

Extreme Makeover

2014 Retro-Commissioning (RC_x) Program



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Healthcare (MTP)	Technical & Cash incentives for eligible ECMs – Health care facilities under 300 beds
Large Commercial (SOP)	Cash incentives for capital expenditures
Advanced Lighting Program (MTP)	Cash incentives for approved outdoor LED lighting fixtures
Load Management Program	Cash incentives for peak load curtailment during designated events
SCORE/CitySmart (MTP)	Technical & Cash incentives for capital expenditures – schools, city, or county facilities

What is Retro-Commissioning?

...the process of assuring that all systems and components are designed, installed, tested, operated, and maintained according to the operational requirements of the owner.

Wikipedia

Program Type	Market Transformation Program
Incentive Type	Services (in-depth energy assessment)
Energy Conservation Measures	Low-cost / No cost measures (typically less than a 3 year Simple Pay Back)
Program Duration	2004 – Present
Types of Projects	Office Buildings Healthcare K-12 schools Universities / Colleges Hotels Entertainment Complexes Manufacturing Etc.

Total Projects completed and verified since 2004	64
Total Program Savings	> 21,600 kW Peak Demand > 66,978,000 kWh/year
Average Program % Savings	~ 10% kW Peak, Up to 15% kWh/year
Average Energy Cost Savings	~ \$0.128 per ft ² based on 50 projects
Average Owner Implementation Costs	~ \$0.08 per ft ² based on 45 projects
Average Program Simple Payback	< 1 year

Total Projects completed **	8
Current Active Projects	20
2013 Program Savings **	1,453 kW 10,213,281 kWh
**Projected by EOY 2013	

Win! → Customer!

Win! → RCx Agent!

Win! → CenterPoint!

RCx Agents are critical members of the RCx team; their responsibilities include:

- ▶ Working with Owner's facility staff to collect all necessary information and discuss potential ECMs
- ▶ Performing comprehensive on-site assessments for each facility, **focusing on low-cost/no-cost measures**
- ▶ Preparing detailed reports with facility descriptions, ECM descriptions, savings calculations, and cost estimates

Facility Owners may select an RCx agent from the approved list on CenterPoint's Energy Efficiency website

Companies interested in becoming approved RCx agents may download a RFQ from CenterPoint's Energy Efficiency website.

Free Comprehensive Energy Assessment

Demand Reduction and
Annual Energy Savings

Operating Cost Savings

Low Implementation Cost, Short
Payback

Equipment Life Enhancement

- Non-Residential Customers in CenterPoint Energy's electric service territory,

AND

- Non-Transmission Customers (< 69KV service),

OR

- Non-Profit / Educational / or Governmental Transmission Customers ***

- Size: $\geq 100,000$ ft²
- High Energy Use Intensity (EUI) – kWh/ft²
- Significant Baseline kWh/yr
- Significant Baseline Peak kW

- ❑ Implementation Commitment
 - Implement all measures with a simple payback up to 1.5 years
 - Maximum commitment is \$0.03/sq ft

- ❑ Non-implementation Penalty
 - Failure to meet implementation commitment
 - Sliding scale based on building size and identified savings

Customer Commitment (cont'd)



- ❑ Example
 - ❑ 100,000 sq ft building
 - ❑ 120,000 kWh savings identified
 - ❑ Max implementation commitment = \$3,000
 - ❑ Non-implementation Penalty = \$6,000

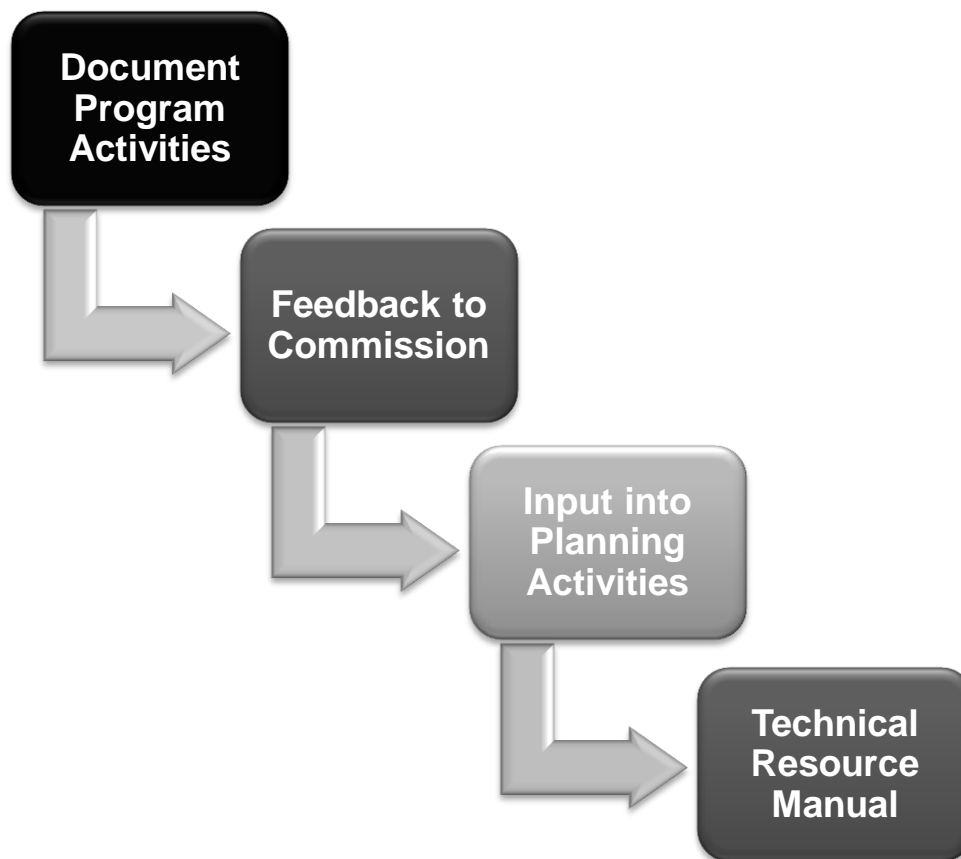
*Average customer spending = \$40,000

- ❑ New laws passed in last session of Texas Legislature called for amendments to the current energy efficiency rules.
- ❑ Public Utility Commission has interpreted the new laws and amended the Substantive Rules effective Jan 1, 2013.
- ❑ Changes Made:
 - Addition of Winter On Peak
 - Manufacturers can opt out
 - All EE Programs must be cost effective

New Energy Efficiency Rule ...

Previous EE Rule (2012)	Section	New EE Rule (effective January 1, 2013)
Summer Peak – June 1 thru Sept 30, M-F, 1pm-7pm, excluding holidays	On Peak Season	<i>Summer Peak and Winter On Peak – Dec, Jan, Feb – M-F, 6am-10am & 6pm-10pm, excluding holidays</i>
For-profit transmission customers only	Industrial Opt-Out	<i>For-profit transmission customers and distribution customers with a tax exemption manufacturing certificate; can opt-out for a minimum of 3-years; certificates to be sent every 3-years</i>
N/A	Evaluation, Measurement & Verification (EM&V)	<i>Ongoing review of programs and collection of data from a PUC appointed EM&V contractor</i>

Evaluation, Measurement & Verification (EM&V)



New Rules

- Customer cash incentives removed from the program
- Customer commitment
- Elimination of the Preliminary Phase report for RCx agents
- Changes to RCx agent fee structure

Preliminary Assessment Report

- Report completed as part of the application screening process
- Owner facility benchmarked against comparable peers
- Identifies end uses (HVAC, lighting, etc.) with potential for savings

Timeline

- Project timeline starts with Project Kickoff
- Maintain project schedules

Program Phases

Application Screening Phase

- Nexant screens application
- Preliminary Assessment Phase report created and sent to building owner
- Contracts are executed

Investigation Phase

- Agent performs In-Depth Site Assessment
- Agent Completes Report with Detailed ECM Savings Calculations, Master List of Findings, etc.
- Owner Signs OST

Implementation Phase

- Owner implements their selected ECMs
- Owner co-ordinates with the agent for verification visit
- Agent informs Nexant on verification methodology

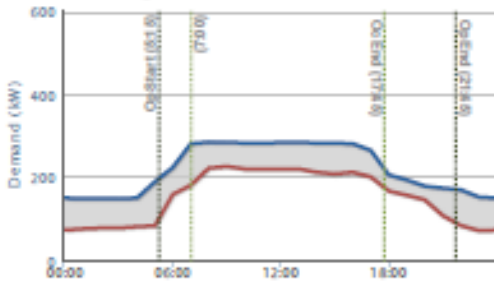
Verification Phase

- Agent conducts verification visit of implemented ECMs
- Agent completes VP report with verified savings

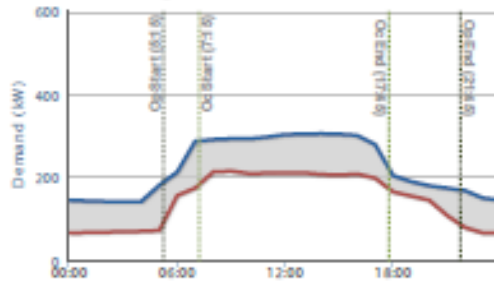
- ❑ Now part of the application screening process
- ❑ Uses information provided in application and utility data provided by CenterPoint to benchmark facility
 - Compare to similar buildings in area
- ❑ Report will be sent to building owner (regardless if project continues to next step)

- ❑ Measures found in preliminary report are high level
- ❑ Range from lighting to plug-load
- ❑ Example of measures found in preliminary report

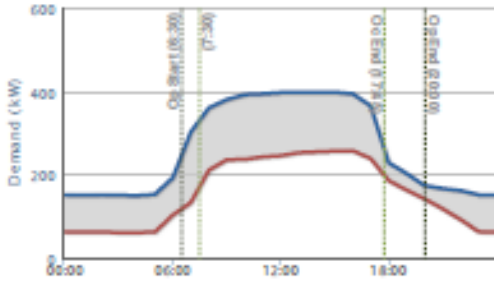
Annual Average Load



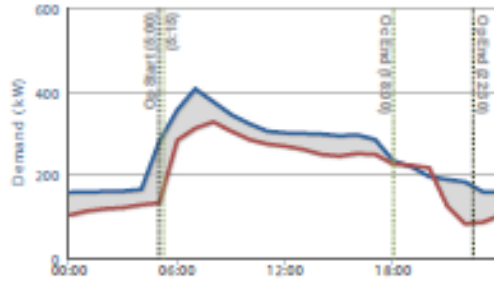
Shoulder Average Load



Summer Average Load

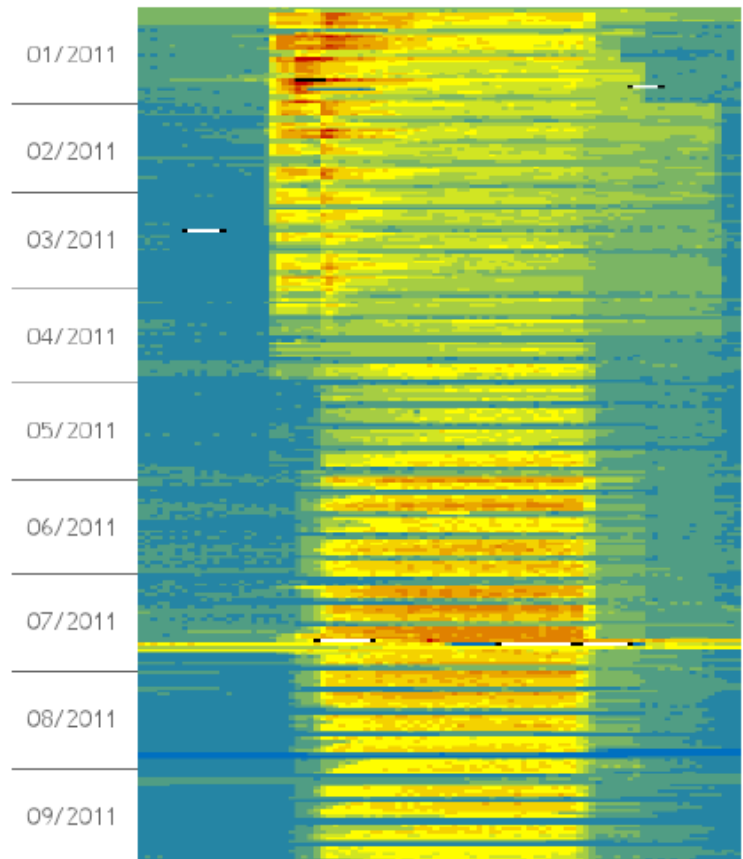
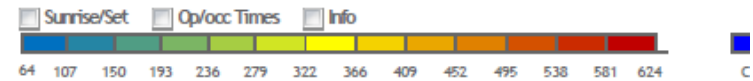


Winter Average Load



— BUILDING AVERAGE — REFERENCE AVERAGE — SAVINGS POTENTIAL

Demand Map



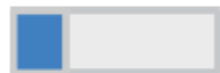
HVAC

space conditioning systems, pumps, fans, & controls



Issues Found: 3

1. Building is both heating and cooling at same time



Low
Savings Potential



Short
Payback Period

Details

Analysis indicates that there are extended periods of simultaneous heating and cooling occurring within the building.

Simultaneous heating and cooling in this building occurs between -- 53.5 °F and 58.5 °F

Solution: Minimize Simultaneous Heating and Cooling

Based on shoulder season variability in electric consumption alone, it appears that this building simultaneously heats and cools. While certain conditions do exist when the building must operate both its heating and cooling systems to maintain occupant comfort, drastic energy savings can be achieved when systems are optimized to reduce these circumstances. Measures or improvements that should be evaluated further include:



Implement/Adjust Disable or Cut-out Temperature for Heating Systems

Heating plant cut-out controls allow for automatically shutting off or disabling heating equipment at set outdoor air conditions. For example, cut-out controls can prevent heating equipment from coming on above 50°F/10°C, reducing the likelihood of concurrent heating and cooling and limiting the heating systems standby losses.



Adjust Discharge Air Temperature Setpoints

Adjusting the discharge air temperature setting on HVAC fan systems based on outdoor air temperature can minimize operating conditions that lead to unnecessary reheating. Specifically, increased discharge air temperatures during moderate and cold weather allows for proper conditioning without the use of reheat equipment.

Typical RCx Measures

HVAC Controls Optimization	HVAC scheduling, temperature reset, chiller sequencing, etc.
Outside Air Optimization	Demand control ventilation, rebalancing, etc.
Variable Frequency Drives (VFDs)	Adding or optimizing VFDs (pumps, fans, etc.)
System Repairs	Control valves, damper actuators, sensors, compressed air leaks, insulation, etc.
Lighting Controls	Occupancy sensors, daylighting, time clocks, etc.
Miscellaneous	De-lamping, carbon monoxide (CO) sensor control of parking garage exhaust fans, re-commissioning old thermal energy storage systems, etc.

Ineligible Measures



Equipment Replacements	Chillers, air handling units (AHU's), motors, etc.
Lighting Retrofits	T12s to T8s, metal halides to LEDs
New DDC System	Adding a full scale DDC unit
Plug Loads	Lamps, kitchen appliances, laptops, etc.



Sample Owner Selection Table

CenterPoint Energy Retro-Commissioning Program - Owner Selection Table											
Project:											
RCx Agent:											
Phase:		Verification Phase									
Select measure by entering Y	No.	Measure Description	Summer Peak Period Reductions		Winter Peak Period Reductions		Annual Savings		Implementation Cost	Simple Payback	Estimated Completion Date
			kW	kWh	kW	kWh	kWh	\$ Electricity	\$	Years	
Totals (For all Selected (Y) values only)			0	0	0	0	0	\$0	\$0	0.00	
Table Total (All Measures Combined)			0	0	0	0	0	\$0	\$0		

By signing this document, you, the Owner, acknowledge that the RCx Agent has discussed with you or others within your organization the implementation of RCx measures within your facility or facilities. Your signature also indicates that:

- 1.) Your company has completed the installation of these selected measures.

Name (printed):	
Title:	

Signature:	
Date:	



Opportunity



RCx program has had many successful projects over the years



Planning to promote some of these past projects on CenterPoint's Energy Efficiency website



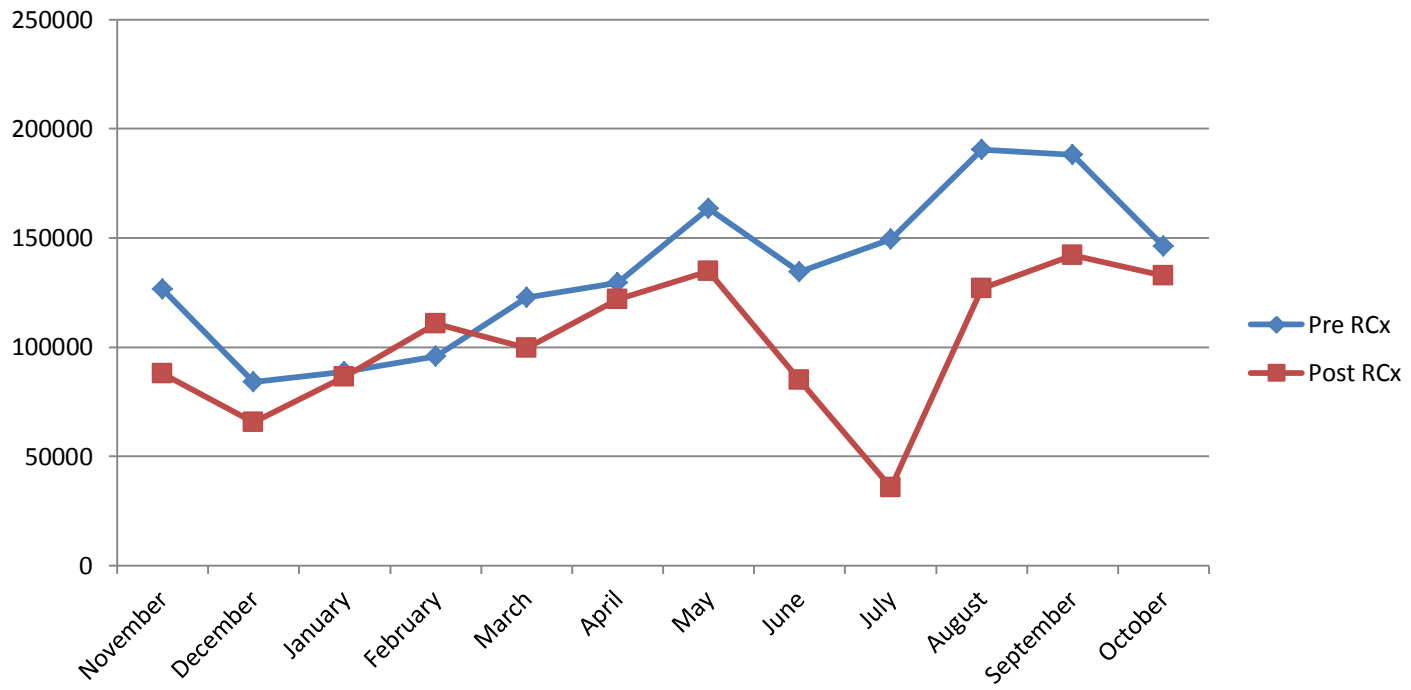
Case Studies & Testimonials

Smith Elementary

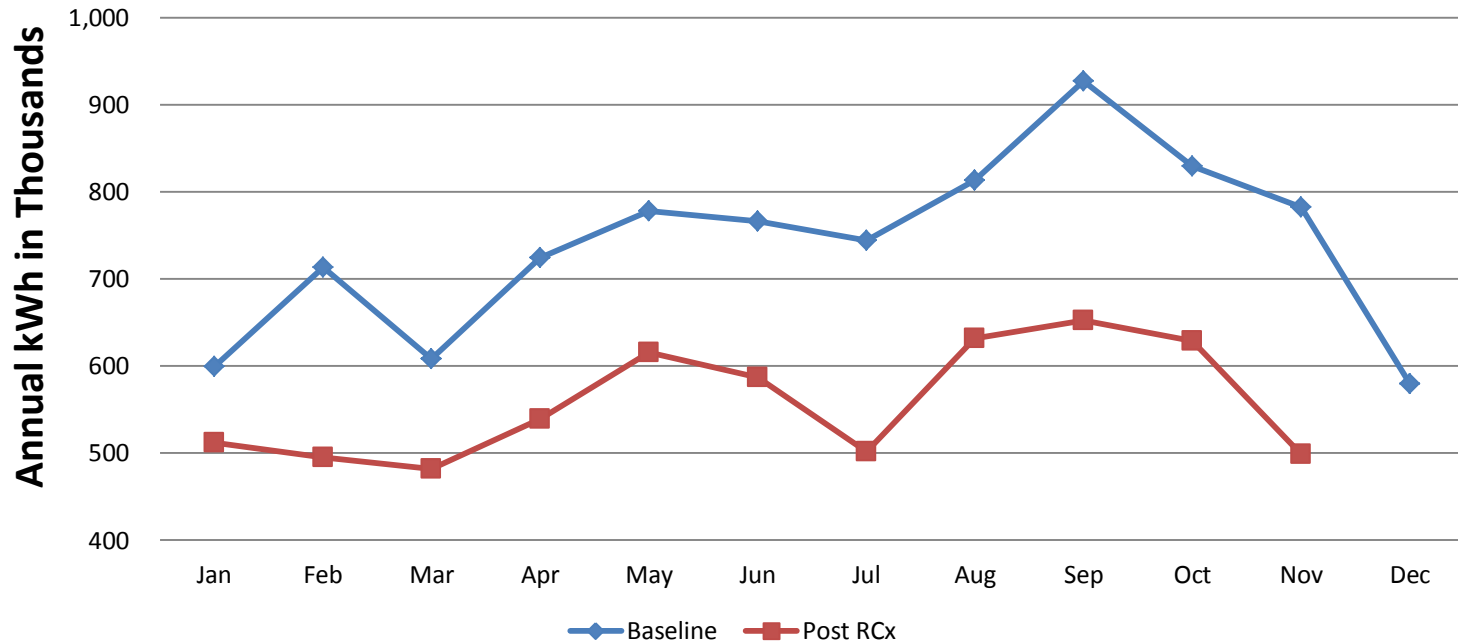
Overall 24% kWh reduction in utility bills

\$39,000 reduction in electricity costs

ECM's : Operating Schedule & Static Pressure optimization, Demand Control Ventilation



Klein Collins High School
Overall 26% reduction in kWh
Over \$276,000 reduction in electricity costs
ECMs: AHUs and CT fans
Implementation cost = \$18,330
Payback = 0.07 years (less than one month)





Healthcare - Annual Savings⁺

Methodist Hospital	\$182,993
MDA Mays Clinic	\$1,815,235
MDA Lutheran Pavilion*	\$179,243
MDA Old Clark*	\$489,321
Texas Children's Hospital*	\$166,266
St. Lukes O'Quinn Medical Tower*	\$29,565
Texas Medical Center – McGovern campus	\$149,488
UTMB Galveston*	\$108,786
Total	= \$3,120,897⁺

⁺ Annual savings may include savings from water, steam, natural gas where data was available

*preliminary estimate





Healthcare - Simple Pay Back

Methodist Hospital	1.25 year
MDA Mays Clinic	0.01 year
MDA Lutheran Pavilion*	0.27 year
MDA Old Clark*	0.09 year
Texas Children's Hospital*	1.19 year
St. Lukes O'Quinn Medical Tower*	0.89 year
Texas Medical Center – McGovern campus	0.38 year
UTMB Galveston*	2.31 year
Average Pay Back	= 0.79 year

*preliminary estimate



For more information on CenterPoint's energy efficiency programs, please visit:

www.centerpointefficiency.com

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