NHsaves
Your Source for Energy Efficiency

Controls Optimization

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New Construction

Controls in New Construction

- **Absolutely essential** for Commercial, Industrial & Municipal buildings
- Integrate & “right size” controls into the design from the start
    - Include **HVAC & Lighting controls** in particular
- Don’t allow **value engineering** to cost the customer more in the long run
- Properly **commission** all systems & controls
    - Educate operators on the features of their systems

Incentive Process

- **Coordinate with the utility early!**
- Multiple pathways exist
    - Design team to collaboratively determine appropriate New Construction incentive pathway
- https://nhsaves.com/programs/new-equipment-construction/

Existing Buildings

When optimizing operations through improved control, which approach makes sense?

Controls Do Not Exist

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Install new controls on existing equipment to run more efficiently

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Controls Installation

Controls Exist & Can Work

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Use installed controls on existing equipment to run more efficiently

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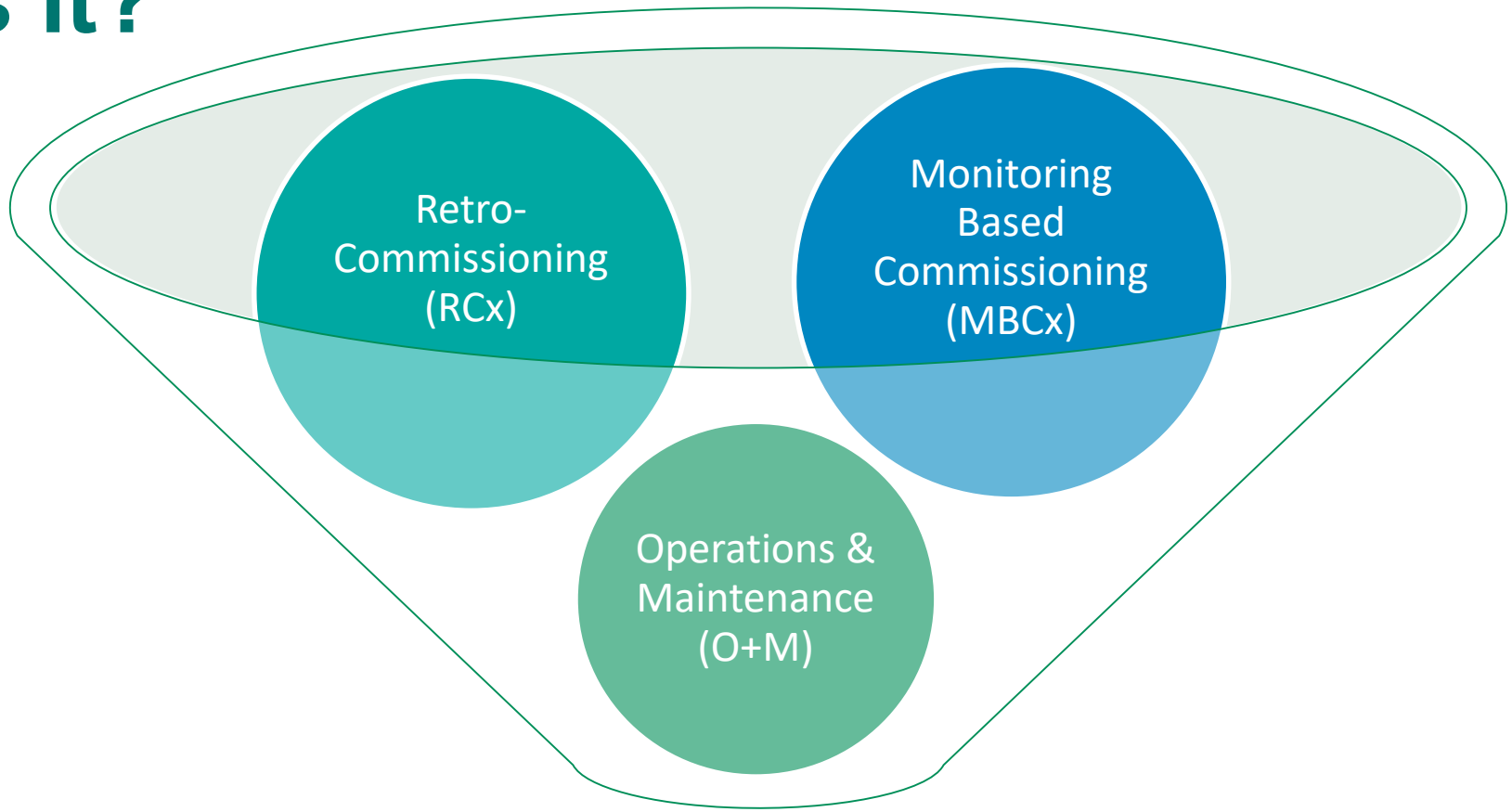
Controls Optimization

What is it?



Controls Optimization

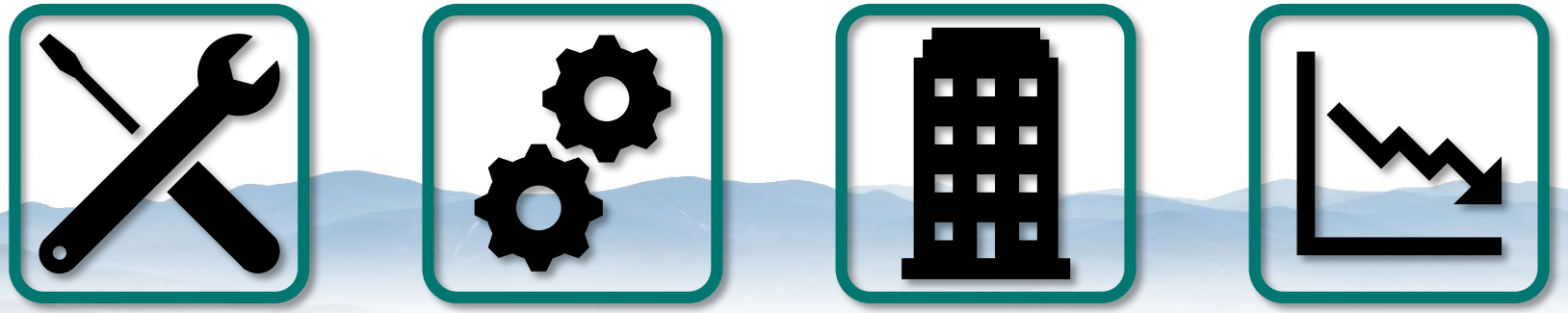
Who, What, When, Where, Why & How

- **Who –** Owner/Operator, Controls Vendors, Commissioning Agents, Engineering Firms, Monitoring Based Commissioning Providers, etc.
- **What –** Use existing controls to operate installed equipment more efficiently
- **When –** Anytime but generally in buildings 2+ years old
- **Where –** Commercial, Industrial & Municipal Customers with or without a BMS
- **Why –** Typically low-cost & non-capital interventions taken to improve overall building, process or system operations
- **How –** Partnering with your utility & qualified partners to assess for controls-based opportunities & plan for implementation

Incentives are available to support this effort!

Improved Operations & Maintenance

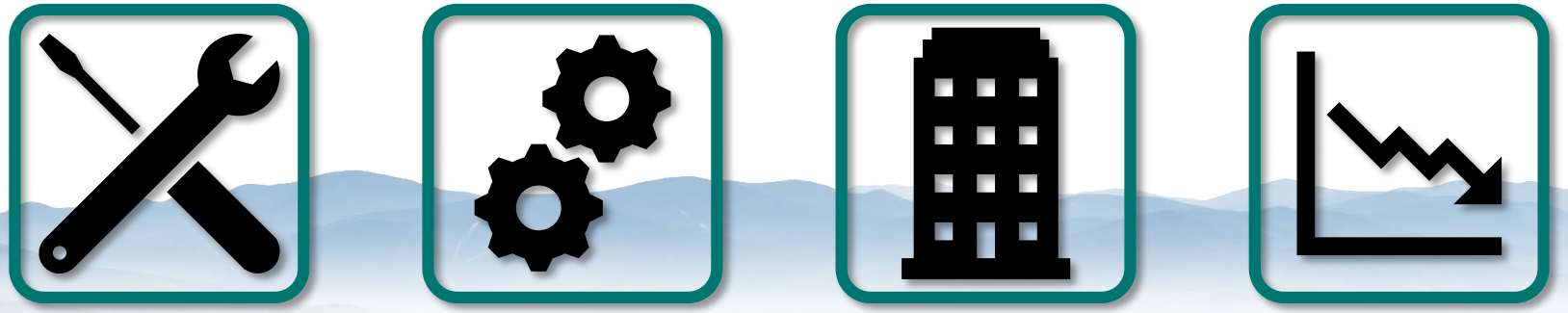
- Enable customer staff or their contractors to more efficiently operate equipment
- Encourage proactive preventative maintenance
- Educate the workforce on efficient operational strategies & best practices
- BMS not required



Retro-Commissioning

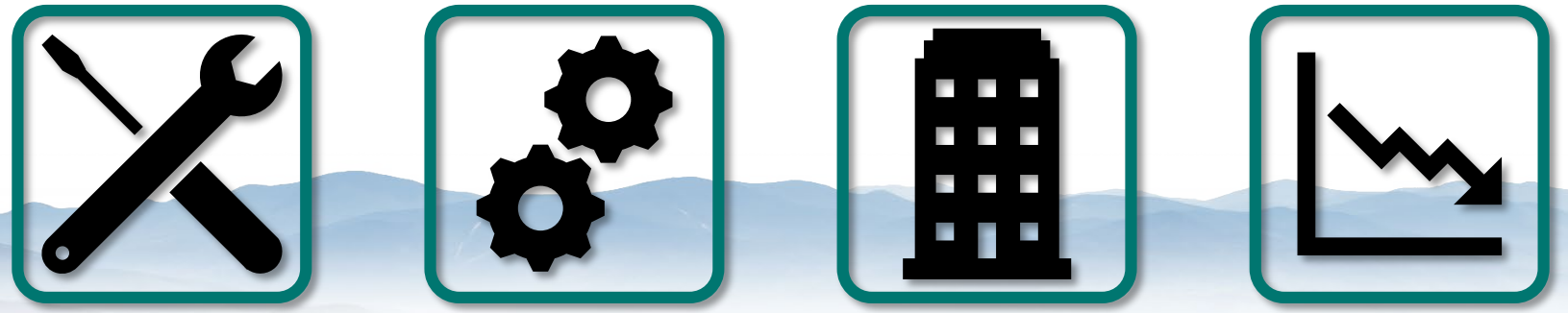
"Retro-commissioning is the process of making **low-cost adjustments to an existing building's operation to improve its energy performance**. Most often, these adjustments are **changes in *sequences of operation* in HVAC controls, such as temperature or airflow *resets*, or *scheduling* changes**. Retro-commissioning is most often implemented over a period of time by a team made up of the **RCx consultant, controls technician, and a building operator**."

https://www.ashrae.org/technical-resources/ashrae-journal/featured-articles/persistence-in-energy-savings-from-retro-commissioning-measures



Monitoring Based Commissioning

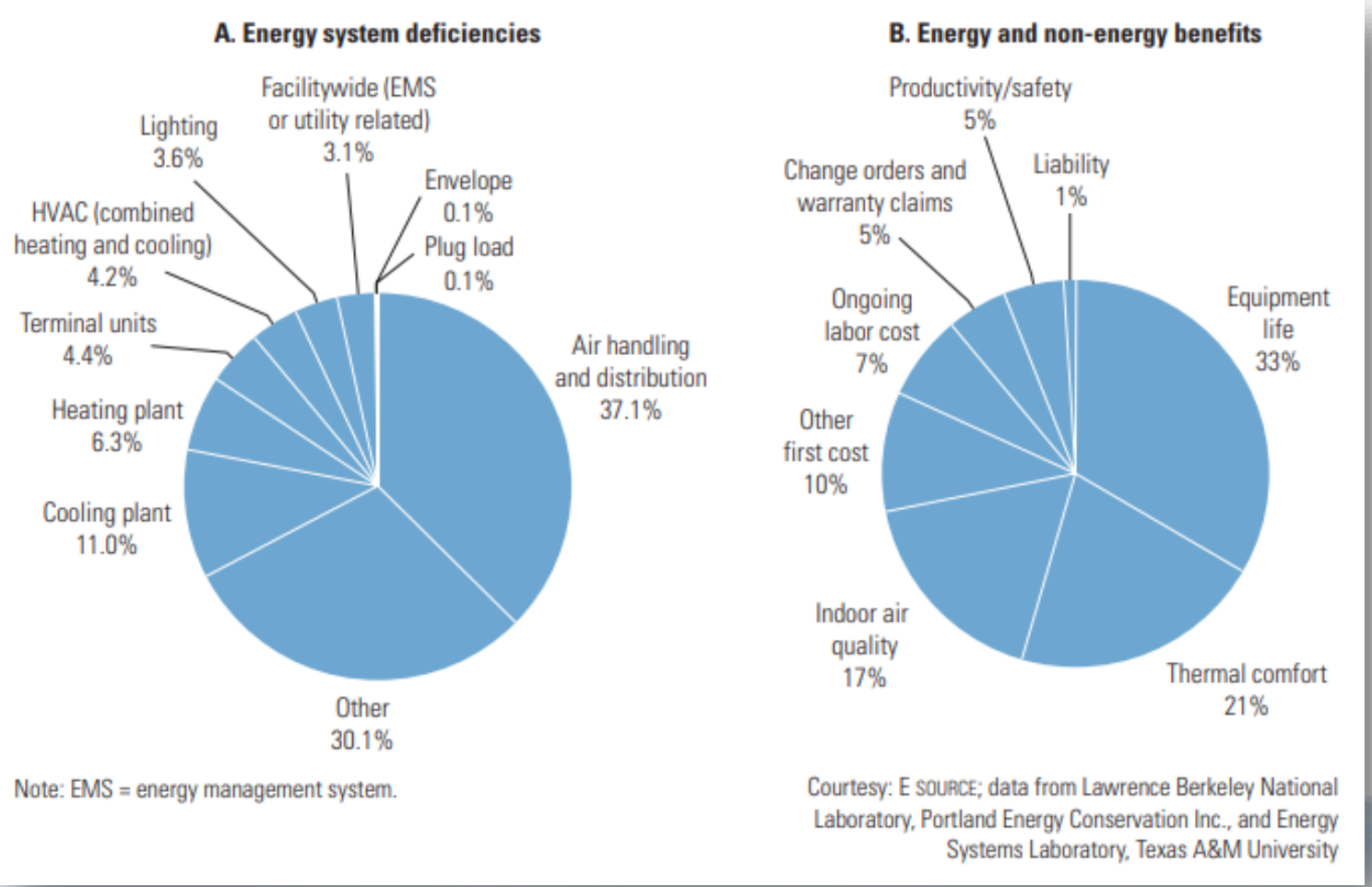
- Emerging market for **proactive, point-level monitoring of systems** to detect inefficiencies through **analytics**
- Lots of types – Fault Detection & Diagnostics (FDD), Energy Management Information Systems (EMIS), etc.
- Best suited for more **advanced & proactive customers with complex systems & modern DDC controls**
- **Monitoring is not enough** – action must be taken by owners & operators to achieve savings via implementation of measures identified



Problems Controls Optimization Can Fix

- Simultaneous heating & cooling
- Inappropriate HVAC sequences of operations
- Nonexistent or improper equipment staging
- Lack of optimal start/stop
- Excess supply & exhaust air
- Inoperable dampers or valves
- Improper economizer programming
- Insufficient temperature deadband
- Inadequate zone control
- Ineffective heat transfer due to fouled surfaces
- Building pressurization issues
- Underutilized reset sequences based on outdoor conditions
- Variable speed drives operating at fixed frequency
- Poorly located or uncalibrated sensors
- Overridden HVAC setpoints
- Altered occupancy schedules for HVAC, domestic hot water, process or lighting loads

Benefits of Controls Optimization



- Controls Optimization is often the **most cost-effective** way to achieve savings in buildings
  - Non-capital intensive
- Lower **energy** bills
- Reduced **carbon** emissions
- Increased **equipment life**
- Improved **comfort/production**

https://www.energystar.gov/sites/default/files/buildings/tools/EPA_BUM_CH5_RetroComm.pdf

Incentive Process

Utility
Involvement &
Guidance

Tailored approach to incentives

- ❑Technical Problems
- ❑Efficiency Opportunity
- ❑Financial Needs

Utility Support Throughout Project to ‘Right-Size’ Offer

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Questions?

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Thank you!

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