13 Easy Steps to Cutting Your Energy Costs by 50%.

A Step-by-Step Process to Enhance Your Bottom Line by Slashing Energy Costs.

When the price of gas increases so does your energy bill. Every aspect of your operations is affected. Profits are eroded. Jobs are threatened. But there are some easy steps you can take - a road map you can follow - to alleviate these concerns. This paper is that road map. If you are a plant manager, business owner, engineer, or maintenance staff member you can follow this guide to lower costs and higher profits. These thirteen easy-to-follow, measurable protocols can cut your energy bill in half. As a bonus we've also included information on a DOE (Department of Energy) Audit that you can conduct yourself or request from the DOE, state energy department or university industrial assistance program.

1. Start with an Energy Audit

You can't cut your gas bill unless you first identify where your consumption is taking place and what areas offer the greatest opportunity for improvement. A plant-wide audit is a great way to find out where energy is being consumed and by how much.

An audit provides you with an inventory of utilities, plant areas, and machinery and data on how much energy is used in each area. It also provides a ratio of energy usage to production units to help determine how much new savings are possible.. An audit reveals simple adjustments that you can make, at little or no cost, that can help you cut costs immediately. (See the end of this paper for more details about this audit.) (Can you put the calculator here as well?)

2. Upgrade Heating and Cooling Methods

Improve heating and cooling methods by replacing old units with newer, more energy-efficient systems. Buy air units with the highest Energy Efficient Ratio (EER) for your building's required cooling capacity. EER is the amount of energy required to cool a particular area. This formula is a ratio calculated by dividing the cooling capacity in Btu's per hour (Btuh) by the power input in watts at a given set of rating conditions.
For furnaces, buy units with high AFUE (Annual Fuel Utilization Energy) ratings. The national minimum is 78%, buy models with ratings of 90% or higher.

Choose a heating and cooling system with a clock thermostat that will control the temperature day and night. During winter months, reduce natural gas costs by

setting the temperature at different levels for various times of the day. On chilly mornings, the temperature might be set slightly higher than on sunny afternoons during winter.

3. Landscape for Savings

Believe it or not, a building's landscape makes a difference in energy costs. Plant shrubbery about one foot from the building's foundation. This provides a natural insulation during winter. Evergreen hedges work very well.

Plant leafy trees around your facility. These provide shade in the summer and, when autumn comes around, the leaves drop to allow the sun through, heating the building through winter.

Tip: Don't allow shrubbery to interfere with an outdoor air unit. Trim shrubs near air units regularly.

4. Examine Windows and Doors for Energy Loss

Old windows and doors can waste heat during the winter and put unnecessary strain on your air unit in the summer. Replace old doors and windows with units that have an R-value of at least 2. Double pane windows are an excellent solution.

Examine windows and doors for leaks. Plug any holes with Styrofoam plugs, which can be found at most hardware stores. Seal cracks around windows, faucets and vents with caulk. Apply weather stripping to windows or doors that are rarely or never used.

5. Set Thermostats at a Lower Temperature

During cold months, set all gas heat thermostats in your plant or warehouse a few degrees lower than usual. A range of 65 F to 68 F is usually sufficient to keep the environment comfortable. Lowering the temperature just a few degrees each day can reduce your heating bill noticeably .

6. Examine Plant Partitions and Entry Ways

Analyze the layout and partitioning of your facility. By identifying unused or seldom-used areas of your facility, you can partition these areas with custom curtain walls. These walls can dramatically reduce the amount of space that needs to be heated or cooled, cutting your energy bill by 20-40%.

Curtain Dividers are most often installed to protect employees from extreme temperatures and from the dangers of hazardous work areas (like welding arc or dust). But these dividers offer additional benefit as well. These dividers trap extreme temperatures in the area of partition, thereby lowering heating and/or cooling costs by as much as 40%.

Also, most plants have areas that tend to heat or cool naturally. Partitioning these areas helps lower energy costs as well.

Finally, look closely at high-traffic areas. Installing strip doors at the entry and exit ways to these areas can lead to lower energy bills. Strip doors are designed to provide easy access to buildings while minimizing temperature flow from the building to the outside and vice versa.

To see how much these kinds of partitioning strategies could save you, take a look at our Energy Savings Calculator.
Link: www.steelguardsafety.com/energy_savings_calculator.htm

7. Improve Furnace Efficiency

Even if you're not planning to replace your furnace soon, you can still increase your current furnace's efficiency by making a few minor changes.

Some furnaces use the thermocouple system, which has two dissimilar metals to provide electricity. This electricity holds the pilot valve open on the gas valve once it is lit. If your furnaces use this system, inspect and adjust the thermocouples to obtain more accurate zone temperature measurements.

Decreasing surplus combustion air can also help. On boiler draft fans, tune damper settings and install over-fire draft control systems. Seal doors as well. Heat is often lost due to excess air in the combustion chamber, causing flue gas to escape. You can increase furnace efficiency by up to 15% when you reduce oxygen and air in this way.

8. Insulate Whenever Possible

Insulate valves, fittings and pipes with removable insulation. This reduces loss in the process heat distribution system. This step may cut your energy bill from 2-5%.

To give an example of just how valuable these small improvements can be, consider the following results. A company employing around 400 people insulated steam lines and installed new steam traps. The result was an energy reduction of about 7,000,000 BTU per hour!

Insulate your walls. Even solid concrete walls can be insulated using a method called "furring", which is accomplished by attaching wood strips to the wall to form an insulation cavity. Insulate ceilings. Ceilings are great candidates for insulation since heat rises.

9. Check Steam Distribution Systems for Leaks

Check for leaks in the pipes, process equipment, seals, flanges, steam traps and

valves of your steam distribution systems. This simple step alone could cut your energy costs by 5%.

10. Improve Plant Ventilation

Ventilation in a plant or warehouse is very important. Ventilation should be provided where necessary, but should also be measured for maximum efficiency. Make sure any worn or warped outdoor air dampers are replaced. This ventilation can be measured with an ultrasonic anemometer to check for max efficiency.

11. Investigate Passive Solar Design

Special window designs enable solar energy to be used for lighting or heating. Although the investment can be significant, the savings can be as well. Newer buildings are often better candidates for this solutions.

12. Renegotiate Your Gas Contract

How long has it been since your company renegotiated its gas contract? If your company is a significant consumer, your gas provider should be motivated to keep you happy and open to negotiation. Inquire if there are any discounts available that your plant or warehouse is not taking advantage of. Or, simply ask them to suggest ways you might reduce your bill. They might have some good suggestions that we have missed.

13. Develop a Maintenance Plan

Develop a maintenance plan to ensure that your heating and cooling methods remain energy efficient. Include a schedule for changing filters for heating and cooling units; checking outdoor units for weeds or other potential hazards; and having air units, furnaces, and temperature control systems professionally serviced.

Measure Your Gas Usage and Savings

To measure how much gas your plant is using and how much you can save, it helps to have an understanding of how gas is measured. Energy is measured using BtU (British Thermal Unit). BTU is the amount of heat that's required to raise the temperature of a pound of water at maximum density. A BTU is the same as 1055 joules. One joule of energy can be used to lift one pound of water by around nine inches.

Read your gas bill carefully each month and monitor increases and decreases. Track not only month-to-month changes, but also compare to the same period the previous year. If you implement one step at a time, you can see how effective each improvement is. This will motivate you to implement more of the steps.

Success Stories

By taking just a few of these steps, you could see tremendous savings within a month or two. Here are some success stories to encourage you to start implementing...

Saved $80,000 per year. One company owned a facility with two boilers and more than 300 steam traps. They were producing 25,000 tons of chemicals annually. By taking a few of the steps above they reduced their annual energy by 27.3 billion BTU, a 17% decrease. The money they spent implementing the changes was made back in less than two months in the form of lower energy bills. The benefit to their annual bottom line: $80,000!

Saved $450,000 per year. This small manufacturer, an employer 300, reported savings of $450,000 after taking a few of these steps.

Need further motivation? Here are the average savings in the industrial sector

- 25% from inspecting and improving process heating systems
- 20% for steam systems
- 18% for motor systems
- 20% - 40% from the implementation of dividers as thermal barriers- See how much you can save with our Energy Savings Cost Calculator (www.steelguardsafety.com/energy_savings_calculator.htm

These companies not only cut their energy consumption, they also enjoyed increased productivity, less downtime at their facilities, safer work environments, and improved employee morale. The intangible benefits from improving energy efficiency can often be just as significant as the tangible, bottom-line benefits.

After applying some or all of these tips, you'll experience tangible savings that will improve your company's bottom line for many years. Enjoy profits – even when gas prices are soaring!

How to get Started

1. Contact the Department of Energy to set up your free walk through Energy Audit and implementation plan.

2. Form a company-wide team to implement the plan. Delegate duties 2 threw 12 to members of this team.

3. Contact one of our experienced staff to help you identify areas where our temperature control solutions can help.

4. Conduct a second audit to evaluate your progress.