

Smart Energy Analytics Campaign

2017 Building Technologies Office Peer Review



Smart Energy Analytics Campaign

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Energy Efficiency &
Renewable Energy

Jessica Granderson, jgranderson@lbl.gov
Lawrence Berkeley National Laboratory

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

Budget:

Total Project \$ to Date:

- DOE: \$855K (\$440K spent last 12 mo.)

Total Project \$:

- DOE: \$TBD

Key Partners:

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

Project Outcome:

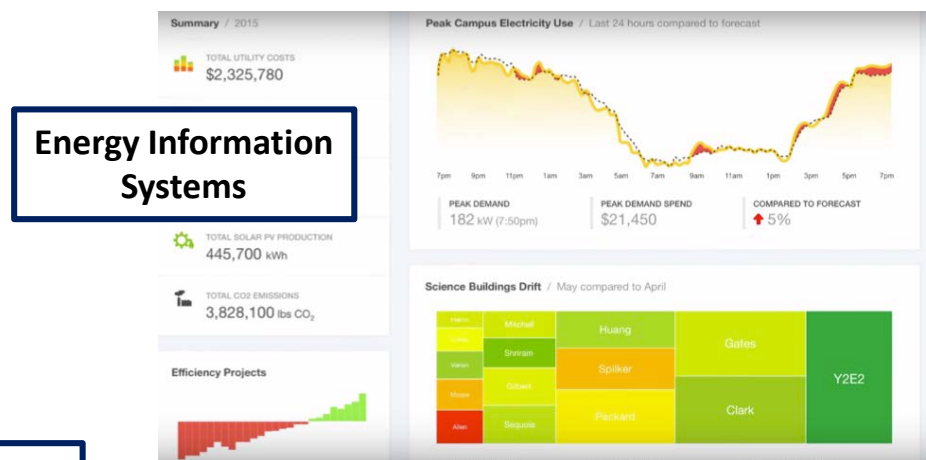
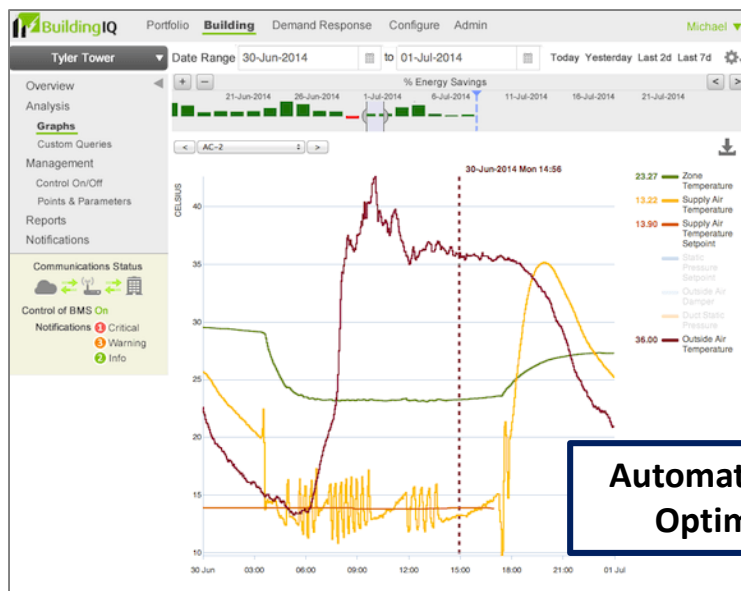
1. Provide EMIS technology cost, benefit, and market information to deployment channel partners to facilitate adoption at scale
2. Provide participants support in adopting and maximizing benefits of EMIS technology, enabling average savings of ~10%.

[CBI MYPP Strat. 1 - Demonstrate perf. in cmcl. buildings, drive adoption with market leaders; application resources, adoption campaigns]

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



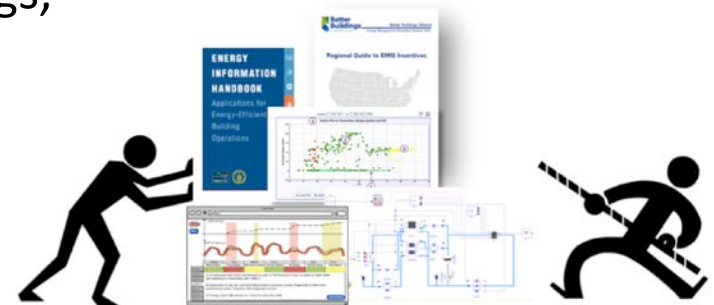
Purpose and Objectives

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)



LBNL with vendor
community

LBNL with owners, utilities,
vendor community

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 EMS tool or service provider? See below for a full list of Energy Information Systems, Automated System Optimization software, Fault Detection and Diagnosis systems, and EMS 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 Support Materials are intended to guide you through the specification, procurement, and selection of an EMIS. The package includes a templates for a Request for Proposal, a Technology Specification and an Evaluation and Selection Criteria.

Vendor Product Videos

Several vendors listed in the tables below have supplied us with short videos that give an overview of their product with highlights of screens and displays. We are always adding more vendor videos, so check back often. Please note that inclusion of these videos is not an endorsement by LBNL or the Organizing Partners of the Smart Energy Analytics Campaign.

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Energy Information Systems

Vendor	Product
Agilis Energy	Agilis Energy
Alaska Housing Finance Corporation	Building Monitoring System (public)
Aquicore	AQ-Optimization
Building IQ	Energy WorkSite

Campaign FAQ

- ▶ Why Energy Management and Information Systems?
- ▶ 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?

Smart Energy Analytics Campaign

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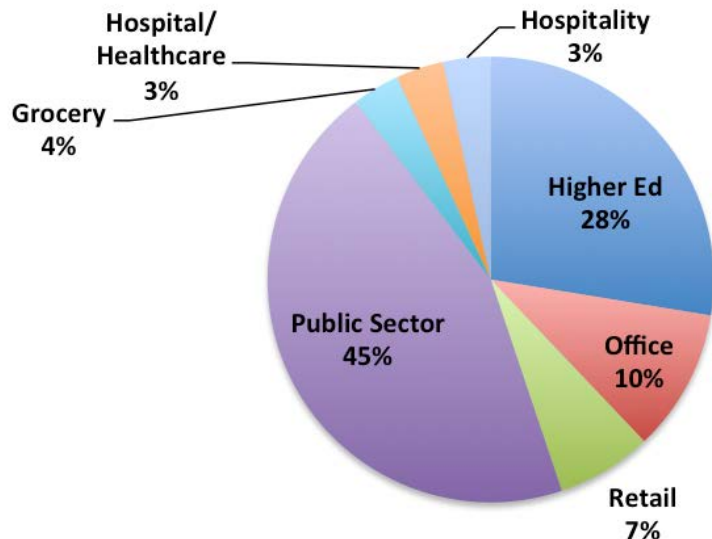


Progress and Accomplishments

Launch and participant recruitment

	To Date	FY '20 Goal
# participants	30	100
Floor area	217M sf	400+M sf
# buildings	2,971	8,000+
Est. Savings at campaign End	.38 TBtu	1.27 TBtu

Sectors represented (by number)



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)



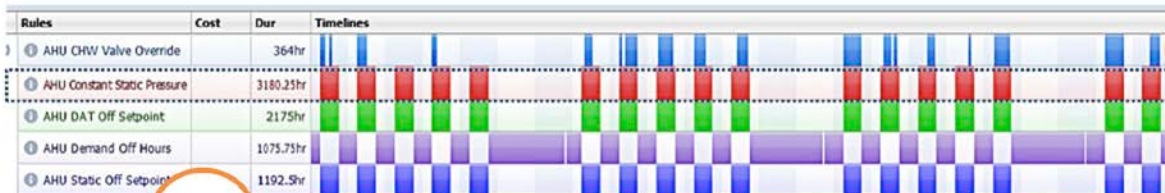
Progress and Accomplishments

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.



1

Source: SkyFoundry

Above: Excerpt from top opportunities guide

Right: Screen shot of guide to utility EMIS incentives

Search by State

Looking for support to finance Energy Management Information Systems (EMIS) at your organization? This guide introduces incentive and financing programs available to support the installation and use of EMIS in commercial buildings. Incentive and financing programs are available in 42 states nationwide. Programs support EMIS types across the **Technology Framework**, including benchmarking tools, energy information systems, building automation systems, and automatic system optimization tools.

Click the dots below to view programs available in each state. States with light gray dots do not have any EMIS programs currently.

No programs available in your area? [Click here](#) for information on EMIS incentive programs to share with your local utility program manager.

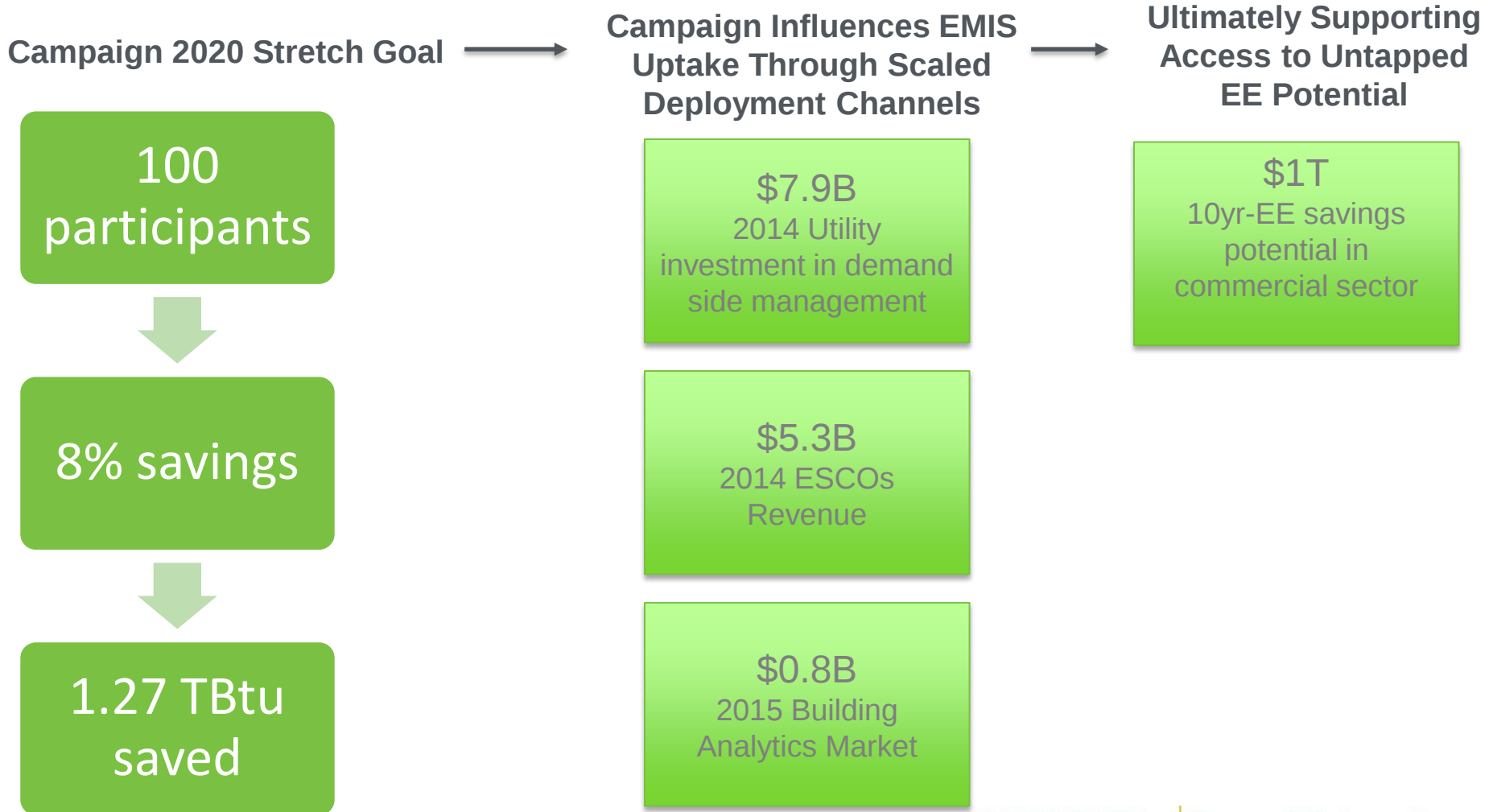


Learn more at eere.energy.gov/betterbuildingsalliance/EMIS

U.S. DEPARTMENT OF
ENERGY

Progress and Accomplishments

Market Impact



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

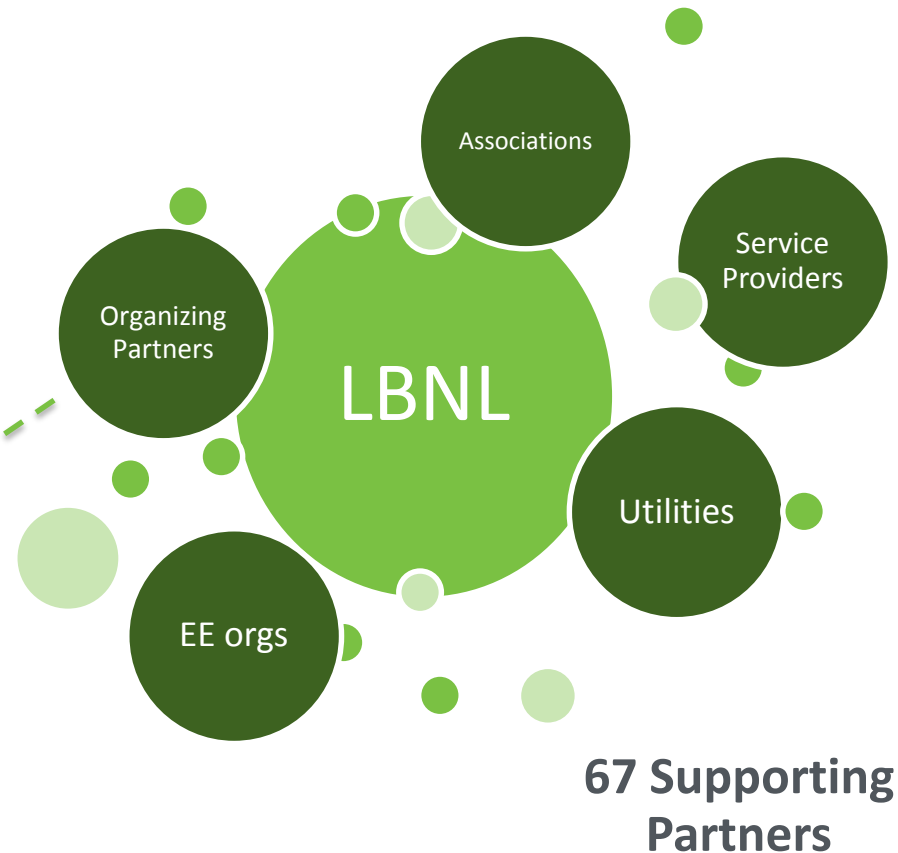


Project Integration and Collaboration

Project Integration:

Organizing Partners collaborate on Campaign strategy, share info through their networks

Supporting Partners assist with outreach & recruitment



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

FY 2016 (past)		FY 2017 (current)		FY 2018 – FY2020 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
\$450,000		\$405,000		TBD	TBD

Project Plan and Schedule

Task													
	STATUS	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept
Past work													
T1 Approval of Camp focus and definition	COMPLETE			◆									
T2. tracking metrics and award categories list	COMPLETE						◆						
T3 Campaign Plan finalized	COMPLETE											◆	
Current Work													
T1. Website updates													
Monthly updates on participants, Bldgs, partners, resources	ONGOING	X	X	X	X	X	x	x	x	x		x	x
Quarterly updates on participants, Bldgs, partners, resources to DOE	ONGOING			◆		X			X			X	
T2. Soft Launch phase update													
Assessment of soft launch, update of goals and tracking metrics	COMPLETE		◆										
T3. Resource dev													
Top Opportunities-draft review	COMPLETE				X	X							
Top Opportunities-final	ONGOING					X	X						
MBCx Plan draft	ONGOING	X				X	X						
MBCx Plan final	NOT STARTED						X	X					
T4. Eval of Campaign Effectiveness													
Go/No Go on Campaign commitments on track to reach 80M SF. Participant data is trackable, quantifiable, and support hand off	NOT STARTED						X						
T5. EOY Outcomes Report													
Year 1 Synthesis of Camp outcomes	NOT STARTED									X	X	X	