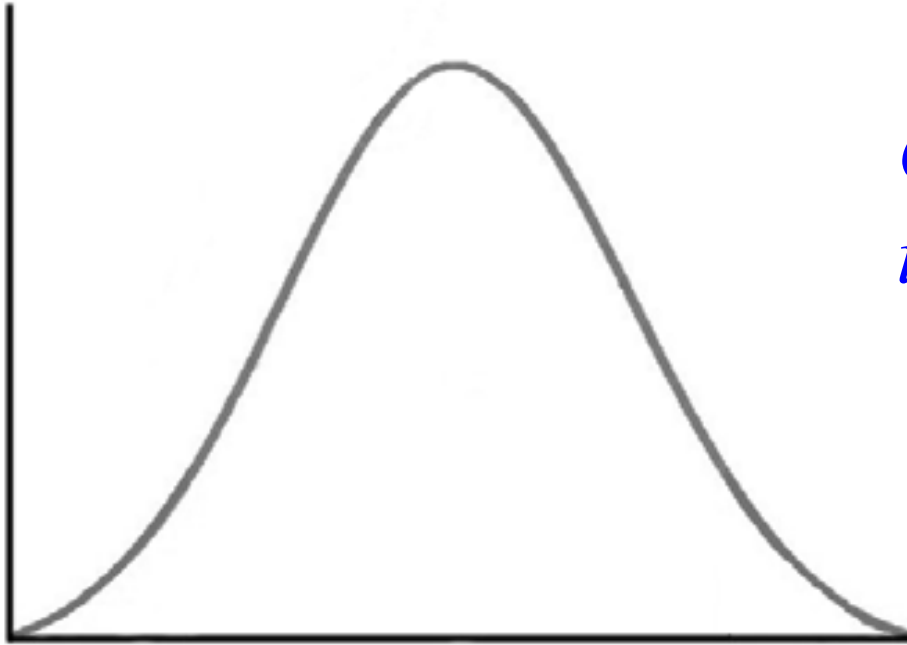


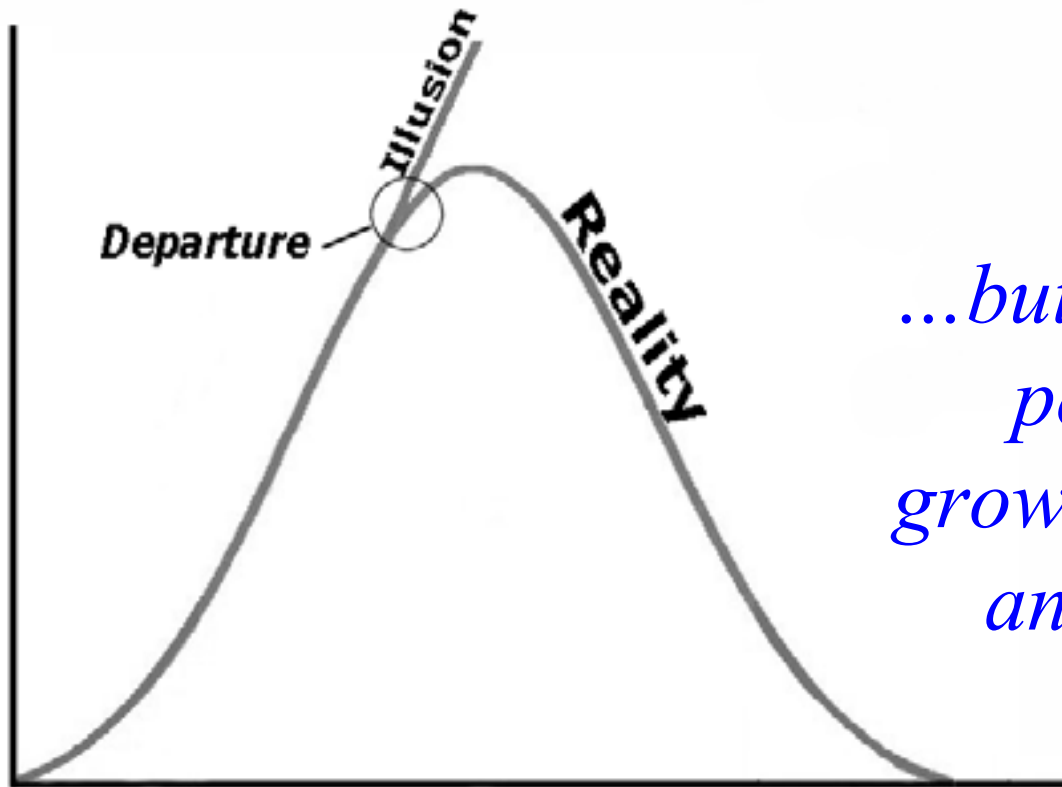
THE ENERGY PROBLEM



*Our economy
is powered by
finite
resources...*



*Our economy
is powered by
finite
resources...*



*...but it relies on
perpetual
growth, which is
an illusion.*

Energy Problem Statement:

The earth's fossil-energy resources, and particularly oil and natural gas, power the world's economy. Unfortunately, the quantity and quality of these resources are steadily declining. The declining quality means that it is becoming progressively more expensive, in terms of energy as well as dollars, to extract and process these resources. Their degradation is furthermore chronic and irreversible, and it has now progressed to the point where the destabilizing effects on our economic, environmental, and geopolitical systems are apparent.

Three Levels of Understanding Decline

1st Order: Resource quantity is finite.

Conclusion: We will run out some day.

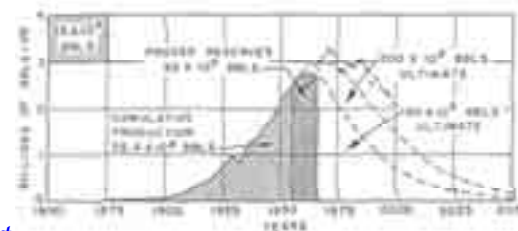


2nd Order: Production has a maximum.

Conclusion: Peak will occur, or has occurred.

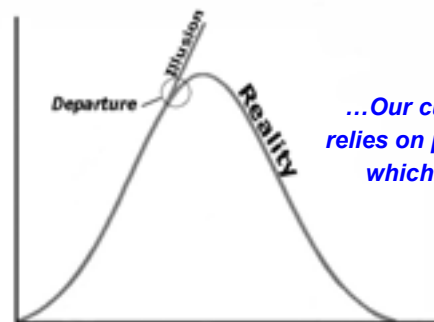


M. King Hubbert



3rd Order: Declining resource quality is destabilizing.

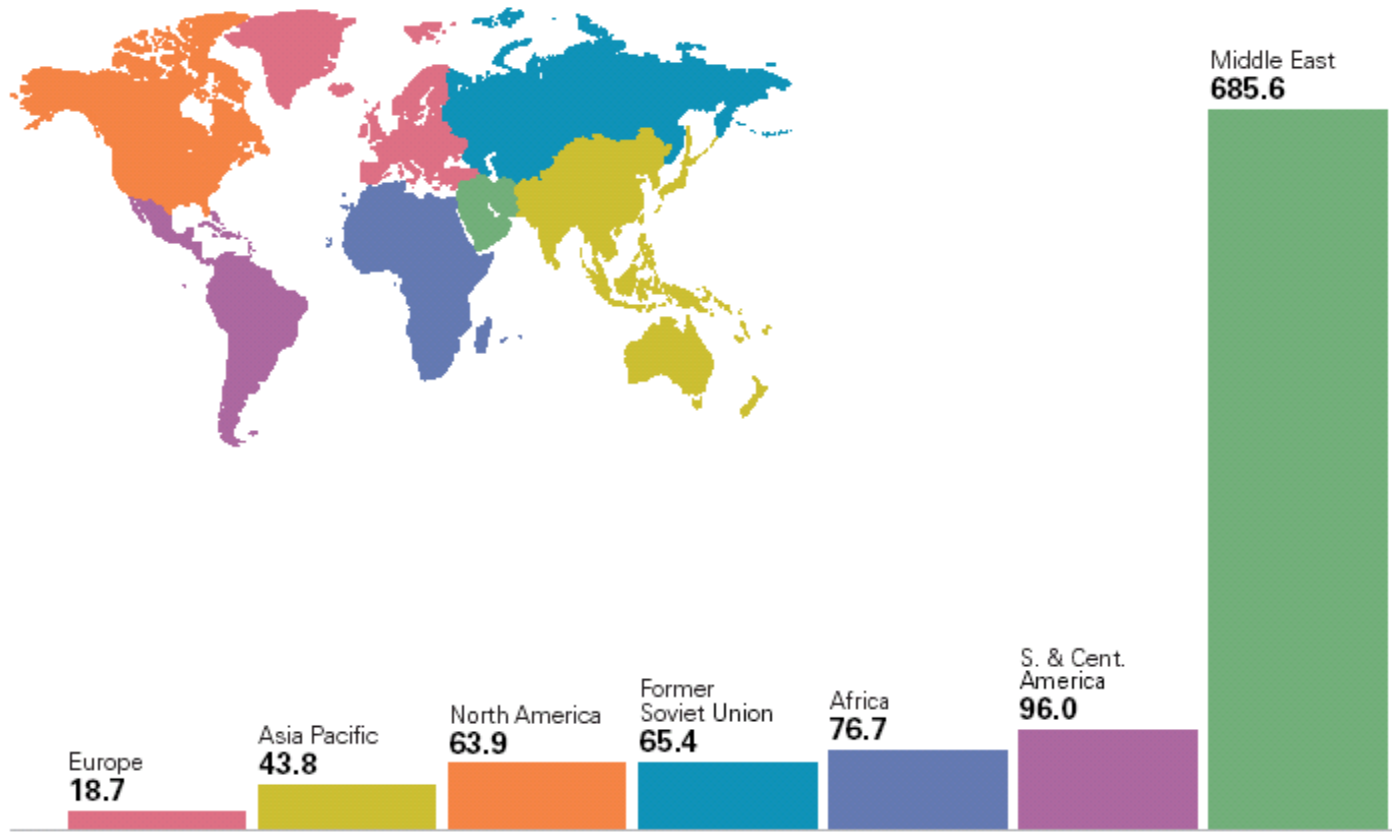
Conclusion: A new economic model is required.



*...Our current economy
relies on perpetual growth,
which is an illusion.*

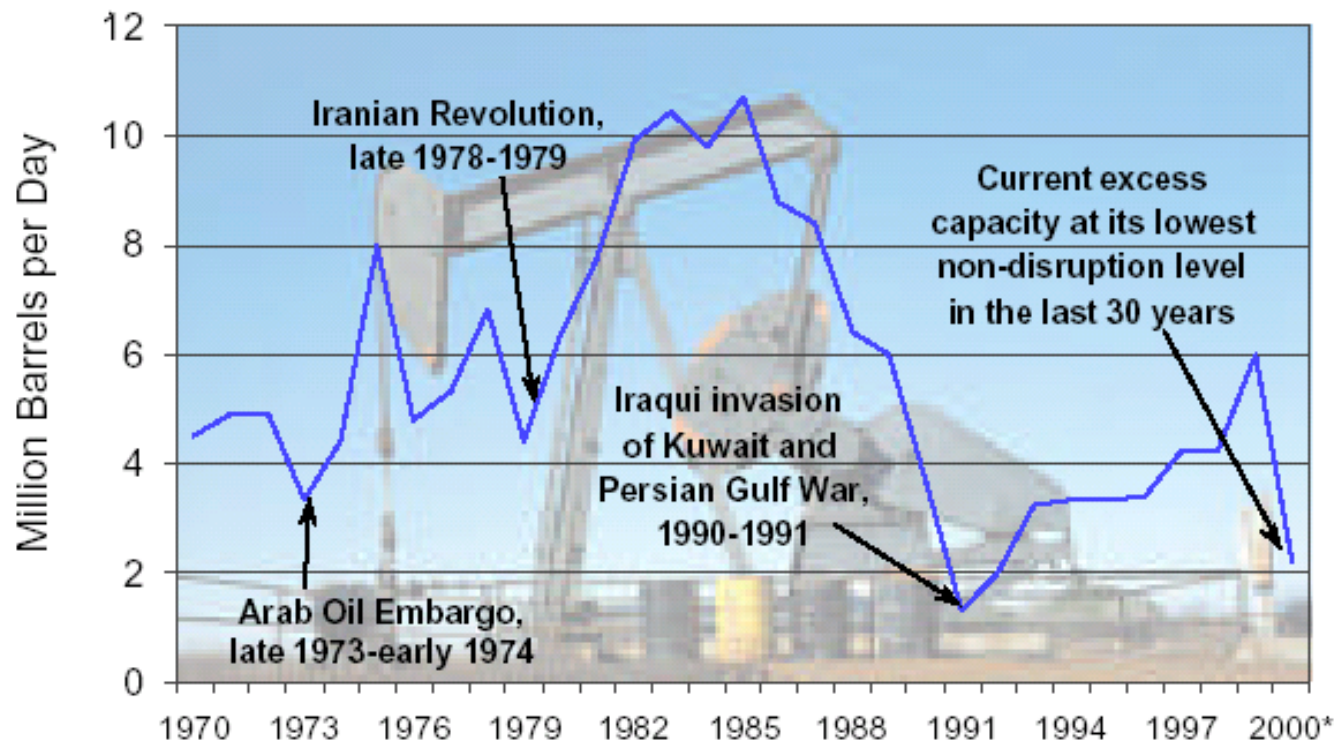
Which Order is Shown Here?

proved reserves at end 2001
Thousand million barrels



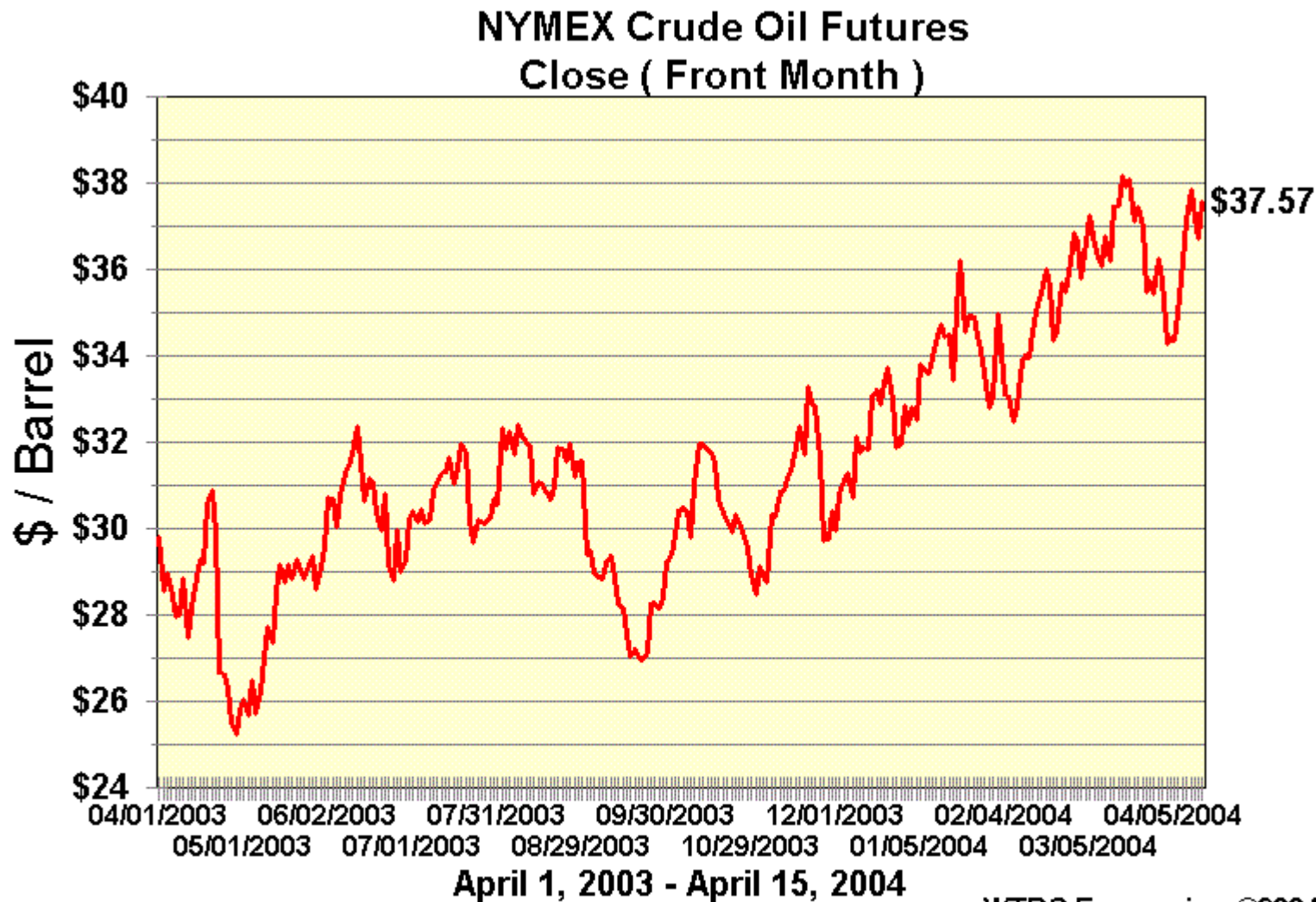
Oil Supply Instability

World Excess Oil Production Capacity *1970 - Present*



*Note: all datapoints are annual averages except 2000, which is for the fourth quarter 2000

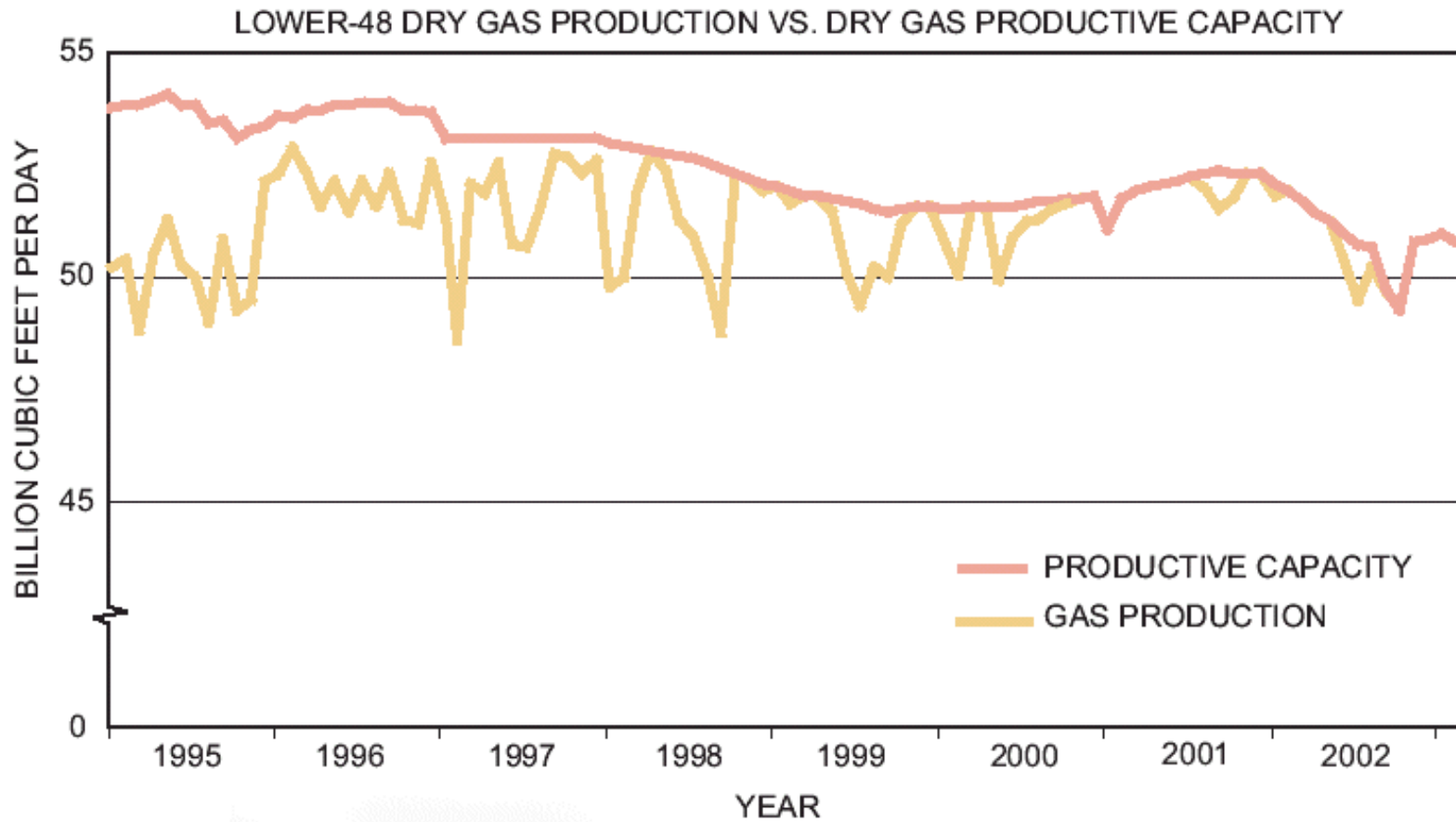
...resulting in oil price instability.



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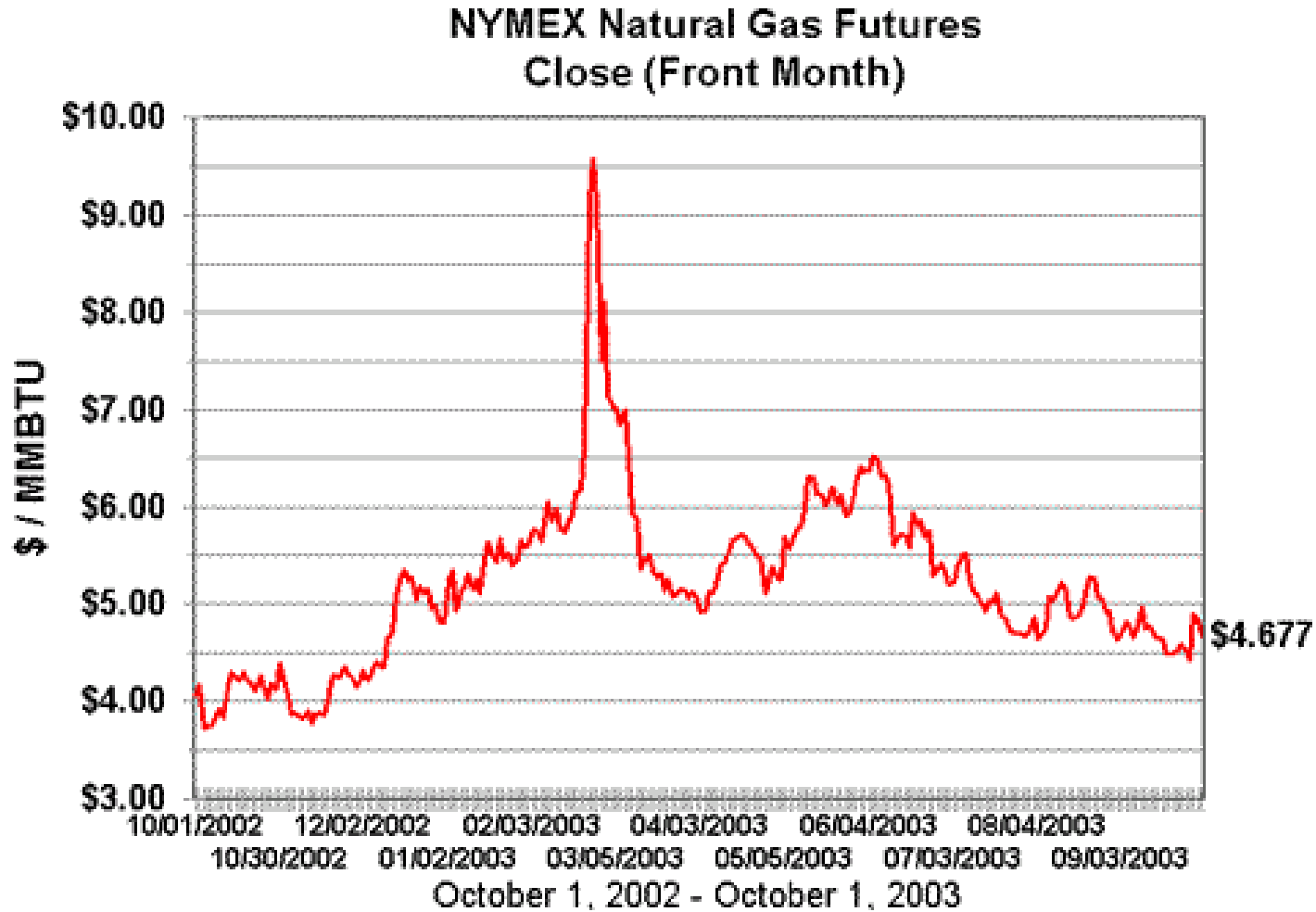
— Close

Gas Supply Instability



Source: Energy and Environmental Analysis, Inc.

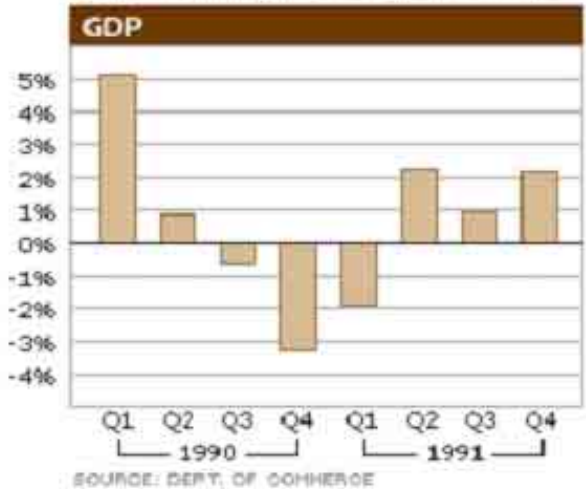
...resulting in gas price instability.



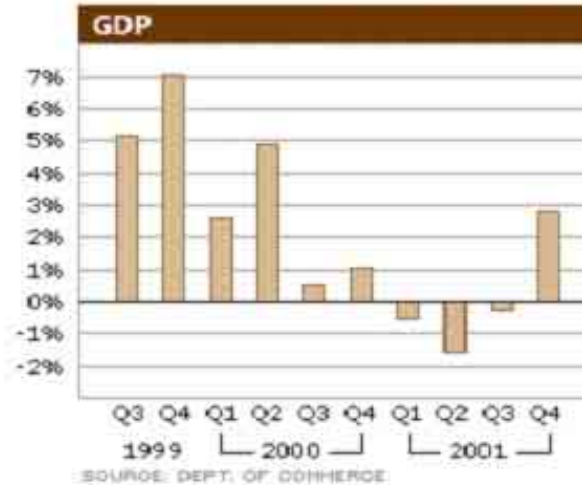
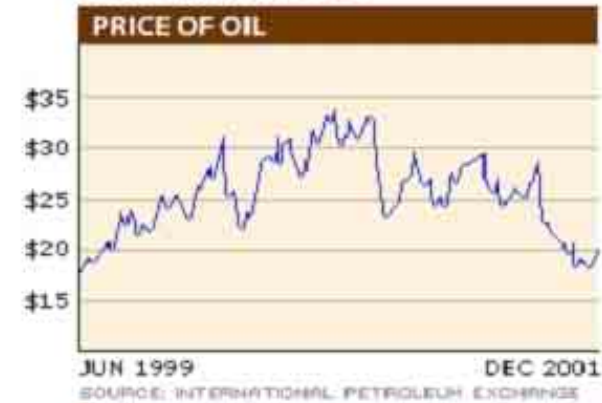
Source: WTRG Economics

...leading to economic instability

The economy stalled as oil prices rose in 1990...



...and again in 2000



...and environmental instability

Daily News

Utilities Look to Coal As Gas Prices Rise

By DAN D'AMBROSIO
Associated Press Writer



DENVER (AP) -- Coal, spurned for decades by power plant builders, is enjoying something of a renaissance as natural gas prices drive up the cost of generating electricity.

In the West, as well as other parts of the country, utility companies are contemplating new coal-fired electric power plants for the first time since the early 1990s. But the renewed interest in coal, prompted by concerns over the volatility in natural gas prices, is also reviving protests by environmentalists worried because coal pollutes the air.

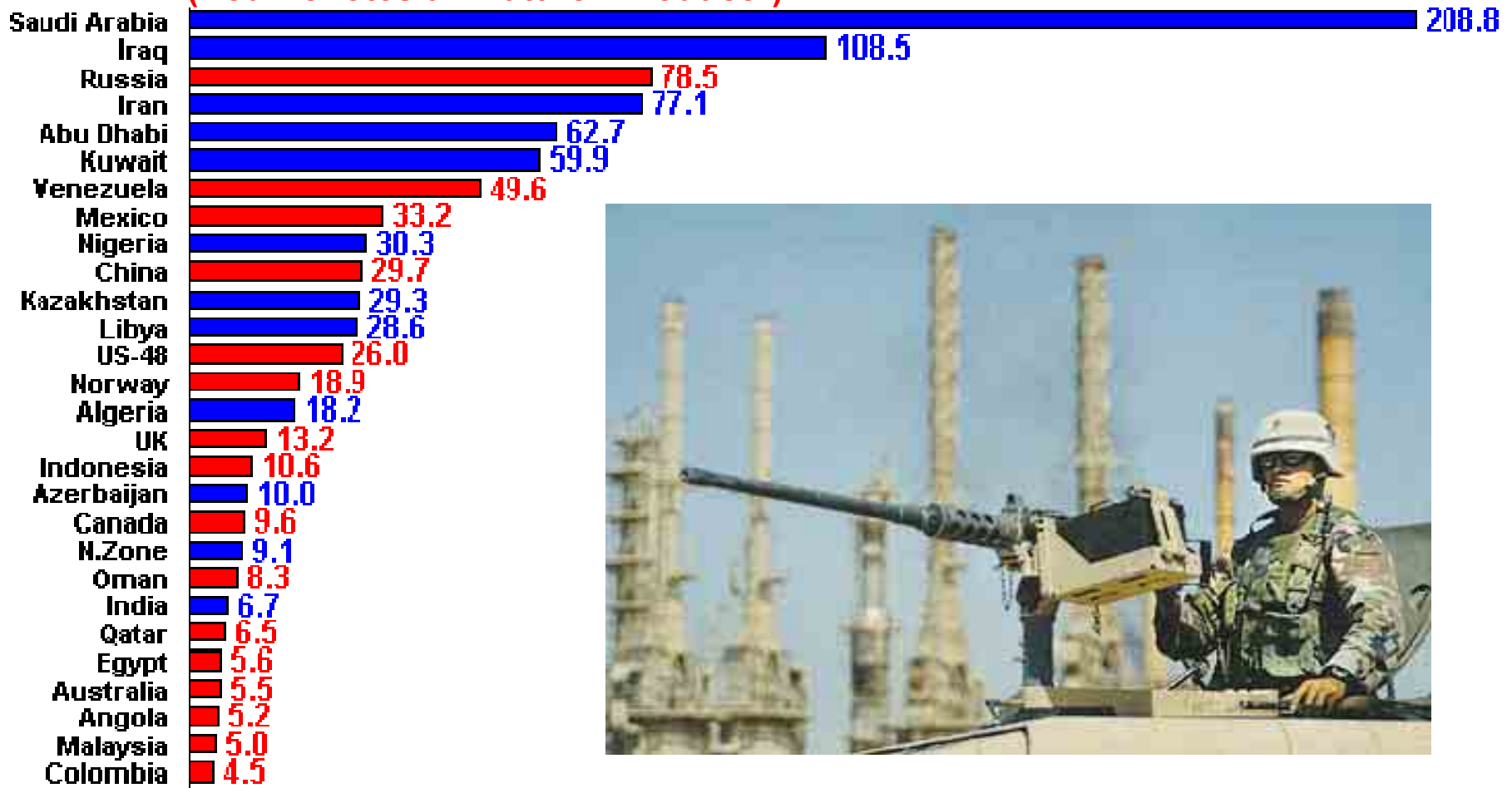
The shift toward coal coincides with the Environmental Protection Agency's implementation of a regional air pollution plan intended to clear haze lingering over western wilderness areas.

"We haven't seen a coal plant built in Colorado in two decades and there's a reason for that," said Robin Hubbard of Environment Colorado. "Denver just had the dirtiest summer we've had in 18 years. We clearly need to look at other means of power generation."

Utilities turned to natural gas for new power in the 1990s because the plants are cheaper to build and cleaner to operate than those run on coal. But then came the jump in natural gas prices.

...and geopolitical instability.

Remaining Oil Reserves, in Billions of Barrels
 (Red Denotes a "Mature" Producer)



Source: Association for the Study of Peak Oil