Preparing to Manage Energy Costs

Basics for Small to Mid-Size Consumers

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Veteran energy trader and hedging advisor addresses the major challenges new hedgers face, how volatility and risk may be understood and the decisions that must be made in order to commence hedging.

Many would-be hedgers claim that they use "fundamentals" in order to do "nonspeculative" forecasting and hedge planning. The problem with this contention is that instead of really using fundamentals (an analysis of what exists), most of these forecasters speculate on what future fundamentals will be and then further speculate on how prices will react to those estimations.

It is never a good idea to base an energy-hedging program on a speculative price forecast. While it is possible to forecast short-term price activity (meaning one week to perhaps a few months), it is neither feasible to forecast events further out, nor rational to rely on such forecasts for strategically hedging corporate exposures.

The reason: minor changes in initial conditions cause large differences in outcomes over time. This is sometimes called the "butterfly effect." The saying goes that a butterfly flapping its wings today as it flies across the Pacific may cause a hurricane a few months or even a year later in the Pacific that hits the U.S. Gulf Coast.

It is not a good idea to employ trading skills for hedging. Companies that do not trade oil or gas are in the business of either finding or producing it, or using it to supply customers with heat and light, or for manufacturing. They do not have the tools to properly estimate hedging points.

Basics for Getting Started

Many energy consumers would like to hedge but do not know how to get started. While this article focuses on natural gas, it applies equally to hedging propane, #2 and #6 fuel oil, and diesel.

First, a hedger must decide how much exposure to include in the program. Typically 50–75% of total exposures are the right amount. This leaves the remainder to either float or to be purchased on a short-term, month-by-month basis. For example, a large end-user consuming 24 BCF/yr of natural gas would hedge ~50%, or 12 BCF. A small end user consuming 0.48 BCF would hedge, perhaps, a larger amount given the small absolute total; i.e., ~75% or 0.36 BCF.

A key factor in fine-tuning one's ability to hedge the exposure set aside for a

hedging program is whether the company has enough cash-flow or credit to weather any negative mark-to-markets in the hedge. To do this, a value at risk, or VaR, calculation must be done.

For example, if one's credit line with a particular dealer or market maker is $100,000 and risk calculation shows a 5% chance that the mark-to-market could reach negative $200,000, the hedge volume anticipated must be cut by half or a new credit line negotiated.

Correlation Issues

The next decision that has to be made is whether to hedge basis NYMEX natural gas or to hedge basis a particular pipeline. The first step is to run a correlation analysis between the pipeline index prices as published by a recognized source, such as *Inside FERC*, first of the month index. Similar correlations can be done between power (electricity) prices and natural gas.

If the correlation is sufficient, which generally means there is a statistically significant R2 of 0.8 or better, then the hedger may choose to do either. Also, a good correlation means that the hedger can participate in a hedging pool using NYMEX. Otherwise, the hedge has to be placed over-the-counter, denominated in the index in question.

Scale In or Not

"Scaling in" means to place hedges incrementally over time. Scaling in allows the hedgers to use strategies that avoid making "all at once" decisions, and to choose to place hedges at different times depending on market conditions.

An entity hedging 15 BCF/yr has the equivalent of 100 futures contracts per month to hedge. Thus, it is easy for them to break their hedges into 1% increments if they choose, because that is equal to one futures contract. That is not the case for the small hedger. With 0.36 BCF/yr, the hedger has only three contracts per month to hedge. Even if it is possible to hedge in one-quarter or one-half contract increments, the hedger's ability to scale in is limited, unless they hedge as part of a consortium.

Hedge Alone or Co-Op/Consortium

As noted earlier, large hedgers can hedge on their own and do not need to hedge as part of a consortium in order to aggregate enough volume to scale in, but that is a challenge for smaller hedgers. If groups of smaller hedgers form a hedging co-op and aggregate their volumes together, the total volume may be sufficiently large and then suitable for scale-in strategies.

Hedges can be placed in a variety of ways. Any hedge instrument can be delivered as a "paper" or financial hedge, or embedded in a physical deal. The most common, simple method is to use fixed-price hedging, which again can be separate as a financial hedge or embedded in the physical as a fixed-price term purchase.

Next in complexity are fixed-range hedges, also called collars, which fix a range within which prices can float. Option or price protection strategies protect prices from rising, but allow them to float below a cap or ceiling price. "Exotics" are combinations of the above. For example, one can hedge with a collar that puts a floor and a cap on prices. However, if prices fall well below the floor, one can get back into a floating price mode. This is called a three-way collar or just a "three-way".

Most small to mid-size industrial consumers stick to simple fixed-price hedges, while those with larger exposures might choose to get more sophisticated in their approach. The key is the inverse relationship between simplicity and up-front cost versus potential all-in costs on the hedge.

For example, a fixed-price hedge is simple to execute and carries no up-front premium or instrument charge. An option is more complicated to execute and carries an up-front premium. However, after the hedge is executed, if the market drops $3.00, the hedge cost to the fixed-price purchaser is $3.00 while the cost to the options buyer is just the up-front premium.

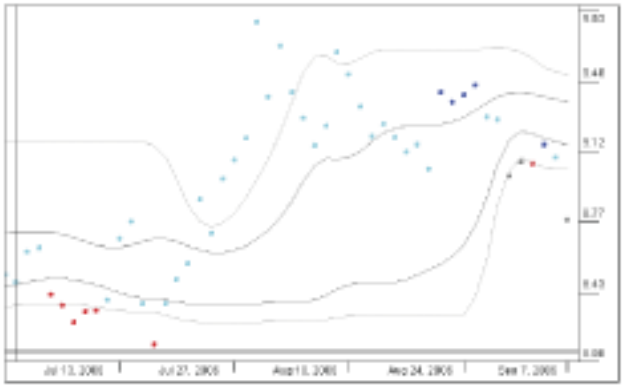
Estimating Risk to Reward Ratios

One of the key questions that potential hedgers consider is how much the cost of a fixed-price hedge might be versus how much of a benefit could be achieved by placing a hedge. The name for the overall methodology to estimate these amounts is called "Value at Risk" and/or "Profit at Risk". The actual technical methods used to calculate these values vary, but here is a primer on what is behind it.

Simply stated, the value at risk is the amount that can be lost based on certain probability, usually either 2.5 or 5%, that a certain amount will be lost. For example, no more than a 5% chance that $200,000 will be lost. The mistake potential hedgers make is to misinterpret the data. For example, there may be no more than a 5% chance that $200,000 will be lost, but at the same time, there could be a 0.1% chance that $360,000 will be lost.

Developing a Strategy

Once basic decisions have been made, a strategy must be developed for execution. The most common type of



How typical volume-averaging systems might look. Dots are plotting on the closing price for the 12-month strip each day. The dots are color-coded and appear in one of five zones created by the four gray lines shown on the screen. The color and the placement in a particular zone tells the hedger how much to execute.

strategy is what I call "consensus" hedging. To quote John Kenneth Galbraith: "When it comes to the markets, the majority is always wrong."

While it is a great idea to develop a consensus on the goals of a hedging program, it is never sensible to use groupthink as a strategy, especially in hierarchical organizations in which the boss, who may not be good at market analysis, rules.

A similar approach is to delegate hedging decisions to an individual or group of traders whether inside the organization or outsourced to a marketing company. Here, the decision-making process is "elevated" to the discretionary (translate speculative) views of people whose incentives, goals and risk appetite may not be in line with the company's risk management program.

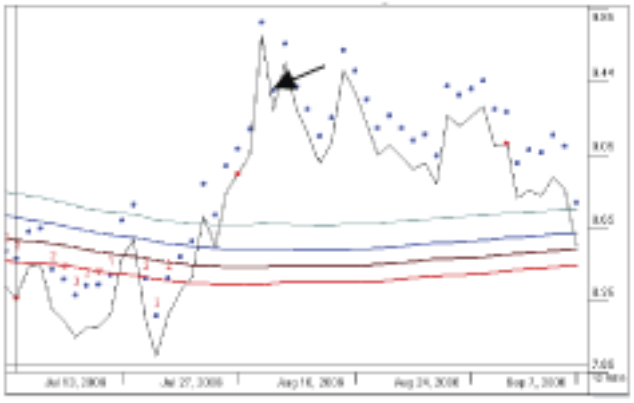
Even if the traders involved are talented, most traders are both short-term and speculatively oriented. Of course, if the talent leaves, the program that relied upon them may fail.

Instead of these methods, various types of scale-in strategies—some using statistical methods and probability theory—can be used. For small end-users, such strategies are of great value because they allow for a uniform method to be used by a co-op or consortium where aggregation of volumes can then allow for the scaling in of small volumes over time.

The first two of the following methods also allow for fully automated signals to be generated, i.e., the signal to hedge is generated by the strategy not by an individual or group of individuals. The value of such programs is that they can be delegated to a gas management firm for execution as part of an aggregated co-op where all members follow the same strategy.

Scale In Using VCA

A simple strategy that requires no talent or thought is to do a straight volume cost averaging (VCA) over time, hedging a 12–month strip in advance. Starting at the point when a contract becomes the 13th nearby, one would accumulate 1/250th per day of volume and when enough volume has been accumulated to hedge a half- or full-contract, a hedge would be placed. Over the long run, such a method would be expected to reflect long-term trends. If the market has been rising, the scale-in method, which is always buying ahead of time, would make money. The reverse would be true of long-term bear markets.



In this model, the dots are not color-coded, as shown in the zone of the lower lines. At that point, according to a nondiscretionary rule-set chosen for a specific risk appetite, the hedger may have bought forward.

Rule-based VCA

Instead of blind volume averaging, rule-based systems that improve performance of such strategies may be employed. While a number of models are available from various consultants in North America, our approach can serve as an example. Instead of buying the same amount every day, we block out certain periods of time in which no hedging takes place.

For example, if the market has been rising for a long time, the odds increase that a downturn will take place, so hedging ceases. Similarly, if the market has been declining for a while, the odds are it will continue to decline, so again, hedging ceases. Also, a higher percentage per day is accumulated when prices are low than if prices are high. Our system is called "ezHedge," and the results for this approach are approximately twice as beneficial (one does not use the word "profitable" when hedging) as a straight dollar cost-averaging method. Not only are the gains larger but also the costs (read "losses") one has to undergo in order to gain in the long run.

A third alternative is to combine rule-based hedging with some discretion. Both of the programs can be used in this way, but the primary design is to buy forward on a fixed-price basis only and to hold until expiration. If an end-user's program allows for discretion relative to instrument use and the removal and replacement of hedges, it may be advisable to use a rule-based system that allows for some discretion.

One such program is our HedgeModel which sets statistically significant points at which to place both fixed-price hedges and for purchasing calls. The entry system is fairly mechanical but allows for a range of rule-sets depending on risk appetite instead of a one-size-fits-all approach as well as a range of instruments to choose.

Hedging can serve to greatly dampen the impact of volatile, rising prices. However, many decisions must be made from a business, technical and strategic standpoint. Once done, even small hedgers can participate in effective programs though the use of aggregating co-ops. ■

About the Author

Cynthia Kase is president of Kase & Company Inc., Cheyenne, Wyo. For more information on hedging cooperatives among groups of small- to mid-size end-users, visit www.kaseco.com.