# North American Natural Gas Outlook: Prospects and Risks

*Northeast Energy and Commerce Association*

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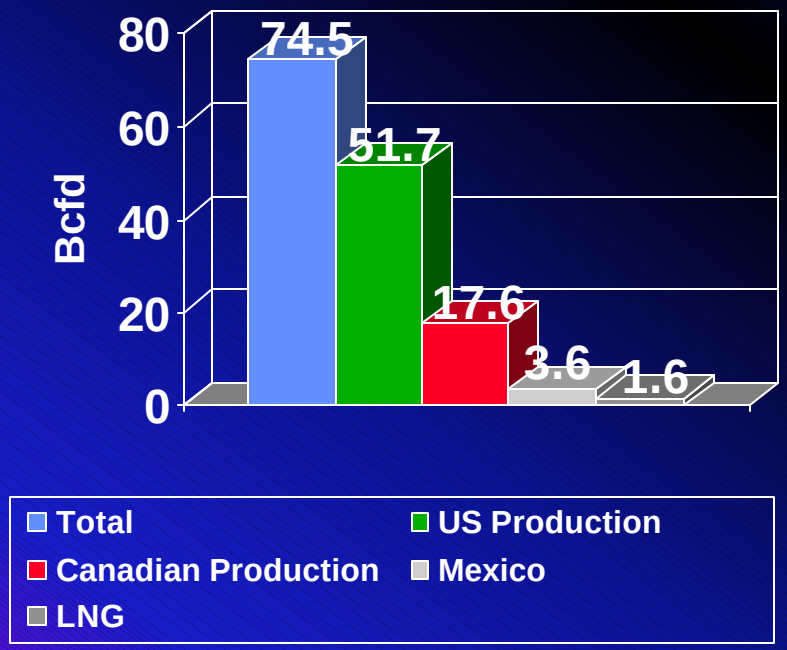
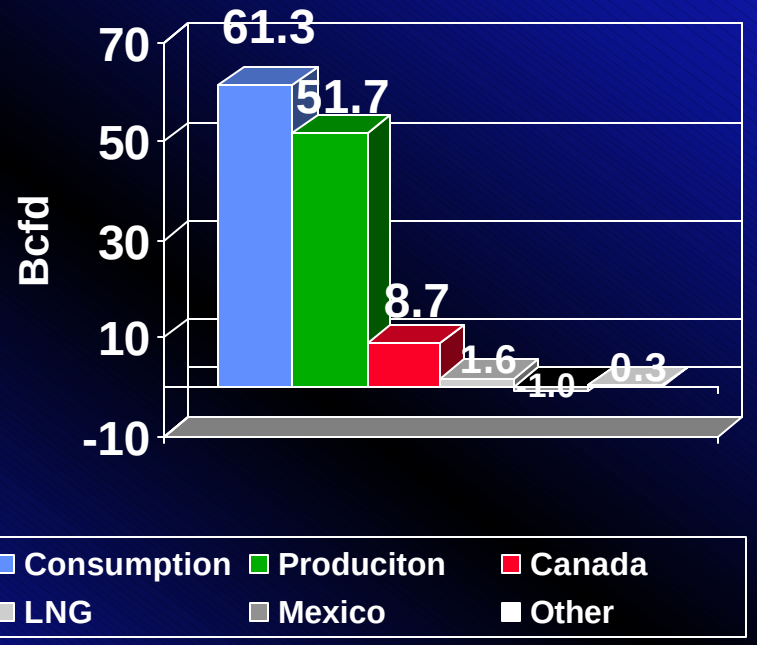
# 2004 North American Natural Gas Supply was 74.5 Bcfd and US Consumption was 61.3 Bcfd. Projected consumption growth rates range from 1.5% to 2.5% per year from 2004-10 (1.0 to 1.6 Bcfd).

## North American Natural Gas Supply (2004)




## US Natural Gas Supply (2004)



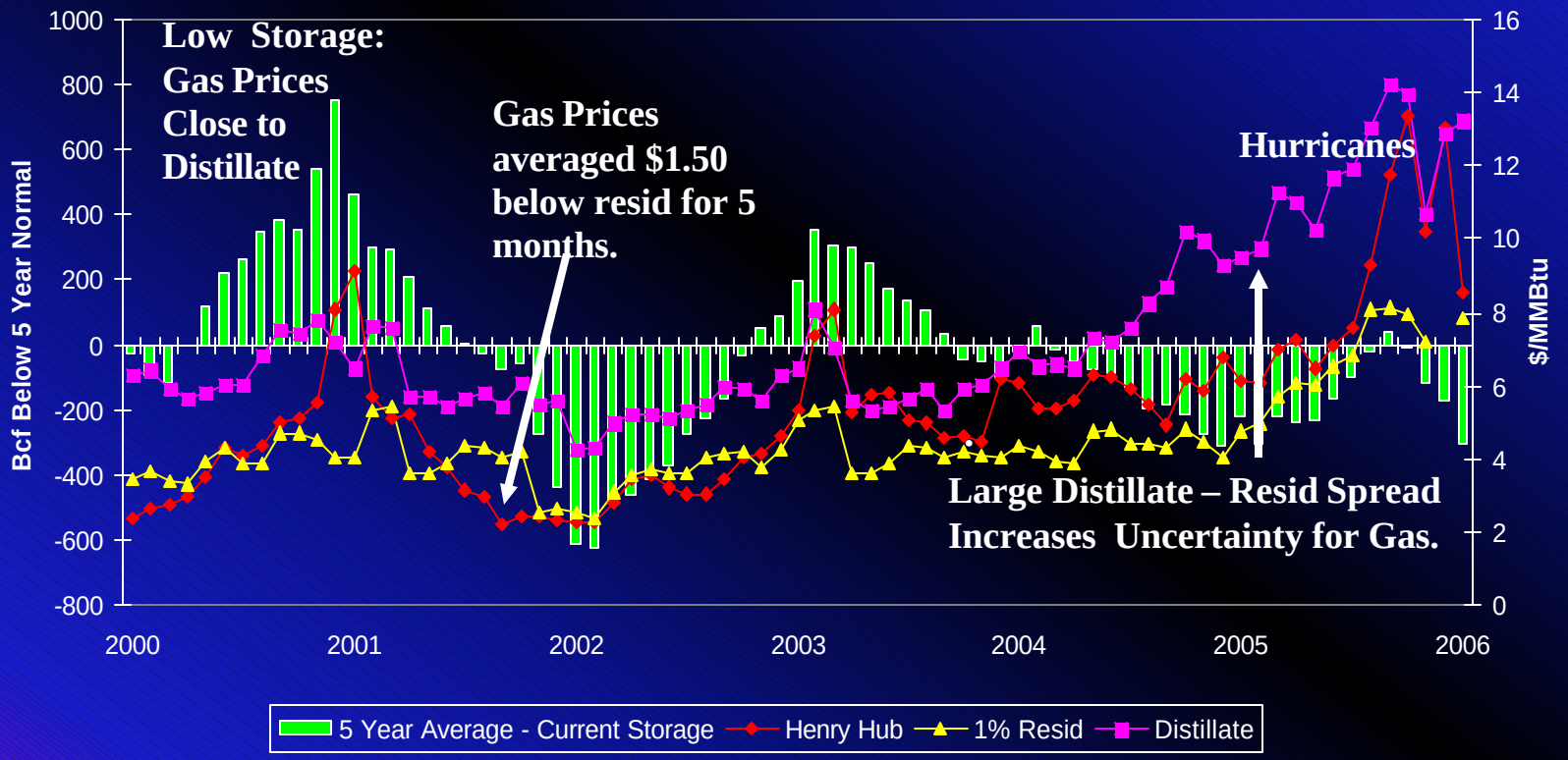

Other is storage and statistical discrepancy

# Working gas storage is likely to end March close to 1500 Bcf. Last year storage ended at 1246 Bcf and the five year average was 1041 Bcf.

- During December and January, weather adjusted working gas storage withdrawals averaged 3 Bcfd lower than the previous year. This implies 4 Bcfd of demand has been lost. (During the period influenced by the holidays, weather adjusted storage withdrawals averaged 7 Bcfd below last year).
- Assuming a 3 Bcfd looser supply demand balance, working gas storage withdrawals would end the heating season at 1500 Bcf with normal weather.
- With Henry Hub prices below $8.00 per MMBtu, 2.5 Bcfd of gas demand could return and supply could be reduced by .5 Bcfd by taking more liquids out of the gas stream.
- With increased demand storage could end March at 1250 Bcf but it is unlikely demand will respond that quickly.

**Henry Hub prices tend to be closer to residual fuel oil when storage is higher than normal, and to distillate when storage is below normal. Will the next few months be a period were gas prices decline below residual fuel oil?**

## Henry Hub Prices vs Working Gas Storage

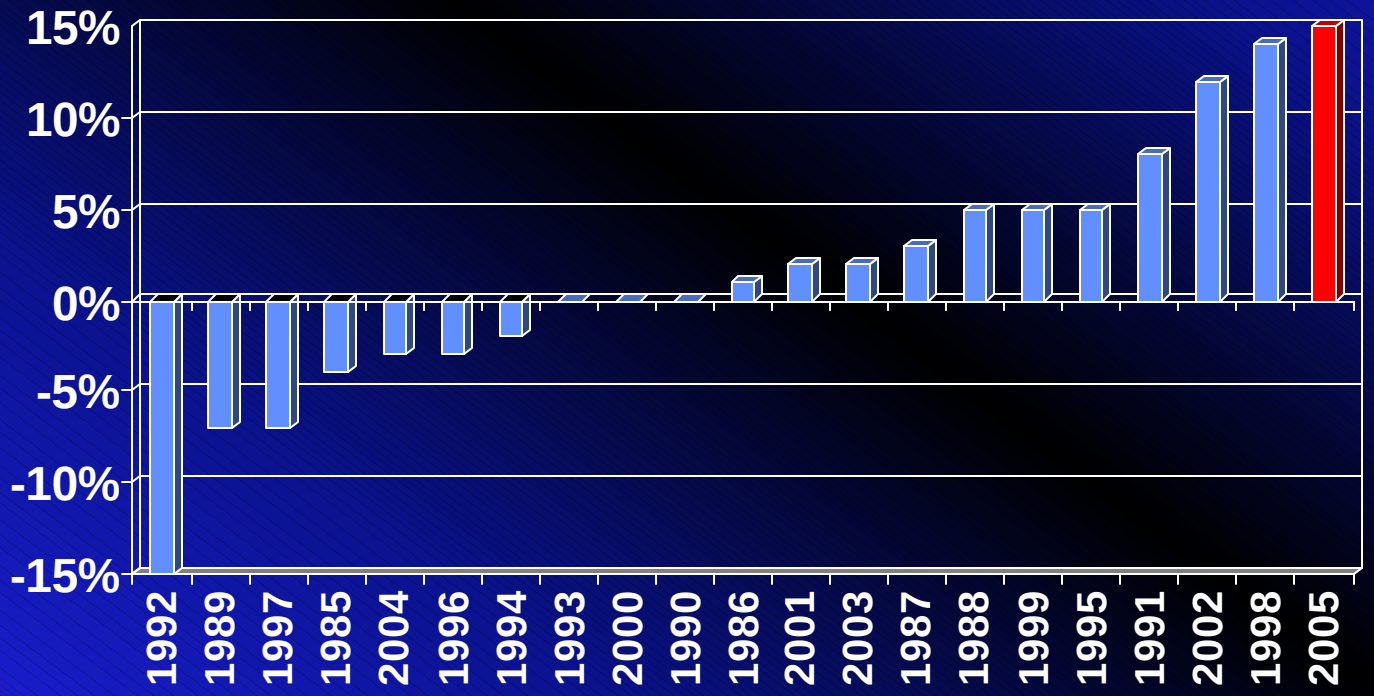


## An important question about how much demand will return is key both for the next few months and the non-heating season.

- $8.00 - .7 Bcfd switch 1% resid to power generation in the Gulf Coast
- $8.00 - .2 Bcfd switch industrial sector
- $8.75 - .7 Bcfd .3% sulfur residual fuel oil in Northeast
- $10.00 - .5 Bcfd Ammonia production coming
- $12.00 - .4 Bcfd process adjustments
- Total - 2.5 of additional industrial demand.
- In addition .5 Bcfd of gas liquids could taken out of the gas stream.

# CDDs have exceeded 10% of normal three out of the last 20 years. All of the extremely warm years have occurred since 1998.

## Non-Heating Season CDD as % of Normal



# Forecasts are for another warmer than normal summer and greater hurricane activity than last year. With normal weather, we expect Henry Hub prices close to residual fuel oil.

- CDDs 10% above normal during the non-heating season could add 200 to 300 Bcf to electric power demand.
- We assume 100 Bcf lost to hurricanes but last year, close to 300 Bcf. was lost.
- Industrial demand return is a big question.
- LNG imports from Nigeria and Trinidad should provide a significant increase in supply.

## Non Heating Season Supply – Disposition (Bcfd)

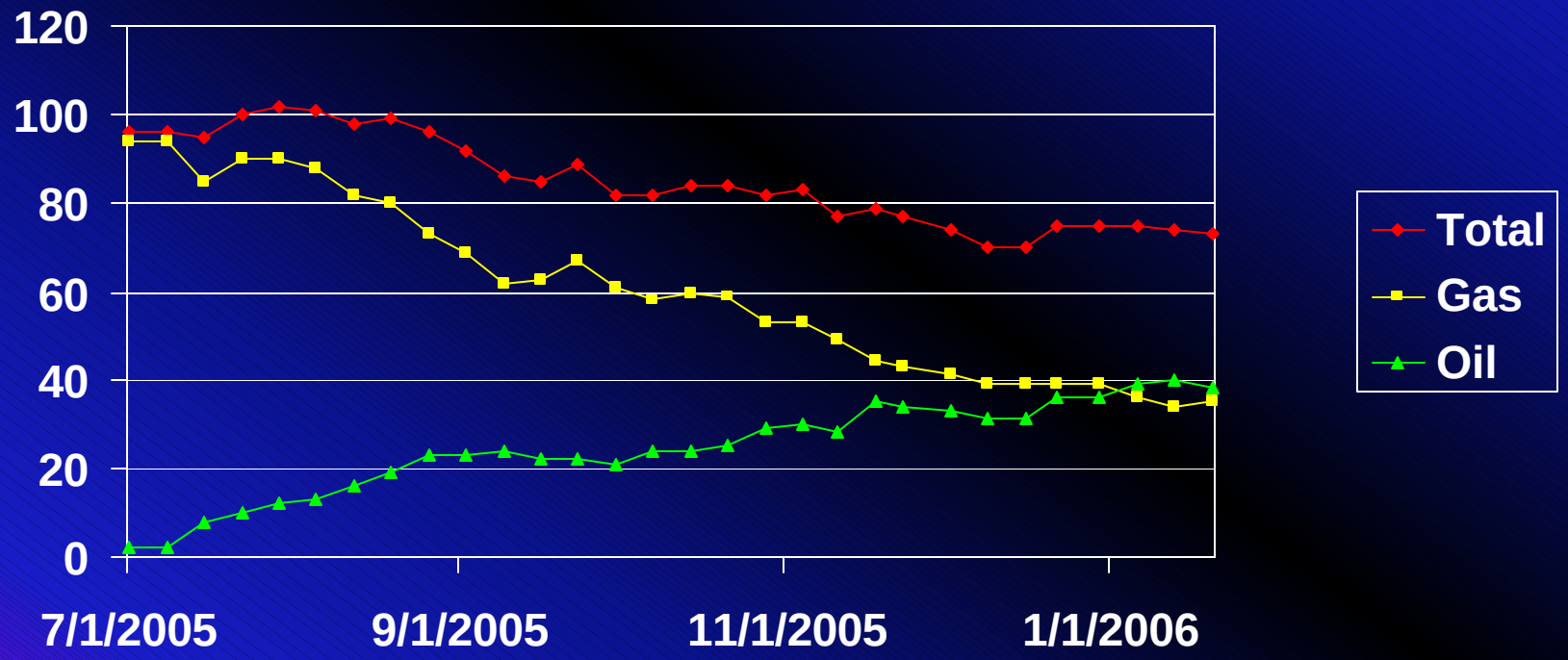
| Sector | 2006 | 2005 | Change | %Change |
|---|---|---|---|---|
| Residential | 6.6 | 6.3 | 0.3 | 4.0% |
| Commercial | 5.4 | 5.3 | 0.1 | 2.6% |
| Industrial | 18.4 | 17.4 | 1.0 | 5.5% |
| Electric Power | 17.3 | 17.0 | 0.4 | 2.1% |
| Other | 4.6 | 4.5 | 0.0 | 0.5% |
| Total Deliveries | 52.3 | 50.5 | 1.8 | 3.4% |
| Production | 50.1 | 49.3 | 0.9 | 1.7% |
| Canada & Mexico | 8.0 | 7.9 | 0.1 | 0.8% |
| LNG | 3.0 | 1.5 | 1.4 | 96.2% |
| Total New Supply | 61.0 | 58.7 | 2.4 | 4.0% |
| | | | | |
| Injections (Bcfd) | 8.7 | | | |
| Total Injections (Bcf) | 1880 | | | |
| March Storage (Bcf) | 1480 | | | |
| October Storage | 3360 | | | |

# Large data errors are a major problem, the market could be much softer than implied by our supply-demand balance. Weather adjusted storage injections/withdrawals is the key market signal.

- Last non-heating season working gas storage injections, were 1900 Bcf despite the loss of close to 300 Bcf of production to hurrianes and the hottest non-heating season in 20 years.
- After adjusting for demand for hurricanes, working gas storage injections would have been about 2100 Bcf. (Note demand was lost because of hurricanes.)
- If we end the March close to 1500 Bcf, 2100 Bcf of injections would bring October storage to 3600 Bcf.
- Cash prices would be drop sharply because of lack of storage capacity in September and October.

# If the shift from gas directed drilling to oil directed drilling continues, production on the shelf could decline by as much as 1 Bcfd more than would have occurred before the shift.

## Gulf of Mexico Gas Rig Count



# Rapidly declining Gulf of Mexico production is expected to offset growth in the Rockies.

## US Production Outlook (Bcfd)

| Region | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Gulf of Mexico-Offshore | 11.5 | 10.6 | 9.8 | 9.1 | 8.8 |
| Gulf Coast-Onshore | 12.2 | 12.0 | 12.3 | 12.6 | 12.8 |
| Mid-Continent | 7.6 | 7.7 | 7.8 | 7.9 | 8.0 |
| Rocky Mountain | 7.0 | 7.2 | 7.6 | 7.9 | 8.3 |
| Permian Basin | 4.6 | 4.5 | 4.4 | 4.3 | 4.2 |
| San Juan Basin | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 |
| Other | 4.4 | 4.3 | 4.2 | 4.3 | 4.4 |
| SEER Total | 51.0 | 49.6 | 49.8 | 50.0 | 50.4 |
| %Change | -1.8% | -2.8% | 0.6% | 0.3% | 0.8% |

# Increased supply will come from LNG. Strong growth in gas consumption of power generation is likely to keep the market tight until 2008.

## US Supply and Disposition (Bcfd)

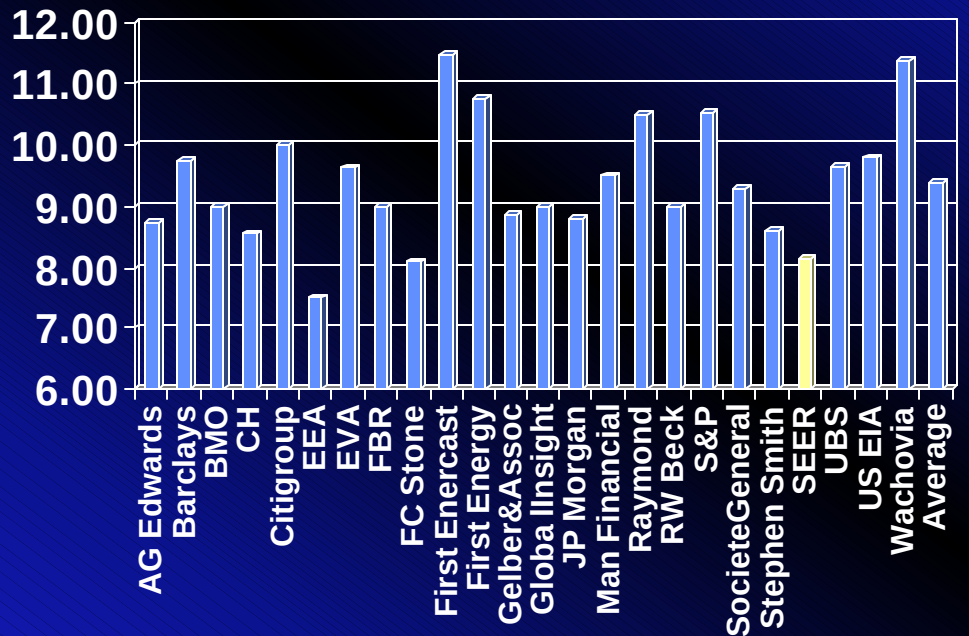
| | 2004 | 2005 | 2006 | 2007 | 2008 | Annual %Ch 05-08 |
|---|---|---|---|---|---|---|
| Dry Gas Production | 51.0 | 49.6 | 49.8 | 50.2 | 50.4 | 0.4% |
| Canada & Mexico | 7.5 | 8.0 | 8.0 | 8.1 | 8.2 | 0.6% |
| LNG | 1.6 | 1.5 | 2.4 | 3.2 | 4.5 | 30.8% |
| Net Imports | 9.0 | 9.5 | 10.4 | 11.3 | 12.7 | 7.4% |
| Supplements | 0.2 | 0.2 | 0.2 | 0.2 | 1.2 | 62.2% |
| **Total New Supply** | 60.2 | 59.3 | 60.7 | 61.6 | 64.3 | 2.1% |
| Percent Change | | -1.5% | 2.4% | 1.6% | 4.3% | |
| *Demand* | **2004** | **2005** | **2006** | **2007** | **2008** | **Annual %Ch 05-08** |
| Residential | 13.1 | 13.3 | 13.1 | 13.5 | 13.9 | 1.2% |
| Commercial | 7.8 | 8.3 | 8.2 | 8.4 | 8.6 | 0.9% |
| Industrial | 20.0 | 18.5 | 18.3 | 19.5 | 19.8 | 1.8% |
| L&P Plant Fuel | 3.0 | 3.0 | 3.0 | 3.0 | 3.2 | 1.5% |
| Transportation | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 0.6% |
| Electric Power | 14.6 | 14.9 | 15.5 | 15.6 | 16.9 | 3.2% |
| Total Demand | 60.3 | 59.8 | 60.0 | 61.8 | 64.3 | 1.8% |
| Percent Change | | -0.9% | 0.3% | 3.1% | 4.0% | |

# Between 2008 and 2010 LNG imports and oil price declines are likely to cause Henry Hub prices to decline but there is substantial disagreement about how far.

- By 2008 substantial increases in oil production and refinery capacity, are likely to cause oil prices to decline to between $30 and $40 per barrel. Longer term there is substantial controversy about oil supply.
- Political instability, increasing reliance on OPEC, project delays, and faster than expected declines of existing production provide the upside for oil and natural gas prices.
- Gas prices will be linked to oil through fuel switching, conversion of oil fired plants to gas, gas and oil use for chemical processes, and gas to liquids production. North America will have to compete for world supplies. The value of the US dollar will be as important as production and shipping cost for LNG.

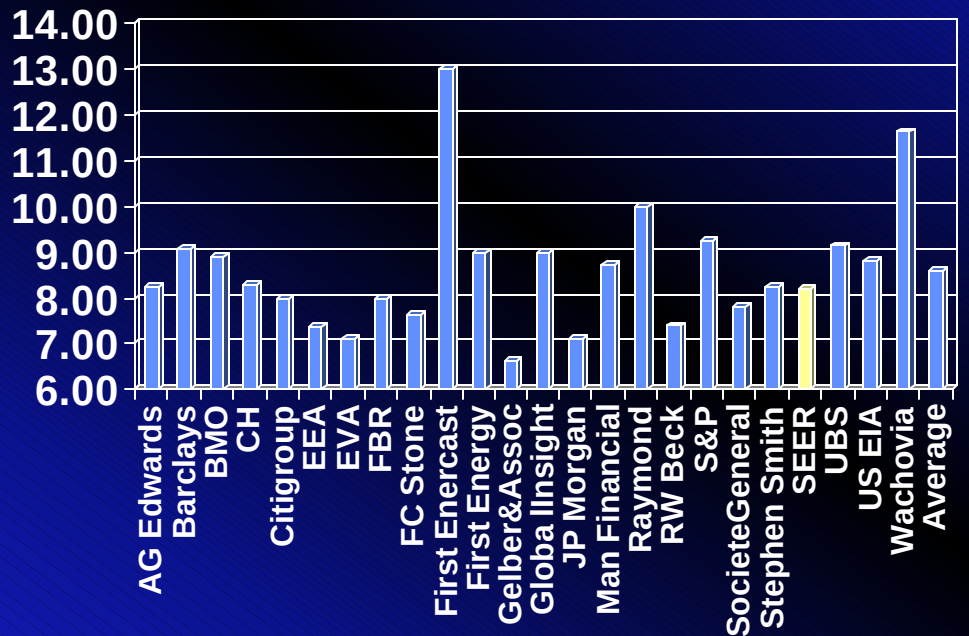
# Average Prices 2006

## Henry Hub Prices $/MMBtu



# Average Prices 2007

## Henry Hub Prices $/MMBtu



# Average Prices 2010

## Henry Hub Prices $/MMBtu