

SIPES Luncheon Meeting

Hedging for Small Independents: A Quantified Approach.

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The petroleum exploration and production business can be likened to the toughest manufacturing businesses: not only do producers not know how much they will produce; they also don't know what price they will get for the production.

Hedging offers producers the tools to manage the price received for their production. There is a seemingly endless list of products and vendors that offer the promise to lock in a specific price, or at least a guaranteed minimum price or floor. The most popular financial structures used when hedging are often referred to as "costless" transactions because the producer has no upfront, out-of-pocket expense. There are costs to hedging, but they are imbedded in the

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transaction by providing the hedge at an off-market price. These transaction costs are composed of slippage, a fee for credit and profit margin. Typically, hedging costs range from 0.5% to 2% of the notional value of the transaction

Once hedges are in place, they are like a knife that cuts both ways. Should prices move lower, the monthly payout received from hedges will help to stabilize the producer's cash flow. But when prices move higher, hedges can drain cash reserves and hamstring operations.

*hedges...are like a knife
that cuts both ways*

Why? The higher than expected revenue from production can be expected to more than offset the hedge payments that come due as hedges settle. The problem is that the open hedges must be collateralized. When prices are high, hedges become a liability. The extent of this liability is measured by mark-to-market of the remaining or open hedges. As prices move higher, the hedger can expect to get a "margin call" from his counterparty. Banks require increasing

amounts of collateral as prices move higher to maintain the hedges. Cash and letters of credit are the collateral preferred by banks. Producers that don't plan for these calls may find themselves in a difficult spot, having to put up collateral they had other plans for or liquidating the hedges at a loss.

The choice of hedge instruments then has a direct impact on the cost/benefit of a hedge strategy. To illustrate this point requires a short review of the random walk assumption. Most will agree that market pricing is random, but few recognize that price distributions are log-normal. Rather than looking like a normal distribution which has a symmetrical bell-shaped curve, log-normal distributions have the high priced tail of the bell elongated. Since market prices can't go to zero, this adjustment allows for the expectation that when it comes to prices, high is higher than low is lower. For producers that hedge, the implication is that on average a hedge is likely to cost them more than it will payout.

When producers hedge by selling swaps, they have maximized three aspects of hedging:

- Price risk reduction
- Potential margin calls
- Negative expected value of the hedge

Most producers want the first, are aware of the second, but are completely blind-sided by the third point. Its importance lies in the fact that, over and above the transaction cost, hedging with strategies that have a negative expected value will eventually add significant opportunity cost to the hedge program and erode its usefulness. It is no surprise that most companies have found that their hedge programs are cost centers, when if designed and maintained properly they should be cost neutral.

Alternative structures like producer collars can be useful in reducing or eliminating these imbedded costs, but they require the use of option models driven by pricing and volatility assumptions that change constantly. In short, asking your hedging counterparty for an options quote without a good estimate of its value is akin to handing a used car salesman your check book when buying a car.

Faced with these challenges, should producers hedge? The answer is yes, if you want to leverage your asset holdings to increase their returns. The questions that should be asked prior to hedging are:

- How much risk do I have?
- How much risk can I tolerate?
- How large a hedge position do I have the credit capacity to support?
- Are the hedging opportunities sufficiently attractive?

Answers to these questions will provide meaningful insight into the appropriateness and likely effectiveness of hedging. ■

*Appropriate
and effective
hedge performance*



Hedge objectives should optimize enterprise performance

Biographical Sketch



WAYNE PENELLO is Founder of Risked Revenue Energy Associates (R²), an industry leading provider of risk management expertise and accounting support to businesses that hedge commodity price risk. R² actively supports the management of assets valued at more than \$15 billion. Its clients range from upstream production companies to mid-stream processors down through to consumers and private equity companies

Wayne has 25 years of market-making, option trading and asset management experience in the energy industry. He began his career on the New York Mercantile Exchange (NYMEX), where he was a market maker and served as Ring Chairman of options trading. Later, he accepted a position with Vitol S.A., in Geneva, Switzerland, managing a portfolio of globally distributed energy assets. Returning to the U.S., he managed the trading and marketing desks for Tenneco Gas Marketing and Torch Energy. He resigned from Torch Energy in 2001 to develop his own consulting business which has retainer clients using R² proprietary analytics as a decision tool supporting their hedge programs. Wayne was formerly a research scientist and holds a Masters degree in Marine Sciences from Stony Brook University and an undergraduate degree in Marine Biology from Southampton College.