# Natural Gas Supply Outlook through 2010: Challenges for North America and the Northeast US

*Northeast Gas Association*

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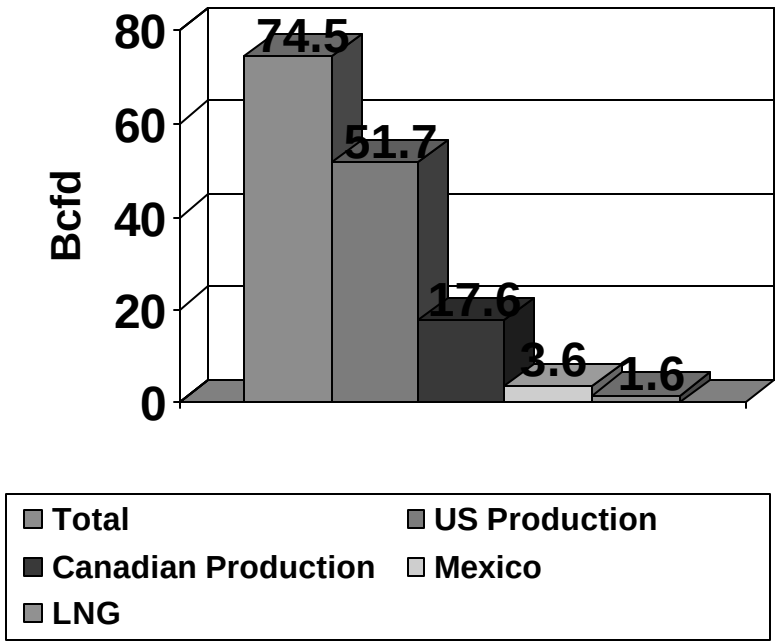
# Outline of Presentation

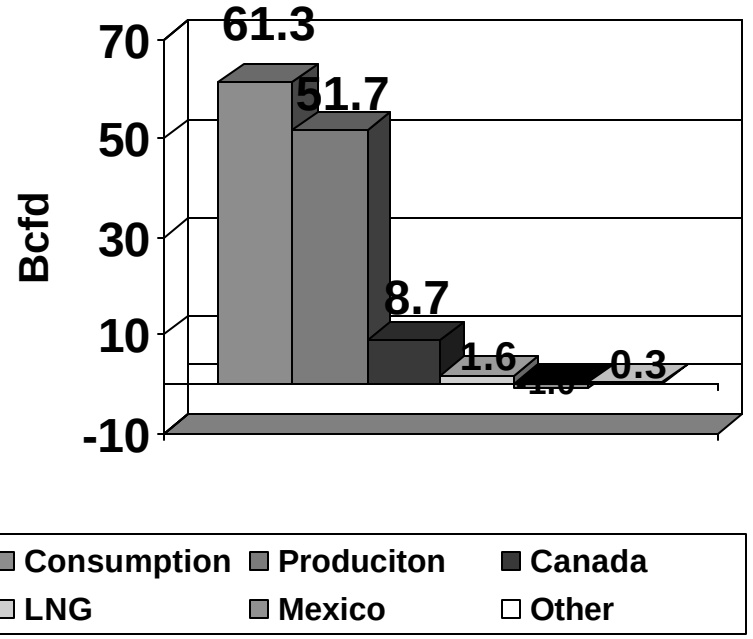
- North American Production Outlook (Focus on Gulf Coast)
- Liquefied Natural Gas
- Northeast Market
- Volatility and Demand

## 2004 North American Natural Gas Supply was 74.5 Bcfd and US Consumption was 61.3 Bcfd. Projected growth rates range from 1.5% to 3% per year from 2004-10 (.9 to 1.8 Bcfd).

### North American Natural Gas Supply (2004)




### US Natural Gas Supply (2004)



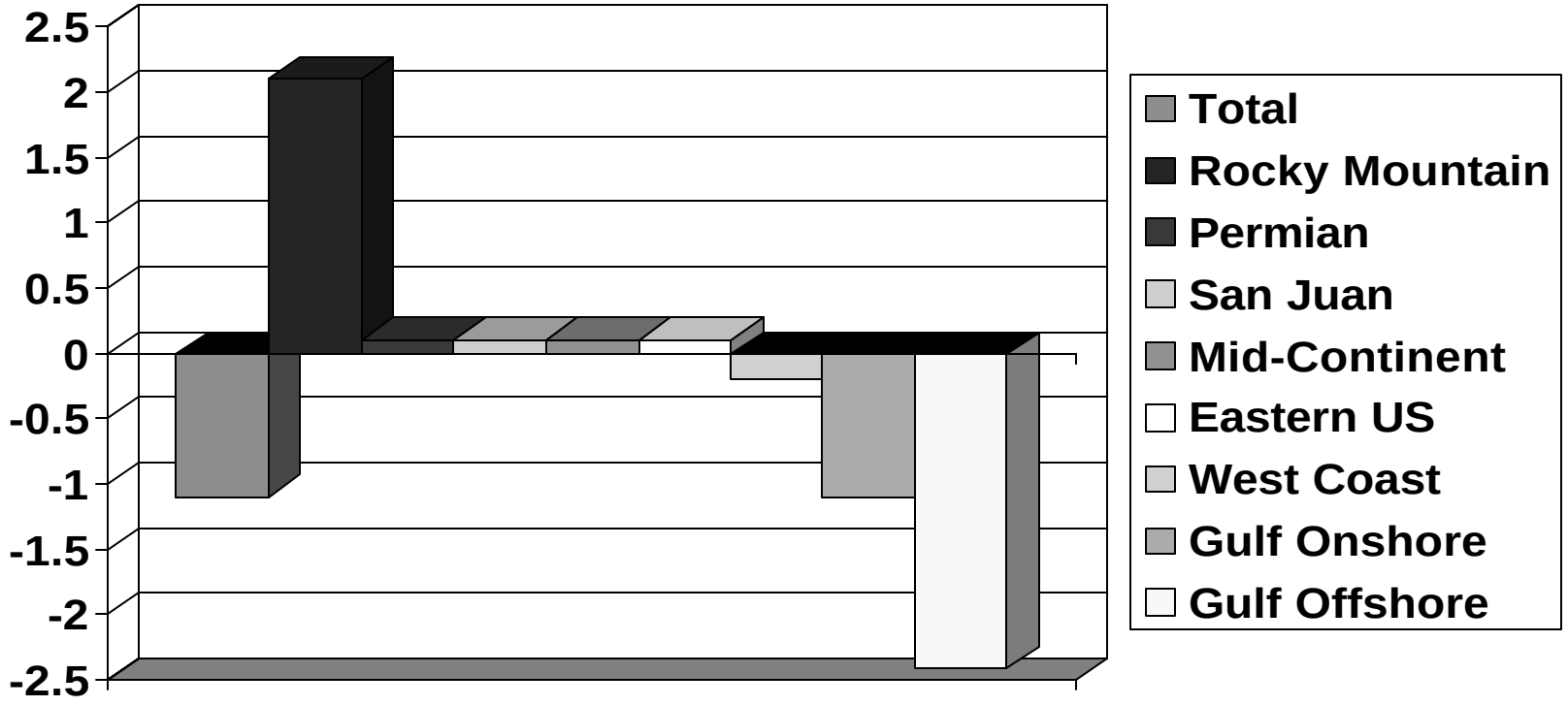

Other is storage and statistical discrepancy

# Lippman Consulting Inc. (LCI) North American natural gas production model

- 111 different supply types
- Production by vintage at the basin level
- Associated and non-associated gas
- Conventional, coal seam modeled separately
- Driven by producer plans

# In 1996 most “Gurus” were forecasting very strong growth in the Offshore Gulf. However, this region has been the major cause of the decline in US production.

## Change in US Natural Gas Production 2000 -2004 (Bcfd)

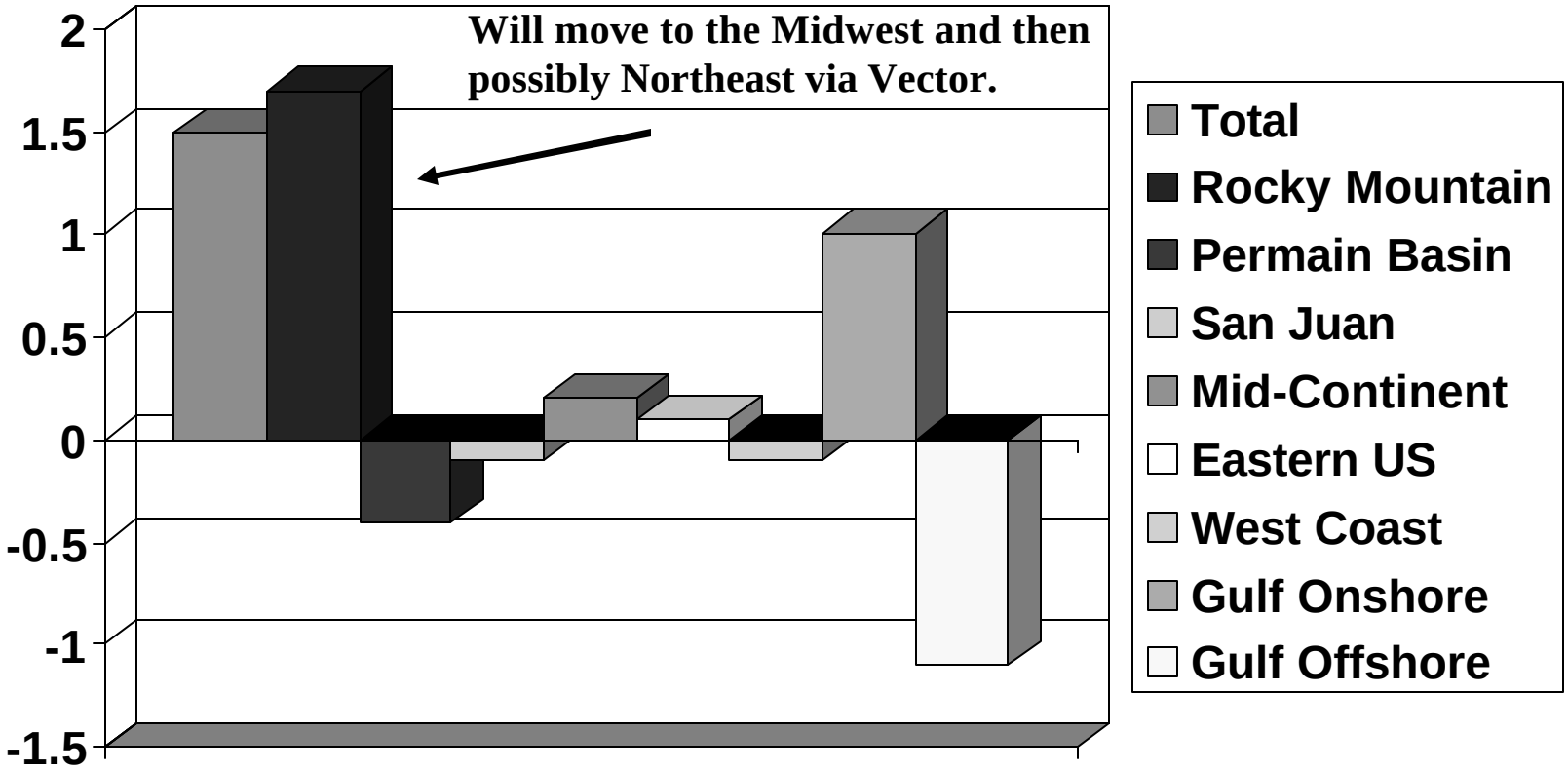


## Conventional gas production has been declining since 1990. Natural gas production growth will be coal bed methane, tight gas, deep shelf and deepwater.

- Tight Gas (3 Bcf/d): Green River tight gas in WY (Jonah and Pinedale), Mamm Creek and Rulison in Colorado, Natural Buttes in Utah, Bossier (TX) and Vernon (LA).
- Coal Bed Methane (5 Bcfd): Deeper Big George coals in the Powder River will offset declines in Wyodak coals.
- Shale gas production will grow from 1.5 to 2.0 Bcfd by 2006 (primarily Barnett Shale in North Texas).
- Deepwater and deep shelf

**The LCI projections are for about 1.5 Bcfd production growth from 2004 to 2010 (.5% per year). AEO 2005 projects 4.1 Bcfd growth (1.3% per year). LCI offshore gulf production is flat but AEO 2005 projects 2.2 Bcfd of growth.**

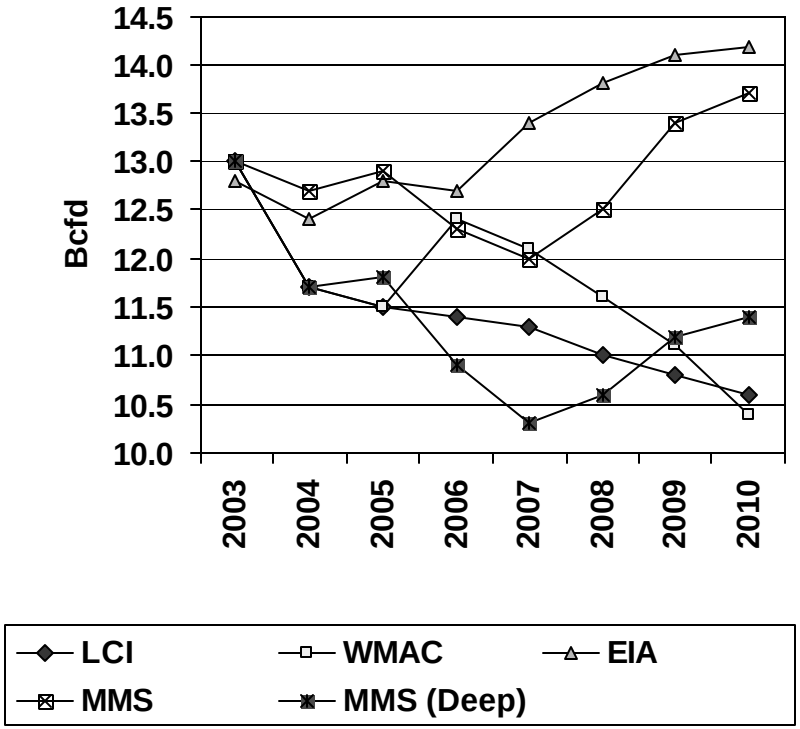
## Change in US Natural Gas Production 2004 -2010 (Bcfd)



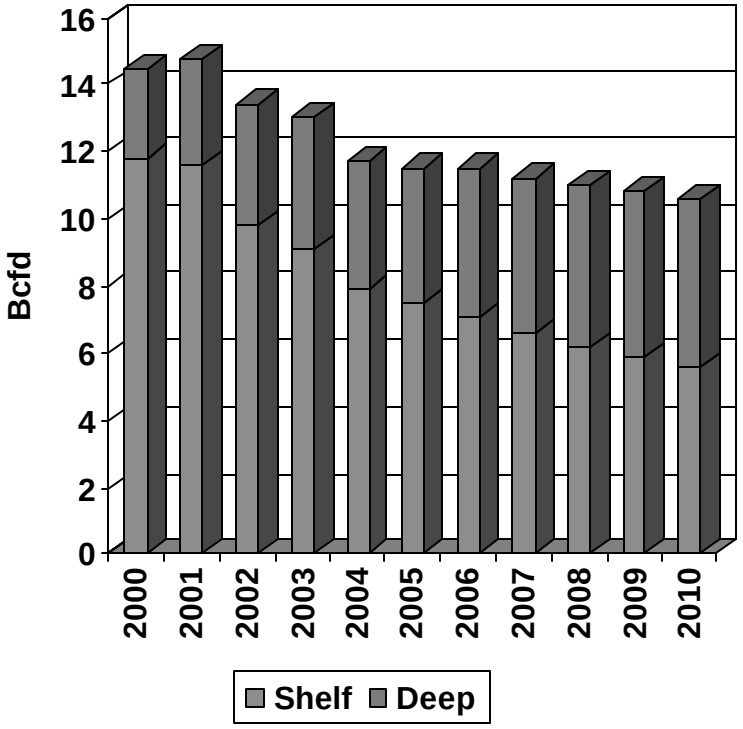

Source: SEER, Lippman Consulting Inc.

# SEER, LCI and WMAC project shelf declines to be greater than deepwater growth. Deepwater and Deep Shelf are major uncertainties.

## Gulf Offshore Production

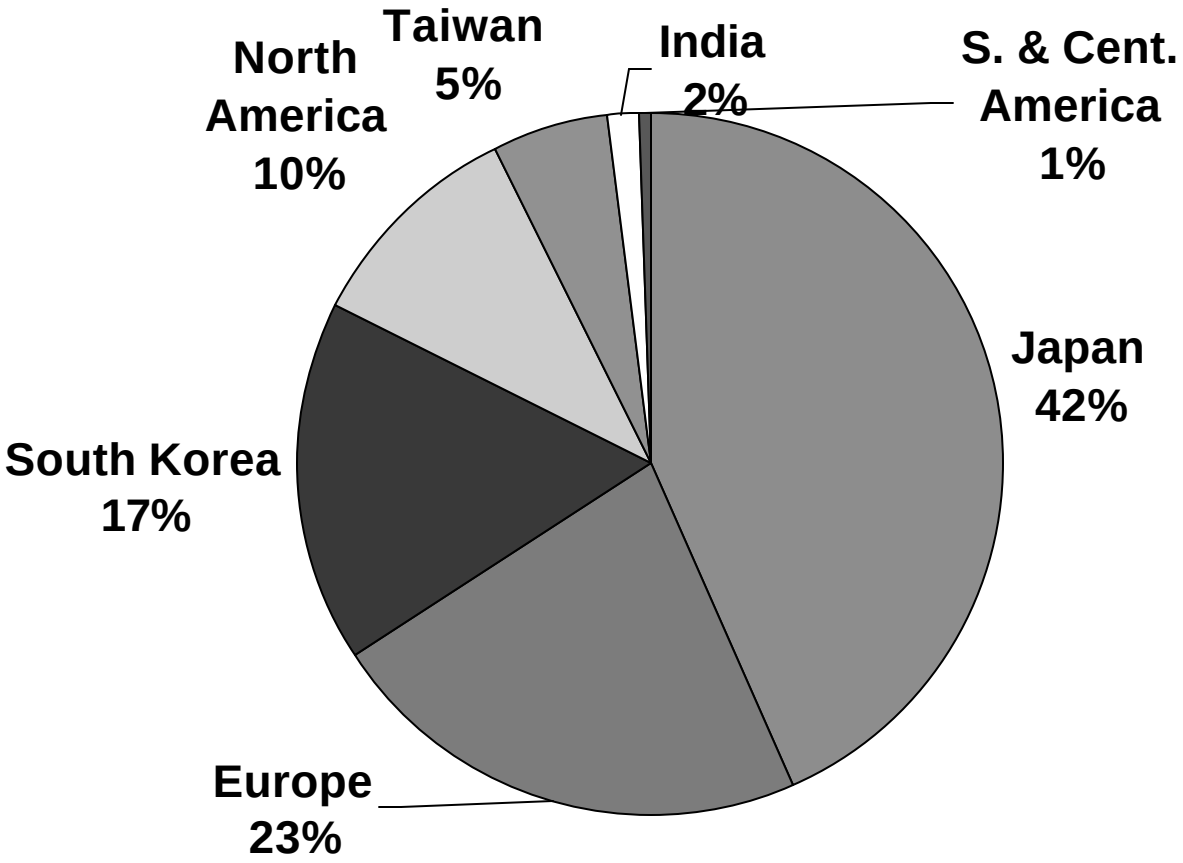



## Gulf Offshore Production




Source : SEER, Lippman Consulting Inc.

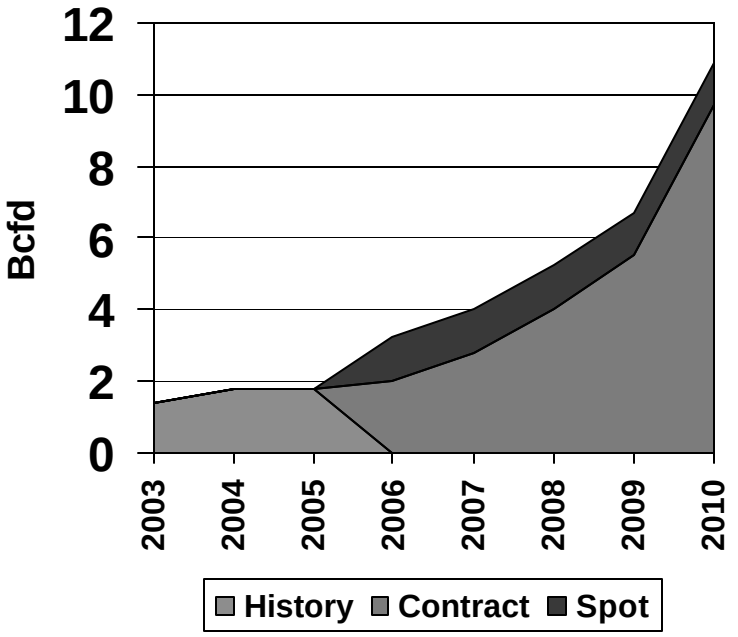
**2004 World LNG trade was about 17.2 Bcfd, versus world wide gas consumption of 270 Bcfd. LNG is a small part of world gas supply and North America is a small player in the LNG market. Consequently, small changes in world demand can have a major impact of the LNG market.**



# Worldwide liquefaction capacity will determine LNG imports. North American LNG imports are likely to increase 7 to 8 Bcfd from the current level of 1.8 Bcfd.

- Projections are based on firm and probable projects and reported volume allocations.
- Some contracts are indexed to US prices but there is volume flexibility. If the LNG market is tight, volumes could be re-directed to Europe or Asia.
- Project slippage and volume redirection could cause volumes to be lower but "possible" projects could increase LNG supply.

## North American Gross LNG Imports



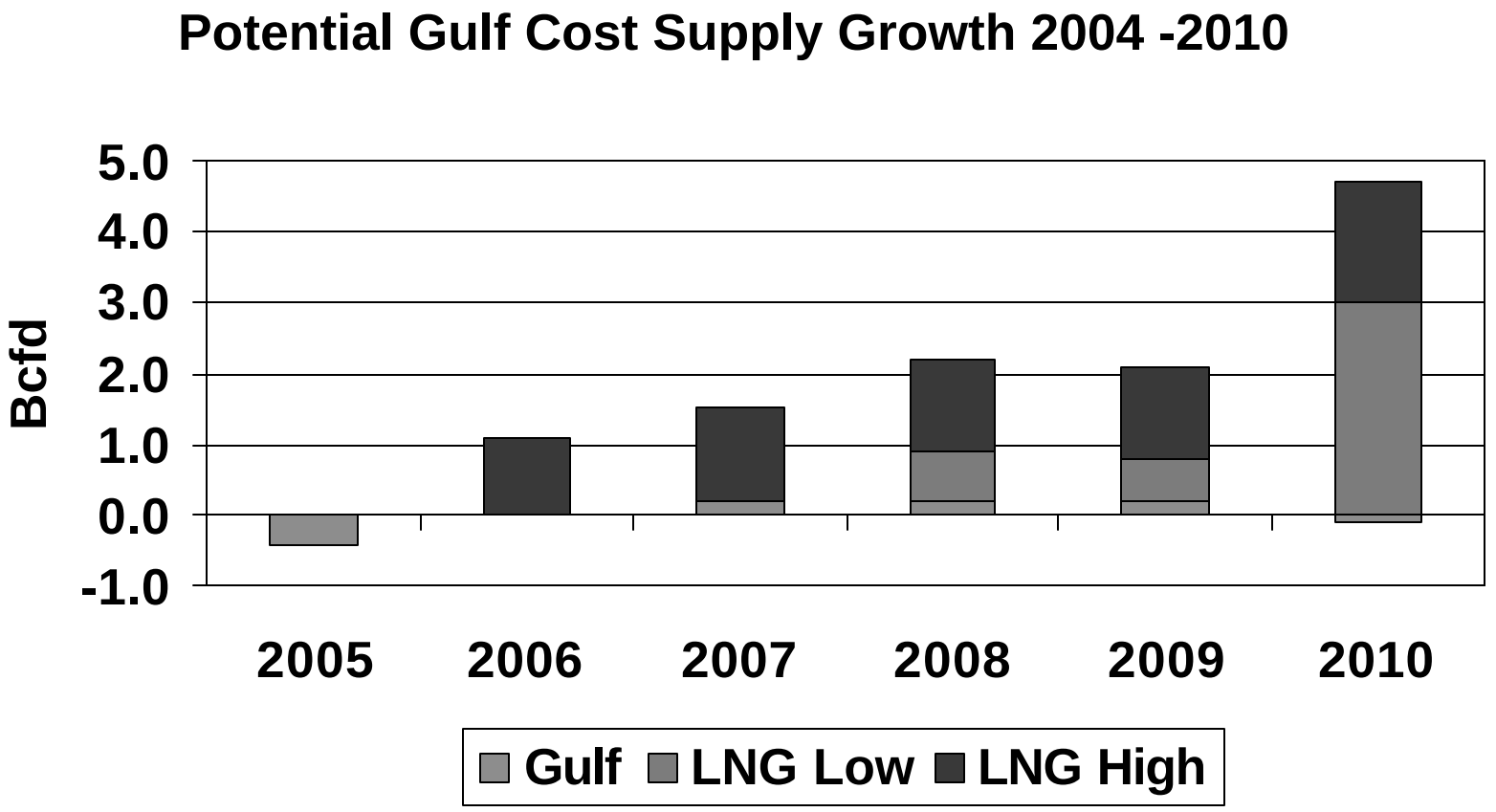
# The Gulf Coast will be the marginal LNG market for Atlantic supply. Netbacks should be higher along the east coast.

**Potential LNG Imports** (1)
**(Bcfd)**

| Year | North east | Cove Point, MD | Elba Island, GA | Gulf Coast | Altamira MX | W US Mexico | Total High | Total Low |
|---|---|---|---|---|---|---|---|---|
| 2005 | 0.5 | 0.5 | 0.3 | 0.4 | | | 2.0 | 2.0 |
| 2006 | 0.6 | 0.6 | 0.6 | 0.4 | | | 3.4 | 2.0 |
| 2007 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.0 | 4.2 | 2.7 |
| 2008 | 0.6 | 0.7 | 0.6 | 0.9 | 0.5 | 0.4 | 5.4 | 3.9 |
| 2009 | 1.0 | 1.3 | 0.6 | 1.0 | 0.6 | 0.9 | 6.9 | 5.4 |
| 2010 | 1.4 | 1.3 | 0.7 | 3.4 | 0.7 | 2.0 | 11.1 | 9.2 |

1. **Allocation is based on low case.**

# LNG imports are likely to be the primary source of Gulf Coast supply growth. Longer term the Gulf Coast supply will grow sharply because of LNG imports.



# Between 2008 and 2010 LNG imports and oil price declines are likely to cause Henry Hub prices to decline to between $4.00 and $5.00 per MMBtu ($2004).

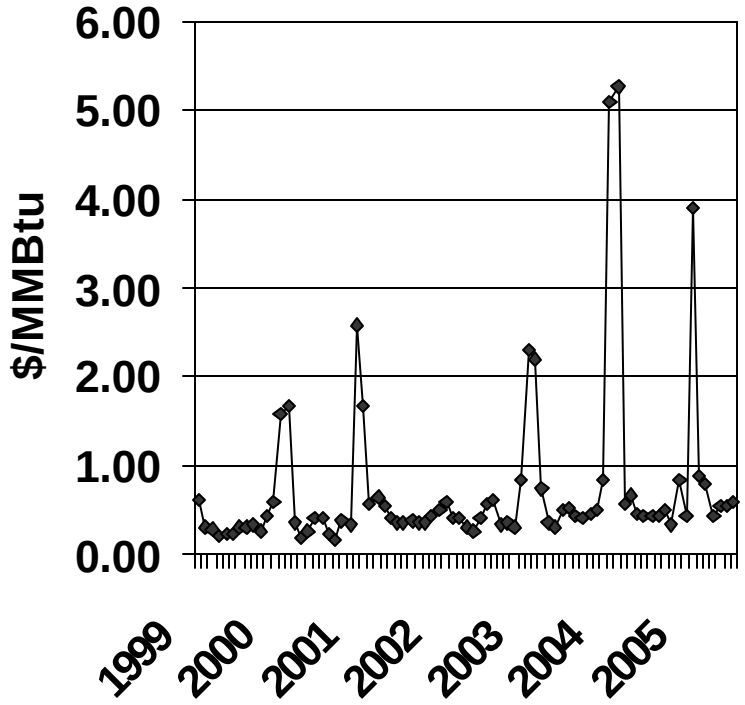
- By 2008 substantial increases in oil production and refinery capacity, are likely to cause oil prices to decline to between $30 and $40 per barrel. Longer term there is substantial controversy about oil supply.
- Political instability, increasing reliance on OPEC, project delays, and faster than expected 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 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 cost and shipping cost for LNG.

## New England gas consumption is about 2.4 Bcfd. The proposed LNG Repsol and Bear Head projects of 1.7 Bcfd is far greater than Dracut capacity of 600 MMcfd. Will New England be able absorb the supply? Northeast demand growth 1 to 1.5 Bcfd and New England .4 to .8 Bcfd (2004 – 10).

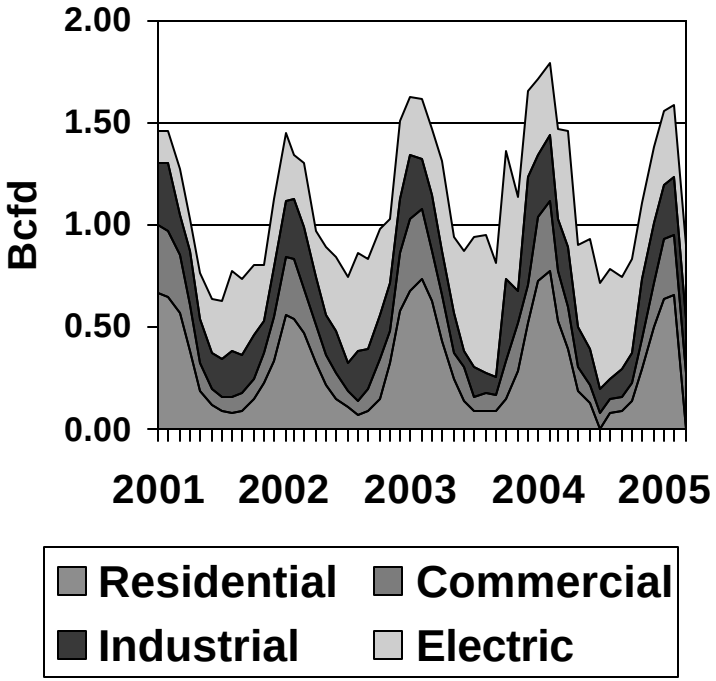
- **Repsol (Canaport LNG terminal (Repsol/Irving Oil)) LNG terminal) and the Bear Head LNG terminal have completed agreements for 750 MMcfd and 1 Bcfd of capacity on Maritimes and Northeast pipeline beginning in 2008.**
- **Both terminals will have a maximum sendout of 1000 MMcfd and sustainable sendout of 800 MMcfd.**
- **Despite new production from the south Venture field Sable Island production has been declining. The Glenelg field was scheduled to on come on in 2007 but has been found to be uneconomic on a stand alone basis.**

# Merchant power plants without firm capacity and a decrease in dual fired power plant capacity have increased the volatility of basis in the Northeast.

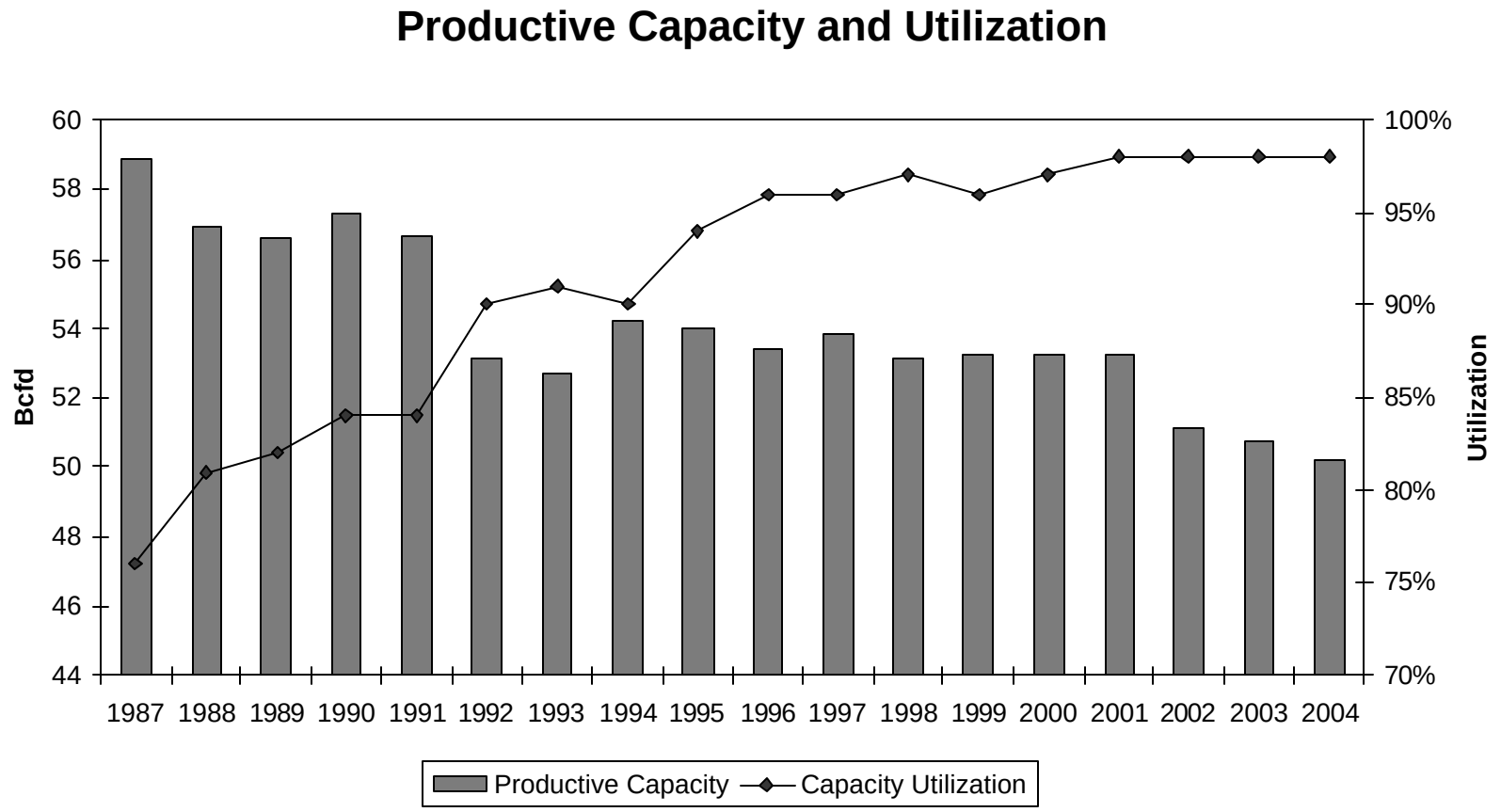
**Boston - Henry Hub Basis**




**Massachusetts Gas Consumption**

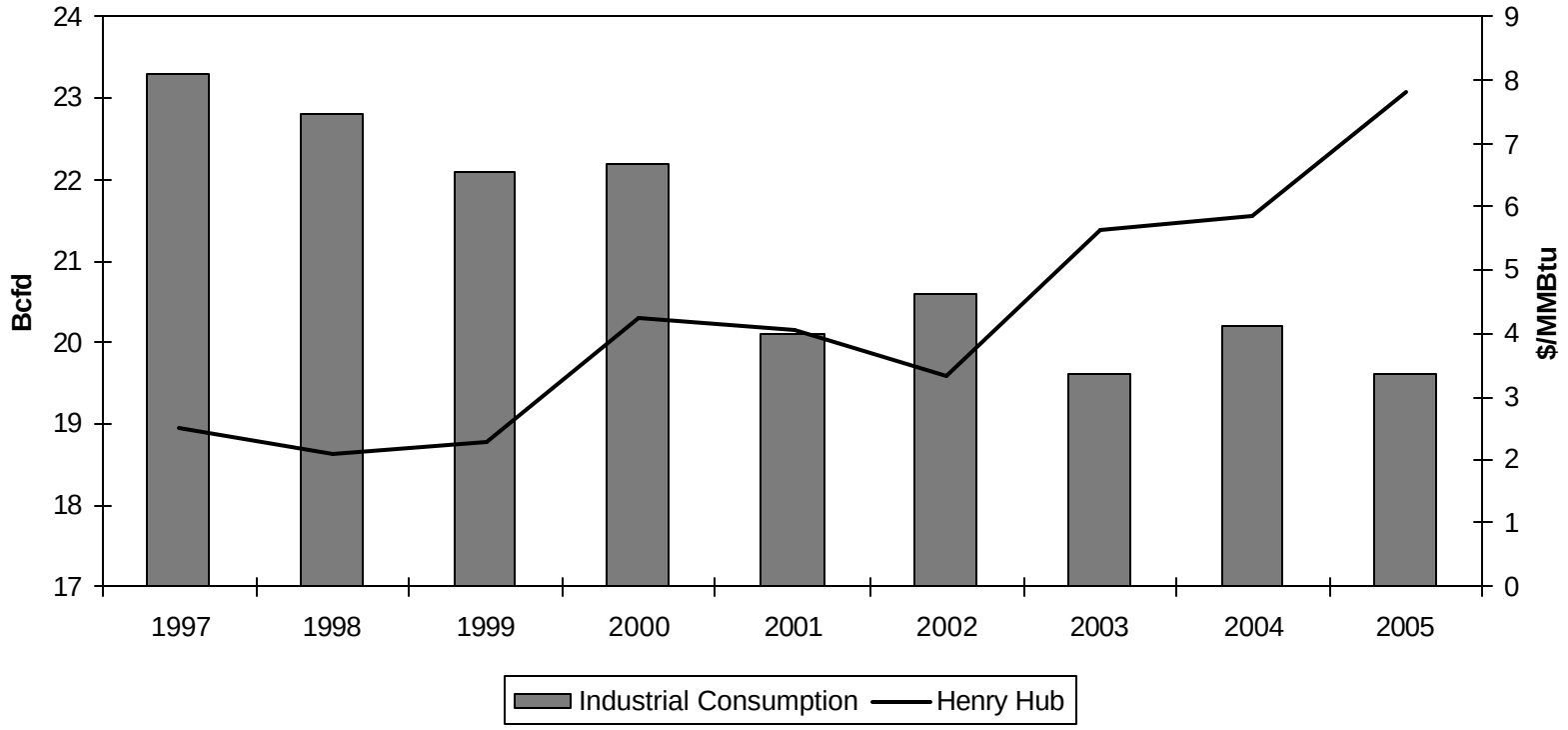


# The decline in excess natural gas productive capacity has been one of the major causes of increased price volatility. By 2010 production area price volatility could decrease substantially because of new supply.



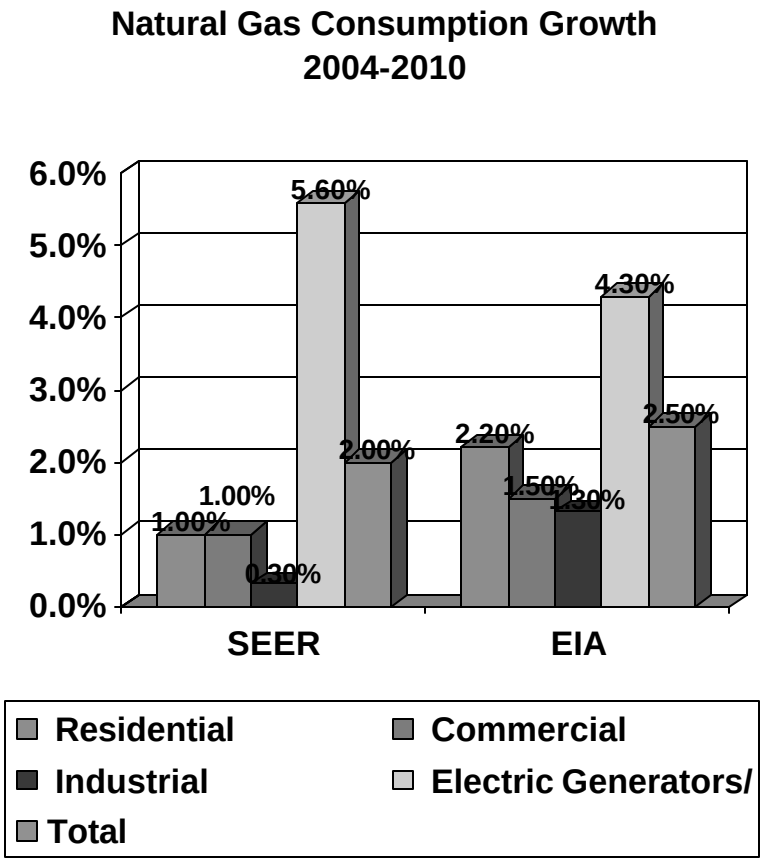
**All sectors have been impacted by high prices and volatility. LDC studies have indicated substantial reductions in residential consumption per customer. Chemicals, 35% of the total industrial gas consumption, have shut-down plants and will construct new plants were the cost of natural gas is low.**

## Industrial Consumption vs Henry Hub Prices



# SEER's projected annual growth rate is 2% versus the EIA 2.5%, primarily because of less optimistic projections of supply.

- Strong growth in power generation will support high prices and force slow growth in other sectors.
- Also, EIA is much more optimistic about coal generation. Coal accounts for half of power generation. Slight changes in coal generation will have a major impact of gas consumption.




SEER data is preliminary.