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Introduction

Electricity is our nation's most prevalent energy form. It drives our nation's economy and powers smart technologies that enhance our quality of life. It's hard to imagine our businesses, offices, and industries without electricity. As a matter of fact, the use of electricity accounts for about 40 percent of the total cost of operations in many businesses.

Most electricity is generated by burning coal or from nuclear power plants. Every time you turn on the lights, you create a little pollution. So saving electricity doesn't just put money in your pocket, it helps keep the air and water clean, too.

There are many things that a business entity can do to reduce electrical energy consumption, as well as many sources of information on the subject. Reasons to decrease electricity consumption in your business are numerous, ranging from saving money by reducing utility bills ... to doing your part to help save our planet ... to getting onto the "Going Green" movement.

Hobaica Services often sees the desire from our customers for an easy to read and understand compilation of simple to do steps to reducing consumption. We can help with air conditioning related issues, which is in many cases the greatest percentage of a business's electrical usage. However, our customers often ask what else they can do, without making a big investment.

Thus the creation of this pamphlet. We borrowed the ideas from reputable sources on the subject, and have presented our findings here in one easy to read outline format. This pamphlet offers no new rocket science techniques, but rather many easy to implement ideas that you may have heard of at one time or another, but never got around to enacting. Or there may be a new idea that you have never considered. Whatever the discoveries, we hope that this information can help to increase your business bottom line, improve your work environment and most of all; provide baby steps toward's improving our country and our planet.

Thank you for your time,

The Staff at Hobaica Services, Inc.

Comments are welcome and can be submitted to customerservice@hobaica.com for review.
For further information on our services please visit us at www.hobaica.com
or call us at 602-995-0387.

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Main Purpose of this Seminar



1) The main purpose of this presentation:

- a) Help you save money on your businesses energy consumption and utility bill.
- b) Improve the energy efficiency of your facility operations and equipment.
- c) Reduce your peak energy demand.
- d) Lower your energy costs.
- e) All at No or Low cost.



2) Secondary benefits:

- a) Improve your business productivity through improvements to the indoor environment.
- b) Improve your facilities climate temperature and humidity.
- c) Improve the air quality of your office/business environment.
- d) Improve your facilities lighting conditions.
- e) Reduce your facilities health and safety risks.
- f) Increase your facilities property value by upgrading building systems.
- g) Improve our global environment for a better tomorrow.

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Glossary of Terms



Amp

The basic unit of electric current.

Kilowatt-Hours (KWh)

Kilowatt-Hours is a measurement of the quantity of power multiplied by time. 1000 watts of power used for one-hour equals one kilowatt-hour.

Watt

A Watt is a measure of power. It is the product of voltage and current.



Incandescent Lighting

In an incandescent light bulb, light is emitted by a hot glowing filament, usually tungsten. Incandescent lighting is characterized by very high CRI (Coloring Rendering Index), but very low efficiency.



Fluorescent Lighting

A fluorescent light bulb is a glass tube with electrodes at each end and an inside surface coated with one or more types of phosphors. Mercury vapor fills the tube at very low pressure, along with one or more buffer gasses. Fluorescent lamps from least efficient to most efficient include the T12, T8 and T5, where the number represents the diameter of the tube. As the diameter gets smaller, glare increases.

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Glossary of Terms



BTU

A BTU or British Thermal Unit is a measurement of heat energy. It is the amount of heat energy required to raise one pound of water by one degree Fahrenheit. It is equivalent to the thermal energy of a wooden match.

Heat Pump

A heat pump takes advantage of outside air to provide heating, cooling and humidity control. It works by moving heat. In the summer the heat pump pulls heat from a building by transferring it to the outside air. Heat pumps can be air source or water source.

CFL

Compact Fluorescent Lamp bulb.



SEER

SEER or Seasonal Energy Efficiency Ratio is a measure of efficiency over an entire cooling season. SEER is the total amount of cooling the air conditioner will provide over the entire cooling season divided by the total number of watt-hours it will consume. The higher the SEER rating, the more efficient the cooling system.

Urban Heat Island

In cities, building rooftops and paved surfaces collectively create Urban Heat Islands. Research has shown that Urban Heat Islands raise the outdoor temperatures 6 to 8° F above surrounding areas.

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Summer Electric Benchmark Consumption

Summer Electric Benchmark Consumption on a Typical Small Office Building in the Phoenix Area

Total Electric Intensity = 16.8 KWh/sqft on an annual basis
Average Electric Consumption per Establishment = 470,000 KWh



	KWh/sqft
Cooling	39.3%
Lighting	31.1%
Office Equip	11.5%
Ventilation	7.8%
Miscellaneous	6.1%
Water Heater	1.8%
Heating	1.4%
Refrigeration	0.6%
Cooking	0.4%

Courtesy of Salt River Project

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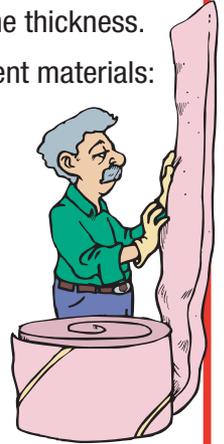
Easy Things You Can Do To Save Energy on Your Business Building

Building Envelope

1. Upgrade Insulation

- Often, insulation is at the ceiling level, and over the years, insulation batts may have been removed or relocated from where they were originally located, resulting in uninsulated areas.
- Insulation batts can also fall from the underside of the roof structure where they were originally wired or otherwise secured.
- If the ceiling has loose blown-in insulation, add to the thickness.
- The following chart compares the R-values of different materials:

“Typical Batt Insulation”



Material	R-value per inch of thickness
Fiberglass Loose Fill	2.5 – 3.0
Fiberglass Batt	3.0 – 4.0
Cellulose Loose Fill	3.1 – 3.7
Polystyrene Foam	4.2
Polyurethane Foam	6.3

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Easy Things You Can Do To Save Energy on Your Business Building

2. Reduce Infiltration

- When outside air enters a building, it has to be cooled or heated to maintain comfort. The more unconditioned air entering the building, the greater the load on the air conditioner and the greater the cost.
- Air can enter 3 ways:
 - 1) Intentionally as fresh air from the HVAC system.
 - 2) Unintentionally through cracks and crevices in the building.
 - 3) Unintentionally through doors and windows as they are opened and closed throughout the day.
- Wind increases infiltration.
- HVAC that has leaky ductwork and/or exhaust fans (from bath rooms, conference rooms, kitchen, etc) may cause air to infiltrate through building crevices as well.
- Ways to reduce infiltration:
 - Caulk and add weather stripping to doors and windows.
 - Install clear vinyl strips on open doorways (such as are often used at loading docks and warehouses).
 - Adjust exhaust hoods to insure that they are exhausting the minimum air necessary to remove contaminants.
 - Keeping conditioned area at a slight positive pressure at all times.

3. Plant Trees

- Strategically plant trees on the east, west and south sides of a one or two-story building.
- The results can be:
 - A reduction in the summer solar heat gain through window.
 - The production of a natural cooling effect in the areas surrounding a building by evaporating water through their leaves.
 - An offset in the “Urban Heat Island” Effect in Phoenix.



4. Automate Restroom Exhaust Fans

- Rewire restroom exhaust fans so that they are turned on and turned off only when the restroom is occupied or install a timer.

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Easy Things You Can Do To Save Energy on Your Business Building

Office Equipment



5. Turn off Plug-in Loads

- Plug plug-in loads into a power strip that can be turned off when not in use.
- Eliminate or minimize the usage of plug-in loads such as:
 - Personal Refrigerators
 - Portable Fans
 - Portable Heaters
 - Radios
 - Chargers
 - Other personal Electronics
 - Computers and Monitors



6. Utilize Computer and Monitor Sleep Modes

- Be sure computers and monitors are set to automatically power down to the sleep mode when not in use. Energy Star computers and monitors save about 50% on electricity costs.
- If the computer needs to be left on at night and weekends, save energy costs by turning off the monitor.
 - Monitors typically use more energy than the computer itself.
 - Liquid crystal displays use less energy than conventional monitors.



7. Use Laptops

- Laptops draw about one-tenth of the power of a conventional desktop computer.

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Easy Things You Can Do To Save Energy on Your Business Building

Office Equipment



8. Turn Off Printers and Scanners at Night

- Be sure to use energy-efficient printers that power down when not in use. They can save over 60% on annual energy costs.
- Printers with double-sided printing capability are more energy efficient and also help reduce paper costs.
- Laser printers consume more energy than inkjet printers.
- Color printers use more energy than black and white.

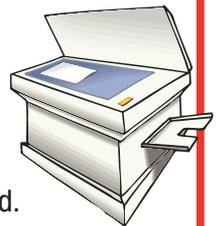
9. Utilize the Energy Saver Mode on Fax Machines

- They still will typically recognize when a fax comes in when in this energy saver mode.



10. Utilize the Low Power Mode on Copiers

- Copiers are the most energy intensive pieces of office equipment. They take energy to keep warm so that the toner can fuse to the paper.
- Be sure copiers are set to go into low-power mode after 15 minutes of inactivity and to an off mode of 5 to 20 Watts after 2 hours of inactivity.
- This will insure that they go off at night and weekend.



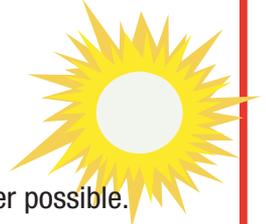
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Easy Things You Can Do To Save Energy on Your Business Building

Lighting

11. Turn Off Unused Lights and Office Equipment

- Turn off lights and office equipment in vacant rooms and when you leave the building at nights and weekends.
- This can be made easier by installing automated controls.
 - Timers work well in predictable usage areas.
 - Occupancy sensors can work well in bathrooms, storage areas and janitorial closets. These can save up to 40% of the lighting energy usage for that area.



12. Take Advantage of Daylight

- Use daylight from windows or skylights when ever possible.

13. Turn Off Signage and Security Lights

- Automatically turn on and off signage and outdoor lighting when not necessary for security and safety.
- On outdoor lighting and signs, daylight photocell controls can sense when natural sunlight is shining.

14. Remove Some Light Bulbs

- In many offices and corridors, two lamps in a four-lamp overhead fixture can be removed, while maintaining appropriate light levels.

15. Replace Incandescent Bulbs with CFLs

- By changing one incandescent bulb that burns 6 hours a day with an ENERGY STAR qualified CFL (compact fluorescent lamps), you can save \$9 on electricity and \$3 on maintenance costs each year.

16. Replace Exit Signs with LED Exit Signs

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Easy Things You Can Do To Save Energy on Your Business Building

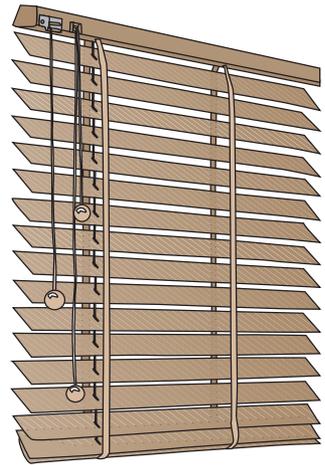
Windows

17. Add Tinted or Reflective Film to Windows

- Window tint and reflective films are efficient at reducing solar gain but can also reduce the light from the outdoors.

18. Add Window Blinds

- Install adjustable blinds on windows that receive direct sunlight and close them when the sunlight is direct.
- Open them when possible to take advantage of outdoor lighting.



19. Use Available Daylight

- Take advantage of daylight to create a pleasant working atmosphere in order to minimize artificial lighting, especially in large opened areas such as:
 - Warehouses
 - Manufacturing plants
 - Office spaces

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Easy Things You Can Do To Save Energy on Your Business Building

Energy Management Systems and Controls

20. Install Timers

- Programmable Timer Controls work well on equipment such as:
 - Hot Water Heaters
 - Office Equipment
 - Battery Re-chargers
 - Coffee Makers
 - Etc.



HVAC

21. Adjust the Temperature

- Adjust the indoor thermostat temperature setting and humidity control to save energy.
- Typically 78° F/30% RH, cooling season
70° F/30% RH, heating season.



22. Layer Clothing

- Adjust your layers of clothing before adjusting the thermostat.



23. Adjust the Work Schedules

- Schedule work hours in order to reduce energy usage during the hours when there is the most demand for electricity.
- If employees start work earlier or go to lunch during the hottest hour of the day, a company can save on air conditioning, lighting and other electricity usage during the hours of peak electrical demand.
- Revise work shifts from 5-8hr days to 4-10hr days



24. Check Air Filters Monthly

- Check and clean, or change your filters as needed.

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Easy Things You Can Do To Save Energy on Your Business Building

HVAC

25. Clean Return and Supply Grills Regularly

- We recommend that grills be cleaned on a quarterly basis.

26. Keep Return Grills Unblocked

- Make sure that return grills are free of obstructions.

27. Tune-up Air Conditioners

- Tune-up heat pumps and air conditioners twice a year.
 - Verify and adjust refrigerant charge to optimum level.
 - Clean the condenser coils.
 - Inspect evaporator coils and clean as needed.
 - Adjust or replace belts.
 - Inspect and replace refrigerant line insulation as needed.

28. Use a Programmable Thermostat

- Programmable thermostats will automatically change the building temperature during unoccupied hours.
 - Automatically raise the temperature after hours in the summer.
 - Automatically lower the temperature after hours in the winter.
 - Be sure the thermostat is properly programmed.
 - Maintain different temperatures at different times of the day to allow for outdoor temperature changes and internal building loads.



29. Balance Supply Registers

- Properly balance supply registers to increase/decrease air flow to hot/cold areas.

30. Close Unused Vents

- Keep vents closed in unoccupied areas such as storage to prevent cooling or heating of those areas.

31. Eliminate Ductwork Leakage

- Make sure that all ductwork is properly sealed.

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Easy Things You Can Do To Save Energy on Your Business Building



32. Positive Pressure

- Maintain a slightly positive interior building air pressure.

Energy Efficient Motors

33. Shutoff Unused Motors

- Turn off motors when not in use with an automatic timer or sensor.
- Examples of motors that can be turned off at night include:
 - Hot Water Circulation
 - Air Compressors
 - Ventilation Fans
 - Exhaust Fans



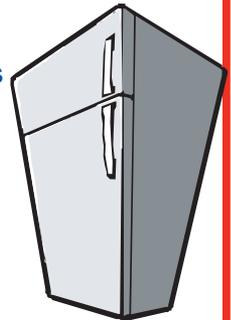
34. Maintain Motors for Peak Efficiency

- Adjust belts
- Lubricate bearings, chains and gears
- Clean fan blades and blower wheels
- Check pump impeller blades for wear
- Clean ventilation intakes, such as grills, etc., regularly

Refrigeration Systems

35. Check Refrigerator Temperatures

- Make sure refrigerators are set for the proper temperature.
- The most common recommended settings are:
 - -14° F to -8° F for Freezers
 - 35° F to 38° F for Refrigerators



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Easy Things You Can Do To Save Energy on Your Business Building

36. Clean Indoor and Outdoor Coils Monthly

37. Check Door Seals

- Verify door seals on Refrigerators, Freezers and Walk-ins for proper seal.

38. Check Defrost Cycles

- Verify proper defrosting of refrigeration equipment by checking for ice buildup.

39. Close Refrigerator Doors

- Do not leave walk-in refrigerator doors opened.

40. Use Vinyl Door Curtains

- Install Vinyl Door Curtains on walk-in doors.

41. Automated Lighting

- Install occupancy sensors or timed switches in walk-in coolers and freezers to control lighting.
- This reduces the lighting energy and also reduces the load on the compressor.

42. Lower Water Temperature

- Decrease the hot water temperature to 120-140 degrees F when applicable.

43. Insulate Hot Water Tanks and Pipes



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Results



Results of Improving Building Efficiencies

1. Lower Electric Bills
2. Less Downtime and Fewer Repairs
3. Lower Maintenance costs
4. Improved Comfort in the Workspace
5. More Productive & Happier Personnel



Utility Company Support

1. Utility Company Websites have plenty of valuable information
2. Choose Pricing and Billing Options
3. Request an Energy Audit



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How to Proceed

1. Educate your staff on the benefits of energy efficiency for the company, the employees, the community, and the environment.
 - Make employees aware of the options and policies so that they are constantly thinking energy savings and efficiency.
 - Come up with innovative and exciting ideas to motivate your staff to buy into the process.
 - Keep them informed as to upgrades as they occur so that they can see that you are serious.
2. Create a task force
 - Come up with an Action Plan
 - List tasks in order of priority that can be implemented to reduce energy consumption.
 - Assign someone to each task along with a timeline for implementation.

3.

***MAKE IT
FUN!!!!!!!!!!***

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Since 1952, Hobaica Services, Inc. has been providing **Heating, Ventilating, Air Conditioning, and Refrigeration** services to Valley of the Sun businesses.

As a family operation, our name is constantly on the line to provide top performance and quality. We promise honest, dependable service and installation, at affordable prices. We are proud of our reputation for providing **quality products and services** through ethical business practices.

Be sure to ask us about a Hobaica **Commercial Maintenance Plan** (CMP).

- You will have **one less thing to worry about.**
- You are **guaranteed 24-hour rapid response** or the service call is FREE.
- You receive a **discount on repairs.**
- You experience **extended equipment life.**
- Your equipment has **improved reliability** with reduced repairs and failures.
- You receive an **energy savings** since your equipment is operating at its peak.
- You receive an **extended 1-year warranty** on any repair parts and labor.

For your next HVACR needs keep us in mind. Our motto at Hobaica is **“No Worries”** and that is what you can expect. **Give us a call today!**

Free HVAC equipment inspection & written recommendation report*

*up to 4-5 ton HVAC systems
No obligation for further service

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