



The Case for:
Building Retro (& Re)
Commissioning



Fall ASCEM
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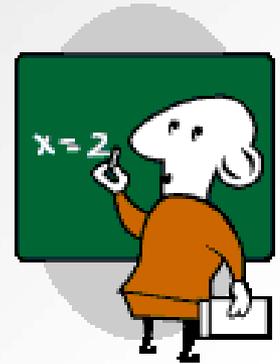
Learning Objectives

What is it?

Why do it?

How to do it?

Probable Results.....



What is: Commissioning / Retro and Re-Commissioning?

Building Commissioning is a quality control process that ensures that a new building will operate the way the owner intended.

Retro-Cx is the documented process of commissioning an existing building.

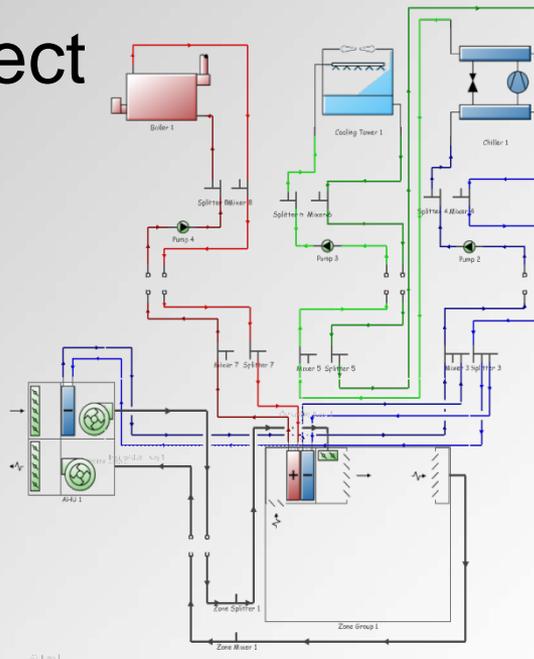
Re-Cx is the process of commissioning a building which has previously been commissioned.

What is: Commissioning / Retro and Re-Commissioning?

Investment opportunity

Payback Widget

Energy Project



What is: Commissioning / Retro and Re-Commissioning?

Goals

Obtain and verify energy savings

Identify improvement to operations

Recommend future capital projects



Goal Setting Charrette

Re/Retro-Commissioning

Why do it?:

- **Energy and Cost Savings**
- **Improved Comfort and Productivity**
- **Better IAQ**
- **Better Trained Staff**
- **Increase Equipment and System Life**

Re/Retro-Commissioning

Why do it?:

- **Low Cost**
- **Low Beta (Risk)**
- **High return on investment**
- **Single-most cost-effective way to save energy**
- **“Stealth” Strategy**

Re/Retro-Commissioning

How To Do It

1. Identify a building

Expensive to operate

Older

DDC

Poor comfort conditions

Poor IAQ

High Maintenance

Re/Retro-Commissioning

How To Do It

2. Get a Commissioning Agent

Consultant

Engineer

“Commissioning Agent”

Owner staff?

BMS Controls Vendor



Re/Retro-Commissioning

How To Do It

3. Develop a Plan.....

Document current conditions
Current operations



Implement Findings

Verify Savings

Re/Retro-Commissioning

How to Optimize Your Payback

Use in-house talent and knowledge

ReCx performed using experienced, knowledgeable, engaged building staff is most likely to produce long lasting results and provide the greatest payback.

Re/Retro-Commissioning

How to Optimize Your Payback Using in-house personnel

Gather building information

Assist in trending and testing

Building evaluations

Short term monitoring

Simple repairs

BMS manipulation

Test Protocol

Facility staff can reduce time spent on functional testing by assisting the commissioning team with tasks such as:

- Defining tests
- Preparing for tests
- Manipulating the systems to conduct tests
- Putting the systems back to normal following testing

A test protocol is a form that describes exactly how a test will be carried out. It includes:

- Purpose of the test
- Instructions for carrying out and documenting test
- Equipment required for test
- Acceptance criteria
- Precautions
- Prerequisites for testing
- Detailed procedural steps for testing
- Procedure for returning to normal
- Analysis required
- Required sign-offs

Re/Retro-Commissioning

How to Optimize Your Payback

Diagnostic Monitoring

BMS Trending / data loggers

Perform in all modes of operation and conditions

temperatures

flow rates

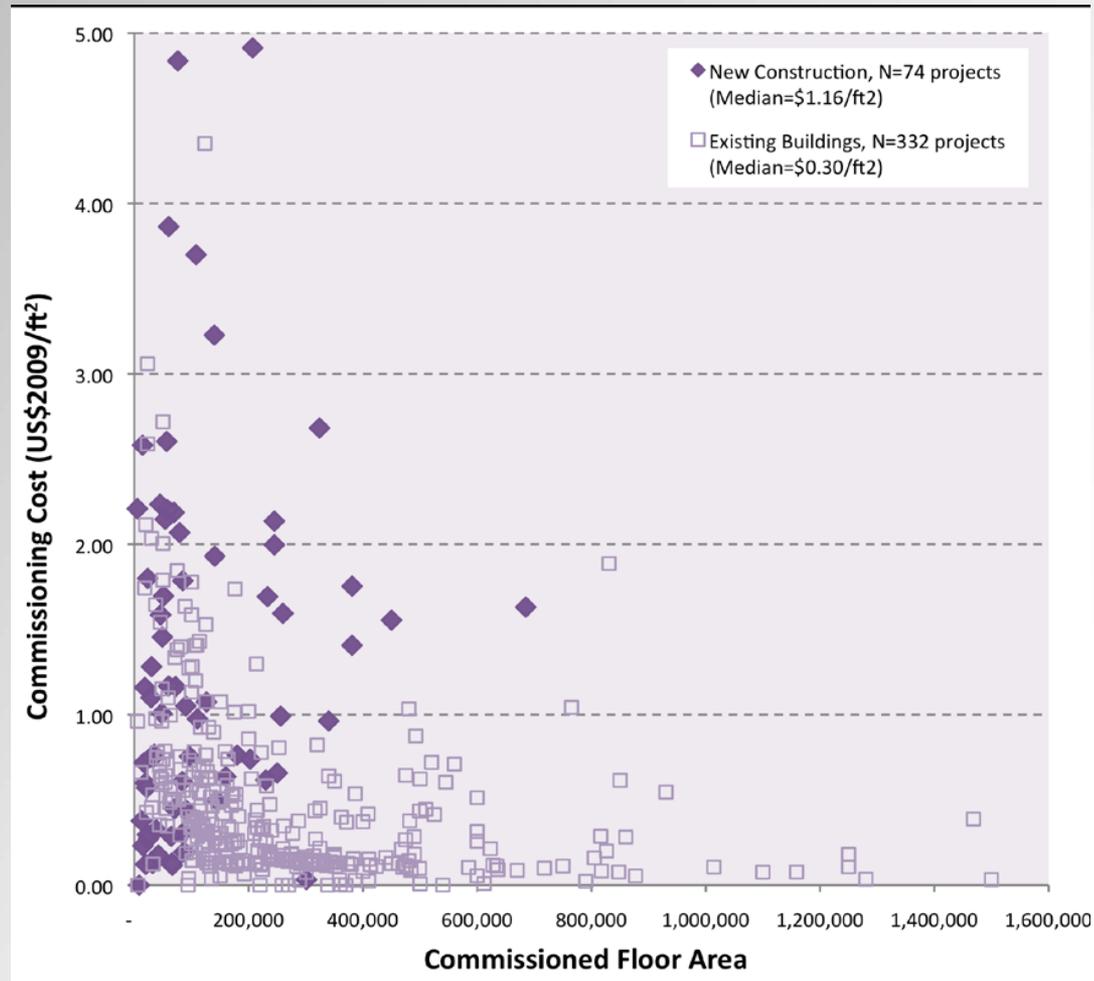
pressures

Analysis and determine root cause

Re-baseline (Building Performance Capabilities)

Re/Retro-Commissioning

\$\$ What Does It Cost \$\$



Re/Retro-Commissioning

\$\$ What Will It Save \$\$

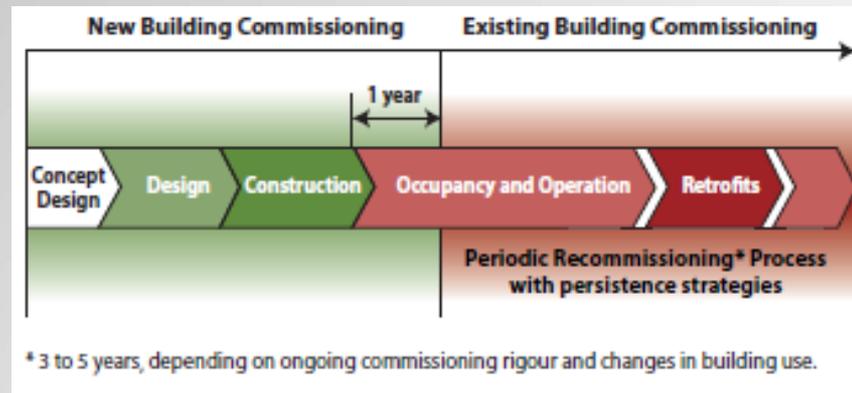
Retrocommissioning Costs²

Actual retrocommissioning costs, as reported in a study of 106 retrocommissioning projects

Description	Value or Ranges
Total RCx Cost	\$0.13 to \$0.45/sqft
Provider Fee as % of Total RCx Cost	35 - 71%
Average RCx Cost Allocation	
Planning and Investigation	69%
Implementation	27%
Verification, Tracking and Reporting	4%
Simple Payback Time	0.2 to 2.1 years

Re/Retro-Commissioning

\$\$ Keep Doing it \$\$



- Schedule
- Alarm logs
- Overrides
- Sequence enhancements
 - Critical zone reset
 - Supply air reset
 - Single Zone VAV
- Calibrations
- Low Delta T
- Supply fan VFD at 0% but unit SP is 3.6". VFD in⁷ Hand. Economizer disabled. No min OSA set point but OSA dampers at 25%.

- Unit running at 100% at warmup SA temp only 63
- Unit running in economizer mode with space temp 79
- VAV box damper at 84% with 0 cfm
- Space set point 69 space temp 61
- AHU unable to reach SP set point
- Unit not in graphics
- Units not mapped properly in graphics
- Poor central plant start/stop
- No VAV box max or mins

Building Retro (& Re) Commissioning

Why Do Anything Else?

Q & A