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# PALLET ENTERPRISE

## Power Play

# How W5H Helps to Reduce Energy Usage and Energy Cost



By Ralph Russell

Like many things in life, finding ways to save money on your power bill starts with asking some key questions. The key to this process is W5H. What is W5H and how can it help you discover energy solutions for your pallet mill or sawmill? Who uses W5H to reduce energy usage and energy cost? When and where is it appropriate to use W5H?

Well, let's explore the answer to those questions because it may be able to save you a lot of money when it comes to your plant's energy bill. W5H stands for who, what, when, where, why, and how! The following questions need to be asked about energy at your company:

1. Who is in charge of managing energy usage and cost?
2. What is the cost of energy and what are the available rate tariffs?
3. When is energy used?
4. Where is energy used?
5. Why is energy being used?
6. How much energy is used?

Now let's explore these questions one at a time so that you can start to develop a strong energy savings strategy.

### **Who Is the Energy Boss?**

Who in your company is responsible for managing energy usage and cost? Does this person even exist? Are energy bills just sent to accounts payable to be paid without any review? In some businesses an energy team has been formed to manage energy. Members of this team might include people with titles such as plant manager, foreman, operations director, energy manager, sustainability officer, purchasing agent, chief financial



officer or manufacturing director. In smaller organizations, this might be a team of one.

You need somebody to watch over this area and champion your cause. If you don't look for savings, don't expect the energy company to just give it to you.

### **Are We Paying a Fair Rate?**

After determining who has responsibility for energy management in the organization, the cost of energy needs to be determined. Create a spreadsheet or use a software program, such as EnergyCAP ([www.energycap.com](http://www.energycap.com)), to monitor energy usage and cost each month. This baseline is important to determine the success of energy management initiatives and to eliminate billing

errors. It will also help identify inefficient facilities and improve energy cost budgeting.

### **When Are Your Peak Hours?**

Businesses must determine when energy is used. The first step is to look at energy consumption on a monthly basis for the past 12 to 36 months. This analysis will help you to determine when during the year that you use the most energy. It will also help to determine if certain business cycles or the weather impact energy consumption.

After looking at monthly energy consumption, take a look at daily energy consumption. Depending on the size of your operation and the utility meter installed, interval data on a half-hour or 15 minute interval may be available from

the utility provider. If this detailed metering data is not available, estimate when energy is being used. Look at equipment start and stop times. For a typical pallet mill/sawmill that operates one or two shifts, the daily energy use profile or load curve is bell shaped. Most of the energy consumption is during the day and little is used at night. The load curve for an industrial or 24/7 operation would be almost flat with consumption around the clock. What does your load curve look like?

In many cases, energy cost can be reduced by shifting load from the “on-peak period” which is typically during the day to the “off-peak period” which is usually at night. As an example, shifting a portion of your operation to a second or third shift during evening hours or weekends might reduce energy cost.

### **Where Do You Use the Most Energy?**

Where is energy used? How can you reduce energy if you don’t know where the energy is being used? In a typical pallet plant, motors, air compressors, and kilns are the largest consumers of energy. Perform a basic energy audit to locate and record the nameplate data for each piece of energy-consuming equipment in a database.

Has more efficient equipment been developed since your equipment was in-



stalled years ago? More efficient motors, lighting and methods of pallet mill operation are always being developed. In some cases it may be financially sound to replace equipment before it fails to cash in on improved efficiencies. Utility rebates for more efficient equipment also helps to improve the return on investment. Energy related incentives and rebates can be found at the Database of State Incentives for Renewables & Efficiency website [www.dsire.org](http://www.dsire.org). MotorMaster+ International can help users evaluate repair/replacement options on a broad range of motors. Find out more at [http://www1.eere.energy.gov/manufacturing/tech\\_assistance/software\\_motormaster\\_intl.html](http://www1.eere.energy.gov/manufacturing/tech_assistance/software_motormaster_intl.html).

### **Why Is Energy Used in Each Part of Your Operation?**

Why is energy being used? What is the purpose of each piece of equipment? Is equipment being used when it could be shut down? Is the optimal kiln temperature and drying time being used? Is equipment being left on during lunch? Is the air compressor turned off at night and on weekends?

Take a look at why energy is being used at each location and determine methods to reduce the energy consumption. It is estimated that a 1/8 inch diameter hole in a 100 psi compressed air system can cost you more than \$1,200 per year in wasted energy. Imagine how much energy and dollars you could save if all of the compressed air leaks in your pallet mill were eliminated. Here are some air compressor energy saving tips: <http://www.mntap.um.edu/greenbusiness/energy/82-CompAir.htm>.

Use of kiln heat exchangers to preheat outside air, improvement of kiln fan efficiency, use of an adjustable speed drive for the fan and proper kiln maintenance to ensure uniformity of the drying environment will help improve kiln energy efficiency.

### **How Much Energy Is Being Used?**

How much energy is used? After determining who will have responsibility for energy management and determining the cost of energy, the next task is to determine how much energy is being used. Creating a baseline of energy con-


sumption for a 12 to 36 time period is important to determine how operational changes, weather, new equipment installation and energy management projects impact energy usage.

### **Energy Baseline & Monitoring**

Whether you use a self-generated spreadsheet or a commercially available software package such as EnergyCAP, develop a method to create an energy usage and cost baseline. Then continue to add data to the system on a monthly basis. While important, creating a baseline is looking at energy consumption in the past. Looking at energy real-time will significantly increase your ability to control energy consumption and cost. If you advance to real-time energy monitoring, sub-metering different manufacturing areas or pieces of equipment can also be helpful.

### **Realizing Savings in Your Operation**

Remember the W5H strategy for reducing energy usage and cost. Who, what, when, where, why & how are the keys to a successful energy management initiative. I once heard of a company with a \$1 million per month energy bill that had someone assigned to monitor cell phone usage but did not have anyone managing its energy.

Most companies have a human resources department to manage the organization’s human capital, a finance department to manage money but no one to manage energy. Consider developing an energy team, even if it is a team of one or two. The results of asking the W5H questions may have a dramatic impact on your bottom line. eDiscoveri is prepared to help your organization discover energy solutions and to be your energy manager “on demand” when needed. 

**Editor’s Note:** *Ralph Russell is president of eDiscoveri, an energy consulting service designed to help companies save money and improve plant efficiencies. Russell formerly worked as a key account manager for Dominion Virginia Power. He can be reached at (804) 291-7667 or email [rwrussell2@eDiscoveri.com](mailto:rwrussell2@eDiscoveri.com) or visit [www.eDiscoveri.com](http://www.eDiscoveri.com).*