



Short Paper Series  
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## **What is “Hedging” in the Context of New Mexico Natural Gas?**

### **Background**

In the Fifth Meeting of the Revenue Stabilization and Tax Policy Committee the consulting firm Goldman Sachs (GS) presented a hedging technique designed to reduce the instability of state revenues, caused by the volatility of natural resource prices such as oil and gas.

This note illustrates, in simple terms and through a numerical example, what the implications would be if the state of NM were to adopt one of these hedging techniques to the price of natural gas. Please note that NMTRI neither supports nor opposes the state adopting any of these hedging techniques. Since the purpose of this short paper is only to demonstrate how these techniques work, many complex technical issues regarding to “hedging” are left aside in order to make this note understandable.

### **The Auto Insurance Analogy**

In this context, hedging techniques are similar to an automobile insurance contract. The owner of a car pays a premium for the probable event that an accident occurs. In a comparable fashion, the state of NM would pay a premium to avoid the risk of sharp decreases of international prices and subsequent falls in state revenues. The risk would be shifted to the insurer, in exchange of a premium. In this analogy, the “automobile accident” is the equivalent to an unexpected international price fall.

### **Numerical Example Applied to Natural Gas**

In this numerical example the state of NM purchases a price floor from GS. If international prices fall below this floor (called the Strike Price) funds would be transferred to the state by the “insurer” to restore the price floor. If prices continue high, or increase even more, states revenues increase as expected. In both cases, the premium has to be paid. The example is presented in relation to the Natural Gas Emergency School Tax.

The NM budgets are and will be prepared using the following consensus forecasts for the price of natural gas:

FY 2008	\$6.10 per million cubic feet
FY 2009	\$5.75
FY 2010	\$5.50

Under the “hedging” proposal, the state of NM would be purchasing “insurance” to make sure that if future prices fall below these levels, revenues collected from natural gas will not fall, thus providing some stability to the budgeting process. These price forecasts then become the price floor, or the strike price.

GS estimates that the premium for this “insurance” would cost:

FY 2008	\$17.8 million
FY 2009	\$16.8
FY 2010	\$15.9

The total for the three years would cost \$50.6 million. If the floor prices were lower than the ones presented above, the premium would also be lower. It is less likely that an international price would fall below a low price floor, than a not-so-low price floor.

These cost estimates presented by GS are calculated assuming that only one half of the Natural Gas Emergency School Tax revenues are hedged. The other half would remain “unprotected.” A pilot project could be started with only 10%, or any percentage for that matter.

To take the example one step further one could ask the question, what would happen to Natural Gas Emergency School Tax revenues in the dramatic scenario that the price of natural gas falls to \$2 dollars in FY 2008, well below the consensus forecast of \$6.10?

If the state of NM is not “protected” under the GS proposal, revenues would fall to \$99 million, against \$301 that was expected in the budget for that year. If the state takes the GS proposal, revenues would fall only to \$201 million. Of course the premium of \$17.9 would have to be paid from this amount, so revenues received in this dramatic scenario would be in the order of \$183.1 (\$201-\$17.9).

What happens if the price of natural gas reaches an unprecedented price of \$8 in FY 2008? The state would receive \$396.7 in revenues, minus the premium of \$17.9 million. The total would be \$378.8.

## Comments

The figures reported in this numerical example are dynamic, in the sense that the premiums would change depending on when one enters the agreement, and what the conditions of the market are at that moment.

The GS example is interesting because it brings the important issue of volatility of international prices and its effects on revenues and the budgeting process. When instability is exogenous as in the case, the rational course of action is to create a buffer system that would insulate revenues from external forces.

One way of dealing with such volatility is by producing conservative estimates of revenue collections, so resources will not fall short of planned expenditures. The drawback of this option is that it generates the possibility of discretionary spending when unexpected revenues surpass budgeted amounts.

There are other “hedging” techniques such as the implementation of a price band, technically called a “collar.” The collar has a floor and a ceiling. When the price is above the ceiling then the “insurer” takes the surplus, and when the price is below the floor the “insurer” compensates the state for the loss. Establishing a ceiling and a floor becomes critical in this case.

A price band system does not necessarily imply using a hedging mechanism such as the one proposed by GS. A fund could be developed that would save surpluses above a pre-determined ceiling during price booms. Those savings would be used if budgetary deficits occur due to a fall in international prices. This is done routinely with other mineral commodities as well as with agricultural commodities.

In the GS example, the official prices released by the consensus forecast become the price floor, and therefore the “hedging” assures that the budgeted revenues will be there for a particular year.