





**A Competitively Bid
Retrocommissioning Project in the
County of Los Angeles –
A Model Process?**

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NCBC San Francisco,
April 19-21, 2006

**Retrocommissioning (RCx)
Partnership & Project Funding**

- Funded by a \$1.6 million grant from California Public Utilities Commission
- Partnership members
 - Southern California Edison
 - Southern California Gas
 - County of Los Angeles
- Facilities maintained and operated by Internal Services Department, County of Los Angeles
- RCx provider
 - EMC Engineers
 - Team of subcontractors

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2

RCx Project - Defined Goals

- Optimize operations of Heating, Ventilation and Air Conditioning (HVAC) systems in the County buildings
- Identify optimization and energy efficiency measures
- Improve thermal comfort, ventilation and indoor air quality in the County buildings
- Develop tool for sustainable reduction of electricity and natural gas
- Provide operations staff with comprehensive facility information, update methods to efficiently operate, maintain and monitor HVAC systems

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3

The RCx Procurement Process – A Leap of Faith

- RCx of HVAC systems provides optimized performance
- Thermal comfort, indoor air quality improvements, maintenance issues take precedence
- Energy savings are likely, but should not be required of the RCx provider

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Request For Proposal: Defined Project Tasks

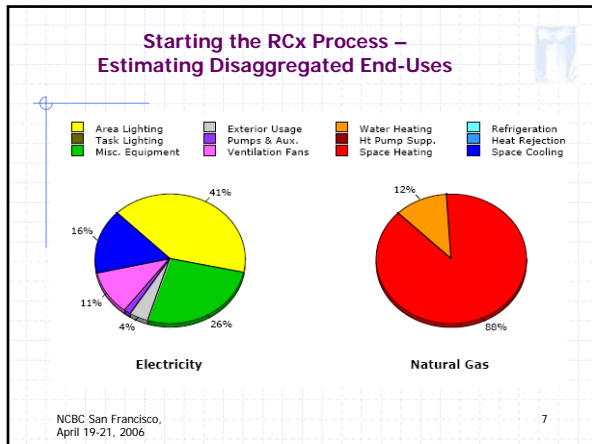
- Whole building energy benchmarking
- Diagnostic measurements
- Prefunctional testing of individual components
- Minor HVAC system repairs
- Building automation improvements
- Functional Performance Testing of HVAC systems
- Install new optimization and energy efficiency measures
- Modeled energy savings projections
- System level benchmarksRetro-commissioning reports & schematics
- Training manual

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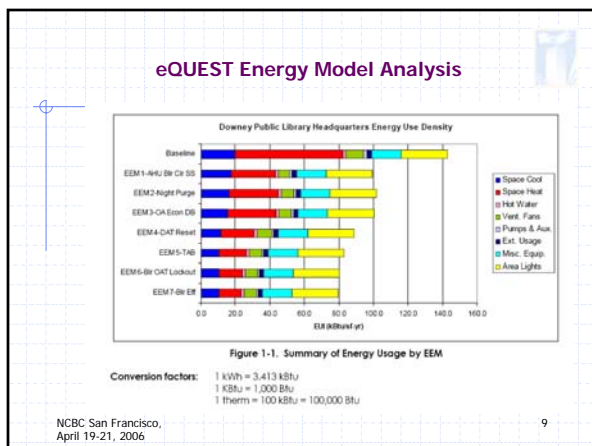
Hiring the RCx Provider

- RFP sent to prequalified list of nineteen RCx providers
- Project goals stated
- Project tasks described
- Change order process described for measure implementation
- Selection criteria described
- Fixed-price bid request for any or all of eight building groups

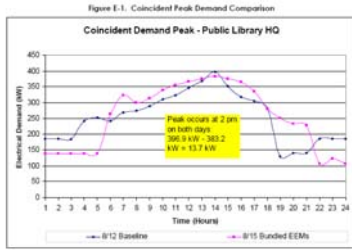
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- ### HVAC RCx Measures
- Tested and calibrated all existing controls
 - Improved Chiller Sequencing
 - Installed customized Purge Cycles
 - Optimized Economizer Controls
 - Improved Boiler Combustion Efficiency
 - Installed Boiler Hot Water Reset Controls
 - Installed Discharge Air Reset Controls
 - Improved VAV Static Pressure Controls
 - Performed Diagnostic Air and Hydronic Testing
 - Selective air balancing and terminal box repairs
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Utility Coincident Peak Demand Impact



Demand savings is captured due to reduced ventilation loads from optimized economizer operation. Electrical consumption savings is increased during unoccupied hours because HVAC equipment is turned off.

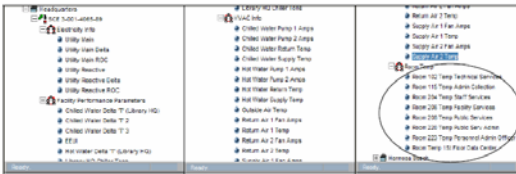
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10

Sustainability of RCx Savings - EEMIS Monitoring Points

3.1 Final EEMIS Points List

Based on screen captures that were taken on October 10, 2005, the following points are currently mapped over to EEMIS:



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11

System Level Benchmark Chiller kW Vs. OAT

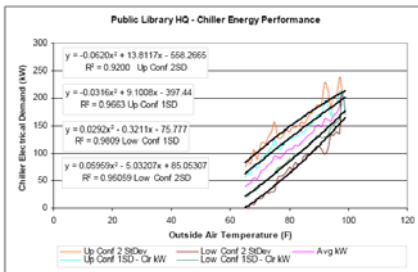


Figure 4-2. Chiller Energy Performance - Representation with Equations

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12

Is The LA County RCx Project A Model Process?



- Energy savings far exceeded program goals
 - Electricity savings goal exceeded by ~70%
 - Natural gas savings exceeded by ~20%
- RCx team focused on optimized HVAC performance
- Integrated County Maintenance & Operation team
- Sustained, optimized performance expected through EEMIS tracking; i.e., persistent savings
- Market price for RCx

PARTNERSHIP CREDITS



- Southern California Edison
 - David Bruder, Energy Efficiency Manager
 - Michael Lo, Program Manger
- Southern California Gas Co.
 - Paulo Morais, Project Manager
- County of Los Angeles – Internal Services Department
 - Howard Choy, Division Manager, ISD, Los Angeles County
 - Nora Hernandez, Section Manager, ISD, Los Angeles County
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