Buying Electricity: Bounding the Risks

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Editor's Note: Dr. Berry's article draws upon his review of dozens of electrical contracts while he was with the staff of the Arizona Corporation Commission. He presents risk management strategies for commercial and industrial consumers of power as electric markets become more competitive.

Businesses spend millions of dollars per year on electricity. In recent years, U.S. commercial and industrial consumers used about 0.36 kWh per dollar of gross domestic product (measured in 1987 dollars). Some businesses, such as supermarkets, are intense users of electricity per square foot of floor space, and some, such as copper mines, are adopting new technologies that are extremely energy intensive. Traditionally, consumers have obtained the electric energy they need for lighting, torque, refrigeration, space conditioning, and other purposes from their local monopoly electric utility. However, the traditional picture is changing rapidly as states begin introducing retail electric competition.

Competitive procurement of electricity may enable businesses to reduce their costs. First, competitive pressures will tend to lower prices relative to what they would have been in a regulated monopoly environment. Second, energy service providers may package conservation services with electricity, thus creating additional opportunities for savings. Third, businesses with multiple sites will be able to aggregate their energy usage and obtain electricity at lower cost than they could when purchasing electricity for each site as a separate account. Fourth, the competitive market will enable consumers to purchase bundles of energy services that are better tailored to their own situations, and not have to accept standardized service packages, thereby lowering costs.

BUT... WHO WILL MANAGE RISK?

Now, with the opportunity to choose, risks that were previously managed by regulators must be managed by consumers. **Business managers will be faced with many choices such as long term versus short term contracts, fixed versus variable prices, and firm versus interruptible service, and they may need to more accurately predict their demand for electricity or else be penalized for taking too much or too little power.**

I will address the major types of risk that consumers will face in a competitive market and then describe some useful risk management techniques in contracting for power. There is no one method of risk management that is suitable for consumers in general. Specific circumstances, such as the availability of alternatives, bargaining power of the parties, the importance of price stability to the consumer, and individual managers' aversion to or acceptance of various risks will determine the outcomes of negotiations.

Common types of risk are:

- *Imperfect information.* Future energy prices are unknown and a consumer's future energy demand may be uncertain.

- *Poor performance. A* new supplier may not be as reliable as expected. New power plants may be delayed or supplies interrupted, for example.

- *Opportunism.* Parties to a contract might be devious. For instance, sellers of energy services might not disclose all the terms of their offer or they may recommend packages of services which are not the best choice for the consumer but are the specialty of the seller.

7 RISK-MANAGEMENT TOOLS—PROVEN IN PRACTICE

Businesses can manage their exposure to these risks with several risk management tools that have been found useful in electric contracting. These tools are not, in themselves, guarantees of successful contracting and they cannot be applied indiscriminately. Further, some risk management techniques are incompatible with others and consumers will have to pursue the ones that best manage the risks they believe are

most important. In addition, sellers face risks in covering their marginal cost, and they will seek to manage those risks in negotiating contracts. Consequently, the negotiation process will not produce for buyers the perfect hedge against risk.

1. **The first risk management tool is to get more information about market prices,** energy usage, supplier reliability, and perhaps other factors. With regard to market prices, keep in mind that services will be differentiated depending on the term of the contract (e.g., 6 months, 3 years, 10 years), the type of service requested (e.g., firm versus interruptible), whether price is constant or varies from hour to hour, and so on. Thus, there will be no single market price as there is with regulated, standardized rates. Market prices can be scoped out using published spot price indices and futures prices (for standardized packages of power purchases) as reported in newspapers, by requesting bids or proposals, and by obtaining expert advice on market and industry conditions.

Information about energy usage can be obtained from an energy audit. This information can reveal hourly usage patterns helpful in evaluating time-of-use rates and other rate designs. In addition, it can highlight major end uses of electricity, and can identify potential energy savings from demand side management.

Sellers' reputations can be researched to weed out those that have a poor track record or no track record. In addition to obtaining information about reputation, consumers may also apply other risk management techniques as described below.

Further, there may be value in postponing a decision until more information is available. A short term contract will enable a decision to be put off.

In complex situations, information can be systematically analyzed using probability decision analysis techniques or scenario analyses to find out which purchase strategies have the greatest risks and which yield the lowest expected costs. However, the detail of the analysis should be commensurate with the electricity costs involved.

2. **A second risk management technique is to seek or make credible commitments.** A consumer's bargaining power increases with the number of credible options available. To get a lower price, a consumer may have to reveal his or her options to potential suppliers to demonstrate

viable alternatives. Further, sellers may want consumers to commit to minimum payments over a long term contract. While this may seem disadvantageous to a consumer, it does lower the risk for a supplier investing in new generating facilities and may, thus, lower the price over the long term to the consumer. Additionally, buyers may seek a credible commitment from the seller in the form of a warranty that the electricity supply will meet certain standards.

3. **Third, consumers can try to retain flexibility** in the amount of power and energy they commit to. Plants or stores with a long record of predictable energy use do not pose a big risk, but new establishments, plants where major changes are planned, or stores which may close during the contract period can have hard-to-predict demand.

In such circumstances, managers may be better off if they do not commit to taking a fixed amount of electricity during the term of the contract. Agreeing to a *range* of purchase quantities, a shorter contract period, or a reopener provision triggered by a usage level or other event can buy flexibility for the consumer. Additionally, a consumer may obtain flexibility by purchasing from several sources—for example, from one supplier for steady base loads and from another supplier to serve less predictable, fluctuating loads.

4. **Fourth, consumers can seek to share, transfer, or spread risks.** For example, in the absence of a reliable crystal ball for future electricity prices, consumers may be able to hedge their bets by linking the price they pay for some of their electricity to independent, verifiable fluctuations in spot market prices or to consumer or producer price indices. This approach shares price risks between buyer and seller and allows the buyer, within the limits of the agreement, to benefit from periods of low prices while taking on the risk of high prices in some periods. Consumers must decide which they value more: the chance of getting lower prices during some periods, or price stability so they can better plan for their primary business.

Electricity price risks may also be transferred by purchasing options or buying or selling futures to bound price risks. However, today, financial derivatives are generally used only by sophisticated wholesalers of power, and, unless retail consumers are familiar with these techniques, they could be misapplied, resulting in costly mistakes. Another way to transfer price risk and gain price stability is to agree on fixed

prices or a fixed price escalator.

Risk spreading may also be achieved by aggregating the loads from multiple sites in a single contract so that peculiar events at one site (e.g., spiked peaks or a period of low demand), which might otherwise raise the price for electricity, are diversified away in the aggregate of loads at many sites. This approach could be used by a firm with many stores or factories or by multiple consumers with single sites banding together to purchase as one entity. It is likely that electricity aggregators will emerge and pursue this approach as agents for consumers.

5. **Fifth, use incentives to help improve or offset poor performance.** Penalties for delays, interruptions, voltage fluctuations, and other power quality deficiencies may deter poor supplier performance and they can compensate consumers for having to incur additional costs to mitigate the effects of poor performance. If incentives are used, the basis for calculating penalties and rewards should be simple and readily verifiable; otherwise disputes will occur.

6. **Sixth, manage the use of electricity.** If an energy audit reveals potential savings, a consumer can reduce electricity usage by implementing the recommended actions. Further, a consumer might be able to accept lower quality service for a lower price (e.g., interruptible service), but to manage the risks of lower quality service, business operations may have to be altered or protective electronic equipment may need to be installed. Some consumers may also be able to reduce consumption during hours of high prices, thereby managing uncertainty in hour-to-hour price variations.

7. **Finally, build trust with the supplier,** typically through long term relationships, to obtain cost savings. For example, having a supplier with a proven record of reliability can obviate the costs of finding a new supplier and the costs of managing poor performance from a new, unknown supplier.

In conclusion, opening up the market for electricity creates new risks for business managers. To benefit from a competitive market in electric energy services, consumers will have to learn how to manage the risks of that market. Table 1 summarizes examples of buyers' risk management tools.

Table 1. Examples of Buyer's Risk Management Tools

Risk Element	Approach	Risk Management Technique
Error in price discovery	Get more information	Request bids; Obtain expert advice; Check published prices; Postpone decision until more information is available
	Spread risk	Link prices to published price
Unstable/unknown future prices of electricity	Transfer risk	Use fixed price contract or fixed price escalator, Purchase futures or options
	Manage business operations	Reduce usage during hours of high prices
Unknown future energy use	Retain flexibility	Allow for range of deliveries; Seek short contract term or reopener; Split load into stable base & varying peak loads
Inefficient energy use	Get more information	Conduct energy audit
	Manage business operations	Implement energy efficient practices

(*Continued*)

Table 1. Examples of Buyer's Risk Management Tools (*Concluded*)

Risk Element	Approach	Risk Management Technique
Unreliable power supply	Use incentives	Use performance incentives or penalties
	Seek credible commitments	Obtain seller warranty
	Get more information	Research seller's track record
	Build trust	Build long term relationship with reliable supplier
Agent advances own purposes	Get more information	Review agent's recommendations; Obtain second opinion
Seller does not believe buyer's alternatives are viable	Make credible commitment	Agree to make minimum payments commensurate with costs of alternative
Unexpected variations in load result in high prices	Spread risk	Aggregate loads of many consumers to dampen load variations
Lower quality service adversely affects business	Manage business operations	Revise operations to accommodate interruptions; Install protective equipment

ABOUT THE AUTHOR

Dr. David Berry was formerly Chief of Economics and Research at the Arizona Corporation Commission, Utilities Division. In 1997 he joined Resource Management International, Inc. in Phoenix as a Principal Consultant. This article draws upon his review of retail electric contracts while with the Corporation Commission. Prior to joining the Corporation Commission in 1985, he was with Abt Associates in Cambridge, Massachusetts and the Regional Science Research Institute in Philadelphia. Dr. Berry has a Ph.D. from the University of Pennsylvania. The opinions expressed in this article are those of the author and should not be construed as the position of the Corporation Commission or of Resource Management International.