GREEN STAR TIP SHEET #5

Energy Efficiency -- HVAC

This tip sheet corresponds with Green Star Award Standard #4 – Reduce Energy and Water Consumption. Another useful tool is Chapter 6 in "Becoming a Green Star: A Waste Prevention Guide for Anchorage Businesses." You can find the guide online in pdf and html format at www.greenstarinc.org/guideindex.php or request a hard copy from Green Star.

What Is HVAC?

Heating, Ventilation, and Air Conditioning (HVAC) make up your building's air temperature regulation system. The HVAC system in your workplace is all about making heat, distributing it and controlling it. These three areas relate directly to the furnace or boiler and its fuel; the ducts, pipes or fans that carry the heat; and how the furnace delivers or witholds that heat.

Energy services cost commercial businesses more than $81.5 billion a year, or on average $1.21 per square foot of commercial floorspace [Energy Information Administration. 2002]. In commercial buildings, heating, ventilation, and air conditioning make up almost 40% of electricity costs.

Peak Demand - The greatest demand placed on an electric system; measured in kilowatts or megawatts; also, the time of day or season of the year when that demand occurs.
Peak Load - The amount of electric power required by a consumer or a system during peak demand; measured in kilowatts or megawatts.

One Anchorage business experienced a jump in electricity costs when another tenant in the building that operated lots of electrical equipment at night moved out of the building. Without the nighttime electricity use, the building's highest electricity use was now during the day, a more expensive time of day due to overall peak demand, even though it reduced the building's overall electricity use.

If You Own Your Building

Owning or operating your own building offers you numerous opportunities to reduce energy use. If you own your building, you have control of all aspects of its operation and can retrofit where necessary. Be sure to look at long-term costs and savings and your payback period whenever you make decisions.

According to the Consortium of Energy Efficiency, at least 25% of all rooftop HVAC units are oversized, resulting in increased energy costs and equipment wear. Properly sized equipment dramatically cuts energy costs, increases the life of the equipment, and reduces pollution.

In addition, office space is often configured and reconfigured over the years with little regard to the original HVAC system, making for an inefficient system and uncomfortable employees and tenants.

High-Performing Commercial HVAC Systems

Commercial HVAC systems differ from residential systems, more so as the building size increases. Air conditioning needs increase, even in cold climates, to reject heat from lighting systems, equipment, and people working in the space. Visit ***www.aceee.org/ogeece/ch3_index.htm*** for details about energy-efficient, high-performing HVAC systems.

Energy Management Systems

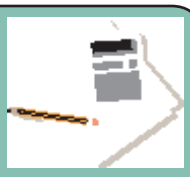
An energy management system (EMS) is a computer that controls the operation of all major building systems in order to run the building efficiently and effectively. An EMS can reduce a building's overall energy use by about 10-20 percent. That may not seem like much but in a large building, 10 percent can add up to big savings. The total installation cost for an EMS may be $2.00 to $4.00 per square foot.

Today, nearly one-third of all U.S. buildings larger than 100,000 square feet have an EMS. Unfortunately, many of these systems are not saving as much energy as they could be. In one study, 5 out of 11 energy management systems were found to be "underachievers." For this reason, commissioning is a necessary part of an EMS. Commissioning is the process by which the operating system of a building is tested and adjusted prior to occupancy. Continuing commissioning activities should take place periodically during occupancy to maintain the integrety of the EMS.

Energy Star for Businesses

Typically, ENERGY STAR products can save businesses approximately $3-4 per square foot over the life of the equipment. For example, a 12,000 square foot building using an ENERGY STAR-qualified HVAC product, could save $36,000 to $48,000, and uses 7-10% less energy than standard equipment. Visit www.energystar.gov for lists of ENERGY STAR-rated products.

Energy Calculators & Software



Find out how your boiler or air chiller rates using one of U.S. Department of Energy's calculator tools. Find the calculator that works for you and plug in your information. You'll find commercial and industrial calculators as well as calculators for homes and vehicles. There also are calculators for specific items such as ice machines, refrigerators and lighting.

http://www1.eere.energy.gov/calculators

ENERGY STAR also offers online trainings and presentations to help businesses improve their energy performance. It offers advice and recommendations about energy-efficient equipment.

If You Don't Own Your Building

Even if you don't own your building, there are things you can do to improve your energy efficiency. Many of these tips involve behavior changes.

- Determine what type of heating system you have and don't undermine it with your actions. For example, a positive pressure air handling system blows air into the building, creating pressure in the building. If employees are hot, opening the doors to let in cool air will only make the system work harder, blowing the air conditioned indoor air right out the door.
- Keep employees away from thermostats! Continual adjustment of thermostats and extreme settings in nearby areas tax the HVAC system. If one office is set at 60º and the next is set at 80º, problems are bound to arise.
- Consider setting an automatic system to start up a little earlier each day so the ideal temperature is reached before individuals are tempted to manually adjust the heat or AC in their area.
- Each dirty heating, ventilating, and air-conditioning filter can cost your business up to $5 per month in energy and may shorten the service life of your equipment. Replace your HVAC unit's filters regularly to save energy and maximize equipment life.

Local Assistance

Here are just a few companies in Anchorage that can help you create a more energy-efficient workspace. Check ENERGY MANAGEMENT in the phone book for others.

Johnson Controls 243-3737
2000 W. International Airport Rd.

Quantum Energy 351-4906
3048 Leighton, #B

Seimens Building Technologies 563-2242
5333 Fairbanks St, Ste. B

How We Did It

Univerity of Alaska Anchorage developed a creative program called "Space Heater Amnesty" to make it fun for employees to save energy. Employees challenged maintenance staff to fix their office heating problems. If the maintenance staff fixed the heating problems, UAA gave the employee who made the initial complaint an award in exchange for turning in his or her space heater, which should no longer be needed. If maintenance staff could not fix the heating problem, UAA allowed the employee to keep his or her space heater while a long-term fix for the heating problem is investigated. Overall, this program reduced energy needs and improved air quality through reduced emissions.

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