IEI and Kaizen Blitz Evaluations

August 6, 2010

Energy Trust of Oregon

Industrial Efficiency Initiative Pilot Evaluation

- Study period: Jan. 2009 – June 2010
- Evaluation Contractor: Navigant Consulting
- Evaluation Methodology:
  - Participant interviews (8 firms)
  - Staff interviews (3)
  - Review of documents

EnergyTrust of Oregon

IEI Pilot

- One year continuous improvement process
- Ten customers
- Monthly networking/training workshops
- One-on-one coaching in-between workshops
- Energy savings measured at the meter
- Incentives of $0.02/kWh first year savings

Findings

- Customers motivated by energy cost reductions (5)
- Corporate sustainability or energy management (3)
- Other reasons include:
  - Corporate citizenship
  - Understanding plant energy use
- Firms entered into the IEI with significant goals that were for the most part achieved
- Satisfaction was quite high with most (6) rating it a 5 on a five point scale.

IEI Pilot

Site #	IEI Goal	Goal Achievement
1	@ least 5%	Yes
2	15%	Exceeded goal
3	5%	Yes
4	Baseline equipment and employee engagement	Yes
5	10%	"Close"
6	5%	Yes
7	10%	Hit 4% and climbing towards 5%
8	3%	8.7%

IEI Pilot: Savings Using MT&R

Site	kWh Savings	Reduction	Incentive
1	503,000	15%	$ 10,060
2	3,385,000	10%	$ 33,850
3	26,000	2%	$ 520
4	1,075,000	10%	$ 21,500
5	855,000	4%	$ 8,550
6	348,000	2%	$ 6,960
7	572,000	2%	$ 11,440
8	690,800	16%	$ 13,816
9	5,573,000	18%	$ 111,460
10	480,800	5%	$ 9,616
Total	13,508,600	8%	$ 227,772

EnergyTrust of Oregon

Further findings

- Participants valued:
  - Developing energy tracking and reporting capabilities (5)
  - Support from SEG (4)
  - Employee engagement (2)
  - Learning how to identify energy savings opportunities (2)
- Did not value
  - Topics not applicable to their firm (3)
  - Some redundant workshop topics (1)
  - Principles (v.s. list of savings opportunities) (1)

EnergyTrust of Oregon

Findings (cont.)

- Elements of IEI success:
  - Corporate support (3) and leadership (1)
  - Corporate culture (1)
  - Availability of time and resources (1)
- Energy Champions primarily in maintenance and engineering (5)

EnergyTrust of Oregon

IEI Activities

- Developed Energy Teams (6)
- Compressed Air improvements (7)
- HVAC improvements (4)
- Lighting (3)
- Capital improvements (2)
- Energy audit and energy baseline development (all)
- Some gas measures
- Many engaged employees in EE practices

EnergyTrust of Oregon

Suggestions for Seminar improvement

- More in-person meetings in lieu of webinars
- Site visits at participants plants
- Shorter meetings

EnergyTrust of Oregon

Study Conclusions

- Participants thought IEI was valuable and a good use of time and resources
- Most participants reached their energy savings goals and expected them to persist
- IEI tools would leverage additional savings.
- High level of satisfaction with the IEI and SEG's support
- Face to face meetings, especially those at other participant facilities, were
- Some participants seemed to struggle with the continuous energy improvement concept or felt that some aspects weren't applicable to their firms.

EnergyTrust of Oregon

Recommendations

- Continue the IEI as a regular component of the PE program
- Continue with current recruitment strategies
- Modify the format of trainings to emphasize face to face meetings
- Analyze the content of the training to make sure that topics are not redundant
- Establish baselines for participants at onset of seminars
- Consider funding SEG as an ongoing resource to IEI participants:
- Leverage participants to continue and expand IEI activities

EnergyTrust of Oregon

Energy Trust Take

- Continuing on with IEI as part of program
- Currently recruiting for Cohort 3
- Incorporating many of the changes recommended by the evaluation
- Interview Cohort 1 (and following cohorts) in a year to determine long term impacts
- Review hand-off to PDC

EnergyTrust of Oregon

Kaizen Blitz Pilot Evaluation

- Study period: May 2008 – June 2010
- Evaluation Contractor: Navigant Consulting
- Evaluation Methodology:
  - Participant interviews (8 firms)
  - Staff interviews (3)
  - Review of documents

EnergyTrust of Oregon

KB Pilot

- Initial on-site tune up (Kaizen Blitz) identifies low or no-cost opportunities
- A final report: documents energy savings opportunities in an action plan for the following year. Capital upgrade projects are also identified
- 2nd Cohort also received energy tracking software
- Technical support provided for a year to:
  - Track and assist with action items
  - Help develop a energy tracking system
- Final inspection and report documenting energy savings after one year

EnergyTrust of Oregon

Participants

- Cohort 1: 4 plants
  - Start date: May 2008
  - Last Inspection: March 2010
- Cohort 2: 5 plants

- Interviews: 4 Cohort 1
  3 Cohort 2

EnergyTrust of Oregon

Site	Estimated Savings if all Action Items Completed (Action Item Report)			Savings Achieved (Inspection Report)		
	Energy Savings (kWh per year)	Cost Savings ($ per year)	Percent Savings (% per year)	Energy Savings (kWh per year)	Cost Savings ($ per year)	Percent Savings (% per year)
1	2,900,000 – 3,500,000	185,000 – 225,000	10 – 12	2,530,000	185,500	8.7
2	1,400,000 – 1,750,000	91,000 – 114,000	8 – 10	2,330,000	184,000	8
3	921,000	56,000	10.2	921,878	69,141	10
4	2,500,000 – 3,500,000	100,000 – 140,000	10 – 14	2,225,969	95,494	4.3 (2008) 5.1 (2009)
5	480,000 – 670,000	39,000 – 54,000	5 – 7	--	--	--
6	Not Avail.	Not Avail.	9-Jun	--	--	--
7	540,000	38,000	13.6	--	--	--
8	696,000	51,400	11.7	--	--	--

EnergyTrust of Oregon

Review of Reports

- Two reports were reviewed
- Baseline was an issue and how to adjust for trends (is trend part of KB or outside?) and actions
- Second report had issues with clarity in describing action items and their savings
- Many other issues were raised on the documentation of the second report
- ETO staff and PDC's aware of issues associated with 2nd report.
- Site still achieved 4%-5% savings

EnergyTrust of Oregon

Review Findings

- A high level of expertise is conveyed to the participant without bogging down the project with too many details or engineering models and calculations
- Level of detail and information provided in the reports is generally adequate
- Customer and administrator can understand the assumed baseline conditions, the steps for implementation and the expected outcome
- Reports are well suited to the needs of the customer, administrator and evaluator

EnergyTrust of Oregon

Interview findings

- Participation motivated by:
  - Energy Savings
  - ROI of less than one year
  - Corporate sustainability
  - Raise employee awareness of EE
  - Identify opportunities for energy savings
  - Success of project
  - Respect for Cascade

EnergyTrust of Oregon

Interview findings (cont.)

- Incentives adequate to motivate action
- Participants would have preferred using their cost share to implement further ECMs
- Not all action items could receive incentives
- 2nd Cohort use and are highly satisfied with energy tracking software

EnergyTrust of Oregon

Interview findings (cont.)

- Participants likely to be repeat PE participants
- Participants adopting practices at other plants
- Concerns could for the most part be addressed:
  - Cost
  - Staff buy-in
  - Equipment failure due to aggressive EE
  - Not all action items could receive incentives
- In some cases resistance to aggressive EE as it might damage equipment and hurt production

EnergyTrust of Oregon

Interview findings (cont.)

- Participants had mixed opinions about the time frame required to complete the Kaizen Blitz action time
- Savings persistence will be helped with :
  - Updated procedures and set points
  - Utility budgets reduced by energy savings
  - Conducting a system audit to check set points
  - Work orders for maintenance and calibration of the equipment
  - Placing locks on thermostats

EnergyTrust of Oregon

Recommendations

- Continue to offer KB services as part of PE Program
- Consider shortening implementation time (6-9 months) while considering seasonal operations and budgeting cycles
- Continue the 90 day/90% incentive kicker to spur action Consider removing the cost sharing requirement; and
- Continue Cascade Energy's role as the KB service provider

EnergyTrust of Oregon

Energy Trust Take

- Successful pilot that resulted in significant savings as well as highly satisfied customers
- Pilot actively working on improving reports and documentation of baselines
- Pilot adopting new components (e.g. 90% by 90, tracking software) and widening scope of future plants
- Service offerings well suited for inclusion in regular PE program

EnergyTrust of Oregon