

Understanding Heat Rate Products

Energy consumers who are evaluating various electricity contracting options available often scratch their head when presented with Heat Rate offers, since some don't understand how these products work and how they ultimately impact the monthly electricity bill.

What is heat rate?

The term "heat rate" refers to a power plant's efficiency in converting fuel to electricity. Heat Rate is expressed as the number of British thermal units (Btu) required to generate a kilowatt hour (kWh) of electricity. Lower Heat Rates are associated with more efficient power generating plants.

What is a Heat Rate price?

In retail electric markets, Heat Rate products offer consumers an opportunity to link their power price to the price of natural gas. Rather than opting for a fixed price contract, customers on a Heat Rate pay a price for electricity that varies based on the level of a gas price index such as the NYMEX natural gas index or Houston Ship Channel Index. Heat Rate prices are typically quoted in the following format:

$$\text{Electricity Price} = (\text{Heat Rate} \times \text{Gas Index}) + \text{Retail Adder}$$

↓
↓
↓
fixed
variable
fixed

where

- The Heat Rate may be based on the market or may be selected by the customer
- Gas Index typically refers to a monthly gas price
- Retail Adder may include items such as ISO fees, ancillary services costs, retail margin, losses, and shaping

costs. The Retail Adder you are quoted may vary based on the Heat Rate chosen. For example, higher Heat Rates typically result in lower retail adders.

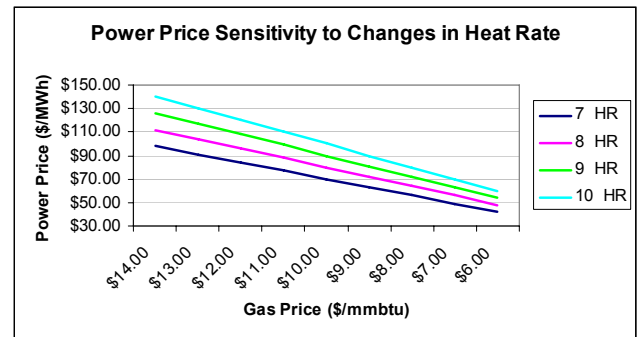
The market implied Heat Rate refers to the forward power price divided by

$$\text{Market Implied Heat Rate} = \frac{\text{Forward Power Price}}{\text{Forward Gas Price}} = \frac{\$70/\text{MWh}}{\$7.25/\text{mmbtu}} = 9.7$$

the forward gas price. For example, At the time of contract signing, the Heat Rate and Retail Adder should be fixed. The Gas Index price, however, typically varies month to month and is not known until you get closer to the delivery month. The NYMEX contract settles three business days prior to the start of the delivery month and the Houston Ship Channel price is typically published the first business day of the delivery month.

chooses a 10 Heat Rate (i.e., 10,000 btu per kWh), every \$1.00/mmbtu change in gas price will have a \$10/MWh impact on your energy bill.

The chart below illustrates the sensitivity of the electricity price by Heat Rate. The higher Heat Rates are represented by lines with steeper slopes. In a declining gas price market, a high Heat Rate will result in a bigger decline in power price than with a lower Heat Rate. The inverse is also true in the



case of an increasing gas price environment.

Are Heat Rate products good for you?

Heat Rate products are most popular in a projected declining gas price environment. Businesses that forecast a downward trend in natural gas prices will choose Heat Rate products rather than opt for fixed price deals so they can take advantage of future declines in market prices.

Whether or not Heat Rate products are good for your company depends on your company's view of the gas market and your tolerance for risk. Heat Rate products are preferred by companies that have energy market

expertise and are able to absorb swings in electricity prices from a financial perspective. Companies that require budgeting certainty and those that do not have on-site energy commodity experts typically favor fixed price alternatives.

How volatile are underlying gas prices?

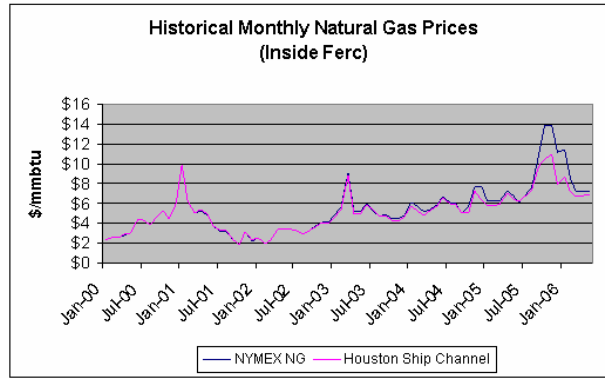
The chart to the right shows the history of NYMEX and Houston Ship Channel monthly gas prices. These indexes tend to be most popular with customers on Heat Rate contracts.

Between 2000 and 2006, the NYMEX natural gas price has fluctuated from \$1.86/mmbtu to \$13.93/mmbtu. The high level of volatility is definitely not for the risk averse. The standard deviation is \$2.50/mmbtu, which can equate to a \$25/MWh swing in electricity terms (assuming a 10 mmbtu/mWh Heat Rate).

Retail Electric Providers may also offer customers the opportunity to lock in gas prices before the delivery month(s). These gas lock provisions allow customers to lock in a gas price when market prices are attractive.

Popularity of Heat Rate products in Texas

Heat Rate products are more popular in ERCOT compared to other regions. However, it's a still a small minority



of customers who elect for this product.

Heat Rates became popular in Texas because of features that are unique to this market. The Lone Star State is the single largest consumer of natural gas in the US. According to 2004 Energy Information Administration data, Texans consumed 3,916,433 million cubic feet of natural gas, or about 17.5% of the nation's consumption. The use of natural gas for plant and lease fuel* represented 35% of overall US consumption. This latter statistic helps illustrate the comfort level with natural gas markets that has been developed by the industrial establishment in Texas.

ERCOT is a less mature power market in comparison to other regions. Historically there was not a good visible index for power, so natural gas became popular by default since natural gas prices and power prices are highly correlated.

Interested in a Heat Rate product?

If you are interested in finding out more about Heat Rate products, contact your SUEZ sales representative.

Plant Profiles

There are 314 generating plants in Texas with capacity >50MW. The chart below shows the breakdown. The two most efficient Heat Rate assets in ERCOT are owned and operated by SUEZ Energy North America (Wise County, Ennis)

Heat Rate	# of Plants	Total MW
>10	189	50,155
9 to 10	16	5,195
8 to 9	20	5,559
7 to 8	53	21,943
< 7	16	9,359

**Natural gas used in well, field, and lease operations (such as gas used in drilling operations, heaters, dehydrators, and field compressors) and as fuel in natural gas processing.*



Customers in Houston (above) and other Texas markets have developed an affinity for Heat Rate products because of the state's unique relationship with natural gas.