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
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/ft²
- Implementation incentives to Owner, ~ $0.05/ft² 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
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
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?”
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
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...
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

<table>
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<tr>
<th>Baseline Building Energy Use</th>
<th>General Inputs</th>
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<tbody>
<tr>
<td>Baseline Annual Electric Use (kWh) 1,400,000</td>
<td>Building Type Office - Large</td>
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<tr>
<td>Baseline Annual Gas Use (Therm) 40,000</td>
<td>Zip Code 90210</td>
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<tr>
<td></td>
<td>CA Climate Zone 9</td>
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<tr>
<td></td>
<td>Year Building Constructed 1985</td>
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<tr>
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<td>Facility Gross Area (ft²) 100,000</td>
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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

Reliable Savings ✓
Cost-Effective ✓
Managed Risk ✓
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

- Reliable Savings
- Cost-Effective
- Managed Risk

18th National Conference on Building Commissioning
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

Reliable Savings
Cost-Effective ✔
Managed Risk ✔
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

- Reliable Savings ✓
- Cost-Effective ✓
- Managed Risk ✓
Retrocommissioning continues to be a promising utility energy efficiency measure…

- Reliable Savings
- Cost-Effective
- Managed Risk

✅
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Thank you!
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