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Articles:

Energy and HVAC Optimization
By Patrick Propst

Let's talk about 30-40% of your electricity bill. That's how much it costs the average homeowner or commercial building owner to provide proper heating, ventilating, and air-conditioning (HVAC). A good HVAC system is the key to maintaining a comfortable, healthy and interior environment. Through the years, I have been asked by many owners for a strategy to reduce their cost of energy and HVAC. They don't want to sacrifice the interior environmental conditions, but they do want a point-by-point plan to follow. The interesting thing that often happens is that energy bills are lowered substantially and the HVAC system performance is improved. This is a standard function of any mechanical engineer specializing in energy and HVAC.

The information on this page will help homeowners, building owners and building operators make informed decisions about existing HVAC systems or future upgrades.

Load Reduction
HVAC Systems
Control Systems
Operation and Maintenance
Load Reduction

The first step to achieve energy and HVAC system optimization is load reduction. This step normally consists of a long range plan which itemizes the actions to be taken based on best return on investment. Reducing your building load allows the existing HVAC system to operate more efficiently. If a new system or systems are being considered, it will be more cost effective to design for the reduced load as opposed to the existing load. A few common load reduction strategies include:

Tighten the building shell and add additional insulation. Adding insulation in existing buildings may not be achievable in some instances, so more consideration should be aimed at the exterior shell, especially windows and doors.
Installing energy-efficient windows. This is a big item on some buildings that still have single pane windows. The installation of double pane windows with a thermal break is a great return on investment. Make sure they are ENERGY STAR qualified windows. Tinting or Low-E coatings will even be better.
Upgrading lighting systems. The average commercial building has a lighting density of 2-3 watts per square foot which maintains proper lighting levels. This is a significant part of the HVAC load and almost any efforts in this direction will lower the cooling requirement for the building. Accent lighting (sometimes called architectural lighting) are not always energy efficient and should not be considered if you want to reduce energy and HVAC costs. Energy-efficient lighting systems emit less heat into conditioned space than older incandescent technology. If you have a return air plenum instead of return air ductwork, consider light troffers so that some of the heat from the lights is returned to the HVAC system instead of going into the occupied area.

Selecting efficient equipment and electronic devices that have a power saver option will reduce the sensible heat gain in the space. Items to consider include copy machines, kitchen equipment, computers and refrigerators.
Control ventilation by having your outside air balanced. Most building owners have drawings of the original HVAC system installation. Have the drawings reviewed by a mechanical engineer to confirm your outside air flow rates conform to the latest code requirements. If no drawings are available, your mechanical engineer should still be able to make recommendations for improvement.
Addressing these items is your first step to reducing energy and HVAC costs.

HVAC Systems

The second step to achieve energy and HVAC system optimization is knowing your system. Your HVAC system is critical to your interior environment, but it also represents a large component of your utility expenses. While it is beyond the scope of this article to discuss every system, a few recommendations can be addressed. Every HVAC system component has increased in efficiency over the years. If your system is more than 13 years old, it's time to begin planning for an upgrade to new equipment. Well maintained residential systems have a life expectancy of about 15 years or so but seem to fail at the worse times. Have a replacement plan ready for the day your equipment fails.

Commercial systems vary, but if your building is using packaged equipment or split systems, the same lifetime can be expected. For larger commercial systems and industrial applications, the HVAC system may be more complex and require an individual analysis by a mechanical engineer. As I said, HVAC systems vary and no one-size-fits-all analysis works for larger systems. What all these systems have in common is they are normally fueled by electricity. Electricity cost money, so any efforts in the direction of increased efficiency is a plus.

HVAC System Tips:

Find a qualified consultant you trust. If you are a home owner or small commercial building owner, find a good HVAC company or mechanic to evaluate and maintain your system. If you are a large commercial building owner, find a commercial HVAC company for normal maintenance and a good mechanical engineer for specific guidance. I do not recommend using a mechanical engineer employed by the HVAC Company; find a third party engineer for unbiased information.
Verify your HVAC system load. Home owners should use ACCA's Manual J calculation method and all others should have a load conducted by a mechanical engineer. Commercial buildings have more requirements related to code conformance, minimum ventilation rates, etc and are individual to each building.
Load reduction-Read the information above.
Select equipment sized for your load. NEVER OVERSIZE! More-is-better does not apply for HVAC systems. It will cost more to purchase the equipment as well as operate it. Get the load and the equipment selection right the first time.

Purchase high efficiency or Energy Star equipment. Many of the new systems include variable speed drives for fans and compressors. Over the years of ownership this will be paid back many times over. Compare standard efficiency equipment to high efficiency equipment in terms of initial cost and life cycle costs. Any good HVAC company or mechanical engineer can obtain this information.
Consider some form of energy recovery for any air exhausted from the building and use it to condition the incoming fresh air. This is air you have paid to condition, so extracting some of the energy before exhausting it should be a priority.
For large commercial buildings, consider conditioning the outside air with a dedicated outside air unit. This will eliminate any problems related to humidity control in most instances. It will also increase occupant comfort and allow for further downsizing of equipment.
Commercial buildings should consider economizers on their equipment. Most current codes require economizers on equipment over 15 tons in size. Often available at a low incremental cost, these units draw in fresh air from the outside when the temperature (sometimes humidity) outside is lower than the temperature inside.
Home owners and small commercial building owners should install programmable thermostats. Commercial building owners should install a Direct Digital Control (DDC) system. The investment in either of these will pay back more than the cost in a small amount of time. Read more below.
Control Systems

The third step to achieve energy and HVAC system optimization is controlling your system.

Programmable Thermostats-The age of digital controls has made saving energy easy. One of the best investments for the homeowner or small commercial building owner is a programmable thermostat. These are simple to use and incorporate strategies based on time scheduling. Most manufacturers offer 7 day programs and setback/setup programs which will turn the HVAC system on and off to compliment your schedule and desired indoor temperature. This is a great way to ensure HVAC systems are used only when necessary.
DDC Systems-For the large commercial building, I consider this as a must have system. Installation costs have steadily decreased and the performance reliability has steadily increased. They can be integrated into any system and expanded as required. Some of the more popular features of these systems are optimized start/stop of the HVAC system, multiple zone control, multiple temperature sensor locations and ventilation control. The best part of these systems is their ability to be scaled up to the largest of commercial applications. This means you can install a simple system and add more controls later to incorporate your whole HVAC system. Again, the payback is short and well worth the investment.
Operation and Maintenance

The fourth and last step to achieve energy and HVAC system optimization is operation and maintenance. The most efficient HVAC systems are well maintained. Ensure reliability, efficiency and a long life for your HVAC system by following these tips.

Find a qualified consultant you trust. If you are a home owner or small commercial building owner, find a good HVAC company or mechanic to evaluate and maintain your system. If you are a large commercial building owner, find a commercial HVAC company for normal maintenance. Make sure you record and document all servicing with dates, times and names of the servicing person.
Home owners should always get a seasonal tune up. The operation of your system will vary with the seasons of the year.
Replace your air filters regularly. Don't use anything less then a MERV 5 filter to assure dust and fibers are removed. Clean filters will save fan energy.
Coil Cleaning-This is always a big item overlooked by residential and commercial building owners. Condenser coils collect dirt and debris on their surfaces because they are outside. This makes the compressor work harder and results in a higher refrigerant temperature in your refrigeration system. Evaporator and heating coils collect dust and fibers that circulate inside your home or building. Clean them at least once a year
Summary

Energy and HVAC optimization will reduce your electricity costs. A little time getting to know your system and familiarizing yourself with improvement strategies will save money and increase the life of your equipment.

Visit my site for more information on Energy and HVAC optimization [http://www.pro-engr.com/Articles/HVAC/Energy_and_HVAC_Optimization.htm].

I am a professional engineer with over 30 years of design experience relating to plumbing and mechanical systems. The articles I write are the result of many successful commercial and residential installations.

Article Source: http://EzineArticles.com/expert/Patrick_Propst/704946
Article Source: http://EzineArticles.com/5216662

HVAC Financing
By Chris Mark Fletcher

HVAC is an acronym of heating, ventilation and air conditioning. It is essential to maintain comfortable temperature and good air in a building. A good HVAC can improve the productivity of the employees working in that building. In turn poor HVAC can affect the performance of the workers. Hence it is indispensable to have good HVAC in an office building.

HVAC is also referred to as climate control and is essential for industrial and office buildings. Some of them even have computerized control. this of course can add to the cost. Though essential installing HVAC system in a building is a costly process and so HVAC financing is often essential.

The enormous size warehouse building requires Roof top HVAC system. It has unique features to ensure safety and protection of the loads. It is therefore essential for every industrial or warehouse buildings. However they can be expensive and so many companies look for HVAC financing.

Stand alone HVAC helps to maintain the temperature. It offers high class performance. It is fully operational and secure. But installing it in an office building is not a simple process. It requires the help of a specialist to install. Installing stand alone HVAC is a costly process and so many companies find it wise to go for HVAC financing.

Many traditional financial institutions may not be willing to finance HVAC due to their extreme cost. However there are some reliable financing companies that can understand the need of HVAC in a building and so they offer financial assistance to them.

The financing companies do not ask any documents to offer HVAC financing. A simple application process is enough to grant approval. Once the business owner submits the application with the financing company, the officials in that company would contact you immediately. They would grant loan amount on the same day itself. However most of the financing companies practice the habit of granting finance to the vendor or dealer mentioned by the applicant.

HVAC indirectly helps to increase the productivity of the company. Hence it is essential to install it. Due to their high cost, many companies hesitate to install them. HVAC financing is an excellent opportunity for them to have HVAC in their office building also.

The financing companies provide financial assistance to acquire HVAC at low interest rates. Hence the companies do not find it difficult to repay the amount in low monthly installments. Since there is no red tapism, the company can get loan at any time they want. Sometimes, HVAC financing can be obtained on the same day itself.

Since there are no cumbersome procedures, many companies find it a great relief to get financing HVAC. In fact, it is often difficult to get financial help for stand alone or roof top HVAC. But the genuine financing companies make it possible for almost all companies to have HVAC in their buildings.

A good HVAC system can also help saving power. Investing in HVAC system is not an expense but a great way to get increased productivity.

Chris Fletcher's page features more about new and used HVAC Financing and other finance topics.

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Article Source: http://EzineArticles.com/1244145

Typical Services Performed by HVAC Companies
By Nicolas Hantge

The typical services performed by HVAC companies are enough to keep your heating, ventilation and air conditioning (HVAC) system efficient. Keeping your heating and ventilation system in good shape will keep you warm when the weather is cold, in the same way that you air conditioning keeps you cool during summer without getting overworked. A poorly maintained HVAC system consumes more energy to just regulate the temperature. If you think that your heating and air conditioning unit is less efficient than before, it is about time that you avail one of the following services.

Inspection and Free Estimate

Typical services performed by HVAC companies start with inspection. Your HVAC system is surveyed as well as the space to which it will provide ventilation. This applies to every kind of HVAC. If you have a centralized HVAC system, it may take more time for the contractors to make a full estimate. There are HVAC contractors that do free estimates. Choose one that offers this package so you can save.

Cleaning and Repair

If your HVAC system is only a few years old and is still in good condition, they may perform the cleaning and repair. The ways HVAC contractors do this vary. Some companies use state of the art technology and some companies don't. They ask different prices too. Just remember that the more sophisticated a contractor is, the more likely you are to charge you higher. Reputable contractors arrive in
time on site to perform these tasks.

Replacement and Installation

If your HVAC is old and outdated, your HVAC contractor may suggest replacement. Large and established HVAC repair companies offer their own HVAC system units. Medium sized companies may recommend a particular brand that they find adequate for your needs. You always have the liberty to choose your own HVAC system, though.

After you have decided on your new HVAC unit, the contractors will install it for you. And because installation is done by professionals, you can rest assured that your heating, ventilation and air conditioning system will bring comfort to your family. Reliable HVAC contractors will also be able to answer your questions during the installation process.

Post Installation Support

The services of an HVAC contractor do not end when the HVAC system is cleaned and repaired or installed. They are always reachable to provide support when something goes wrong with your HVAC. It is true that the works of professionals are impeccable but it is

also true that there are variables that affect the entire repair and installation job. But no matter what the problem is, your reputable HVAC contractor will be ready to assist. Moreover, reputable contractors are insured, licensed and bonded.

To find a good contractor, start searching through the internet. List down several contractors according to your preference and do some research about them. You can ask your family and friends if they heard about these companies. Remember the typical services performed by HVAC companies because these is the core of their business and these are all that you need.

If you are looking for a Denver hvac company [http://hvacindenver.com] I strongly recommend checking out their online reviews to make sure they are a reputable company and their previous customers are happy with their services. If you are looking for air conditioning repairs contact the experts at Denver Heating at (303) 586-6442 or stop by their office at 1827 Grant St. Denver, CO 80211.

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How to Lower Your Energy Costs With Regular HVAC Maintenance By Scott Tracy

Proper maintenance of your HVAC system is essential to the normal everyday function of your business. By making sure there is proper and regular maintenance performed on your HVAC unit, you can dramatically improve the efficiency and save on your energy costs. Regular maintenance will also help you to avoid and expensive repairs and replacements. The following regular maintenance steps that your HVAC contractor can do for you will help you extend the life of your HVAC system.

Change Your Air Filters Regularly

One of the most cost effective steps that you can do to help lower your energy costs is to change your air filters regularly. Your HVAC filters help to keep dust, dirt and allergens out of the air circulating throughout your building. By changing these filters regularly or having your HVAC contractor do it for you, you can help to keep your HVAC system running cleaner and more efficiently.

Check Your Fan Regularly

During the normal operation of your HVAC unit, the fan that circulates the air throughout your building can become loose due to the cumulative effects of vibration. Whenever you change your filters or have them changed for you, your HVAC contractor will make sure to check your fan to be sure that it is working properly.

Have Your Fan Blades Cleaned Regularly

Your HVAC contractor should also check the vacuum and blower area of your HVAC unit. They will be able to properly clean the fan blades and remove any build up of dust, dirt or other debris that may be causing extra strain on your HVAC unit's motor. Proper and regular cleaning can help to keep your fan balanced and maintain efficiency for your HVAC system.

Have Your Blower Motor Oiled Regularly

Your HVAC contractor can keep your fan motor oiled and running smoothly if it requires it. Depending on the HVAC blower motor, it may be sealed and may not require regular oiling. Your HVAC contractor can help you determine whether your blower motor requires this.

By having a professional HVAC contractor take care of your HVAC unit for you, you will be able to lower your energy costs, extend the life of your system and lower your maintenance costs. Waiting until something is broken down is not only more stressful but more costly than regular maintenance from your HVAC service provider. By making sure you are having professional and regular maintenance on your HVAC system, you will be sure to have one less thing to stress over when it comes to running all of the many operations that your business or organization requires. At a minimum, be sure that you have an HVAC maintenance service inspect your HVAC unit. If your facility has a combination heating and cooling unit, be sure to have it checked at least every quarter.

Chiller Systems Service, Inc. is the #1 choice for industrial, institutional and commercial HVAC, heating, ventilation and air conditioning services in the Denver area. We serve any installation, repair and maintenance needs. Chiller Systems Service can be contacted for your commercial, industrial or institutional Denver HVAC contractor needs at (303) 275-6250 or you can visit our website at http://www.chillersystemsservice.com/.

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Getting the Most From Your HVAC Systems
By Jon Levine

Does your HVAC system operate as efficiently as it could? Is your HVAC system compliant with health, safety and environmental regulations? Do you face continual maintenance issues with your HVAC system? In other words: is your HVAC system in good shape, or is it costing you a bundle for no good reason?

With any facility assessment, one of the first areas to check out is the HVAC. You need to determine how much time you have left on the system's lifecycle. If your HVAC system is extremely old, it could be sucking up energy and wasting your money. It could

also be causing indoor air quality issues that lead to problems like Sick Building Syndrome. Or, your old HVAC could be racking up big maintenance bills. If so, then you need to know what's wrong so you can fix it.

Energy use is a good starting point because the opportunity for cost savings is significant. Lighting tops the list of the potential savings, but HVAC runs a close second. Did you know high-tech HVAC systems could save 30 percent to 40 percent on energy costs? That's nothing to sneeze at. The return on investment on HVAC upgrades ranges from one to five years, depending on the system's level of use. That's well worth the money, considering HVAC systems can last 10 or more years, depending on usage and climate conditions.

Interestingly, the design of an HVAC system has major impacts on productivity and energy savings. If you don't have good controls on your HVAC, then you are wasting tons of money. It could be that you are simultaneously heating and cooling different parts of the building at the same time. That's counterproductive and puts a lot of strain on the HVAC.

According to the California Energy Commission, an HVAC system should be properly sized to provide correct air flow, and meet room-by-room calculated heating and cooling loads. It should also be installed so that the static air pressure drop across the handler is within manufacturer and design specifications to have the capacity to meet the calculated loads.

Beyond the proper design and installation, experts encourage regular HVAC maintenance to ensure the best operation. Air filters should be changed each month, for example, and HVACs also need to be properly charged with refrigerant and have proper burner operation and draft.

If you do not have an HVAC maintenance crew on site, be sure to contract with a local air conditioning maintenance company to do regular check ups. This will extend the life of your HVAC and save money on heating and cooling costs.

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HVAC Sizing 101 - How To Determine The Size Of The HVAC System You Need For Your Home

By Alex A. Ortiz

An HVAC system is a large investment on your part. We're not just speaking in reference to the initial costs of purchasing and installing the equipment, but we're also referencing the amount of money you will spend on energy bills over the years. Statistics say that you will spend well over $2,000 this year on energy bills alone. Your HVAC system accounts for almost half of the energy your home consumes within that time period. Your home, no matter how old or new, is an energy hog. Whether you're choosing to upgrade your existing HVAC system or installing a new one in your new home, here are some tips you should adhere to in order to choose the proper-sized system that will ensure energy-efficiency.

So what does one do to prevent your home from sucking up so much energy? First, understand that if your equipment is old, it's time to replace it. Equipment that is 10 years or older is extremely inefficient and should be replaced, preferably with an energy-efficient model (i.e. Energy Star qualified). When purchasing any type of HVAC equipment, it's smart to go with an energy-efficient model. It will save you a ton of money over the years.

You're probably wondering, "So if I choose energy-efficient equipment, why does sizing matter?" It matters! Choosing the proper-sized equipment (i.e. proper heating/cooling output) directly affects your comfort, your HVAC system's efficiency and its maintenance and operating costs. You can see how important and underestimated this topic is. In fact, it has been estimated that over half of the HVAC industry does not size your HVAC systems properly.

"Oversizing" tends to be the biggest mistake that is made. When you oversize an HVAC system, it can affect a number of areas within the process. For example, the installation will be more expensive. Typically oversized systems tend to cost more to operate, break down often, run inefficiently and require more maintenance. Oversized air conditioners tend to shut off before they've had a chance to dehumidify the air properly. This results in a clammy environment that may be prone to mold. Oversized furnaces create uncomfortable temperature swings.

When your HVAC technician attempts to size your system, they should not be reading a label or simple by-the-book standards. Instead, the calculation should be multi-variable and include factors that are unique to your situation. For example, what is the climate like in your area? How many windows do you have and what size are they? How much insulation is there and what type of insulation is it? How big is the house? Is the house two-story or one-story? How much outside are is sneaking in? How many occupants are there?

There are two industry standards that should be used to help determine the proper size for your system. These are "Manual J" and "Manual D", created by the Air Conditioning

Contractors of America. Manual J, also called "Residential Load Calculation", is primarily used to determine HVAC size calculations. A reputable HVAC company will tell you that they use Manual J to determine sizing. Manual D, also called "Residential Duct Design", is used to determine duct sizing. When looking for a company to help install your new HVAC system, always be sure to inquire whether or not they use Manual J and D in their sizing and installation process.

Alex A. Ortiz is founder and owner of Ortiz Heating & Air Conditioning. With several locations throughout the San Francisco Bay Area, Ortiz Heating & Air Conditioning providers their customers with a 100% satisfaction guarantee. To sign up for free newsletters and HVAC tips, visit http://www.ortizheatingac.com.

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Regular Ductwork Cleaning and Maintenance Is an Essential Part of Energy Efficiency
By Ali Withers

Ductwork is used as part of heating, ventilation, and air conditioning (HVAC) systems to deliver and remove air to ensure acceptable indoor air quality as well as thermal comfort.

Traditionally ducts are made of sheet metal which is then lagged with insulation, but they can also be made of fibreglass duct board panels with provide built-in thermal insulation or coiled wire with a plastic covering for flexible ducting.

A ductwork system is completed with diffusers, air grills and filters as well as volume control and fire dampening mechanisms. The ductwork system should also be sealed to ensure that it is airtight and works efficiently.

Ductwork systems are used in many buildings, such as apartment bocks, offices, factories, hospitals and schools and ideally they should be designed to the standards of the industry body HVAC (heating, ventilation, and air conditioning).

HVAC offers both training and information leaflets to ensure they are installed to the recommended industry standards, but there are many buildings throughout the UK that have older ductwork systems that may have been installed before the advent of the current standards.

All systems need regular ductwork cleaning and maintenance not only to ensure they are working efficiently and not using more energy than they need to but also because their purpose is to ensure the air quality and temperature in the buildings where they are used is the best possible for the occupants.

Building facilities managers have the responsibility for ensuring the health and safety of those living, using or working in large buildings and there may be additional reasons where occupants are frail as in residential homes for the elderly or vulnerable to infection as in hospitals.

gradually over time deposits collect in all ductwork systems, filters can become clogged and seals can weaken. All these can affect the system's efficiency and safety as well as increasing the risk of fire breaking out or of airborne infections being transmitted throughout a building.

The telltale signs of problems include more cleaning needed than usual in the building and after cleaning left over dust floating visibly in the air. The users of the building may complain of headaches, nasal congestion, or other sinus problems and rooms may have little or no air flow coming from the vents.

Stale and musty odours when turning on a heating or air condition system are another sign and above average fluctuation in energy bills over the seasons.

Regular maintenance and duct cleaning using a specialist commercial cleaning company will ensure that any potential problems are identified before they become bigger and more costly and that the system is working efficiently.

Regular ductwork cleaning and maintenance checks will ensure a heating or ventilation system is both energy efficient and delivering adequate and clean air to a building. By Ali Withers.

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