

# E-Notes

## Energy Efficiency Notes

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### Ten Steps to Energy Efficiency

#### Background

Just do it!

So goes the slogan for a famous running shoe company.

Achieving energy efficiency in a facility, however, is more than just doing it. There are a number of time-proven steps developed to help you implement a sound energy management program. Rushing off without a plan or a set of objectives will often result in disappointment. In your own home, you can “Just do it”; in an organization a multi-step group of activities will **almost always** be needed to achieve success with energy efficiency.

This E-Note outlines a ten step program that has proven successful. Go for it!

#### Ten Steps to Energy Efficiency

##### **Step 1. Secure the approval of senior management.**

A program to reduce energy use **must** be approved by senior management. An effective program will involve serious capital expenditures with payback periods over a number of years, and the full support of senior management is essential.

A “lone ranger” approach in which one person tries to do everything without upper management approval will not be very successful.

A good energy management program will likely involve changes in almost every room in every building; senior management must be on board.

Some of the arguments that work with senior management are the following:

1. The return on investment is attractive.
2. Some of the newer, more efficient equipment has some labour savings. For instance, new exit light bulbs last a minimum of ten years without replacement; newer T8 light fixtures with electronic ballasts and silver reflectors often have half the lamps and half the ballasts of

- older light fixtures.
- 4 Some retrofitting is inevitable because of the changeover from CFC type refrigerants.
  5. Saving energy in one part of a plant may free up energy supply capacity such as transformers for plant expansions.
  6. Reducing energy waste is good for the environment and demonstrates good corporate citizenship.

### **Step 2. Appoint a person who will champion the process.**

The dictionaries define a champion as “a valiant fighter, someone who fights for a cause or another person.”

As a champion you will need a goal-oriented people person, someone who can work with a variety of people and motivate them. Armchair philosophers are **not** recommended for the champion’s position. The person need not be technically oriented, but should have an interest in practical energy savings.

### **Step 3. Where appropriate, appoint a steering committee.**

In larger organizations, communication and implementation can often greatly be improved through use of a steering committee. If your organization has an environmental committee or a green committee, a similar type of group can be used. Perhaps some of the same members can serve on an energy management committee.

### **Step 4. Set realistic targets for the program.**

A useful target for a program is to implement energy management projects that have a rate of return or payback period that is acceptable.

For instance, the target for the program might be expressed as follows: “Our organization will implement all energy efficiency measures with a simple payback period of X years or less.”

The simple payback period is equal to the installed cost of the measure divided by the first year savings. For example, if a project cost \$9000 and had an energy saving of \$3000 the first year, the simple payback period would be three years.

What is an acceptable simple payback period? Standards for acceptable payback periods vary according to the current interest rate, and the type of organization. Some organizations will accept projects with simple payback periods up to seven years. Other organizations will only accept simple payback periods that are much less.

There are a lot of energy efficiency measures available today with payback periods less than three or four years.

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December 2, 1997

### **Step 5. Secure an energy audit of your facility with recommendations for improvements.**

The Saskatchewan Building Energy Management Program can provide energy audits for a nominal fee. For small buildings the cost of an audit is approximately five cents per square foot of the facility. For buildings larger than 15,000 square feet, the cost per square foot declines.

A number of the energy service companies (ESCOs) and some consulting firms can also provide energy audits.

A good audit will document all the energy using equipment in the facility, and make specific recommendations for cost-effective energy retrofits.

Typical energy measures that have proven cost-effective include the following:

1. Lighting upgrades and delamping
2. Space heating system and air-conditioning system tuneups
3. Ventilation system upgrades
4. Programmable thermostats
5. Scheduling of the startup and shutdown of seasonally-operated equipment to minimize electrical demand charges
6. Scheduling of daily energy use to minimize peak electrical demand charges.
7. Power factor correction on electrical systems
8. Air sealing and infiltration control
9. Attic insulation, if the attic is accessible
10. Electric motor system upgrades--cogged v-belts, timer controls, and replacement of standard efficiency motors with high efficiency motors where annual hours of use are high

Some measures that are usually not cost-effective are the addition of wall and roof insulation to an existing building, unless the roof or wall needs major repairs or replacement. The replacement of windows is also usually not cost-effective unless the window needs replacement. In addition, the replacement of equipment with low annual hours of use is also usually not cost-effective.

### **Step 6. Secure financing for the capital costs.**

There are a number of funding sources available:

1. Internal financing
2. Equipment supplier financing
3. Bank loans
4. Energy service companies

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### **Step 7. Get the audit recommendations implemented.**

A well written energy audit report will often provide enough information to proceed with small projects that can be done with existing staff. For larger projects, electrical or mechanical contractors with experience in the area of energy efficiency can be hired. For very large projects, a general contractor can be hired.

### **Step 8. Provide staff training.**

It goes without saying that the staff must be properly trained. Devices such as time clock controls, programmable thermostats, new lighting systems, and new motor drives all require that some staff training take place. Other simple ideas such as turning off unnecessary lights and equipment should be reinforced with all staff members.

### **Step 9. Monitor the energy savings.**

Energy use can be tracked using the monthly bills from the utility. Monthly energy use before and after the retrofit can be plotted on a graph to indicate progress in energy saving. Space heating use will vary with the coldness of the outdoor climate. One way to track the savings is to divide the annual space heating energy use by the annual heating degree-days available from Environment Canada. Annual heating degree days can vary by about plus or minus 15% in Saskatchewan. Unless you correct the space heating numbers to account for colder or milder winters, some errors will occur in assessing the real benefit of the energy conservation measures.

### **Step 10. Provide feedback to management and rewards to staff.**

Senior management will want to be kept informed of progress with the energy measures. Regular reporting of energy savings will help the project along, and also build good will toward the program.

## **Points to Watch**

Almost all of the above ten steps will be needed if the energy management plan is to succeed. There is an old saying "those who fail to plan, plan to fail." There is also an old saying to watch out for the "paralysis of analysis." The energy savings are out there. Go for it!