INDUSTRIAL COMPETITIVENESS: UTILITY/INDUSTRY PARTNERSHIP SUCCESSES

By William M. Smith

The EPRI Partnership for Industrial Competitiveness (EPIC) has succeeded in forging alliances between electric utilities and firms representing a dozen key industries. EPIC follows a recipe that recognizes the need to identify and prioritize the opportunities that industrial firms have to increase their competitiveness through environmental, efficiency, and productivity gains. The program addresses the fact that industrial firms generally value compliance with environmental regulations and productivity measures (like product quality/throughput) far greater than energy efficiency. Also, since most utility energy efficiency programs for industrial customers encompass generic end-use technologies like lighting and motors, they miss the potential locked up in the manufacturing processes that account for 90% of industrial energy use.

SUCCESS DEPENDS ON COMMON GROUND

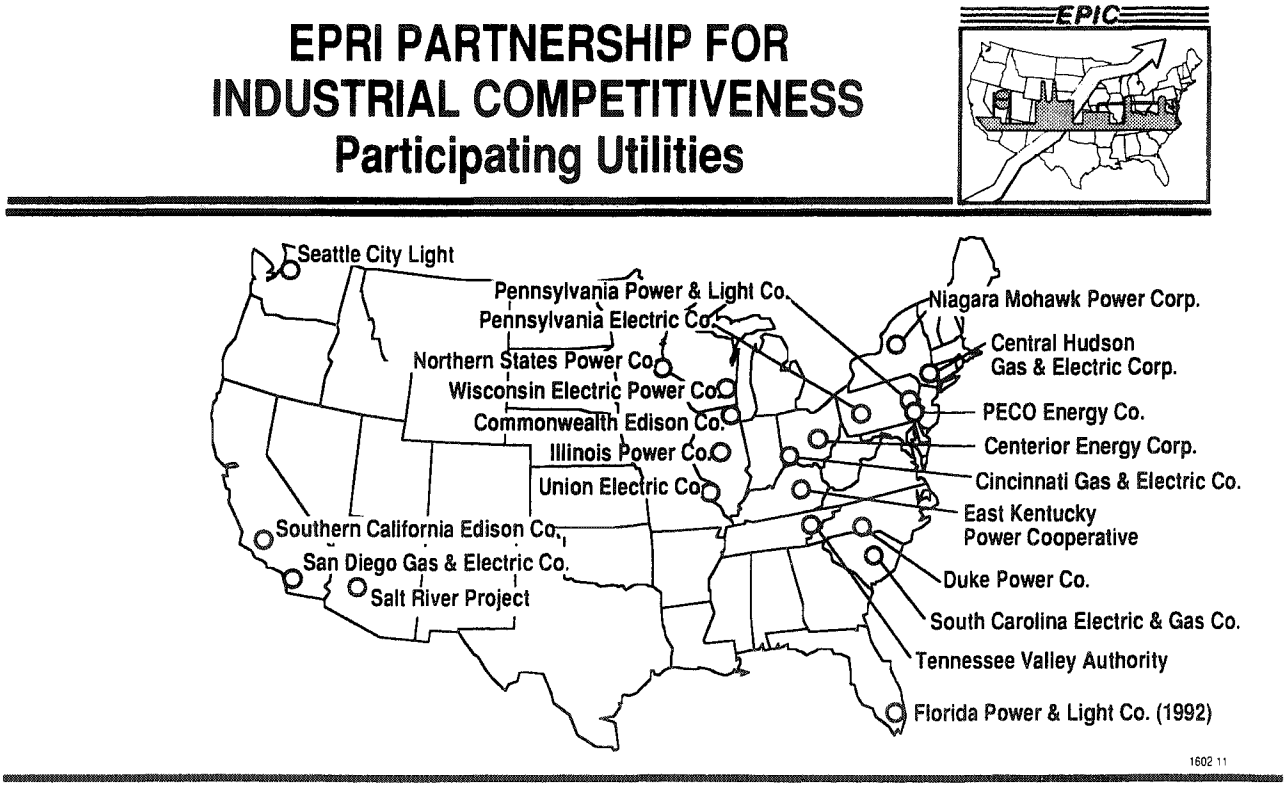
EPIC's success rests on its ability to uncover win-win opportunities that represent common ground between the two divergent sets of priorities held by industrial firms and utilities. It is crucial to build on this common ground to meet the program's bottom line: industrial customers taking action on the opportunities identified to achieve competitive advantage. Further, the highest priority opportunities, having the greatest potential for improvement at the industrial plant level, must be given the greatest consideration. It is here that EPIC represents a new paradigm — a top down, holistic, strategic examination of plant activities, rather than isolated and sporadic evaluations of individual specific improvements. While the latter approach may result in a stand-alone success, the improvement in question may rank 6th or 10th on a strategically derived list. The industrial firm then runs some risk that the isolated activity would divert attention and resources from opportunities of higher priority regarding overall plant success — possibly to the point where plant closure becomes inevitable a few years later. EPRI believes it is much better to forego the battle for the war.

Establishing common ground for forging win-win alliances between utilities and industrial firms requires understanding the business priorities each follows. Electric utilities are (decreasingly) regulated energy companies; the greatest social good they can provide is to promote the efficient use of electrical energy. Therefore, energy efficiency and demand-side management (DSM) have become hallmarks of the industry. Environmental issues follow closely, not only for their own operations but, especially in non-attainment areas, for their customers as well. Customer service has also become an increasingly important issue as utilities move into a competitive business environment. The recent activity regarding retail wheeling in several states will continue to fuel this emphasis on customer service.

Industrial firms value safety most highly, followed by meeting compliance requirements of environmental regulations in the most cost-effective manner, and then productivity, with energy efficiency generally trailing by a good margin. The reason industrial customers place energy efficiency/DSM low is simple: for most firms, energy accounts for less than 5% of their total costs. The forgoing discussion suggests that the best way to bridge utilities with industry is to package energy efficiency/DSM with solutions to problems involving the environment and productivity.

The electric utilities (see map) that have banded together with EPRI have found that the EPIC recipe can indeed provide the results desired. Case studies described later exemplify the benefits achieved

(and achievable) in the form of customer relations, technical applications, and reduced cycle time for implementation.



HOW EPIC WORKS

The EPIC initiative currently has 21 participants, with a goal of 30. The utilities can participate for one or more years; specific sets of industries, defined at the 3 or 4 digit SIC (Standard Industrial Classification) code level, are associated with each year of participation. Participants use the tools developed — Industry Manuals, Action Guides, and Plant Surveys — to help their industrial customers boost productivity, improve efficiency, and minimize waste. Table 1 shows the industries already addressed, and the industries planned for the future.

Table 1: Industries Encompassed by EPIC

Already Covered	
Dairy Processing	Chip Manufacturing
Plastics Fabrication	Foundries
Metals Fabrication	Textiles
Pulp & Paper	Printed Circuit Boards
Plastic Resins	Forging/Heat Treating
Copper Processing	Printing

Targeted for the Future	
Baking	Refrigeration Machinery
Canned/Frozen Foods	Engines Turbines
Brewing	Industrial Gases
Carbonated Beverages	Household Wood Furniture
Meat Products	Computer Equipment
Metalworking Machinery	

- *Industry Manuals* provide utility marketing personnel with technical and business information about specific industries. The Manuals give utility marketing personnel an understanding of their industrial customers' operations, as well as greater credibility when interacting with these customers.

- *Action Guides* offer utilities and their industrial customers information on environmental, efficiency, and productivity opportunities likely to be present in specific plants of an industry. They also identify key factors to include in evaluating the reasonableness (e.g., payback period) of implementing changes.

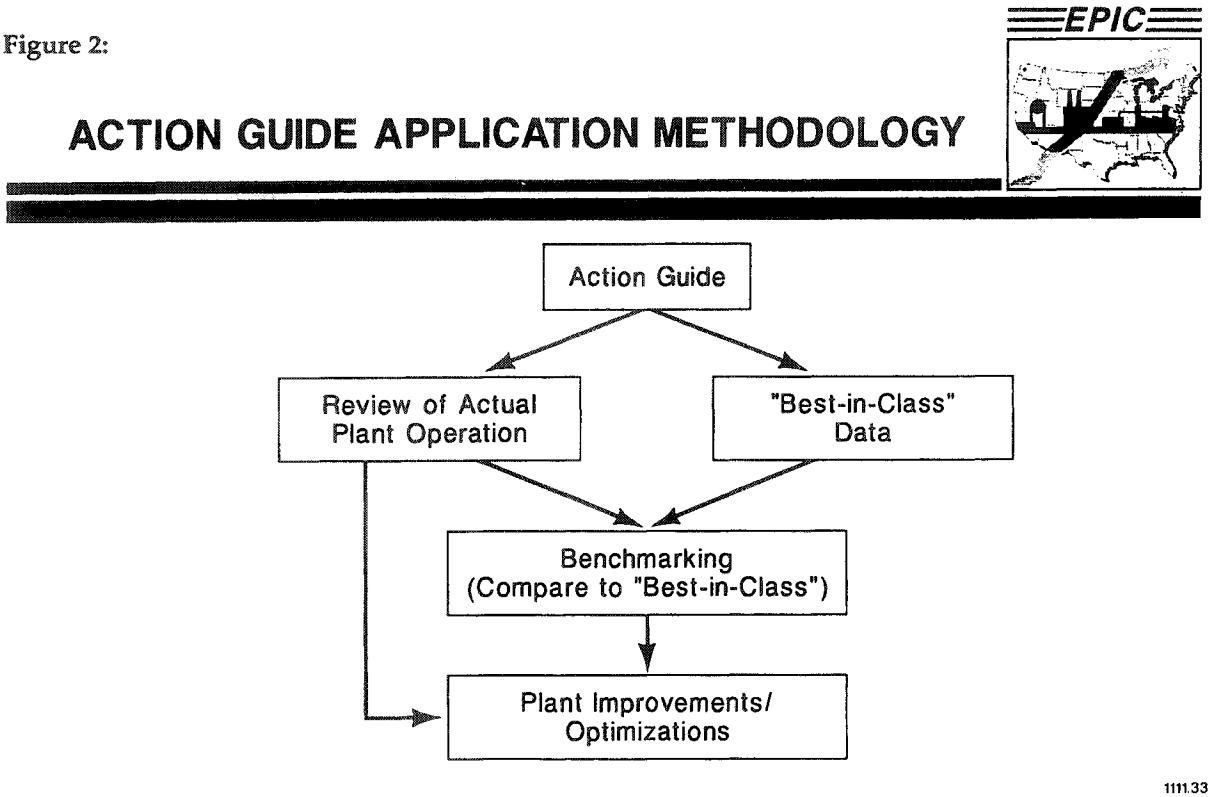
- *Plant Surveys* performed by EPRI-sponsored teams — consisting of utility and industrial plant personnel as well as qualified consultants — present specific customers with prioritized recommendations for improving competitiveness in a global economy. These efforts, involving two days on site, include customer personnel as team members to build customer receptivity regarding the implementation of identified improvement strategies. So does asking the customer to review and comment on early drafts of the recommendations.

Figure 1 shows the elements of the environmental, efficiency, and productivity areas addressed under EPIC. Figure 2 illustrates the steps involved in applying the knowledge resident in each Action Guide to produce recommendations for enhancing competitiveness.

Figure 1: Key Factors That Action Guides and Plant Surveys Consider

Productivity	Environmental Impacts	Efficiency
√ Equipment	√ Waste Minimization	√ Electrotechnology Alternatives
√ Quality—Yield/Rework	√ Waste Treatment	√ Demand-Side Management
√ Manufacturing Processes	√ Recycle	√ Energy Source Options
	√ Recovery	

Figure 2:



PLANT SURVEY RESULTS—THREE CASES

Applying the EPIC approach has resulted in a number of cases where significant benefits have accrued to utilities and their industrial customers. As a general benefit, reports of improved customer relations — sometimes quite dramatic — have occurred. In one instance, a customer had previously expressed its displeasure with the electric utility in a letter to the utility CEO. After participating in a plant survey and working with the utility to evaluate and implement some of the recommendations received, the same customer now sees the utility as a key ally. In another instance, the relationship between the utility and the customer has grown from moderately good to where the customer now argues with the utility marketing representative about who's going to take whom to lunch! And, the customer frequently initiates the contact.

The following examples illustrate recent EPIC successes associated with the implementation of plant survey recommendations by industrial customers.

Plastics Fabrication

PECO Energy and one of its customers, a plastics fabricator manufacturing several lines of blow molded plastic products, performed a plant survey in October, 1993. Of the various opportunities identified, the customer has already moved forward on three.

Quick Die Changes — a Just-In-Time (JIT) technique to enhance productivity that can reduce the time to change molds in the blow molding machines — from hours to less than 30 minutes — is expected to result in a 30% to 50% reduction in the inventory buildup associated with long production runs, that helps carry through idle periods when die changes are performed. This action will free up floor space for other purposes and avoid carrying charges connected with idle product. In many instances this change in operating practice can also avoid the capital investment needed to have additional blowmolding machines available to meet product demand while the machines undergoing die changes stand idle. This latter situation applies most to plants with product lines that normally involve short production runs.

Barrel Insulation — raw plastic is heated using electric resistance bands around the circumference of the barrels. Surrounding the barrels/bands with insulation represents an energy efficiency measure that will save 20% of the energy use associated with the 6 heating barrels at the plant.

Infrared (IR) Heating — replacing incandescent banks of 8 kW incandescent lamps, used to maintain/increase the temperature of "preform" bottles queued for later blowmolding, with tuned IR lamps, can result in a 50%-75% energy efficiency improvement. This savings is realized because IR lamps heat the plastic through direct radiation, whereas incandescent lamps heat the air more than the material. This action translates into an $8,000 to $10,000 annual savings per blowmolding machine, or at least $50,000/year since 6 machines are generally on at any one time. The payback period will range from 3 to 6 months because the lighting fixtures do not have to be replaced, only the lamps. The only other minor capital investment is a voltage regulator to assure even IR output at the desired level of heating.

Copper Processing

Salt River Project (Phoenix, AZ) performed a plant survey with one of the copper processors in their service territory in August of 1993, identifying eight opportunities for well-defined savings or operational improvements, of which one has been implemented, and two are being actively considered for implementation.

Finer Screens for Crusher Discharge — producing a finer crusher discharge through the use of smaller screen openings coupled with tighter crusher settings on ball mill feed results in a productivity increase of 3%, with no increase in electricity use. This implemented action will yield a 840 kW and 6.9 million kWh offset annually, or $340,000 a year at current rates (payback in less than one year).

Consolidating Ore Feeds — by shutting down one of two underloaded mills, and diverting the ore feed to the other, this change can eliminate the need to operate one pump and one mill drive, reducing demand by 400 kW and reducing energy use by 3.3 million kWh/year, or $160,000 annually (payback also less than a year).

Titanium Anodes for Copper Deposition— a recommendation that may soon be the subject of a mobile test program at several operations, it involves replacing lead anodes currently used for deposition of copper from purified acid leach solutions, providing an environmental benefit by avoiding hazardous waste. This waste consists of sludge containing lead from anode deterioration (and cobalt from the cobalt sulfate used to stabilize the lead anode) in the conventional process. A productivity benefit accrues because lead now migrates into the deposited copper during the conventional process, weakening the metal structure and resulting in a lower strength final product (e.g., wire). This action would have an energy efficiency benefit of 370,000 kWh annually, or 15% of the energy normally consumed. Total annual savings would be $770,000 per year with a payback of just over two years.

Metals Fabrication

Based on the plant survey conducted in October, 1993 by a utility in the northeast for a metals fabricator, several recommendations were pursued.

Changes in Plant Layout and Process Flow — this JIT principle helped improve productivity by altering production practices from staged batch processing to continuous flow. Work in progress piles have disappeared, reducing both floor space utilization and production cycle time.

Activity-based Costing — instead of using standard costing with generic multipliers to derive product prices, this more suitable accounting practice helps determine the true cost of producing a product. By comparing such costs to the price the products will bring in the marketplace, the fabricator can now better weed out poor profit products and avoid overpricing good products. For a plant producing over 1000 independent products, this change will greatly enhance its competitiveness.

Concurrent Engineering — integrates design, manufacturing and marketing of a product from start to finish, greatly reducing the time involved to bring new products to market, a major competitive advantage.

(Proposed) Powdered Paint Coating with Infrared Drying — plant management has proposed to its parent company the purchase and installation of an automated system that dries powdered paint coatings using infrared technology. This recommendation demonstrates the energy-source neutral focus that EPIC takes regarding what's best for the customer; the proposed IR drying system will be gas-fired.

Workspace Ergonomics — the plant has concerns about physical strains on employees, associated with their current workspaces. Plant management would also like to boost productivity through improved employee comfort and assuring all tools and parts are within easy reach. To build employee spirit and accomplish these goals, the manufacturer has begun a design-your-own-workspace contest, with financial rewards for the best ideas proposed by employees.

Faster Implementation

The teaming by utilities with their industrial customers has produced an additional generic benefit. The time scale, from presentation of Plant Survey recommendations until implementation activities begin, has generally been less than 6 months, rather than the 1 to 2 year periods normally experienced in association with similar efforts conducted without utilities playing a role.

ADDING UP TO SUCCESS

Clearly, the involvement of utilities as catalytic agents in advancing the competitiveness of American industries contributes great value, as shown by the efforts of the electric utilities participating in EPIC.

The success underscores the opportunity for all U.S. utilities — electric, gas, water, telecommunications, etc. — to become formidable allies in providing competitive advantage to industrial firms. They can do this by teaming with industrial customers to address environmental, efficiency and productivity concerns. Everybody wins.

An opportunity also exists for federal and state agencies to collaborate with utilities. These agencies can effectively take advantage of established utility customer relations channels to obtain first hand knowledge of industrial needs, as well as to disseminate technical solutions to identified problems. The key to success, it seems, lies in partnerships. The joint DOE-EPA effort on the Climatewise program, which would provide recognition to firms that show dramatic decreases in environmental impact, is a step in the right direction.

EPIC serves as a model for streamlining the development and demonstration of technologies and techniques that enhance competitiveness. The approach opens the door for moving from prescriptive, broad-based programs presumed applicable to the entire industrial class (e.g., efficient motor rebates), to programs that concentrate on opportunities specific to individual sectors and customers. It represents an early move to "mass customization" of improvements that can snowball into widespread bottom line advantage to our nation's industrial base, if more agencies become involved.

Certainly, for electric utilities, the ability to positively influence the customer relationship (ever more critical as retail wheeling practices emerge) — as well as energy efficiency and load shapes — of the industrial firms they serve will greatly enhance utility competitiveness. This influence can only be achieved by helping these firms deal with global competition while meeting the requirements of increasingly stricter environmental regulations. This what will motivate industrial firms.

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