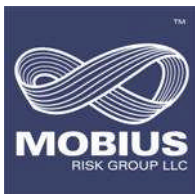


Energy Challenges Facing the US Manufacturing Industry

Martyn Harsley
Vice President, Mobius Risk Group LLC

BMI Management Conference

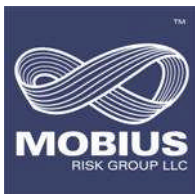
May 2, 2006



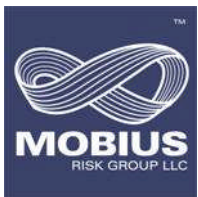
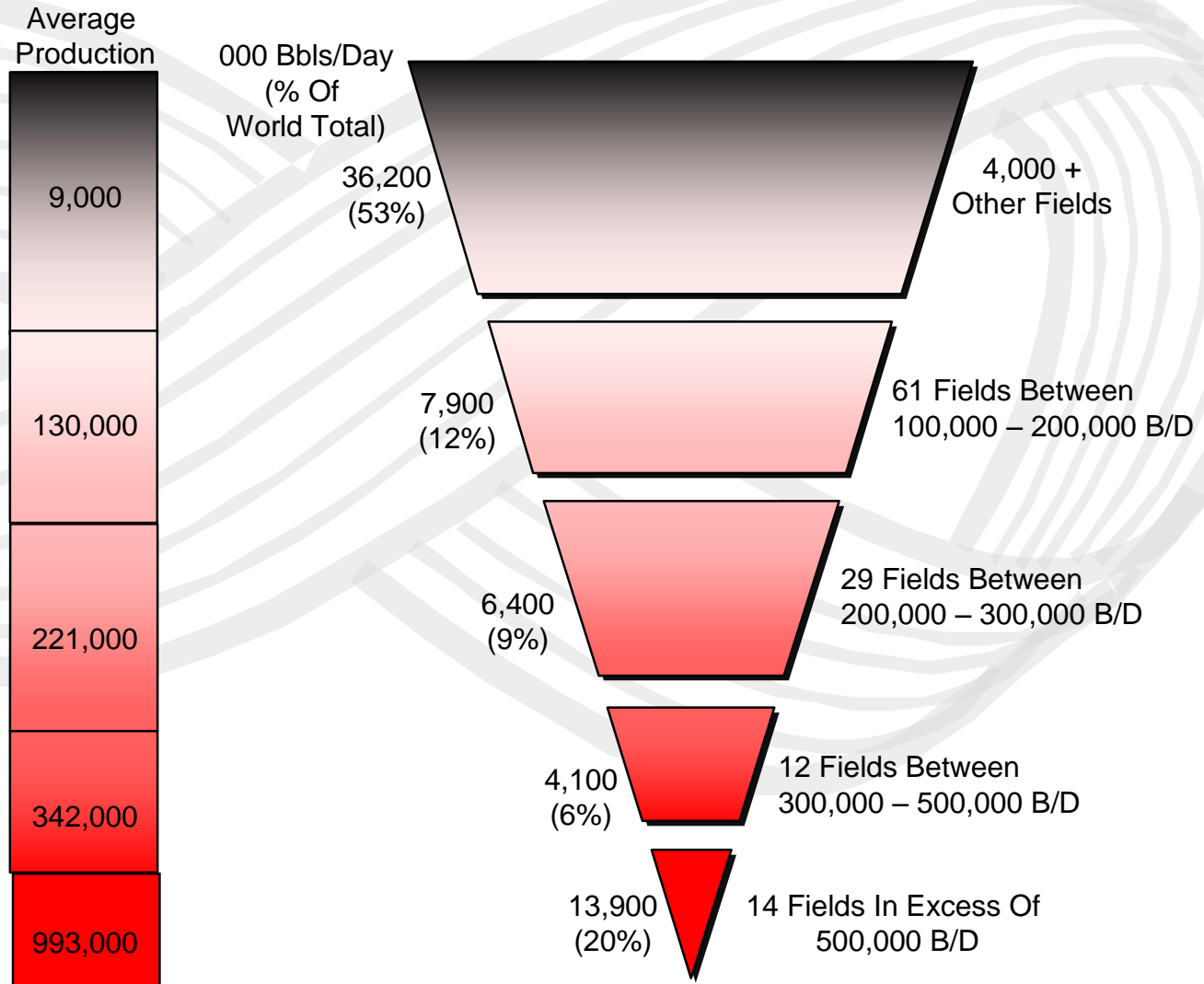


Agenda

- Global and US Energy Market Overview
- Energy Strategies for US Manufacturers
- About Mobius Risk Group

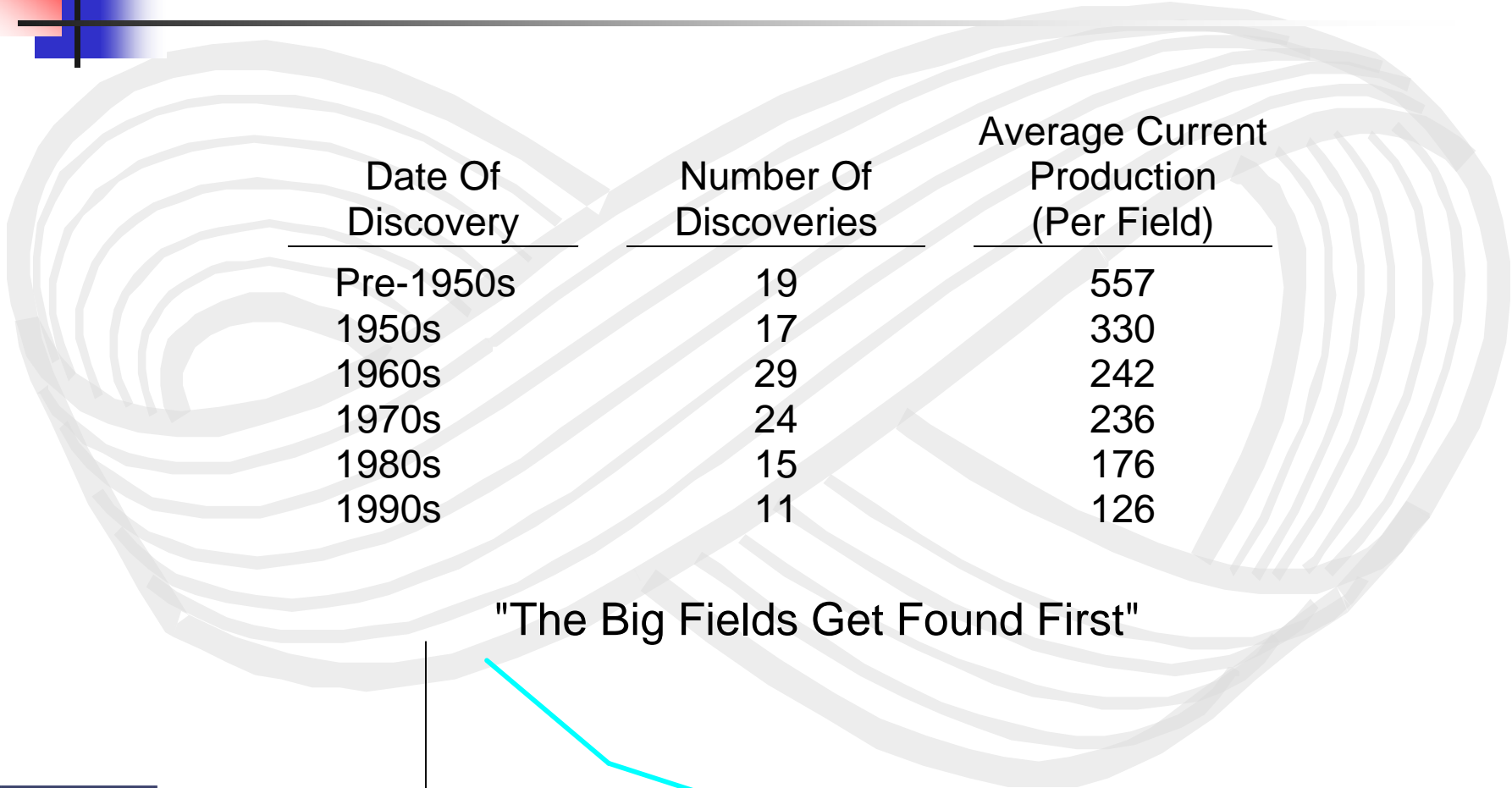


Global Crude Oil Supply Profile



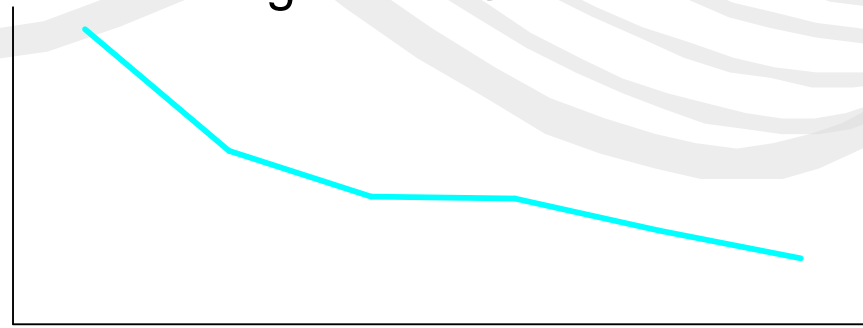


The Elephant in the Haystack



<u>Date Of Discovery</u>	<u>Number Of Discoveries</u>	<u>Average Current Production (Per Field)</u>
Pre-1950s	19	557
1950s	17	330
1960s	29	242
1970s	24	236
1980s	15	176
1990s	11	126

"The Big Fields Get Found First"





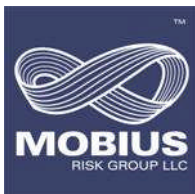
Kuwait's Burgan Oil Field

It was an incredible revelation last week that the second largest oil field in the world is exhausted and past its peak output. Yet that is what the Kuwait Oil Company revealed about its Burgan field.

The peak output of the Burgan oil field will now be around 1.7 million barrels per day, and not the two million barrels per day forecast for the rest of the field's 30 to 40 years of life, Chairman Farouk Al Zanki told Bloomberg.

He said that engineers had tried to maintain 1.9 million barrels per day but that 1.7 million is the optimum rate. Kuwait will now spend some \$3 billion a year for the next year to boost output and exports from other fields.

However, it is surely a landmark moment when the world's second largest oil field begins to run dry. For Burgan has been pumping oil for almost 60 years and accounts for more than half of Kuwait's proven oil reserves. This is also not what forecasters are currently assuming.



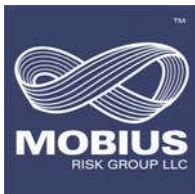
Source: Middle East Finance and Economy – Nov 12th, 2005



Some Saudi Arabia Energy Facts

- Five old super giant fields have produced approx 90% of it's oil
- Three other giant fields make up most of the balance
- All their producing fields are mature, have depleted their highest quality oil and face serious water maintenance and corrosion problems
- All "new projects" are complex oil structures that "never worked" in 1970's era
- 35 years of intense exploration found little new oil

Source: Simmons and Company International



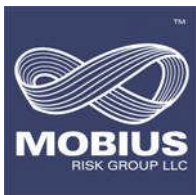
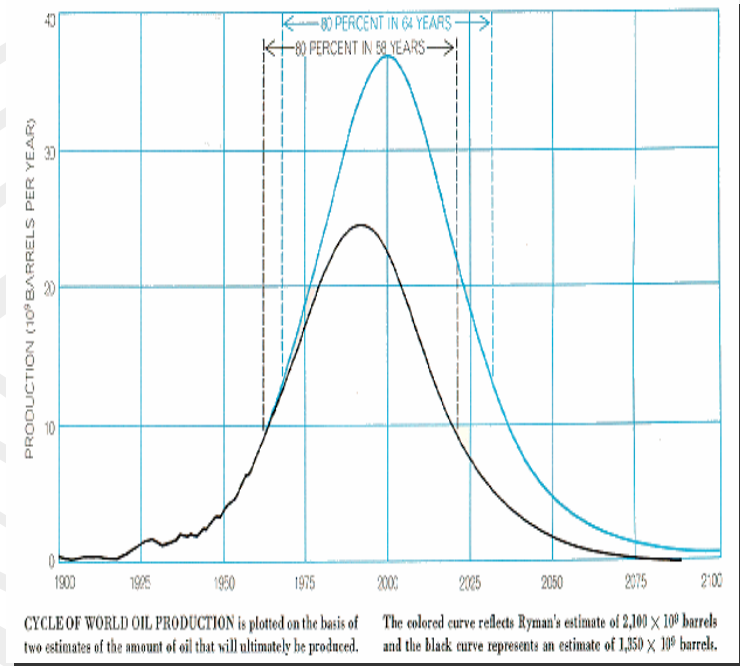
Peak Oil Phenomenon

Dr. King Hubbert predicted in 1956 that U.S. oil production would peak in about 1970 and decline thereafter

U.S. peaked in 1972 at 11,185,000 bpd

Geologists using same methods estimate world production peak between 2000 and 2012

Sources: Simmons & Company International & Hubbert's Peak





Crude Oil Demand Trends

Crude Oil Demand (Millions of bbl/day)

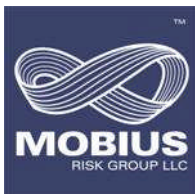
	<u>1995</u>	<u>2004</u>
United States	17.72	20.73
Europe	14.16	15.21
S. Korea	2.01	2.15
China	3.36	6.52

Population (Millions)

	<u>1995</u>	<u>2004</u>
United States	262.8	293.6
Europe	469.6	488.7
S. Korea	45.04	47.97
China	1219.4	1313.5

Crude Oil Demand per Capita per Year

	<u>1995</u>	<u>2004</u>
United States	24.61	25.77
Europe	11.01	11.36
S. Korea	16.29	16.36
China	1.01	1.81





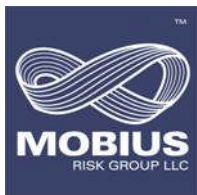
China – The World's Fastest Growing Auto Market

- 2003: Over 2 million cars sold (80% increase over 2002)
- 2005: 2.8 million cars sold (24% increase over 2004)

"The strong passenger vehicle sales in 2005 mainly resulted from booming demand in China's second and third-tier cities," said Xu Changming, an auto industry analyst with the State Information Centre.

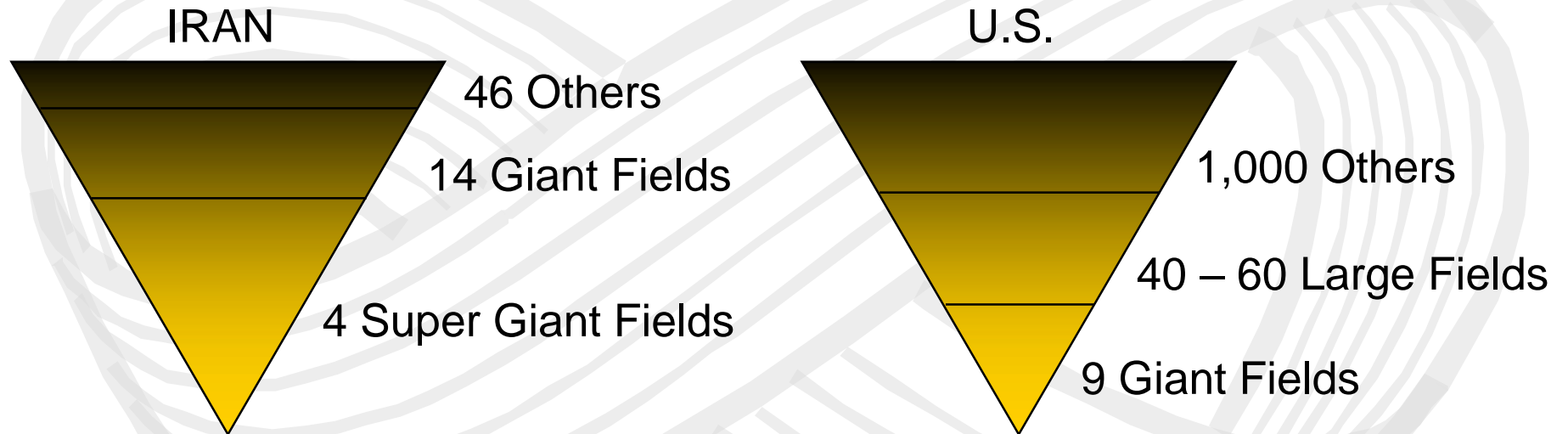
Crude Oil Demand Trends (Cont'd)

- World Bank and Exxon Mobil both forecast:
 - Growth in oil demand by 2020 – 2030 to between 115 and 125 million bbl/day (150% of current global production)
- BP estimates that at the current global growth rate, we will need:
 - An additional 7.25 million bpd of production to meet demand in 2007
 - 39 million bpd by 2010 with current 4.8% depletion rate
- China and India alone will need:
 - An additional 13 million bpd by 2010 at 15% per year demand increase (rate that Japanese demand grew between 1965 and 1973)
- If China and India:
 - Increase their per-capita consumption to the level of South Korea (only 60% of U.S.)
 - Demand in these two countries alone reaches 119 million bpd (150% of current global production)

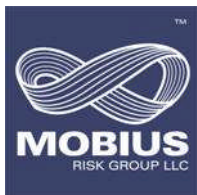


Natural Gas

Most Producers have Pyramid Supply Characteristics

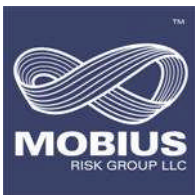
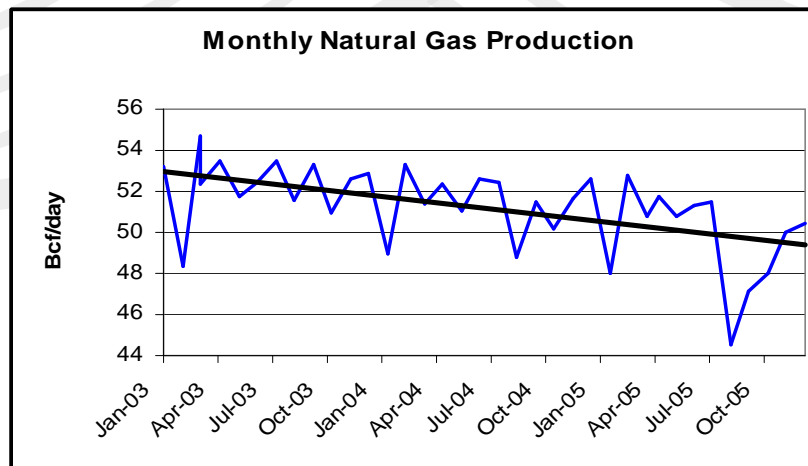
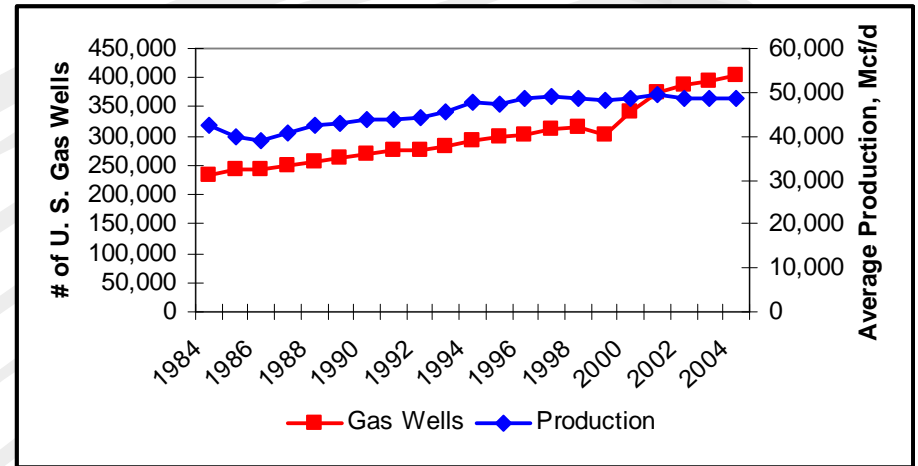
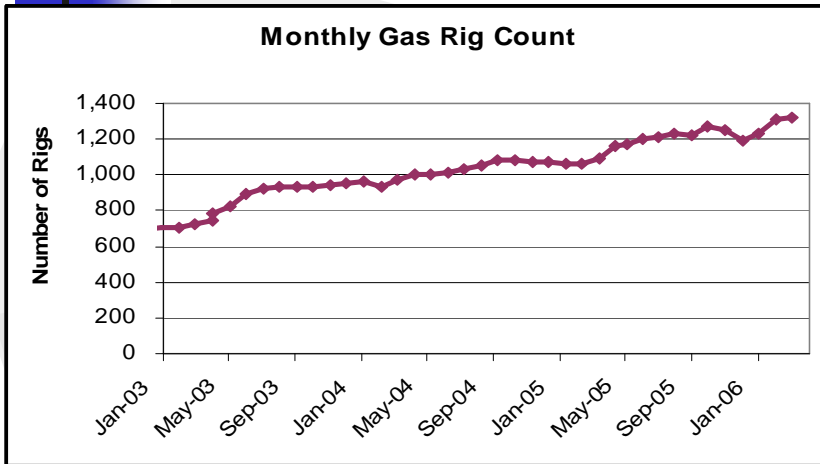


Key take away: Production is highly concentrated in a small number of fields, and those fields are depleting



Source: Dr. A.M.S. Bakhitari, NOIC February 2002.

U.S. Gas Well Productivity has Declined Despite High Exploration Activity (Faster Decline than Oil)



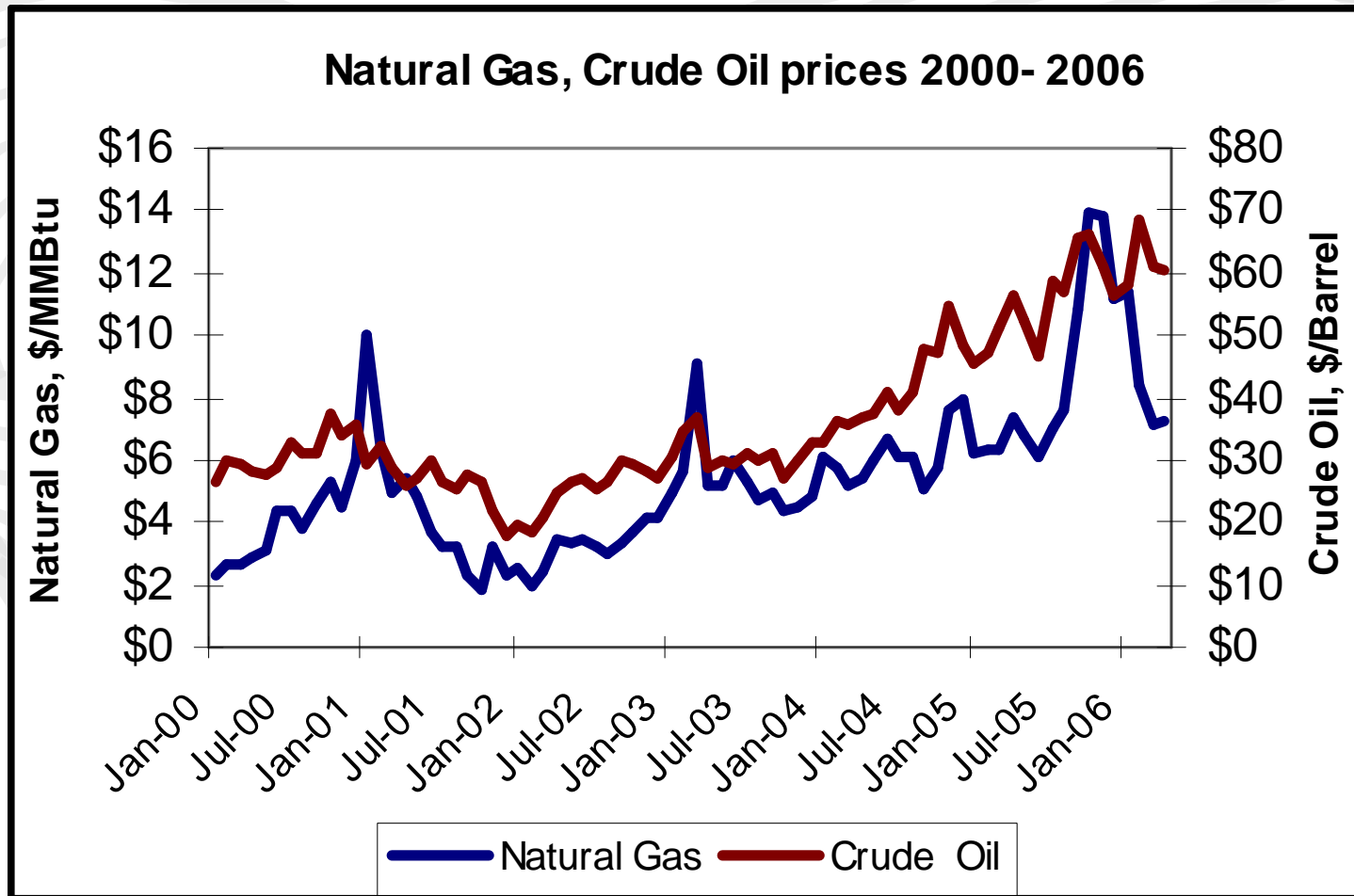
Source: EIA, Baker Hughes



What Does this All Mean?

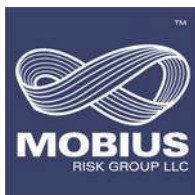
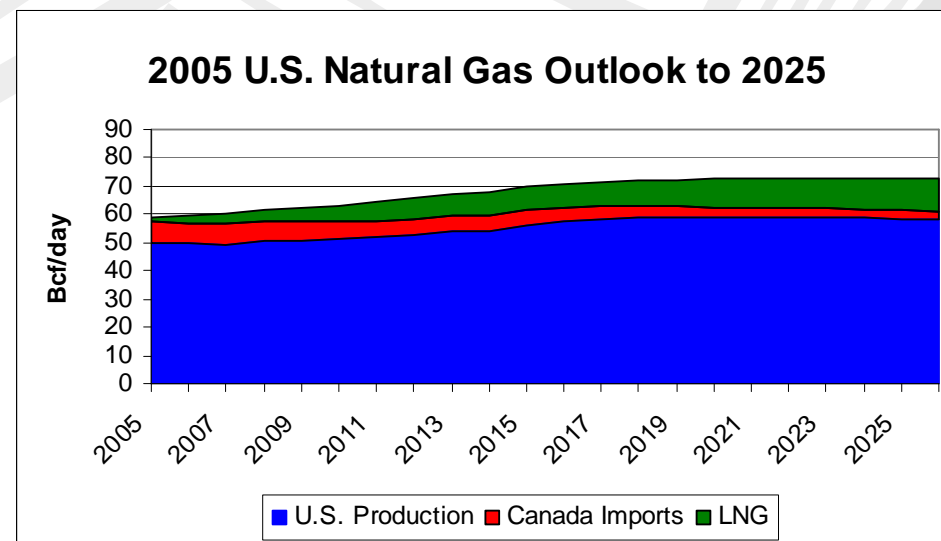
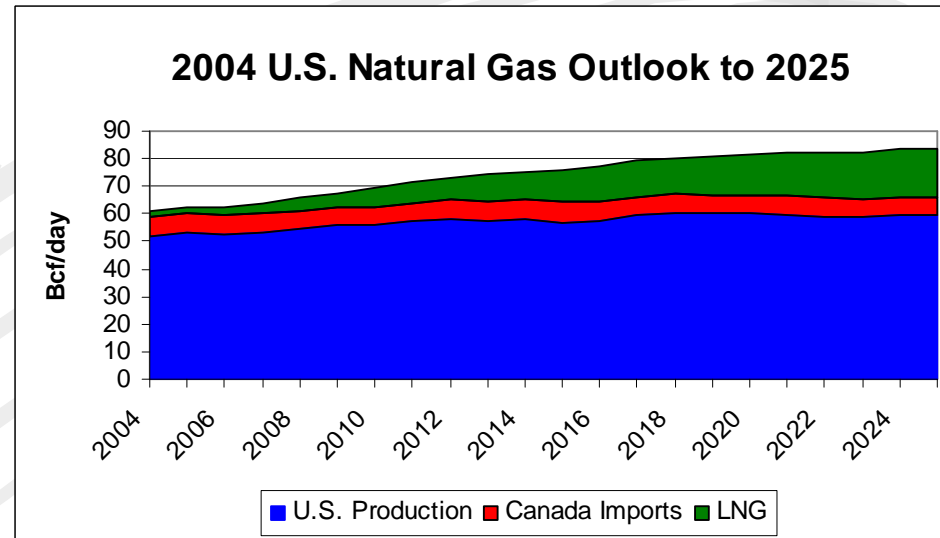
- Significantly tighter supply/demand dynamics
- We have entered a new energy price regime
- High energy prices and volatility are not a short term phenomenon
- We will continue to experience price spikes
- High price volatility and price spikes have masked this phenomenon
 - A significant following believe(d) high prices were anomalies and would revert to “normal” levels

Supporting Evidence



U.S. Rethinks Natural Gas

- High prices
- Declining growth rate in industrial & manufacturing sectors
- EPCA2005 conservation measures
- U. S. production growth is slow
- Canadian imports decline
- Growth in total U.S. supply coming from LNG

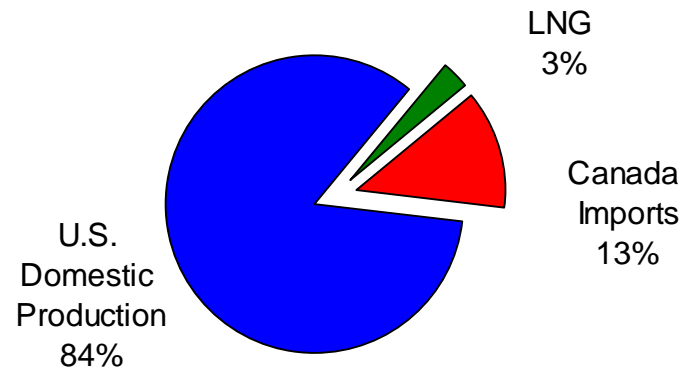


Source: EIA

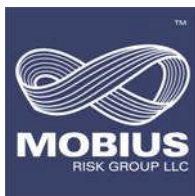
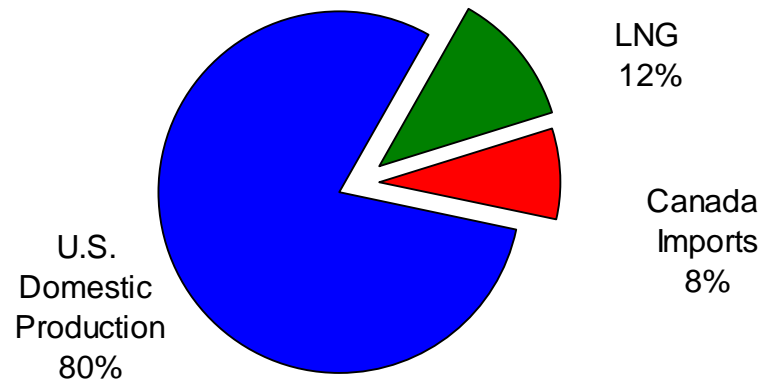
LNG's Growing Role for U.S. Gas Supply

- LNG role set to grow from current 3%
- LNG to supply 12% of U.S. requirements by 2015

U.S. Gas Supplies- 2005



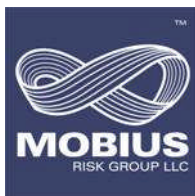
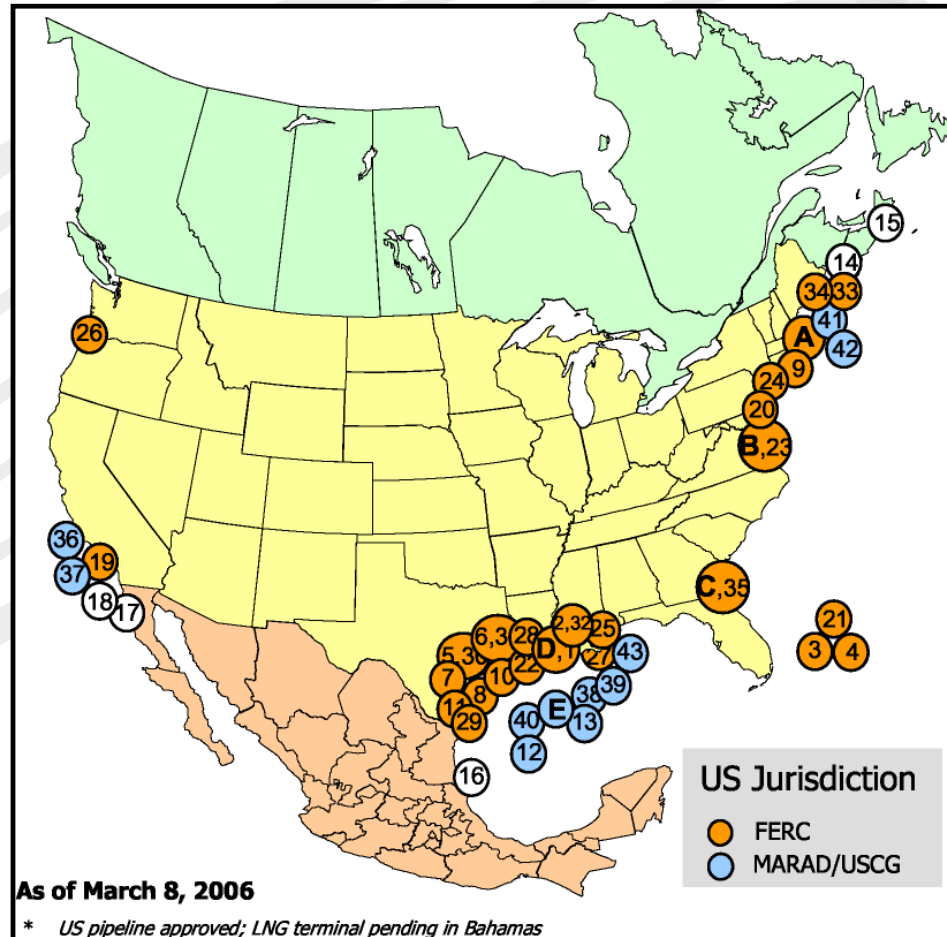
Projected U.S. Gas Supplies - 2015



Source: EIA

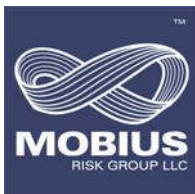
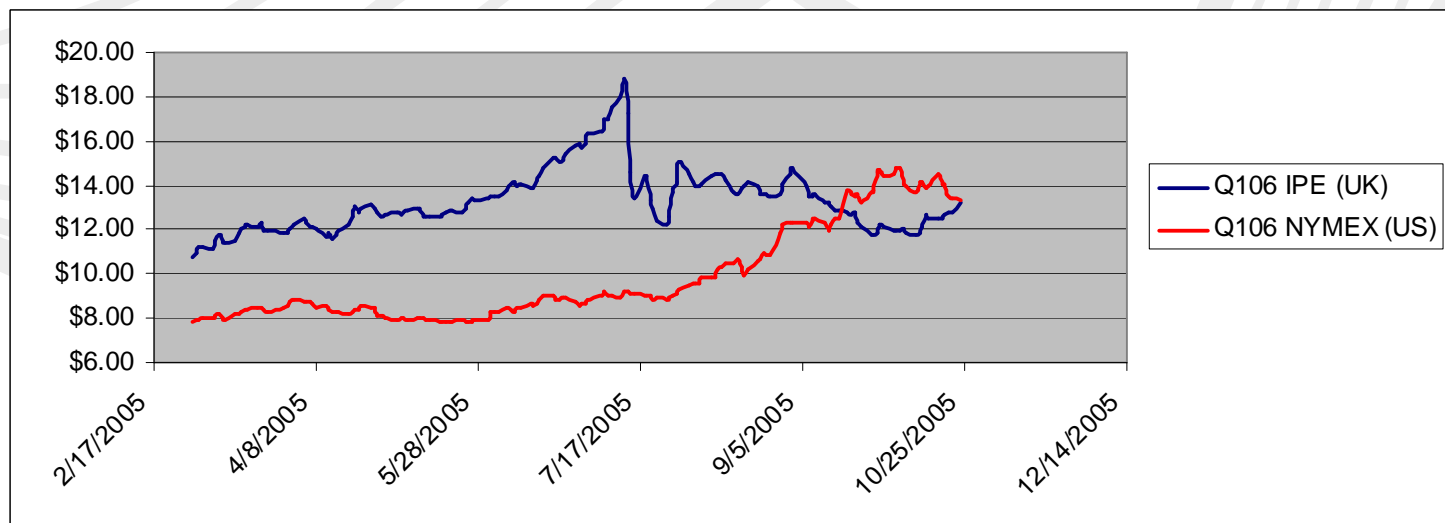
Proposed LNG Projects

- 5 existing import facilities
- 13 projects approved in U.S.
- 2 Canadian projects approved
- 3 Mexico projects approved
- 25 proposed projects for U.S.
- 18 more potential projects for U.S.



LNG (The Marginal Unit)

- Will expose the U.S. to a global natural gas market
 - Proximity to liquefaction terminals
 - Competing gas prices e.g. International Petroleum Exchange (IPE) in U.K.
 - Currency fluctuations and revaluations





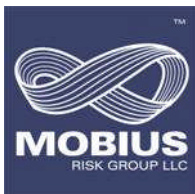
U.S. Natural Gas Demand by Season

Consumption of Natural Gas in Billions of Cubic Feet per Day

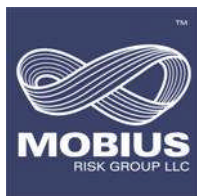
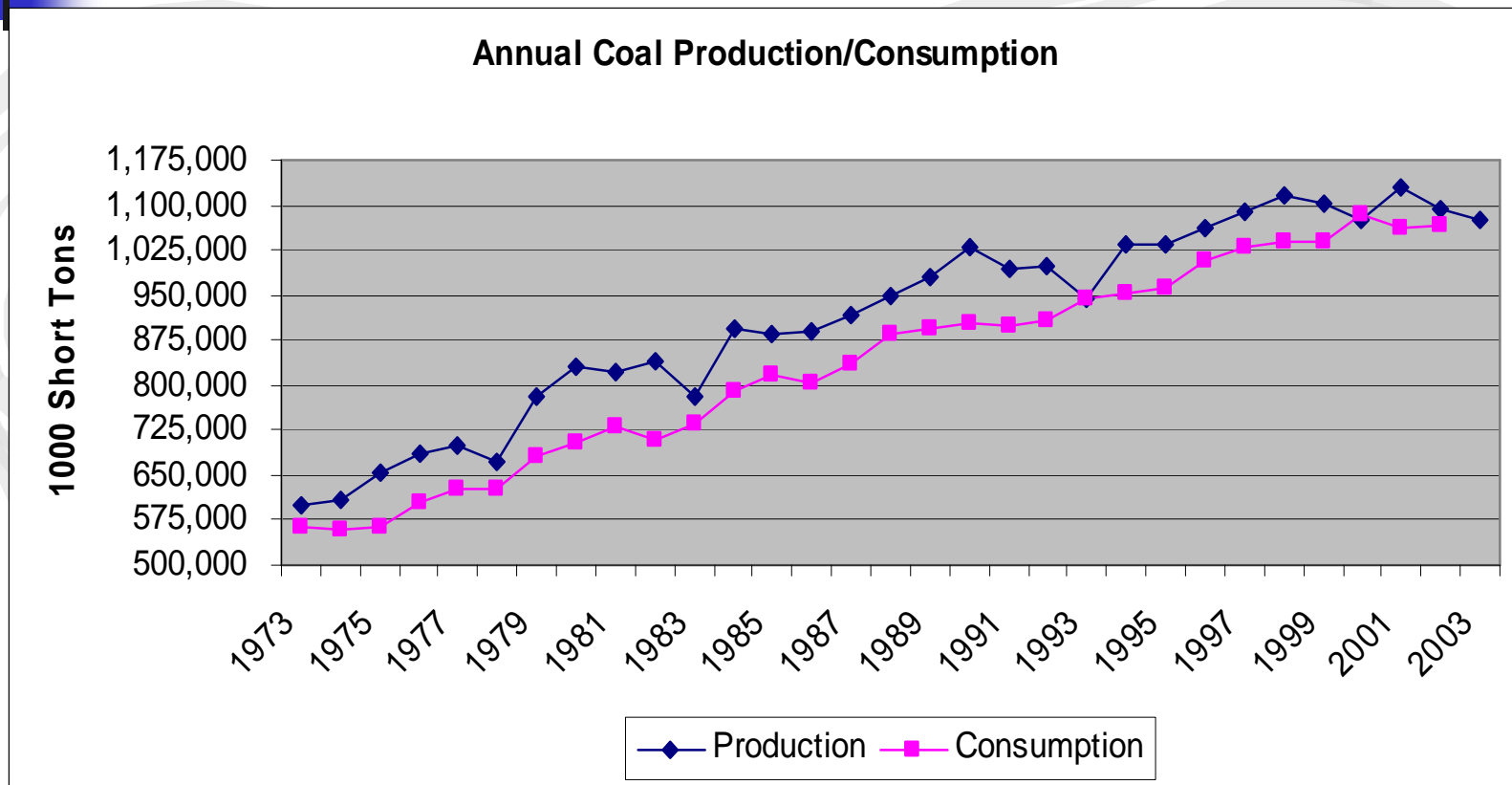
	<u>Residential</u>	<u>Commerical</u>	<u>Industrial</u>	<u>Generation</u>	<u>Total</u>
Jul-05	5.0	4.3	17.4	25.2	51.9
Jan-06	23.5	13.3	18.7	10.1	65.6
Feb-06	23.1	13.1	18.0	9.7	63.9

Consumption of Natural Gas as Percent of Total

	<u>Residential</u>	<u>Commerical</u>	<u>Industrial</u>	<u>Generation</u>	<u>Total</u>
Jul-05	10%	8%	34%	49%	100%
Jan-06	36%	20%	29%	15%	100%
Feb-06	36%	21%	28%	15%	100%



U.S. The Saudi Arabia of Coal

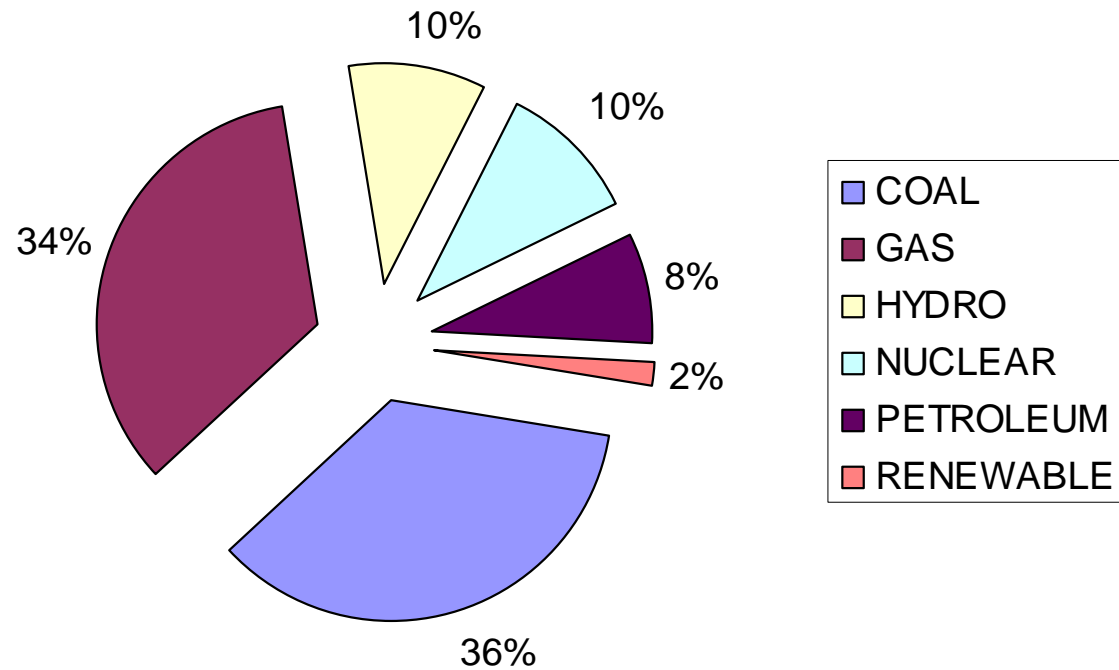


Delivery is subject to constraints of rail and shipping

High priced scrubbing technology (2005 Energy Act is providing relief)

Fuels for U.S. Power Generation

U.S. Generation Stack By Fuel Type



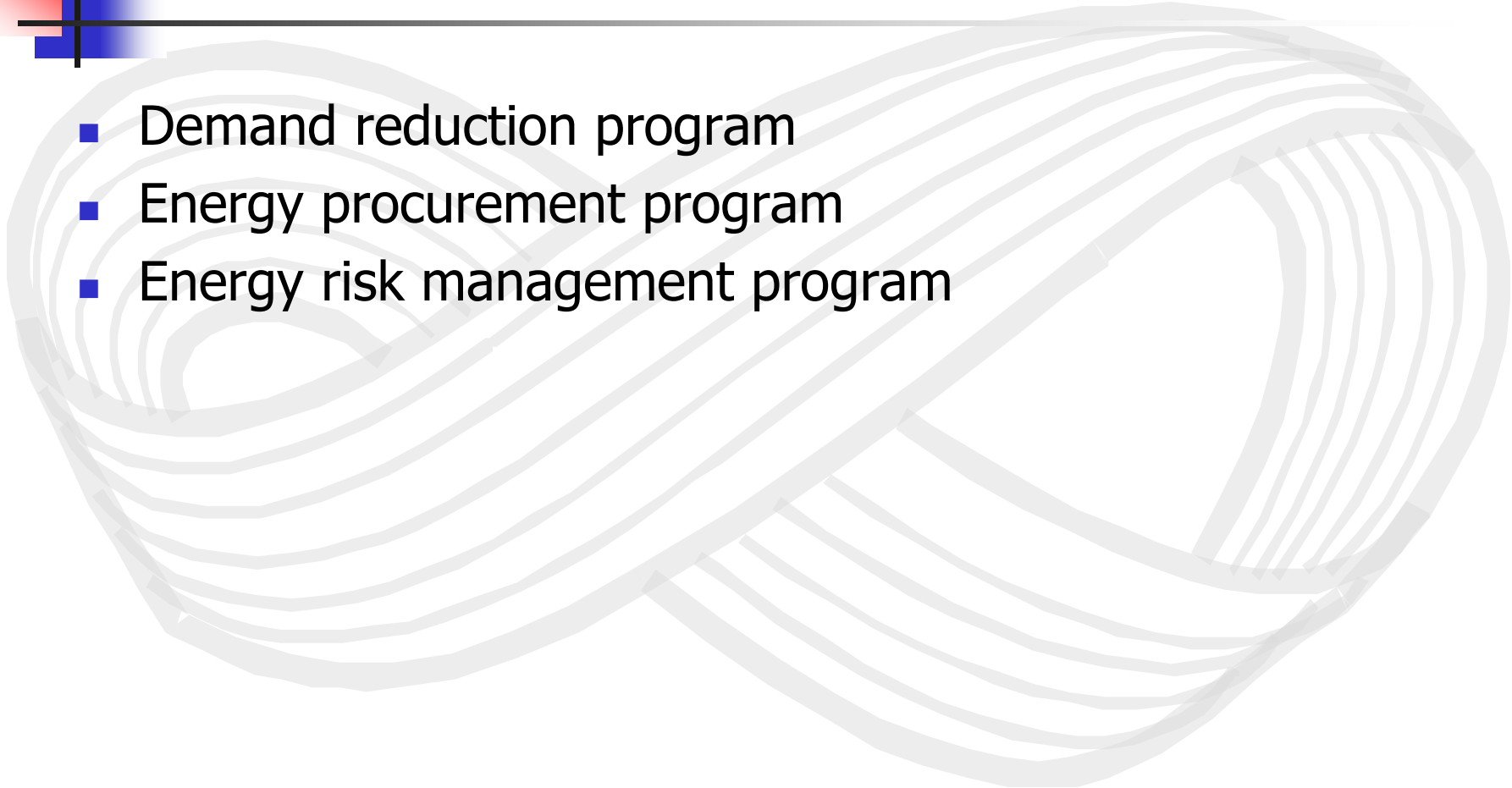


Conclusions

- No silver bullet
- Reduce dependence on gas-fired power generation
- Nuclear?
- Efficiency/demand Reduction
- Step change in technology
- Legislative relief (2005 Energy Act is a good start)



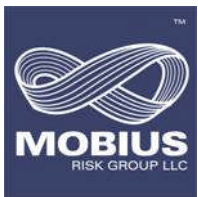
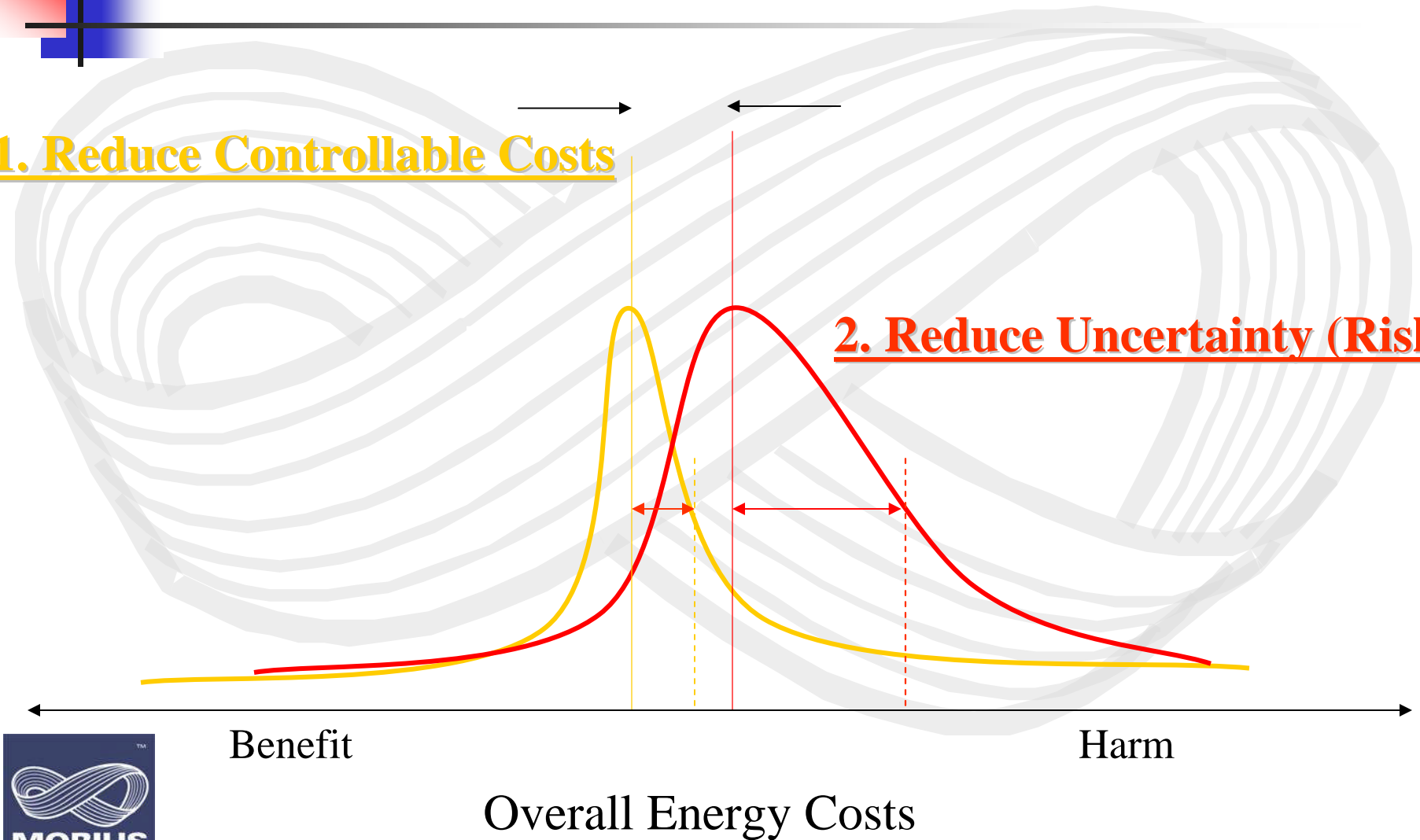
Key Elements of a Successful Energy Strategy

- 
- Demand reduction program
 - Energy procurement program
 - Energy risk management program

Objectives of an Energy Strategy

1. Reduce Controllable Costs

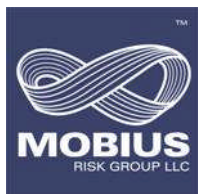
2. Reduce Uncertainty (Risk)



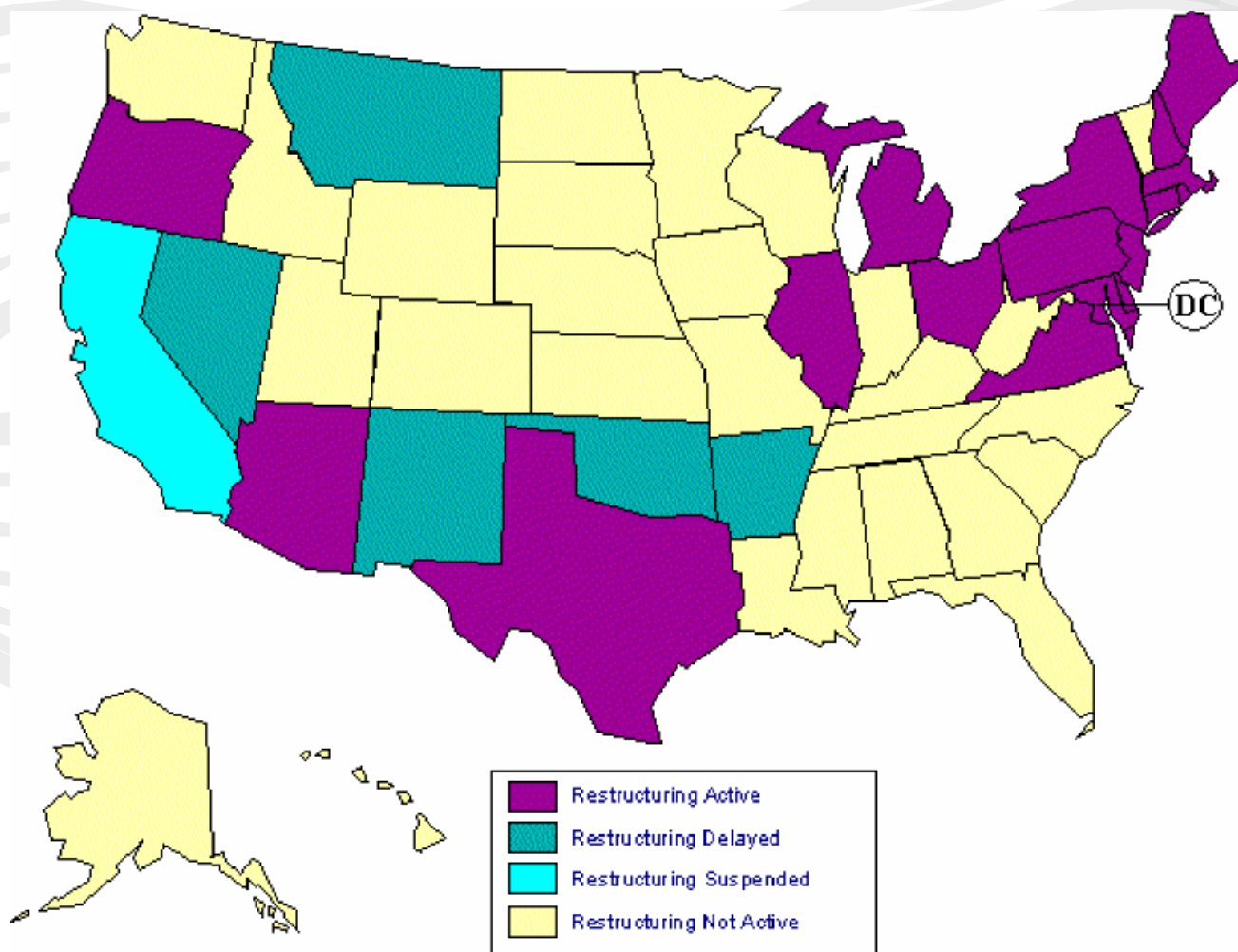


Demand Reduction/Efficiencies

- Invoke a sustainable program versus initiatives or projects
- Ascertain a clear understanding of current energy consumption
 - Translate power, gas usage e.t.c. into common units
 - Steam and compressed air systems often yield low hanging fruit in the paper industry
- Establish benchmarking process and stretch goals for usage and efficiencies
- Develop policies that encourage energy efficiencies in future capital improvement projects
- Communicate and share initiatives with other locations
- Up to \$1.80 per ft² tax deductions for cost of new energy efficient equipment in commercial buildings
 - 2005 Energy Act
 - In effect Jan 1, 2006 to December 31, 2007



U.S. Electric Industry Restructuring Status



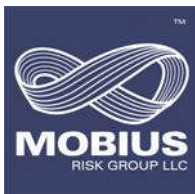
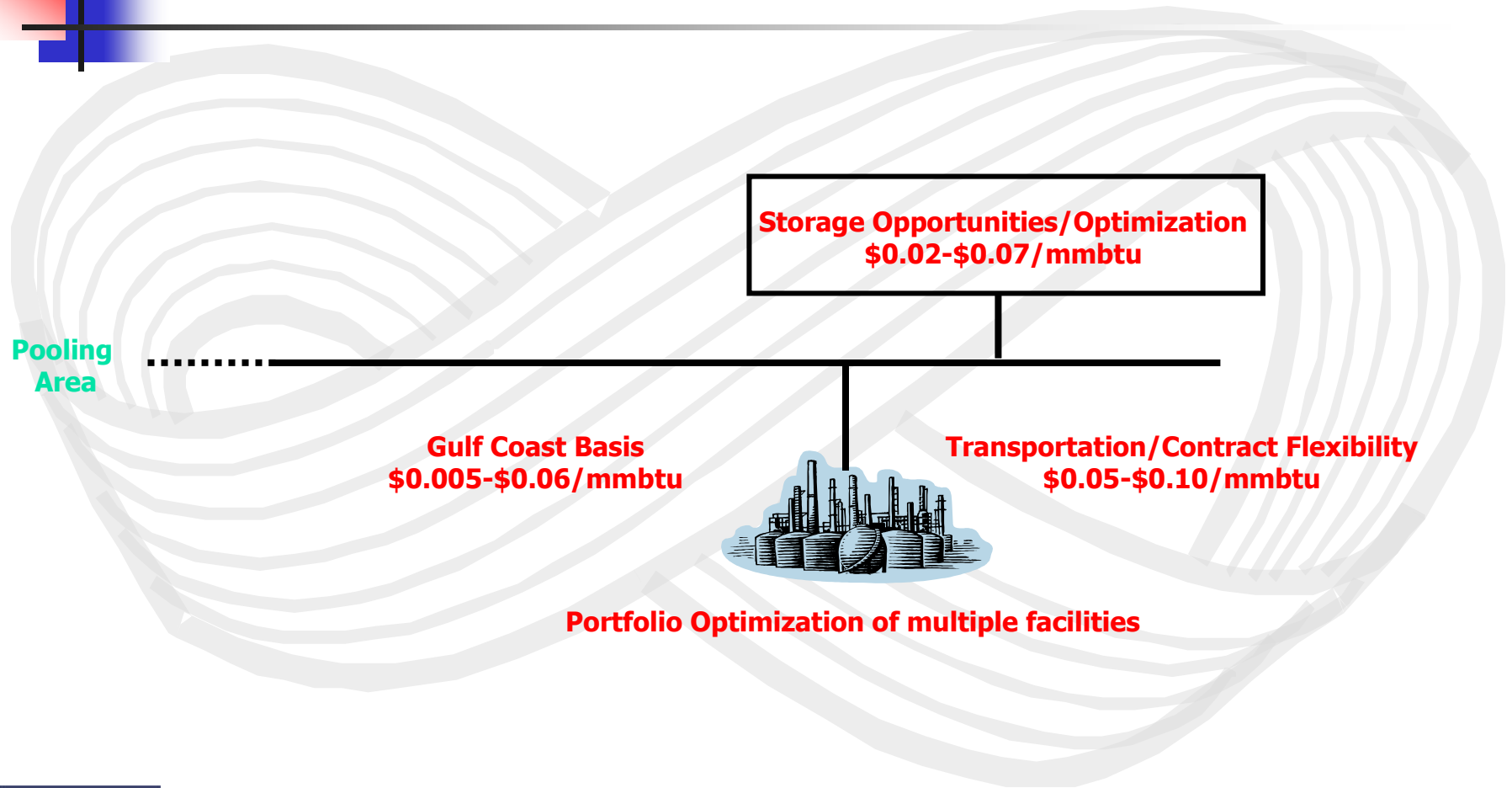
Source: EIA



Power Procurement Issues and Opportunities

- Consider portfolio management products (e.g. heat rate, power blocks) to manage risk
 - Versus fixing 100% of price at one time
 - TX, NJ and Northeast Markets
- Illinois is unfreezing utility rates after 10 years effective Jan 07
- Good opportunities in Maryland if passed by legislature

Example of Natural Gas Unbundling Opportunities





Energy Risk Management To Hedge or not to Hedge?

- Hedging strategy of forest product companies (response to analysts questions on Q405 earnings calls)
 - Company A – 30% Hedged
 - Company B – 70% Hedged
 - Company C – 50% Hedged
 - Company D – 0% Hedged (seen as adding to costs)
- Key questions is: what is company's exposure to energy price volatility?
 - Can this exposure have material impact?
 - Can price increases be passed through?



Exposure to Energy Price Volatility can be Measured (Value at Risk)

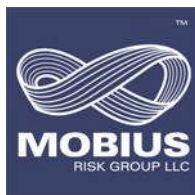
- Standard metric in the energy industry
- Promotes analytical versus emotional approach
- For 13,000 mmbtu/day consumption of natural gas
 - Q3 2006 costs at current market of \$8.25 million
 - 5% probability that Q3 2006 costs could increase by \$2.85 million or greater
- Assuming 5 mmbtu of natural gas required to make one ton of paper product
 - Q3 2006 costs at current market of \$35.30 per ton
 - 5% probability that Q3 2006 costs could increase by \$11.90 or greater per ton

Impact of Energy Price Volatility on Earnings

Q3 2006 Income Statement (in thousands)

	At Market	5% Case
Revenues	\$ 250,000	\$ 250,000
Cost of Goods Sold	\$ 213,000	\$ 215,850
Gross Margin	\$ 37,000	\$ 34,150
Depreciation	\$ 14,125	\$ 14,125
SG & A	\$ 15,000	\$ 15,000
Operating Expenses	\$ 29,125	\$ 29,125
Operating Income	\$ 7,875	\$ 5,025
Provision for Taxes	\$ 2,756	\$ 1,759
Earnings	\$ 5,119	\$ 3,266

Although natural gas costs are less than 4% of total costs, net earnings will be adversely impacted by 36% if the 5% scenario occurs





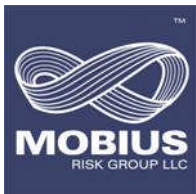
Risk Management Program

- Focus on risk
- Protect against price spikes and price increases
- Evaluate upside and downside price movement
- Exploit price pullbacks
- Have 12 month or greater time horizon (lower volatility in out months)
- Lock in costs, cash flows and budget certainty
- Don't try to time the market (risk additive)



Some Risk Management Tools and Techniques

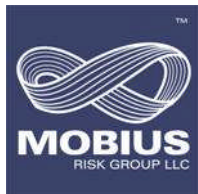
- Swap - Exchange floating price of gas for a fixed price for a fixed period of time in the future (price strip). Large intra-day and inter-day changes in strip prices
- Trailing Stop Loss Order – Set a maximum price trigger for gas and buy a swap if price reaches this maximum. If prices fall, adjust the maximum price trigger down by corresponding amount. This protects against runaway upward prices and “trails” falling prices
- Limit Order – Set floor price and buy a swap if prices reach this floor
- Execute only on a fraction of required volumes (layer) to further reduce risk by averaging prices. Execute multiple layers until exposure is within desired objective
- Options based tools to participate in downside price movements (less transparent than straight swaps)



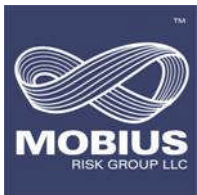
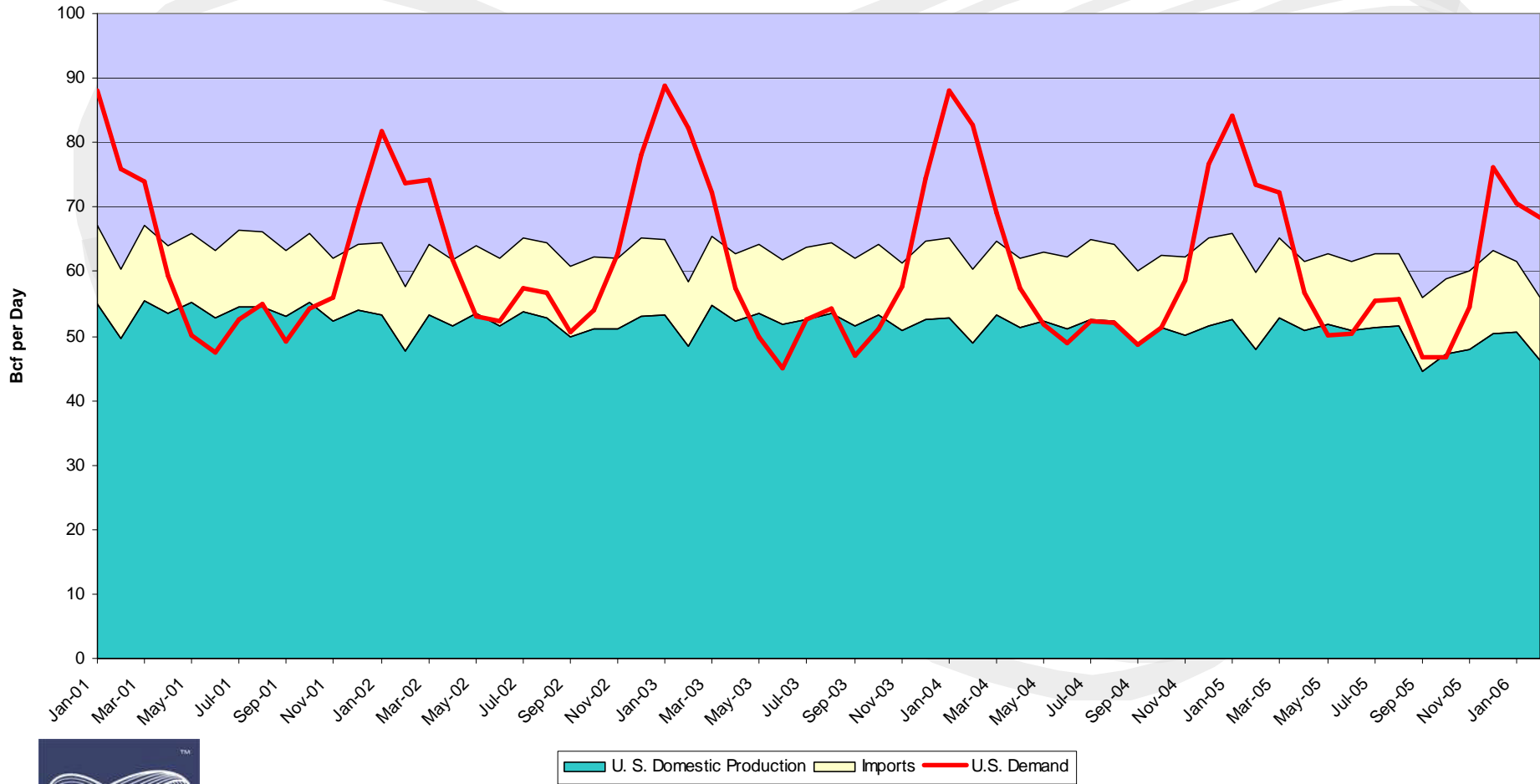


Some Factors Impacting U.S. Natural Gas Prices

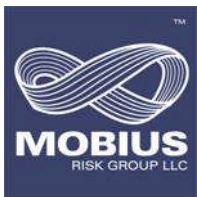
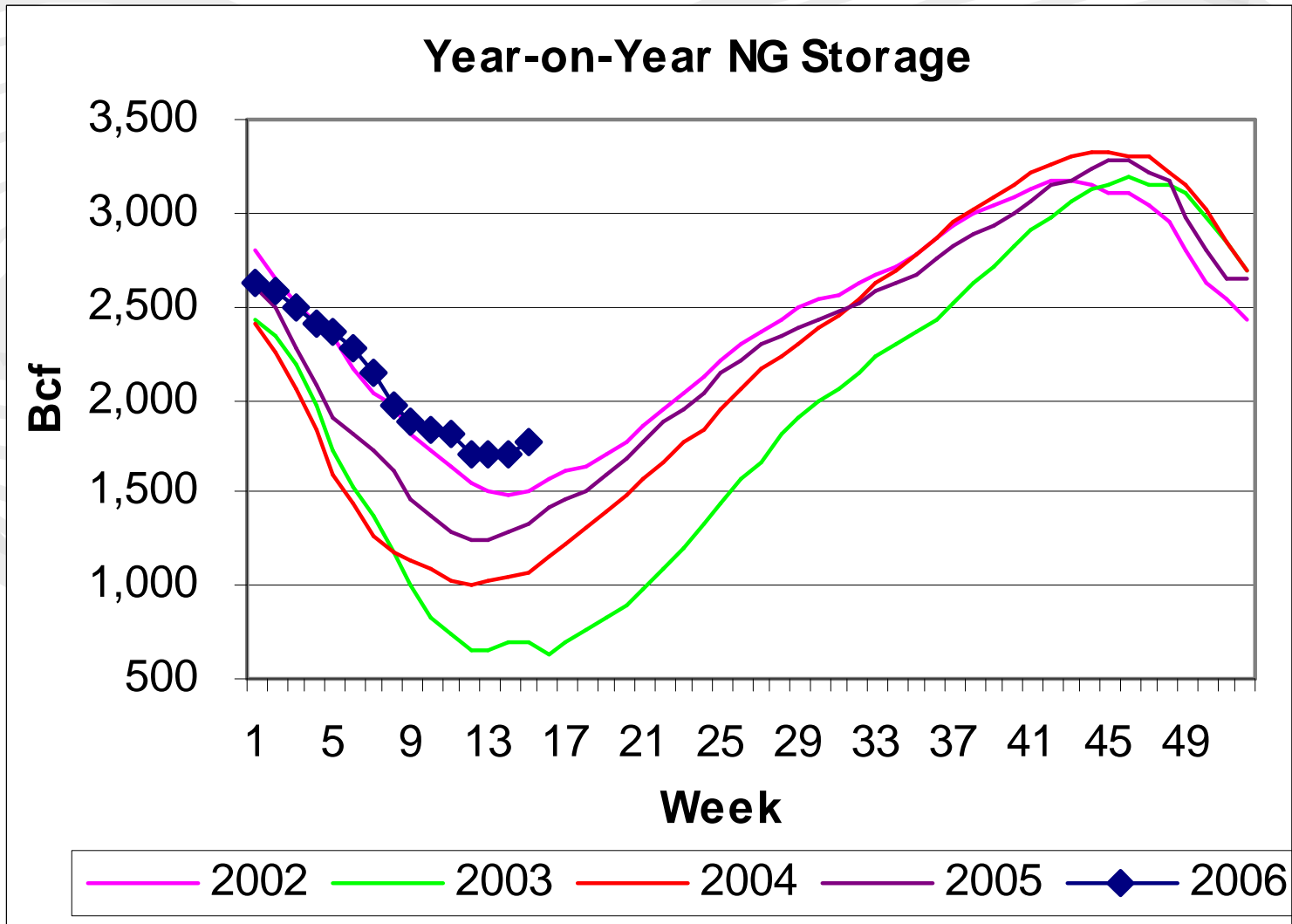
- Rig counts
- U.S. and global economy
- Weather
 - For heating and power generation
 - Hurricanes/storms can destroy supply or demand
- Gas in storage
 - Weekly injection/withdrawal reports
- Crude oil and refined products prices
 - Approximately 4 bcf/day of fuel switching between fuel oils and natural gas
- Nature of capital in the market



U.S. Natural Gas Supply Demand Relationship



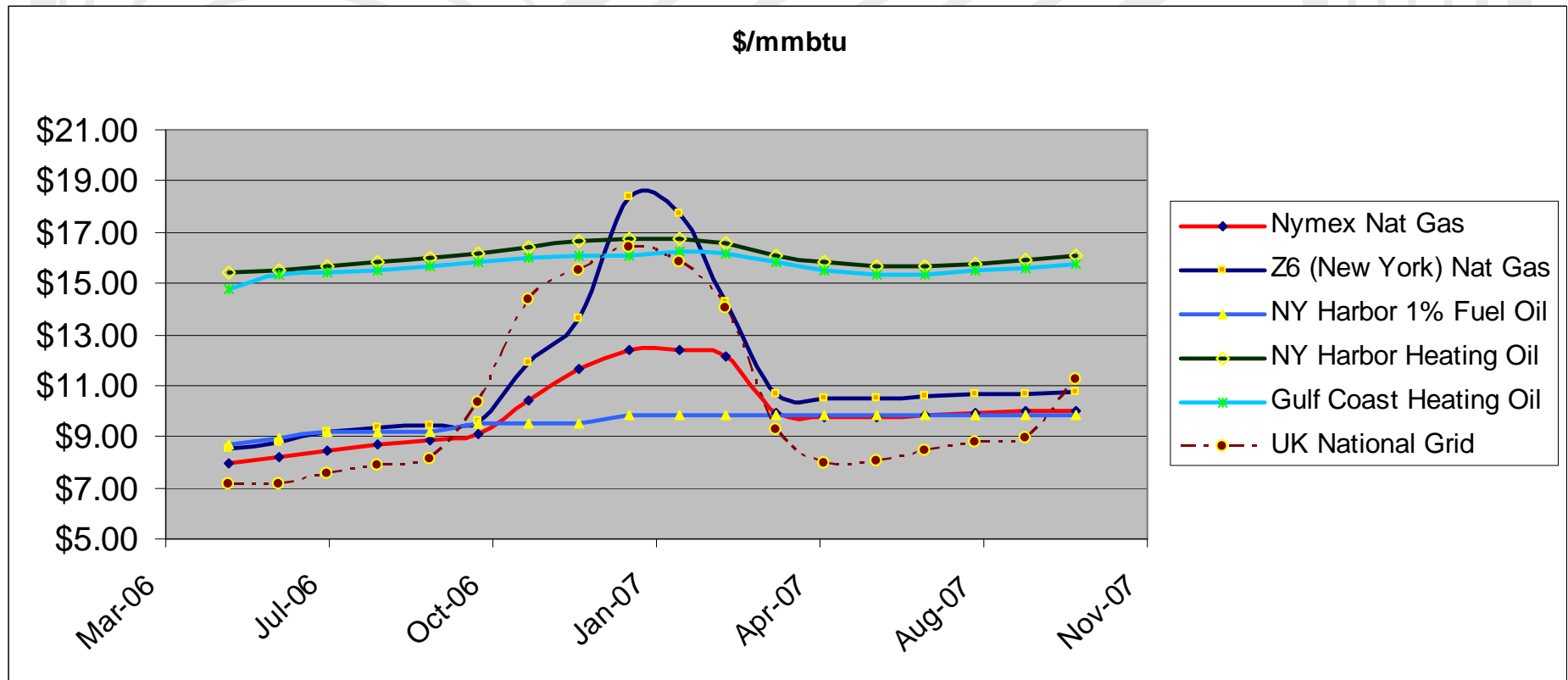
Gas Storage Provides the Buffer



Relative Value of Alternative Fuels

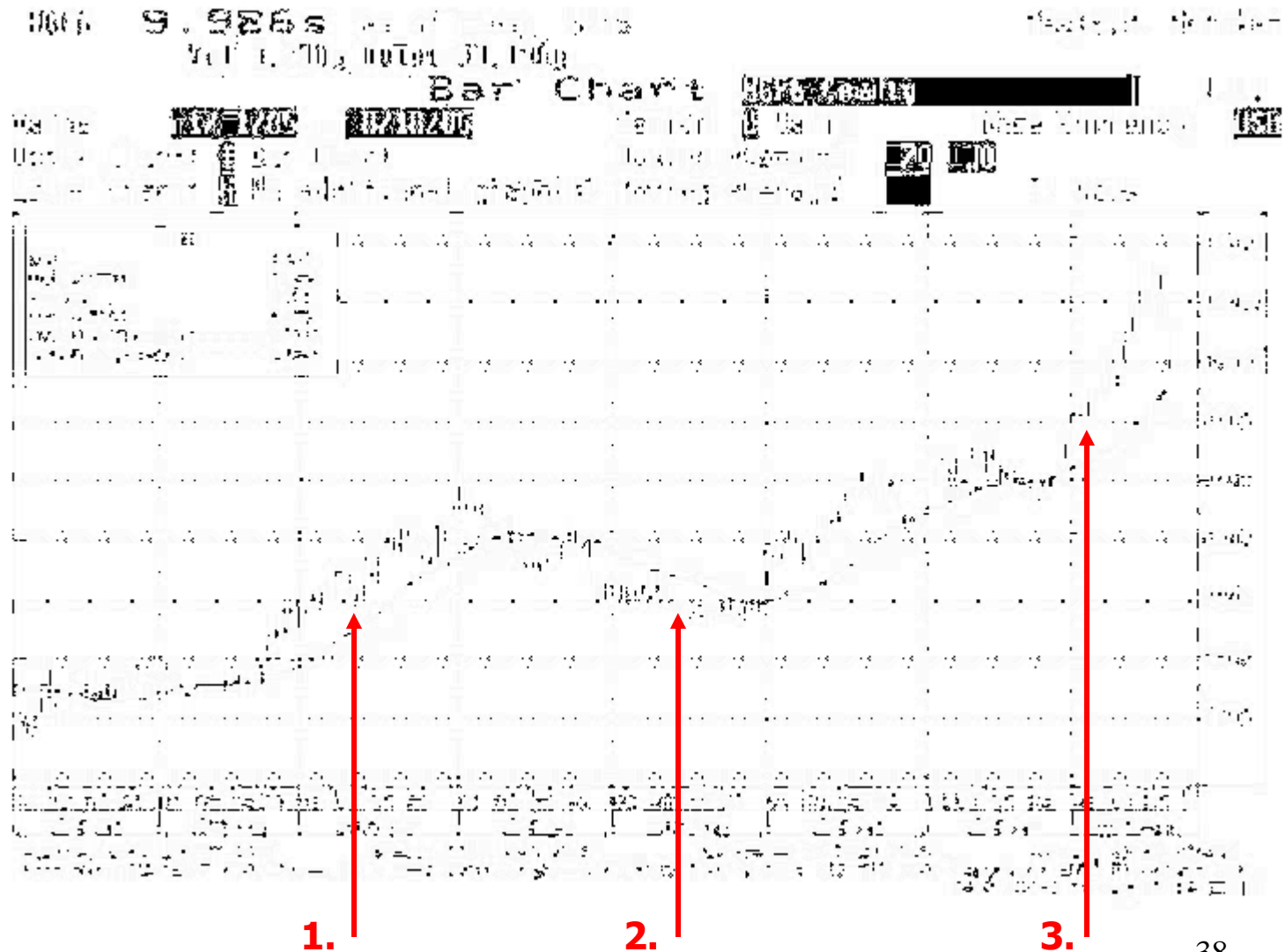
Heating oil and fuel oil prices provide resistance and support for gas prices

UK national grid gas price represents competition for LNG cargoes

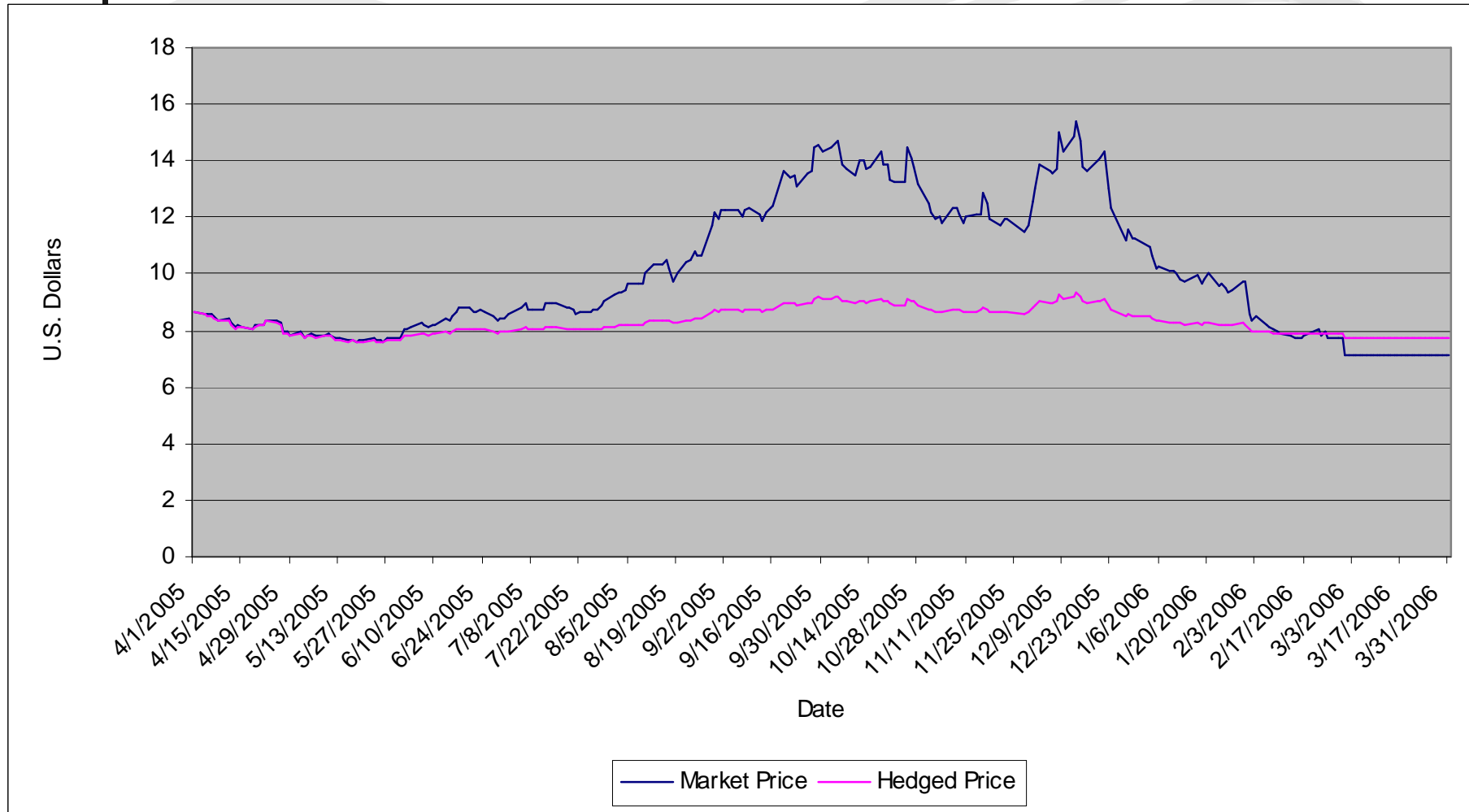


Execution Example for Winter 05/06 Period

1. Execute first layer (take risk off the table)
2. Execute second layer (limit order to lock in floor price)
3. Execute third layer (stop loss to protect against price breakout)



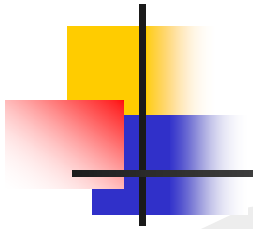
Benefits of an Effective Risk Management Strategy





About Mobius Risk Group

- **Houston-based independent energy advisory services business:**
 - North American scope (Offices in Houston, Los Angeles, Phoenix, Las Vegas & Boston)
 - All energy commodities and energy efficiency
 - Independently owned and operated
- **Extensive experience:**
 - > 400 years energy procurement, trading, structuring, marketing, finance & efficiency experience
 - Goldman Sachs, Bear Stearns, Salomon Smith Barney, Koch Industries, TXU, Reliant, Enron, Hess, Avista, Southland Industries, etc.
- **Develop & implement solutions to reduce exposure to energy market risk:**
 - Improved energy procurement decisions
 - Improved risk management decisions
 - Improved energy asset efficiency
 - Aligned with broader corporate objectives to yield improved financial results
- **Major corporations:**
 - >\$4.0 billion in annual energy spend
 - >\$200 million in energy projects identified
 - >\$80 million in energy technology projects



Thank you!

Martyn Harsley

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