



Continuous Energy Improvement

The Pepco C&I Energy Savings Plan Perspective

April 12, 2011



C&I Energy Savings Program

PHI Introduction

Pepco Holdings, Inc.



C&I Energy Savings Program

Pepco Holdings Inc.

- ▶ Services over 1.9 million customers in DE, DC, MD, and NJ
- ▶ 3 regulated electric utility companies
 - Atlantic City Electric- NJ
 - Pepco – DC and MD
 - Delmarva Power- MD and DE
 - Unregulated ESCO - Pepco Energy Services
- ▶ Pepco & Delmarva Power Maryland participate in the C&I Energy Savings Program



Pepco- Regulated Electric Utility

- ▶ Services DC, Prince George's and Montgomery Counties in Maryland



C&I Energy Savings Program

PHI Wins Major Environmental Award



Edison Place Case Study

- ▶ Exploring the role of retro-commissioning (RCx) in PHI's Corporate HQ becoming Washington DC's first LEED EBOM building



Edison Place- Pepco HQ

- ▶ Edison Place was built in 2001 and is 100% occupied by PHI.
- ▶ 400,000 square foot Class A office building located at 701 Ninth St., NW with ten levels above ground and four levels of parking below.
- ▶ The LEED process began in 2007 as part of PHI's Blueprint for the Future plan.
- ▶ Achieved LEED EBOM Silver Rating in 2009.
- ▶ The building began with an ENERGY STAR Rating of 66.
- ▶ ENERGY STAR Rating after the LEED certification was 83.
- ▶ RCx was a priority with a focus on energy and water reductions ensuring a better working environment for employees.



RCx Measures Performed

- ▶ Full building RCx and implementation of select energy conservation measures reduced the building's energy consumption by 17% and CO₂ emissions by over 508 metric tons.
 - Thermostat calibrations
 - Building Automation System re-programming
 - Installation of occupancy sensors
 - Reduction of HVAC equipment operating hours by 2 hours per day
 - Installation of VFD's on Chiller
 - Lighting upgrades from existing T8 30 watt lamps to 25 Watt lamps with energy efficient ballasts
 - Replacement of incandescent bulbs with compact fluorescent lamps (CFLs)



Findings & Results

- ▶ Overall energy reduction was 17%
- ▶ There was a long list of low/no cost measures many of which were addressed in RCx
- ▶ Due to budget constraints most capital projects were not completed
- ▶ Created new overtime HVAC scheduling to reduce off hour usage
- ▶ Savings are still in tact. Why?
 - Edison Place has a Chief Building Engineer who has been on site since the construction stage in 2001.
 - Made permanent changes to operation.



Program Overview

Pepco C&I Energy Savings Program



C&I Energy Savings Program

Program Portfolio

1. **Prescriptive Incentives**
 - Lighting, lighting controls, variable frequency drives, & vending machine controls
2. **HVAC Incentives**
 - Packaged units, heat pumps, economizers
3. **Custom Incentives**
 - All other measures that result in a reduction of kWh
4. **Commissioning & O&M**
 - Retro-Commissioning (RCx) for Existing Buildings
 - Enhanced Commissioning (ECx) for New Construction
 - O&M Training



Integrating CEI

Retro-Commissioning
O&M Training



CEI Energy Savings Program

Commissioning Program Design

- ▶ Input from Cx Agents was important
 - Reached out to the area's largest and most prominent Cx Agents
 - Held private and roundtable meetings
- ▶ Used common definitions and language
- ▶ Streamlined processes with LEED credit criteria
- ▶ Reduced barriers to entry
- ▶ Required training as part of our RCx process
- ▶ Allowed proactive diagnostic software
- ▶ Encouraged post-project walk thrus



Retro-Commissioning

- ▶ RCx is a comprehensive process which allows for the integration of elements of CEI
- ▶ Pulls in all measures of the program
- ▶ CEI is most apparent in Phase IV of the program, we call it Continuous Commissioning
- ▶ Continuous Commissioning encourages the implementation of:
 - Documentation of all energy savings and improvements made
 - Energy Management Plan
 - Operations and Maintenance Schedules
 - Training Plans
 - Continuous Energy Improvement Plan



Key Decisions for RCx

- ▶ Customers can enter the program at any phase for RCx
- ▶ Pneumatic systems are eligible for the RCx process
- ▶ The use of proactive software or energy management system reports can qualify for Continuous Commissioning in RCx Phase IV
- ▶ Incentive potential is high, \$30K maximum
- ▶ Documentation requirements are paramount in ensuring the integrity of the RCx process



The Four Phases of RCX Incentives

- ▶ **Phase I - Development of a Retro-Commissioning (RCx) Plan:**
ASHRAE Level I Audit
- ▶ **Phase II – Executing the Retro-Commissioning Plan - Detailed Investigative Stage:** ASHRAE Level II Audit, ECM's
- ▶ **Phase III - Implementation of Retro-Commissioning Recommended Measures:** low/no cost ECM's are implemented, capital projects may come out of the process and may be paid by other incentive programs
- ▶ **Phase IV - Continuing Commissioning:** training, additional walk-thrus and/or energy management reports & tracking



RCx Incentives

Phase	\$/square foot	% Percentage Match	Maximum Incentive Amount
I	\$0.02	50% of Cost	\$ 4,000
II	\$0.06	50% of Cost	\$12,000
III	\$0.05	50% of Cost	\$ 10,000
IV	\$0.02	50% of Cost	\$ 4,000



Phase IV- Continuing Cx Plan

- ▶ How we address CEI in the context of RCx?
 - Final reports on all energy savings is due
 - Training Plans are due
 - Key elements of Continuous Energy Improvement Plans are implemented
- ▶ Encourages ongoing energy savings
 - If the customer understands how they achieved savings
 - Customer has completed 3 phases of data collection
 - They see the value in ongoing energy savings and improvement



Phase IV- Continuing Cx

- ▶ Continuous Commissioning Plan options:
 - Contract for additional walk-thrus by the Cx Agent at 3 months and 6 months. Cx Agent must report findings for this option including trend data on improvements.
 - Installation of software to provide proactive diagnostics
 - Installation or re-programming of BAS or other centralized system which trends data and provides critical alarms.
- ▶ Cx Agents must provide additional training in the months after project completion



O&M Training

Training is the key to maintaining energy improvements and savings



O&M Training

- ▶ Began with the BOC (Building Operators Certification) course as a concept.
- ▶ No local courses available, so we redesigned the program to include other training programs
- ▶ Created a Market Based Approach partnering with Organizations
- ▶ Applicants can submit a training course of their choice for evaluation to receive 80% up to \$1,000.00
- ▶ Trainers can submit courses for pre-qualification



O&M Training Eligibility

- ▶ Applicants must:
 - Have influence over a building's energy performance
 - Be responsible for day-to-day operations
 - Numerous titles and levels of applicants fit this category



Examples of Pre-Qualified Courses

- ▶ **Association of Energy Engineers (AEE)**
 - Certified Energy Manager (CEM)
 - Certified Energy Manager in Training (CEIT)
 - Certified Building Commissioning Professional (CBCP)
 - Certified Lighting Efficiency Professional (CLEP)
 - Existing Building Commissioning Professional (EBCP)
 - Certified Business Energy Professional (BEP)
 - Certified Energy Auditor (CEA)
- ▶ **International Association of Lighting Management Companies (NALMCO)**
 - Certified Apprentice Lighting Technician (CALT)
 - Certified Senior Lighting Technician (CSLT)
- ▶ **International Facilities Management Association (IFMA)**
 - Certified Facility Manager (CFM)
- ▶ **Leadership in Energy and Environmental Design (LEED)**
 - Accredited Professional Certification (Leadership in Energy and Environmental Design- Existing Buildings: Operations & Maintenance and New Construction).
 - Green Associate



Challenges of CEI in Program Design

- ▶ Programs are short in length, average is 3 years from implementation to close out
- ▶ No measurement and verification required
- ▶ Prescriptive measures are still more popular than Custom, Commissioning and O&M
- ▶ Difficulty in finding high impact, high savings projects
- ▶ Receiving buy-in from customers to commit to long-range energy efficiency goals



Best Practices

What we have learned so far...



C&I Energy Savings Program

What we have learned so far...

- ▶ A comprehensive approach to commissioning requires incentives be offered for all activities: HVAC, Custom, Lighting etc.
- ▶ Acquisition costs to gain a participant can vary especially in a down economy such as we experienced all thru 2010
- ▶ CX programs are long term initiatives
- ▶ Public Service Commissions expectations to see energy savings right away needs to be managed
- ▶ Approved programs should have flexibility to allow program administrators to adapt quickly to changing conditions in the marketplace such as adjusting offering and incentives





Questions

For More Information

Visit us online at www.pepco.com/business

Call the Pepco C&I Energy Savings Program
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Thank You!



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