

THE HIGH PERFORMANCE PORTFOLIO: BUILDING TUNE-UPS



BETTERBRICKS
Bottom line thinking on energy.

SUMMARY:

A building tune-up is a periodic (every 2-3 years) process intended to identify and implement cost-effective operational improvements that will improve a building's energy performance, given current operating conditions and occupant needs. Changes resulting from a building tune-up usually require minimal investments and can be accomplished through simple equipment adjustments or reprogramming of controls. A building tune-up may also identify opportunities where small capital improvements could make a big difference.

IN DEPTH:

Like your car's regularly scheduled maintenance, the building tune-up takes a systematic approach to zeroing in on areas where specific improvements can be made. Over time, many characteristics of a building can change — the needs of tenants, the character and nature of mechanical equipment, the experience levels of staff, and the physical structure itself. These changes can accumulate and impact the operating conditions of the property, potentially degrading energy performance. A building tune-up identifies and adjusts building operations to changing conditions, and re-aligns building energy performance with the current goals of the property managers and owners.

Building tune-ups require specialized expertise in the operation of HVAC systems, a sound understanding of equipment interactions from an energy perspective, strong diagnostic and analysis skills, and the ability to present recommendations to decision-makers. You may have an individual or a team of employees in-house with these necessary skills; however, most organizations benefit greatly from hiring an outside contractor to perform these activities. When you outsource the building tune-up, be sure to closely involve building operators in the process so they can learn more about their systems and become advocates for the required changes.

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KEY STEPS TO A BUILDING TUNE-UP

Diagnosing Problems and Opportunities

- **Information gathering:** Review findings from previous studies; perform a walkthrough inspection of the building; and interview operations staff to collect the necessary data.
- **Quick fixes:** Some immediate adjustments to building controls may be possible during this stage. Perform any obvious, low-cost changes as they're identified.

Formulating and Implementing a Building Tune-Up Action Plan

- **Action plan:** Recommend operational changes to improve energy performance, provide cost-benefit estimates and specific implementation steps to decision-makers; formulate a plan to implement approved changes. Also provide a summary of any quick fixes already performed, achieved savings, and recommended maintenance practices to avoid similar problems in the future.
- **Implementation:** Assemble and organize resources to carry out the action plan. Involve building operations staff in implementing changes, as well as controls and maintenance providers.
- **Verification:** Confirm that the operational changes have been correctly implemented and are achieving the desired results.

Developing Recommendations for Further Action

- **Enhanced O&M practices:** Recommend enhanced O&M practices to help ensure the integrity of the newly established operational changes, and maintain system/equipment functionality over time. These can include changes to standard O&M management procedures and additional staff training.
- **Equipment replacement:** In the process of examining building performance, you may identify capital projects that can significantly improve energy performance. Take appropriate steps to investigate these opportunities, and contact your local utility for possible technical or financial assistance in implementing them.

TUNE-UPS VS. RETROCOMMISSIONING

While a tune-up may identify equipment that need replacing, it is not a project focused on capital improvements. Nor is it retrocommissioning—a much more comprehensive and expensive process. Retrocommissioning is a formal, in-depth assessment of the building's functioning. It involves documenting the intended operation of building systems and conducting a thorough functional testing of equipment and systems.

A building tune-up focuses on low cost operational improvements and typically includes:

- Systematically diagnosing and repairing problems
- Implementing specific operational changes
- Optimizing controls
- Scheduling equipment
- Identifying key performance indicators

COMMON OPPORTUNITIES FOUND DURING TUNE-UPS

Calibrating and Adjusting Building Controls

- Calibrate occupancy sensors. Does a ten-minute timer actually shut the lights down after ten minutes? An extra few minutes here and there really add up.
- Check dampers and valve controls to be sure they are functioning properly. Adjust dampers to reduce the amount of outside air brought in (within codes). This reduces the need to condition outside air and lowers HVAC energy usage.
- Adjust schedules to reflect occupancy patterns.
- Adjust automatic doors to minimize air loss from the building.

Conducting Lighting System Tune-Up

- Establish a strategic lighting maintenance plan of scheduled group relamping and fixture cleaning. Cleaning alone may boost fixture light output from 10 to 60 percent.
- Calibrate lighting controls (automatic and others). Simple calibration of occupancy sensors and photocells can reduce energy used by the lighting system in those areas by 50 percent or more.
 - Account for seasonal changes to lighting requirements.
 - Be sure that lighting isn't obstructed by furniture or décor.
 - Ensure the building meets illumination level standards set by the Illuminating Engineering Society of North America.

Confirm that built-in start/stop controls are enabled and operating according to the schedule you have established.

Managing Supplemental Loads

- Turn office equipment completely off when it's not needed for long periods of time.
- Install and use power-management features and low-energy screen savers on computers.

Adjusting Equipment Operating Schedules

- Adjust operating schedules to ensure equipment is on only when necessary. Are tenants really using the overtime air they requested a year ago? Are you fully conditioning large areas of vacant space unnecessarily?
- Ensure that lights are turned off when space is not in use.

- Optimize start-up and power-down time. Can you start your systems 15 minutes later and still achieve the desired temperature by the time the tenants arrive in the morning – or power down 45 minutes earlier and “coast” for the rest of the evening? Also confirm that built-in start/stop controls are enabled and operating according to the schedule you have established.
- Conduct testing, adjusting, and balancing – spot-checking for problem areas and making adjustments to bring HVAC systems back into balance, given changes in occupancy levels and space utilization.

Fixing Equipment Problems

- Check for leaks or blockages in ductwork.
- Repair air leaks in windows, doors, walls, and roofs
- Clean debris from outside air intakes.

THE BOTTOM LINE:

- A building tune-up is a periodic (every 2-3 years) process intended to identify and implement cost-effective operational improvements that will improve a building’s energy performance.
- Changes to use and physical characteristics over time may require a tune-up to bring energy performance back to intended levels.
- The key steps include diagnosing problems and opportunities; formulating and implementing an action plan; and developing recommendations for changes to O&M procedures.
- Building tune-ups are focused on operational, low-cost opportunities to reduce energy consumption such as calibration of controls, adjustments to equipment scheduling, control of outside air and system coordination.

USEFUL LINKS:

The High Performance Portfolio Framework
www.betterbricks.com/office/framework

Enhanced Operations and Maintenance
www.betterbricks.com/office/briefs

BetterBricks Better Building Operating
 Performance Resources
www.betterbricks.com/operations



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