

Energy Efficiency Is In the Air



Optimizing your heating, ventilation and air conditioning (HVAC) system offers a multitude of benefits above and beyond simple energy efficiency.

A well-optimized (HVAC) system does more than just treat the air. It's an important part of your business, providing a healthy, productive work environment and an atmosphere that is more inviting to customers. Plus, when your HVAC system is working at optimum efficiency it wastes less energy and can contribute to lower energy bills.

Conserving Power Is Easier Than You Think

There are a number of ways to better manage your energy budget by focusing on improving your building's "envelope" and improving your HVAC system through proper maintenance, accessorizing and purchasing new, more energy-efficient equipment.

Measures like the ones detailed in this guide not only help you better manage energy demand; they assist us in reducing strain on the electrical grid.

HVAC Essentials

Though often unseen, an HVAC system performs a variety of essential functions within your business. It must:

✓ Work reliably

HVAC breakdowns can create significant unexpected repair costs and productivity losses.

✓ Provide comfortable, consistent temperature and humidity

A good system must accomplish this regardless of the size and type of office space or number of occupants.

✓ Supply fresh air, free of toxins

Your HVAC system must also ventilate carbon dioxide (CO₂), carbon monoxide (CO), airborne allergens, viruses and other pollutants.

✓ Run efficiently

Inefficient HVAC systems increase your energy costs and waste energy.

When your HVAC is not meeting these needs, it's not simply a maintenance issue; it's a business problem. Employees can become less productive and miss more time due to illnesses contracted at the office. Plus, energy costs can become a bigger burden to your bottom line. HVAC optimization is the answer.

Benefits Of HVAC Optimization

Optimizing your HVAC provides many important benefits—whether through proper maintenance, by adding energy-smart accessories or by replacing old, poor-performing equipment.

✓ Reliable performance

Fewer HVAC breakdowns mean less disruption to your business, and fewer incidents that might impact customer relations, business volume and revenues. A good system can also help you maintain good working relationships with tenants or company management.

Energizing Insights:

Optimizing your HVAC system could **reduce your energy costs by 59%.¹**

¹ The Vital Role of HVAC in Offices. SCE, 2014.

✓ Real cost savings

Keeping your HVAC system running well can reduce contractor labor and equipment costs. It also helps you avoid lost productivity in areas affected by an HVAC outage, along with lost wages should employees need to be sent home.

✓ Better air quality

The U.S. Environmental Protection Agency (EPA) named poor air quality as one of the top five risks to public health; and HVAC performance is the most important factor in maintaining it in an indoor business setting.²

✓ Improved productivity

Studies show that proper room temperature, humidity and lighting can raise productivity by up to 7%.³

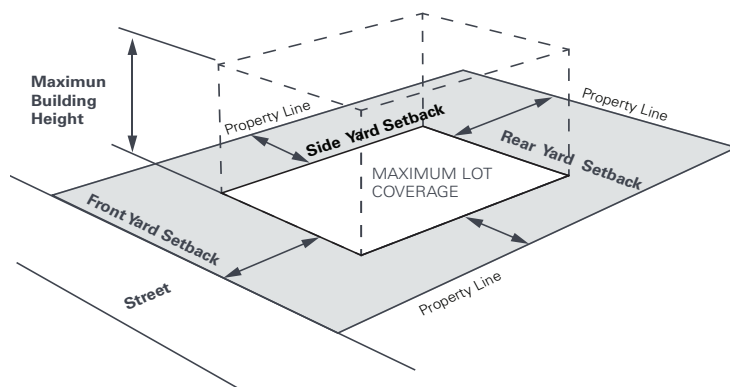
✓ A More Customer-Friendly Environment

Fewer complaints about temperature and draftiness foster a more inviting atmosphere for customers, which can increase your business revenues.

Be Aware Of Your Building “Envelope”

The exterior of your building—the outer walls, ceiling, windows and floor—is called the “envelope.” With the help of a skilled contractor, you can save up to 20% on heating and cooling costs or up to 10% on your annual energy bill by ensuring this envelope is properly sealed.⁴

Doing so will also make your heating and cooling system run more efficiently.



Building Envelope⁵

Cold, Hard Fact:

The Environmental Protection Agency named indoor air quality as one of the **top five environmental risks** to public health.⁶

Optimizing the HVAC system is something every **business can do** to improve indoor air quality.

Seal air leaks

Sealing window and door leaks with caulk, spray foam or weather stripping will improve your comfort and reduce utility bills. So will making sure combustion appliances (gas- or oil-fired furnaces, water heaters, etc.) are venting properly.

Provide proper insulation

Proper insulation, especially in an attic, can keep your building cooler in summer and warmer in winter. Performance here is measured by R-value, with higher values meaning more insulating power.

Note that different R-values are recommended for walls, attics, basements and crawlspaces depending on your area of the country.

Install Energy Star®-Qualified windows

Energy Star-Qualified windows feature advanced technologies such as invisible glass coatings, vacuum-sealed spaces filled with inert gas between the panes, improved framing materials, better weather stripping and warm edge spacers—all of which reduce undesirable heat gain and loss. Installing Energy Star-Qualified windows can reduce your energy bill by 7 to 24% compared to conventional windows.⁷

Simple Ways To Improve HVAC Efficiency

Many aspects of HVAC optimization are best left to expert contractors. Yet, there are many things you can do yourself to ensure your system is running at its best.

✓ Inspect, clean or change air filters

Clean air filters prevent dust and dirt from building up in your HVAC system, which can lead to expensive maintenance and/or early system failure. Be sure to check filters every month, especially in winter and summer months when use tends to be heavier.

² EPA.gov.

³ *Linking Energy to Health and Productivity in the Built Environment*. Carnegie Mellon University Center for Building Performance and Diagnostics; U.S. DOE; Lawrence Berkeley National Laboratory Advanced Building Systems Integration Consortium (ABSIC).

⁴ *A Guide to Energy-Efficient Heating and Cooling*. U.S. Environmental Protection Agency, August 2009.

⁵ Energystar.gov, August 2009.

⁶ EPA.gov.

⁷ Ibid.

✓ Keep equipment tuned up

Proper maintenance by a qualified technician is one of the most important steps you can take to prevent HVAC problems. Among other things, have them inspect ducting for leaks, plus examine unit refrigerant and airflow to see if any corrections need to be made. Learn more and find an SCE HVAC Optimization Contractor at hvacoptimization.com/customers/find-participating-contractor/search.

✓ Program your thermostat

Proper thermostat settings are key to optimizing HVAC usage. The best way to accomplish that is by ensuring your thermostat is programmable and set according to Energy Star recommendations [see the chart below].

✓ Check the electrical supply

Faulty electrical connections can cause your system to operate unsafely and can reduce its service life too. Make sure you measure voltage and current on motors to ensure proper electrical flow.

✓ Lubricate moving parts

Excess friction makes equipment wear out faster, contributes to more frequent repairs and replacements plus increases the amount of electricity you use as well.

✓ Check system controls to ensure proper and safe operation

Verify the starting cycle of your equipment to ensure it starts, operates and shuts off properly. Refer to the user manual, or have your contractor perform this important task.

Upgrade, Accessorize—and Save

While proper maintenance and tuning can have a big impact, taking advantage of the latest HVAC technology can also yield significant energy savings.

Economizers

Economizers save energy by letting your HVAC system take advantage of a free resource: air. Under certain conditions, they admit outside air to attain proper indoor temperature. Compressors won't need to run as often, which can save lots of energy.

Energy Star Recommended Thermostat Settings⁸

Setting	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Wake	6:00 a.m.	<70°F	>78°F
Day	8:00 a.m.	Setback at least 8°F	Setup at least 7°F
Evening	6:00 p.m.	<70°F	>78°F
Sleep	10:00 p.m.	Setback at least 8°F	Setup at least 4°F

These devices have such an impact on energy efficiency that California Building Code Title 24 requires that most new HVAC units have them, along with means of notifying a technician should they malfunction.

What's more, economizers serve as a foundation to introduce even more cost-saving technology like Demand-Control Ventilation (DCV) with a Variable Frequency Drive (VFD), which are discussed below.

Demand-Controlled Ventilation (DCV) with a Variable Frequency Drive (VFD)

These HVAC accessories help ventilate indoor space according to occupancy data captured by CO² sensors. They keep your system from over-ventilating, which wastes energy and money, or under-ventilating, which lessens air quality. Installing a DCV with a VFD could save you up to 40% more energy.⁹

Digital Economizer Controls

Replacing existing controls with digital economizer controls allows your economizer to work more reliably and efficiently, saving money while improving air quality and comfort.

Notched V-Belts

Rooftop HVAC units commonly rely on smooth belts to drive fan pulleys. Notching reduces the belt's surface area, allowing it to bend more easily and spin the pulley with less resistance. That increased mechanical efficiency not only saves energy, but helps the machinery run cooler and last longer too.

When to Buy New Equipment

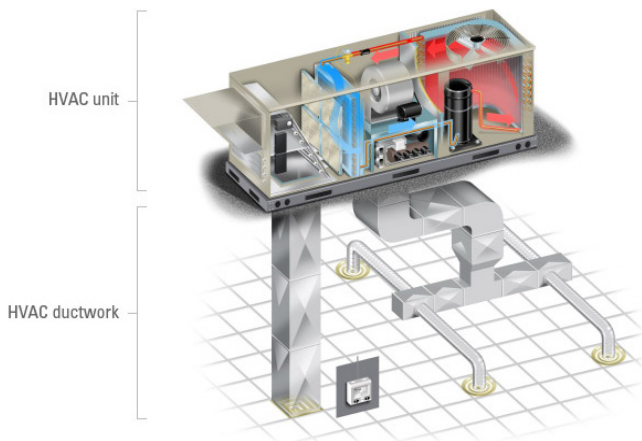
As your HVAC unit ages, its performance naturally degrades making it increasingly inefficient, especially when compared to newer, highly-efficient models. Older units are also more likely to break down, requiring extensive repairs and maintenance.

If you've followed the steps to improve HVAC efficiency outlined in this guide, yet continue experiencing problems, or if your HVAC system is 10 to 15 years old, or not working, consider purchasing a new, high-efficiency Energy Star-Qualified unit. These can reduce your HVAC energy usage by about 30%.¹⁰

⁸ A Guide to Energy-Efficient Heating and Cooling. U.S. Environmental Protection Agency, August 2009

⁹ HVAC Optimization. SCE, 2014.

¹⁰ SCE.com. Based on the replacement of a 10 SEER unit with a new, qualifying unit.



Anatomy Of an HVAC System¹¹

An HVAC system is made up of the HVAC unit, which conditions air and controls air intake, plus ductwork, which delivers the air to the spaces inside. For an HVAC system to run efficiently as possible, all parts of the unit and ductwork must work in harmony.

A Word Or Two About Efficiency Ratings

How do you gauge the energy efficiency of a new HVAC system? Look for the SEER and EER ratings. Both are important when choosing a new product.

SEER

The Seasonal Energy Efficiency Ratio, or SEER, is the most commonly used measurement. It shows how efficiently a cooling system will operate over an entire season. The higher the rating, the less energy the unit requires to produce cool air. As implied, the SEER more accurately reflects overall system efficiency on a seasonal basis.

EER

The Energy Efficiency Ratio, or EER, denotes energy efficiency at peak day operations, measuring how well a system will operate when the outdoor temperature is at a specific level (95°F). The higher the EER, the more efficient the system.

Take Advantage Of Our HVAC Optimization Program

In your quest for greater HVAC energy efficiency, look into our HVAC Optimization Program. It offers financial incentives for a wide variety of services proven to elevate HVAC performance, increase energy efficiency, improve air quality, make your office more comfortable and reduce the amount of energy your office uses.

This program could help you reduce energy costs by up to 59%.¹² Learn more and find a qualified contractor at hvacoptimization.com or contact us at 1-888-345-6067.

Apply for SCE Incentives

Talk to your Account Manager about our Express and Customized Solutions programs or connect with local contractors who may offer new, high-efficiency HVAC units to customers at a reduced costs.

By Conserving Energy, We All Win

Your HVAC system is vital to the success of your business. Keeping it at peak performance will make your workplace more comfortable, reduce the amount of energy your office uses and help everyone who counts on the electrical grid for power.

For more help in saving energy, contact your Account Manager or your contractor.



Additional Resources

Energystar.gov

The Vital Role of HVAC in Offices. SCE, 2014.

A Guide to Energy-Efficient Heating and Cooling.

Energystar.gov, August 2009. energystar.gov/ia/partners/publications/pubdocs/HeatingCoolingGuide%20FINAL_9-4-09.pdf

Interested In Learning More?

Choose from the many topics in our Energy Conservation Series:

- LED Lights: A Bright New Way to Conserve Energy
- Plug In To Greater Energy Savings— With Smart Plug Load Management
- Switch To a More Energy-Efficient Business—With Smart Lighting Controls
- Manufacturing Motors & Compressors: Start Your Energy-Efficient Engines
- On the Menu: Major Energy Savings With Restaurant Refrigeration
- Cold Hard Facts About Refrigeration and Energy Conservation for Grocery and Convenience Stores
- Agricultural Pumping: Pumped and Primed to Save Energy