PECI's RCx Programs: The Next Generation

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Learning Objectives

1. **Understand the background and history of PECI's 2006-2009 California RCx programs**
2. **Understand highlights and successes to implementing these RCx programs**
3. **Identify actions PECI is taking to move existing and future programs forward**

PECI's 2006-2009 California RCx Programs

Utilities:

- SCE, SDG&E, PG&E, SMUD
- PECI as a 3rd Party Implementer

Target:

- Buildings >100,000 sq ft
- Large commercial office, retail, hotels, hospitals, data centers

Measures:

- Improve the operation of **existing** systems and equipment

RCx Program Design

Going into a relatively immature market for RCx, PECI needed to:

- Recruit buildings: Educate & motivate customers
- Deliver results: Move projects through implementation
- Ensure quality: Create consistency in approach, deliverables

Key Program Services & Incentives

On-the-ground Program Representative:

- Build awareness & market the program
- Assist the Owner from start to finish
- Maintain project momentum

Program "Toolkit":

- Report templates, workshops, trainings
- Technical guidelines for baseline documentation, savings calculations and verification methods for 21 common measures

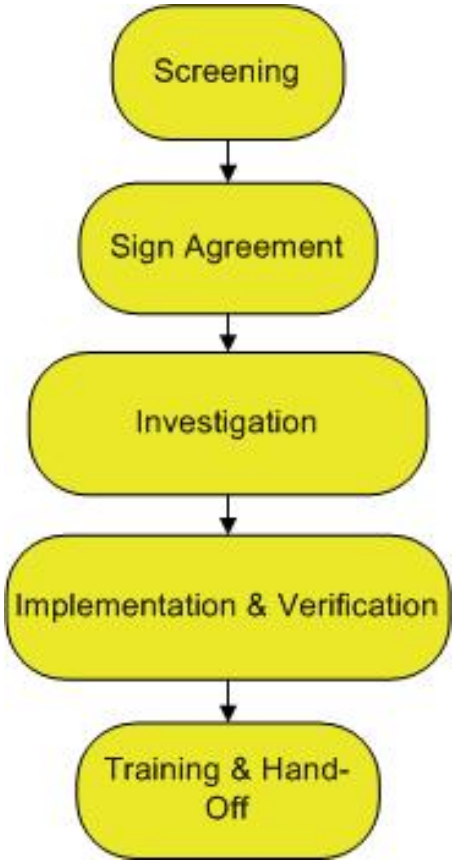
Incentives to motivate:

- Investigation/follow-up fee to Provider, ~$0.12/ft^2
- Implementation incentives to Owner, ~ $0.05/ft^2 for measures with a payback > one year

Example Project

229,000 square foot hotel:

- Provider fee (incentive): $34,000
- Implementation incentives: $9,500
- Implementation cost: $64,000
- 6% annual electric savings
- ~12 months from start to finish



Program Highlights

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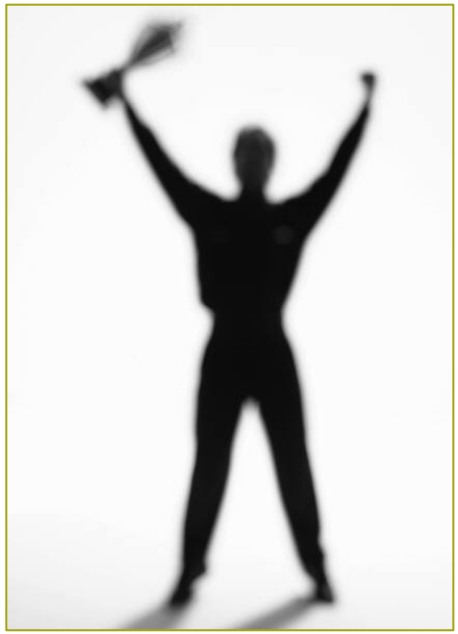
Reached hundreds of buildings:

- 500 program applications received
- 430 building screenings conducted
- 135 RCx projects completed
- 62M kWh in annual savings identified
- 37M kWh in annual savings achieved in current program cycle



Program Highlights (Cont'd)

Established the RCx value proposition:

- Large portfolio managers are approaching the Programs
- Discussions with potential customers are shifting from "What is RCx?" to:
  - "How does the Program work?"
  - "How many of my buildings qualify?"
  - "How soon can we start?"

Program Highlights (Cont'd)

Increased levels of Provider capacity to support utility RCx:

- Qualified over 45 RCx Providers
- Delivered technical Program trainings for all participating Providers
- Published Program Toolkit to standardize deliverables
- Assisted Providers in adapting to meet utility and regulatory requirements

Program Highlights (Cont'd)

Drove high level of rigor in process for verification of savings:

- Established methodology to address EM&V needs
- Mapped out a project's measure verification approach prior to implementation
- Instituted data-driven approaches to validate savings
- Received early indication that the higher level of rigor is paying off

Looking Ahead…

Current & Future Programs

RCx programs must continue to focus on addressing high-priority needs:

- ✓ Securing reliable energy savings
- ✓ Improving cost-effectiveness
- ✓ Managing risk

PECI is taking action to address these…

Program Enhancements

1. Standardize tools & processes
2. Enhance screening & scoping
3. Scale Program effort to the opportunity
4. Integrate persistence tracking

1. Standardize Tools & Processes

2006-2008 CA RCx Impact Evaluation Recommendation:

"*Reduce RCx service providers' burden for quantifying energy savings…Providers…need simple, straightforward tools…*"

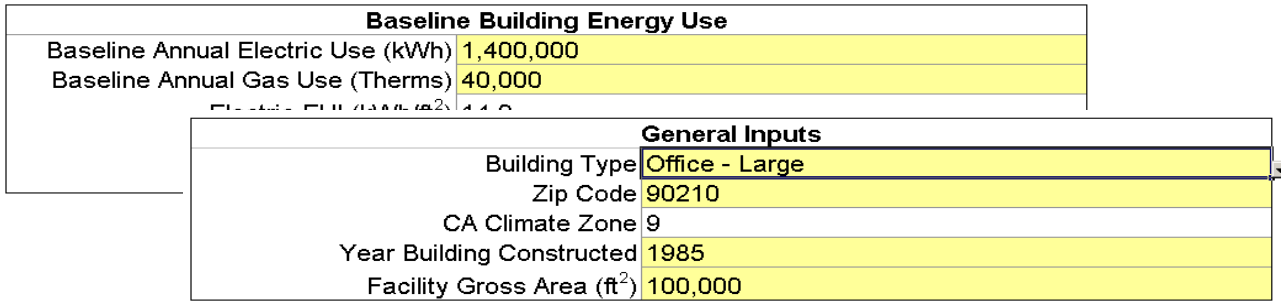
Spend more time on what's important –

Investigating opportunities in the building (Provider) & making building optimization improvements (Owner)!

1. Standardize Tools (Cont'd)

Investing in and partnering for the development of technical tools:

- California Public Interest Energy Research (PIER) Tools Project (2010-2011)
  - Targets 8 typical HVAC measures for cooling plants and air handlers
  - Scalable tool can handle complex measures, be used for large savings, multiple building types
- PG&E & SCE: Simplified savings analysis tool (2010)
  - Targets 13 common measures for HVAC and lighting
  - <75,000 kWh measures
  - Large office, large retail, hospital, hotel, and university building types



Baseline Building Energy Use	
Baseline Annual Electric Use (kWh)	1,400,000
Baseline Annual Gas Use (Therms)	40,000

General Inputs	
Building Type	Office - Large
Zip Code	90210
CA Climate Zone	9
Year Building Constructed	1985
Facility Gross Area (ft^2)	100,000

1. Standardize Tools (Cont'd)

PG&E/SCE Building Optimization Analysis (BOA) tool rolling out in 2010:

13 common HVAC and lighting measures:

- Reduce supply fan operating schedule
- Reduce lighting operating schedule
- Add / optimize occupancy sensors for lighting control
- Add / optimize boiler lockout
- Adjust zone temperature deadband
- Adjust airside economizers
- Add supply air temperature setpoint reset strategy
- Reduce supply duct static pressure setpoint
- Add supply duct static pressure setpoint reset strategy
- Add / restore supply fan VFD
- Add chilled water supply temperature setpoint reset strategy
- Add condenser water supply temperature setpoint reset strategy
- Add / restore chilled water pump VFD

2. Enhance Screening & Scoping

Integrate a scoping step prior to committing to a full-scale investigation:

- Avoid low or no-savings projects
- Hone in on specific energy savings measures
- Inform the scope of the investigation

2. Enhance Scoping (Cont'd)

Key elements of our streamlined scoping approach:

- Engage Provider in 2-4 week scoping study
  - BOA tool use
  - Preliminary list of measures
  - Rough savings calculations and cost estimates
  - Assessment of building data trending and BAS capabilities
- Identify barriers to implementation and other project risks

3. Scale Program Effort to the Opportunity

Align investigation scope with incentives:

- Allow scoping to inform the investigation scale
- Balance the provider scope & fee to the building-specific opportunity

Distribute risk across project stakeholders:

- Integrate pay-for-performance component into contracts
- Maintain a viable business case for the Utility, PECI, Providers, and Owners

3. Scale Program Effort (Cont'd)

Setting project scope upfront:

- Decision to include or exclude retrofits, persistence components
- Investigation scope is defined:
  - Specific measures identified
  - Measures most likely to be implemented
  - Commonly found measures

Adjusting investigation fees to match scope and opportunity level:

- Balance Utility, Owner, and Provider risk
  - 50-75% base provider fee based on square footage & system complexity
  - 25-50% pay for performance (e.g. $/per kWh installed)
  - Bonus potential for high kWh returns

4. Integrate Persistence Tracking

Utilities and owners want savings that last.
Persistence tracking:

- Confirms estimated measure lives
- Promotes higher performing buildings over time
- Builds confidence for future program expansion

4. Integrate Persistence (Cont'd)

SDG&E RCx Program - Performance Tracking

- Leverages existing BMS or new monitoring equipment
- One year of quarterly engineering reports and review meetings
- Assist with issue resolution

ComEd Monitoring-based Cx Pilot Project

- Current partnership with Sieben Energy Associates
- Comprised of RCx study, BMS upgrades, on-going monitoring
- Perform iterative RCx and persistence management

California PIER Persistence Research Project

- Characterize performance tracking tools
- Review best practices and experiences in the field
- Performance Tracking Guide for building owners

Conclusion

Retrocommissioning continues to be a promising utility energy efficiency measure…

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Thank you!

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