



Uncover Savings with HVAC Optimizations, No Matter the Season

Winter, spring, summer or fall, new HVAC tools, including AI, can benefit all kinds of businesses.

When is the right time to assess your business's HVAC system energy usage? With new and powerful tools, the truth is, you can optimize your building's heating, cooling and ventilation systems to save any time of year.

This article explores five strategies to make cooling and ventilation more efficient during the warmer months, along with five strategies to ensure heating systems work properly in the colder months. These common-sense approaches will empower and equip you to create a comfortable and sustainable working environment through the spring, summer and beyond.

Perhaps most exciting of all, powerful new AI-driven HVAC optimizations improve heating and cooling throughout the year. Leveraging AI can help businesses achieve predictive maintenance conditions, yielding significant productivity benefits. Deloitte estimates businesses using predictive maintenance practices experience 19% less downtime and 87% fewer defects than those using preventive maintenance.¹ That's a massive advantage for those willing to optimize.

So if you're ready to make your building more comfortable and efficient through a comprehensive HVAC program, get started here.

PECO Incentives That Save Energy and Money

Oftentimes, an adjustment or minor repair can bring equipment back to optimal performance. When these measures aren't enough, it may be time for an upgrade.

When you are ready to upgrade, PECO offers financial incentives and has the technical expertise to guide you toward reductions in energy use that result in financial savings. If completely replacing your HVAC system isn't necessary, alternative options, such as adding HVAC controls or VFDs, can improve your HVAC system's efficiency.

Proper Maintenance Is Key

Your heating system is your most considerable energy expense during winter months. As equipment ages, it becomes less efficient and effective, and more costly to repair. If you haven't already inspected, maintained or repaired your heating system, do so now to avoid additional unexpected disruptions this winter. By planning and taking the proactive steps outlined below, you could prevent system downtime, occupant discomfort, wasted energy and expensive emergency repairs.



Top 5 Strategies for Maintaining an Efficient HVAC System:

1. Inspect and clean equipment and components

- Hire a professional HVAC contractor if someone in-house isn't trained or available to do so.
- Depending on your specific system, focus on these areas:
 - Burner assembly
 - Heat exchanger
 - Flue system
 - Carbon monoxide levels: Ensure they're within acceptable limits.
 - Gas pressure
 - Electrical connections: Ensure wires aren't frayed or damaged and replace them as needed.
 - Motor bearings and moveable parts: Lubricate if not moving as intended.
 - Belts: Replace if worn or damaged.
 - Boiler tubes: Check for scale build-up, which can inhibit heat transfer.

2. Ensure proper airflow

- Clear any airflow obstructions. Anything that obstructs airflow will cause your heating system to work harder, using more energy and straining your equipment.
- Clean or replace air filters.
- Clear away anything blocking vents, such as furniture, desks or other equipment.

3. Minimize heat loss

- The heat that escapes is wasted energy and wasted money.
- Ductwork is a common area where leaks occur.
 - Seal leaks with mastic tape.
 - Ducts that radiate heat are a sign of heat loss: insulate them.
- Doors and windows
 - Check the weatherstripping around doors and windows: Replace cracked or damaged weatherstripping.
 - Replace cracked window panes.
 - Ensure doors and windows close correctly: Repair them if they don't.
 - Insulate to recommended levels: Consult the ASHRAE Standard 90.1 for building energy efficiency.

4. Implement controls (including AI controls) and ensure they are properly set up and calibrated

- Adjust system operations and temperature settings based on your operating schedule, current weather conditions or building occupancy.
- If you've already implemented controls, ensure they are still calibrated and performing as intended; controls and systems can drift as your facility changes over time.
- Heating, ventilation and air conditioning units get a massive boost from AI-driven controls. Sensors send a complex series of inputs with real-time data, like indoor and outdoor temperature, weather forecasting, building occupancy, energy usage, humidity levels and even sunlight. AI controls adjust systems to create ideal temperature conditions — without any input or worries from you. By anticipating future conditions, adjustments are precise in real time, rather than schedule-based.

5. Replace aging equipment

- Replace equipment before it fails to save on repairs and avoid the stress and expense of emergency replacement.
- Plan ahead to give you a wider range of equipment options.
- Install high-efficiency boilers, packaged systems or heat pumps to offer long-term savings.

Top 5 Strategies to Stay Cool and Save Energy in the Summer:

1. Conduct Preventive Maintenance

In addition to an annual system inspection, it's important to carry out routine preventive maintenance to ensure your system is operating efficiently.

Consider this checklist before and throughout summer:

- Replace air filters and clean air registers — blockages can lead to equipment working harder to cool your facility.
- Listen for unusual sounds while cooling equipment is operating.
- Ensure oil temperature and pressure are in line with the manufacturers' recommendations.
- Examine motors and fan belt drives and ensure they're properly lubricated.
- Check the tension and alignment of fan belts.
- Monitor for mold and mildew. Mold and mildew thrive in warm, humid environments, especially HVAC unit coils, and evidence of them could indicate that cooling equipment is malfunctioning and might require cleaning.

2. Adjust Controls and Automation and Optimize HVAC Systems

HVAC systems are major contributors to energy consumption. To better enhance cooling efficiency, consider the following:

- **Programmable Thermostats:** Install programmable or smart thermostats to regulate temperature settings automatically. This allows you to adjust

cooling based on occupancy and specific temperature setpoints, reducing unnecessary energy usage.

- **Zoning Systems:** Implement zoning systems to control cooling and ventilation in specific areas. By tailoring temperature settings according to individual needs, you can reduce energy waste and increase employee comfort.
- **AI Controls:** By combining data from a complex set of inputs in real time, AI-driven controls allow for incredible precision. The result is a more comfortable work environment that's also more efficient, saving money on energy bills. Studies show comfortable employees are more focused and productive — and AI controls provide that comfort, allowing building managers to focus on other areas.

3. Maximize Natural Cooling and Ventilation

In general, south- and west-facing windows receive more direct sunlight, which can heat buildings through solar gain, resulting in an increased need for cooling system operations. Adding window film, screens, blinds and curtains can mitigate temperature increases associated with solar gain. Utilizing the power of natural ventilation replaces the need for excess air conditioning.

Consider these cooling strategies:

- Plant trees in the area of those windows to create more shade.
- Caulk/weatherstrip areas around windows and doors where air leaks could let in warm outside air.
- Install energy efficient windows and adjustable shades to allow natural light and fresh air in while minimizing heat gain. Reflective coatings or films can reduce solar heat gain during peak sunlight.
- Design your workspace to facilitate cross-ventilation by strategically placing windows and doors. This creates a natural airflow and reduces reliance on air conditioning.

4. Invest in High-Efficiency Equipment and Install Economizers

HVAC economizers use sensors to measure the outside air temperature and humidity levels. When the temperature and humidity are at comfortable levels, the economizer will give your HVAC system a break and bring in outside air instead to cool your facility. An **economizer** can reduce cooling loads by up to 30% as part of a well-designed system.²

Upgrading to energy efficient equipment can significantly reduce cooling costs and improve overall efficiency. Consider the following options:

- **ENERGY STAR® Certified Equipment:** Opt for ENERGY STAR

labeled HVAC units, fans and other cooling equipment. These products meet strict energy efficiency guidelines, ensuring substantial energy savings in the long run.

- **Variable Speed Drives (VSDs):** Replace constant-speed motors with VSDs where possible. VSDs adjust the motor speed based on cooling demand, resulting in energy savings and extended equipment lifespan.

5. Utilize Demand Control Ventilation

According to the EPA, many buildings are over-ventilated by **as much as six times what is required.**³

Demand control ventilation (DCV) uses CO2 sensors to estimate the occupancy of spaces within a building and adjusts the outside air damper to allow for more or less outside air. The CO2 sensors monitor temperature, occupancy and other environmental factors. This data can help you identify trends, optimize cooling settings and detect anomalies that may indicate energy wastage.

DCV can achieve, on average, **nearly 18% energy savings** relative to simple occupancy sensing for lighting alone.⁴ Facilities that save the most from implementing DCV include those with long operating hours and widely varying occupancy levels.

Data Analytics, Building Automation and Advanced Building Management Systems

Advanced building management systems can regulate temperature, airflow, and other factors based on real-time data, resulting in precise and efficient control. Leveraging data analytics and building automation systems can also provide real-time insights and automation capabilities to optimize efficiency.

Integrated AI-driven controls, along with fault detection and data logging, can enable predictive maintenance practices — which yields productivity benefits. The advantages are massive, and you'd be wise to consider them in your yearly budget

▶ Visit peco.com/business/contact-us to learn more.

¹ Deloitte. Predictive Maintenance. 2023, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/process-and-operations/us-smart-manufacturing-predictive-maintenance-infographic.pdf>.

² Biz Energy Advisor. "Economizers." source.bizenergyadvisor.com, 21 May 2019, <https://source.bizenergyadvisor.com/article/economizers>. Accessed 7/1/2025.

³ Persily, A. et al. Analysis of Ventilation Data from the U.S. Environmental Protection Agency Building Assessment Survey and Evaluation (BASE) Study (2004). <https://www.nist.gov/publications/analysis-ventilation-data-us-environmental-protection-agency-building-assessment-survey>

⁴ Zhang, J. et al. Pnnl-22072 1-79 (2013). https://www.pnnl.gov/main/publications/external/technical_reports/pnnl-22072.pdf