to deployment channel partners to facilitate adoption at scale
2. Provide participants support in adopting and maximizing benefits of EMIS technology, enabling average savings of ~10%.

Budget:

Total Project $ to Date:
• DOE: $855K ($440K spent last 12 mo.)

Total Project $:
• DOE: $TBD
Grounding Definitions

Energy management and information systems (EMIS): a broad family of information technologies for no/low-cost operational efficiency

Clockwise from top right: SkyFoundry, Lucid, BuildingIQ

Fault Detection and Diagnostics

Energy Information Systems

Automated System Optimization

U.S. DEPARTMENT OF ENERGY

Energy Efficiency & Renewable Energy
Purpose and Objectives

**Problem Statement:** Advanced analytics, diagnostics and control technologies can enable average portfolio savings of 8-10%, yet these “Energy Management and Information Systems (EMIS)” remain underutilized in the commercial stock.

**Key barriers** to more pervasive use include:
- Credible third party information on technology costs and benefits
- Transparency in capabilities and performance across a diverse market
- Technical and organizational best practices to maximize savings
- No established market transformation programs, utility pipeline for EMIS

Goal of this work referenced in MYPP CBI Strategy 1: Demonstrate performance in commercial buildings, drive adoption with market leaders (application resources, adoption campaigns)
Purpose and Objectives

**Outcome:** Provide EMIS technology cost and benefit and market information to deployment channel partners to facilitate adoption at scale

For the SEA Campaign participant, outcome is to encourage greater adoption of EMIS to achieve average annual energy savings of 8-10%

**Target Market and Audience for Campaign:**
Commercial buildings (> 50K sf), campuses, portfolios – 335K buildings, 44B sf, 3895 TBtu

Facility managers, energy managers, building owners and operators from public and private sector

Utilities, market transformation programs, voluntary and mandatory codes, training and certification programs

**2020 stretch goals:**
100 participants, 1.7 TBtu savings
Purpose and Objectives

Impact of Project

Near term: Participants pledge to use EMIS to identify and implement at least one energy saving opportunity, share information with peers, and DOE team.

Intermediate term: Participants maximize EMIS benefits through Campaign resources and direct technical assistance.

Campaign currently supports 2900 buildings, 217M sf of real estate

Success measures:
#participants
sf enrolled
EUI reductions
Quality of info on measures, process, EMIS cost

Below: Replication of CBI Logic Model – objectives, activities, short- mid- and long-term outcomes

- Accelerate adoption of EE by providing information...
- Facilitate use of tools, access to standardized transparent performance data
- Owners, investors equipped with tools to understand and value energy performance
- Stakeholders use performance data to incorporate EE into financial transactions
- Adoption of solutions to improve whole-building energy performance
Purpose and Objectives

Impact of Project

• Long term:
  – DOE collects info on market barriers and best practices, facilitates replicable best practices and recognition through Better Buildings Alliance leaders and Campaign
  – Commercial building market (cautious, risk averse), able to navigate complex and rapidly evolving EMIS technology landscape.
  – Deployment channel partners provided with EMIS technology cost and benefit information to facilitate scaled future deployment activities.

CBI Goal: 30% EUI improvement in existing buildings of market leaders

Strategy 1: Demonstrate technologies in buildings and drive adoption w market leaders -- adoption campaigns, best practice guidance
**Approach**

**Approach:** Build from foundation of Better Buildings Alliance work to engage owners, develop early guidance, understand user challenges and technology potential - cost effective portfolio savings from study of 2 doz. organizations.

Expand foundation through larger dedicated multi-year adoption campaign
- Assistance for individual technical needs, understand problems, success
- Awards provide recognition, granular info on savings, costs, innovate/exemplary use
- Resources, guidance enable replication and adoption of best practice

**Key Issues:**
- EMIS are process tools, not efficient equipment! Must collect more detailed info on over-time EUI reductions, process and specific measures identified, cost, uses

**Distinctive Characteristics:** Provide understanding of market needs to inform advanced analytics, diagnostics, controls development work in ET program.
  - Communicate key barriers, needs, issues of usability
  - Transfer knowledge of commercial offerings, gaps
Progress and Accomplishments

Campaign design and infrastructure

- Developed reporting and tracking metrics, reach and impact goals
- Obtained commitments from organizing and supporting partners
- Developed and released website for communications, protected reporting, data collection
- Established awards categories and fall/spring recognition schedule
  - Best Practice & Innovation; Largest Portfolio
  - Energy Performance; New installation
  - Monitoring-based commissioning provider of the year

Find a Product or Service

Looking for a specific EMIS tool or service provider? See below for a list of Energy Information Systems, Automated System Optimization software, Fault Detection and Diagnosis systems, and EMIS service providers. Can’t find what you are looking for? Let us know and we’ll see how we can help.

EMIS Procurement Specification

The EMIS Specification and Procurement Request Matrix is intended to guide you through the specification, procurement, and selection of an EMIS. The package includes a template for a Request for Proposal, a Technology Specification, and Evaluation Statement Guide.

Vendor Product Videos

Several vendor products below have supplied us with short videos that give an overview of their product with highlights and benefits. We are always adding more vendor videos, as well as others. Please note third inclusion of these videos was published on YouTube.

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Energy Information Systems

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<th>Vendor</th>
<th>Product</th>
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<td>Agile Energy</td>
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<tr>
<td>Alaska Housing Finance Corp.</td>
<td>Building Monitoring System</td>
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<tr>
<td>Aquione</td>
<td>AG Optimization</td>
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<tr>
<td>Building IQ</td>
<td>Energy Workbench</td>
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</table>

Smart Energy Analytics Campaign

Campaign FAQ

- Why Energy Management and Information?
- What is the Smart Energy Analytics Campaign?
- What is the goal of the Smart Energy Analytics Campaign?
- How do I get started? How do I join the Smart Energy Analytics Campaign?
- What are the steps in the Smart Energy Analytics Campaign process?
- What is the deadline to join the Smart Energy Analytics Campaign?
- What are the benefits of joining the Smart Energy Analytics Campaign?
- Is the Smart Energy Analytics Campaign targeting certain building sizes or market sectors?
- Can owners of both new and existing buildings participate in the Smart Energy Analytics Campaign?
Progress and Accomplishments

Launch and participant recruitment

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<tr>
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<th>To Date</th>
<th>FY ‘20 Goal</th>
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<tr>
<td># participants</td>
<td>30</td>
<td>100</td>
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<tr>
<td>Floor area</td>
<td>217M sf</td>
<td>400+M sf</td>
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<tr>
<td># buildings</td>
<td>2,971</td>
<td>8,000+</td>
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<td>Est. Savings at campaign End</td>
<td>.38 TBtu</td>
<td>1.27 TBtu</td>
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</table>

Sectors represented (by number)

- Public Sector: 45%
- Office: 10%
- Retail: 7%
- Hospitality: 3%
- Higher Ed: 28%
- Hospital/Healthcare: 3%
- Grocery: 4%

Arlington County, VA
Brown University
City of Boston
City of Newburyport
City of San Antonio
County of Kauai
District of Columbia - Dept of General Services
Emory University
Kohl's
Lawrence Berkeley National Laboratory
Macy's, Inc.
MGM Resorts International
Michigan State University
National Renewable Energy Laboratory
Oak Ridge National Laboratory
Oregon Health & Science University
Rhode Island - Office of Energy Resources
Trane
University of California, Davis
University of California, Office of the President
University of California, San Francisco
University of California, Santa Cruz
University of Miami
Western Michigan University
Whole Foods Market
Progress and Accomplishments (Cont)

Technical assistance

• All participants receive support for best practice implementation & operation
  – Direct 1:1 Lab support, and organization-specific guidance
  – Peer learning cohorts, launched w fault detection and diagnostics
  – Topic specific webinar series
  – Collecting and posting vendor product overviews (beyond standard marketing)
Progress and Accomplishments

New application guidance resources

- Updated guide to utility EMIS incentives
- Using EMIS to identify top opportunities for commercial building efficiency
- Market Characterization of Fault Detection and Diagnostic Offerings
- Monitoring-based commissioning process template

① Fault description provided to the user.

② Fault duration and times of occurrence. The fault indicates that the AHU static pressure has been constant during all occupied periods for the past 4 weeks.

Above: Excerpt from top opportunities guide
Right: Screen shot of guide to utility EMIS incentives
Progress and Accomplishments

Market Impact

Campaign 2020 Stretch Goal

- 100 participants
- 8% savings
- 1.27 TBtu saved

Campaign Influences EMIS Uptake Through Scaled Deployment Channels

- $7.9B 2014 Utility investment in demand side management
- $5.3B 2014 ESCOs Revenue
- $0.8B 2015 Building Analytics Market

Ultimately Supporting Access to Untapped EE Potential

- $1T 10yr-EE savings potential in commercial sector
Progress and Accomplishments

Lessons Learned:

• EMIS enable cost-effective savings of 8-10% from low or no-cost measures

• Ongoing data protects savings, especially those from capital investments, so that they continue into the future

• Well-tuned buildings often have fewer comfort complaints

• Though solutions are rapidly emerging, owners, operators, designers and technology providers struggle with cost and complexity of integration, interoperability across diverse information flows and legacy or proprietary systems
Project Integration:
Organizing Partners collaborate on Campaign strategy, share info through their networks

Supporting Partners assist with outreach & recruitment

5 Organizing Partners

67 Supporting Partners
Project Integration and Collaboration

Communication:
• Outreach to 60+ EMIS vendors, service providers for participant recruiting, awareness building
• 140+ postings on social media, partner networks, web news articles

Conference presentations:
Professional Retail Store Maintenance Association
National Conference on Building Commissioning
Building Commissioning Association webinar
Association of Professional Energy Managers
Energy Exchange
SXSW Eco
Xcel Energy Efficiency Expo
Next Steps and Future Plans

Next Steps

• First round of awards & information on measures implemented based on technology use

• Continued recruitment & outreach

• Provision of technical assistance and publication of new resources
  - Top EMIS Opportunities
  - Characterization of FDD offerings
  - Monitoring-based commissioning process template

• Report on findings from first year of Campaign delivery
Next Steps and Future Plans

**Future Plans**: Clear information on best practice technology uses, costs, and value, lead to routine EMIS use in commercial buildings

  Thriving ecosystem of utility EMIS and market transformation programs

  Minimum points/measurement requirements in code
  Inclusion in operator and commissioning curricula and certification

Pervasive EMIS use enables deep & persistent operational savings, efficient performance in existing buildings

Buildings that operate as intended can be further optimized, used as a controllable resource as EE, storage, distributed generation, and transaction-based services converge.
REFERENCE SLIDES
**Project Budget**

**Project Budget:** $855 from FY15-FY17

**Variances:** None

**Cost to Date:** $609K (through Jan 2017)

**Additional Funding:** None

### Budget History

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<th>FY 2018 – FY2020 (planned)</th>
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# Project Plan and Schedule

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