The Search for New Technologies that are Program Ready

Jennifer Anziano
Senior Program Manager
April 3, 2012
Washington, DC

Session Objectives

- Learn about a variety of emerging technologies and what is known and not know about various aspects of their program readiness

- Discuss how we as an industry can advance these opportunities for future, successful program adoption

Agenda

- Outline high level considerations for program readiness
- Presentations on some emerging technologies assessment
  - Kurt Roth, Fraunhofer Center for Sustainable Energy Systems
  - Nate Taylor, San Diego Gas & Electric
- Open discussion on what we can do as an industry to move these forward

A Consortium of Program Administrators

- > 130 members serve all or part of 45 states and 8 provinces
- 86% of the $9.1B* total efficiency budget is managed by members
- 2009 EPA Climate Protection Award recognized CEE member approach

- CEE is a member-driven nonprofit, governed by a Board of Directors from member organizations

* Source: CEE State of the Efficiency Program Industry 2011

CEE Member Approach

- Develop binational program approaches to:
  - Overcome technical and market barriers
  - Reduce the cost of capturing greater EE savings
- Voluntary adoption by members enables greater consistency in program offerings
- Partnering with industry supports increased availability of high efficiency products

By working together binationally, CEE members capture greater savings locally

Differing Program Priorities

- Different aspects of value for efficiency

  (e.g., load balance, grid reliability, carbon mitigation, offsetting capital investment, etc)
- Time and locational benefits may vary
- Understanding the context is important

  (e.g., time of use, extent of use, seasonality and climate)

Emerging technology assessment results cannot necessarily be compared on an apples to apples basis

Aspects of Program Readiness

- **Technical Readiness**
- Market Readiness
- Other Considerations

- Savings potential
- Performance
- Reliability
- Safety

Aspects of Program Readiness

- Technical Readiness
- **Market Readiness**
- Other Considerations

- Sufficient supply
- Distribution network in place
- Installation, operations, and maintenance considerations
- Customer need and awareness
- Customer satisfaction

Aspects of Program Readiness

- Technical Readiness
- Market Readiness
- **Other Considerations**

- Cost effectiveness
- Behavior interactions

Speaking to Program Readiness

Speaking to the known aspects of program readiness and providing sufficient context around the assessments provides a basis for translating the results for one's own program considerations.

Presenters

CA Statewide Emerging Technologies Program

Program Goal:

To accelerate the market introduction of new and emerging energy efficiency technologies

2010-2012 Statewide Program PIP includes six areas of activity:

- Technology Assessment
- Scaled Field Placements
- Demonstrations and Showcase
- Market and Behavioral Studies
- Technology Development Support
- Business Incubation Support

SCE has received funding to administer the TRIO program under Business Incubation, and develop a ZNE laboratory
SCG/SDG&E ETP's activities will be directed toward the first three areas

Considerations For ET Testing

Emerging Technology Project Assessment (ETPA) Sheet
(Technology)

Value Proposition: For _____(target customer), Who _____(statement of customer need), The _____(product) is a, _____(recognized product category), That _____(statement of key benefit). Unlike _____ (primary competitive alternative), our product _____ (statement of primary differentiation).

Description of Concept	
1.0 Technology Risk	**5.0 Non Energy Benefits**
Technical Risk Leading Suppliers	GHG Reductions: Emission Reductions: Water Usage Reductions: Maintenance Savings:
2.0 Technical Savings Potential	**6.0 Criticality of SEU Involvement**
Annual Energy Savings: A: End of Life Replacement B: Early Life Replacement	
3.0 Technology Economics	**7.0 Program Viability**
First Cost: Incremental Cost ($): Annual Savings ($): Simple Payback ($):	Distribution Channels Persistence of Savings Impact on Customer Behavior/training Rebate/Upstream/Statewide/other
4.0 Market Information	**8.0 Other Information**
Market Development Issues: Potential Customers: Market Risk:	

Considerations For ET Testing

Seven Parameters Used to Evaluate Technology

	Parameter	Wt	1	2	3	4	5
1	Technology Risk	10%	High	High – Medium	Medium	Medium – Low	Low
2	Technical Savings Potential (Annual Energy Savings)	20%	<25 MWh	25-50 MWh	50-100 MWh	100-200 MWh	>200 MWh
			<0.5 MW	0.5-1.0 MW	1.0-2.5 MW	2.5-5.0 MW	>5.0 MW
			<25 MMTh	25-50 MMTh	50-100 MMTh	100-200 MMTh	>200 MMTh
3	Technology Economics(per unit)/Competitive Analysis (Simple Payback Period)	15%	> 10 years	10.0 - 7.0 years	7.0 – 4.0 years	4.0 – 2.0 years	<2.0 years
4	Market Information (Market Risk)	15%	High	High – Medium	Medium	Medium – Low	Low
5	Non-energy Benefits	10%	None	Limited	Various	Significant	Extensive
6	Criticality of SCG/SDGE Involvement (Need for Utility Support)	15%	Not Essential	Not Important	Limited Impact	Very Important	Essential
7	Program Viability Risk	15%	High	High – Medium	Medium	Medium – Low	Low

Total Score:_____

Promising New Technology

- LED Lighting!
- Longer runtime applications for better ROI
- Less maintenance
- Longevity/quality/degradation is still in question
  - We want to ensure that quality is good so we don’t have similar issues to the original CFL rollouts
- Cost is still quite high, but improvements are coming rapidly!

High Ceiling Lighting Options Technology Assessment

- Host Site: Hyatt Regency La Jolla
- Base case (grand foyer): 100 fixtures of 70 W incandescent lamps
- Replaced with 18 W LED direct replacement lamps

Project Results

Table 1: Energy and Demand Savings

Lamp	Power/lamp (watts)	Operating Hours	Total Lamps	Energy (kWh)	Demand (kW)	Savings (%)
Incandescent - Base Case (70W)	70.0	8760	100	61,320	7.0	-
CFL (26W)	28.0	8760	100	24,528	2.8	60%
LED (18W)	15.4	8760	100	13,490	1.5	78%
LED retrofit kit (36W)	35.0	8760	100	30,660	3.5	50%

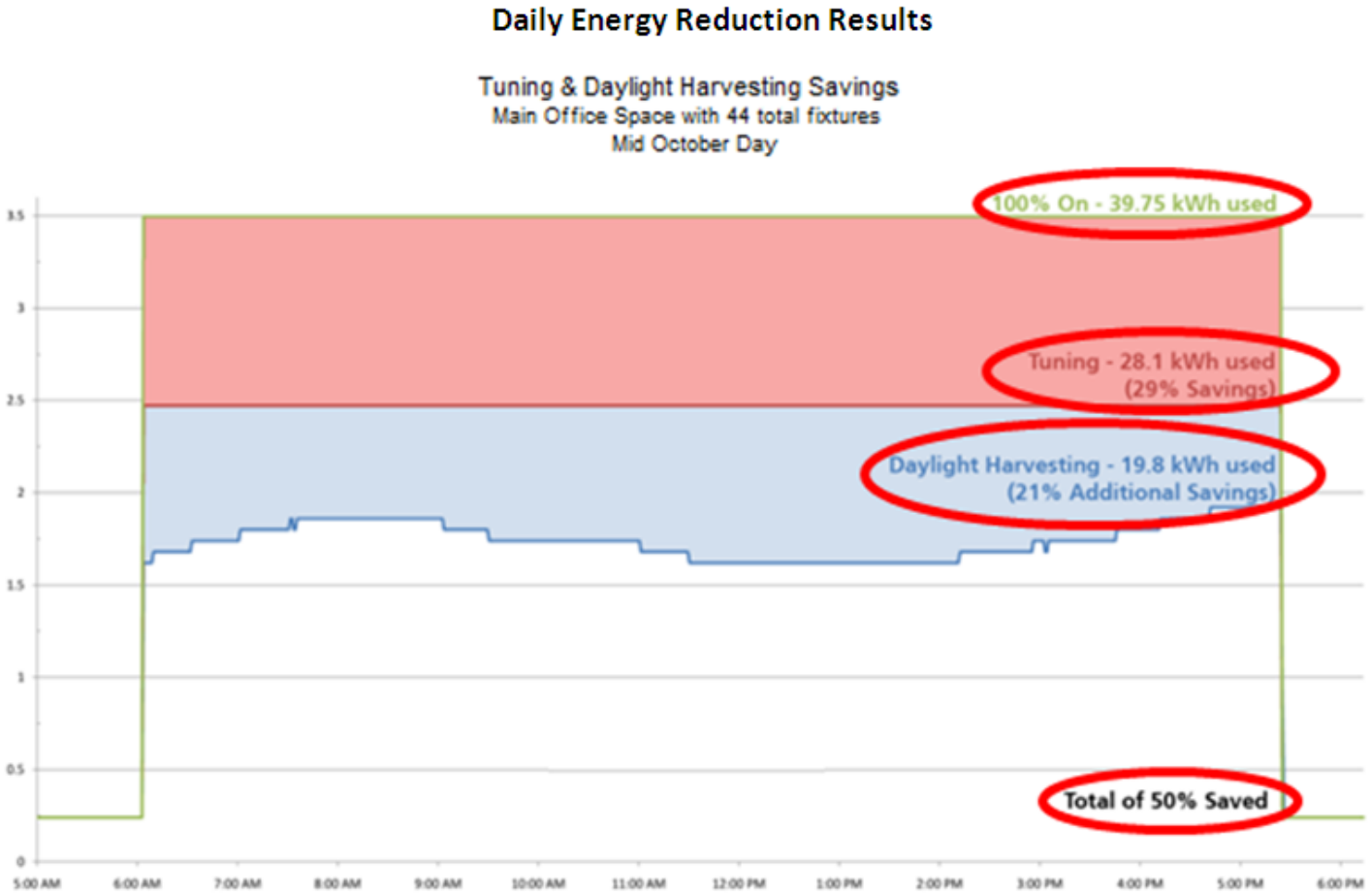
Table 2: Simple Payback – Retrofit

Lamp	Cost/lamp ($)	Number of Lamps	Total Product Cost ($)	Energy (kWh)	Energy Cost (per kWh)	Annual Energy Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (years)
Incandescent - Base Case (70W)	13	100	1,300	61,320	0.17	10424	-	-
CFL (26W)	136	100	13,600	24,528	0.17	4170	6255	2.2
LED (18W)	60	100	6,000	13,490	0.17	2293	8131	0.7
LED retrofit kit (36W)	175	100	17,500	30,660	0.17	5212	5212	3.4

Some Challenges…

- Advanced Lighting Controls
  - Estimating and measuring savings
  - Ensuring proper installation
  - Integrating Building Management System (BMS) and lighting controls on existing buildings (i.e. zones don’t match, pneumatic controls, rudimentary controls, etc.)

Office of the Future – Advanced Lighting Control System



Discussion

Discussion Questions

- Are there additional aspects of program readiness that are important for your program?
- What experiences, if any, have you had with these technologies that might provide more perspective on their relative program readiness?
- Understanding what remains to be known about these technologies, how might we move forward to accelerate the assessment and potential adoption by efficiency programs?

Contact

Jennifer Anziano
Senior Program Manager
617-532-0993
janziano@cee1.org