



*An Energy-Efficiency Workshop and
Exposition -Orlando, Florida*

Hot Topics in Gas and Power Markets

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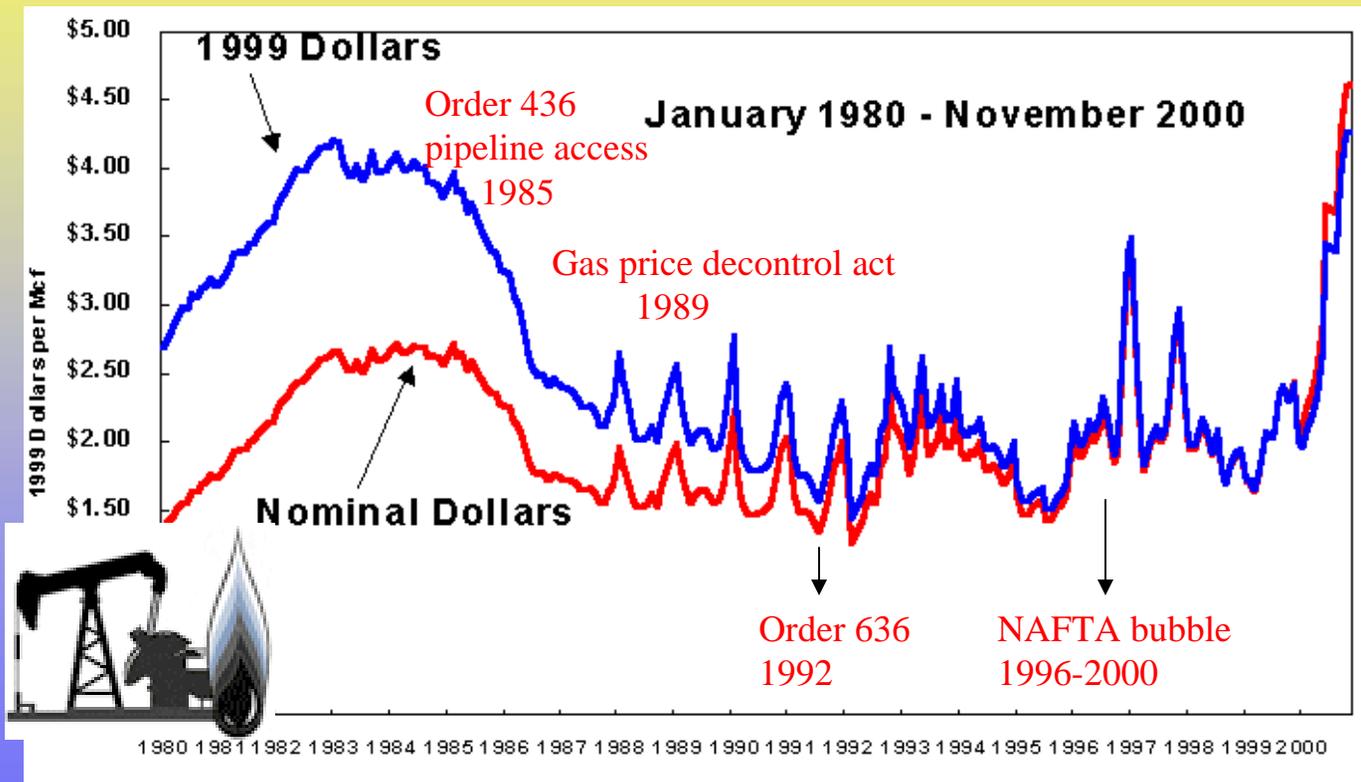
The Natural Gas “Crisis”

Like most “crises,” this is more about price than supply.

We won’t see “cheap gas” again.



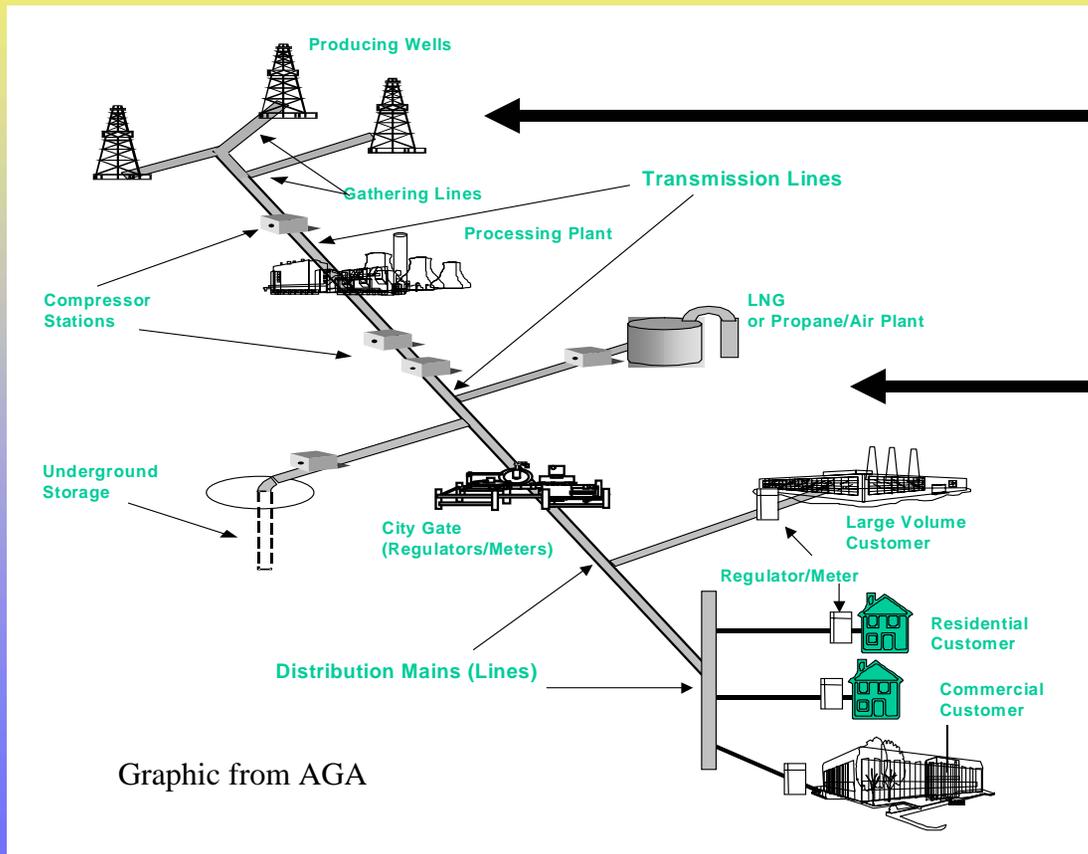
Deregulation brought lower prices, but it was a one-time change



Source: DOE EIA



Natural Gas 101



Production

Storage

Consumption



Natural Gas Pricing 101

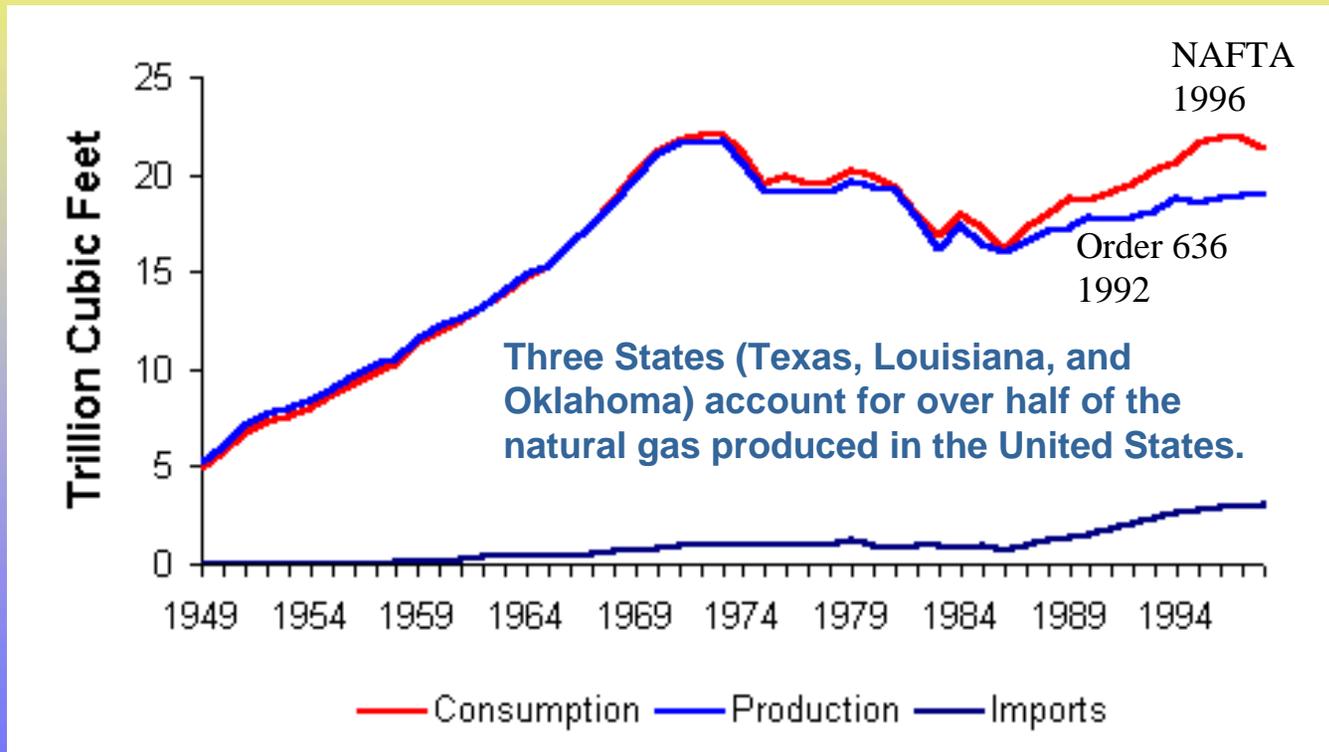
- Price is a function of:
 - Production volume
 - Domestic
 - Imports
 - LNG
 - Transport capacity
 - Gas in storage
 - Demand
 - Core
 - Non-core/interruptible
 - Curtailments
- And speculation, of course.



Near Term Analysis



US demand began to outstrip domestic production in the late 1980s, but Canadian imports filled the gap thanks to FERC & NAFTA

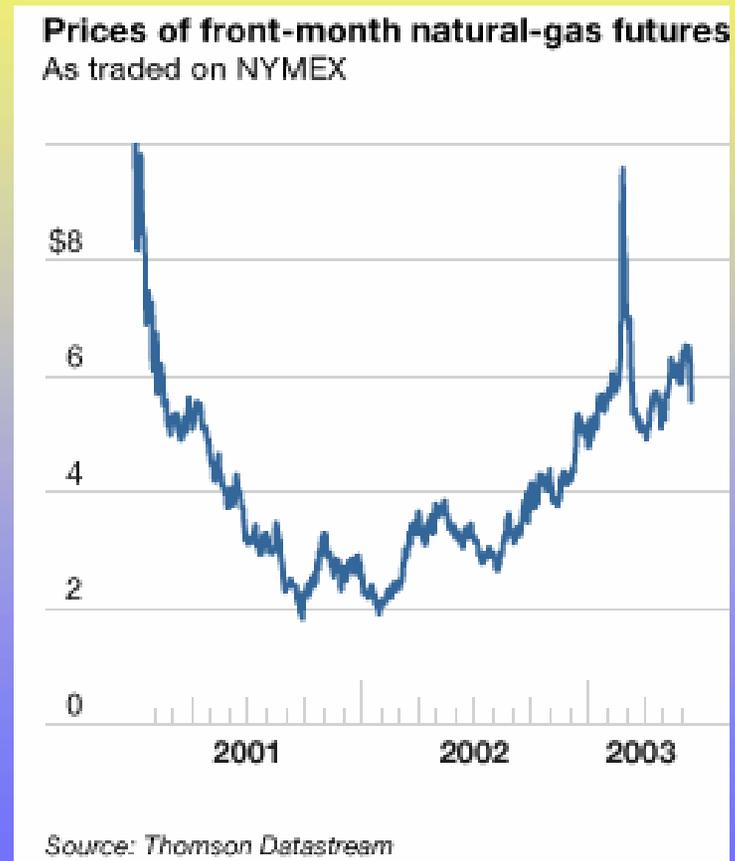


Source: DOE EIA Annual Energy Review, 7/7/99, Energy in the United States: A Brief History and Current Trends



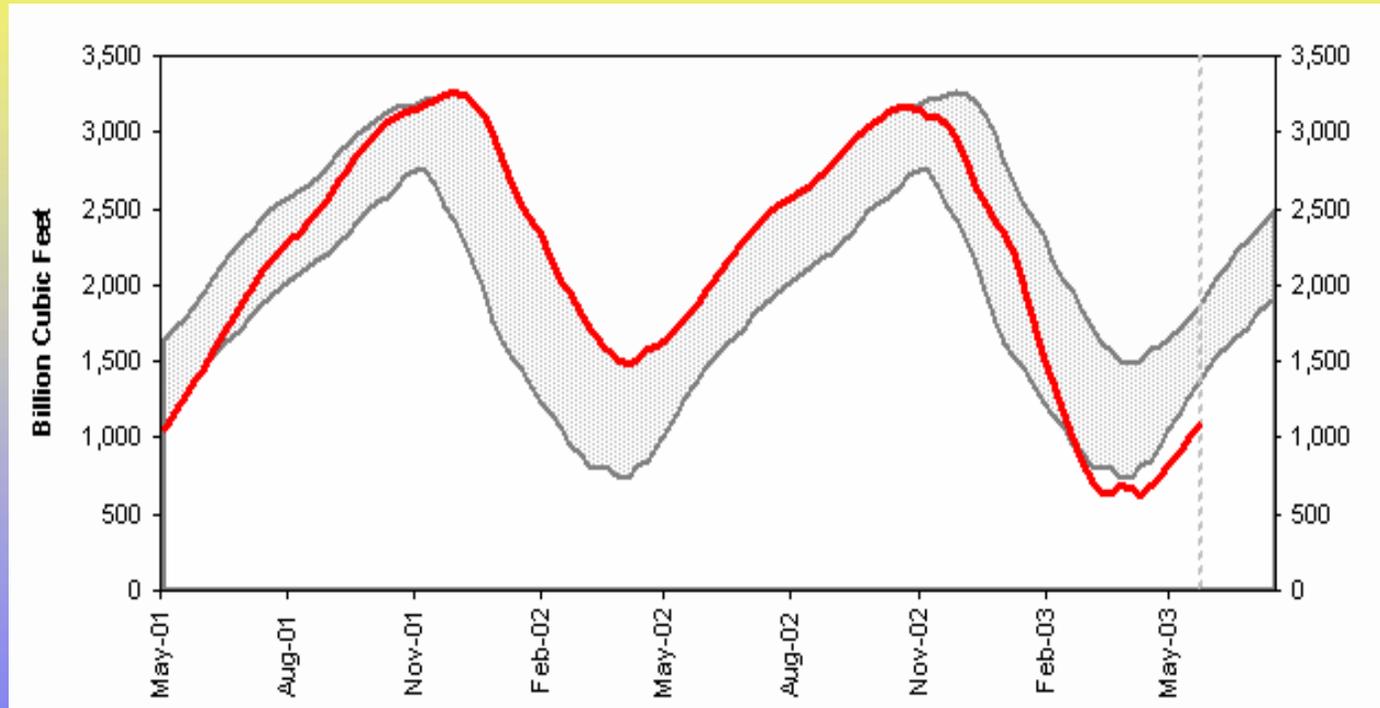
Volatility has only increased

- “Fundamentals” have changed
 - Production fell off due to low prices during NAFTA bubble
 - Manipulation of prices/pipeline capacity shook market confidence
 - Credit crisis forced market to contract
 - Canadian gas imports slowing





'02 storage was down

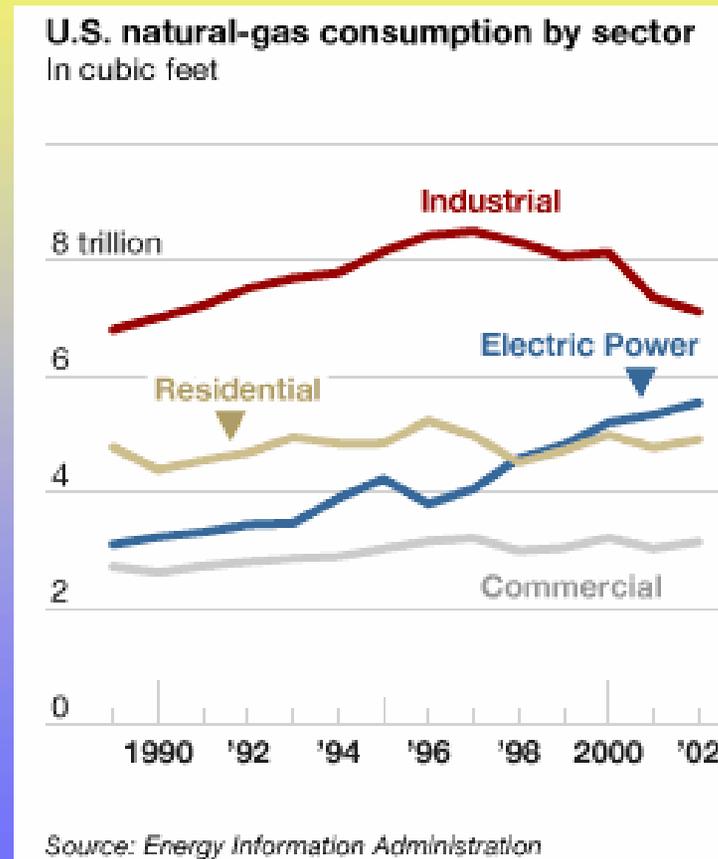


- '02 levels below historic average
- '02 weather was better than average



Price pressure wasn't from gas generation

- Economic slump depressed industrial demand.
- Export of manufacturing jobs reduced industrial demand.
- Together, these about equal increase due to power demand.





What happened?

- Combination of high prices during refill season and credit crisis caused marketers and utilities to put off purchases for storage.
- Low prices leading into 2002 and economic slump depressed exploration and production levels (as did credit crisis).
- Early cold snap in face of lower than average storage pushed up prices and late cold snap when storage level was at historic lows pushed them up further.
- Then, panic started to build regarding both the cost and the capacity to refill storage. This kept prices high.
- Future prices remain high because of low storage levels, high summer prices, and falling imports from Canada.

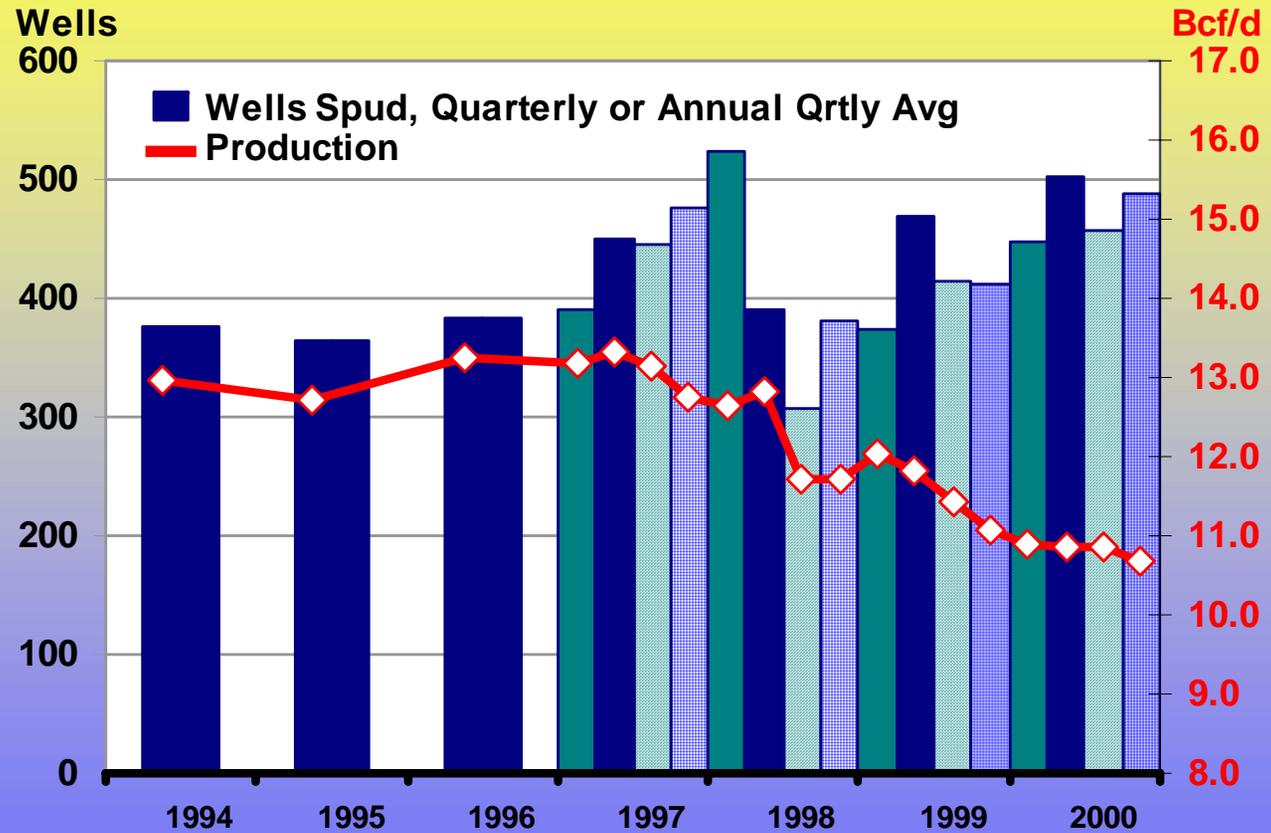


The Rest of the Story

- Domestic demand exceeds supply
- Conventional supplies are playing out
- New ones are less well understood
- And, they are playing out faster
- But, we can run faster to stay in place
- But will rely more on imports
- That cost more
- And increase gas prices, long term.
- Plus, economic recovery will really jack them up!



Conventional wells are playing out



Production & Wells Spud <1000 ft in Gulf

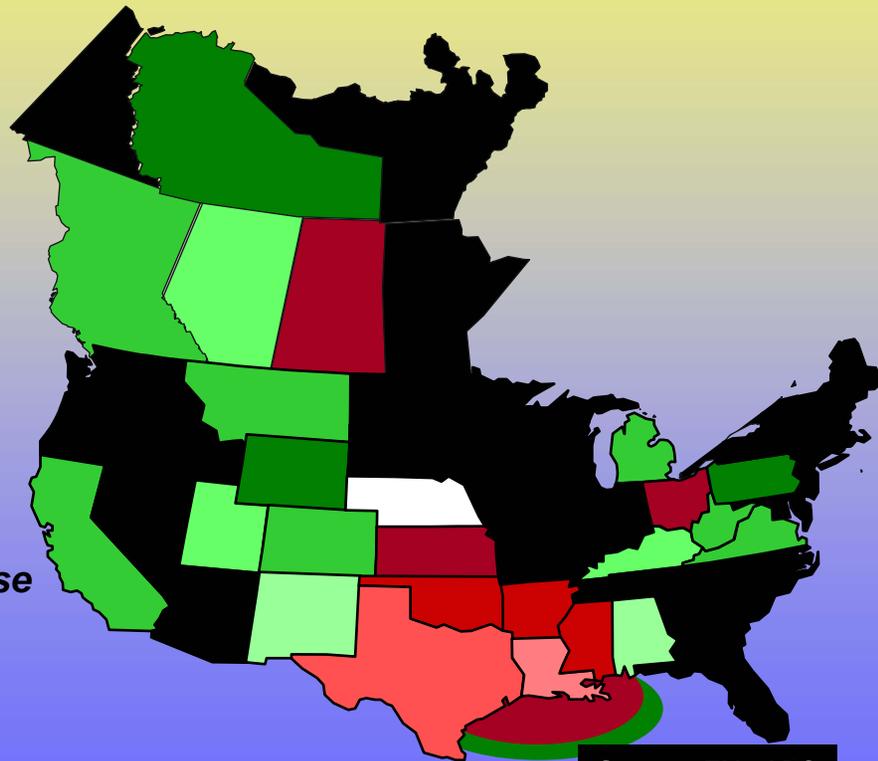
Graphic from AGA, Source: NRG Assc., APC



E&P ACTIVITY IS MOVING TO LESS DEVELOPED REGIONS

**Change in Gas Production:
1995 vs. 2000**

Green = increase
Darker green is greater increase
Red = decrease
Darker red is greater decrease



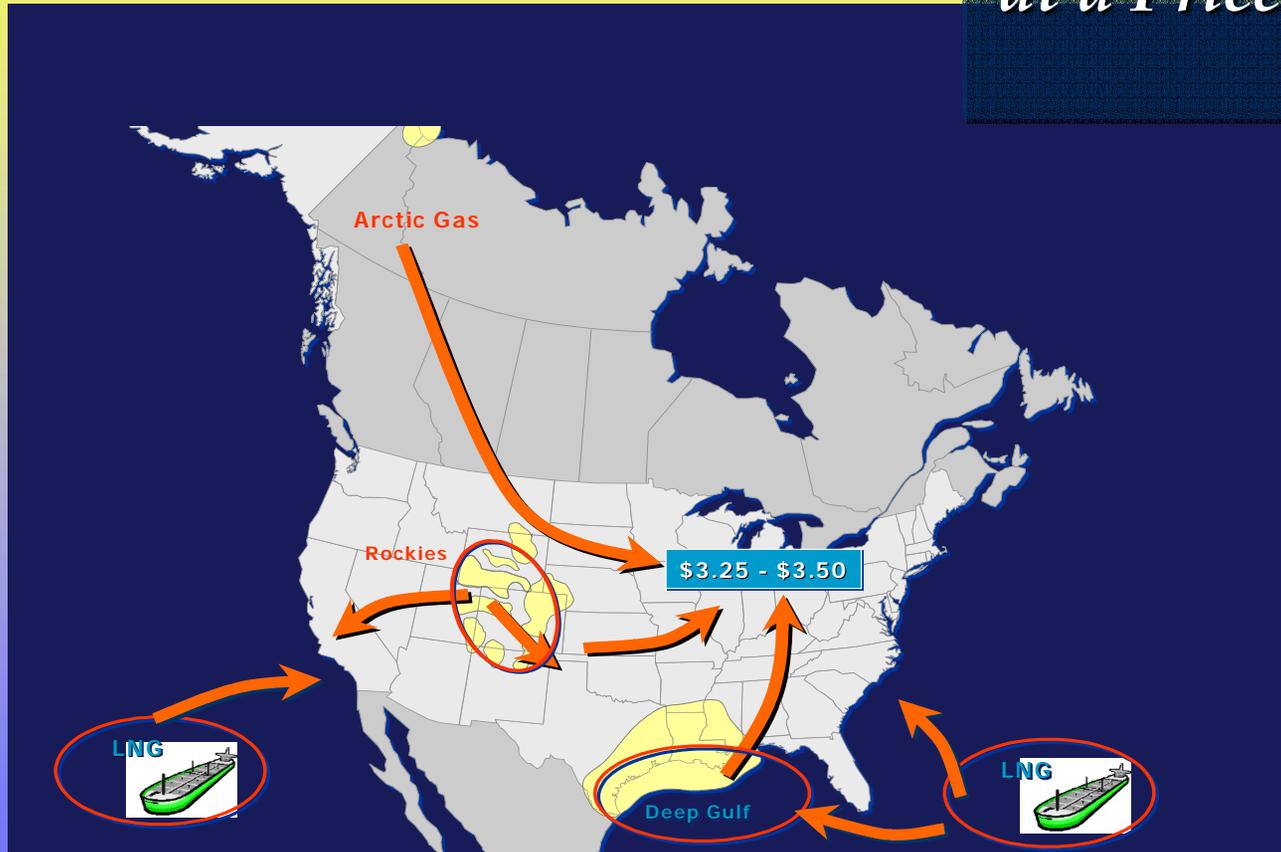
Source: EIA, APC

Graphic from AGA



NEW SUPPLY MUST COME FROM
NEW AREAS...

*... But Will Only Come
at a Price that Supports
Development.*



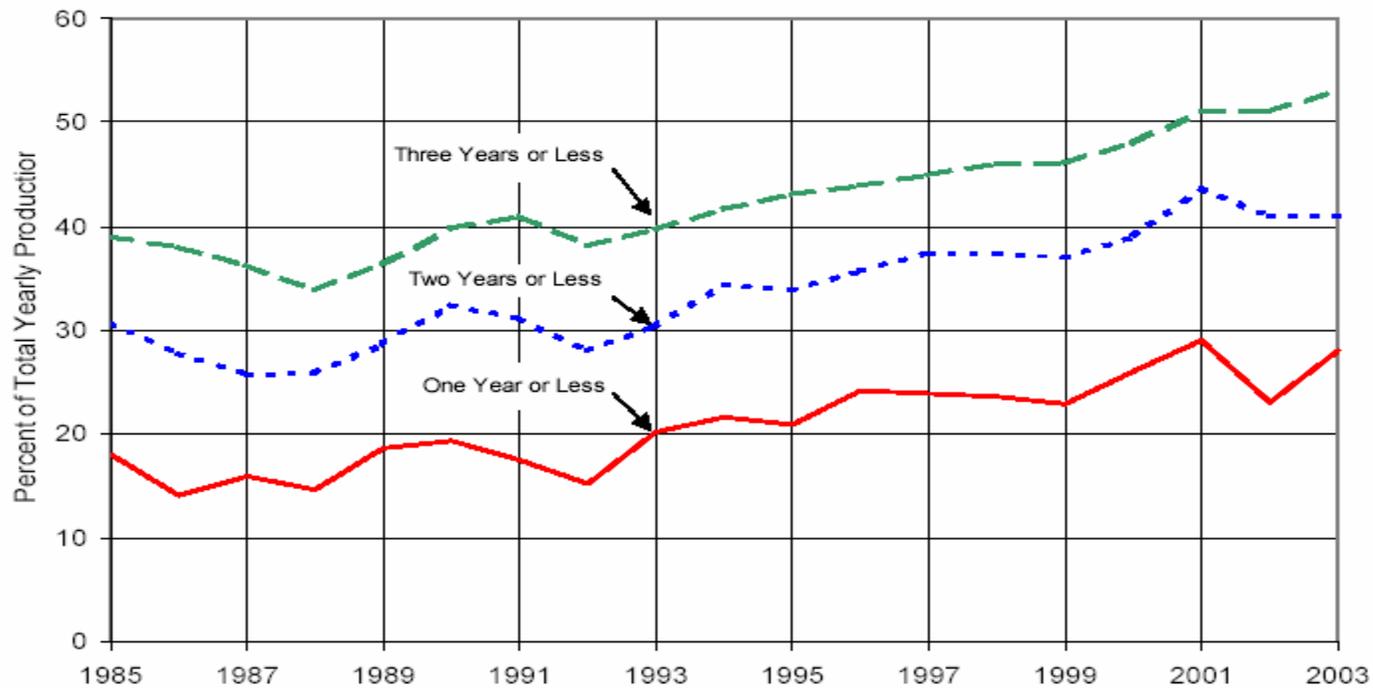
Graphic from AGA

Source: CMS Panhandle Companies



New Sources Play out Faster than Expected

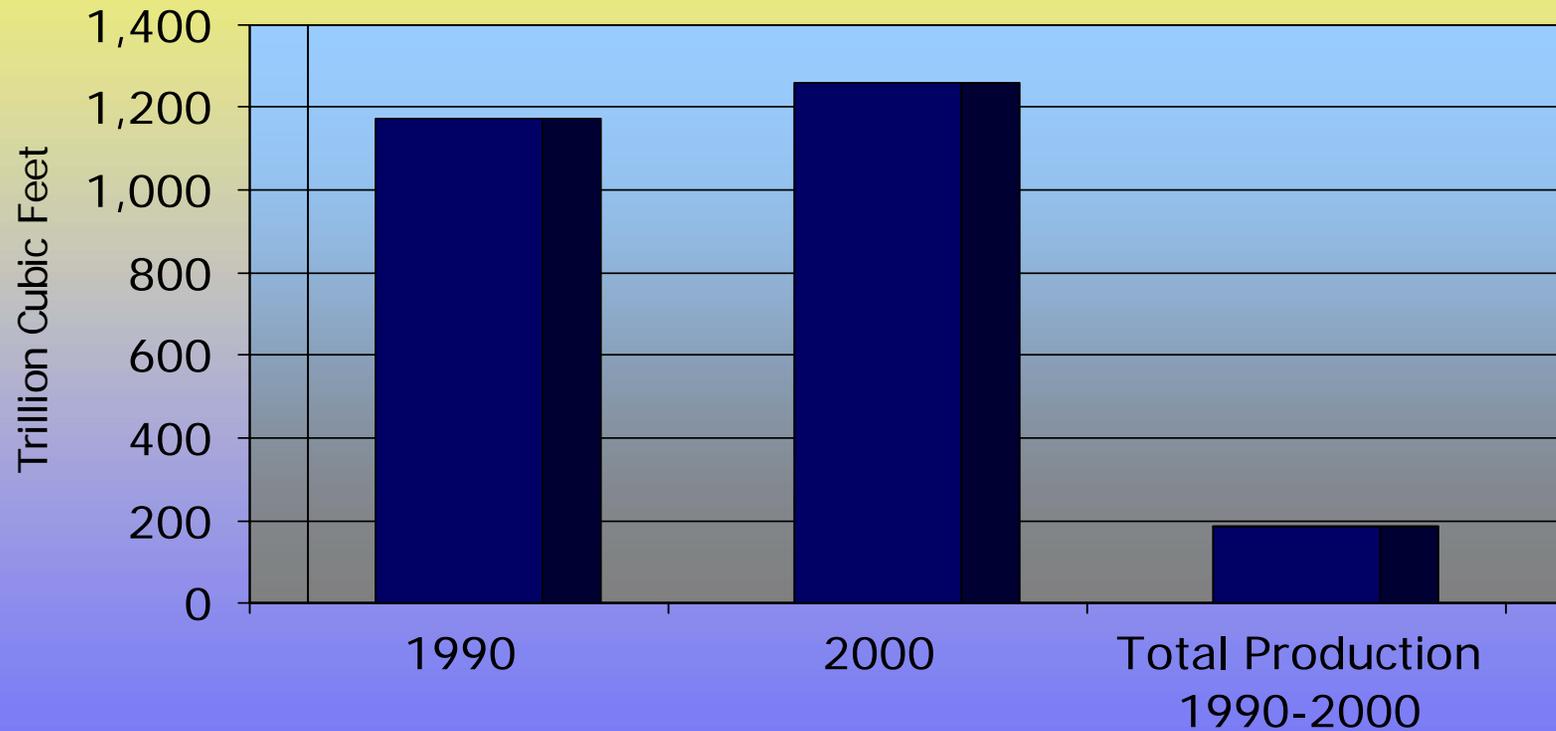
Most Production Flows from Wells Not More Than Three Years Old



Source: Energy Information Administration.



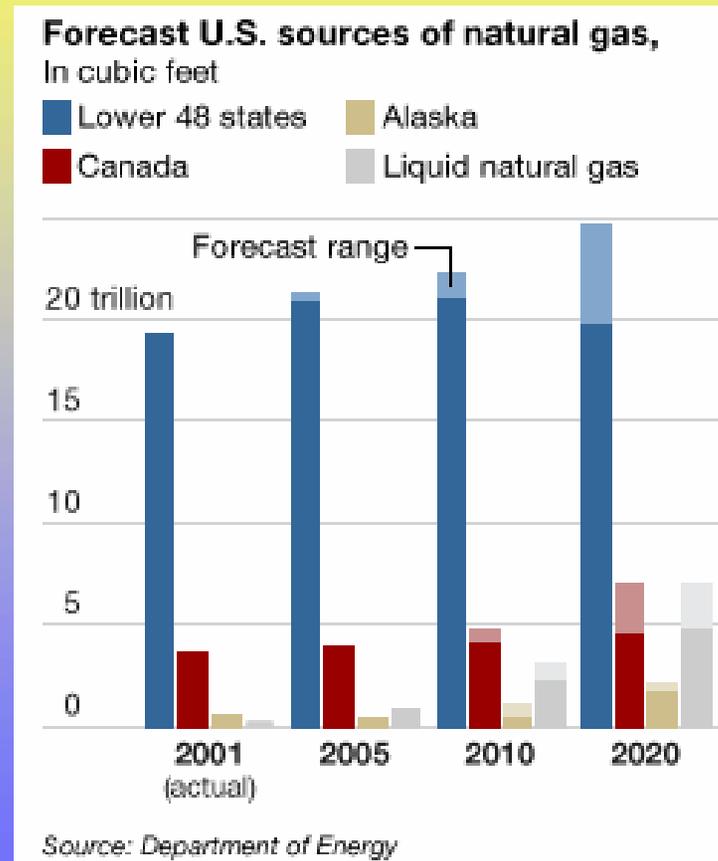
Resource Base Continues to Increase with New Discoveries. We May be Just Running in Place, but not Running out of Gas





We will Rely More On Imports

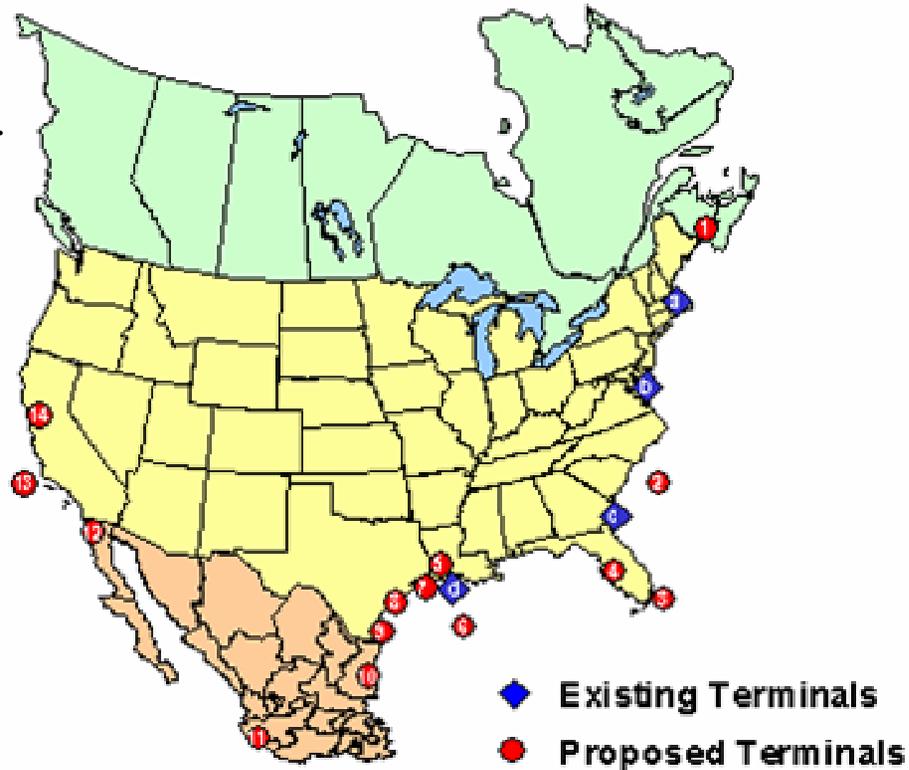
- New sources in the North cost more to develop
- Imports of LNG are expensive – that will increase marginal price of gas (if LNG becomes a significant source)
- LNG may tie gas prices to oil prices





But LNG Won't be a Big Player Anytime Soon

Too few terminals
Not much capacity now.
Adding new terminals
Is controversial, will
Take time.



Graphic from AGA

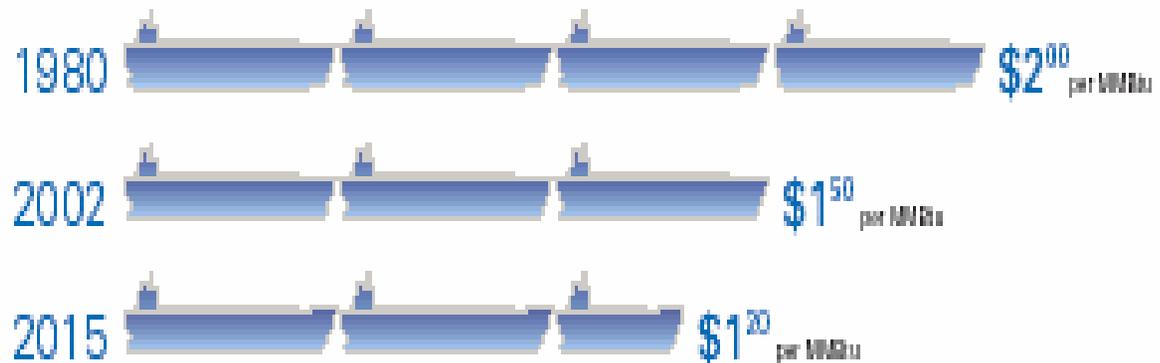


LNG Cost = E&P + Overhead
If it is the marginal resource, prices will stay high.

LNG Overhead Costs Have Dropped 25% Since 1980

(Includes costs of liquefaction, shipping and regasification for liquid natural gas)

Further declines of 10-20 percent over the next decade are possible, helping to position LNG as a growing portion of the U.S. natural gas supply.



Graphic from AGA

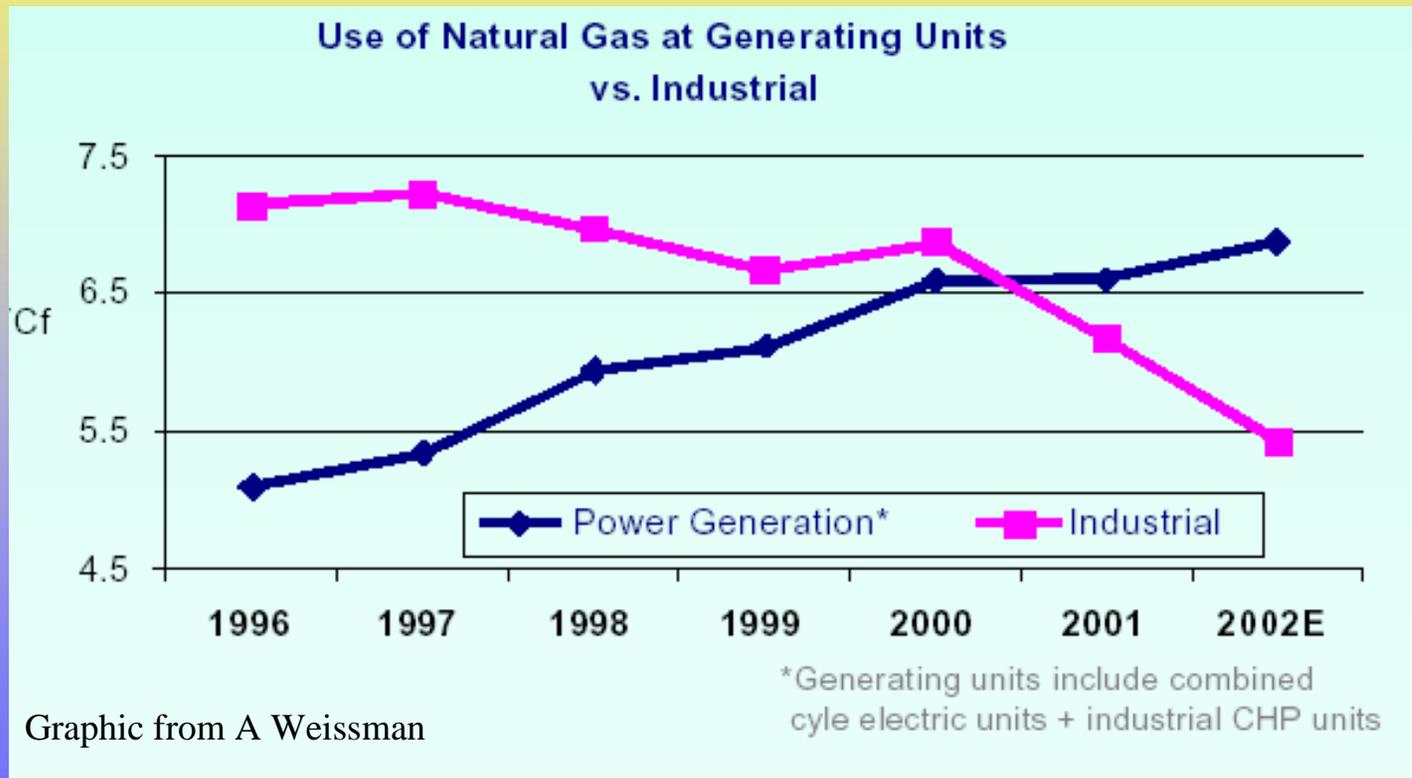


Demand: The “Other” Shoe

- Industrial demand has been “swing” resource to meet peaks
 - Interruptible
 - Curtailable
- Industrial demand is falling, becoming less flexible (chemicals and fertilizer, not thermal uses)
- Gas power generation is about to have its day.

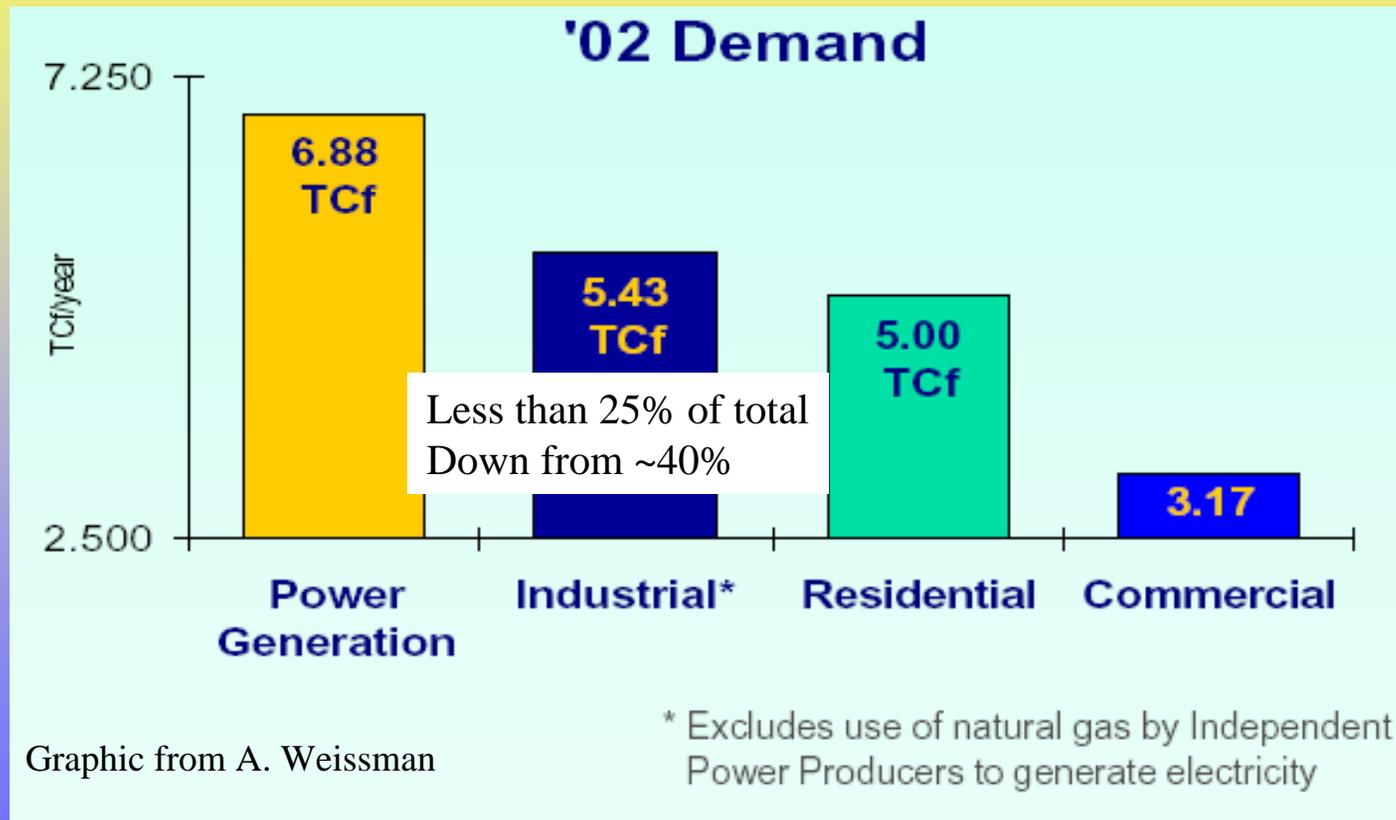


Increase in Generation Demand offset by Decline in Industrial Demand





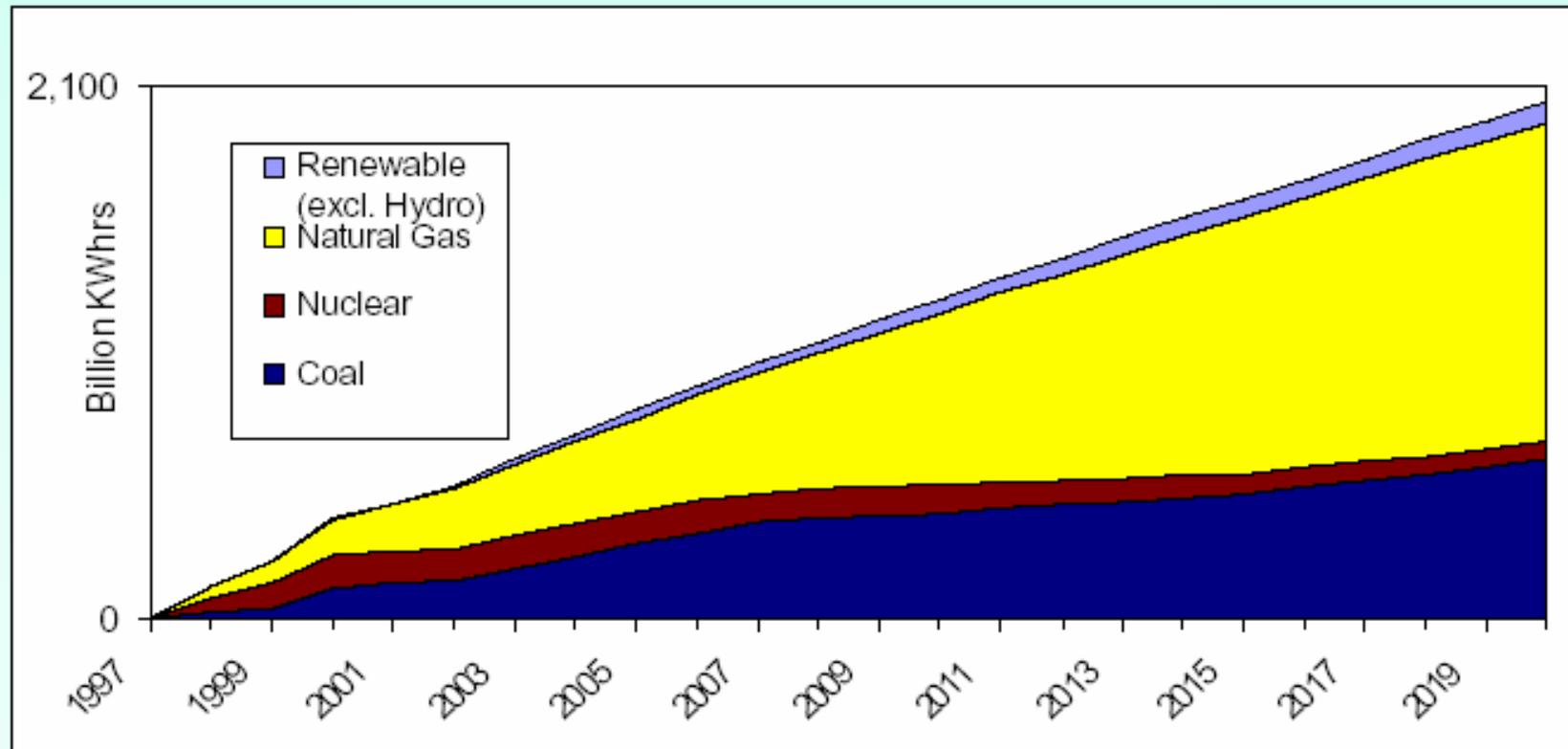
Industry Shrinking % of Market Less “Swing” Potential





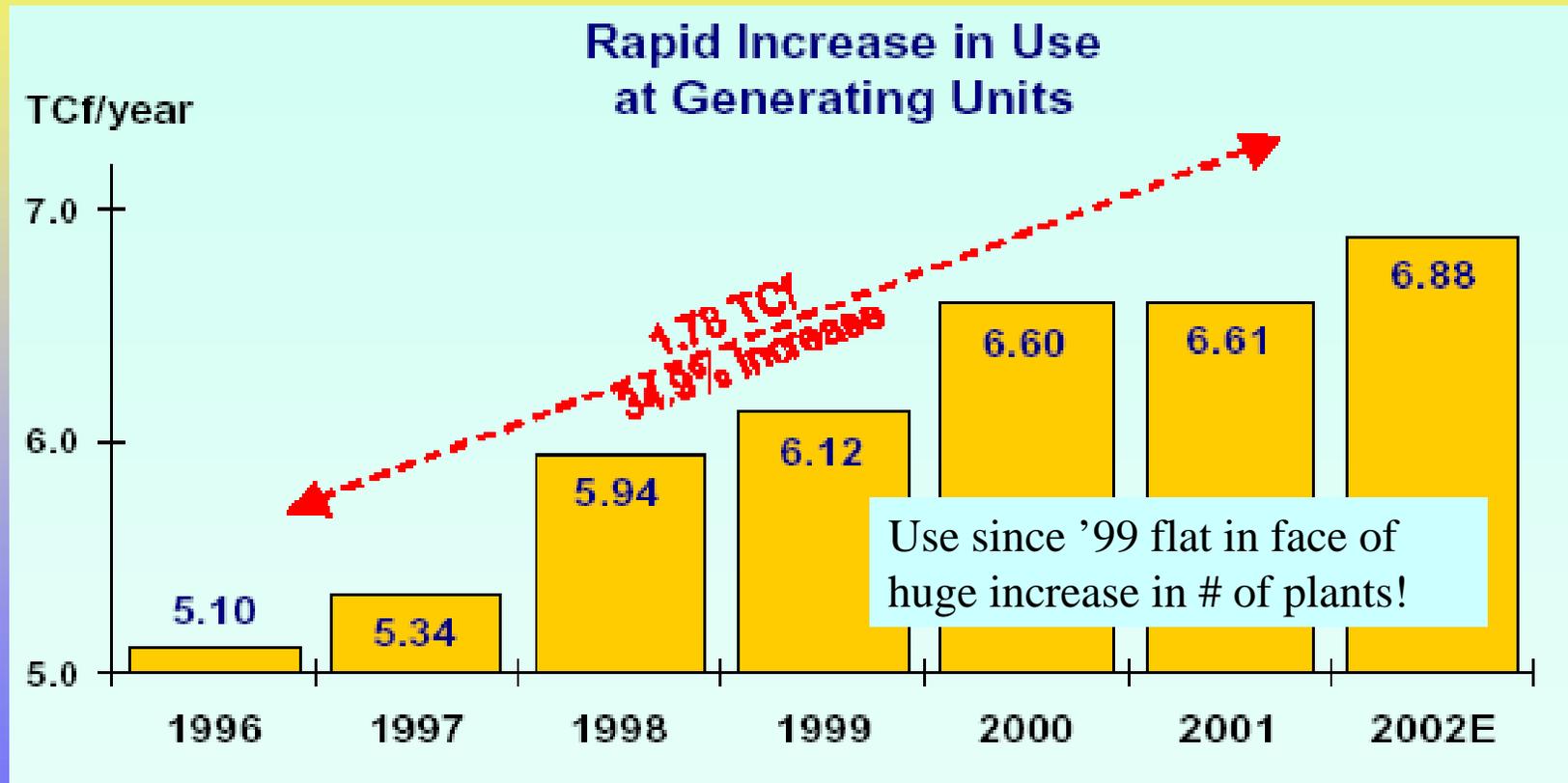
Gas Generation may Rule the Market

Sources of Incremental Generation





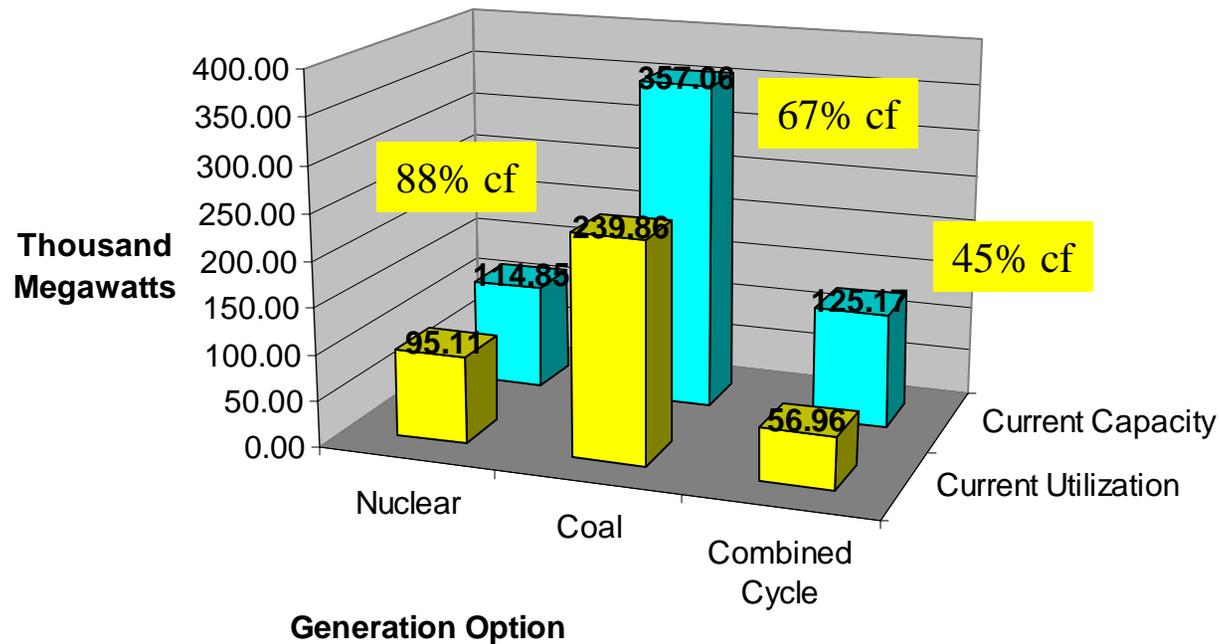
But it Hasn't Yet





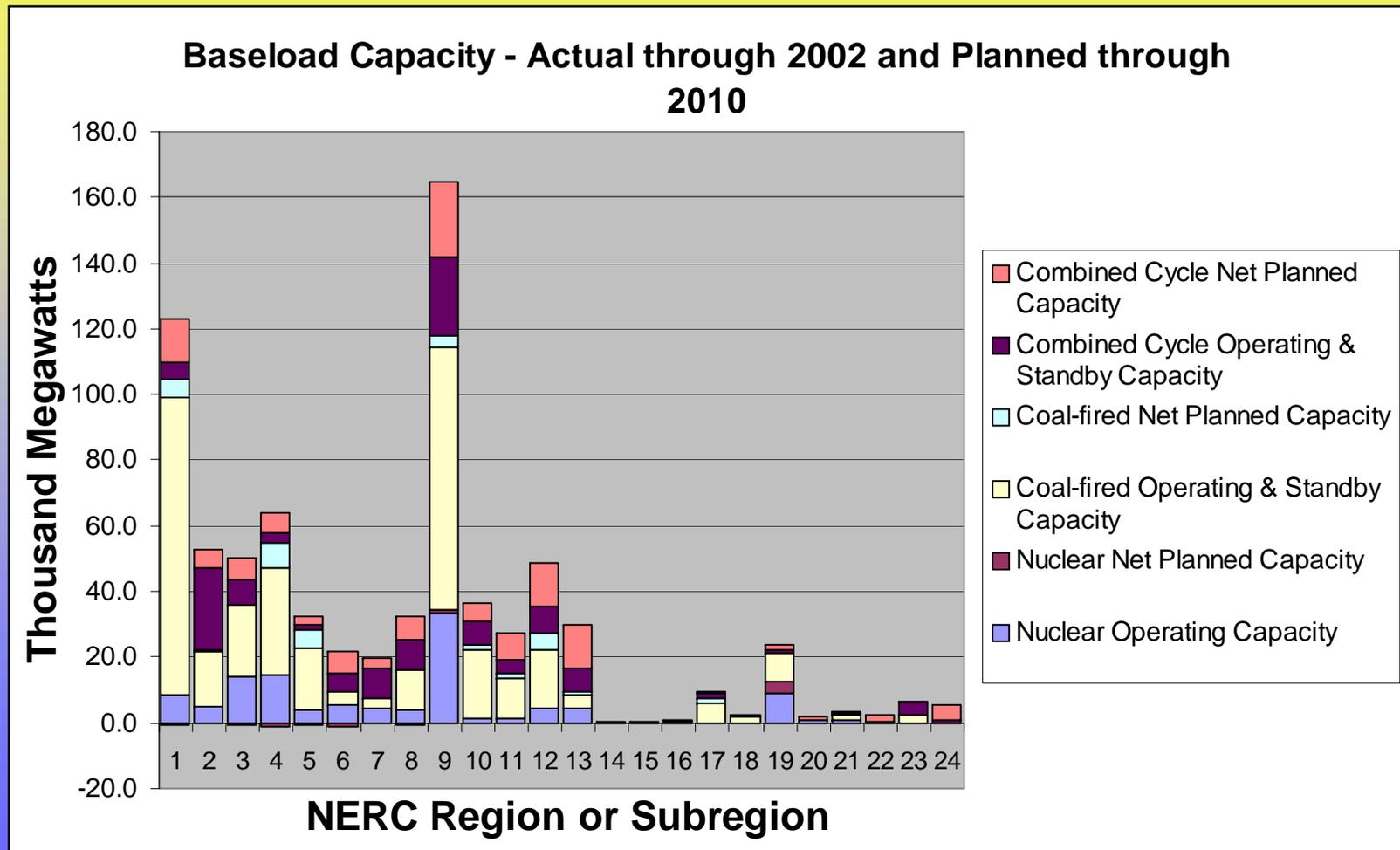
Because “old” coal and nuke plants are taking up the slack – leaving gas for peaking.

Baseload Electricity Supply Option Capacity and Current Utilization





But That Won't Last!





High Prices are Here to Stay

- Prices remain high and storage will be low again this year.
- Summer has been mild, but lucky weather breaks are bound to end.
- The economy will recover and industrial demand will increase.
- Gas generation will finally start to impact demand in a significant way as old plant capacity factor limits are reached (soon I think) and combined cycle plants run in baseload mode.
- Imports from new source in the North and LNG will set marginal price going forward.
- How high?



Standard Market Design Report



What Would SMD Do?

- Adopt a single “network service” transmission tariff.
- Extend FERC’s reach to retail transmission rates.
- Require Independent Transmission Providers (ITPs).
- ITP will administer day-ahead and RT energy and AS markets in conjunction with the network tariff.
- Establish an “access charge” to recover embedded transmission costs.
- Implement LMP to manage congestion.
- Create tradable financial rights (“congestion revenue rights”).
- Establish procedures to assure resource adequacy.
- Establish procedures to monitor and mitigate market power.
- Require ITP to prepare long term load/resource plan.
- Establish Regional State Advisory Committees.
- Clarify system security obligations.



FERC Standard Market Design (SMD) Status

- FERC issued SMD NOPR in 2002.
- Backlash from SE and NW states delayed process.
- New language from FERC failed to quell political opposition. Congress drafted language barring implementation.
- May 03 FERC Issued “Market Platform” White Paper and new schedule.
- June 03 DC Circuit Court ruling saying FERC has no authority to order utility to join/leave RTO, must be voluntary, is upheld. RTOs are key to SMD.
- Status: Dead as policy, may be implemented through piecemeal rulings.



FERC's Market Platform White Paper – “Non-Standard Market Design”

- State's will retain authority over:
 - Transmission tariff for retail customers
 - Reliability levels and plans.
- Utilities must join existing or proposed RTO (DC Circuit opinion may void this, Congress prohibits prior to 2005).
- Markets and LMP should be set up, but up to RTO and states as to when and how.
- New Order due Fall 2004 (Congress prohibited).



Value of RTOs

- FERC White Paper documents value from allowing “cheap” power to flow to high-cost areas, even if RTO adds costs.
- DOE Paper shows similar advantages, although it recognizes customers in “cheap” states will pay more. Overall value of RTOs is marginal (no huge net savings predicted).



SMD versus “Market Platform”

- Single “network service” tariff – **Maybe eventually**
- FERC’s reach to retail transmission rates – **Not a chance**
- Independent Transmission Providers (ITPs) – **Sort of independent**
- Day-ahead and RT energy and AS markets – **Maybe eventually**
- “Access charge” – **FERC will allow, up to each State if they will**
- LMP to manage congestion – **Something like it eventually**
- Congestion revenue rights – **Up to each RTO**
- Establish procedures to assure resource adequacy – **Up to States**
- Establish procedures to monitor and mitigate market power - **Somehow**
- Require ITP to prepare long term load/resource plan – **Up to States**
- Establish Regional State Advisory Committees – **Up to States**
- Clarify system security obligations - **Yes**



RTO Report



2 FERC Approved RTOs

(Regional Transmission Organizations)

- **PJM (Penn, NJ, Maryland)**
 - Nation's first fully functioning RTO in 2001
 - Began in 1927 by forming the world's first power pool
 - Serves 25 million people in 7 states and District of Columbia
- **MISO (Midwest Independent System Operator)**
 - Will begin Fall 2004
 - Midwest ISO formed in 1996
 - Nation's first RTO in 2001
 - Selling transmission service under tariff in 2002
 - Serves 15 states and parts of Canada



Proposed RTOs

("Serious" applications pending)

- ISO New England
- New York ISO
- California ISO
- Electric Reliability Council of Texas
(operating; no application pending as it
doesn't require FERC approval, but ...)



Dubious RTO Applications

(in light of NSMD and DC Circuit Court decision)

- RTO West
- West Connect
- Crescent Moon
- SE RTO



Dead Proposals

- ISO NE/NY ISO merger
- Merger of ISO NE and NY ISO into PJM
- Merger of SPP into MISO