

# Business Energy Savings Program





Internal Use Only

# **Retro-Commissioning**

Bring New Life to Buildings





# Overview

- What is Retro-Commissioning (RCx)?
- The Evergy RCx Process
- Our Program & Incentive Tracks
- Case Studies
- Get Started Saving





4



# What is Retro-Commissioning?





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# Retro-Commissioning (RCx) is...

...a systematic process to improve the efficiency of an existing building's equipment and/or energy intensive systems.



# Retro-Commissioning (RCx) can...

...often resolve problems that occurred during design or construction, or address problems that have developed throughout the building's life, as equipment has aged, or as building usage has changed.



# Our RCx Process requires...

...an engineering study that will identify and describe:

- recommended EE measures for implementation, and
- a verification report describing measures that were implemented.



# Our RCx Process is not...

...an energy audit!







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# Retro-Commissioning Program Tracks



Compressed Air



Industrial Refrigeration



11

# Commercial Building (RCx) Program



## **Facility Eligibility**

- Facility must have an EMS (Energy Management System)
- At least one of the following conditions:
  - Facilities with >100,000 ft<sup>2</sup> of conditioned space
  - Facilities using systems with higher than average energy use intensity
- Customer must use an experienced RCx Service
   Provider
- Must be 2+ years since last RCx study was conducted



12

13

# Damper MotorsVFDs

Temperature sensors

• Eligible upgrades include:

- Operational Logic Updates
- Process Improvements
- Additional upgrades available with Custom Incentives

# Commercial Building (RCx) Program





## **RCx is great for:**

- Office Buildings
- Hospitals
- Schools
- Universities
- Large Manufacturing
- Nursing Facilities



# Commercial Building Retro-Commissioning



Figure Data Source: Mills, E., 2009. "Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions"

## **Typical Problem Areas:**

- Equipment or lighting that is on unnecessarily
- Systems that simultaneously heat and cool
- Malfunctioning belts and valves
- Thermostats and sensors that are out of calibration
- Air balancing systems that are less than optimal
- Economizers that are not working as designed
- Controls sequences that are functioning incorrectly
- Variable-frequency drives that operate at unnecessarily high speeds, or that operate at a constant speed even though the load being served is variable



15



	Table of Contents	
	Acknowledgements	3
	1.0 Executive Summary	5
	1.1 Project Objectives	6
	1.2 Project Scope	6
	2.0 Facility Profile	7
	2.1 HVAC Systems	8
	2.2 Building Automation System	8
	2.3 Lighting Systems	8
	3.0 Energy Usage Baseline & Analysis	9
	3.1 Overview	9
	3.2 Usage Breakdown by Utility	. 10
	3.2.1 Electric Usage	. 10
	4.0 Energy Efficiency Measures (EEMs)	. 11
	EEM 1: Schedule Units and Exhaust Fan	. 11
	EEM 2: Discharge Air Temperature Reset	. 14
	EEM 3: Discharge Air Static Pressure Reset	16
	EEM 4: Optimize Economizer	. 17
	EEM 5: Replace Inlet Guide Vanes with VFDs	. 18
	EEM 6: Install EndoCube Thermostat Covers	18
	EEM 7: Schedule Kitchen Hood & MAU-1	19
	4.1 Other Recommendations	21
	5.0 Sustaining Savings	22
	5.1 Utility Analytics	22
	6.0 Appendices	25
	6.1 Space Occupancy Summary	25
	6.2 Major Equipment Information	26
~	March 5, 2020	



Energy	Current Facility	Target	Median Building
ENERGY STAR score (1-100)	18	75	50
Source EUI (kBtu/ft²)	338.9	133.7	192.5
Site EUI (kBtu/ft²)	121	47.8	68.7
Source Energy Use	46,218,400	18,234,900	26,252,103
Energy Cost	\$377,864	\$148,878	\$214,334
Total GHG Emissions (Metric Tons CO2e)	3,560	1,405	2,002





RCX PROJECT TYPE: Commercial Office Building

**HVAC** Optimization MEASURES INCLUDED:

ANNUAL KWh SAVINGS: 1,519,800

TOTAL INCENTIVE PAID: \$ 136,114

Liberty Mutual

ANNUAL ENERGY \$ 118,500

1.28 years PAYBACK:

March 5. 2020













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## **Commercial Buildings:**

Identify your facility or system efficiency with ENERGY STAR<sup>®</sup> Portfolio Manager. This will help you:

- Establish an Energy Use Intensity (EUI)
- Determine your building's efficiency compared with
  - Your building's past performance
  - Similar buildings in similar climates

If your results aren't the best, consult with an engineering, or mechanical, or equipment specialist to get information on a possible RCx approach.



20

# Pre-Apply Online



### Retro-Commissioning Incentive Pre-Application

WELCOME	ELIGIBILITY	GENERAL INFO	PROJECT INFO	STUDY & SCHEDULE	PAYMENT & SUBMIT

#### Welcome!

Thank you for your interest in conducting a Retro-Commissioning (RCx) project in your facility. This form will collect basic project information and data that will be used to determine eligibility for incentives and expedite the application process.

#### **Terms & Conditions**

1. Download and read through the Program terms and conditions using the link below.

2. Electronically sign below to indicate you understand and agree to the terms and conditions.

#### Evergy Business Energy Savings Program Terms & Conditions

#### Authorization for Release of Customer Account Information

I authorize Evergy to access energy usage data for the specified accounts at the physical site address of the project and release to the Trade Ally listed on this application. I agree that Evergy may include my name, city or county of business, Program services/incentives and resulting energy savings in reports or other documentation submitted to Evergy and relevant agencies administering energy programs. Evergy will treat all other information gathered through the Program as confidential.

#### Agreement

I understand and agree to comply with the Terms and Conditions of the Evergy Energy Efficiency Program and that all energy efficiency measures identified in this application comply with program rules.

If you decide to pursue an RCx project, our simple online application makes it easy to establish eligibility and submit your facility's information to move forward with your project.

A Program Representative will contact you regarding next steps and how to proceed with your RCx application and project.



Who is completing this application? \*





6

- **1** Select RCx Service Provider
  - Complete Online Pre-Application
- 3 Complete RCx Energy Study
- 4

2

**Complete Application** 

- 5 Implement Measures
  - Send Completion Docs
- 7 Final Review & Report

# 8 Receive Incentive

# Business Development Representatives



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## **Support Team**

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# **Questions?**





## A Review of RCx Projects (2009 – 2019):

**147 Projects** 

Customer Type	RCx Type	Number of Projects	Total kWh Savings	Average kWh Savings	Average Incentive
Healthcare	CB RCx	18	41,757,520	2,319,862	\$ 169,091
Education	CB RCx	40	20,873,167	521,829	\$ 39,726
Manufacturing	CA RCx	58	28,633,413	493,680	\$ 32,330
Office	CB RCx	24	16,192,837	674,702	\$ 69,424
Lodging	CB RCx	7	7,980,768	1,140,110	\$ 56,395

Incentive Category	Incentive (per kWh saved)	
Compressed Air	8¢	
HVAC Controls Optimization with Peak Demand <sup>1</sup> Reduction	10¢	-
HVAC Controls Optimization without Peak Demand <sup>1</sup> Reduction	4¢	
Refrigeration	6¢	

Total Incentive = RCx Study Incentive (1-3¢/kWh) + measure kWh (< 18 mo.) x Incentive Rate by Incentive Category







# **Compressed Air Retro-Commissioning (RCx)**





- Focus on Low Cost/No Cost measures (< 18 mos. payback.), starting with <u>leak detection</u> and repair
- Operations & maintenance procedure optimization
- Customers are eligible for a CA RCx Study reimbursement incentive for < 18 mo. simple payback for approved energy-efficient measure (EEM) implementation

Annual kWh Savings	Compressed Air Study Incentive Rate
<u>&lt;</u> 500,000 kWhs	1¢ per kWh
> 500,000 kWhs	2¢ per kWh

 Measures identified as < 18 mo. payback, can qualify as Custom measures @

Incentive Category	Incentive (per kWh saved)
Compressed Air	8¢
HVAC Controls Optimization with Peak Demand <sup>1</sup>	10¢
Reduction	
HVAC Controls Optimization without Peak Demand <sup>1</sup>	4¢
Reduction	
Refrigeration	6¢











CA RSP conducted the leak check using the SDT ultrasonic detector.

Leaks were tagged and logged with notation as to the approximate flow loss and are summarized

below.

#### TOTAL LEAKS TAGGED:

SMALL 7 LEAKS AT .41 CFM = 2.9 CFM

MEDIUM 28 LEAKS AT 1.6 CFM = 45 CFM

LARGE 34 LEAKS AT 6.5 CFM = 221 CFM

XL 10 LEAKS AT 26 CFM = 260 CFM

TOTALS 79 LEAKS 529 CFM

ESTIMATED TOTAL CFM LOST TO LEAKAGE: **529 CFM** 529 CFM / 16,160 CFM = 3% OF ACTIVE GENERATION CAPACITY 529 CFM / 8,394 CFM = 6% OF AVERAGE CFM DEMAND

ESTIMATED COST IN ENERGY TO SUPPORT LEAKAGE: 49.6 kW 49.6 kW x 8592 hours = **426,163 kWhs** 









## Industrial Refrigeration Retro-Commissioning (RCx)



# Industrial Refrigeration Retro-Commissioning Details

- Focus on Low Cost/No Cost measures (< 18 mos. payback.)
- Operations & maintenance procedure optimization
- Optimize Control Measure opportunities

30

 Customers are eligible for a IR RCx Study reimbursement incentive for < 18 mo. simple payback for approved energyefficient measure (EEM) implementation

Annual kWh Savings	Industrial Refrigeration Study Incentive Rate
<u>&lt;</u> 500,000 kWhs	1¢ per kWh
> 500,000 kWhs	2¢ per kWh

 Measures identified as < 18 mo. payback, can qualify as Custom measures @

Incentive Category	Incentive (per kWh saved)
Compressed Air	8¢
HVAC Controls Optimization with Peak Demand <sup>1</sup>	10¢
Reduction	
HVAC Controls Optimization without Peak Demand <sup>1</sup>	4¢
Reduction	
Refrigeration	6¢









## **Typical Industries:**

- Refrigerated warehouse
- Fruit and vegetable processing
- Brewery or winery
- Carbonated beverages
- Dairy and ice cream processing
- Meat, poultry, and fish
- Chemical, petrochemical
- Pharmaceutical











## Industrial Refrigeration Retro-Commissioning



### **Control Measures:**

- Floating head pressure control
- Compressor staging controls
- Active defrost management
- Adjust suction pressure setpoints

## Low Cost Measures:

- Repair refrigeration line leaks
- Adjust operating pressures

## **Equipment Retrofit Measures:**

- VFDs on Evaporator Fans
- VFDs on Condenser Fans
- VFDs on Screw Compressors
- Condensate Subcooling
- Desuperheater



