Spark Spread

A newer trading strategy is the spark spread, which is intended to simulate the profits from a power plant. It was possible from 1996 to 2002 to hedge or sell such a spread on Nymex by shorting electric power and buying the fuel used for generation – fuel oil, natural gas, or coal. However, in May, 2002 the electricity contracts on Nymex became over the counter, so spark spreads must now be bought on Nymex over the counter as well. Spark spreads have also started trading OTC in Europe.

The ratio of the short to the long position is determined by the heat rate of the plant. Lets take a natural gas example. If the heat rate for a gas turbine were 8 MMBtu/Mwh, then for every megawatt hour (Mwh) you sold, you would want to buy 8 million Btus (MMBtus) of natural gas. (Be careful of the units. Mwh is a megawatt hour or a million watt hours or a 1,000 kilowatts, while MBtu is a thousand Btus and MMBtu is a million Btu's.) If power sold for $31 per Mwh and the price of gas was $2.60 per MMBtu, then the profit from the position would be $31 - 8*$2.60 = $10.20 per Mwh. For more details, go to (http://www.margrabe.com/Energy.html).

There is, however, one small wrinkle to the problem. We cannot simply buy nine gas contracts to every electricity contact, since an electricity contract is 736 Mwh and gas contracts are in 10,000 MMBtus. Therefore, we have to determine a hedge ratio h, which represents the number of gas contracts relative to 1 electricity contract. This is quite easy to compute. We need to chose h so that the ratio of gas to electricity (8 Mbtu/1 Mwh) is the same for the contracts or

$$\frac{8 \text{ MMBtu}}{1 \text{Mwh}} = \frac{h*10{,}000 \text{ MMBtu}}{736 \text{ Mwh}}$$

Solving for h we get 0.59. Thus, for every 1 electricity contract, we would need to buy approximately 0.6 gas contracts. Since we can't buy fractions of a contract, we need to rewrite h as a fraction with lowest common denominator. Thus h = 3/5 and we would buy 3 gas contracts for every 5 electricity contracts.