



Energy Savings

GUIDE FOR BUSINESS



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BENEFIT FROM ENERGY SAVINGS

SRP knows the bottom line of running a successful business is to make every dollar count. Limiting unnecessary energy use keeps money in your pocket and keeps your business running efficiently. The table on the opposite page identifies the biggest energy users by segment. The tips in this guide can help you cut your business’s energy costs substantially — and even improve comfort and productivity. It’s easy to do and works whether you own or rent. What’s more, there are many things you can do yourself. We hope you find this guide to no- and low-cost ways to save on your energy bill helpful. You can find this guide and even more ways to save, including information about SRP rebate programs, at savewithsrpbiz.com.

TOP 4 IDENTIFIED ENERGY USERS BY SEGMENT

	Cooling	Lighting	Office Equipment	Ventilation
Data centers	44.2%	0.9%	48.8%	4.7%
Education	38.4%	31.7%	6.0%	10.9%
Healthcare	43.4%	20.1%	2.2%	11.4%
Hospitals	42.8%	18.1%	2.4%	16.4%
Lodging and hospitality	41.8%	26.1%	1.6%	7.3%
Office buildings (small)	39.3%	31.1%	11.5%	7.8%
Office buildings (large)	34.9%	28.1%	12.1%	12.0%
Public assembly	38.1%	39.0%	1.6%	6.2%
Retail (small)	35.8%	43.1%	2.5%	5.7%
Retail (large)	39.6%	35.6%	2.6%	7.8%
Warehousing	20.0%	57.3%	3.1%	5.7%

	Cooling	Lighting	Water heating	Ventilation
Dry cleaning	33.2%	25.5%	15.8%	9.7%

	Cooling	Lighting	Refrigeration	Ventilation
Grocery and convenience	20.0%	18.6%	50.4%	4.9%
Multifamily apartments	39.4%	8.5%	8.5%	5.3%

	Cooling	Lighting	Refrigeration	Cooking
Restaurants	28.2%	18.4%	20.9%	19.1%

	Cooling	Lighting	Motors/ Machine Drive	Process Heating
Manufacturing – Computers and Electronics	28.6%	12.8%	22.8%	11.3%
Manufacturing – Machinery	18.41%	13.67%	48.57%	7.63%
Manufacturing – Fabricated Metal Products	10.11%	9.43%	44.05%	23.08%

Source: Questline

LIGHTING

Lighting represents one of the largest energy expenses for a business. Factoring in the air conditioning required to reduce heat produced by inefficient, outdated lighting systems, total costs for lighting may be as much as one-third to one-half of the electric bill for a business. A retrofit can save up to 35% on lighting energy costs, but there are also little things you can do.

TURN OFF INDOOR LIGHTS

- **Turn off lights in unoccupied areas.** Encourage employees to turn off the lights in their workspaces when they go to lunch or meetings. People leaving unoccupied restrooms or storage areas should also turn off the lights. Put signs near light switches as a reminder.
- **Install occupancy sensors.** These sensors automatically turn lights on and off and work well in areas such as conference rooms, break rooms and offices that are not occupied continuously.
- **Take advantage of natural lighting.** Turn off or dim lighting when adequate sunlight is available to illuminate interior spaces.
- **Use partial lighting before and after “public” hours.** There may be times when employees must work in an area but the public isn’t there. You may be able to turn on half the lights and provide enough light throughout the area to meet employees’ needs.

LIGHTING REBATES

SRP has rebates for lighting controls. Visit savewithsrpbiz.com to find an SRP Alliance Contractor.

MAINTENANCE TIP

Keep lamps and fixtures clean. Accumulation of dust, grease and other dirt can reduce light output by as much as 30%. It is recommended that you clean your light fixtures every two or three years and replace yellowed or hazy lenses and diffusers. In greasy, dusty or smoky settings, or when light fixtures are integrated with the HVAC system, more frequent cleaning may be necessary.

REDUCE OUTSIDE LIGHTING

You may be able to turn off or reduce lighting in parking areas, on signs, in entrances, on walls and in landscaping.

- › **Use only necessary safety and security lighting.** At night and in unoccupied areas, the only lights left on should be for safety or security. Consider using “instant-on” lighting controlled by a motion sensor. Ensure that outdoor lighting is off during the day.
- › **Comply with codes.** Be sure to abide by code requirements for safety, emergency and security lighting, such as exit signs and stairways.
- › **Make sure automatic controls are working properly.** Some of your lighting may be controlled by a time clock that switches the lights on and off automatically at predetermined times you select. Make sure the timer is adjusted as sunrise and sunset times change throughout the year. Just an hour or two a day of unnecessary lighting can add up to substantial energy costs.

REMOVE UNNEEDED LAMPS

Lighting levels often are higher than necessary, because many buildings were designed and built before energy efficiency was a priority. A simple way to save on energy costs is to remove lamps where lighting levels are too high. Too much light can be as bad for visual quality as too little light — and it costs a lot more. With careful attention to people’s needs, you can reduce lighting costs and preserve comfort, productivity and safety.

TIPS FOR REMOVING FLUORESCENTS

- › **Disconnect the ballasts.** Fluorescent fixtures include components called ballasts that provide proper voltage and current for starting and running the lamps. Ballasts use electricity even when the lamps are removed. For maximum savings when removing lamps, have a licensed electrician disconnect the ballasts as well.
- › **Remove pairs.** In two- and four-lamp fluorescent fixtures with magnetic ballasts, lamps are usually wired in pairs and therefore must be removed in pairs (both lamps stop working when one is removed). In four-lamp fixtures with magnetic ballasts, you can remove either the two outermost lamps or the inner pair. When removing lamps in a highly visible ceiling, you may want to remove the same pair (inner or outer) from each fixture to achieve a uniform lighting pattern. With electronic ballasts, typically used with T8 lamps, you can remove individual lamps.

INSTALL MOST EFFICIENT LAMPS AVAILABLE

One of the most effective ways to save on energy costs is to use the most efficient lamp suitable for the purpose. Examples of inefficient and efficient technologies can be found on Page 22.

› **Install the most energy-efficient lamps in recessed downlights.** You occasionally see standard light bulbs being used in recessed downlights. A standard incandescent bulb is a poor choice for this kind of fixture because it radiates light in almost all directions rather than just down. As a result, the fixture “traps” much of the light.

› **Use a reflector lamp instead of a standard bulb.** A lower-wattage reflector lamp’s design allows it to project the same amount of light as a higher-wattage standard bulb. Reflector lamps are available in compact fluorescent light bulbs (CFLs) and light-emitting diodes (LEDs).

› **Replace incandescent bulbs or CFLs with LEDs.** ENERGY STAR® qualified LEDs use about 90% less energy than standard incandescent bulbs and last up to 40 times longer. They also produce about 90% less heat, so they’re safer to operate and can cut energy costs associated with cooling. Unlike CFLs, LEDs are mercury-free. LEDs come in a variety of sizes and shapes, so they will fit many of the fixtures you use with incandescent light bulbs. Light bulb packaging includes a lighting facts label to help you better understand bulbs (see example on the opposite page). LEDs qualify for SRP commercial rebates.

LIGHTING REBATES

SRP has rebates for lighting retrofits. Some customers may even qualify for a no-cost lighting audit. Visit savewithsrpbiz.com or call (602) 236-3054 to find an SRP Alliance Contractor. And be sure to apply before ordering or installing lighting equipment.

LIGHT PROJECTED FROM RECESSED DOWNLIGHT

Standard “A” bulb



LEAST

“R” or “BR” reflector

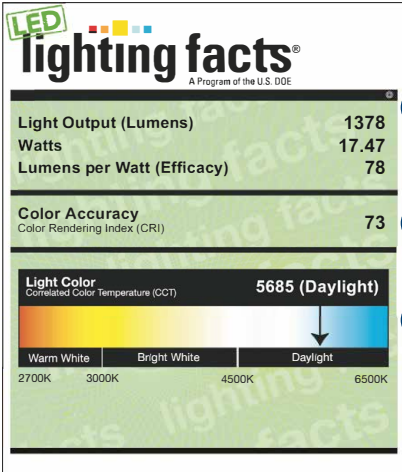


MORE

“ER” or “PAR” reflector



MOST



A Light Output/Lumens: Measures light output. The higher the number, the more light is emitted.

Watts: Measures energy required to light the product. The lower the wattage, the less energy used.

Lumens per Watt/Efficacy: Measures efficiency. The higher the number, the more efficient the product.

B Color Accuracy: Effect of the light's lamp spectrum on the color appearance of objects.

C Light Color: Measured in Kelvins (K). "Cool" colors have higher Kelvin temperatures (3600-5500 K); "warm" colors have lower color temperatures (2700-3500 K).

➤ **Upgrade linear fluorescent fixtures.** Without changing the fixture, you may be able to replace existing fluorescent lamps with high-efficiency fluorescent or LED lamps. For example, replacing T12 fluorescent lighting with T8 lamps and electronic ballasts can reduce energy costs by as much as 30%–40%. Replacing the same T12 lamps with LED lamps can reduce energy costs by 50% or more.

EVALUATE SAFETY AND SECURITY LIGHTING

Most buildings have lights that are on all the time to satisfy codes or safety and security needs. While meeting code requirements, you should be using only those fixtures necessary to do the job. Although safety and security lighting may not be the biggest part of your lighting costs, retrofitting it can save you money (see the sidebar "Retrofit Your Exit Signs").

In parking areas, LEDs have become the technology of choice for replacing existing high-intensity discharge (HID) lights, including mercury vapor, metal halide and high-pressure sodium. Modern LEDs for parking and exterior applications provide energy savings and reduce maintenance costs due to long lives and greater reliability.

RETROFIT YOUR EXIT SIGNS

Replace incandescent exit signs with LED signs. Exit signs operate 24/7, resulting in 8,760 hours of use each year.

	LED Lamps	Incandescent Lamps
Watts	2–4	20–50
Lamp life (hours)	25,000+	2,000–5,000
Cost at \$0.10/kWh	Less than \$2/year	\$18–\$44/year

OTHER LIGHTING IMPROVEMENTS

Every lighting system is different. To find an SRP Alliance Contractor specializing in lighting, visit savewithsrpbiz.com or call (602) 236-3054.

Up to \$145 on a Light Bulb*

See how the numbers compare for a BR30 Flood Lamp for 25,000 hours:

Specs	LED	Halogen
Watts	10	65
Light output (lumens)	700	700
Lamp life (hours)*	25,000	2,000
Energy use (kWh)	250	1,560
Lamp replacements	0	12
Cost		
Energy cost (at \$0.10/kWh)	\$25	\$156
Original lamp cost	\$12	\$2
Cost of lamp replacements	\$0	\$24
Total cost for 25,000 hours	\$37	\$182

**TOTAL SAVINGS for
25,000 hours (at \$0.10/kWh)****

\$145

*Results may vary.

**Source: Environmental Protection Agency ENERGY STAR program requirements for LEDs, 2016

***Savings does not include labor costs for replacement.

MYTH 1

Bulbs burn out faster when switched on and off. Although the total hours of a fluorescent lamp can be shortened if the lamp is turned on and off frequently, energy cost savings far outweigh the cost of these lamps during their lifetimes. Plus, even though the total hours may be reduced, the calendar life is extended. Turn off lights if nobody will be in the area for five minutes or longer.

MYTH 2

Leaving lights on uses less energy than turning them on and off. Many employees leave office lights on when they go to lunch, thinking that it will use more energy to turn them back on than to just leave them on. In most cases, the small surge of power needed to start a device is much less than the power that is wasted by leaving a light on when it is not needed.

HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

An HVAC system can account for a big portion of your energy bill. The good news is that there are many ways you can reduce HVAC use.

MAKE THE MOST OF YOUR THERMOSTAT

Changing the temperature just a few degrees can make a big difference in energy use. You may be cooling or heating your business more than needed. See the table below for recommended settings.

SAVE 2% TO 3% FOR EVERY DEGREE THE TEMPERATURE IS RAISED IN THE SUMMER OR LOWERED IN THE WINTER.

Try these temperature levels:

	Occupied/business hours	Unoccupied hours
Cooling season	78°–80°	Above 80°
Heating season	65°–68°	60°–65°

SOME OTHER TIPS TO KEEP IN MIND:

- › **Make gradual changes.** Changing the temperature gradually, say by one degree every week or so, gives employees time to adjust.
- › **Experiment with settings.** Try different temperature settings to see how high in summer or how low in winter is still comfortable.
- › **Consider locking devices.** Installing locking covers on thermostats can help you maintain desired temperature settings.

CHECK THERMOSTATS FOR ACCURACY

If you have an inaccurate thermostat, energy dollars may be going to waste. Judge the accuracy of your thermostat with one you're sure is correct. Once you know how many degrees your thermostat is off by, you can adjust the settings accordingly. For example, if your thermostat is off by four degrees, setting it at 82° will give you a true 78° temperature.

REDUCE HVAC RUNNING TIME

Turn off or reduce the air conditioning or heat a half-hour to an hour before closing time. It should remain cool or warm enough inside to keep people comfortable.

Exceptions include the following:

- › Health or building codes may require minimum ventilation at all times.
- › During the winter, turning off a heat pump that has auxiliary heat strips may not result in energy savings unless the heat pump has a “smart” thermostat.
- › Heat pumps that will be shut off in cold weather should have crankcase heaters.

LIMIT HVAC USE DURING UNOCCUPIED HOURS

You may be using energy to cool or heat the air when nobody is there to benefit — at night or on weekends, for example. Eliminating that kind of waste is an excellent way to save energy dollars.

Turn off the air conditioner and heater when nobody is around. If only a few people remain, fans may be enough. Air-handling (ventilation) systems also use energy and should be shut down during unoccupied hours. For exceptions, see above.

TRY THE FOLLOWING TO KEEP YOUR BUSINESS ENERGY EFFICIENT AND COMFORTABLE:

- › **Install programmable or smart thermostats.** Programmable thermostats automatically adjust temperature settings based on the time of day and day of week. If you have multiple HVAC units, set thermostats to return to the “occupied” temperature half an hour apart. If you’re likely to forget to set your thermostat manually, a programmable thermostat can be worth many times its cost.

Smart thermostats provide all of the benefits of a standard programmable thermostat but are Wi-Fi compatible, allowing you to access and control the thermostat using a smartphone, laptop or tablet.
- › **Reduce cooling/heating in unused areas.** Turn off or substantially reduce the cooling or heating for any area not being used. Keep windows and window coverings closed to insulate the unused area. Close any doors between the unused area and the rest of your space.

HELP YOUR HVAC WORK MORE EFFICIENTLY

You can waste energy dollars by overworking your air-conditioning or heating system. Here are some ways to make your HVAC system more efficient and economical.

› **If you have a central air system, make sure the system is balanced.** You may be working the entire system very hard just to get a bit of cooling or warmth to the area farthest from the central air-conditioning or heating plant. “Balancing” the system involves adjusting the volume control dampers (if your system has them) and the registers.

The registers let the cooled or heated air into each area. They often can be opened or closed by moving a lever, a chain, a slotted screw or the louvers themselves. Turn on the air conditioning or heat, and adjust the registers so each area gets just the amount of cool or warm air it needs. Usually, registers farthest away from the central plant or circulating fan should be wide open and those closer to it partially closed.

Caution: Most of the air supply registers should remain at least partially open to avoid damage to the system.

Although you can make the adjustments yourself, the best way to balance a system properly is to call an expert who has special instruments. A properly balanced system will allow you to set your thermostat at more energy-saving levels.

› **Establish a preventive maintenance program.**

- Change or clean all air filters, preferably every month.
- Clean all heat exchanger surfaces, water and refrigerant coils, condensers and evaporators.
- Repair leaks at the unit(s) and in the piping, air ducts, coils and fittings.
- Replace defective equipment insulation, ducting and piping.

GET HVAC UNITS SERVICED BY AN EXPERT

Making sure your HVAC plant is working efficiently is one of the best and easiest ways to save energy dollars. In a single season, a tuneup by an expert can often save much more than it costs.

BUYING A NEW UNIT OR SYSTEM

When buying a new unit or system, get one that is both energy efficient and the proper size. In air conditioners, choose the model with the highest energy efficiency ratio for the size you need. Have an expert perform a “Manual N” calculation to select a properly sized system based on your building load characteristics and occupancy needs.

The buying guide on Page 21 will give you a basic understanding of the efficiency ratings used. Consider ENERGY STAR components when you buy.



OTHER HVAC IMPROVEMENTS

There are many energy-saving modifications available for HVAC systems that may make sense. For example, using outside air and water-side economizers for “free cooling” when outside temperatures and conditions permit could be a good energy-saving investment. To find an SRP Alliance Contractor specializing in HVAC, visit savewithsrpbiz.com or call (602) 236-3054.

MYTH 1

A heating and cooling system works harder to reach a comfortable temperature after it is set back or forward. Thermostats often are not adjusted at night or on weekends while the facility is unoccupied because of the common misconception that the heating or cooling system must work harder or use more energy to reheat or recool the building. This is not how a thermostat works. The system activates to reach a set level and then shuts off when that level is reached. It's like a switch that shuts on and off rather than a gas pedal that accelerates faster the more you step on it.

MYTH 2

Installing an energy-efficient HVAC or boiler system will automatically reduce energy costs. This is true to some extent, but optimal savings will not be achieved unless the system is sized and installed correctly. Installing an efficient but oversized system can negate much of the potential savings. A poorly designed duct or piping system can also have an impact on efficiency and comfort.

BUILDING ENCLOSURE

Sealing and insulating your facility's building enclosure — its walls, ceilings, windows, doors, roof, floors and perhaps skylights — is a cost-effective way to improve energy efficiency and comfort. The building enclosure protects the climate-controlled indoor environment from outside elements.

SEAL DOORS AND WINDOWS

Doors and windows that don't close completely let conditioned air escape and let in outside air. Follow these tips to tighten up your doors and windows:

- **Repair doors and windows that don't close.** A double-hung window may be missing the lock that keeps the upper sash closed. Outside doors that don't close completely may need to be refitted or rehung, or you may just need to adjust the striker plate or plane.
- **Adjust automatic door closers.** Closers may shut the door slowly or not completely. Often a simple adjustment can be made with a screwdriver.
- **Close gaps.** Close any penetration of the building enclosure. Air and energy dollars leak out of gaps where doors meet, where parts of windows meet, and where doors and windows meet the walls. Use the correct type of caulking or weather stripping to seal cracks around doors and windows, between the foundation and wall, and in other openings for electrical or communication lines. To detect gaps, run your hand around door and window frames to feel for air passing through, and look for daylight around them.
- **Replace broken glass.** Broken or missing panes let air enter and escape.

SHADE WINDOWS

Windows are a major source of heat gain. Heat gain makes your air conditioner run longer, which translates into higher energy costs. These ideas can help you keep your business's heat gain under control:

- **Close window treatments during summer months.** Install shade screens and awnings on east-, west- and south-facing windows.
- **Add reflective solar films to windows.** Look for a solar heat gain coefficient of 0.35 or less.
- **Plan landscape design to shade windows in sunstruck sections of your building.** Consider deciduous trees that will block the sun in the summer yet shed their leaves in the winter.

INSPECT INSULATION

Does your air conditioner seem to run nonstop on hot days? Does your heating system do the same on cold days? You may need roof or wall insulation.

Without proper insulation, you may be paying more than you should for air conditioning or heating, especially if your business is on the top floor. The correct amount of insulation is critical in a hot desert climate.

- › **Look under the roof and feel the walls.** If you're on the top floor and there is a suspended ceiling, push up a ceiling panel and look for insulation. If there's an attic, you may need to look there instead. If you have a flat roof, the insulation may be outside and hard to detect. If the walls feel warm on a hot day or cold on a cold day, they may need insulation.
- › **Consider insulation if your business doesn't have it.** Insulation is often the best energy investment for a business, depending on the number of stories and the percentage of the roof area to the overall building enclosure. Check out the Buying for Efficiency section (Page 21) to see if your building could benefit from insulation.

TAX INCENTIVES

Remember that building enclosure upgrades for commercial buildings may qualify for a tax deduction of up to \$0.60 per square foot of building space. They can also be part of an overall energy efficiency upgrade, with deductions of up to \$1.80 per square foot of building space. For more information, visit the Commercial Building Tax Deduction Coalition's website at efficientbuildings.org.

SRP REBATES

SRP has rebates to improve your building enclosure. Visit savewithsrpbiz.com.

HOT WATER

Hot water may be used in your building for showering or hand-washing, or it may be used in specialized machines, such as restaurant dishwashers or commercial laundry equipment. These energy-efficient strategies can help you reduce your water-heating costs.

LOWER THE TEMPERATURE

Even if you rent the space you use, you may be able to control the water heater's temperature setting.

Many offices need hot or warm water only in the restrooms. Yet lots of water is kept ready at a high temperature — say 140° — all day long. In such a case, the water heater could be set at a more moderate temperature, such as 105°. Adjusting the thermostat is something you can probably do yourself. The thermostat is usually on the side of the water heater's storage tank, but it may be hidden from view. You may need to remove a few screws and a cover plate to get to it.

IMPORTANT: If it is an electric water heater, shut off the electric current at the breaker switch to the heater before you do this.

If you have any doubts about making the adjustment, contact your utility, an electrician or a local heating/hot-water contractor or dealer. Try different thermostat settings to find the lowest one that will meet your needs and code requirements.

REDUCE HOT-WATER USE

Here are some ways to use less hot water:

- Turn off the hot-water tap when it's not needed.
- Run only full loads in dishwashers.
- In machines, use chemicals or cleaning materials that will work with cooler water.

HOT-WATER TEMPERATURES

Hand washing	105° F
Showers	105° F
Laundry*	160° F
Dishwasher rinse**	180° F

*Check code requirements. Temperatures as low as 120° may be used with some soaps and detergents.

**Most dishwashers need water to enter at 140° to boost it to 180°.

REPAIR LEAKS

It always pays to fix hot-water leaks. Because hot-water systems are pressurized, most leaks gradually get worse. You can do many repairs yourself — quickly, easily and at virtually no cost. A few minutes and a few cents for a new washer may be all it takes to fix a leaky faucet.

INSULATE THE TANK AND PIPES

If your hot-water storage tank or distribution pipes are not insulated, consider adding an insulating jacket to the tank and installing tubular insulation on the pipes. If the tank feels hot or warm, it needs insulation.

If you have a gas-fired water heater, stay safe by using only a retrofit kit obtained from a hardware, plumbing or building supplier.

CLEAN OUT SEDIMENT

Efficiency is lost when sediment accumulates in the bottom of tank-type water heaters. The sediment acts as an internal insulator and inhibits the transfer of heat from the heating elements to the water.

To prevent deposits from building up, periodically open the drain valve near the bottom of the tank and draw off water until it runs clear (about 2 to 5 gallons of water should be adequate).

Flush the tank every six months unless there are high concentrations of lime and other minerals in your area. In that case, it may be necessary to flush monthly. Experiment to see what the proper interval is or ask your water company.

OTHER WAYS TO SAVE

- › Use a seven-day timer to control when the water heater operates.
- › Install a small “point-of-use” water heater right where the hot water is needed, if your current water heater is far from there.
- › Replace a failing water heater with a new efficient one. Check the “energy factor” tag before buying. The higher the energy factor, the more efficient the water heater.
- › Install a heat pump water heater. Heat pump water heaters use electricity to move heat from one place to another instead of generating heat directly. Therefore, they can be two to three times more energy efficient than conventional electric resistance water heaters. To move the heat, heat pumps work like a refrigerator in reverse.

WATER-SAVING TIPS

- › Detect and repair all water leaks.
- › As appliances and equipment wear out, replace them with water-saving models (look for the EPA WaterSense® label).
- › Eliminate “once-through” cooling of equipment with municipal water by recycling water flow to the cooling tower or replacing equipment with air-cooled models.
- › Minimize the water used in cooling equipment in accordance with the manufacturer’s recommendations. Shut off cooling units when not needed.
- › Install high-efficiency toilets (1.3 gallons per flush [GPF] or less).
- › Install high-efficiency urinals (0.5 GPF or less).
- › Install faucet aerators and high-efficiency showerheads (1.5 gallons per minute or less).
- › Use water-conserving ice makers.
- › Consider desert landscaping. View the SRP Landscape Research Exhibit at srpnet.com/dwexhibit for ideas.
- › Install a smart irrigation controller.
- › Water before sunrise to reduce the amount of water lost to evaporation.
- › Use rain gutters to channel rainwater toward your landscaped area.



WATER CONSERVATION

To learn how you
can do your part, visit
srpwater.com.

MACHINES

Many kinds of equipment use energy to transform or “process” material or to do some other job that needs an energy assist.

Even if your operation is relatively small, as are many restaurants, bakeries, automotive paint shops, and printing and electroplating plants, your “process energy” cost is important to control.

In fact, process energy may be the big item in your energy expenditures.

ELECTRIC MOTORS

Electric motors account for about three-fourths of total electricity use in industry and half of the electricity use in commercial buildings. You may have electric motors in HVAC and refrigeration systems, conveyor belts, printing presses, blowers, pumps, and manufacturing and assembly equipment.



MOTOR AND DRIVE REBATES

SRP has rebates for motors and drives. Visit savewithsrpbiz.com to find an SRP Alliance Contractor.

BUYING A MOTOR

- › **High-efficiency motors are generally 2%–8% more efficient than standard motors.** Be sure the motor has a high-efficiency rating, and consider a super-premium efficiency motor. Ask to see the National Electrical Manufacturers Association (NEMA) ratings.
- › **Buy the right size, not an oversized motor.**
- › **Electronically commutated motors (ECMs) are brushless direct current motors that have variable-speed capability.** An ECM saves energy by coming on slowly and adjusting its speed to run only at the speed required by the application. Consider upgrading constant speed motors to ECMs to save energy in HVAC, refrigeration and process applications.

MODIFYING A MOTOR

- › If full power is not always required, install variable-frequency drives (VFDs) on large motor loads to reduce energy usage further.

MORE WAYS TO REDUCE ENERGY USE

- › Adjust the temperature, speed and other controls to settings that use less energy but still do the job properly.
- › Replace worn parts on equipment, and clean, tune, adjust, lubricate and otherwise maintain the equipment.
- › Don't release process heat inside your building that the air-conditioning system must then cool.

PROCESSES

- › **Operate and modify machines for efficiency.** Make every effort to control the energy use of motors. Modifying machines can be an inexpensive way to make a big difference.
- › **Find out more about your equipment.** Industrial processes and types of energy-using equipment vary greatly. Ask your trade association or SRP for more information about energy-saving techniques.

SAVE WITH SRP TIME-OF-USE

Save more energy and money with the SRP Time-of-Use™ (TOU) Price Plan. With TOU the cost of energy varies during the day. The more energy you use during the lower-priced hours, the more you save. This works particularly well when motors and drives are a big part of a company's energy use. To learn more, visit srpnet.com/prices/business/tou.

OFFICE EQUIPMENT

Office equipment is the fastest-growing energy user in commercial buildings. The energy used by computers, printers and photocopiers (per worker) is sometimes more than that used by lights. Implement these ideas in your business and you could see significant savings:

- › **Turn off machines rather than letting them idle.** To conserve energy and reduce internal heat gain, turn off office equipment outside of business hours. During work hours, request that employees use the “sleep” mode and shut off nonessential equipment, such as fax machines, coffee makers and, if feasible, 50% of printers.
- › **Use a smart power strip.** A smart power strip can sense when monitors, printers and other equipment are in use and turn them off automatically when they are inactive for extended periods.
- › **Select smaller machines.** If there is a choice of a small or a large machine to leave running — for example, a photocopier — select the smaller one.

When buying new office equipment, look for the ENERGY STAR label (see Page 21).

FOOD SERVICE EQUIPMENT

Food service equipment can be a source of considerable energy and water consumption in a facility. Compared with other commercial buildings, restaurants use more than twice the energy per square foot.

USE THESE TIPS TO SAVE ENERGY DOLLARS:

COOKING

- › Turn equipment off when it's not in use.
- › Set temperatures only as high as needed.
- › Examine your cooking methods. For example, ovens tend to be more efficient than rotisseries, and griddles are often more efficient than broilers.

REFRIGERATION AND FREEZING

- › Don't overload cases.
- › Add strip curtains and automatic door closers to walk-in refrigerators.
- › Remove some lights.
- › Set controls only as low as necessary.

REFRIGERATION LEVELS*

Frozen food	-8° F
Ice cream	-14° F
Delicatessen	35° F
Beer, soft drinks	40° F

*To ensure proper levels for your needs, check with your refrigeration contractor.

WASHING AND DRYING

- › Reduce water temperatures.
- › Use cleaning materials that don't require hot water.
- › Maintain the correct dishwasher pressure. If the gauge shows pressure above 25 psi, there's a good chance you are using more water than needed.
- › Wash only full loads in machines. Cutting wash cycles could save you hundreds of dollars annually.

MYTH 1

Turning off equipment causes damage. Many people, including IT personnel, believe that switching off PCs and other equipment causes damage to internal components. It is thought that the change in temperature resulting from turning equipment on and off harms the circuitry. Modern electronic equipment is designed specifically to minimize these effects, and the reduced running time that results from power-saving features can actually increase the life expectancy of equipment.

MYTH 2

Screen savers save energy. Screen savers do not save energy. Essentially, it takes as much energy to display a screen saver as any other image on your computer. To save energy, simply turn off the monitor when it's not in use or adjust your settings so that the monitor shuts down after a specified period of idleness.

MYTH 3

Surge protection equipment saves energy. Some makers of surge suppressors have claimed energy-saving benefits for their technology, even though there is no reliable evidence to back up these claims. In reality surge protection equipment is dormant more than 99% of the time, becoming active only in the event of a voltage spike. Surge suppressors are an effective method for protecting electronic equipment, but they do not have any demonstrated energy-saving benefits.

MYTH 4

When a device is turned off, it is off. Many appliances and electronic devices in the office, such as coffee makers and fax machines, continue to use power after they have been switched off — sometimes as much as when they were on. This is known as standby power or phantom load. To stop the drain of power from these devices, unplug them or use a “smart” power strip.

BUYING FOR EFFICIENCY

Take a hard look at what you buy. Make sure what you get is the right size and type, has a high-efficiency rating and uses as little energy as possible to accomplish your purpose.

TIP: Where you may be buying many, such as new reflector lamps, get a few and try them out before committing to a major purchase.

ENERGY STAR PRODUCTS



ENERGY STAR products perform as well or better than standard products, but they use less energy. To earn ENERGY STAR certification, products must meet strict energy efficiency criteria set by the Environmental Protection Agency or the U.S. Department of Energy. For example, ENERGY STAR qualified office and imaging products use as much as 30%–75% less electricity than standard models. To learn more, visit energystar.gov.

CONSORTIUM FOR ENERGY EFFICIENCY

The Consortium for Energy Efficiency, a national nonprofit benefits corporation, promotes the manufacture and purchase of energy-efficient equipment. To learn more, visit cee1.org.

INSULATION

Insulation is measured in R-values — the higher the R-value, the better your building will resist heat transfer. See the table below.

R-VALUE OF SOME INSULATION MATERIALS

Material	R-value per inch of thickness*
Fiberglass loose fill	2.5–3.0
Fiberglass batt	3.0
Cellulose loose fill	3.1–3.7
Polystyrene foam board	4.2

*The R-values are representative. Insulating products are labeled for actual R-value.

LIGHTING

Check ballast efficiency and fixture characteristics as well as the lamps. For instance, electronic ballasts are more efficient than magnetic ones. An SRP Alliance Contractor can help you determine the type of lighting that is right for your business and help you take full advantage of the SRP lighting rebates. To learn more about these rebates and find a contractor, visit savewithsrpbiz.com or call (602) 236-3054. You must apply before ordering or purchasing any equipment.

OLDER, INEFFICIENT TECHNOLOGIES

Standard incandescents
Mercury vapor
Standard metal halide
T12 linear fluorescents
Magnetic ballasts
Halogen

NEWER, MORE EFFICIENT TECHNOLOGIES

CFLs
LEDs
T8 and T5 linear fluorescents
Electronic ballasts
Ceramic metal halide
Induction

ELECTRIC MOTORS

The National Electrical Manufacturers Association (NEMA) sets technical standards for motors. When buying a motor, or equipment powered by a motor, be sure to check the NEMA rating. Motors must have NEMA Super Premium Efficiency Rating to qualify for rebates under the SRP custom program. To learn more about NEMA ratings, visit nema.org.

HVAC EQUIPMENT

➤ **Buy the right size.** Make sure the unit you buy delivers the right amount of heating, cooling or ventilation for the space it serves. A unit that is too large can waste energy; too small and it won't be able to do the job. Look for British thermal units (Btu) of heating or cooling power. Cooling equipment is often rated in tons (1 ton = 12,000 Btu per hour).

MOTOR AND DRIVE REBATES

SRP has rebates for motors and variable-frequency drives. Visit savewithsrpbiz.com to find an SRP Alliance Contractor.

REMEMBER: Consider buying equipment that is more efficient than the minimum standard. Available rebates and increased energy savings will often more than pay for the incremental cost of going with high-efficiency equipment.

- › **Check the data and labels.** Be sure to request energy efficiency data. The data should include an EER, SEER/IEER, HSPF and/or COP rating. The rating usually is found on a tag or label on the equipment; it is always available in the manufacturer's literature.

HVAC EFFICIENCY STANDARDS

- › **EER:** Window air conditioners are rated in terms of the Energy Efficiency Ratio (EER), the cooling output in Btu per hour for a watt of input power. A window unit with an EER of 12.0 would use 25% less electricity to deliver the same amount of cooling as a unit with an EER of 9.0.
- › **IEER:** Integrated Energy Efficiency Ratio. This measure expresses cooling part-load EER efficiency for commercial unitary air conditioning and heat pump equipment on the basis of weighted operation at various load capacities.
- › **SEER:** Central air conditioners and heat pumps (in cooling mode) are rated in terms of the Seasonal Energy Efficiency Ratio (SEER). The SEER represents cooling performance over an entire cooling season and is equal to the total Btu of cooling delivered divided by the total watt-hours of power used during a representative season. Water-cooled models and air-cooled models larger than 65,000 Btu per hour have EER ratings.
- › **HSPF:** Heat pumps in the heating mode are rated in terms of the Heating Seasonal Performance Factor (HSPF). Similar to SEER, HSPF represents heating performance over an entire heating season and is equal to the total Btu of heating delivered divided by the total watt-hours of power used during a representative heating season.
- › **COP:** All water-cooled heat pumps and all air-cooled heat pumps larger than 65,000 Btu per hour are rated in terms of the Coefficient of Performance (COP), which is a measure of efficiency in the heating mode that represents the ratio of total heating capacity (Btu) to electrical input (also in Btu).

HVAC REBATES

SRP has rebates for HVAC equipment. Visit savewithsrpbiz.com to find an SRP Alliance Contractor.

REBATES FOR ENERGY EFFICIENCY PROJECTS

SRP offers rebates for just about any energy-saving measure, including:

- › Lighting
- › HVAC/chillers
- › Compressed air systems
- › Refrigeration equipment
- › Variable-frequency drives
- › Energy management systems
- › Programmable and smart thermostats
- › Rooftop unit (RTU) controllers
- › Multi-split variable refrigerant flow (VRF) systems

We can also help with rebates for custom, one-of-a-kind projects and provide:

- › Lighting audits for small businesses
- › Technical assessments for more complex systems
- › Compressed air assessment
- › Data center assessment
- › Compressed air leak test assessment
- › Pump test assessment

SRP's rebate programs not only offer industry-specific solutions that help make energy efficiency affordable, but they can also lower electric bills — quickly delivering a solid return on investment. To learn more, visit savewithsrpbiz.com or call (602) 236-3054.

HOW CAN AN ENERGY EXPERT HELP?

Energy experts can:

- › Analyze the parts of your energy systems that you don't understand.
- › Explain possible energy savers, including system modifications, changes in control settings, and new, more efficient controls or equipment.
- › Estimate potential costs and energy savings.
- › Adjust your existing equipment to reduce energy costs immediately.
- › Help you avoid costly mistakes.

To find an SRP Alliance Contractor who specializes in our rebates, visit savewithsrpbiz.com.

ENERGY IMPROVEMENTS CAN BE AN EXCELLENT INVESTMENT

Financially sound energy improvements can pay for themselves and then yield continuing savings, providing you with a good return on investment.

You will want to have a payback analysis like the one below and likely a life cycle/rate-of-return analysis as well.

SIMPLE PAYBACK EXAMPLE

$$\frac{\text{Cost of energy improvement}}{\text{Annual energy savings}} = \frac{\$500}{\$250} = \text{Two years}$$

In addition to financial benefits, other important results may include enhanced employee productivity and improved merchandise visibility and appeal.

In addition to SRP rebates, the following incentives may be available:

- › **State incentives** — Many states, including Arizona, provide low-interest loans, tax credits and other financing to help with energy efficiency investments. The Database of State Incentives for Renewables & Efficiency® (dsireusa.org) provides a comprehensive list of state and federal incentives for energy efficiency.
- › **Federal incentives** — The Energy Policy Act of 2005 included a provision for an Energy Efficient Commercial Buildings Deduction. This deduction includes expenses incurred for energy-efficient building expenditures made by a building owner. It was expanded by the Emergency Economic Stabilization Act of 2008 and amended by the American Recovery and Reinvestment Act of 2009. The deduction is still limited to \$1.80 per square foot of the property, with allowances for partial deductions for improvements in interior lighting, HVAC systems, hot-water systems and building enclosure systems. The provision is effective for property placed in service from Jan. 1, 2006, through Dec. 31, 2014. The Consolidated Appropriations Act, signed in December 2015, retroactively reinstated the tax credit for projects completed in 2015 and 2016.

SELF-AUDIT CHECKLIST

BASIC FACILITY REVIEW

HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

- Thermostats checked for accuracy
- Current thermostat settings:
_____ day
_____ night/weekend
- Programmable thermostats programmed: _____
- Areas where heating/cooling can be reduced: _____

- System last serviced/balanced: _____

LIGHTING

- Lighting turned off when not needed
- Current type of light fixture: _____ lamp (bulb) wattage
- Areas where lighting can be reduced: _____
- Is there a timer? _____ Is it set properly? _____
- Is there a photocell control or motion/occupancy sensor? _____

BUILDING ENCLOSURE

- Insulation needed
- Caulking needed
- Weather stripping needed
- Door closers, other repairs needed

HOT WATER

- Insulation needed
- Current temperature setting: _____
- Water-saving devices needed
- Drips, leaks, other repairs needed

MACHINES AND EQUIPMENT

- Turned off when not needed, if possible
- Automatic shut-off controls working
- Using “smart” power strips
- Sleep mode enabled
- Loaded to capacity when used
- Last serviced: _____

IDEAS/COMMENTS

ENERGY CONSERVATION

IS IT REALLY TURNED OFF?

Plugged-in devices can account for up to one-fifth of an office's energy bill. But simply turning them off doesn't always help your bottom line. "Vampire" appliances use electricity even when they are turned off, because they go into a standby mode rather than fully powering down. Look for these characteristics:

- › External power supplies — cellphone, laptop and iPod chargers
- › Remote controls — overhead projectors and televisions
- › Continuous clock displays — coffee makers and radios

Unplugging these types of devices at the end of the workday can reduce your electric bill. Simply turning off one desktop PC each night can save up to \$100 in energy costs a year. Power strips make it easy to turn off multiple devices at once. Also consider "smart" power strips for computers. They sense when computers go into sleep mode or are turned off and automatically cut power to peripheral devices, such as monitors, speakers and printers.

ENCOURAGE EMPLOYEE ENERGY CONSERVATION — THE FINAL ENERGY-SAVING STEP

A successful conservation strategy should look at energy consumption behaviors in addition to facility and equipment upgrades. Companies that take a back-to-basics conservation approach of turning things off, turning things down, cleaning and maintenance can quickly realize significant energy savings at little or no cost. Combine these measures with needed upgrades to maximize energy efficiency.

- › Start an employee action committee to encourage resource stewardship at work and at home.
- › Establish short- and long-term goals for energy conservation among departments and work groups.

CONTACT US

You are a valuable business customer. As you know, utility costs can be one of the biggest expenses for any business. Controlling energy usage translates into saving money. Your SRP business team can help you do both.

To learn more about no-cost/low-cost solutions for your business, visit **savewithsrpbiz.com**. Open 24/7, this business-only site includes account management tools, energy-saving advice and SRP Business Solutions for your industry.

**SRP BUSINESS ENERGY
EFFICIENCY WEBSITE**
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