Short Term Issues…..Long Term Issues

The Outlook for Natural Gas

Institute for Regulatory Policy Studies
Illinois State University

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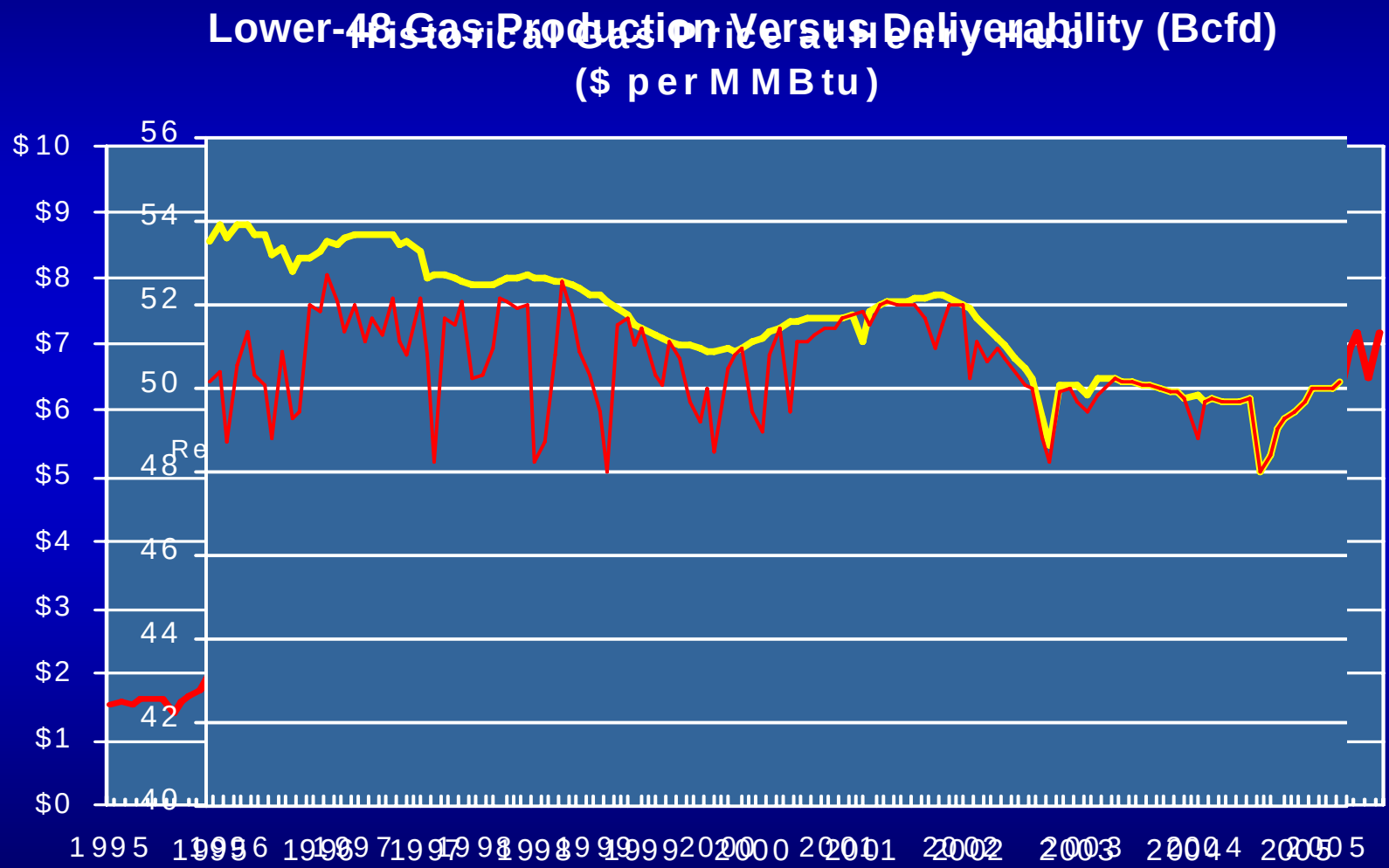
www.ingaa.org

How Did the Market Get Here?



Source: Platts Gas Daily & Energy and Environmental Analysis, Inc.

Courtesy of EEA

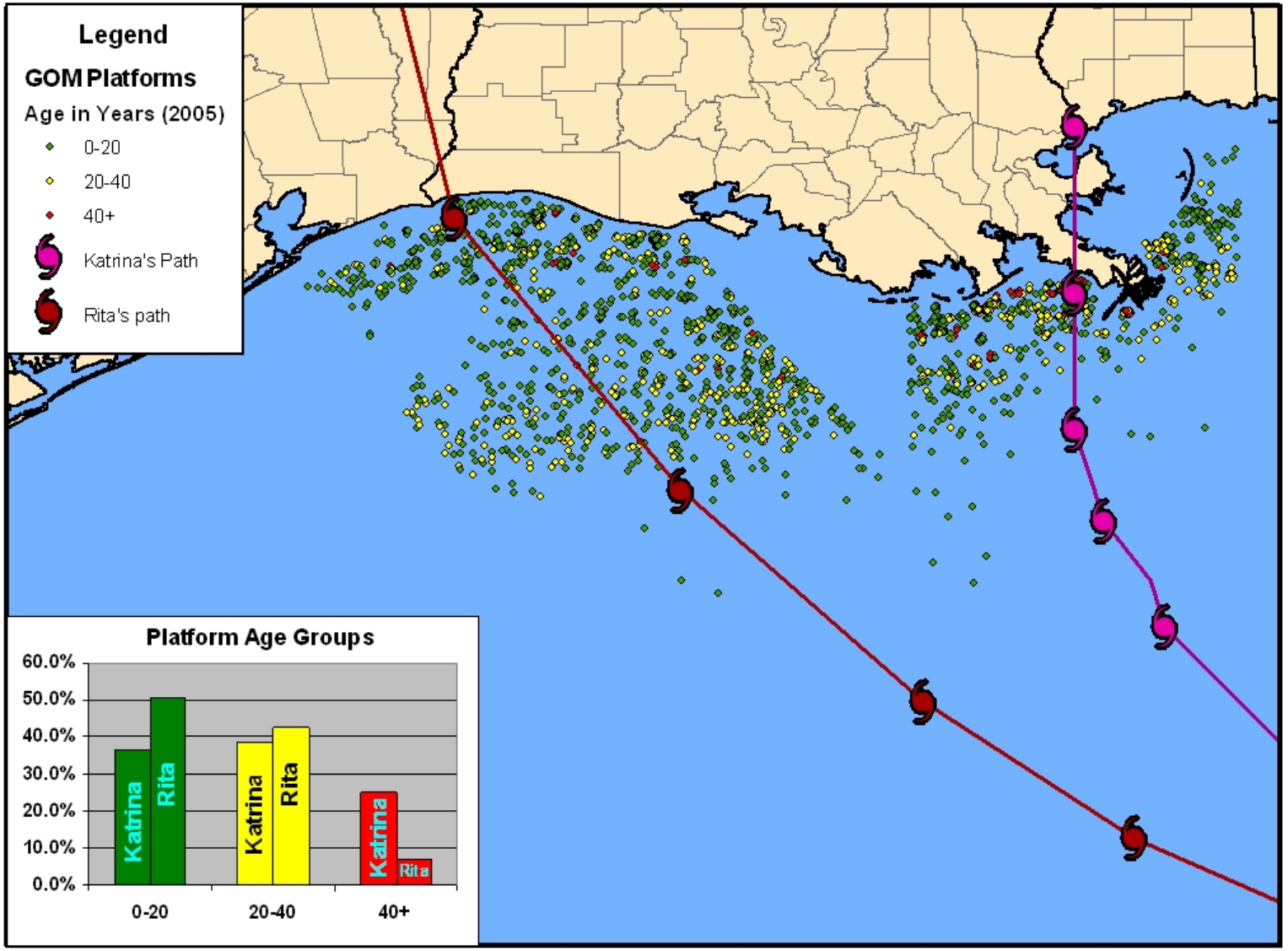
Demand Increased Because of Hot Summer

- Hotter than normal summer temperatures have kept upward pressure on gas prices.
- An early summer heat wave covered the Midwestern and Central states in June.
- July provided extreme heat to the Western United States.
- Late summer included more heat, with South Atlantic and Gulf Coast states seeing the hottest summer in ten years.

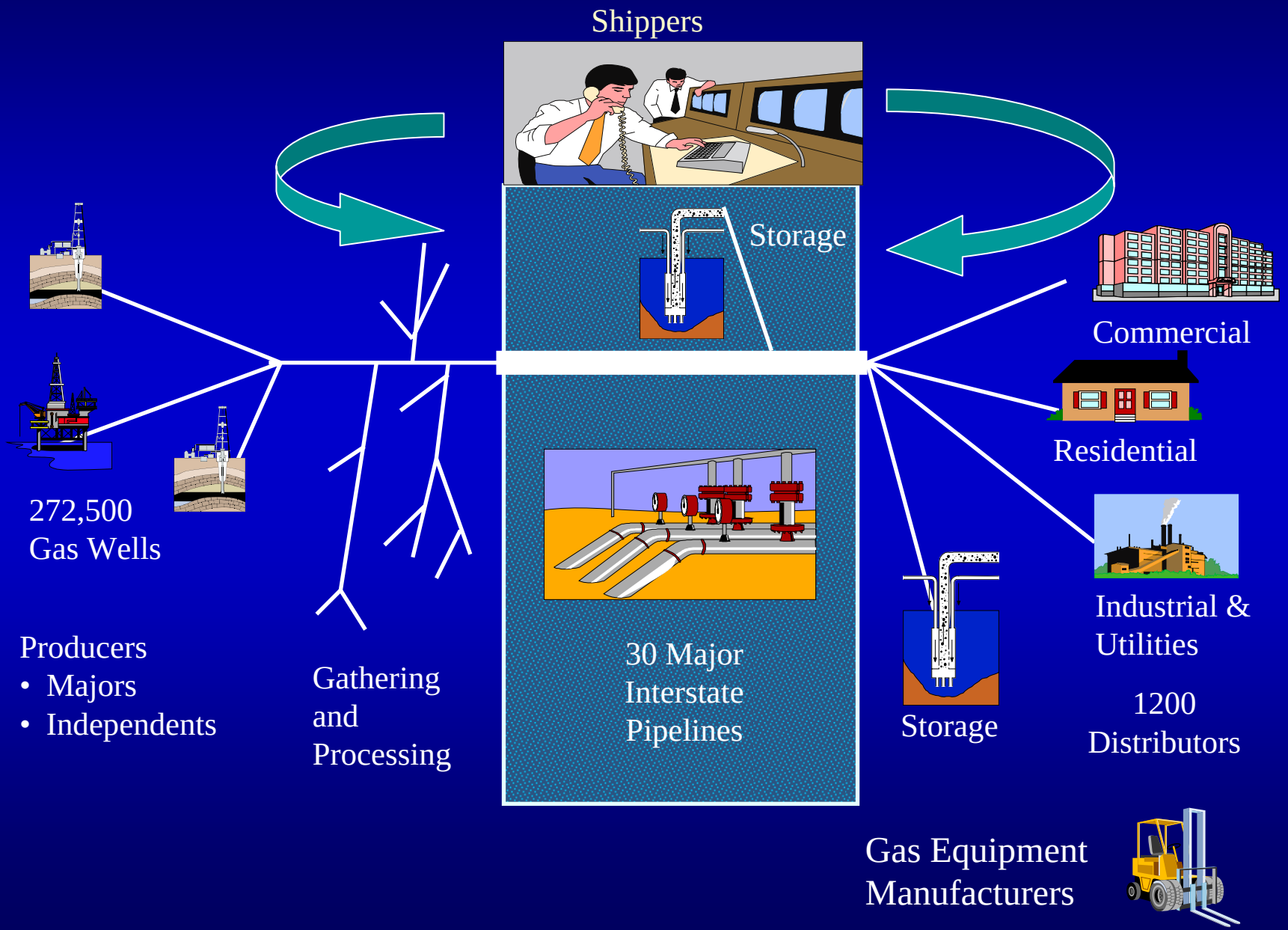
U.S.	2005 CDD	Normal	% Different
June	260	213	22%
July	367	321	14%
August	348	290	20%
MATL			
June	205	117	75%
July	309	247	25%
August	306	205	49%
SATL			
June	335	319	5%
July	462	425	9%
August	451	393	15%
ENC			
June	249	147	69%
July	294	245	20%
August	258	197	31%
ESC			
June	335	296	13%
July	433	412	5%
August	457	376	22%
WSC			
June	482	431	12%
July	558	545	2%
August	575	527	9%
PAC			
June	92	100	-8%
July	239	188	27%
August	223	193	16%

Courtesy of EEA

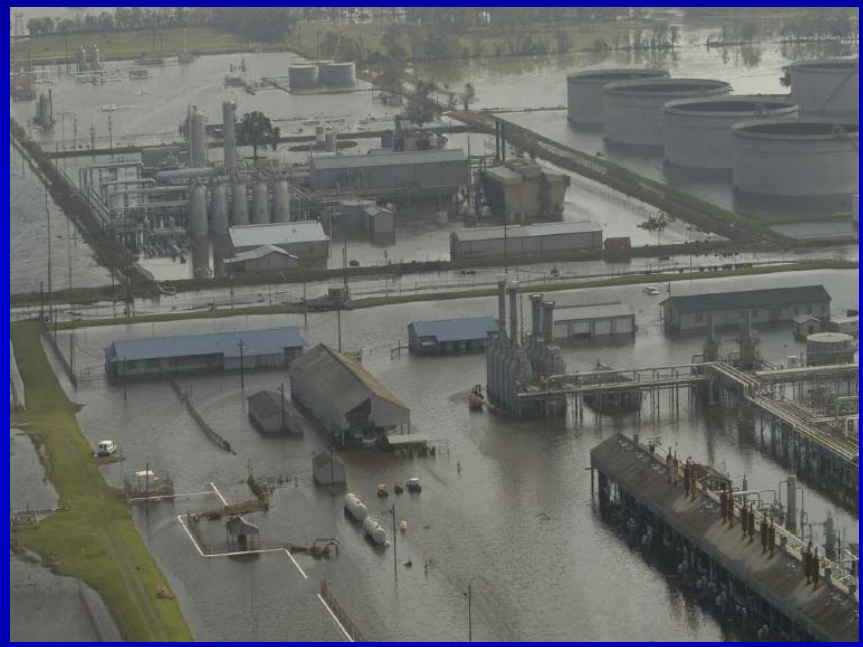
Platforms/Structures Impacted by Rita & Katrina



Will the Gas Market Work?

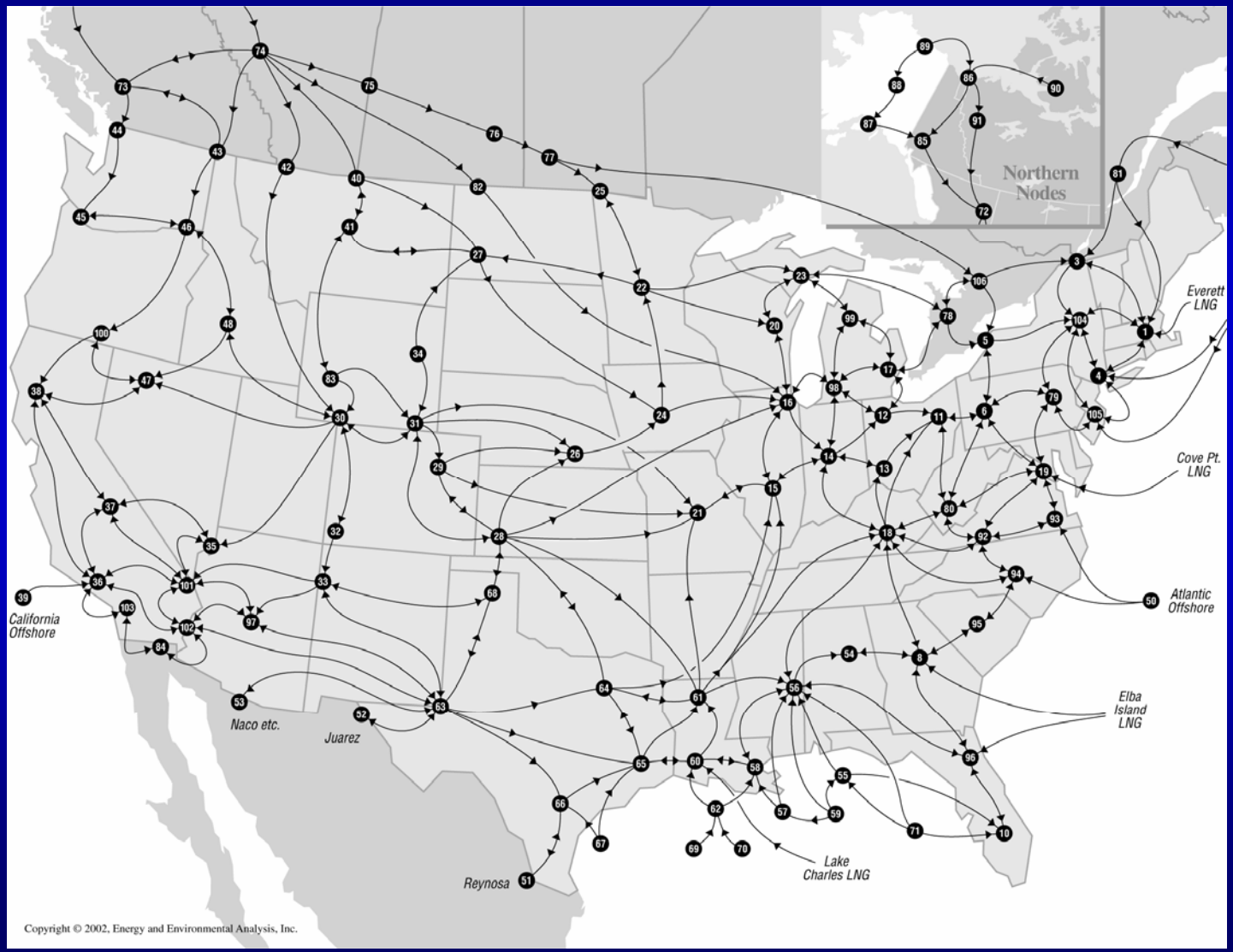


Some Parts Won't



But the Market is Resilient

Model Used to Analyze Hurricane Impacts

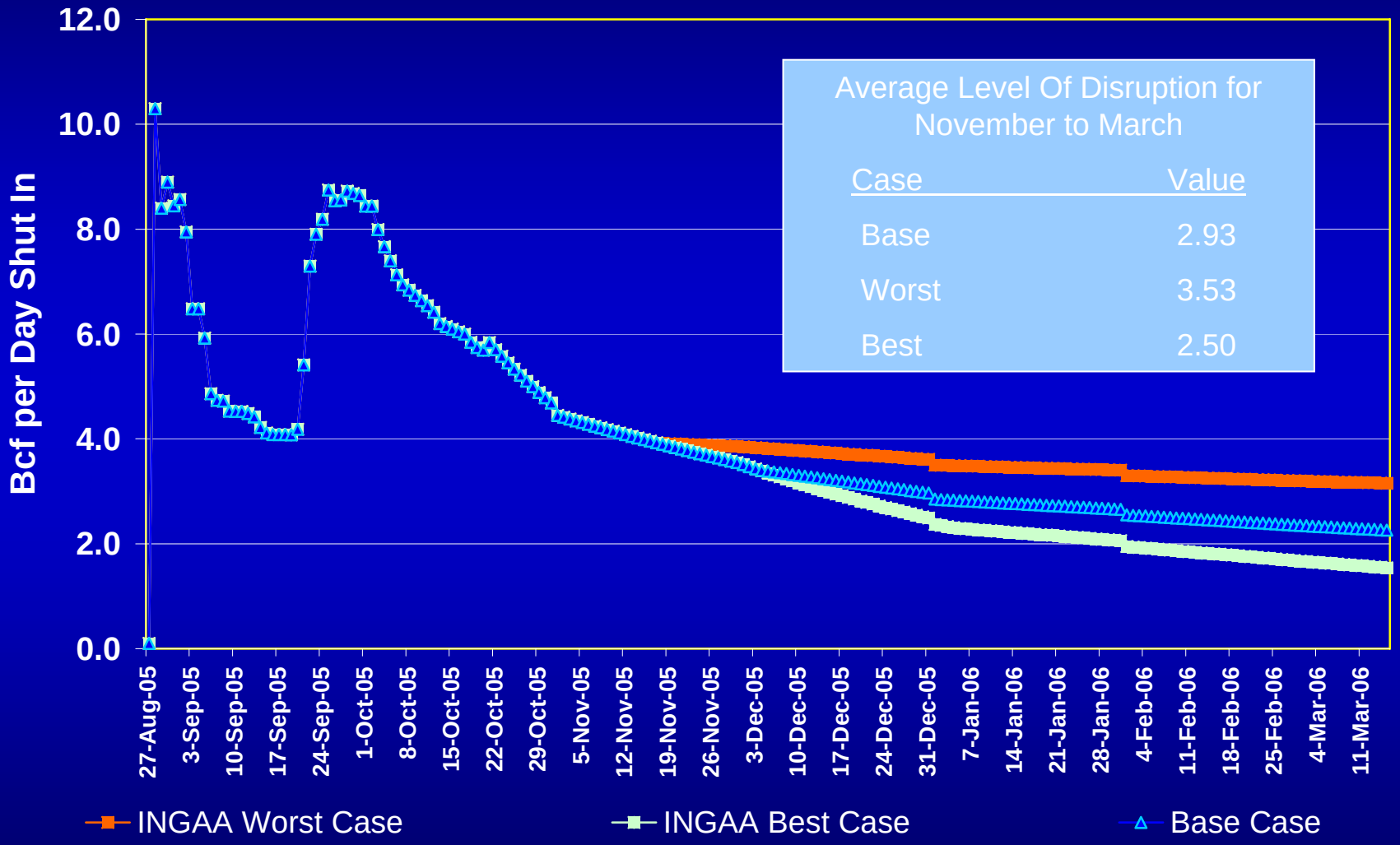


Courtesy of EEA

Studied Recovery Scenarios

- Base Case
  - Best guess at recovery pattern for gas supply in the Gulf Coast area.
  - Net LNG imports a little above last winter's level, averaging about 1.7 Bcfd.
- Worst Case
  - Slower than expected recovery for Gulf Coast supply with less capacity improvement during winter.
    - Gas quality restrictions reduce the effectiveness of "partial processing" (JT effect).
  - Net LNG imports average about 1.3 Bcfd.
    - Incremental gas from Egypt, Nigeria, and Trinidad goes to Europe.
- Best Case
  - Faster than expected recovery. Greater capacity improvement than anticipated.
    - More effective "Rita work-arounds".
  - Net LNG imports average about 2.1 Bcfd.
    - Incremental gas makes its way to U.S. with mild European winter.

Comparison of Gulf Coast Recovery Scenarios



Note: Includes both offshore and onshore production.

Summary of Winter Gas Supply
(Excludes Gas Storage)

(All values Represent Average Bcf per Day Throughout last Winter and the Upcoming Winter)	November - March				Gain/(Loss) Base Versus '04-'05 Values
	'05-'06			'04-'05	
	Worst	Base	Best		
U.S. Production Before Impact of Hurricanes	51.5	51.5	51.5	51.5	0.0
(plus) Net LNG Imports	1.3	1.7	2.1	1.6	0.1
(plus) Net Canadian Imports	9.9	9.9	9.9	9.2	0.7
(less) Net Mexican Exports	1.1	1.1	1.1	1.0	0.1
(equals) Net Flowing Supply for U.S. Consumers Before Impact of Hurricanes	61.7	62.1	62.5	61.3	0.8
(less) Impact of Hurricanes	3.5	2.9	2.5	0.7	2.2
(equals) Net Flowing Supply for U.S. Consumers Including Impact of Hurricanes	58.1	59.1	60.0	60.6	-1.5

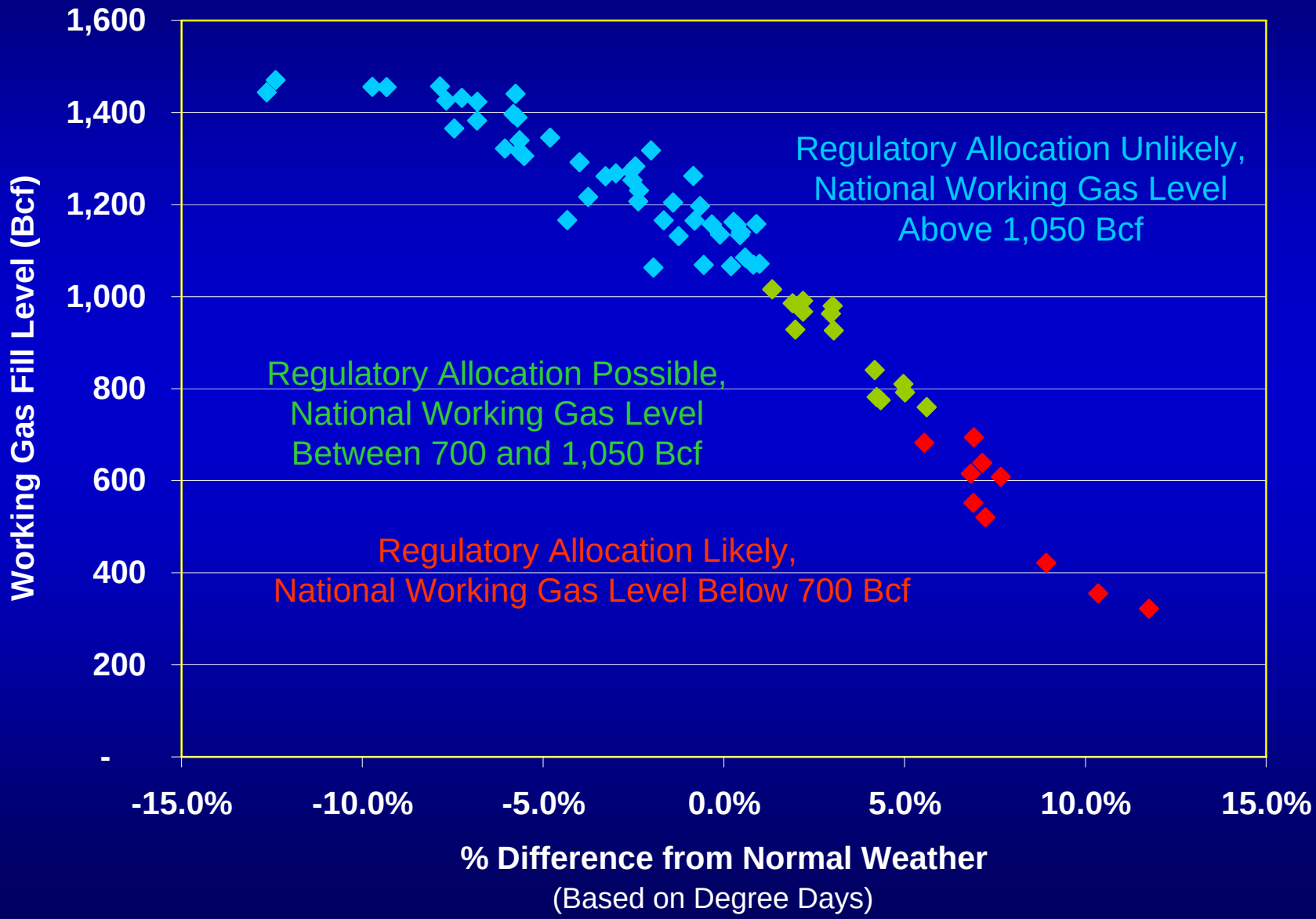
Versus last winter, natural gas supply (excluding storage) will be down by between 0.6 and 2.5 Bcfd depending on the recovery of supplies in the Gulf Coast area.

Definition of Regulatory Allocation Pertaining to This Study

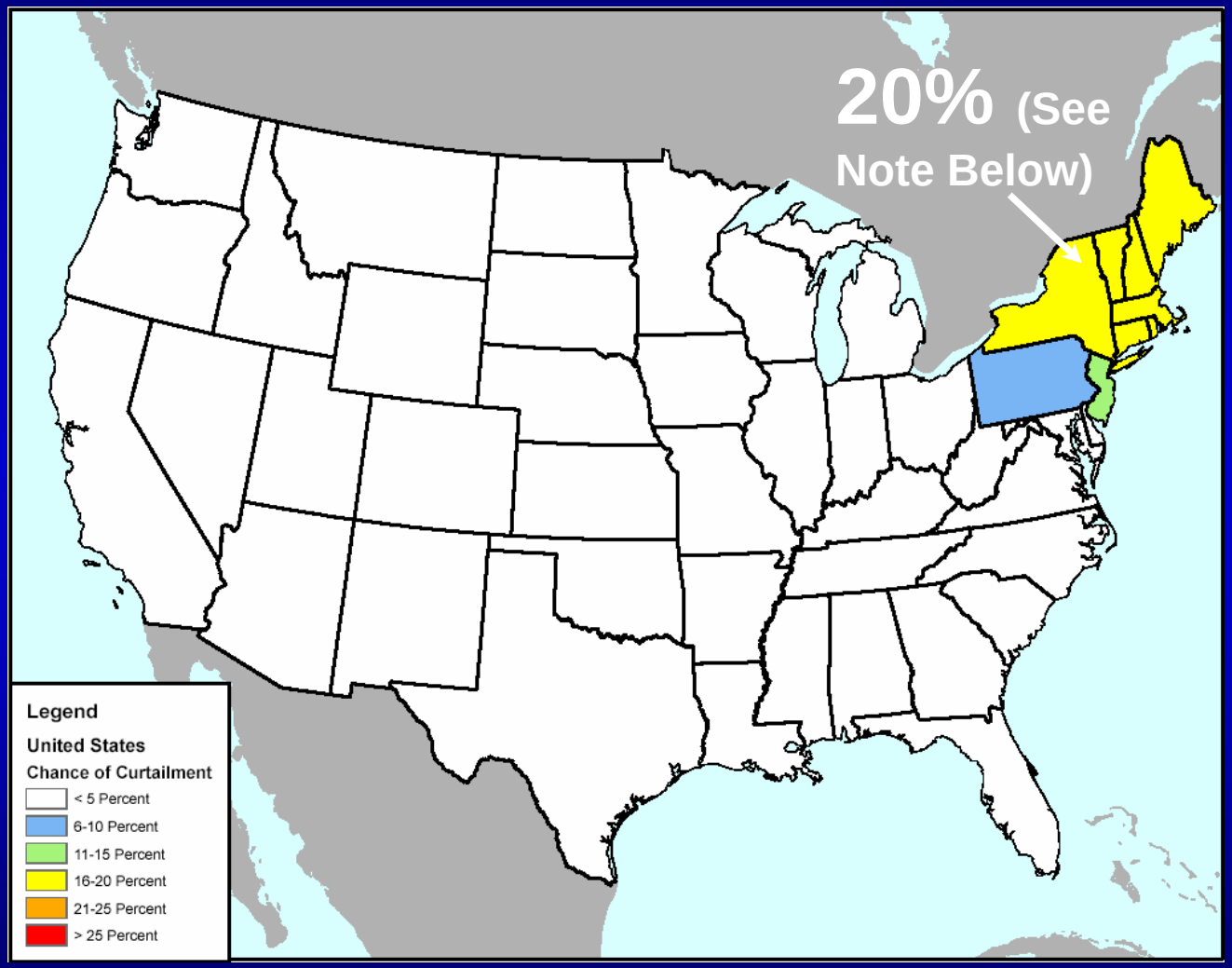
A regulatory allocation situation occurs when the EEA Model indicates that supply into a market region is not sufficient to meet all demand even when all economic alternatives have been exhausted.

Note: Residential and commercial customers served by local distribution companies that hold firm transportation and gas supply entitlements will continue to receive natural gas service, sufficient to meet their requirements throughout the winter, even during periods of peak demand.

INGAA Base Case Recovery Scenario
U.S. End of March 2006 Working Gas Levels Versus Weather

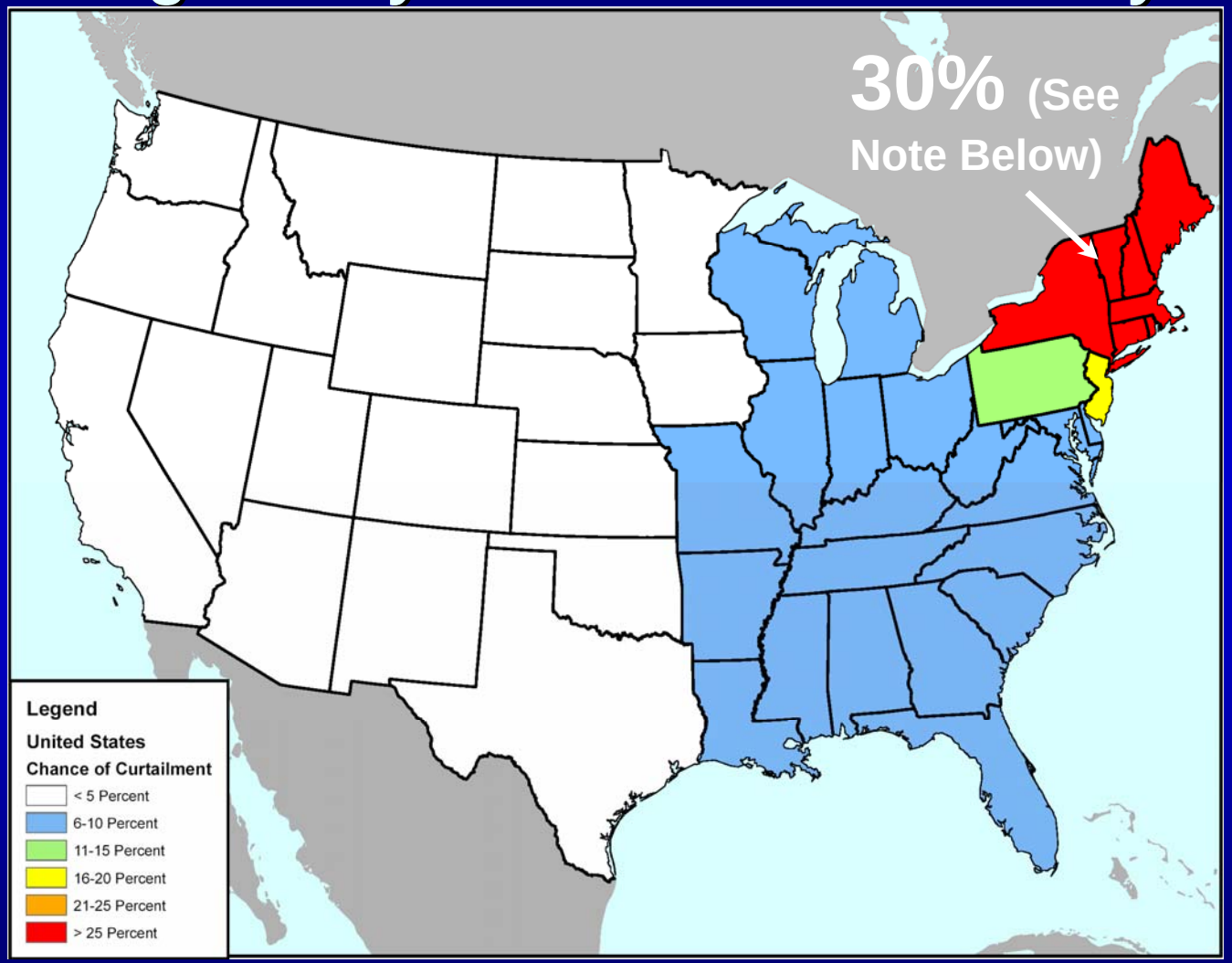


EEA Reference Case (without Hurricane Outages) Regulatory Allocation Probability



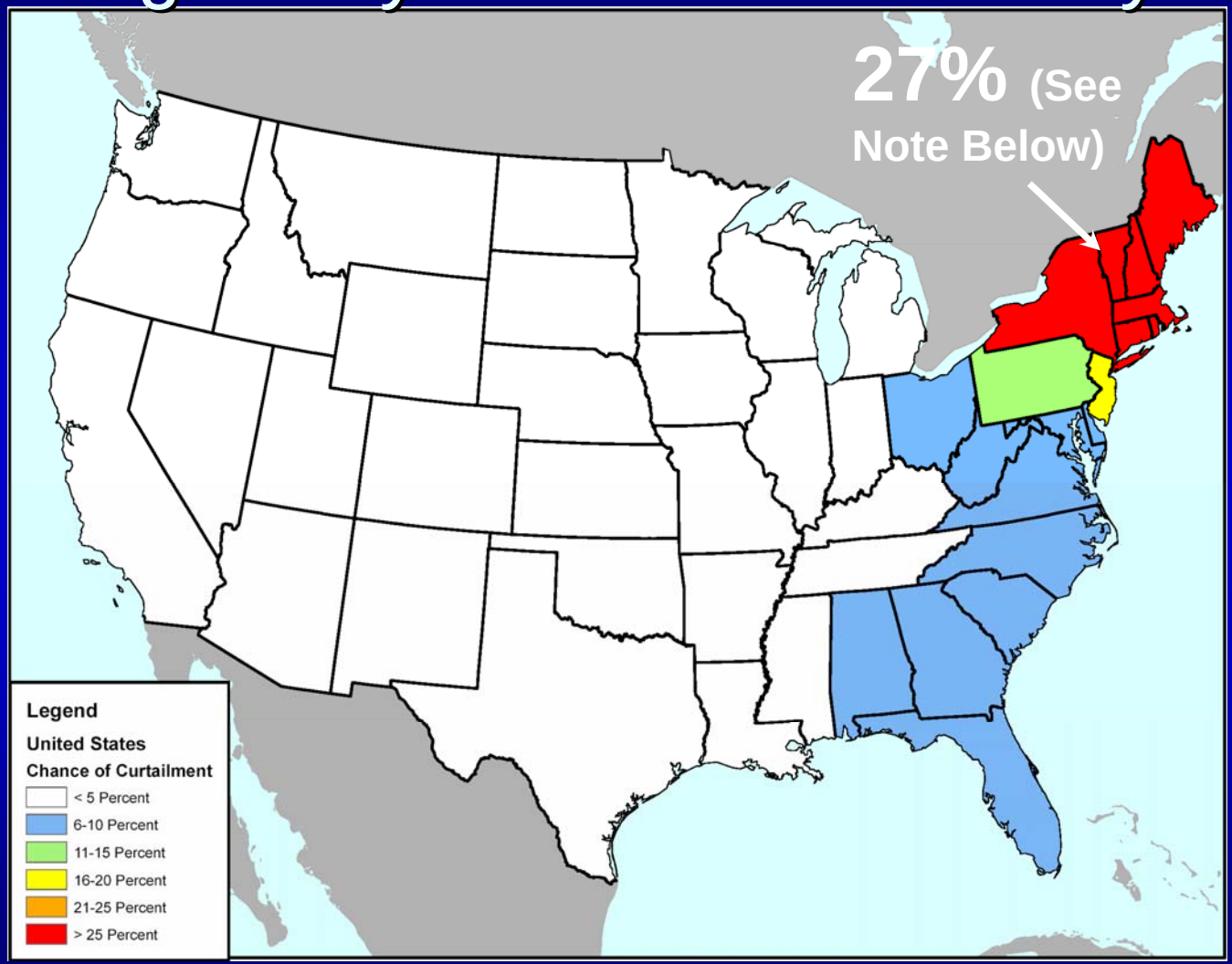
Note: 20% probability means that there is a 1 in 5 chance that the weather will be cold enough to require regulatory allocation on a few days.

INGAA Base Case Recovery Scenario Regulatory Allocation Probability



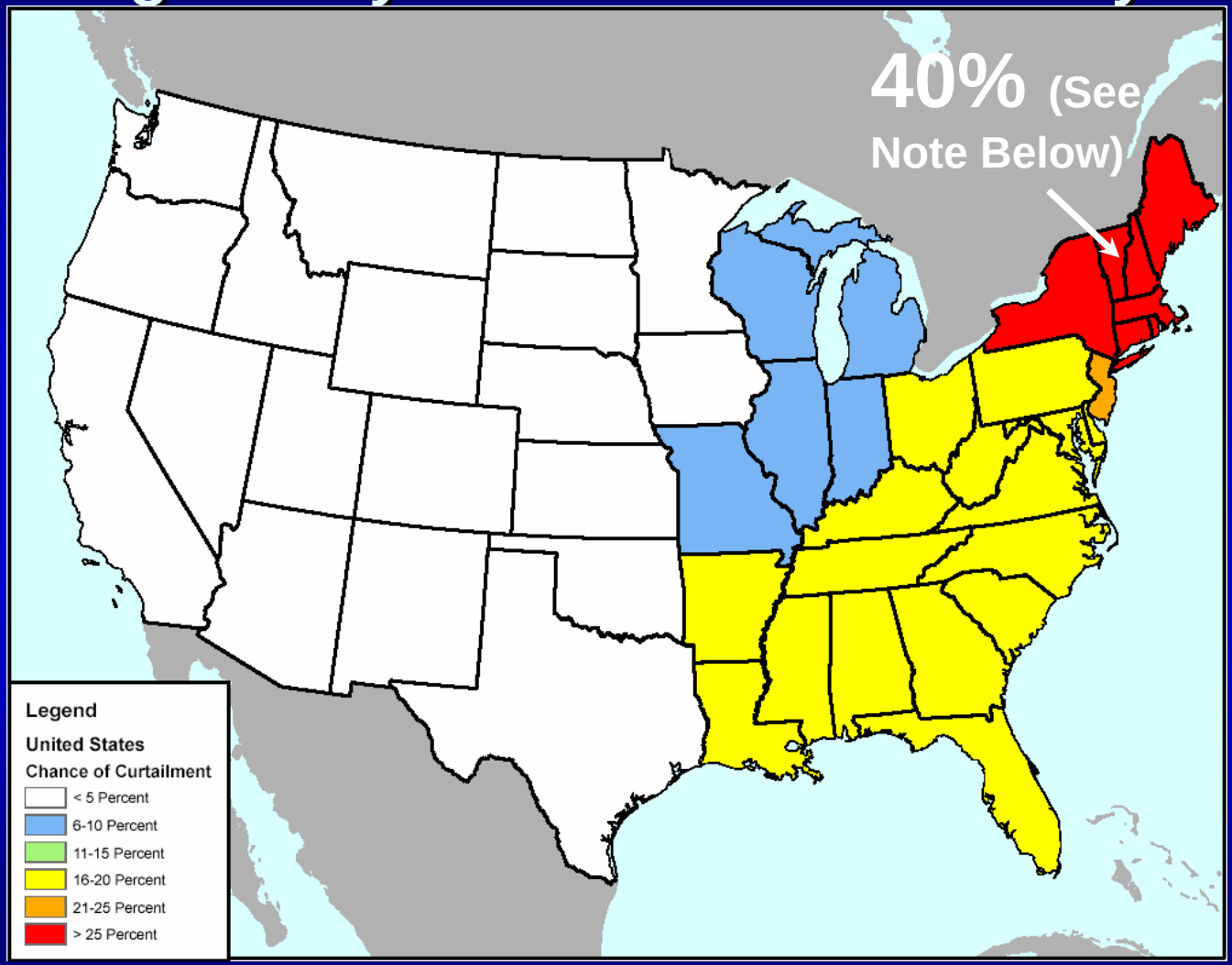
Note: 30% probability means that there is an approximate 1 in 3 chance that the weather will be cold enough to require regulatory allocation on a few days.

INGAA Best Case Recovery Scenario Regulatory Allocation Probability



Note: 27% probability means that there is less than a 1 in 3 chance that the weather will be cold enough to require regulatory allocation on a few days.

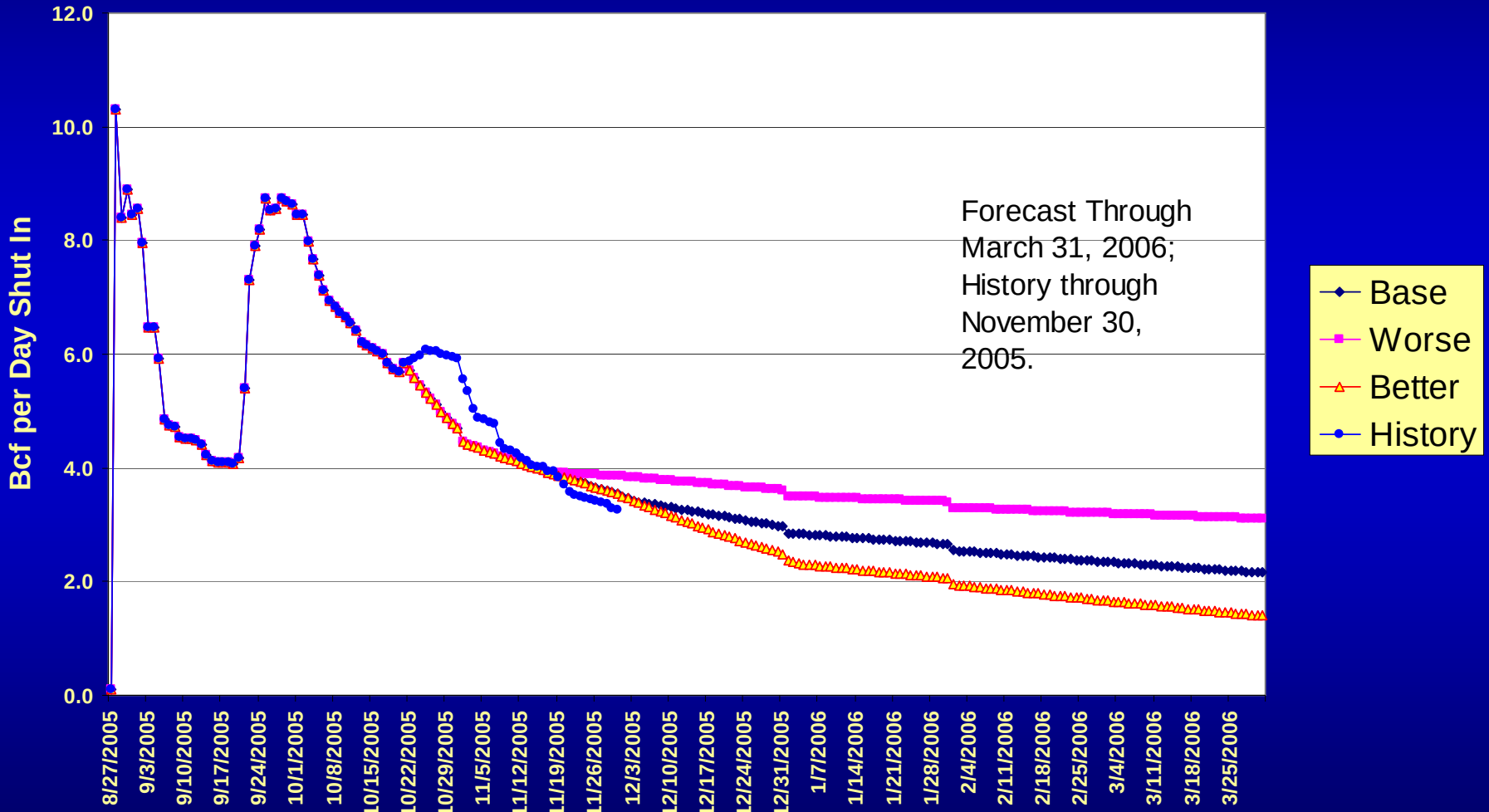
INGAA Worst Case Recovery Scenario Regulatory Allocation Probability



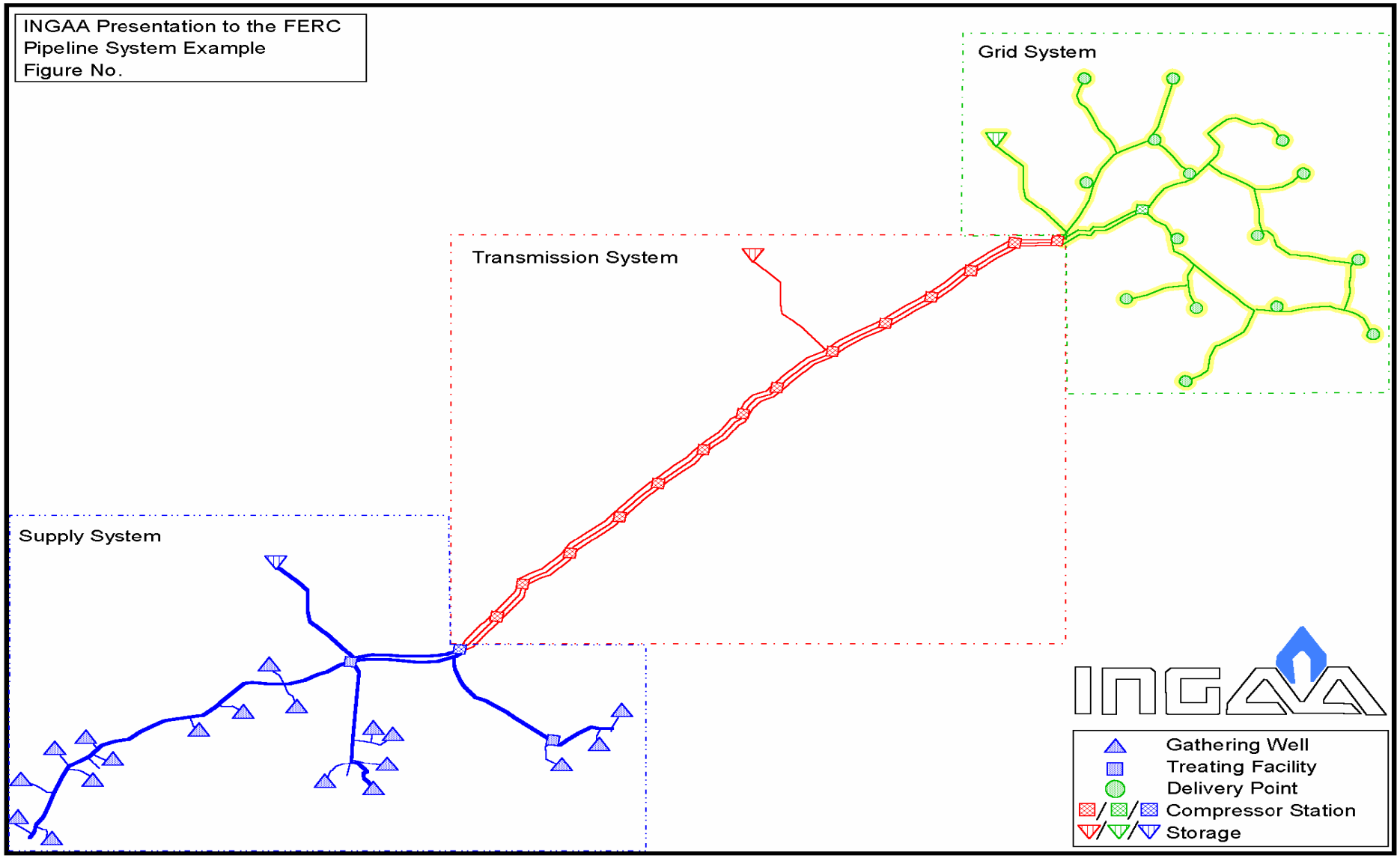
Note: 40% probability means that there is a 2 in 5 chance that the weather will be cold enough to require regulatory allocation on a few days.

Comparison of INGAA Gulf of Mexico/Gulf Coast Shut-In Forecast With Actual Through November 30, 2005

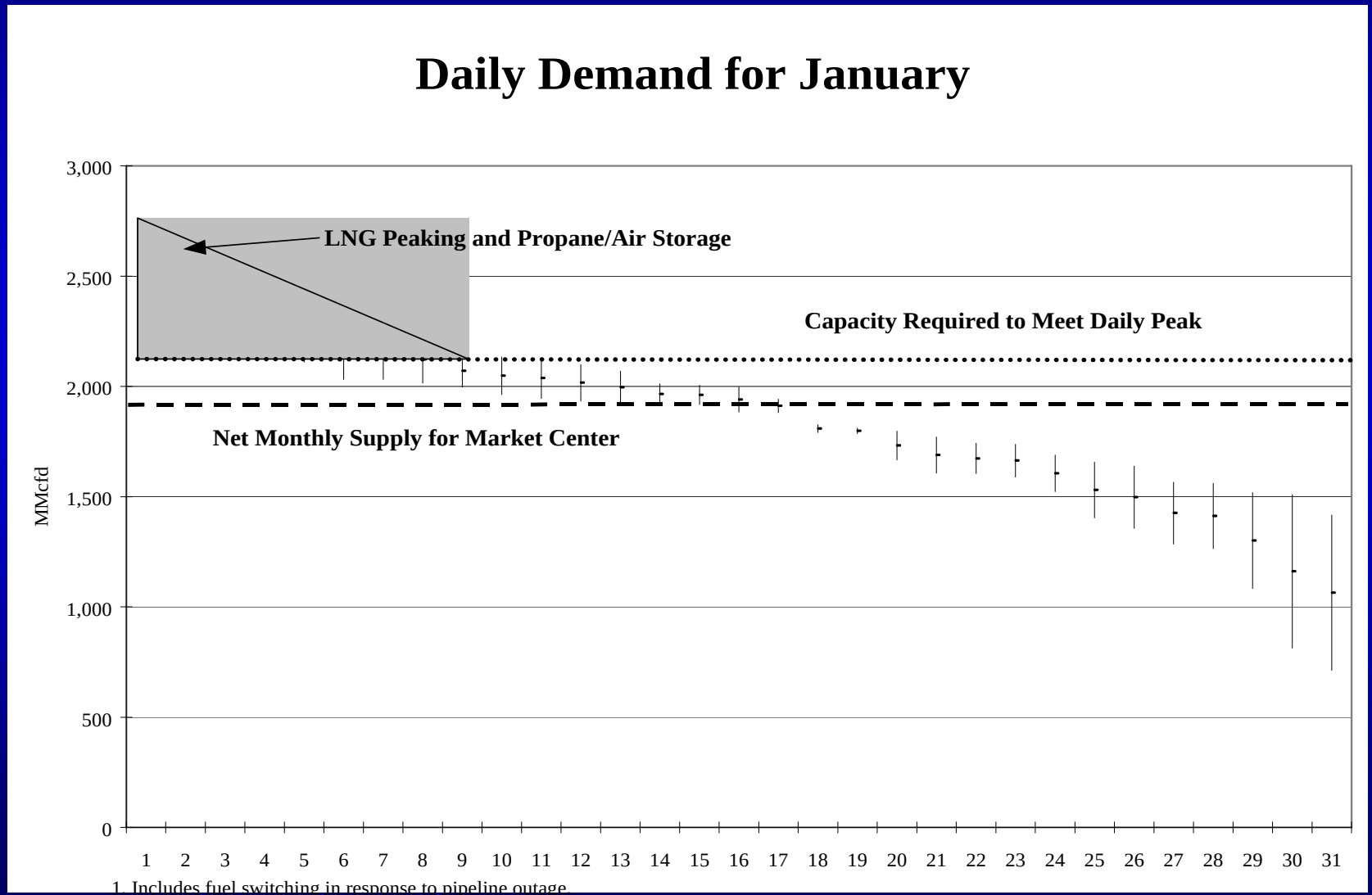
Includes Onshore; Energy and Environmental Analysis, Inc.



Getting the Gas to the Right Place....

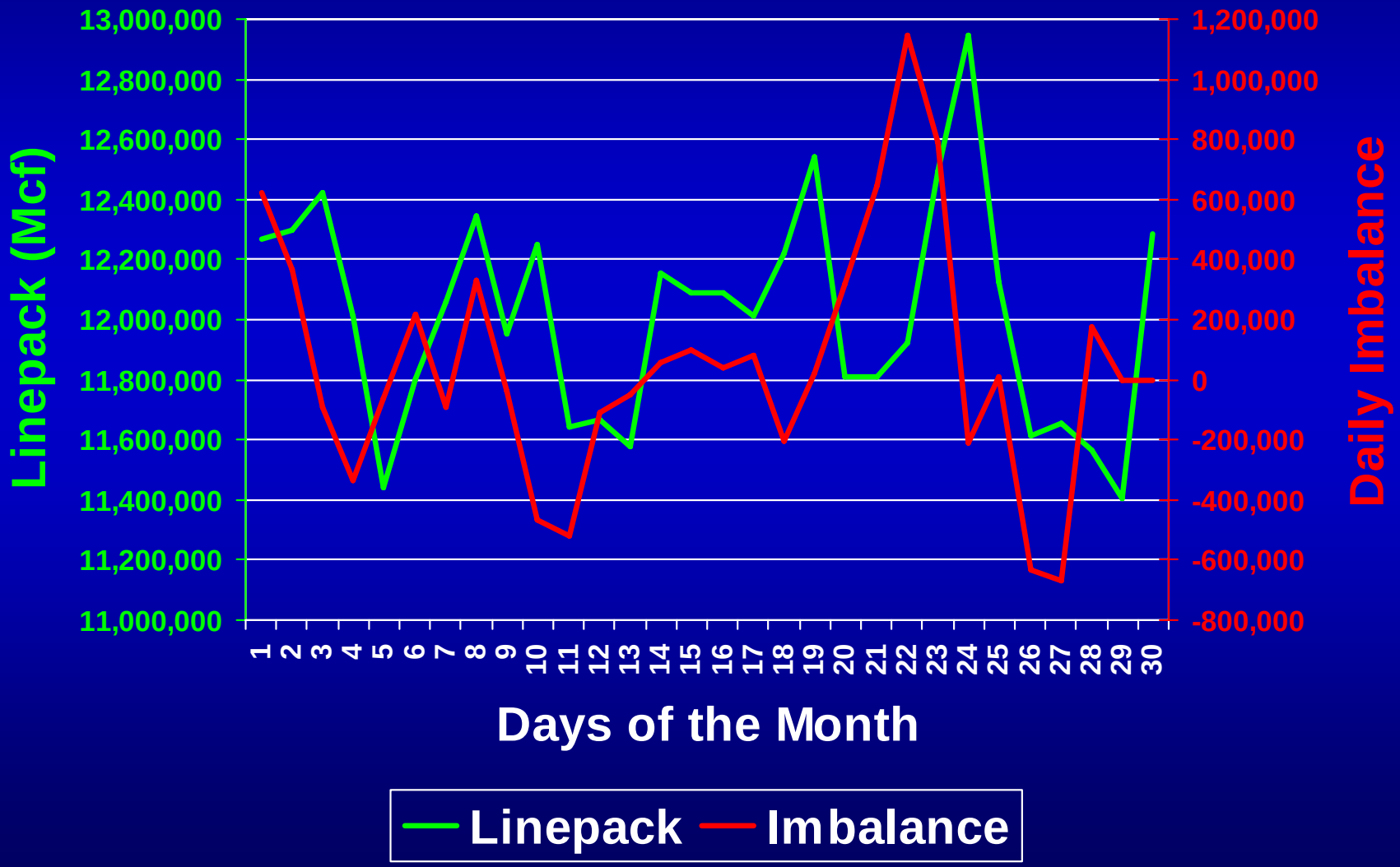


Individual Market Sustainability during Daily Peak Load Swings Depends on Infrastructure

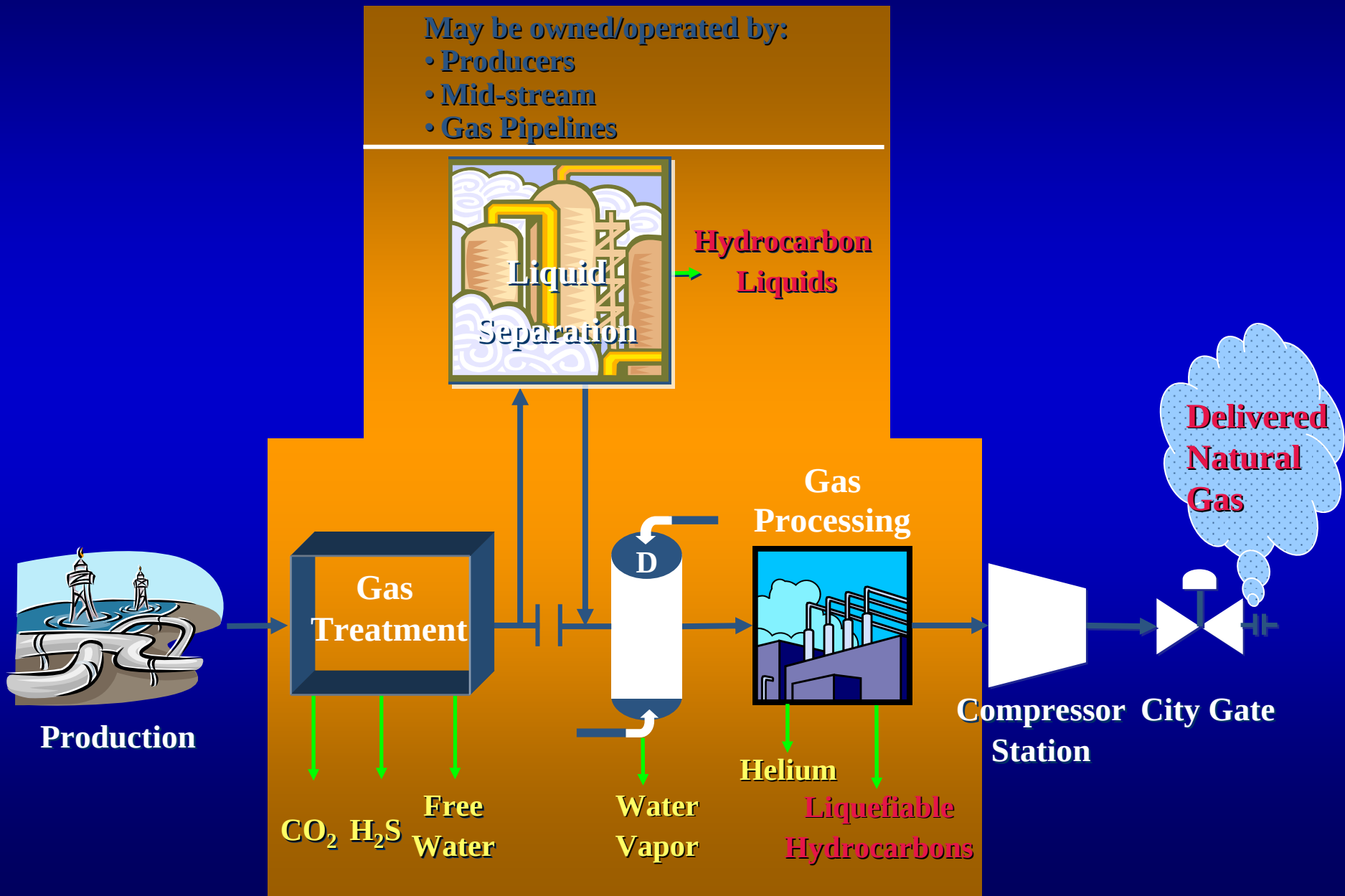


Courtesy of EEA

Linepack vs. Imbalance



Gas Processing Also an Issue.....



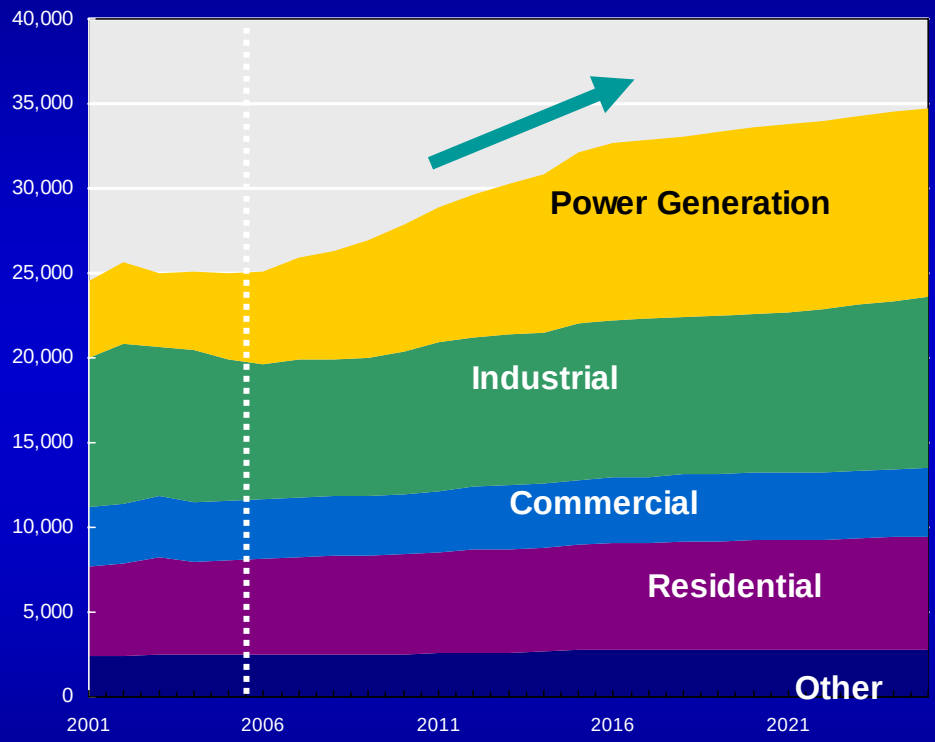
Long Term Issues.....

Gas Demand Outlook

- Gas consumption in the power sector will grow substantially.
  - Over 200 GW's of new gas-based generating capacity in the U.S. will be used to satisfy increasing electric load.
- Modest growth in R/C gas consumption.
- Industrial gas consumption will fluctuate around current levels.
  - Well below pre-2000 levels.
- When necessary, price-induced demand reductions will balance the market.

U.S. and Canada Gas Consumption

(Trillion Cubic Feet, Tcf)



	Delta 2004-2015	Delta 2004-2025
Power Generation	+5.4 Tcf	+6.5 Tcf
Industrial	+0.2 Tcf	+1.1 Tcf
Commercial	+0.3 Tcf	+0.6 Tcf
Residential	+0.7 Tcf	+1.2 Tcf
Other	+0.3 Tcf	+0.3 Tcf

The North American gas market may be best characterized as a "demand leads supply market" for the foreseeable future.

Courtesy of EEA

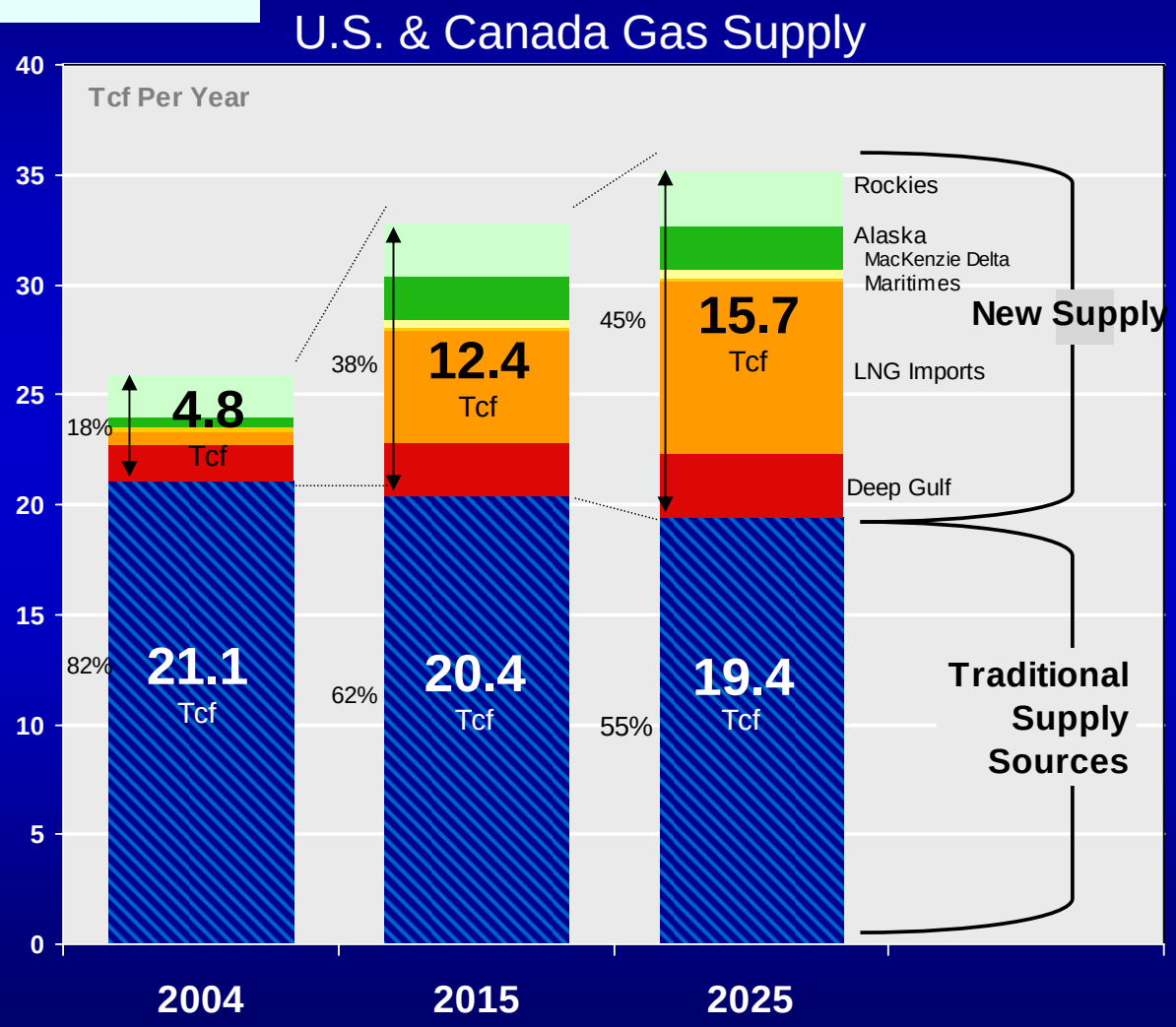
Historical Background: Natural Gas

- 1950s to early 1980's: interstate gas markets highly regulated, long-term contracts predominated
  - long-term contracts for wellhead supplies between pipelines and producers lasted for "life of reserves" or a long, fixed period
  - contracts between pipeline and LDCs often had 20-year terms
  - existence of contracts needed for approval of new pipeline capacity
- Through 1980's and 1990's: gas restructuring period
  - NGPA, Natural Gas Wellhead Decontrol Act
  - FERC Orders 380, 436 and 636
  - State-level customer choice programs for large industrials and then others
  - Resulted in take-or-pay, stranded cost problems
  - Led to many more contracts of shorter duration

Where is the Natural Gas Supply?

Relying On New Frontiers

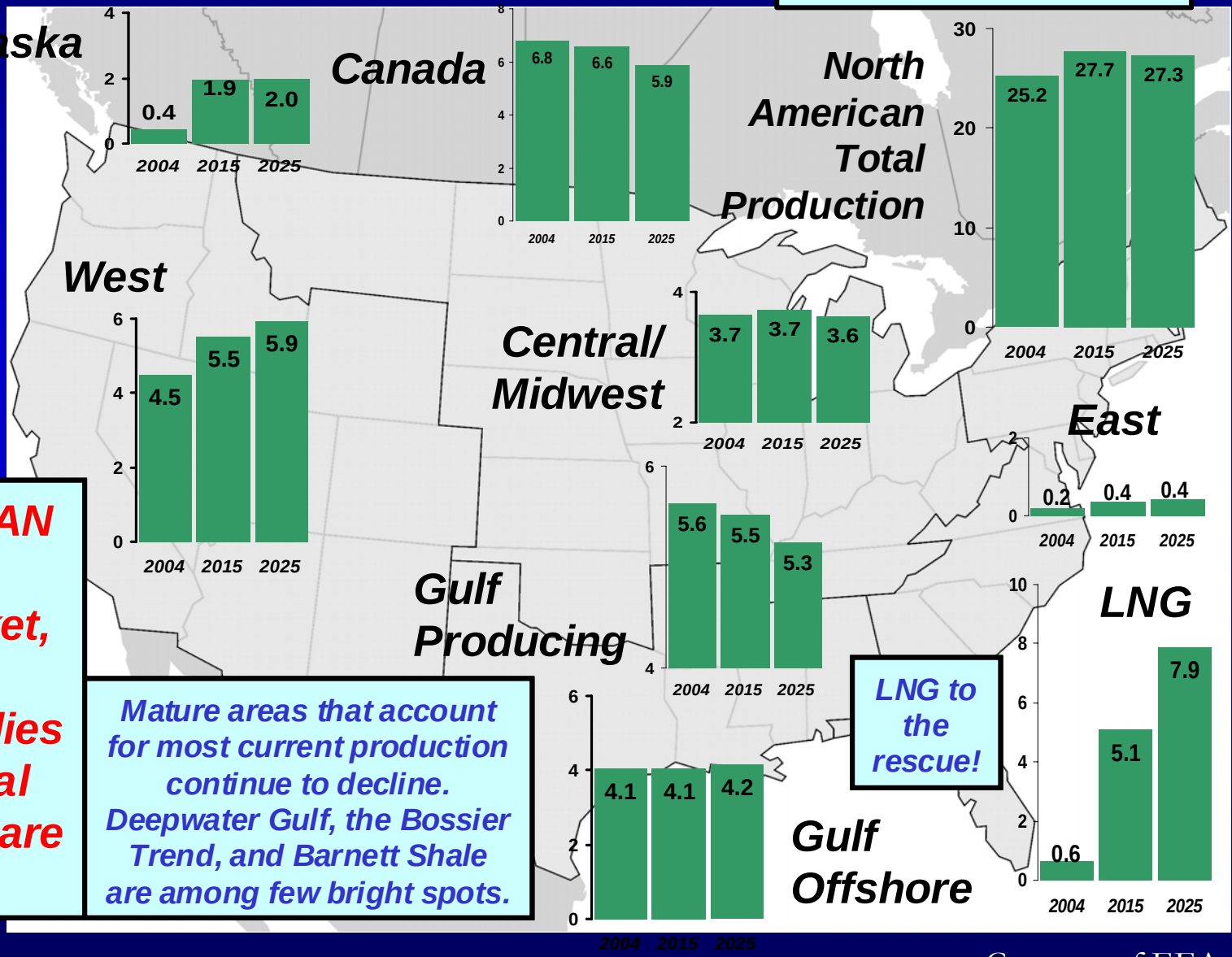
- Production from mature producing areas will decline by about 1% per year.
- New frontier supplies will account for 38% and 45% of total U.S. and Canada gas supply in 2015 and 2025, respectively, versus only 18% today.



Courtesy of EEA

Regional Gas Supply (TCF/year)

Canada declines even with MacKenzie Delta and coalbed methane.



Alaska always 10 years out - but needed.

The Rocky Mountain Basins continue to shine.

Gas supply CAN support a growing market, but "new frontier" supplies and additional infrastructure are required.

Mature areas that account for most current production continue to decline. Deepwater Gulf, the Bossier Trend, and Barnett Shale are among few bright spots.

LNG to the rescue!

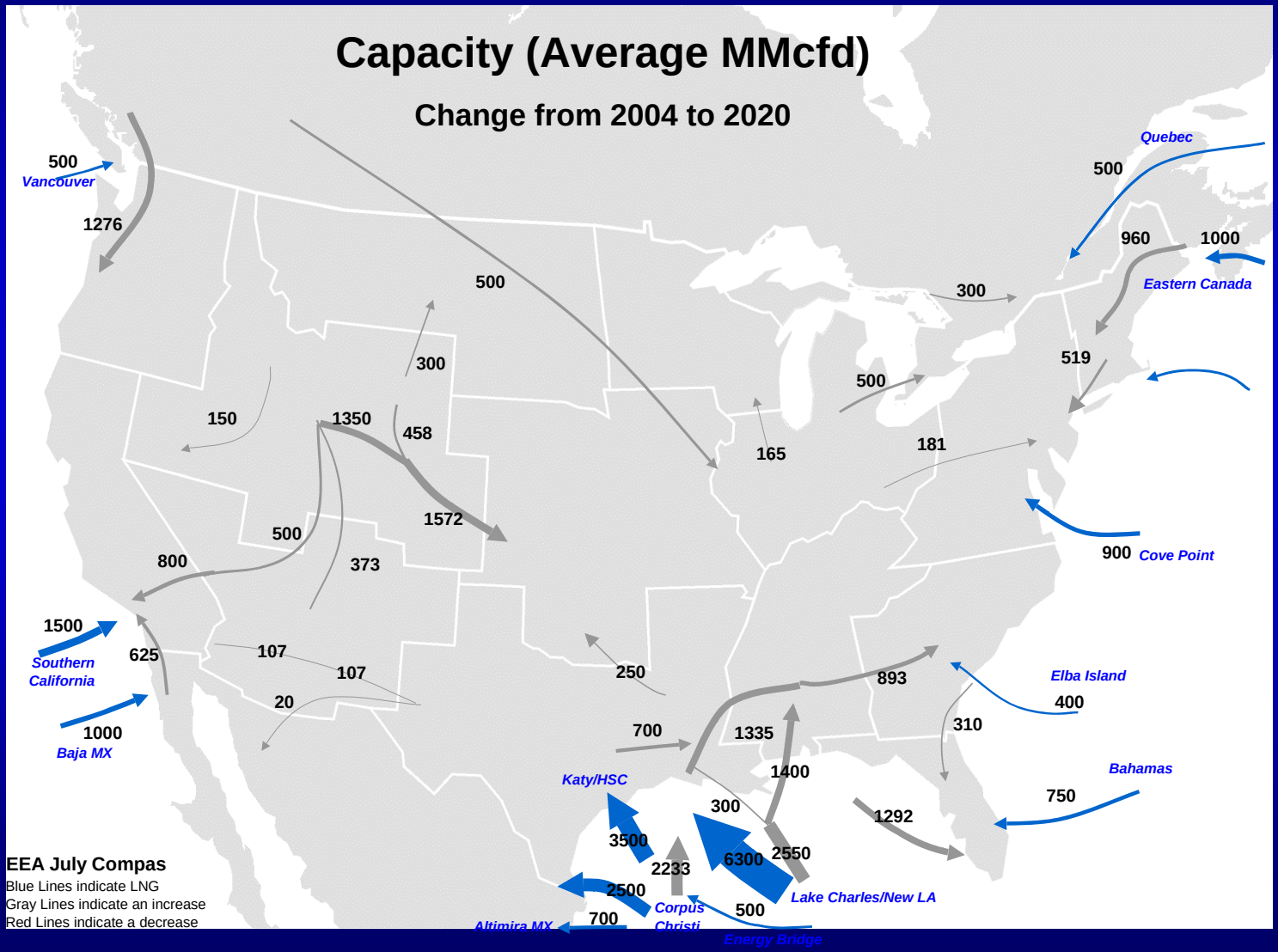
Courtesy of EEA

Obstacles For Supply Growth

- Large Capital Requirements
- Recent Liquidity Crunch
- Investor Recognition of Opportunities
- Price Volatility Creates Uncertainty
- Uncertainty About Future Gas Demand
- Access Restrictions
- Cumbersome Approvals Process
- Environmental and Siting Issues
- Contracting Issues

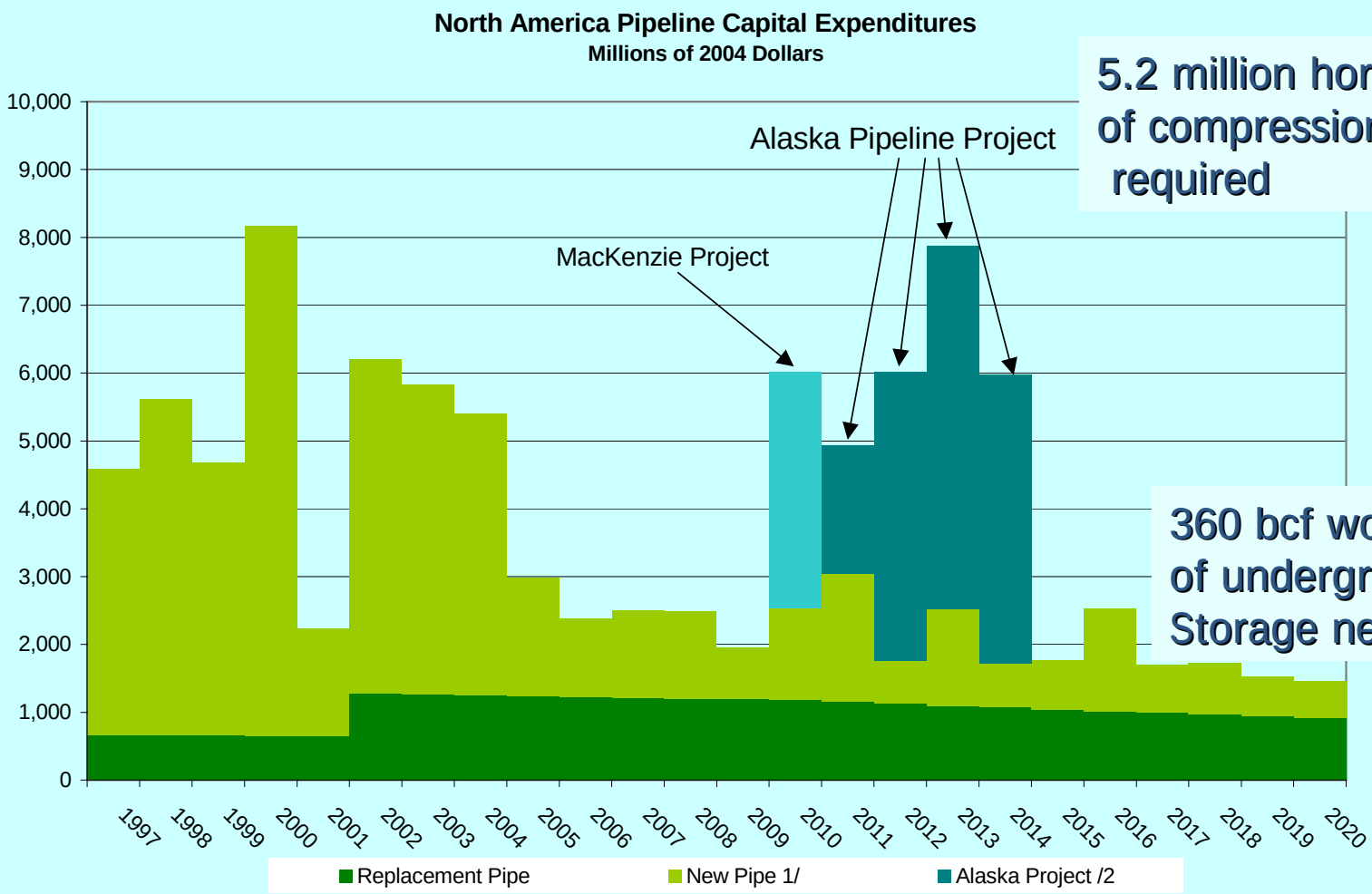
There is much uncertainty about future gas supply development.

New Long Haul Pipeline Capacity Needed



Courtesy of EEA

Pipeline Capital Expenditures Needed



5.2 million horsepower of compression will be required

360 bcf working gas of underground Storage needed

/1 Includes estimates for new transmission pipe, production plant hookup, cost for new underground storage, and power plant connection costs.

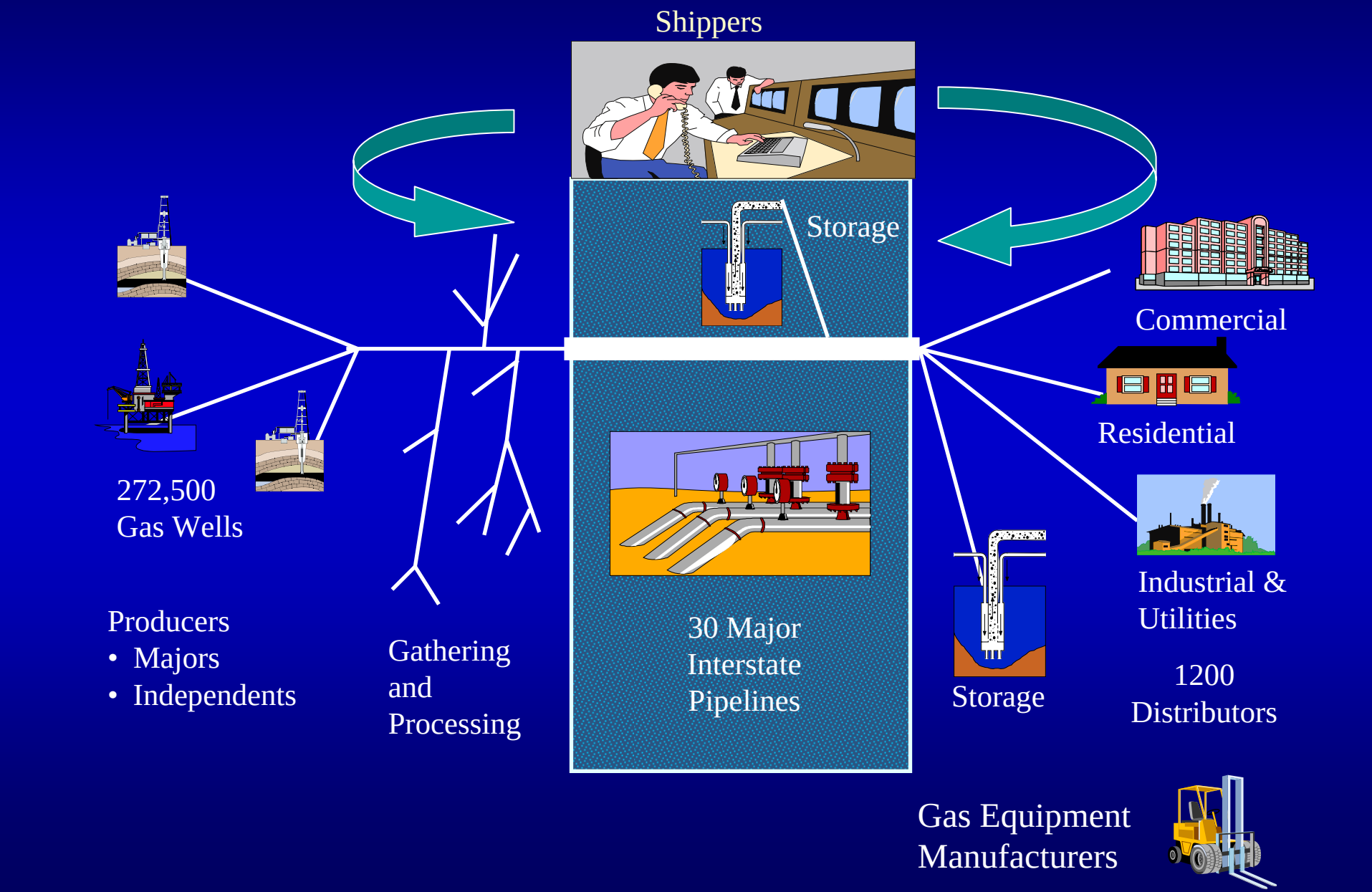
/2 Includes cost of new pipe built to Chicago in conjuction with Alaska Pipeline Project and pipe to connect production plants to the pipeline, but excludes cost of gas processing plants in Alaska and natural gas liquids extraction plants in western Canada.

Courtesy of EEA

Role of Long-term Contracts

- Contracts assign rights and obligations and allocate risks to pipelines, equity holders, debt holders, insurers, suppliers, buyers, etc.
- Long-term contracts are an important way of managing risks to all participants in new and existing gas supply, transportation and storage facilities
  - mitigate "volume risk" by assuring that a minimum amount of sales or throughput
  - mitigate "price risk" by setting a fixed price or by specifying a pricing formula

Who is the Gas Market?



Holders of U.S. Gas Pipeline Capacity

	Percent of Pipeline Capacity Held		Approx. Share of Enduse Consumption	
	1998	**2002**	**2005**	**2020**
LDC	46%	42%	39%	33%
Power	12%	15%	25%	39%
Industrial	4%	3%	36%	27%
Marketer	13%	24%		
Producer	9%	10%		
Pipeline	9%	5%		
Other	7%	1%		
Total	**100%**	**100%**	**100%**	**100%**

Sources: NPC, Balancing Natural Gas Policy, Volume V, page T-15
EEA July Base Case

Current Views and Perceptions: LDCs

- LDCs see “asymmetric risk” in long-term gas commodity, transportation and storage contracts
- Little prospect for full cost recovery by LDCs
- “Regulatory risk” from prudence reviews
- Fear of stranded costs from market loss caused by state regulatory actions, e.g., customer choice programs

Current Views and Perceptions: Power Generators

- Reluctant to sign or retain long-term firm contracts for anything but capacity on service laterals
- Recovery of costs for firm pipeline capacity generally not available through electricity sales contracts or operation of competitive markets (e.g. electric generation capacity payments)
- Willing to shut down or pay high spot gas prices in gas-constrained days - because electricity prices also go up (i.e., don't feel consumers' pain caused by price volatility)

Current Views and Perceptions: Gas Suppliers

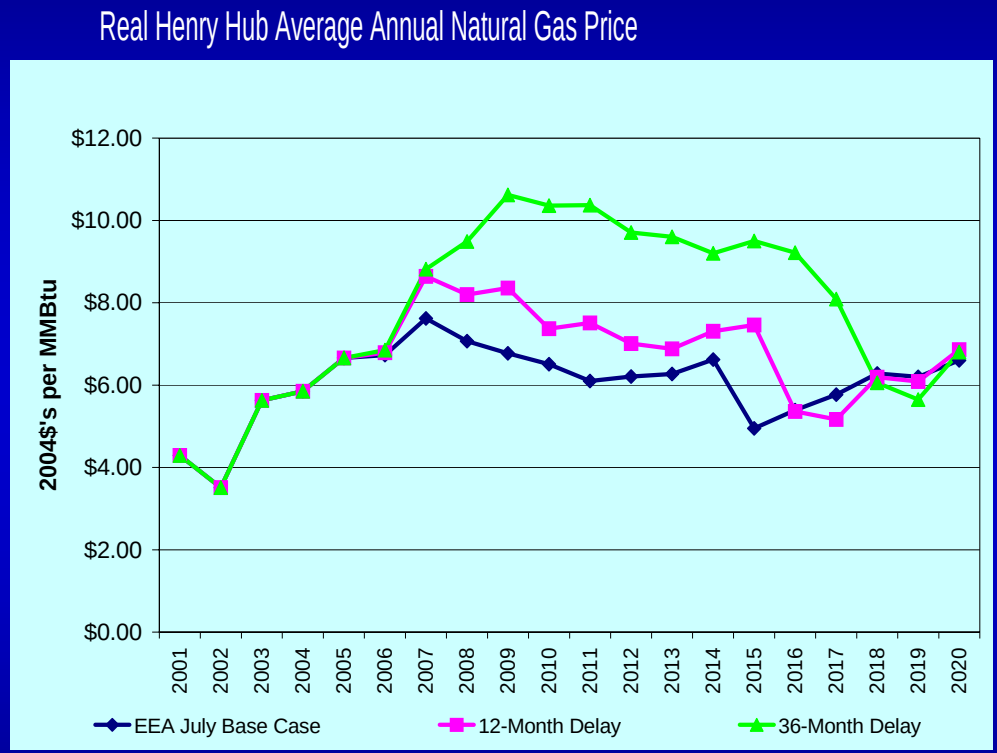
- Domestic producers generally prefer to sell at the wellhead or use interruptible pipeline service to avoid firm charges
- However, producers need outlets for supplies and have been willing to sign supply area pipeline contracts to reach liquid trading points
  - Eastern Canada Offshore (M&N)
  - Rockies
  - Deepwater GOM
  - East Texas
- New LNG terminal builders want pipeline capacity to interconnect to grid

Current Views and Perceptions: Gas Pipelines

- Incentives and regulatory policies do not encourage “speculative” or “at risk” pipeline or storage construction
- Shippers’ preferences for contract lengths of 5 years or less, do not match 20- to 30-year cost recovery period for new projects - financing more difficult and expensive
- Fewer and shorter-term firm contracts also undermine pipelines’ ability to maintain existing capacity

Consumer Price Impact of Infrastructure Delays

- 12-month delays lead to average price increase of $0.67 or 11%
- 36-month delays lead to average price increase of $2.35 or 37%
- Increased costs to gas consumers ranges from $179 to $653 billion over 2006 to 2020 period
- Consumers would also experience substantial electricity price increases, economic dislocation (lost jobs, multiplier effects)



Courtesy of EEA

Long Term Contract Options: State Natural Gas Regulations

- States Could Grant Pre-approval of LDC Contracting Practices for Cost Recovery
- State Could Review Customer Choice Programs

NARUC Gas Resolution is a Great Start

Long Term Contract Options: Electricity Markets

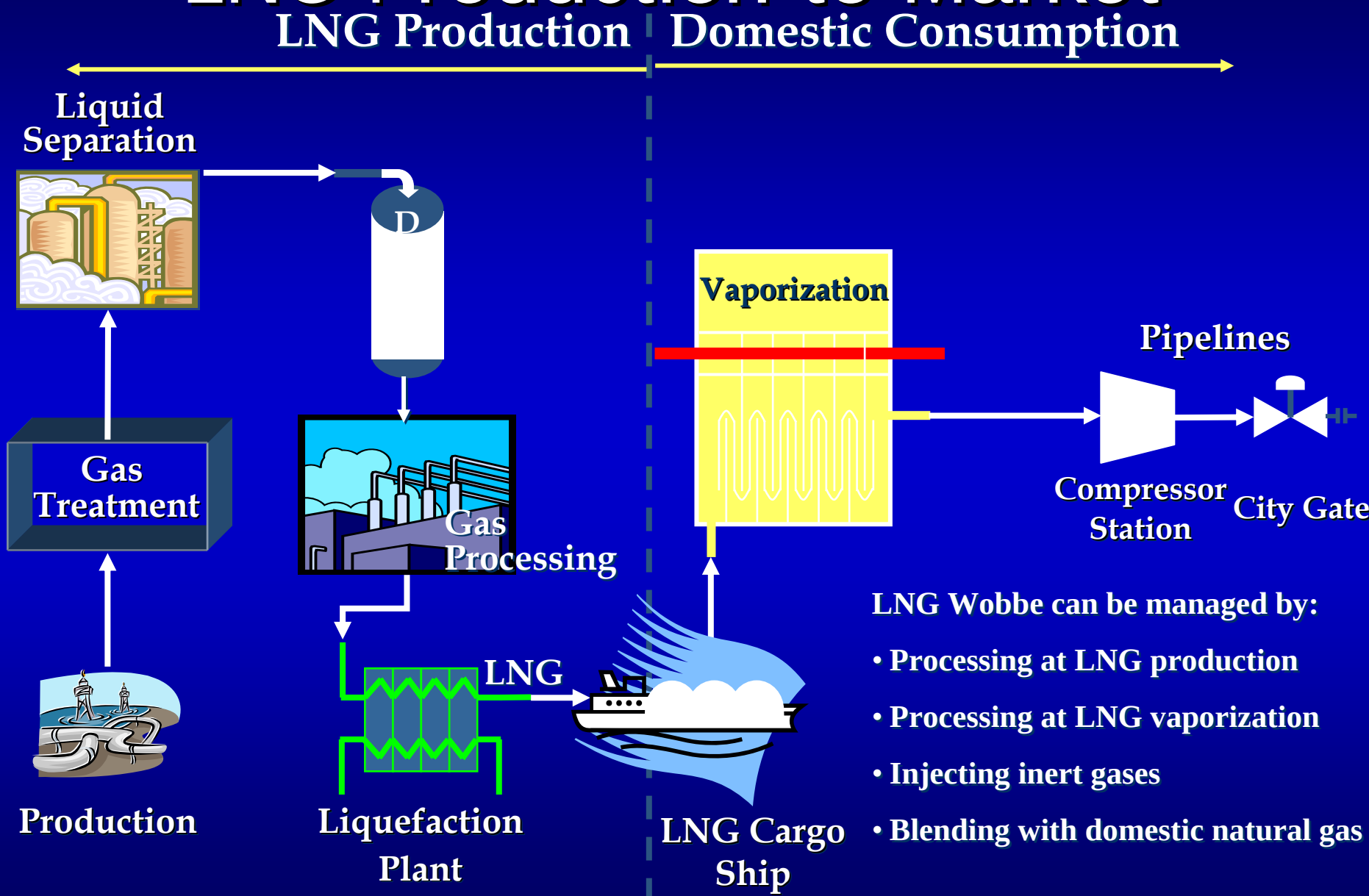
- Incorporate firmness of fuel supplies and transportation into power generation capacity payments
- Incorporate firmness of fuel supplies and transportation into electric reliability rules
- Allowing ISO/RTO's or states to contract gas pipeline and storage capacity for reliability benefits

Other Options: Federal and State Aid to Financing

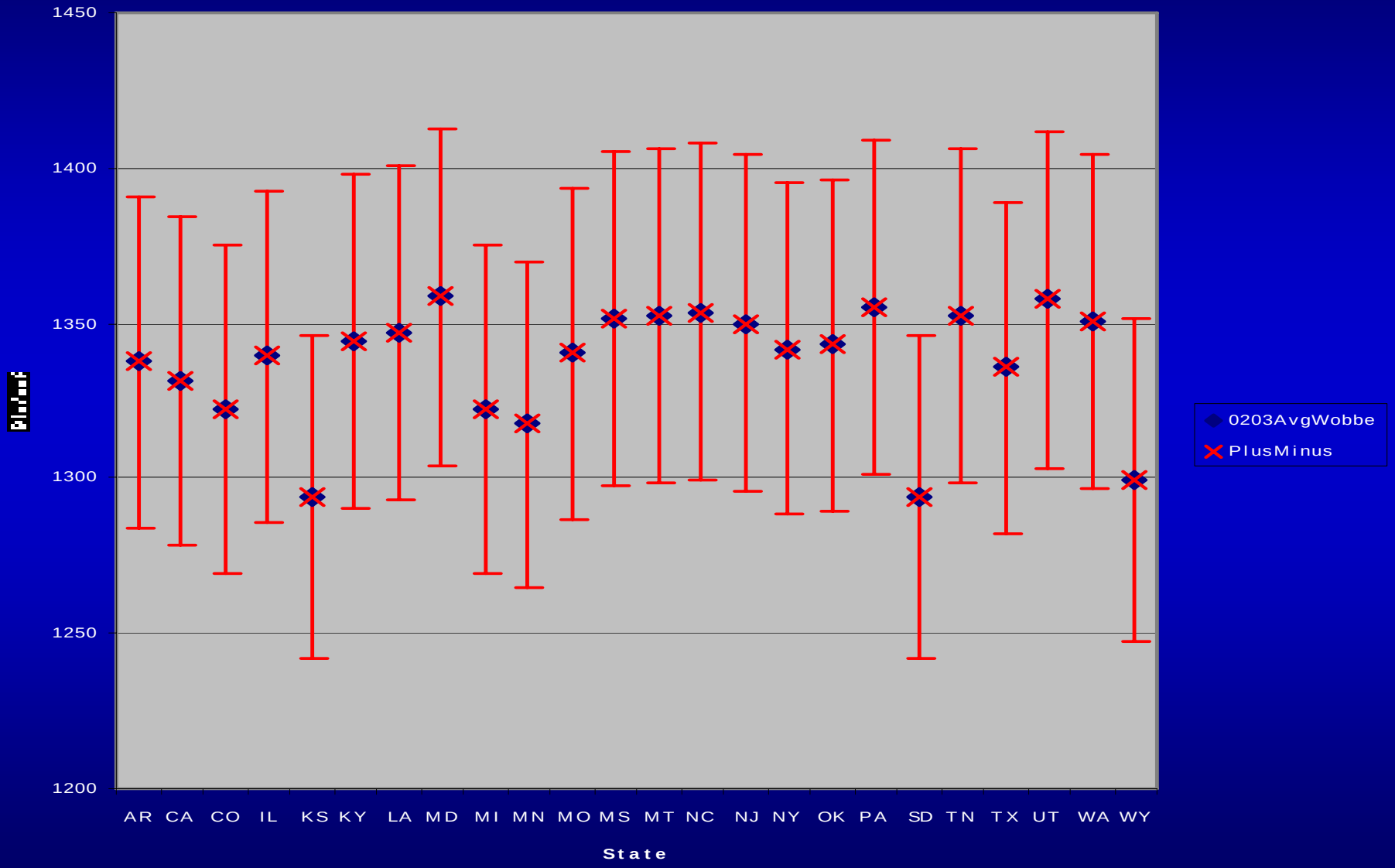
- Offer flexible loan guarantees to large, high-risk projects
- Provide tax certainty and incentives
- Contract directly for capacity for royalty gas or for reliability benefits
- Continue loans and loan guarantees for LNG development projects through Ex-Im Bank, OPIC, MIGA and similar agencies

LNG, an International Solution.....

LNG Production to Market



Natural Gas Varies Throughout the United States



Average Wobbe +-4% using 2002-2003 Partial LDC Data

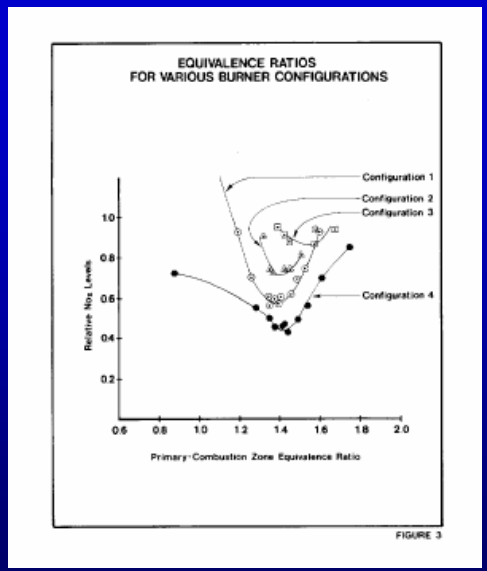
Gas Interchangeability Concerns

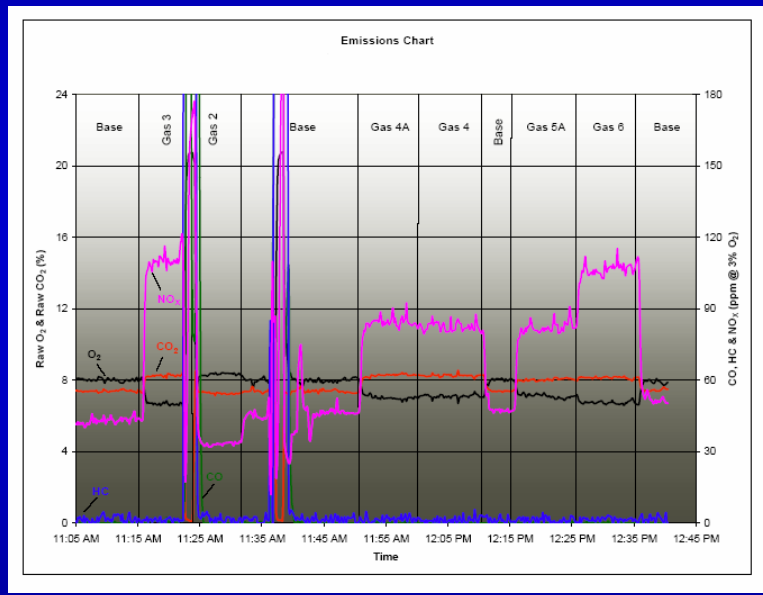
Equipment

- Efficiency
- Environmental Performance
- Maintenance
- Longevity

- Natural Gas Supply Cost
- Fungibility of Natural Gas Transportation Market

New high efficiency, low emission natural gas uses are sensitive to gas composition





Pictures and Diagrams courtesy John Zink Co. LLC & Sempra

Gas Supply Investment: LNG

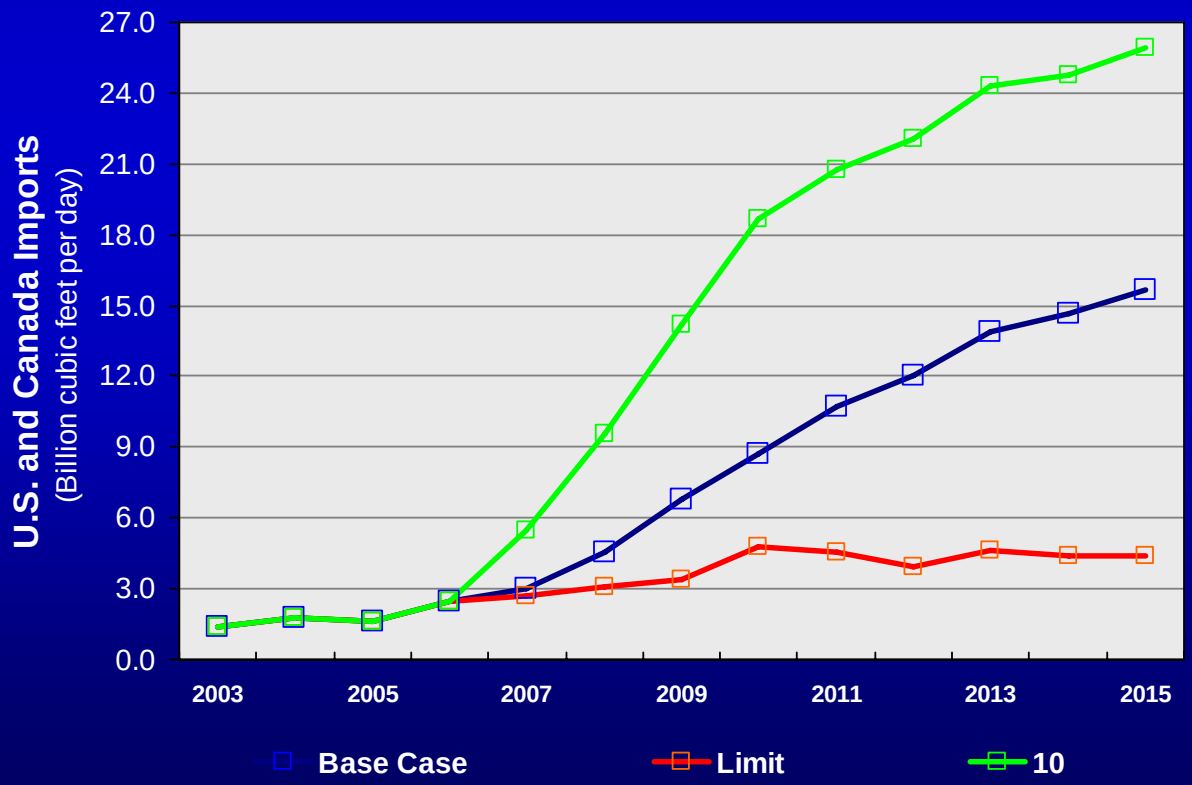
- Approximately 14 additional terminals will need to be constructed: 1 more East Coast terminal, 9 Gulf Coast terminals, 1 terminal on the West Coast and 3 Canadian terminals
- Full LNG value chain for new terminals and expansions will cost over $100 billion, including shipping, liquefaction and upstream

Example Capital Costs for a 1 Bcfd LNG Project

	Million Dollars			
	Lower End		Upper End	Approx. Percent
Upstream	1,400	-	2,900	38%
Liquefaction Plant	1,400	-	2,500	35%
Ships	500	-	1,800	20%
Receipt Terminal & Storage	150	-	600	7%
Total	3,450		7,800	100%

LNG Imports - A Wildcard

- LNG imports will likely become the most important determinant of market conditions in the next 10 years.
- Many different scenarios are possible:
  - LNG Supply to U.S. is limited by demand growth elsewhere.
  - Base Case - Approximately 16 Bcfd of imports by 2015.
  - 10 Bcfd of LNG added to the Base Case by 2015.



Courtesy of EEA

Key Conclusions

- Prices will be high this winter, but there will be delivered gas.... if repair work is on schedule, it is a reasonable winter and the market and government acts rationally
- U.S. and Canadian gas infrastructure investments for pipeline, storage and LNG terminals will cost $60 billion by 2020 are needed
  - To provide outlet for new supply sources
  - To ensure continued service on traditional corridors
  - To integrate new gas consumers to grid
- Long-term contracts are one important way of managing risks to all participants in pipeline and storage facilities and LNG terminals
- LNG is needed to satisfy demand, diversify supply, reduce prices and dampen volatility