



An Energy-Efficiency Workshop and
Exposition -Orlando, Florida

Hot Topics in Gas and Power Markets

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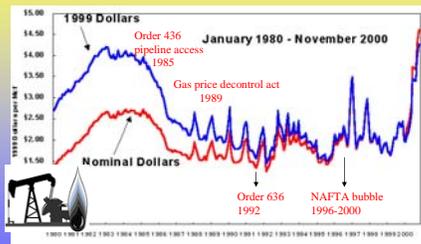


The Natural Gas "Crisis"

Like most "crises," this is more about
price than supply.
We won't see "cheap gas" again.



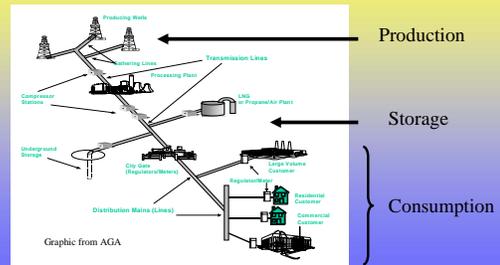
Deregulation brought lower prices,
but it was a one-time change



Source: DOE EIA



Natural Gas 101



Natural Gas Pricing 101

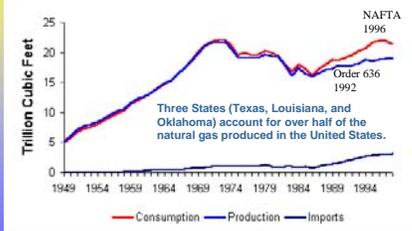
- Price is a function of:
 - Production volume
 - Domestic
 - Imports
 - LNG
 - Transport capacity
 - Gas in storage
 - Demand
 - Core
 - Non-core/interruptible
 - Curtailments
- And speculation, of course.



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, 77/99, Energy in the United States: A Brief History and Current Trends



Volatility has only increased

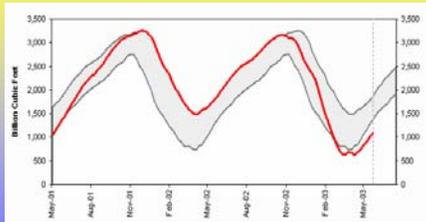
- “Fundamentals” have changed
 - Production fell off due to low prices during NAFTA bubble
 - Manipulation of prices/pipeline capacity shook market confidence
 - Credit crisis forced market to contract
 - Canadian gas imports slowing



Source: Thomson Datastream



'02 storage was down

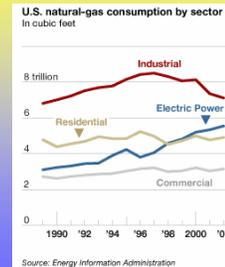


- '02 levels below historic average
- '02 weather was better than average



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.



Source: Energy Information Administration



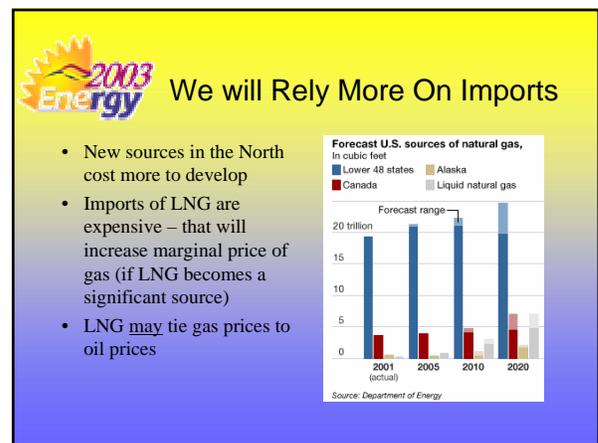
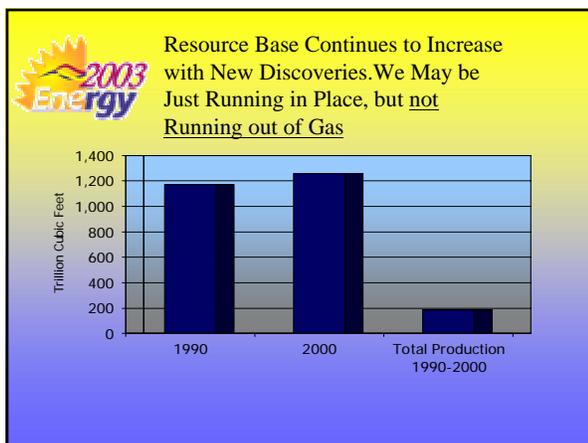
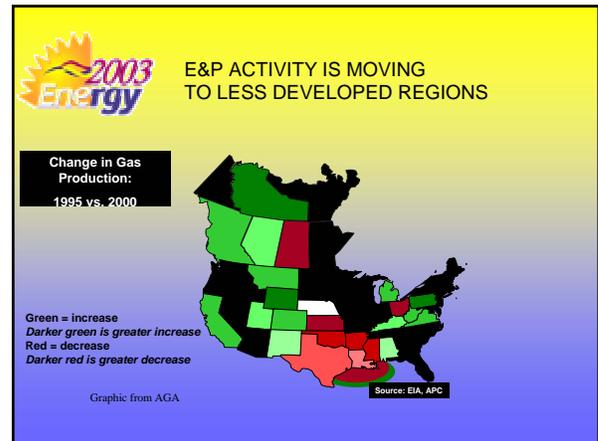
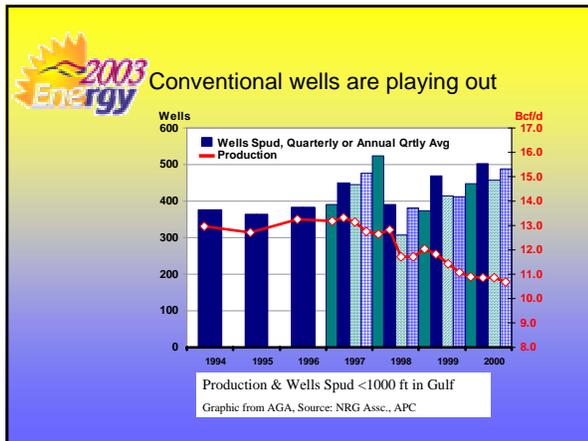
What happened?

- 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!



2003 Energy 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

● Existing Terminals
● Proposed Terminals

2003 Energy 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 decline 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.

Year	Cost per 1000 Btu
1980	\$2.00
2002	\$1.50
2015	\$1.25

Graphic from AGA

2003 Energy 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.

2003 Energy Increase in Generation Demand offset by Decline in Industrial Demand

Use of Natural Gas at Generating Units vs. Industrial

Year	Power Generation* (Cf)	Industrial (Cf)
1996	~4.8	~7.0
1997	~5.0	~7.0
1998	~5.5	~6.8
1999	~5.8	~6.5
2000	~6.2	~6.5
2001	~6.5	~6.0
2002E	~6.8	~5.5

Graphic from A Weissman

*Generating units include combined cycle electric units + industrial CHP units

2003 Energy Industry Shrinking % of Market
Less "Swing" Potential

'02 Demand

Sector	Demand (Tcf/yr)
Power Generation	6.88
Industrial*	5.43
Residential	5.00
Commercial	3.17

Graphic from A. Weissman

* Excludes use of natural gas by Independent Power Producers to generate electricity

Less than 25% of total
Down from ~40%

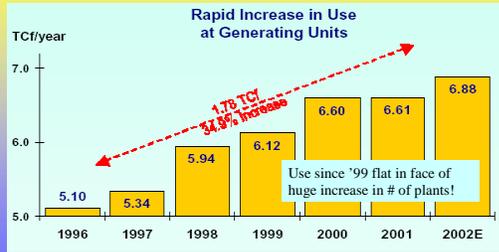
2003 Energy Gas Generation may Rule the Market

Sources of Incremental Generation

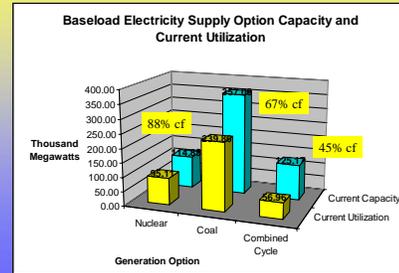
Legend: Renewable (excl. Hydro), Natural Gas, Nuclear, Coal



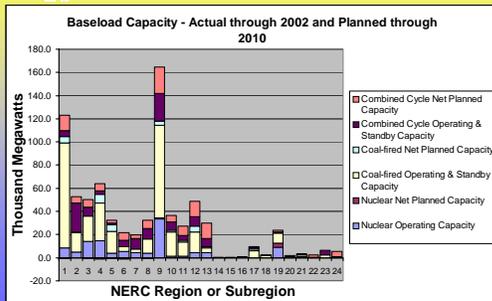
But it Hasn't Yet



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



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