



*Free resources
and training are
available.*

CONTINUOUS RETUNING

What is it?

Continuous retuning evaluates and optimizes the operation and maintenance (O&M) of a building's energy systems. It identifies low-cost and no-cost O&M measures to increase energy efficiency. One DOE sponsored program found that equipment retrofits cost about 20-times more than low-cost O&M measures and realize the same energy savings (Sullivan et al., 2010).

A variety of O&M measures can be pursued to improve a building's energy performance:

- Operation activities include: periodically checking schedules and controls, adjusting temperature and/or static pressure set points, and regulating night- time setbacks.
- Maintenance activities include: component-by-component, equipment specific actions such as changing filters, cleaning coils, and tightening fan belts (PECI, 1999; Sullivan et al., 2010).

Why do it?

If you are not continuously retuning your building, you are wasting energy and money. Buildings need continuous retuning to achieve the best possible efficiency or perfect harmony of systems. Continuously retuning can lead to 5-20% savings in an existing building's total energy costs (Katipamula, 2010).

These savings are significant because energy costs represent the largest operational expense for existing buildings after fixed expenses. Government-occupied facilities spend an average of \$2.37 per square foot on utilities annually (BOMA-Kingsley, 2010). Continuously retuning also helps you to comply with the federal mandates in effect for federal buildings to reduce energy consumption.

How do you do it?

Although continuous retuning is similar to retro-commissioning, you don't need to hire an outside consultant to continuously retune your building. With a little training, in-house staff can do it.

Join your facility management peers using retuning training and resources available online to boost your building's energy performance. Of particular value is [Pacific Northwest National Laboratory's \(PNNL\) free online training and continuous re-tuning resources](#). Other useful and freely available retuning resources are listed below:

- [Facility Management Institute \(FMI\) Skills Assessment & Planning](#): Includes FBTA resources, a self-assessment tool, and links to training focusing on key competency areas including but not limited to management and performance of O&M, energy management, sustainability, and performance measures.
- [Putting the "O" back in O&M](#): Describes the importance of operations practices as different from maintenance activities, outlines ways to improve operational efficiency, and provides a sample preventative operation plan that could be integrated with standard preventative maintenance plans.
- [Operations & Maintenance Best Practices – A Guide to Achieving Operational Efficiency, Federal Energy Management Program](#): Offers detailed guidance for implementing O&M best practices, with special focus on operational efficiency and improving overall energy efficiency.
- [Energy Information Handbook: Applications for Energy-Efficient Building Operations, Lawrence Berkeley National Laboratory](#): Provides guidance on energy tracking and management and introduces the ways building owners can both track energy (from simple to advanced) and articulates the strategies.
- [The Building Performance Tracking Handbook – Continuous Improvement for Every Building](#): Encompasses tools and practices for more responsible and effective strategies for building energy management.

Costs for additional training, if needed, range between \$10,000-\$25,000, depending on travel and support required (Katipamula, 2013). Retuning, inclusive of training, is more cost efficient than retro-commissioning, which can be up to \$0.40/square foot each time the building is serviced (Sullivan et al., 2010); or up to \$40,000 for a 100,000 square foot building.

Best Practices

Retuning training and resources impart both the knowledge and skills essential to improving your building's performance. They teach you how to be proactive rather than reactive. You will learn ways to develop a continuous Energy Management Plan to access and adopt continuous retuning measures that fit individual buildings. Finally, these resources will describe how to implement no-cost/low-cost improvements identified in building energy assessments.

In addition to the insights from retuning training and resources, prior experience sheds light upon best practices that should be considered for retuning your building (Granderson et al., 2010):

- Create an efficient practices training program for building O&M staff;
- Enable staff with the diagnostic tools that they may need for continuous re tuning;
- Track energy use and compare against expected performance;
- Practice continuous energy accounting to alert managers when energy consumption increases;
- Refine building automation tools to control setbacks, economizers and warm ups;
- Adapt equipment schedules periodically to meet the changing requirements of occupants;
- Document actions recommended, measures implemented, and results achieved;
- Review and revise Energy Management Plan for continual improvement (i.e., corrective actions).

Case Study: Wichita U.S. Court House

A cost-effective retuning program helped the 80-year-old U.S. Court House in Wichita, Kansas reduce its energy consumption by 20% and save \$40,000 over a 12 month period. These savings were achieved despite substantial winter heating and summer cooling seasons. The effort took advantage of the free retuning training offered by Pacific Northwest National Laboratory (PNNL). It included retuning building control systems and training the building staff on more energy-efficient building management techniques. The program also included encouragement for employees to reduce energy. It earned the 2013 Better Buildings Federal Award, bestowed by the Energy Department. Read more about the Wichita U.S. Court House [here](#).

The retuning program targeted:

- Static pressure and supply air temperature reset on the air-handling units;
- Optimal Start for all air-handling units;
- Zero minimum outside air when;
- AHUs operate during unoccupied periods;
- Seasonal manual adjustments to chiller and pump valves.

With low-cost energy savings measures as follows:

- Integration of chiller control with the building automation system that allowed chillers to be scheduled “as needed” rather than run on 24/7 schedule during the summer cooling season. This modification also enabled the BAS system to control chilled water temperature reset thereby providing additional savings during non-peak cooling months;
- Installation of timer controls on parking garage air handling make-up air and exhaust fans not controlled by the BAS system allowed the building staff to synchronize the garage AHU operation with tenant occupancy and thereby reduce unnecessary after-hours equipment usage;
- Reduced run times of building exhaust fans by adjusting existing timers;
- Installed digital timers on parking garage lighting circuits, allowing more precise timer control while reducing hours of illumination;
- Installed LED bulbs on several lights that are on night light circuits;
- Federal buildings must reduce fossil fuel-generated energy consumption by increasing percentages reaching 100% reduction in 2030.

Equip your facility managers with the resources and training they need to establish a continuously retuning maintenance model.



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