

PROCESS REENGINEERING FOR INCREASED MANUFACTURING EFFICIENCY (PRIME)

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THE NORTHEAST UTILITIES SYSTEM

Northeast Utilities is the parent company of the NU system (collectively referred to as NU). NU is among the 20 largest electric utility systems in the country, and it is the largest in New England. The company has 9,400 employees, serving 1.7 million customers, in 407 communities, covering 11,335 square miles in Connecticut, western Massachusetts, and New Hampshire.

Operating revenues in 1994 totaled \$3.6 billion on sales of 40 billion kWh. Sales to industrial customers accounted for 15% of revenues.

A BRIEF HISTORY OF NU'S DSM PROGRAMS

In the early 1980's, when Northeast Utilities developed its first Demand Side Management (DSM) programs, they resulted primarily from regulatory pressures to implement national and regional energy and environmental policies. Collectively referred to as *NU 80s/90s*, some of these rudimentary programs offered basic energy audits and limited services and rebates, but most of them were largely informational in nature.

In 1986, NU created *The Energy Alliance* to build on the DSM initiatives launched previously. Within two years, the company and the Conservation Law Foundation pioneered the "collaborative planning process" to support regulatory initiatives to design, implement, and monitor DSM programs. As the region's need for capacity increased to meet a sustained growth in electric demand of 4 - 5% per year, environmental and consumer advocates contended that a massive building program could not be justified until after the conservation resource had been more fully developed.

Accordingly, NU agreed to design a complete range of comprehensive energy efficiency programs that would shoulder most of the financial and logistical burden of efficiency improvements in customer facilities--an approach that was labeled "direct investment."

By 1991, after a decade of developing and marketing innovative DSM programs for its customers, NU's efforts served as a model for public and private utilities in the U.S. as well as overseas. Since then, our DSM programs have served virtually every segment of society, ranging from supplying free compact fluorescent light bulbs to low income customers, to rebating millions of dollars to industrial customers for energy efficiency improvements. Measured in more objective terms, all of NU's DSM programs combined have:

- served 300,000 customers, saving them over \$600 million in electricity expense
- lowered customer peak demand for energy by about 400 megawatts (6%)
- saved 7 billion kWh
- invested over \$400 million in customer energy efficiency measures
- reduced power plant emissions by 38,000 tons of sulfur dioxide, by 13,000 tons of nitrogen oxides, and by 6 million tons of carbon dioxide
- moved the need for new supply resources into the 21st century

In this presentation we will discuss a few Industry/Utility Partnerships--some very successful and one "less than perfect" case study from our DSM programs for large industrial customers, plus talk about our company's current marketing strategy with respect to energy efficiency in industry.

1995 DSM BUDGET

Our total DSM budget for 1995 is \$53 million. Today, NU's programs provide all of our customers--residential, commercial, and industrial--with information, technical expertise, installation services and/or financial incentives for conserving electricity in their homes and businesses. Where incentives are offered, they have been determined to provide both long-term benefits to our customers as well as acceptable payback levels on their DSM investments.

THE ENERGY ACTION PROGRAM

One-third of NU's DSM budget is allocated to the Energy Action Program (EAP), an energy efficiency retrofit program for our large commercial and industrial customers.

The original version of the EAP was introduced in January 1988, "to help customers reduce their operating costs by saving energy." But why would a utility company want to help customers save energy?

At the time, the correct answer was "to avoid the high cost of new power plants." Today, we realize that our customers are not very concerned about *our* need or desire to avoid the construction of new generating capacity. Customers are more likely to partner with those who can help solve *their* problems.

PARTICIPATION 1988-1995

In the seven years since the EAP was first introduced, over 1,200 projects have been initiated. Unfortunately, more than 500 of these projects have been canceled. Had we been concentrating more on satisfying our customers' needs rather than our own or public policy, maybe the dropout rate would have been less. Notwithstanding these pitfalls, about 250 projects eventually were completed, and about 450 currently are in-progress. Nearly \$57 million of cash incentives have been paid to EAP participants since 1988.

About 40% of our successful EAP projects are in the industrial market segment.

IT TAKES MORE THAN JUST OUR DOUGH TO HELP A BAKERY SURVIVE

The "less than perfect" example is a project that was initiated at a bread baking company in January 1990, at a time when we were just ramping up our new industrial energy conservation program. Others may learn from our mistakes with this particular case study.

This project was not prescreened using the same methodology or to the same standards that we use today. It included \$54K of lighting retrofits and a \$240K improvement to the customer's roll baking line, resulting in substantial reductions in the company's electricity bill.

The customer installed the process improvement measure and received an incentive check from NU for \$203K. A short time afterwards, the company ceased operations. Fortunately, in this case, the lighting retrofits were not done. Unfortunately, our \$203K "direct investment" in the process measure will never be recovered. Worst of all, the company is gone, and with it, all of the direct and indirect revenues associated with this once important Connecticut employer.

THE POWER OF CHANGE

In 1991, as part of a regionwide effort to restore economic vitality to New England, NU launched an economic development program based on energy conservation assistance and flexible (FLEX) rates for financially threatened commercial and industrial customers, and for customers planning to expand or move into our service territory.

One successful case study is a flexible packaging manufacturer, whose main offices and operations are located in our service territory, but who also has branch plants in three other states. This project was successful, primarily because we changed our marketing strategy, and offered a package of DSM incentives and temporary FLEX rates to help improve energy efficiency and retain the customer.

The customer was prescreened prior to offering them energy efficiency services. Their needs and concerns were determined up front. It was evident that the manufacturer was facing severe pricing pressures from its competitors and cost pressures from its own branch plants. They needed to reduce costs in order to stay in the state.

Process improvements that also generated significant cost savings were recommended. The project revolved around a new scrap plastic reclaim system that, coincidentally, was about the same cost as the bakery's oven improvement project. The customer installed the process improvement measure and received an incentive check for \$220K. Later, the balance of the project also was completed, and an additional \$171K in incentives was received.

A couple of years later NU would use a platform called *The Power of Change* to enhance its customer focus, become more market-driven, reduce its costs, expand its market share, and increase profitability.

HOW DO THESE CASE STUDIES COMPARE?

The contrast between these two projects is striking. In the first case, we were so focused on the conservation measure that we somehow overlooked the fact that the bakery was going out of business. The energy savings and the DSM incentive were of little consequence in helping to save the customer, and we had no other way of helping them at the time.

In the second case, we used a complementary set of FLEX rate incentives to help keep the customer from moving to Tennessee while the DSM project was being developed and installed. When the project was approached from an economic development and business retention perspective, rather than purely a DSM effort, it was successful in helping the customer to reduce its operating costs and become more competitive. In addition, we kept a manufacturer as a customer, and the town retained a significant employer and taxpayer.

THE POWER OF PARTNERSHIPS

During the past five years, and due in large part to the recession, NU discovered that many of its large commercial and industrial customers were considering relocation of their businesses and factories elsewhere. Facing the loss of more jobs in the region and a loss of customers, NU contemplated how to "partner" with these companies to keep them in our service area.

While the original objective of the EAP was to help customers become more energy efficient, it was found to be an even more effective tool for enhancing the overall economic condition of businesses. In fact, energy efficiency by itself holds a relatively low priority with industrial customers. The cost of electricity is less than 5% of total product costs for more than 90% of manufacturers. These companies are more concerned with process improvements that will increase productivity, quality, environmental compliance, and market share. By showing industrial customers how other process inputs as well as energy can be optimized to increase profits and increase their competitiveness, a lasting and profitable partnership can be developed.

PRIME

In 1994, NU launched a new program called PRIME (Process Reengineering for Increased Manufacturing Efficiency). This program provides productivity audits for selected industrial customers, and draws on the engineering expertise of outside consultants for identifying industrial process improvements. NU then works with the customer to develop ideas on how to improve their manufacturing efficiency. Some of the recommendations may save energy and qualify for financial incentives under the company's various DSM programs.

Through the PRIME program, NU works with its industrial customers to form an audit team to apply process analysis and reengineering techniques to identify process changes that result in significant improvements in the areas of:

- energy utilization (including non-electrical)
- raw material utilization
- labor productivity
- environmental compliance
- product quality
- increased capacity
- process optimization
- identification of new process technologies (including electrotechnologies)

A PRIME EXAMPLE OF A SUCCESSFUL INDUSTRY/UTILITY PARTNERSHIP

The third case study represents our current industrial DSM marketing strategy, which is more customer-focused and is embodied in the PRIME program.

An EAP/PRIME project at a battery manufacturing company will be reviewed, where the customer benefits include not only energy efficiency, but manufacturing efficiency improvements that significantly improve the customer's competitiveness.

Since the programs were offered in April 1993, the customer has successfully consolidated plant operations from 262,000 square feet to 140,000 square feet, while increasing its manufacturing capabilities by 25%, significantly increasing manufacturing productivity, and reducing their overall energy usage by 30%.