



Supply Side Management Kit

Services for Energy Suppliers and Process Industry Customers

TE-114024

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ABSTRACT

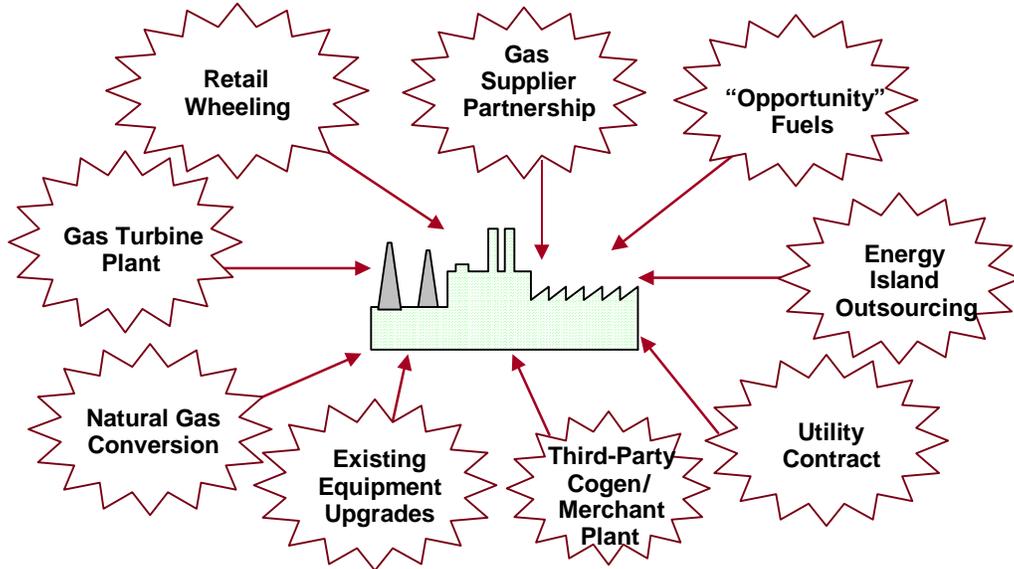
The Supply Side Management Kit highlights proposed EPRI's services for energy suppliers and process industries in the supply side area. With the onset of electricity deregulation, process industry customers are increasingly looking at reducing energy costs on the supply of energy. The new environment has created significant opportunities for cost-effective purchase, management, generation, utilization, and sale of energy for process industries. This kit discusses the services offered by EPRI to meet its customers' needs in power procurement, fuels portfolio structuring, powerhouse asset valuation, merchant cogeneration, and risk management.

INTRODUCTION

The objective of this kit is to highlight EPRI's services in the energy supply side area. Until recently, EPRI's focus has been on helping process industry customers reduce energy cost on the "end-use" or demand side. EPRI has built a considerable track record in this area and its services include Pinch Technology, load management and peak shaving, steam system balance, analysis of electric and steam drives, and application of electrotechnologies such as Mechanical Vapor Recompessors (MVR's), ozonation, electrosynthesis and membranes.

With the onset of electricity deregulation, process industry customers are increasingly looking to reducing energy costs on the supply side. The new environment has created significant opportunities for cost-effective purchase, management, generation and sale of energy. The new opportunities also come with risks.

Supply Side Options



What should the optimal strategy be? This kit discusses the services offered by EPRI to meet your needs. The organization of each opportunity consists of a description, EPRI services, the audience for whom the services are intended and representative benefits. Also presented are case studies where such services were performed by EPRI consultants.

The following items are covered in this kit:

- Competitive Power Procurement
- Fuels Portfolio Structuring
- Powerhouse Asset Valuation Services
- Merchant Cogeneration
- Risk Management

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COMPETITIVE POWER PROCUREMENT

Description

As industrial customers begin to buy electricity from third-party suppliers, many are discovering that deregulation does not necessarily result in reduced costs. For some, poorly negotiated contracts, defaulting suppliers, and failure to understand the “actual contract terms” have actually resulted in higher costs, and subsequent misunderstanding.

With dozens of potential suppliers offering a confusing patchwork of contract terms, weighing the merits of competing bids can be difficult. The key to the Request For Proposal (RFP) process lies in combining the price rankings with the contract terms. This enables each respondent’s bid to be placed on level ground for a fair and accurate comparison. At the same time, it is worthwhile to allow room for the respondents to exercise creativity in their approach to meeting an industrial customer’s load requirements.

EPRI Services

EPRI can assist member utilities, and energy service providers, to understand industrial customers’ strategies in future power procurements. EPRI can also assist industrial customers through this process, ensuring they receive the most competitive rates, and negotiating contracts that protect them from exposure to financial risk.

Audience

Member Utilities, Energy Service Companies, Process Industry Customers

Benefits

Several industrial customers have benefited from the newly restructured power markets in Massachusetts and California by developing innovative cost-saving strategies and bringing clarity and organization to a confusing procurement process. It is anticipated that Illinois, New Jersey, New York, and Delaware are areas that offer cost-effective power procurement opportunities for industrial customers in the near future.

As one example, 16 industrial firms participating in a Pennsylvania electricity sourcing program are expected to save more than \$3.5 million in 1999.

Case Studies

Pennsylvania Electricity Sourcing Program

Sixteen industrial companies participating in the first year of Pennsylvania retail choice program used advisory services to purchase electricity on their behalf. The advisor assisted with qualification of suppliers and packaging of load data. Participants were organized into 2 aggregate buyers' groups to receive discounted pricing based on volume purchases and improved overall load factor.

Following the supplier selection process, power supply contracts were negotiated and terms and conditions for meeting aggregate load requirements were developed. To finalize negotiations and agreements, an in-depth comparative price report detailing the specifics of the transaction was generated. In addition, state regulatory changes were monitored by the consultant and advice provided to the industrial firms on such matters.

As a result of these solicitation and negotiation efforts, members of the buyers group are expected to save more than \$ 3.5 million in 1999 as compared to the utility price offerings.

Paper Mill

A mid-west paper mill received advisory support in performing an in-depth evaluation of an interruptible buy-through power contract. The paper mill was recently forced to shut down operations following a series of disturbances in the regional electric power grid and associated markets. These events led to prices for short-term energy in excess of \$5,000/MWH (approximately 100 times higher than prices under normal conditions), and effectively negated the advantages of the buy-through provision. The mill's electric utility provider indicated that further interruptions of service were anticipated throughout the summer, and the mill needed to develop the means to mitigate the loss of revenue that accompanies these events.

On behalf of the paper mill, cost saving opportunities were implemented through the following actions: (1) an examination and evaluation of the power supplier's activities during the interruption of service and subsequent offer of replacement electricity at market rates; (2) enlistment of alternative suppliers of replacement electricity under the terms of the applicable tariff; (3) development of a pricing model to support power purchase decisions; (4) evaluation of risk management opportunities.

FUEL PORTFOLIO STRUCTURING

Description

Several process industries use natural gas for both process heat needs and electricity production (cogeneration). When the process plant's natural gas buyers look to the deregulated market for supply, they normally expect to purchase gas in the way they once did from their local gas utility. They expect to buy what they consume from the gas marketer. Little consideration is given to how and when the gas is used, or how weather, production, and fuel use options (including purchased vs. self produced electricity) will affect gas expenditures. Most buyers are primarily interested in trouble-free deliveries. This approach appears reasonable but is in fact a reactive procurement strategy with risks and usually results in higher energy costs.

By taking a closer look at a facility's consumption profile as it changes throughout the buying period, a comprehensive fuel portfolio can be developed. With this information in hand, better decisions can be made with regard to the timing and volume of gas purchases. Decisions can also be made whether to produce electricity, and sell excess capacity to the grid, or reduce/eliminate cogeneration, and buy power from the electric utility. Developing a fuel portfolio involves more than simply buying what was bought last month, what was bought for the same month last year, or requesting that a supplier "deliver what is necessary." In order to develop a portfolio that offers the customer the lowest priced gas and allows for full utilization of pipeline and utility provisions, the following information is required:

- A projection of daily consumption over the next year
- The tariffs of the interstate pipeline and utility that serve the facility
- Current natural gas pricing to receipt point of delivery
- Current electricity pricing, and rtp type options
- Correlation between natural gas pricing and weather stress
- Availability of alternate fuel, including fuel type, and size of on site storage tanks

EPRI Services

EPRI can assist member utilities to help their process customers to build a portfolio design model that details each cost component of natural gas supply. The model computes these costs under varying production scenarios and weather outcomes, to determine the optimum fuel portfolio structure.

Audience

Member utilities, Process Industry Customers

Benefits

Fuel energy costs can be significantly reduced as by developing a fuel supply portfolio that allows:

- Proactive buying strategy.
- Opportunities for “free banking and balancing”
- Avoidance of price spike purchasing.

Case Studies

National Multi-Facility Industrial

A nationally recognized multi-site industrial retained the services of an EPRI consultant to manage the energy procurement and consumption at all 14 of its North American facilities. Currently, a comprehensive Strategic Energy Review is being conducted through energy data collection and fuels and electricity analyses to develop a complete evaluation of cost reduction options. The primary objective is to optimize energy savings opportunities and implement procedures that ensure long-term savings and mitigate price risk.

The EPRI consultant helped the Corporate Energy Manager in negotiating supply and utility contracts, thereby ensuring reliable delivery of energy supply, managing pipeline and fuel arbitrage opportunities, nominating and balancing of natural gas supplies, converting facilities from purchasing fuel from their utilities to transportation, and identifying and implementing savings initiatives to reduce long-term energy costs. The EPRI consultant helped the client take advantage of deregulating electricity markets by positioning facilities to participate in pilot programs and negotiating power purchase agreements in states where purchasing from a non-utility supplier is already available. At two of the Pennsylvania facilities, over \$350,000 savings is planned in the first year. In addition to energy procurement, the industrials are also receiving support with contract development and negotiations, and regulatory monitoring and intervention.

Paper Company

Supply Acquisition: The EPRI consultant helped the fuel manager for a paper mill in acquiring firm gas supply on a monthly basis, which allowed for greater flexibility. By utilizing the spot market, the mill purchased natural gas at prices significantly lower than would have been achieved through long-term contracts. During a three-month period, the plant saved over \$60,000 relative to its initial fuel plan.

Fuel Management Activities: On behalf of the mill, the EPRI consultant acquired all necessary gas supply and transportation. Invoice verification and reconciliation, as well as reporting, were included in the consultant’s fuel management tasks. Additionally, daily fuel consumption was monitored through on-line flow rate monitoring. Based on this review, the mill was advised of any irregularities. Furthermore all alternate fuel supply and delivery to the project were coordinated. The primary goal was to develop fuel strategies that would reduce cost by making effective use of the project’s resources.

POWERHOUSE ASSET VALUATION SERVICES

Description

Many industrial plants are increasingly focused on their core operations and are outsourcing their powerhouse assets for ownership or operation by third parties that can perform the utility function more cost-effectively. With this new market for buying, selling, and/or developing powerhouse assets, there remains the issue of asset valuation. Determining the value of these assets is a complex matter given the volatility of energy prices, changing regulations and the rapid influx of new players in the market.

Valuation of powerhouse assets requires knowledge of the regional market for power, power-clearing prices for capacity and energy, forecasts of regional gas prices and bases for optimizing supply. Each plant's hourly operating and performance parameters are superimposed onto market forecasts for gas and electricity commodities. The detailed results of this analysis then flows into the plant's financial pro-forma.

The analysis must give owners, operators, buyers, sellers, and financial investors a candid look at a given asset's projected financial and operating performance. It should also provides investors with all the information they need to make valuation and investment decisions.

EPRI Services

EPRI can assist member utilities, energy service companies, and industrial customers and energy companies in asset valuation through the use of accepted practices, techniques, financial and market forecast models. The approach and tools have been developed based on experience with several outsourcing transactions.

Audience

Member Utilities, Energy Service Companies, Process Industry Customers

Benefits

The benefits from asset valuation are increased profits and reduced project risk. The party that has performed the due diligence gains a competitive edge in negotiations.

Case Studies

Multi-Site (5) Industrial Outsourcing Assessment

Industry: Paper Manufacturer Mill

An EPRI consultant was hired to determine whether Energy Outsourcing could provide significant benefits to one or more of an industrial's five paper mills and to identify the mill (or mills) which appear to have the greatest potential for an Energy Outsourcing Program. The Energy Outsourcing Feasibility Review consisted of a Multi-site Data Review and Feasibility Study. The EPRI consultant evaluated whether facilities could benefit from outsourcing, including quantifying potential benefits from outsourcing fuel procurement, operations, maintenance, cogeneration, merchant power, capital projects, and/or asset transfer. As a result of its work, the paper company embarked on specific opportunities identified at two of the five mills.

Alumina Producer

Industry: Alumina Producer

Power Supply Expansion Option Analysis: An alumina producer required an analysis of the power supply options available for meeting the facility's expanding electricity needs. The facility had historically generated its entire power needs from a 100 MW "inside the fence" power house, and was faced with a near term shortage of power supply due to expanded operations. Various options were analyzed, ranging from expanding the existing power plant, to connecting to the grid and contracting with the local utility, to municipalizing the surrounding community and seeking wholesale power supplies for the entire community. The EPRI consultant investigated dozens of generating technologies and expansion alternatives, projected the long-term market price for the wholesale and retail power supplies in the relevant power pool, and estimated the local utility's short- and long-term cost structure to determine the utility's negotiating position with the industrial facility.

MERCHANT COGENERATION

Description

The indiscriminate development of industrial “qualifying cogeneration facilities” ended in the late 1980’s. In the mid-90’s, commencement of electricity market deregulation sparked renewed interest in domestic power plant development. However, this time around, the rules of the game have changed dramatically.

Faced with intense competition, low margins, and high market risk, developers are seeking innovative strategies to enhance their competitive advantage. While a variety of strategies are being deployed, industrial cogeneration has reemerged within the energy industry.

In today’s market, a growing number of developers are considering the development of new generation capacity at industrial sites. This strategy offers several advantages over greenfield development, including anchor energy demand and revenue stream; access to fuel, transmission, water, labor, and infrastructure; and ease of permitting. However, the most significant advantage is the cogeneration heat sink, which ensures a long-term competitive advantage over competing gas-turbine combined cycle plants.

EPRI Services

A decade ago, industrials took advantage of developers’ lucrative PURPA-supported power sales contracts and secured ultra-low or no- cost steam agreements. At the same time, developers reaped considerable returns with relatively low market risk. Clearly times have changed. In today’s competitive and sophisticated marketplace, development transactions must be creatively structured, ensuring that project risk and rewards are appropriately shared and all parties’ business objectives are met. EPRI can provide assistance in ensuring technical, economic and market viability for the member utility, energy service company or the customer.

Audience

Member Utilities, Energy Service Companies, Process Industry Customers

Benefits

During the last year, over 5,000 MW of industrial cogeneration plants have been announced. The vast majority of these plants are to be built, owned, and operated by independent power developers seeking to generate low-cost “merchant” power for export sales. Industrial hosts benefit from these third-party arrangements through long-term, low-cost steam and electricity, investment opportunities, capital avoidance, expansion opportunities, fuel advantages, reliability enhancement, and outsourcing of a variety of responsibilities and risks.

Case Studies

Merchant Cogeneration Development

Industry: Chemicals Manufacturer

A large chemical producer received advisory support on a third-party merchant cogeneration opportunity presented by a leading IPP. Initial support activities included analysis of on-site energy use and generation, cogeneration prospects, the State's power market conditions, and the IPP's proposal. The industrial plant continues to receive advice regarding on-going project development and negotiations.

Merchant Plant Siting at Fertilizer Production Facilities

Industry: Fertilizer Manufacturer

A leading fertilizer producer retained advisory services to assess merchant plant opportunities at its three locations. The industrial plant had been approached by a prominent IPP regarding land options for future power project development. The objective was to determine the attractiveness of the IPP's proposals relative to other current and future potential opportunities and, if appropriate, develop a negotiating strategy to capture maximum benefits for the industrial. The advisor assessed the three sites for power plant suitability and quantified synergies associated with each site. Ultimately, a site was selected and siting benefits were quantified and translated into an attractive options agreement.

Industrial Facility With A Municipal Waste To Energy Plant

Industry: Municipal Waste-to-Energy Plant

An industrial facility with a 500 tpd municipal waste-to-energy plant required a power project feasibility study. The facility uses waste heat to generate both steam and power to meet the plants energy needs. Excess energy is sold to an adjacent chemicals manufacturer to produce additional revenue. Installation of new environment and pollution control equipment increased the internal power demand above that which can be efficiently produced by the industrial facility. The advisor explored opportunities where the facility could expand its energy delivery capability. The review focused on the industrial facility's need to meet parasitic load at minimum cost and evaluated options to maximize excess energy sales to the chemical manufacturer and alternate markets. Various steam and gas turbine arrangements and equipment were also investigated. In addition, power market deregulation and pricing were considered. Recommendations were made based on continued development of the gas pipeline bypass, implementation of a gas turbine project, and exporting additional energy to the chemicals plant.

RISK MANAGEMENT

Description

“Risk Management”, as it relates to energy procurement, can be thought of as a form of insurance against the risks involved in purchasing energy. As is the case when you buy insurance for your home or car to protect against unforeseen and potentially catastrophic losses, a risk management program helps keep your energy costs in check. Unfortunately, even large energy users overlook protection against changing energy costs. Every year they risk tens of thousands, even millions of dollars, simply by accepting the market price of energy, as offered by their suppliers.

The main reason risk management is used in buying energy is to reach a price objective and to protect it, once achieved. This approach is proactive rather than reactive. The first objective in developing a risk management program is to determine what the industrial operator’s goals are. For example, the plant may wish to fix their energy costs for one or two years. This can be accomplished by purchasing physical gas from a producer or by using the futures market. Another industrial operator may want to take advantage of alternate fuel capabilities when there is a wide price disparity between two different fuels (e.g. buying gas vs. oil). Again, the futures market can be used for this purpose. In some cases the plant may want to establish a budget ceiling that must not be exceeded. In other cases the operator may wish to “ride the market down” while seeking protection against a rising market.

EPRI Services

EPRI can help you understand the basics of risk management through a program of training and seminars.

Audience

Process Industry Customers.

Benefits

Risk management is used, first and foremost, to protect one’s company against catastrophic losses. In most cases, it can also help companies save more on their energy expenditures than they ever thought possible. Although the discussion here has centered on the natural gas market, the principles of risk management are just as relevant to large consumers of other forms of energy. In the electric industry, for example, consumers are facing rapid changes in the way electricity is bought and sold. Even though electric deregulation is still in its infancy, many utilities are already positioning for the future by being receptive to new ideas now.

Case Studies

Energy Price Risk Management

Industry: National Food Manufacturer

EPRI consultant developed price risk management strategies utilizing portfolios of commodity futures and options for a major food manufacturer and end-user of natural gas. The sources and degrees of price risk were first identified. A strategy was developed for managing the risk. The EPRI consultant provided specific advice on the structure and timing of hedges in an implementation phase.

Natural Gas Hedges

Industry: Chemicals Manufacturer

In the middle of a fall run-up in natural gas prices, a chemical plant was looking for advice on what to do about gas prices. The plant had already seen prices move up well above the allowed budget targets for the year (about \$2.20 equivalent on a 12-month strip). The plant was seriously considering hedging not only this year's price (for which it was already over budget) but also the next two years at an average strip price of \$2.60.

The advisor retained by the plant performed a fundamental and technical analysis of the market and advised the plant that a three-year hedge at these prices was not the best option. A preferred strategy was to place a hedge on the highest risk months, namely the winter, then wait for a market correction to selectively hedge non-winter volumes at lower price levels. The plant took the advised action, placing an average three-year winter price hedge at around \$2.30, and then selectively taking advantage of the subsequent winter "thaw" to hedge second, third, and fourth quarter prices below the \$2.20 target. The strategy yielded savings of \$600,000 to the plant fuel budget.

About EPRI

EPRI creates science and technology solutions for the global energy and energy services industry. U.S. electric utilities established the Electric Power Research Institute in 1973 as a nonprofit research consortium for the benefit of utility members, their customers, and society. Now known simply as EPRI, the company provides a wide range of innovative products and services to more than 1000 energy-related organizations in 40 countries. EPRI's multidisciplinary team of scientists and engineers draws on a worldwide network of technical and business expertise to help solve today's toughest energy and environmental problems.

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