Building Performance Tracking & Control Systems Pilot

The Existing Buildings Program

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Why O&M?

- There is a goldmine of operations-based savings potential in the commercial market
- There is less capital in the market to spend on EEMs
- Production Efficiency has achieved outstanding success with this approach

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Pilot Structure

SYSTEMS BEING EVALUATED

Energy Information Systems (EIS)

- Whole building monitoring with fault detection
- Building ≥100,000 sq. ft with DDC Controls
- Large offices, hotels, public sector

Energy Management Systems (EMS)

- HVAC/Lighting and other control mechanisms
- Problem Troubleshooting
- Scalable – price by number of control points
- Buildings ≤100,000 sq. ft
- Retail, small offices, restaurant

Automated Optimization Software (AOS)*

- Control Optimization Software
- Any facility with a chiller plant 600 tons or greater or VAV Systems in buildings ≥250,000 sq.ft
- College/universities, hospitals

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Savings & Incentive Structure

EIS	EMS	AOS
Estimated Savings 5% of Baseline	**Estimated Savings** 15% of Baseline	**Estimated Savings** 25% of HVAC Baseline
Incentive 50% of Install & subscription cost	**Incentive** 50% of Install & subscription cost	**Incentive** 50% of Install Cost up to $0.25/kWh

*3 Year Measure Life for all systems

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Savings Goals & Incentives

Product	Number of Sites	kWh Savings	Therm Savings	Incentives
EIS	10	1,110,000 kWh	8,300 therms	$170,000
EMS	40	1,556,000 kWh	58,000 therms	$250,000
AOS	5	4,193,000 kWh	45,300 therms	$500,000
Totals	**55**	**6,859,000 kWh**	**111,600 therms**	**$920,000**

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Goals of the pilot

- Verify savings & persistency of savings in the commercial market
- Use building performance systems to help operators and decision makers understand and optimize energy use
- Determine which product specs are necessary to achieve savings
- Determine impact on program resources

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Methods to Promote Success

- Prequalify sites – Does the product have a chance to be successful?
- Select sites with dedicated, trained facility managers who have attended building operations training programs
- Pilot products that have mature consultancy departments
- Program and Consultants work together to maximize operational performance and recommend EEMs
- Bolster communications between operator and decision makers through periodic performance reviews
- Target buildings with service contractors in place
- Establish an alert response protocol
- Track customer satisfaction

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Participant, Vendor & Contractor Requirements

Participant Requirements

EIS EMS AOS

- Supply 3 years historical energy usage data and supply bills after system installation
- CFO, business or building owner to sign application and be cc'd on reports generated by consultant
- Program to be provided username & password to the web-dashboard
- 3 year commitment to subscription
- Participant to receive training by vendor
- Energy Trust will have visualization of any report sent to participant by consultant
- Participate in quarterly or semi-annual interview to establish satisfaction with consultant
- Commitment to use system to monitor building performance and implement actions recommended by consultant

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Site Requirements

EIS

- Three years Historical Energy Data
- Energy Audit Walk-through to gather building data
- Post-install Inspection by Program
- **DDC Controls Installed**

EMS

- Three years Historical Energy Data
- Energy Audit Walk-through to gather building data
- Post-install Inspection by Program

AOS

- Three years historical energy data
- Energy-Audit Walkthrough to gather building data
- Post-install Inspection by Program
- **Chiller plants of 600 tons or greater or VAV Systems in buildings 250k sq.ft. or more**

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Data Analysis & Program/Participant Interface

Data Analysis & Program/Participant Interface

EIS EMS AOS

- Compare monthly usage against past performance
- Receive participant feedback on changes of occupancy/usage/etc.
- Verify customer satisfaction with product & consultant with quarterly or semi-annually with phone interviews and/or short surveys
- Log trends, spikes, alerts, corrective actions, successes
- Provide consultant reports to participant including incentives and deemed savings in recommendations and add any maintenance recommendations that consultant failed to include.
- Program cc'd of all final reports submitted by consultant to participant
- Log instances of EEM implementation
- Track customer usage of system, verify level of involvement with consultant

Next steps

- Work with planning to finalize and bless structure
- Targeted effort to identify and recruit sites
- Implement, gather results and modify and/or expand as applicable

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Appendix

Systems that will be installed for pilot

EIS	EMS	AOS
Northwrite's Energy Expert Plus - $34,000 including 3-yr subscription	• Makad's DreamWatts - $5,000 - $10,000 w/ 3 yr subscription • Kite & Lightning's Unity EMS – $7,000 - $12,000 w/ 3 yr subscription	OptimumEnergy's OptimumHVAC • OptimumLoop (Chillers) • OptimumTrav (VAV Systems) $150,000 - $225,000 w/ 3 yr subscription)

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Pre-Installation Inspection Criteria

EIS

- None Required although buildings with DDC will be targeted first.

EMS

- Age & condition of mechanical equipment to include: HVAC, H2O heating, pumps, exhaust fans, etc.
- Age & condition of building shell; insulation, windows, roofing, etc.
- All standard aspects of a walk-through survey

AOS

- Chiller Plant 600 tons or greater (OptimumLoop)
- VAV System (OptimumTrav)

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Vendor Requirements

EIS EMS AOS

- Limited pool of installers
- Vendor to QC contractor's install
- Vendor to warranty hardware and software for life of subscription
- Adequately train participant on use of system
- Provide reports to program prior to submission to participant to maximize recommendations
- cc program on all final reports to participant
- Advise program on any EEM or maintenance implementation
- Advise program on any corrective actions (maintenance/behavioral/ troubleshooting)
- 2nd responder to alerts & corrective actions (contractor first)
- Provide program with a log on alerts/corrective actions/results
- Report to program on participant's level of involvement
- Post-install by program

- Interface with Controls Contractor
- Final QC on System Install
- cc program on reports to customers
- Advise program on any corrective actions

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Installation Contractor Requirements

EIS EMS AOS

- Hardware installed at site
- First responder to system alerts on mechanical issues
- Implement operations, maintenance, and energy efficiency measure recommendations provided in vendor reports

- Installation by vendor including integration with existing controls
- QC system operation to make sure that it performs optimally

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List of Installers

EIS

- Energy Expert Plus
  - Partcipant's Preferred Service Contractor
- If service contractor is not in place then:
  - McKinstry
  - MacDonald-Miller

EMS

- DreamWatts
  - Partcipant's Preferred Service Contractor
- If service contractor is not in place then:
  - Reitmeyer
  - MacDonald-Miller
- Unity
  - Partcipant's Preferred Service Contractor
- If service contractor is not in place then:
  - IES Commercial
  - Bear Electric

AOS

- OptimumHVAC
  - OptimumEnergy w/ control contractor interface

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