

**IETC 2005 – Industrial Energy  
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**Energy Conservation Fund:  
Helping Corporations Develop  
Energy Conservation Strategies  
and Reduce Utility Costs**

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**ABSTRACT**

Energy conservation projects can save companies significant money over time and often pay for themselves very quickly. This is especially true with the dramatic increase in energy costs over the past few years. Yet convincing corporate decision makers of their value is challenging, since most plants with limited capital tend to direct resources toward projects that increase production rather than toward those that save energy. The irony is that production projects may not realize savings if markets change, while conservation improvements usually change a plant's infrastructure in ways that ensure continued savings.

Establishing a business unit or department focused on energy cost reduction and investing its profits in an Energy Conservation Fund (ECF) is part of a total energy approach that helps corporations identify projects, dedicate funds and implement changes. It makes conservation improvement projects more attractive on the front end, so companies can enjoy the long-term benefits.

**PAPER**

You probably have heard the expression, "It depends on how you look at it." Take conservation, for example. Historically, most organizations have looked at cost reductions due to energy savings as a bonus rather than viewing conservation as a profit center that deserves direction and dedicated resources. That perception is changing. Many companies are starting to view energy projects as a way to directly improve the bottom line and are willing to allow a lower hurdle rate for payback. One major food processing company has set a hurdle rate of three-year simple payback for production products and four years for energy projects.

The challenge often lies in setting aside funds for conservation improvements. One way to begin is by establishing a separate department or business unit within your organization with a defined budget and clear goals for conservation projects—let's call it an Energy Cost Reduction Company (ECRC). Like any company, your ECRC would evaluate all projects and select the ones that: 1) showed the best return and 2) stayed within its budget. Its profits would be reinvested in a revolving Energy Conservation Fund (ECF), making resources available for future improvements.

Illustration 1 shows the five-step process for starting and operating an ECRC:

**Illustration 1. Five Step Process for a Corporate Energy Cost Reduction Company**



3 years).

Benchmarking is also very important to determine if your ECRC is successful. Many variables could affect the results of your plan. Actual benchmarking will vary from plant to plant, depending on the process, location and set goals. For instance, if your plant changes its operation to increase production, the energy consumed will most likely increase, as well—if the only benchmark is total energy consumed, the energy savings will be understated. On the other hand, if the benchmark is solely energy cost, an increase in utility rates or fuel cost adjustment could adversely affect the energy savings results. A change in the plant's operation also could shift the energy cost if more process was completed during peak periods.

It is best to look at a good base year for the benchmarking. Use a year that is consistent with normal operation. Track the total energy used in the year for both natural gas and electricity. If you use propane or fuel oil, it is a good idea to track that, as well, since it may be good to switch fuels at some point in time to reduce costs. Also the production numbers should be tracked showing the total Btu used per unit produced.

### STEP 3 – DEVELOP A PLAN

Take an overall approach to best reduce energy costs. There are two ways to lower your energy costs—reduce the unit cost and reduce the amount consumed. Items that influence the unit costs of energy are classified as the energy "supply" functions. Reduced usage and efficiencies are classified as energy "demand" functions. When developing an overall strategy to reduce energy costs it is important to remember that they are interrelated and consider both.

An example illustrates this concept: *ABC Company has hired an energy company to look at supply services, but has not informed it of plans to add a new production line. Because the utility is unaware of the pending operational change, it is unable to select the best tariff for the company, which could include a discounted rate for the increased load. Focusing on supply, while overlooking demand, is a costly mistake.*

A site visit is always important to understand an operation and how energy is used. There is only

### STEP 1 – CORPORATE COMMITMENT

So how do you get your ERCR and its energy conservation fund off the ground? The first step is corporate commitment. That includes seed money. Without a budget, this whole process will go nowhere. Your corporation needs to set a goal and assign a budget so the ECRC can start working on a plan to reduce energy costs. Decision makers have to realize that any energy savings will go directly to the bottom line, year after year. In fact, the savings will most likely continue to grow as energy costs continue to rise.

*EXAMPLE: If a company wants to increase the annual bottom line by \$100,000 through an energy project, it may have to invest \$300,000. The \$100,000 profit will increase by \$5,000 each year, assuming energy costs increase by the same amount. To achieve the same return through a new product, the company must spend time to research the product (\$20,000), test the market (\$10,000), invest in new infrastructure to make the product (\$300,000) and sell possibly 12 times the profit goal (\$1,200,000) in products to achieve the desired return. If all of these costs are added together, it really takes \$1,530,000 of overall costs and sales to realize the same \$100,000 profit.*

We have seen cases where a food company has launched a new product only to find the market wasn't there to sell it. So much for profits! An energy reduction project is guaranteed to save and grow.

### STEP 2 – SET GOAL

Once your organization has committed to this process, it is important to set goals and benchmarking criteria to measure the results of the new energy-saving venture. Numerous large companies have been able to save five to six percent of their energy costs over extended periods of time. While your organization must set its own goals, it is realistic to expect a five percent savings for each of the next three years. You will need to budget accordingly. If a company spends \$1,000,000 on energy each year and is looking for a three-year simple payback on projects, it will need to budget \$150,000 for each of the next three years ( $\$1,000,000 \times 5\% \times$

so much that can be done if you are trying to manage energy from an office.

The corporation also should be analyzed as a group of facilities as opposed to individual plants. In many cases, a similar project at several facilities can result in 20% savings due to economies of scale. If a company wants to implement an energy efficient buying program of motors they will get a better price for more volume. The same holds for energy reduction projects.

There are three distinct areas to consider when developing your energy management plan and implementing your program:

1. Supply
  2. Price volatility control (price risk management)
  3. Reduce energy consumption (demand side management)
- Following are suggestions for assessing these areas.

### **Supply**

1. Analyze each consuming location to determine the proper level of service - firm versus interruptible
2. Evaluate transportation options to each location
  - a. If only one option - DO NOT LOSE CONTROL
  - b. Develop strategy to minimize cost
3. Analyze each location to determine a competitive bid process to purchase the commodity
4. Review utility tariffs annually to insure the location is using the best tariff and maximizing all of the benefits, such as economic development rates (EDR), rebates, etc.
5. Develop an automated reasonableness test for all invoices, including levels of sales tax, franchise tax, etc.
6. Decide what will be done in-house and what will be out-sourced

### **Price Volatility Control (Price Risk Management)**

1. The purpose of price risk management (hedging) is to control volatile prices within a budget.
2. Hedging is NOT speculating. Not hedging is maximizing speculation.
- a. Crude oil: last 15 months \$28 to \$55; 96%

variation

- b. Natural gas: last 15 months \$4.80 to \$8.00; 67% variation
3. All "wild card" events (terrorism to energy production, nuclear or large coal generating plant unexpectedly shuts down, cold spell, hot spell, pipeline rupture, hurricane in the Gulf of Mexico) cause energy prices to spike. None cause them to go down
  - a. 65% of declared oil reserves located in the Persian Gulf region
  - b. 75% of the oil and gas supplies for the eastern United States could be halted by a few people never leaving Louisiana?

4. Determine your corporate risk aptitude and strategy.

- a. What is the financial impact of changes in the cost of energy to your bottom line?

5. Determine the hedge execution process.

- a. Physical forward price with the delivering physical supplier.

-Easiest to do

-Cost not transparent - most

likely the highest cost

- b. Physical swap transaction with a counter party (usually an energy marketing company)

- Cost known and agreed upon

by contract

- Contract complicated

c. Open an account with a commodity futures merchant.

- Lowest cost and most

financially secure.

- Impacts corporate financial

people.

6. Determine how to obtain and utilize fundamental and technical market data to facilitate price execution decisions.

- a. Industry publications

b. Use a futures trading advisor who specializes in energy

### **Reduce Energy Consumption (Demand Side Management)**

1. Perform a walk through energy assessment at all consuming locations with an experienced energy auditor looking at:

- a. Lights/controls
- b. Motors
- c. HVAC
- d. Refrigeration
- e. Compressed air
- f. Waste heat

- g. Steam/hot water
- 2. Experienced energy auditor:
  - a. Brings ideas and applications from other plants
  - b. Knowledgeable of utilities' audit reimbursement and energy conservation rebate programs
  - c. Knowledgeable of the most efficient energy products on the market.
  - d. Knowledgeable of equipment, especially auditors or engineers who focus on specific equipment like compressed air systems, steam systems, etc.
- 3. Identify potential projects, quantify savings +/- 20%, estimate paybacks and prioritize the project list
- 4. Implement the best projects
- 5. Decide what will be done in house and what will be outsourced.

#### **STEP 4 – IMPLEMENT PLAN**

Once you have gathered all of the data above, complete a priority list to track options and identify which areas should be implemented first. It is important to note that this is an ongoing process because market conditions both inside and outside the plant continuously change. That is why it is important to review and refine the priority list monthly. If the gas market caves and gas is being sold for \$3/MMBtu, the priority level of a steam trap audit may be lowered. If there is a new technology that can reduce energy substantially with a low payback, perhaps it needs to be added to the list as a high priority. In the planning stage, you determined how you wanted to implement the projects. Will this be outsourced on a turnkey basis, will you do all of the work, will you just manage the process or will you hire a company to manage the process for you?

#### **STEP 5 – TRACK AND VERIFY**

The final step is probably the most important. If you don't track and verify the savings, your ECRC will go out of business because the financial backers (your corporate decision makers) will not believe the results. Energy and production numbers should be tracked monthly to demonstrate the program's value. As changes occur—and they will—you must be flexible. Changes could include increased production or higher than normal fuel costs. If you have a good benchmark, all of these changes can be

accounted for so you can show the true results of the energy savings. The energy savings should also be converted into greenhouse gas reductions, which can be used to promote your company. A \$100,000 energy savings can also result in savings 835 to 1,366 tons of greenhouse gases or an equivalent of up to 150 homes.

#### **SUMMARY**

Establishing an Energy Cost Reduction "Company" (ECRC) with a revolving Energy Conservation Fund (ECF) can be great way to lower energy costs, reduce emissions, and improve the bottom line. Energy savings projects will continue to show savings year after year and in fact may actually increase in savings. This approach can help companies reduce energy costs by 10-15%, at a time when companies are looking for any way to reduce costs. This is a great way for companies to be socially responsible while improving the bottom line. It all depends upon how you look at it! □□