

Oil and Gas Prices

Will They Stay Linked?

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**Energy and
Environmental
Analysis, Inc.**

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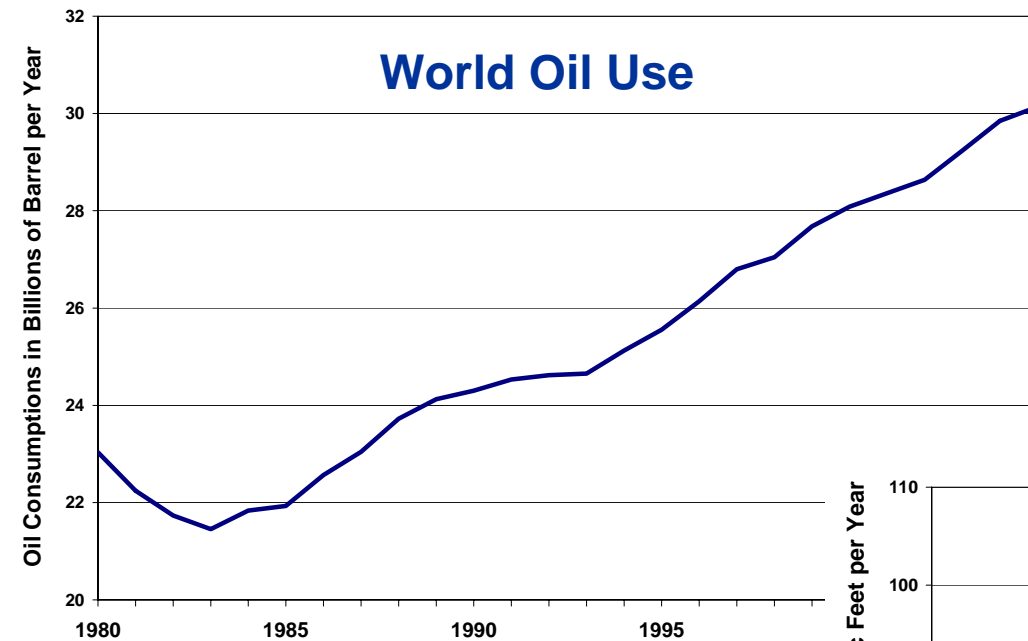
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Contents

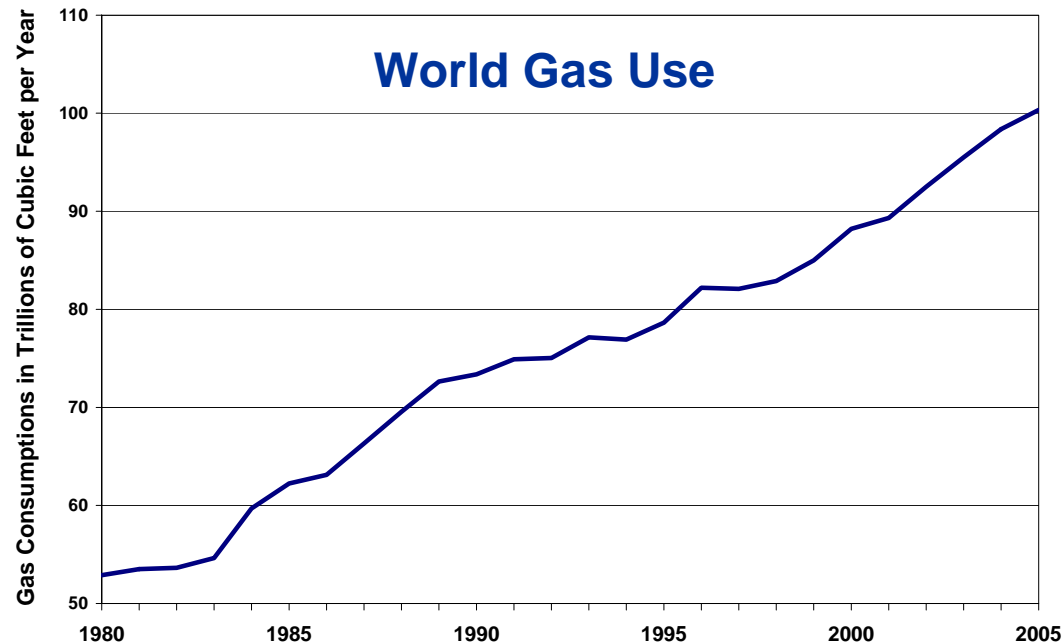
- ◆ Recent Trends in Oil and Gas Markets
- ◆ Projected Trends
- ◆ Future Linkage Between Oil and Gas Prices

Growth in World Oil and Gas Use



◆ *Bottom Line:
Robust growth in
both fuels.*

- ◆ **Global oil use rising at 1.6 percent per year.**
 - Tiger economies dominate growth.
- ◆ **Global gas use rising at 2.6 percent per year.**
 - Growth evenly spread geographically.

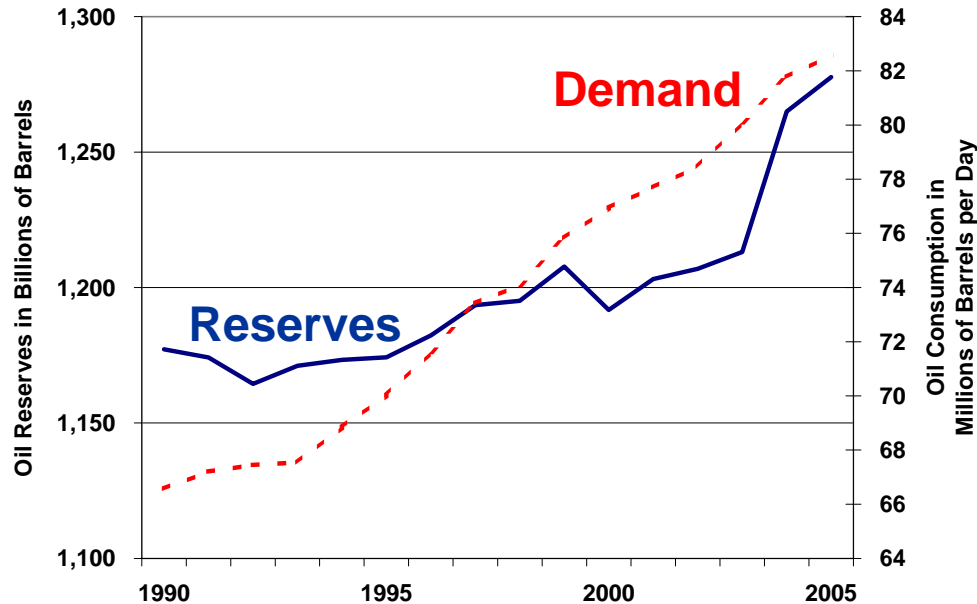


Source: International Energy Agency

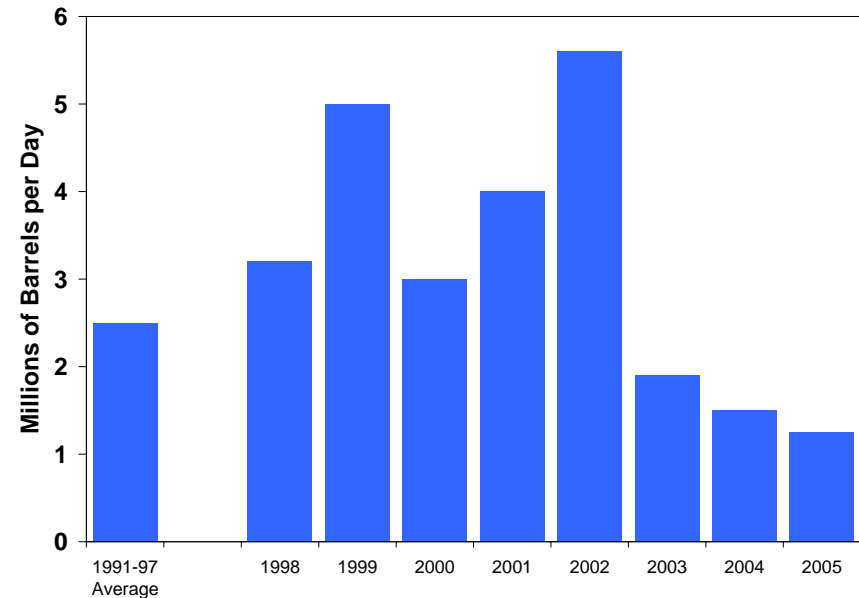
Oil Supply

The Tightening Oil Balance

World Oil Reserves versus Oil Demand



World Oil Spare Productive Capacity



Source: Energy Information Administration

World oil use has grown at 1.6 percent per year, however, proven reserves have grown by only 0.5 percent per year.

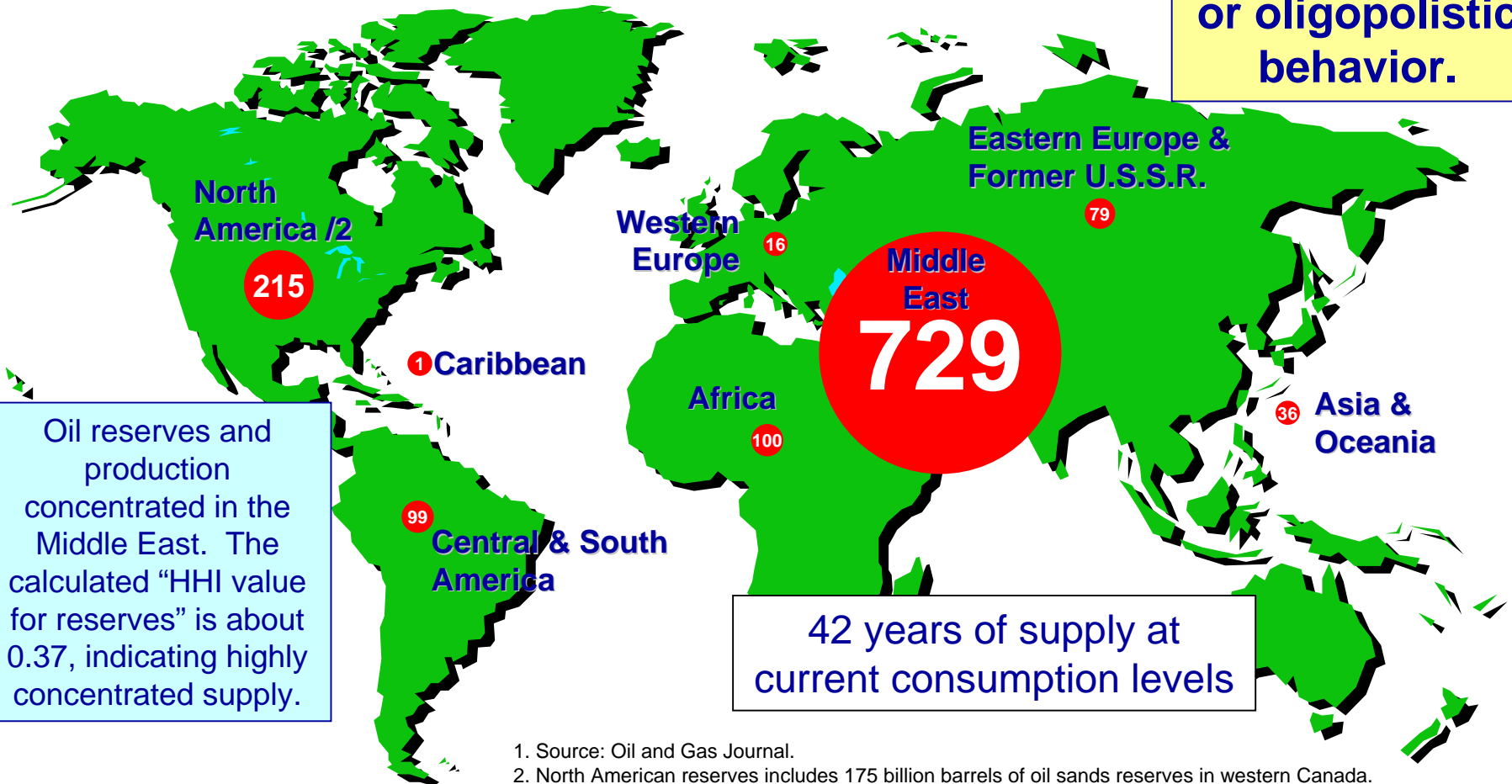
While oil demand has grown, spare productive capacity has declined.

Even though reserve growth has kept pace with demand growth during the past 6 or 7 years, spare productive capacity has declined, indicating a reduced productivity for developed reserves.

World Oil Reserves

**1,277 Billion Barrels
of Proven Oil Reserves /1**

Market subject
to monopolistic
or oligopolistic
behavior.



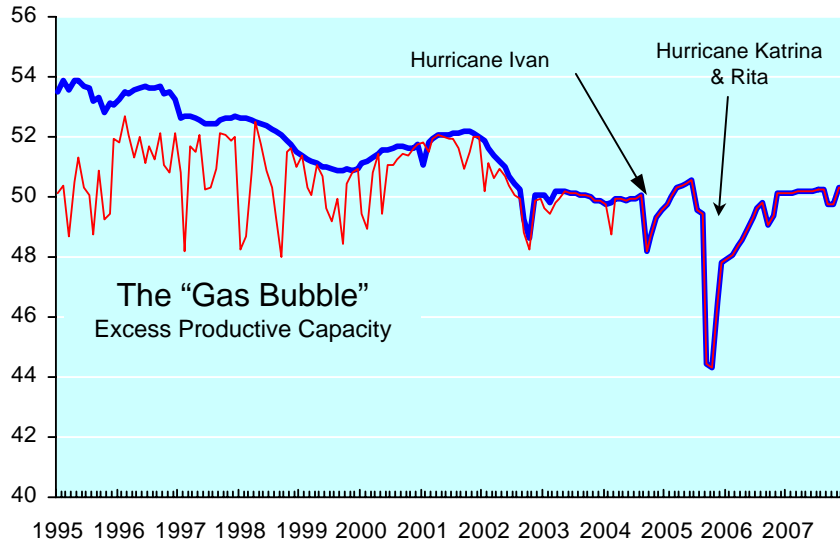
Oil reserves and production concentrated in the Middle East. The calculated “HHI value for reserves” is about 0.37, indicating highly concentrated supply.

42 years of supply at
current consumption levels

1. Source: Oil and Gas Journal.
2. North American reserves includes 175 billion barrels of oil sands reserves in western Canada.

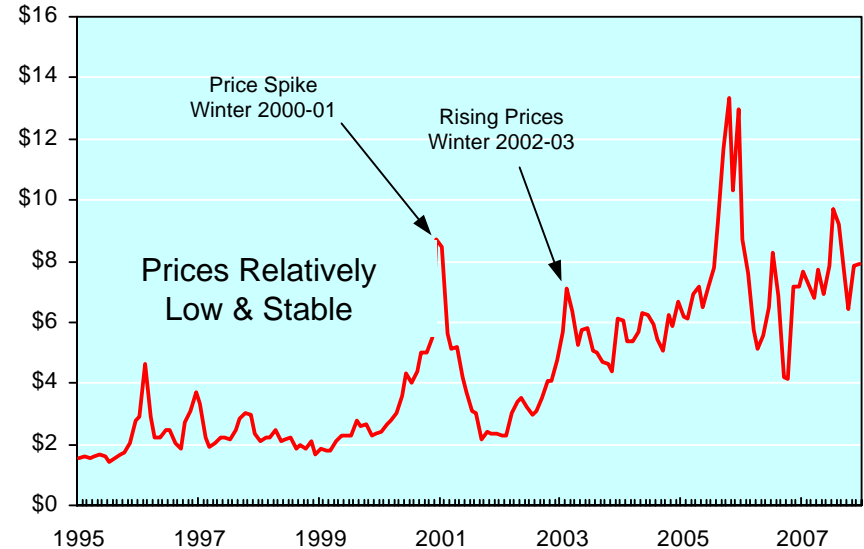
The Changing Gas Balance

Lower-48 Dry Gas Production Vs. Dry Gas Capacity (BCFD)



Source: Energy and Environmental Analysis, Inc.

Historical Gas Price at Henry Hub (\$ per MMBtu)



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

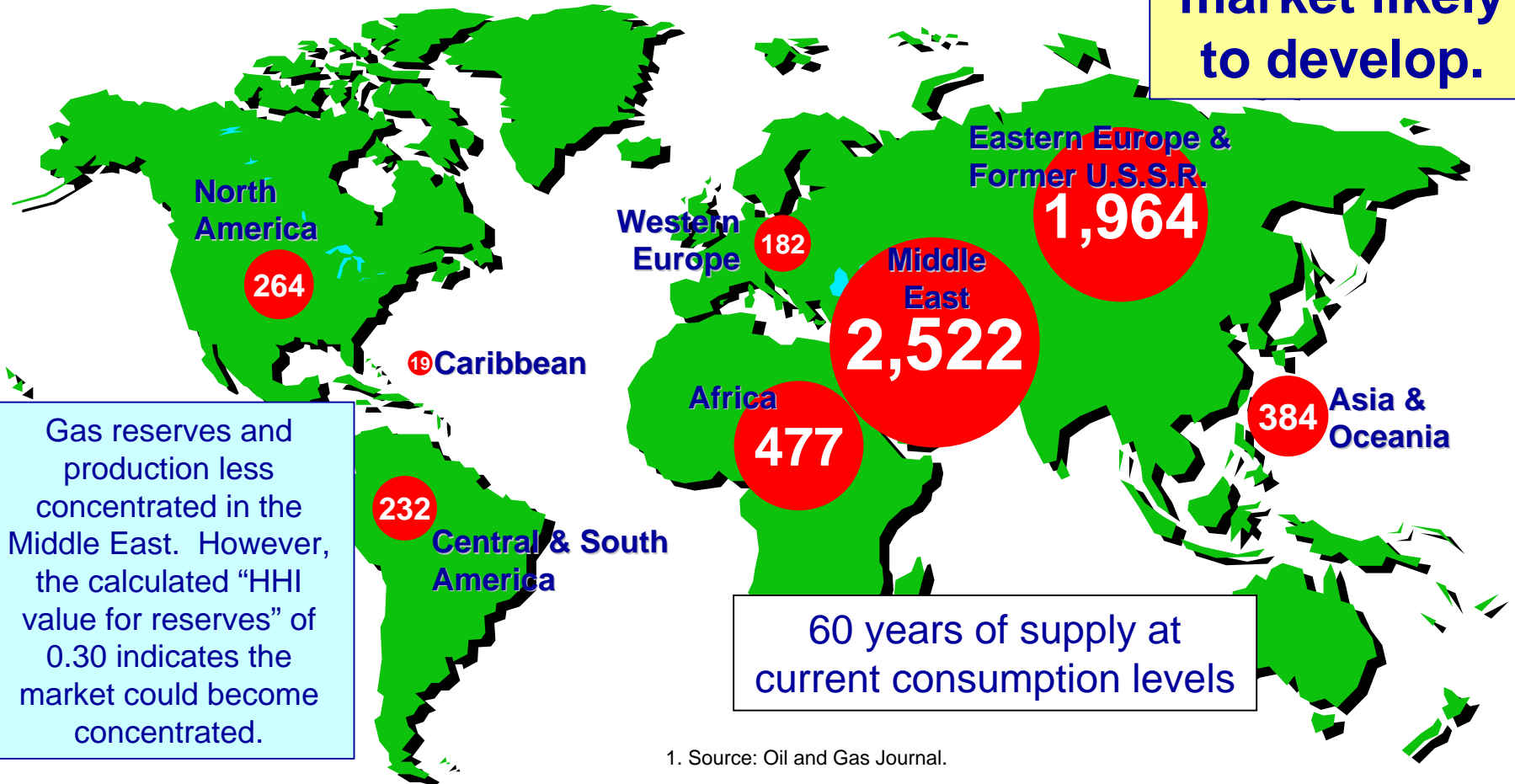
Divergent trends in gas supply and demand have led to a tight balance between supply and demand, higher gas prices, and increased price volatility.

TIGHT BALANCE EXPECTED TO CONTINUE

World Gas Reserves

6,044 Trillion Cubic Feet
of Proven Gas Reserves /1

Global gas market likely to develop.



Gas reserves and production less concentrated in the Middle East. However, the calculated “HHI value for reserves” of 0.30 indicates the market could become concentrated.

60 years of supply at current consumption levels

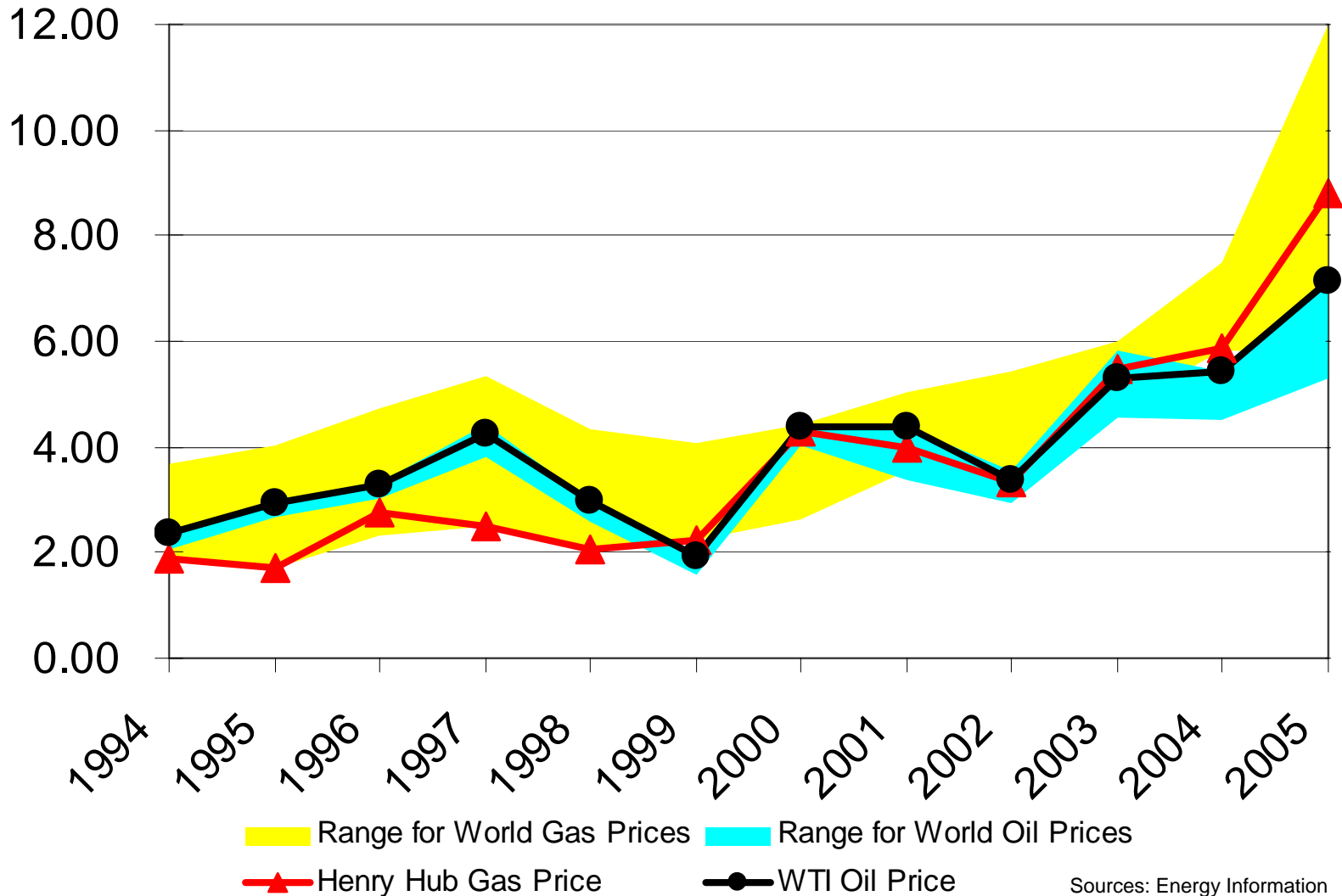
1. Source: Oil and Gas Journal.

Summary of Global Oil and Gas Production

- ◆ Oil reserves not increasing as quickly as oil use.
 - Productivity of recently developed reserves declining.
- ◆ Oil reserves and production concentrated.
- ◆ Gas markets tightening around the world.
 - Production waning in a number of areas (most notably the U.S. and Western Europe).
- ◆ Global LNG trade immature compared to oil trade.
- ◆ *Bottom Line: Supplies under pressure to keep up with demand, leading to higher prices for both fuels ...*

Oil and Gas Prices

Annual Average Values in U.S. Nominal Dollars per MMBtu



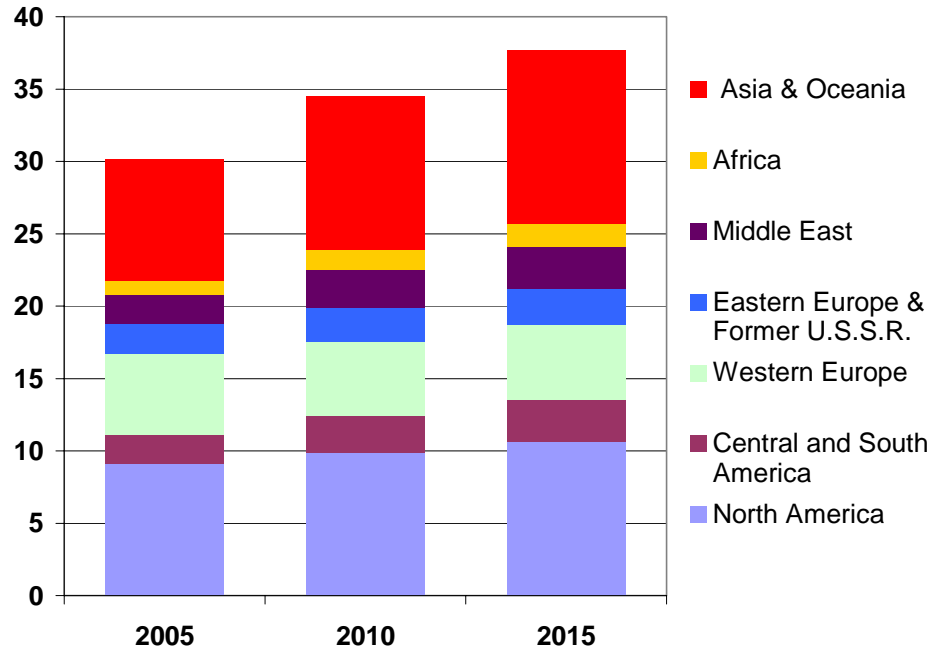
Sources: Energy Information Administration and Platts Gas Daily

Summary of Oil and Gas Prices

- ◆ Upward price trends indicative of tightening supply/demand balances globally.
- ◆ Wider range for gas prices indicates relatively weak correlation among regional markets.
- ◆ Global oil and gas prices historically linked by market competition and contract pricing.
- ◆ U.S. oil and gas prices more recently linked (weak correlation in 1990s).
 - *Correlation likely to be strengthened as a global LNG market evolves....*

Projected Consumption for Oil and Gas

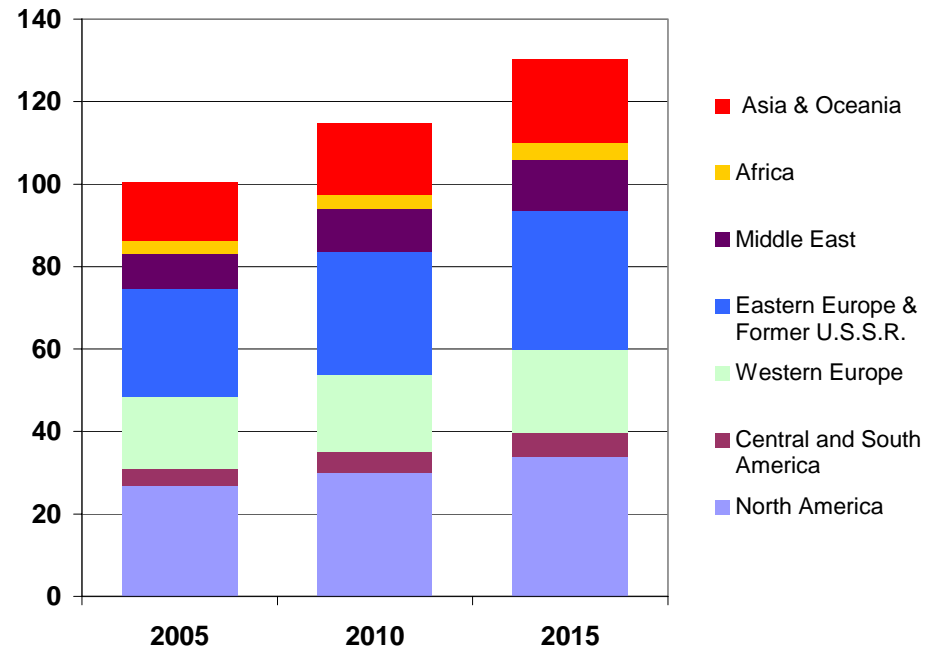
Projected World Oil Demand
(in Billions of Barrels per Year)



Source: Energy Information Administration

- ◆ According to the U.S. Energy Information Administration, over the next ten years, world demand for oil will grow at 2.3 percent per year to nearly 38 billion barrels in 2015.
- ◆ Demand is driven by economic growth, particularly in developing countries like China.

Projected World Gas Demand
(in Trillions of Cubic Feet per Year)



Source: Energy and Environmental Analysis, Inc.

- ◆ We expect gas demand to grow even more quickly, at 2.6 percent per year to 130 trillion cubic feet in 2015.
- ◆ Development of new liquefaction facilities uses “stranded gas” and fosters development of a true world market for natural gas.

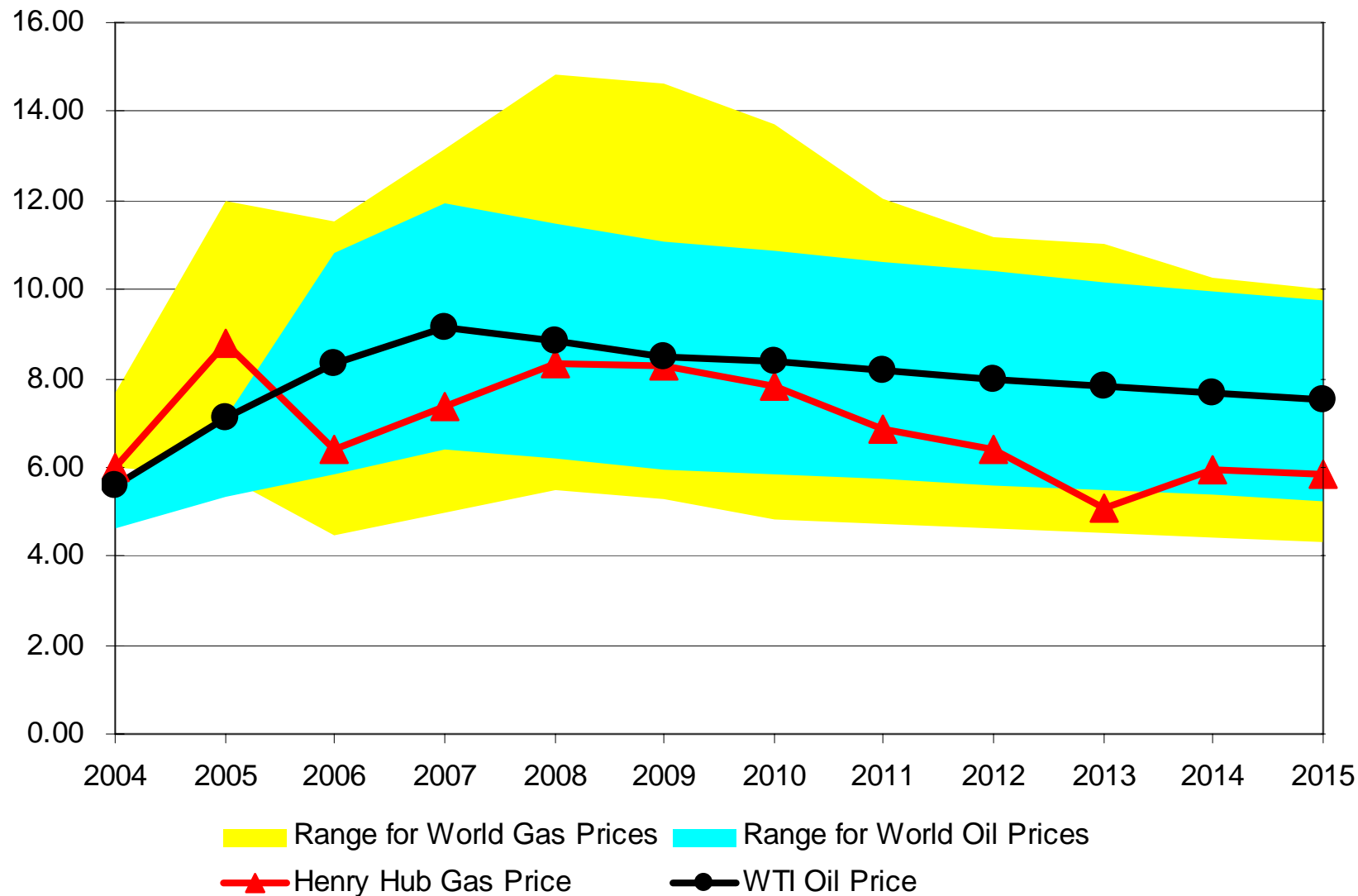
Bottom Line

Oil and gas supplies will have difficulty keeping pace with demand for the foreseeable future, continuing to place upward pressure on oil and gas prices.

... gas and oil prices likely to stay coupled in this environment.

Projected Oil and Gas Prices

Annual Average Values in U.S. Dollars per MMBtu (2005\$)

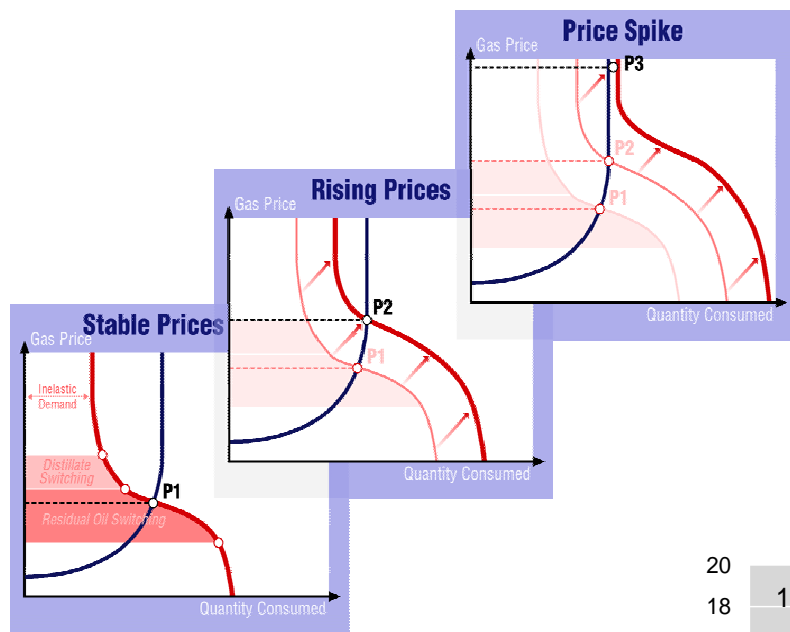


Summary of Oil and Gas Prices

- ◆ Supply/demand balances expected to remain tight, keeping prices relatively high and volatile.
- ◆ Wider range for gas prices indicates relatively weak correlation between regional markets.
 - However, regional prices should converge over time as the global LNG market evolves.
- ◆ Oil and gas prices are likely to trend in the same direction, but may disconnect over periods of time within any market.
- ◆ Current linkage between oil and gas prices is mostly a result of demand-side competition, such as fuel switching. Future linkage will be driven increasingly by supply-side activity (i.e., LNG versus oil resource development, gas-to-liquid conversion).

Gas Prices

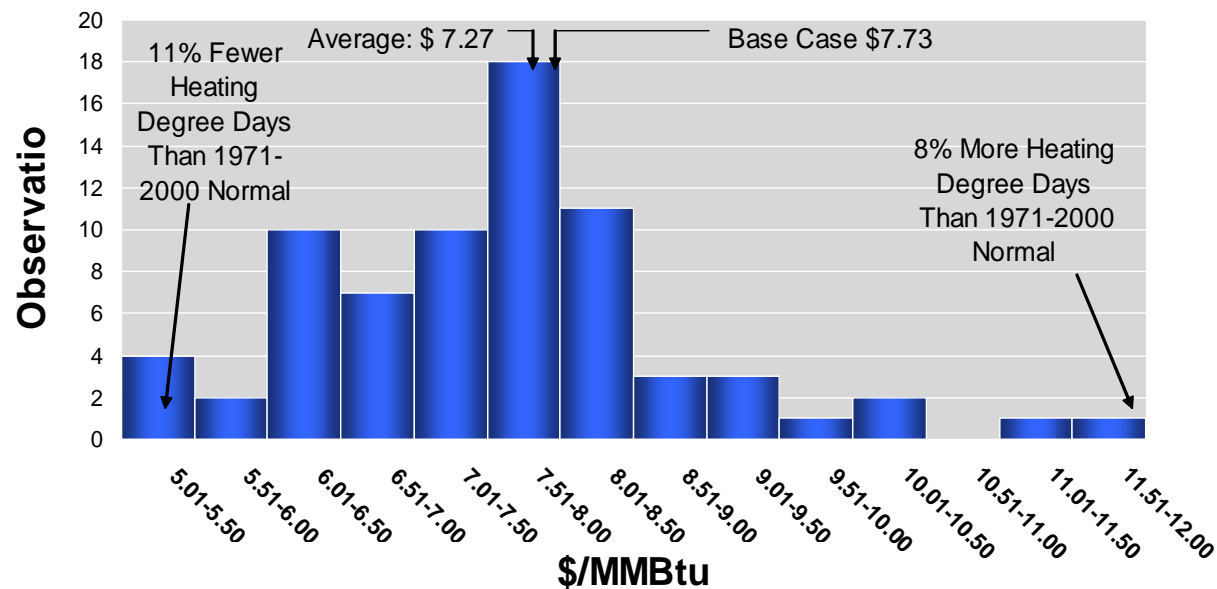
Impact of Weather



Changes in weather shift daily demand, causing wide swings in gas prices.

Significant price volatility suggests need of additional gas storage, peakshaving capability, or fuel switching capability.

Henry Hub Price Distribution For Jan. 2007 - Dec. 2007



Some Signposts to Watch to Determine Whether Oil and Gas Prices Will Remain Coupled (A U.S. Perspective)

Signpost	Example Market Event	Likely Outcome
Gas-to-oil switching capacity	Retirement of capacity	Gas prices up relative to oil prices
Globalization of LNG	Political turmoil delays liquefaction development	Gas prices up
Globalization of LNG	Aggressive development of LNG liquefaction capability	Gas prices fall relative to oil prices
Environmental policies favoring gas	Carbon control leading to retirement of coal capacity	Gas prices up
Environmental policies favoring other fuels	Nuclear or IGCC subsidy	Gas prices down
Weather	Significant hurricane disruptions along the Gulf Coast	Gas prices up
Weather	Mild temperatures with wetter than normal conditions in the western U.S.	Gas prices down
Underground Gas Storage	Aggressive development of storage facilities	Reduces the impact of adverse weather conditions, increasing the correlation between gas and oil prices

Conclusions

- ◆ Demand growth in the face of waning oil and gas supplies is driving upward price pressure for both fuels.
 - Oil and gas prices have both been on an upward trend over the past five years. Prices have been highly correlated.
- ◆ Oil and gas prices are likely to stay coupled as supply/demand balances remain tight for both fuels, however, significant price volatility is likely.
 - Weather alone can swing average annual prices by \$3 to \$4 up or down from a baseline trend.
- ◆ Development of the global LNG market is a critical signpost.
 - Slower than expected development of liquefaction capability would maintain upward pressure on gas prices and weaken correlation between regional gas prices and oil prices.
 - However, rapid deployment of liquefaction capacity may create temporary surpluses in regional gas markets, causing short episodes of gas price depression.

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