

# Combined Heat and Power

## Natural Gas Opportunities for Las Vegas



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# Southwest Gas

- Founded 75 years ago in Barstow, CA
- 2,600 employees serve more than 1.7 million natural gas customers throughout parts of Arizona, California and Nevada
- 29,000 miles of operating pipe
- One of the fastest-growing utilities



# What impacts natural gas prices?

- Supply and demand balance –
  - tight supply market
- Most new electric generation fueled by natural gas –
  - national and local
- Lags in bringing new production to market



Price for Electricity, **X**

Cost of Fuel, **Y**

Equivalent Price for Electricity, **Z**

$$Z = \frac{Y}{\text{CHP Efficiency}} \times \text{Fuel Conversion Factor}$$

$$\text{Spark Spread} = X - Z$$

Example:

Electricity Price **\$.092/kWhr**

Fuel Price **\$8.70/MMBtu**

Cogen Efficiency of 85%

Equivalent Cost =  $(8.70 / .85) * 3412 \text{ Btu/kWhr} = \mathbf{$.035/kWhr}$

**Spark Spread = \$.092 - \$.035 = \$.057/kWhr**

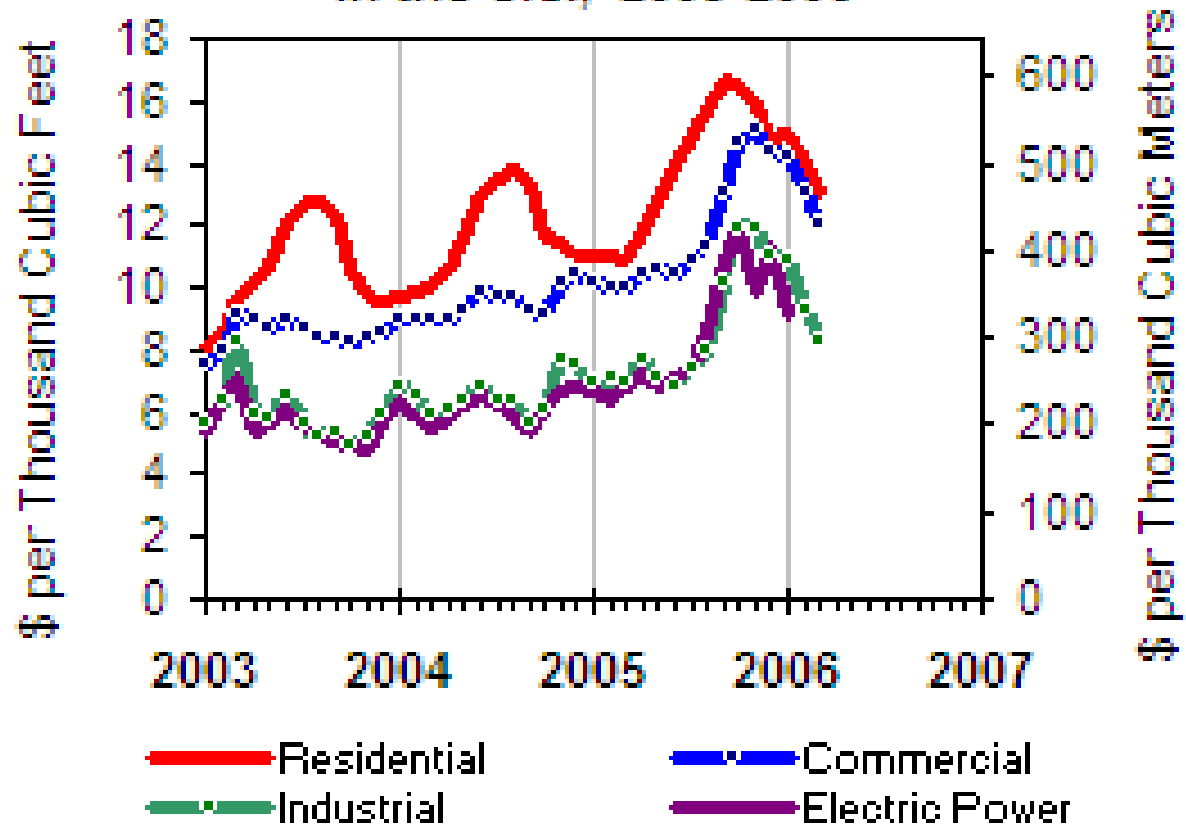
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Spark spread is important to determine the economics of the CHP market.

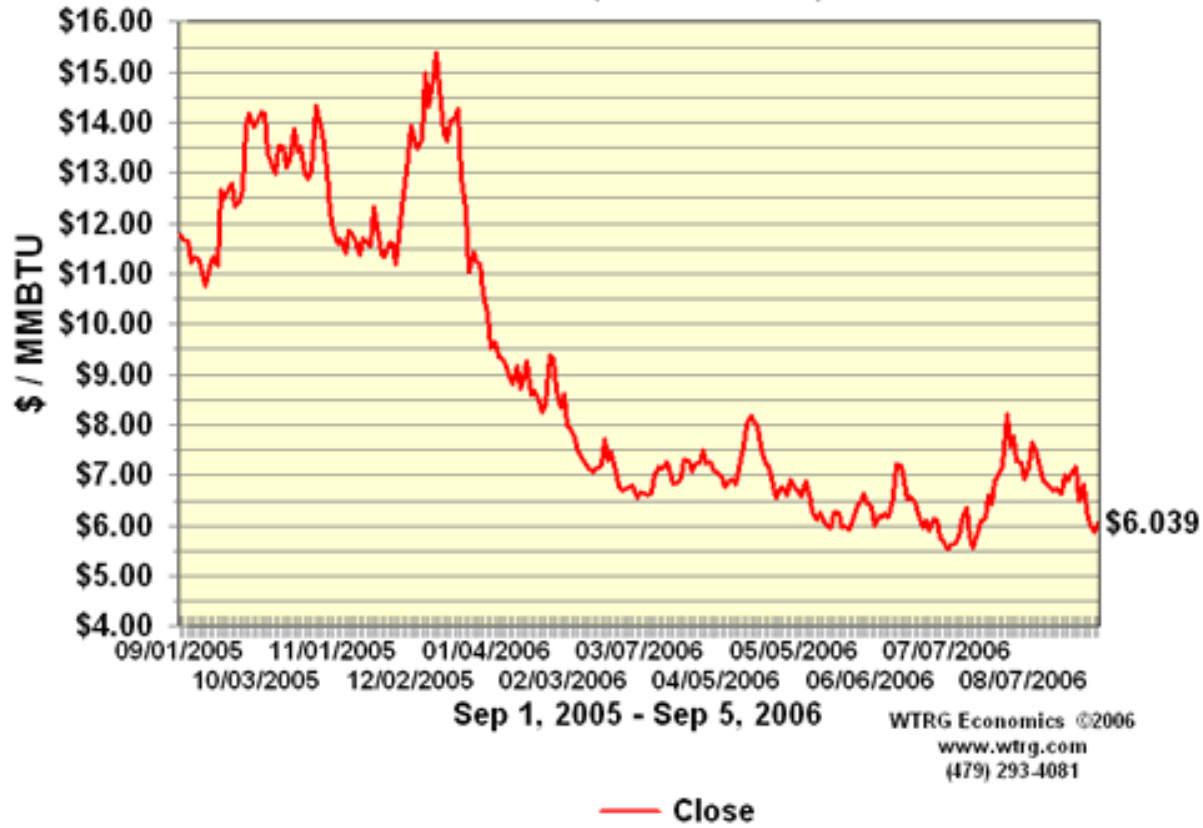
Spark spread is the difference between the price of electricity delivered and price of fuel purchased. The higher the CHP system's efficiency, the lower the equivalent electricity cost.



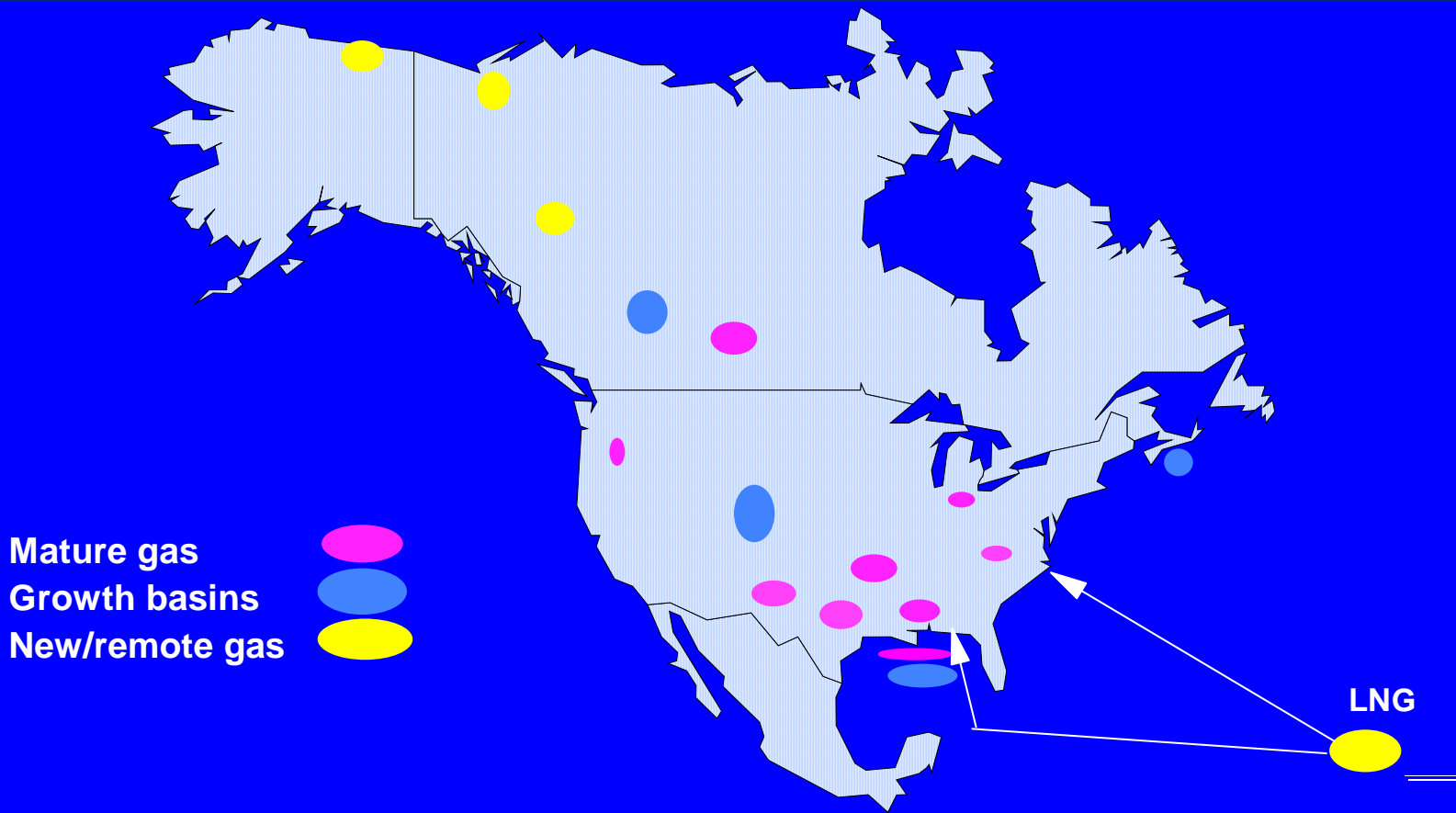
### Average Consumer Price of Natural Gas in the U.S., 2003-2006



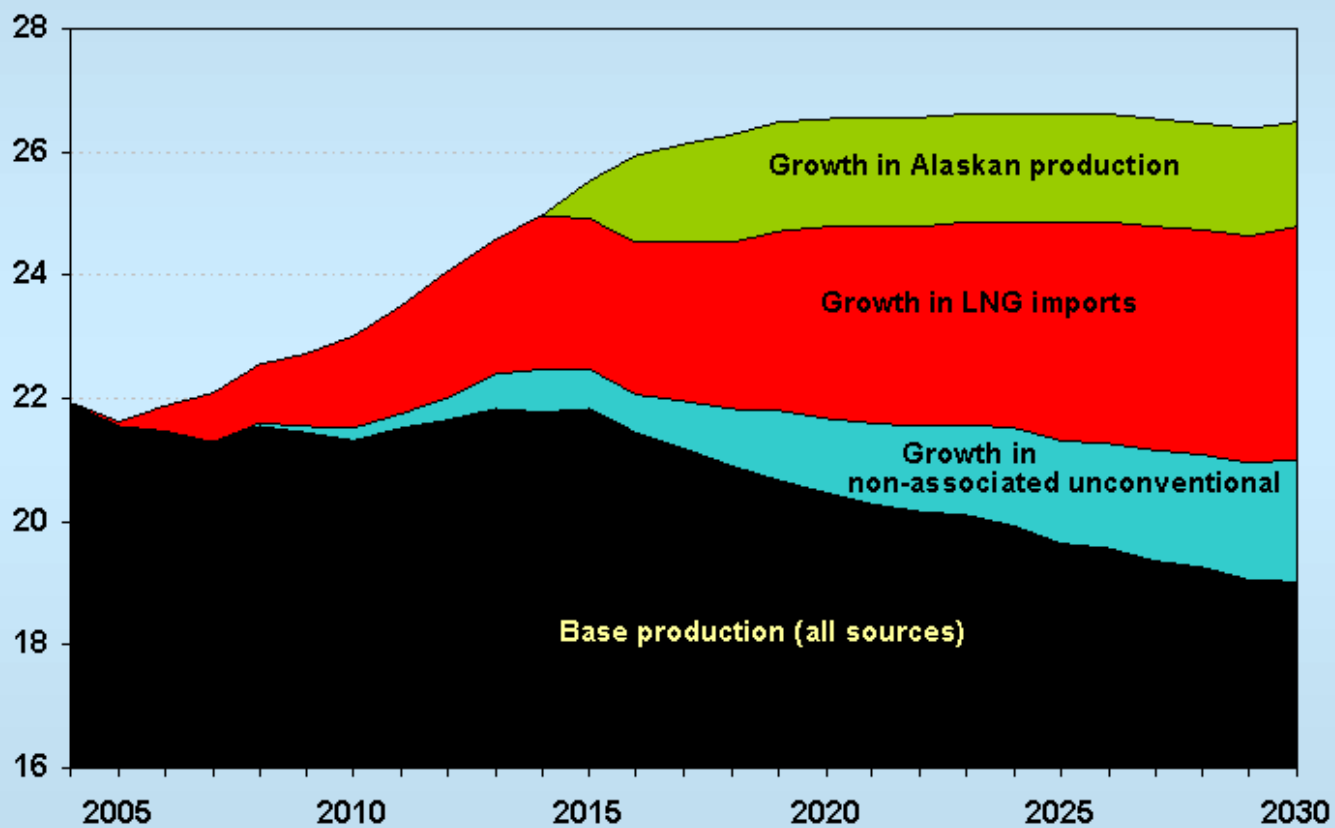
### NYMEX Natural Gas Futures Close (Front Month)



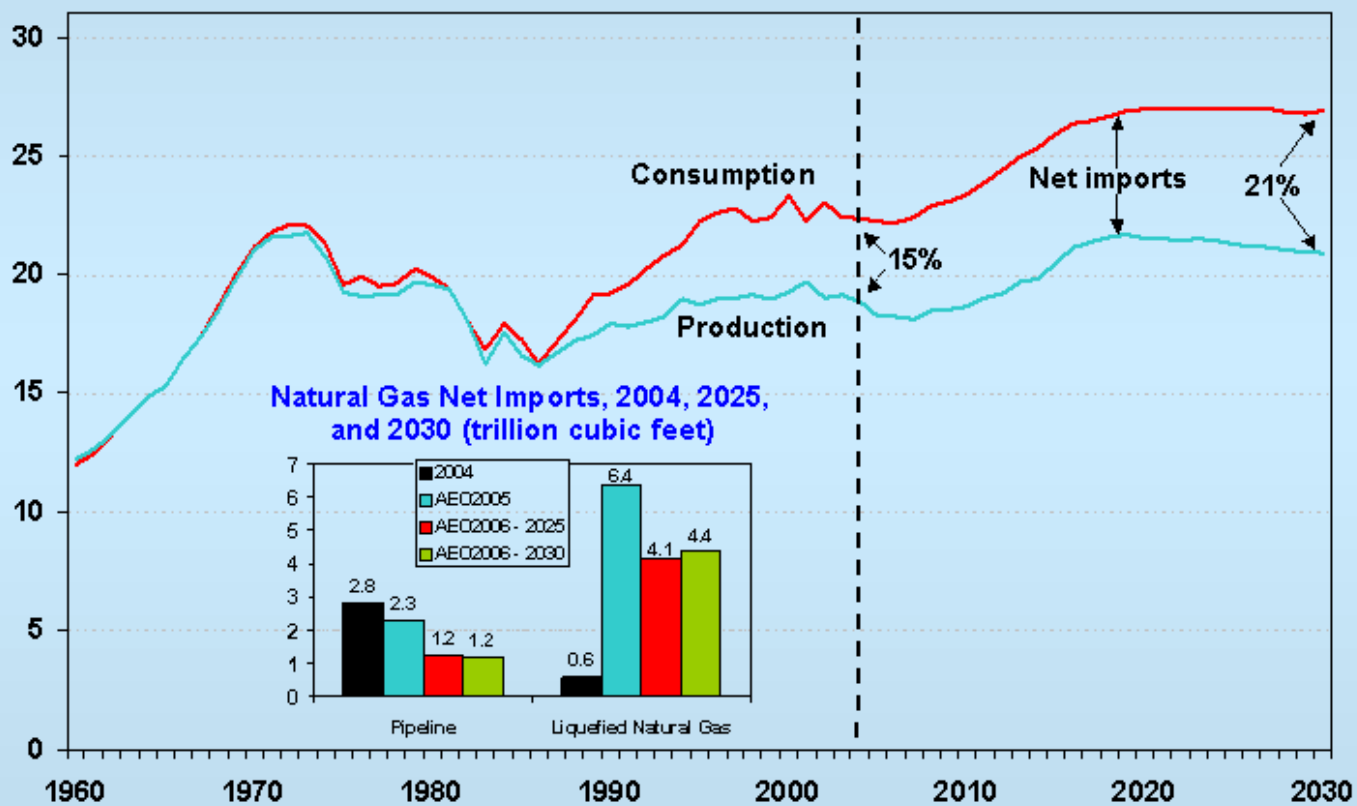
# U.S. Gas Supply is Migrating to More Remote Sources



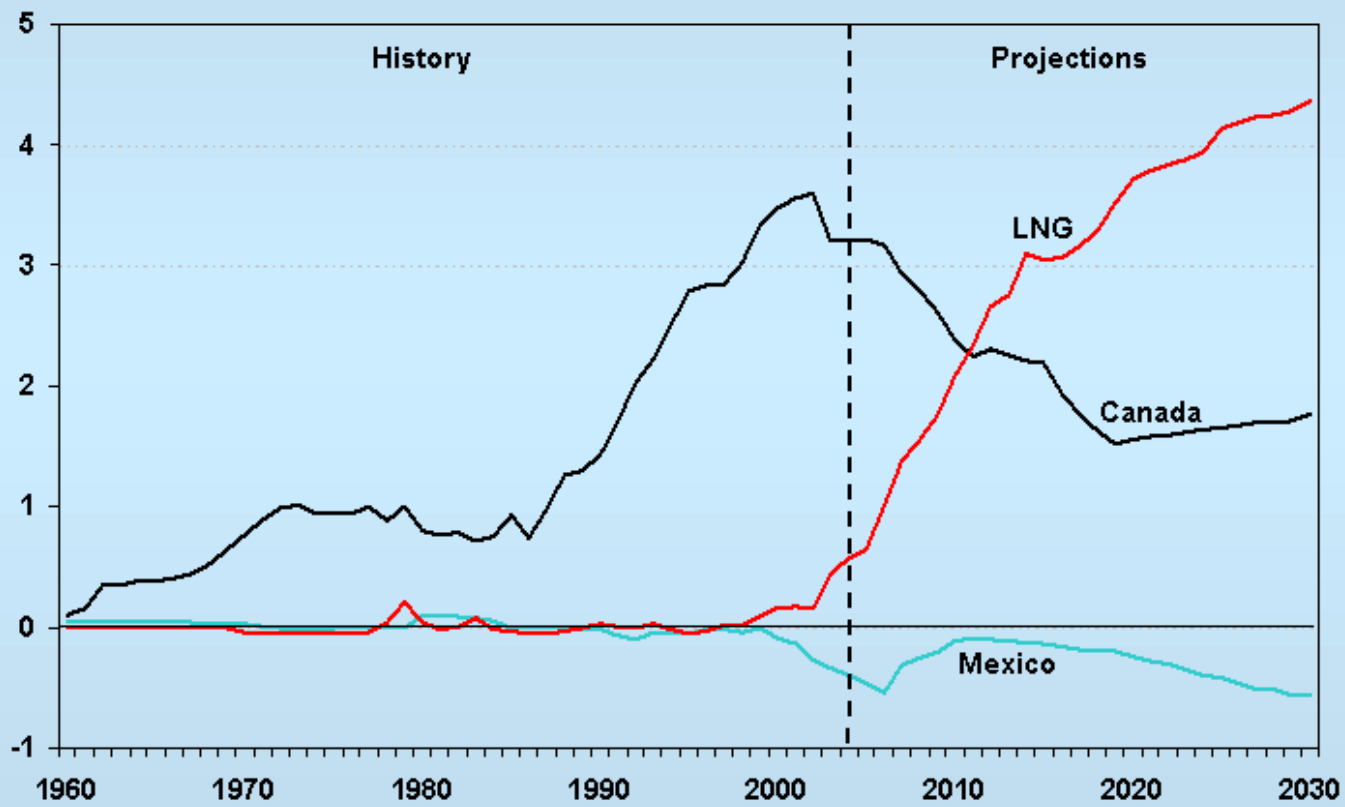
## Major Sources of Incremental Natural Gas Supply, 2004-2030 (trillion cubic feet)



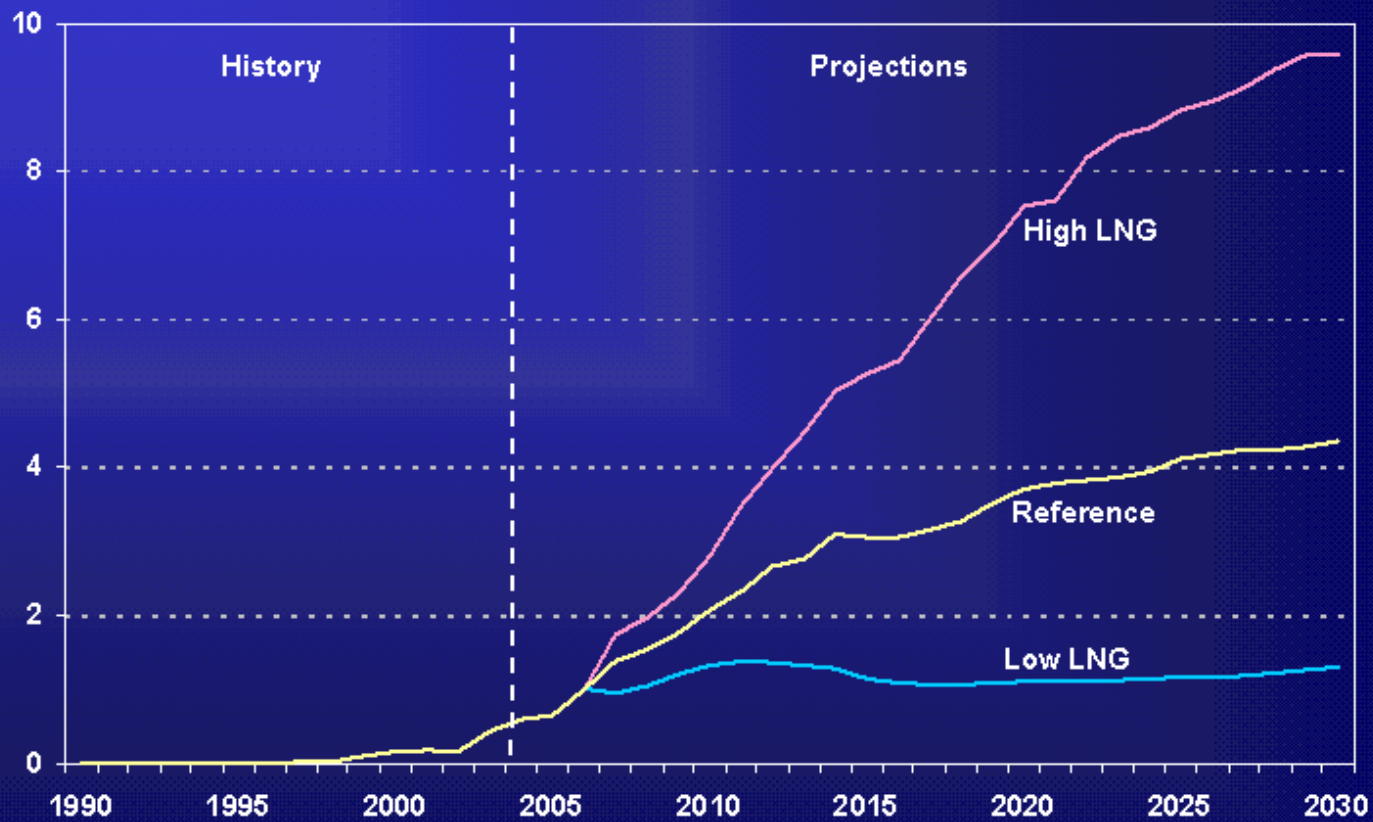
## Natural Gas Production, Consumption, and Imports, 1960-2030 (trillion cubic feet)



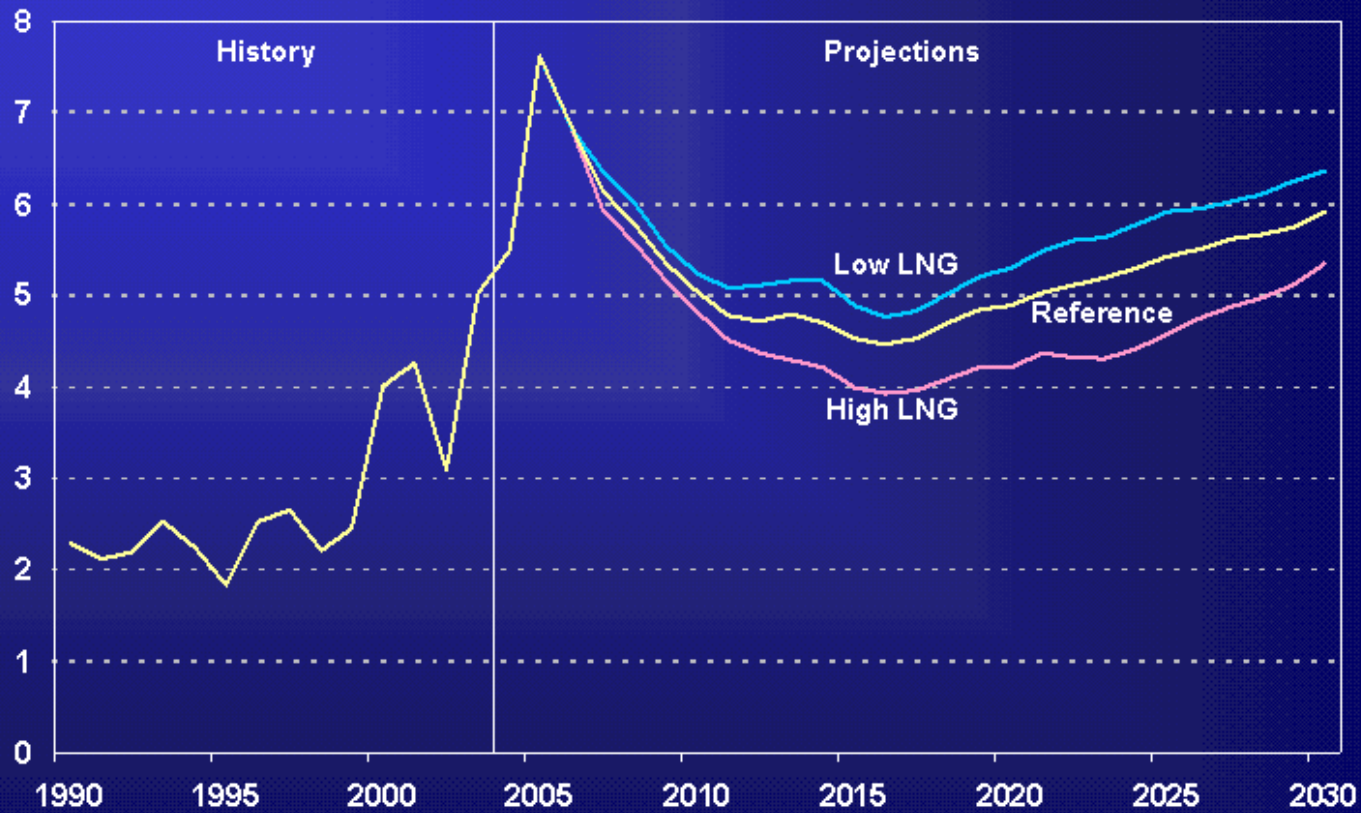
## U.S. Net Imports of Natural Gas, 1960-2030 (trillion cubic feet)



## Net Imports of Liquefied Natural Gas in Three Cases (trillion cubic feet)



## Lower 48 Natural Gas Wellhead Prices (2004 dollars per thousand cubic feet)



# The Future?

*Figure 1. Energy prices, 1980-2030 (2004 dollars per million Btu)*



# Southwest Gas Your CHP Partner

- Southwest Gas key account manager provides:
  - Gas availability, pressure, capacity and hook-up information
  - Initiation of a preliminary economic feasibility study
  - Technical guidance
  - Ongoing assistance and support

