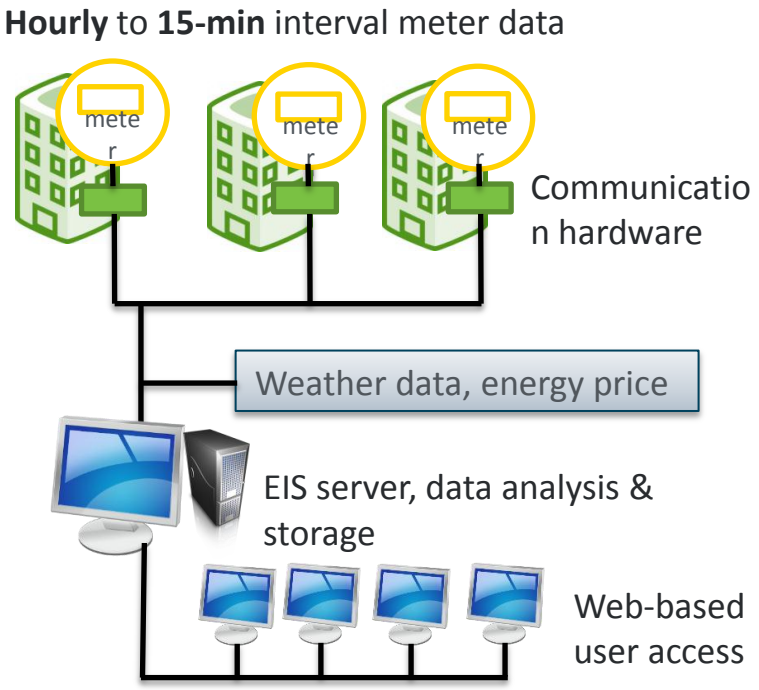
Energy Management and Information Systems, BBA Technical Team

2014 Building Technologies Office Peer Review



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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Project Summary

Timeline:

Start date: October 2012

Planned end date: Ongoing BBA Tech Team

Key Milestones

1. EIS costs and benefits study findings, best practices, business case; September 2013
2. Region-by-region guide to EMIS utility incentives; February 2014
3. EMIS procurement support materials; September 2014

Budget:

Total DOE $ to date: $500K

Total future DOE $: TBD

Target Market/Audience:

Commercial buildings >100K sf

Enterprise energy/sustainability managers

Building owners, efficiency decision makers

Technology vendors (secondary)

Key Partners:

Vendors of diverse EMIS solutions	BBA members from all sectors

Project Goal:

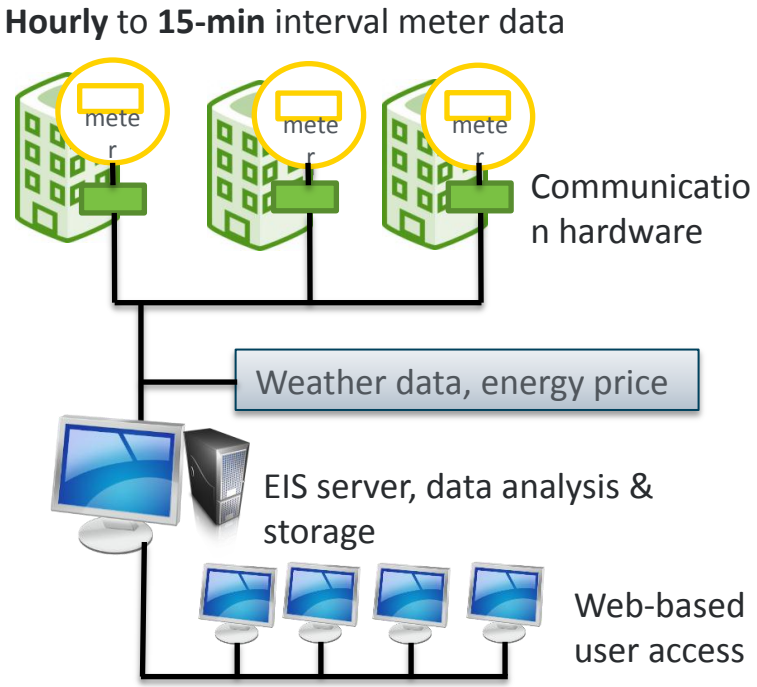
Member (and general public) energy savings of 5-20+% through increased adoption and use of EMIS technologies

Purpose and Objectives

Problem Statement: EIS enable site energy savings, up to 20%, yet remain under-adopted due to: 1) lack of information on technology costs and associated energy savings; 2) limited understanding of technology uses for maximum benefit.

Target Market and Audience:
Market = commercial buildings >100K sf, representing 2425 TBtu annual energy use

Audience = Enterprise energy/sustainability managers; building owners, efficiency decision maker; technology vendors (secondary)



Purpose and Objectives

Impact of Project: At 15% site savings, increasing adoption of analytics to even 5% of a *subset* of the target market, 100-200 sf range, would result in 7 TBTU savings.

1. Year 1 project output – Business Case for EIS adoption based on technology costs, assoc energy savings, best practice uses

2. Impact path to increased adoption and use of EMIS technologies
   a. Disseminate Business Case findings to BBA members and vendors' prospective clients

   b. Supplement business case with additional resources and technical assistance – incentives, procurement support materials, cliff's notes of existing guides handbooks etc, demo logins

   c. Work with members to identify opportunities for expanded/new EMIS use, to implement, and to track impact

Approach

Approach: Remove largest barriers to EIS adoption – inability to make business case; difficulty cutting through marketing

Key Issues: Insufficient value proposition, save 0-20%, cost 5K-no ceiling, vendor materials blur distinctions 20% claims common

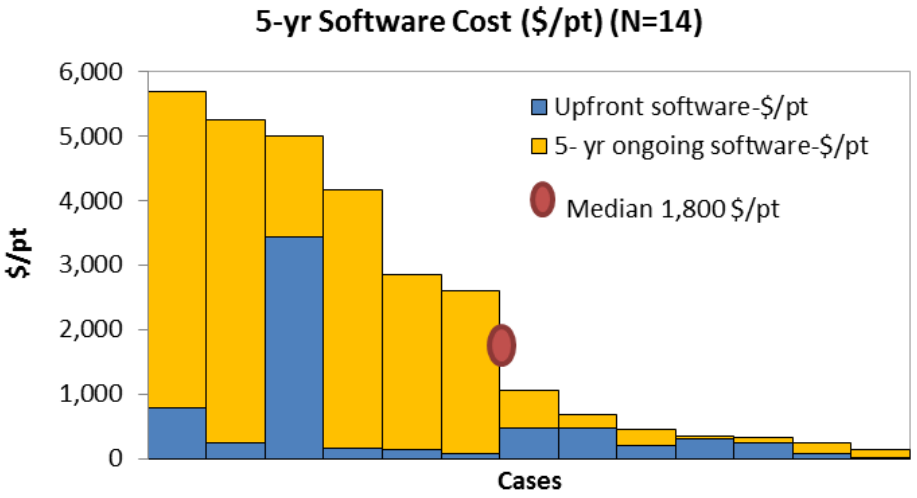
Distinctive Characteristics: First ever synthesis of targeted case investigations (2 dozen+), as-implemented costs, energy savings, analysis of best practices, factors assoc with larger savings

26 participating organizations, 260M sf install base, 17 unique EIS

Progress and Accomplishments

Accomplishments: Documentation of EIS technology costs (software only), not available in public domain, or published by vendors

Median 5-yr cost of ownership = $150K, 1800$/pt, .06$/sf



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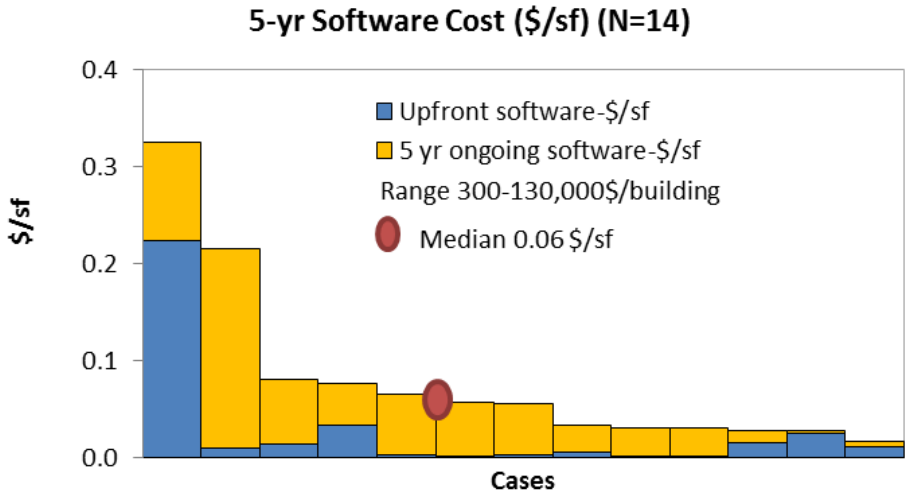

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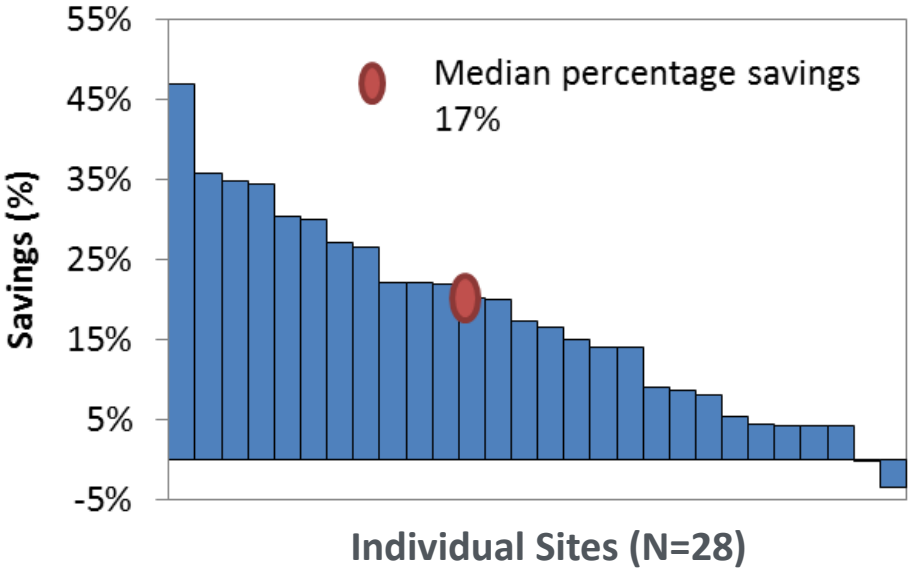
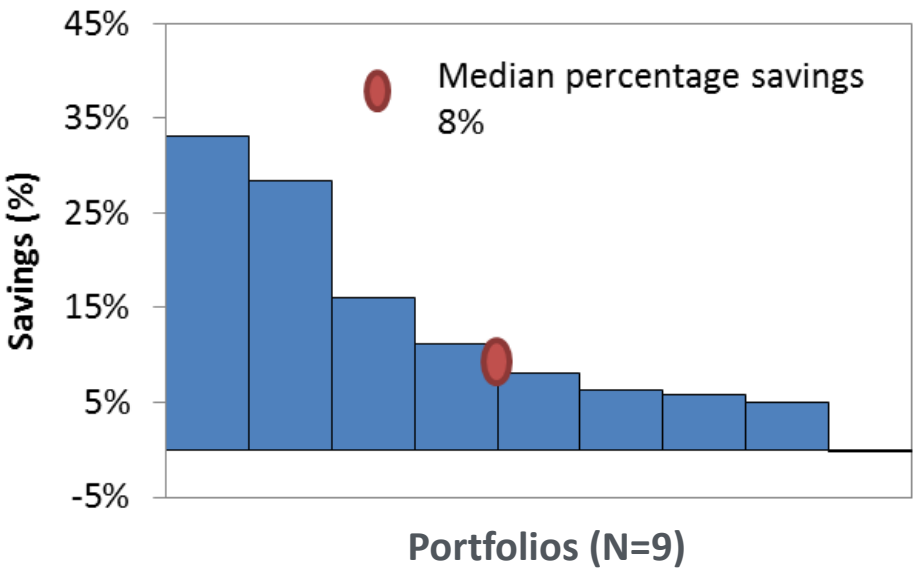
Progress and Accomplishments

Accomplishments: Quantification of EIS technology benefits

- Median building and portfolio savings of 17% and 8% would not be possible without use of the EIS
  - Median building and portfolio utility savings of $56K, and $1.3M

- Key benefits
  - Operational efficiency, utility validation and payment, data for other analyses



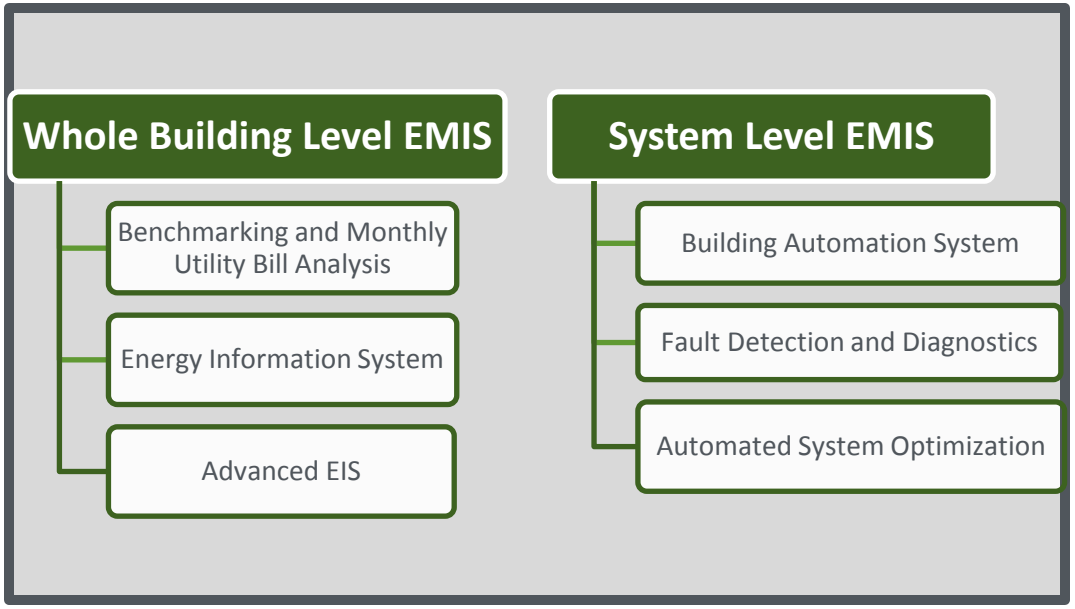


Progress and Accomplishments

- Before this study we knew that
  - EIS enable savings up to 20% depending on ……..
  - EIS cost $5K/yr on up …..
- After this study we can say that
  - In 21 of 23 cases, median building savings of 17% and 8% portfolio savings ($56K and $1.3M) could not have been achieved without use of the EIS
    - Initial EUI, extent of efficiency projects, depth of metering, and total years of installation were correlated with higher savings
  - Median procurement costs for EIS, excluding costs of monitoring hardware, was $150K, 1800$/pt over 5 year horizon
    - Some economies of scale, lower $/pt paid with higher # of points

Progress and Accomplishments

- Lack of standard terminology, difficulty distinguishing offerings,
- Established terminology framework of EMIS technologies
  - Convergence of terms between research and practice, e.g., CEE whole buildings committee, PECI, LBNL, others
  - Vetted with 35+ stakeholders industry, users, researchers
  - Data inputs, resolution, frequency of use, key applications, 'also-known-as', representative commercial offering



Progress and Accomplishments

Market Impact:

Measured impacts: EIS use critical in enabling savings of 8% and $1.3M (portfolio), 17% and $56K with rapid payback

Use of products and dissemination of knowledge: 25 project team members representing enterprise retail, real estate, hospital, higher ed, and state/municipal sectors; additional dissemination through network of 30+ EMIS vendors

Impact acceleration: strong indication of vendor use of findings and first-hand use by potential technology adopters; continued work with enterprises in BBA

Awards/Recognition: N/A

Project Integration and Collaboration

Project Integration: Direct, ongoing collaboration with industry, researchers, EMIS users, BBA members is key to the success of this work in accelerating market adoption of EMIS technology

Partners, Subcontractors, and Collaborators:

Communications: BBA Webinar of EIS business case findings, monthly team meetings with BBA members, Building Energy Summit 2014

Next Steps and Future Plans

FY 14 Activity for BBA Members: Implement or expand the use of EMIS in your organization

Resources to support this activity
Crash course to successful EMIS use, with Cliff's notes synthesis of existing guides, handbooks, case studies, specifications

Product overviews and guest logins – EMIS of highest interest to members

Regional guide to utility EMIS incentives to offset first costs

Procurement support materials to facilitate an owner-driven spec, bid, selection process analogous to other building technologies

Next Steps and Future Plans

Better Buildings
U.S. DEPARTMENT OF ENERGY

Better Buildings Alliance
Energy Management Information Systems Team

Regional Guide to EMIS Incentives

Jessica Granderson, Guanjing Lin, Erin Hult &

< Search by State

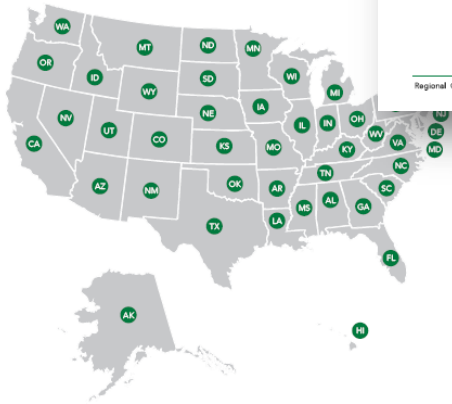
Maryland

Program Name	Benchmarking	EIS	BAS	FDD	ASO
Potomic Electric Power Co (Pepco) Continuous Energy Improvement Conditions	●	○	○	●	○
Potomic Electric Power Co (Pepco) Full Retro-Commissioning for Existing Buildings	●	○	○	○	○

Regional Guide to EMIS Incentives

Search by State

Incentive programs are organized by states
Stats on programs available / coverage
Spotlight programs / quots / lessons learned
(some highlighted programs / info with links to similar programs
No programs in your area? Here are some resources to share with your local



Regional Guide to EMIS Incentives < 2 > U.S. Department of Energy

< Search by State

Commonwealth Edison
Retro-Commissioning

Location	Benchmarking	EIS	BAS	FDD	ASO
< Illinois	○	●	●	●	○

Budget / Type of Incentive

For MBCx:

- $25K cash incentive to help with software integration costs.
- 7 cents per verified kWh saved

RCx customers:

- receive engineering study and training at no cost

Eligibility and Restrictions

- ≥150K square feet of conditioned space
- ≥500 kW
- part of a non-public organization

Description

The program is run by Commonwealth Edison, in partnership with Nicor Gas, People's Gas, and North Shore. MBCx is offered in partnership with Nicor Gas. Customers can receive a traditional EBCx study at no cost in exchange for implementing operational improvements with a simple combined payback of 18 months or less. A monitoring-based option is also available, in which a customer commits to 18+ months of monitoring. Customer receives a cash incentive to aid in software integration with BAS, as well as performance-based incentives for verified energy savings.

More Information

http://www.comed.com/RCx

Regional Guide to EMIS Incentives < 6 > U.S. Department of Energy

REFERENCE SLIDES

Project Budget

Project Budget: $520K

Variances: None

Cost to Date: $400K, through April 2014

Additional Funding: N/A

Budget History					
October 2012, FY2013 (past)		FY2014 (current)		FY2015 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
$270K	$0K	$250K	$0K	TBD	TBD

Project Plan and Schedule

Project original initiation date & project planned completion date

- Project kicked off in October FY2013
- Continuation into FY2015 is expected

Schedule and Milestones

- All FY2013 deliverables and milestones have been completed
- Work is underway on the FY2014 scope

Minor schedule slip in FY2013 final findings to accommodate BBA members' schedules and federal government shut down

Go/no-go on EIS costs and benefits study design successfully passed in Q2FY2013

Past, current, and future work described in Gantt charts on following slides

Project Plan and Schedule