

# The Impact of China and India on Oil and Strategic Metal Prices

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## Themes of this Presentation:

- Most of us in the petroleum business are well aware of the impact that rising demand from China and India have had on oil and gas prices.
- There is far less awareness that the same trends are impacting a wide range of strategic metals.
- A substantial change occurred around 2003 that appears to represent a new economic reality.
- This change has serious implications for the U.S. economy and for our industry.

First, let's look at energy:

In only 15 years,  
China has gone  
from this:



To this

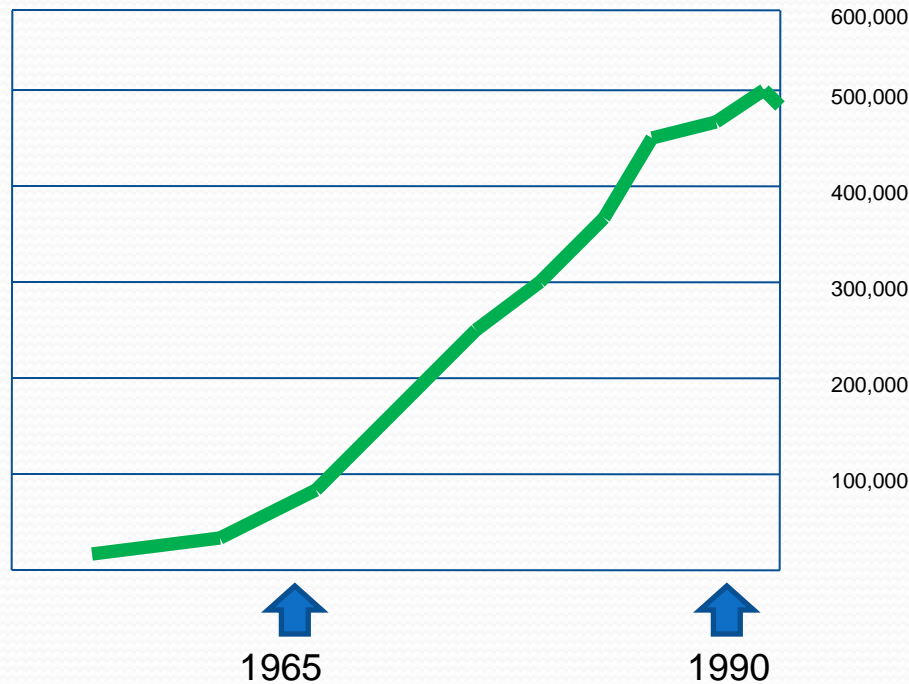




**China is now the 2<sup>nd</sup> largest automobile market – after the U.S.**

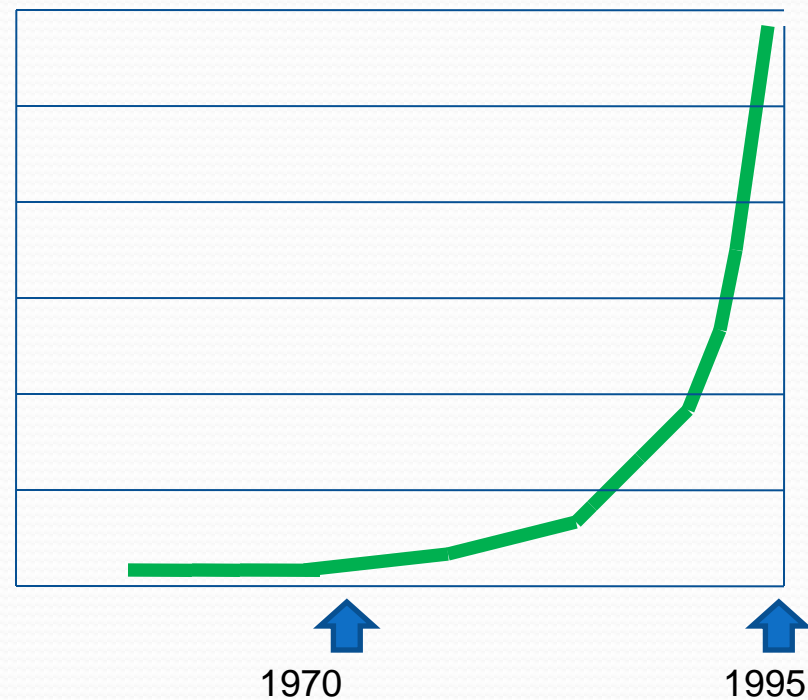
# GDP Growth Comparison for Their Best 25-Year Periods

Japan



Japan's Economy  
Grew 13-Fold

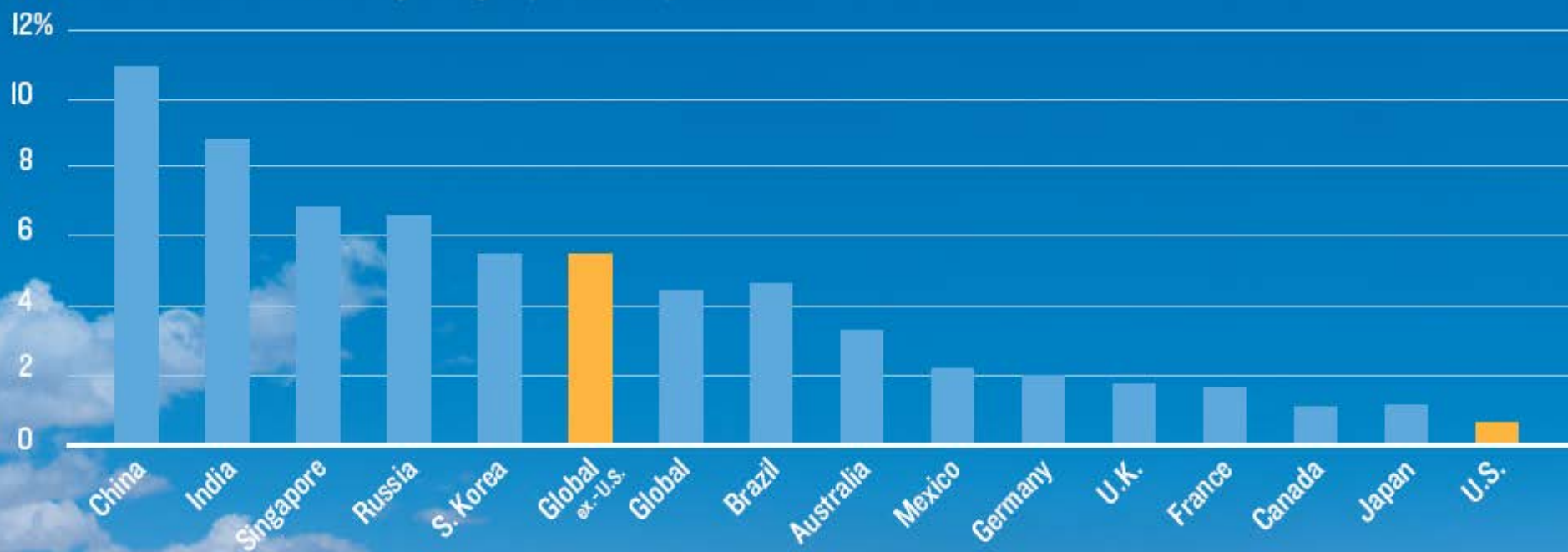
China



China's Economy  
Grew 26-Fold

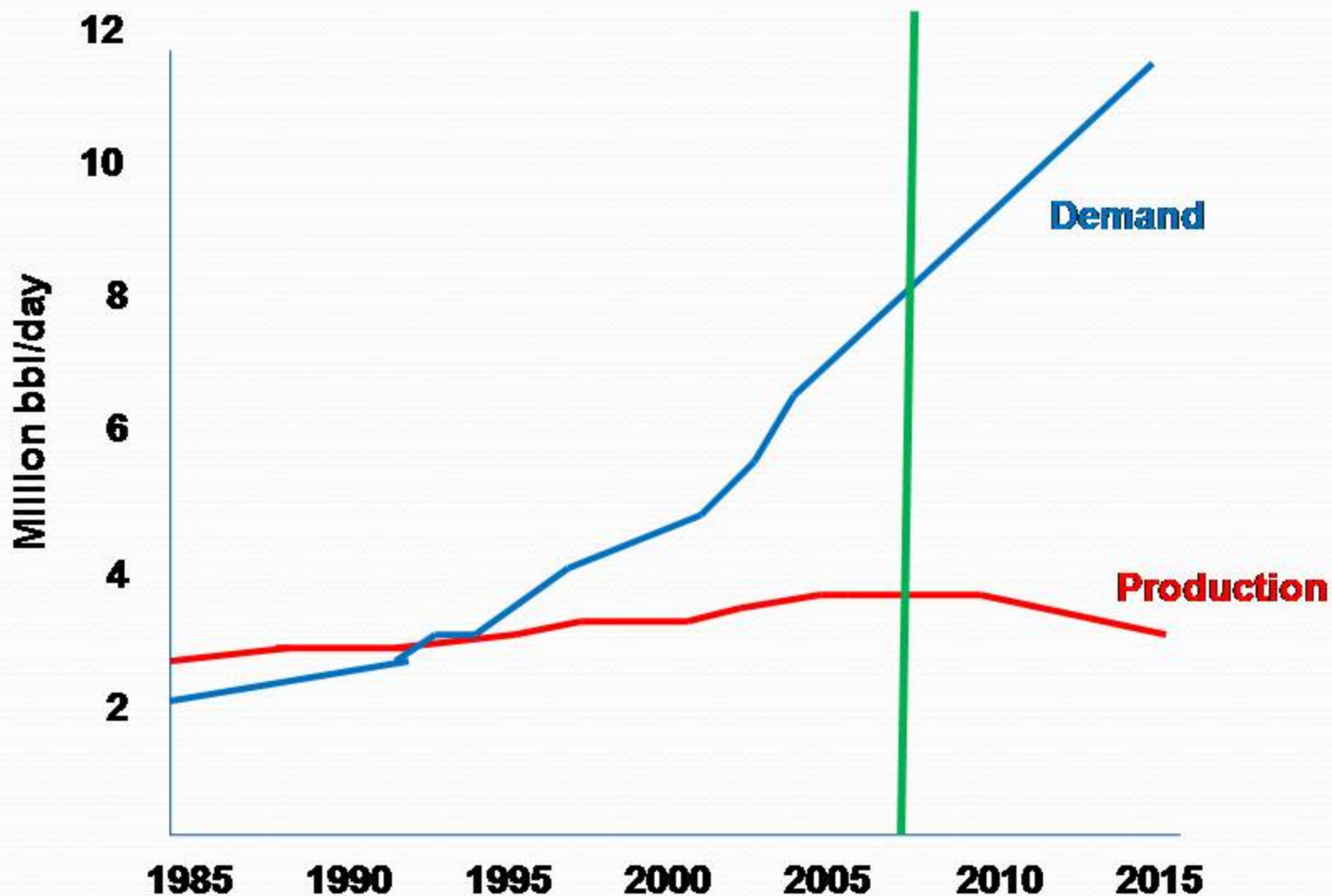
## Real GDP Growth — 2008 Forecasts

U.S. is forecast as slowest-growing major economy in 2008



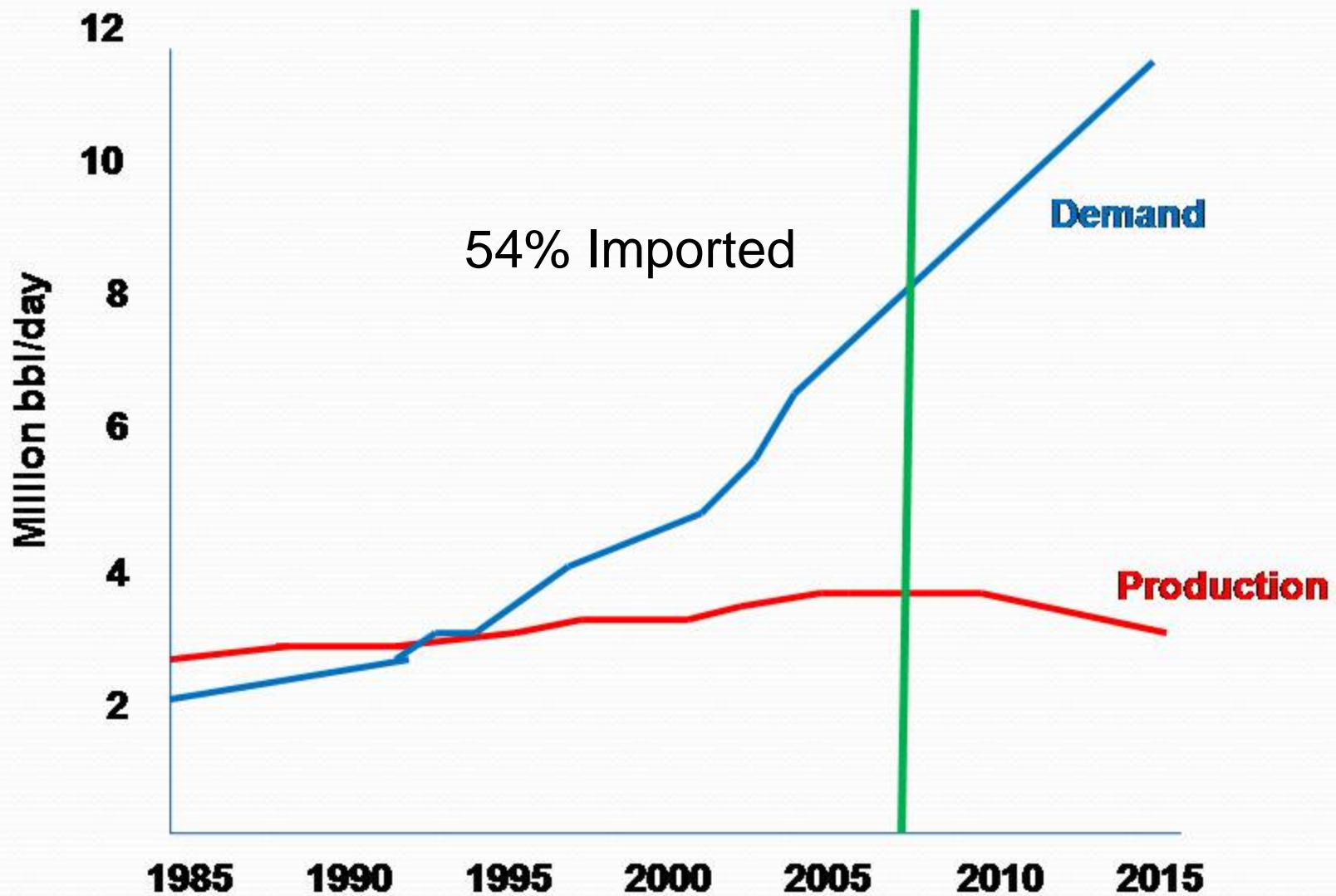
Source: Merrill Lynch; RIC Report as of February 2008. Forecasts and estimates have inherent limitations and may not come to pass.

# China's Oil Supply and Demand

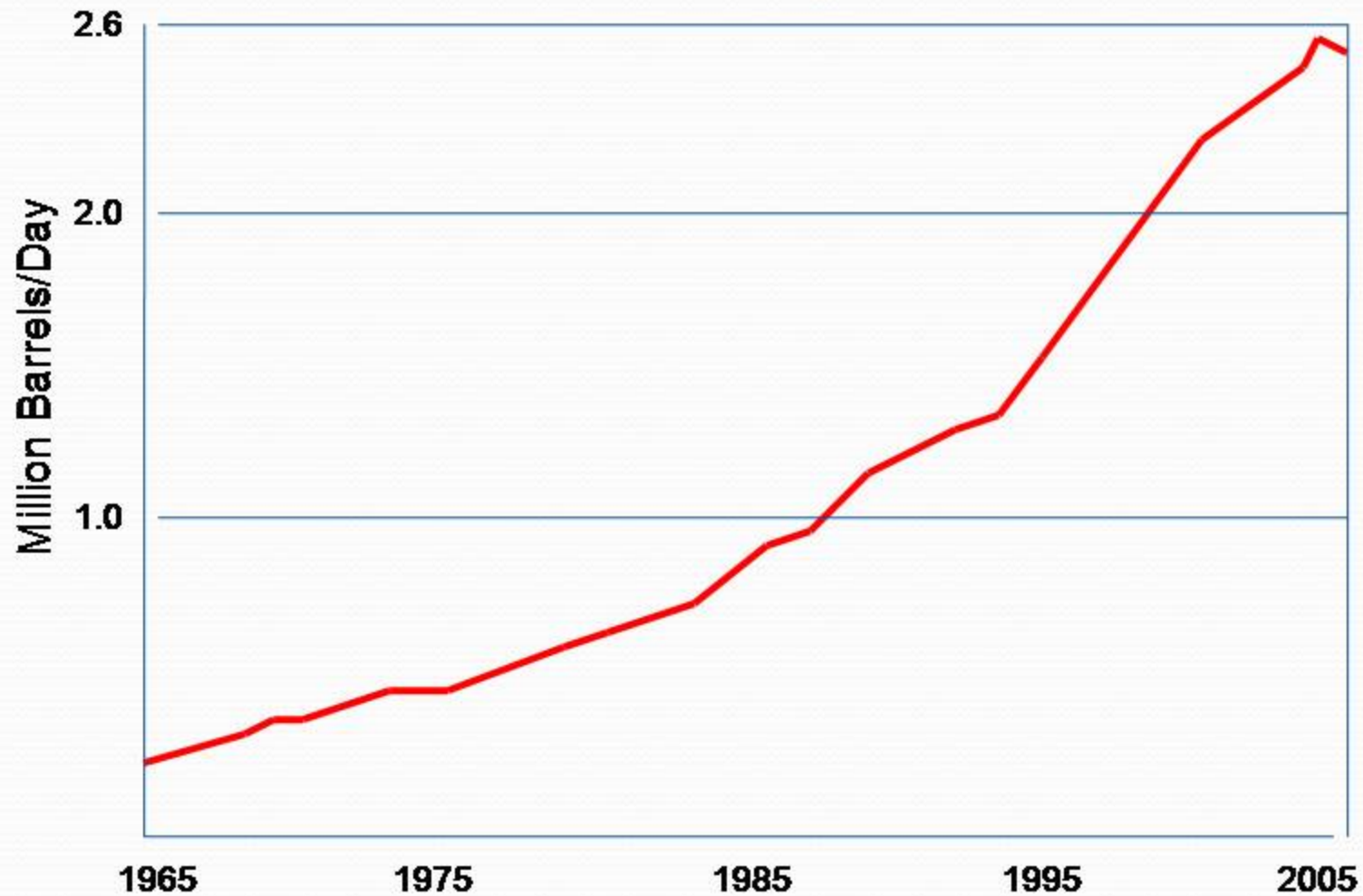




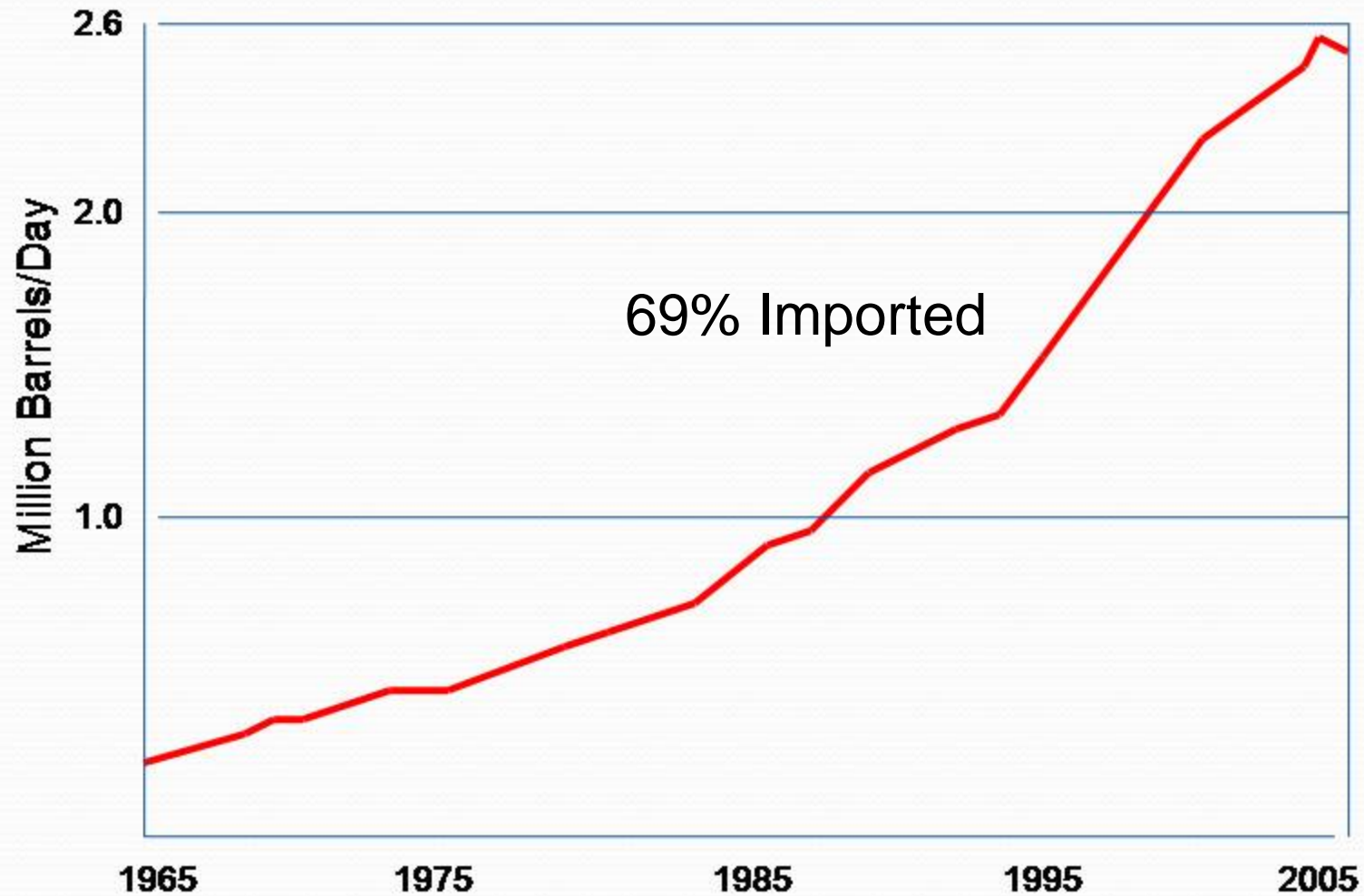
# China's Oil Supply and Demand



# India's Oil Consumption



# India's Oil Consumption





But, it's not fair to just blame India and China :

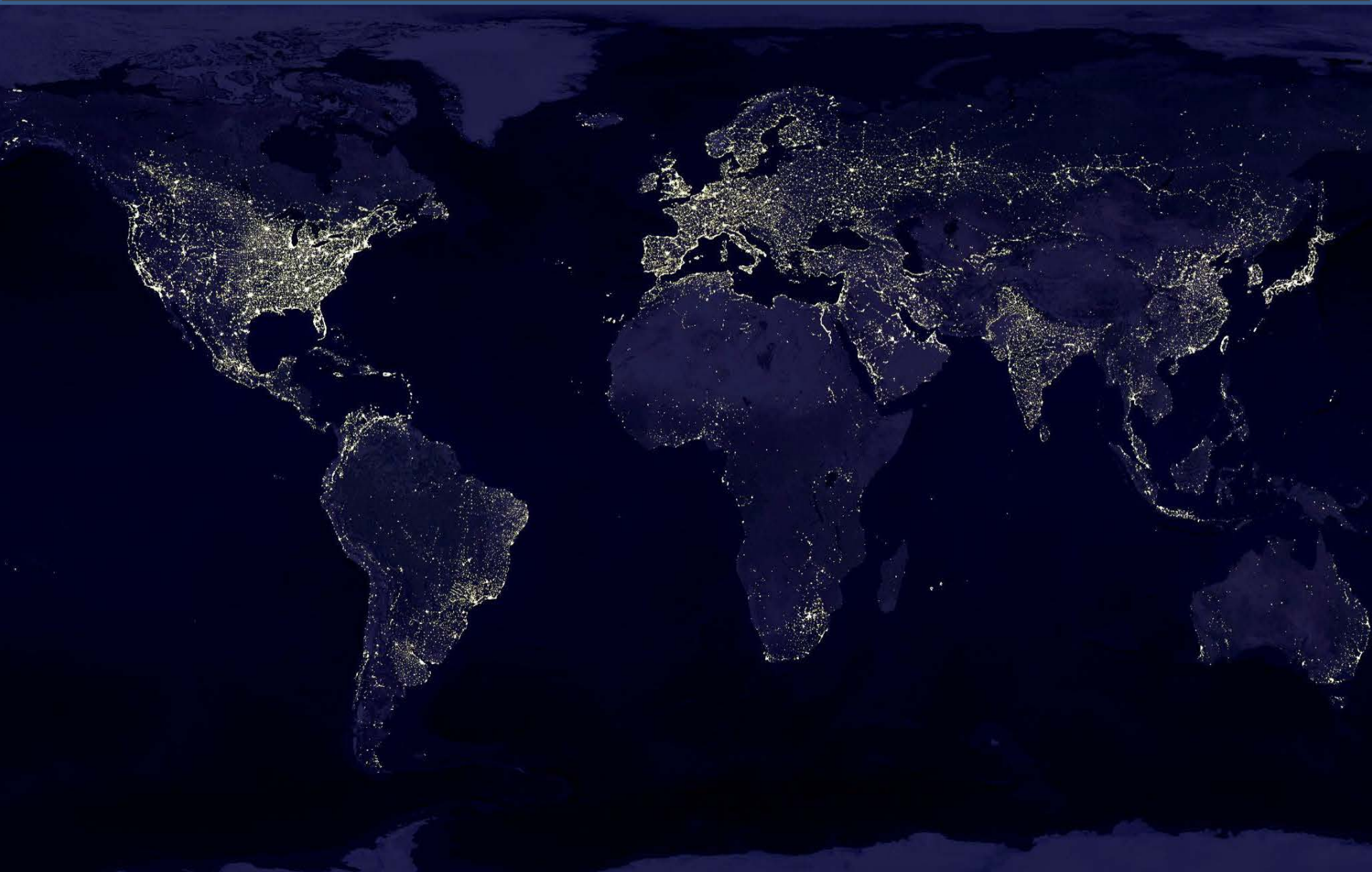
It is a global issue

# Night Energy Use – Early 1970s

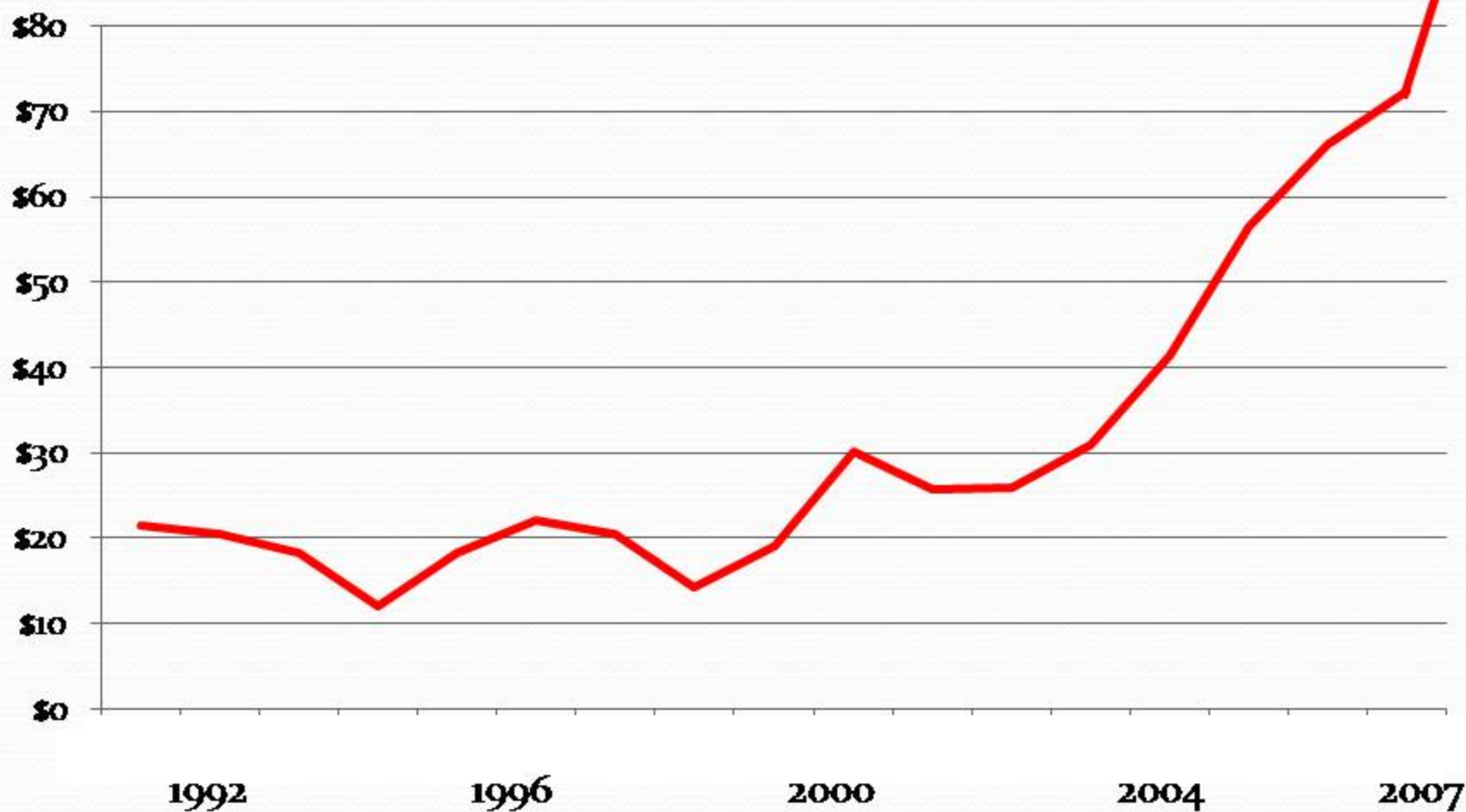




# Night Energy Use – 2005



## Oil (WTI, Annual Average)






# We tend to focus on oil prices

But other mineral commodities are being impacted by rising demand – especially from China.



## China is a leading producer of many critical mineral commodities

Commodity	% World Production	Rank
Tungsten	86	1 <sup>st</sup>
Antimony	81	1 <sup>st</sup>
Cement	50	1 <sup>st</sup>
Indium	49	1 <sup>st</sup>
Tin	43	1 <sup>st</sup>
Magnesium	41	1 <sup>st</sup>
Coal	39	1 <sup>st</sup>
Lead	37	1 <sup>st</sup>
Copper	36	1 <sup>st</sup>
Iron	32	1 <sup>st</sup>
Aluminum	31	1 <sup>st</sup>
Zinc	27	1 <sup>st</sup>
Molybdenum	25	2 <sup>nd</sup>
Cadmium	17	2 <sup>nd</sup>
Silver	13	3 <sup>rd</sup>
Gold	10	3 <sup>rd</sup>
Oil	5	6 <sup>th</sup>



China is a leading producer of many critical mineral commodities

.... And was self sufficient in most of them until around the year 2001

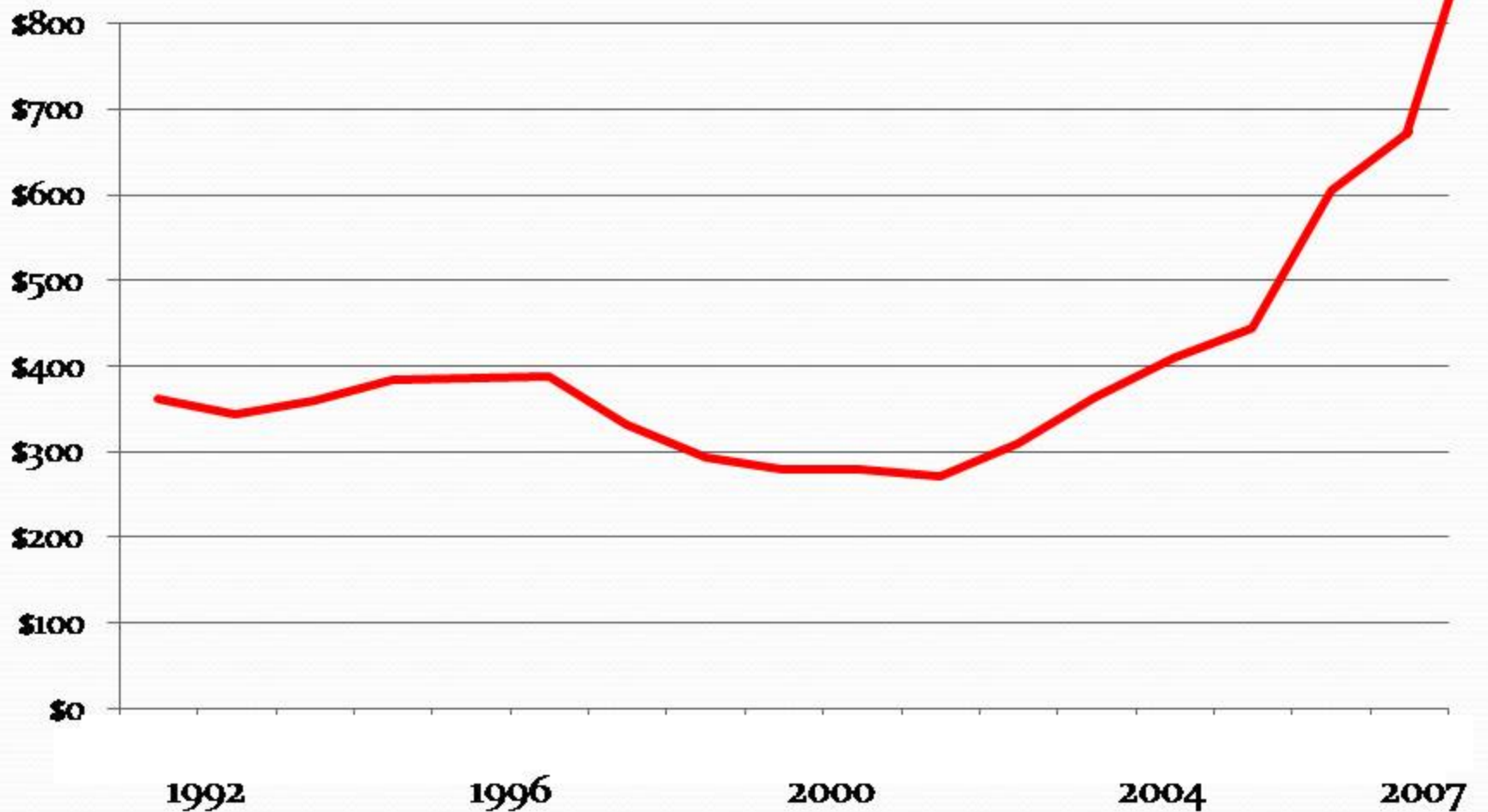


Some commodities show price rises for reasons other than Chinese demand or industrial use:

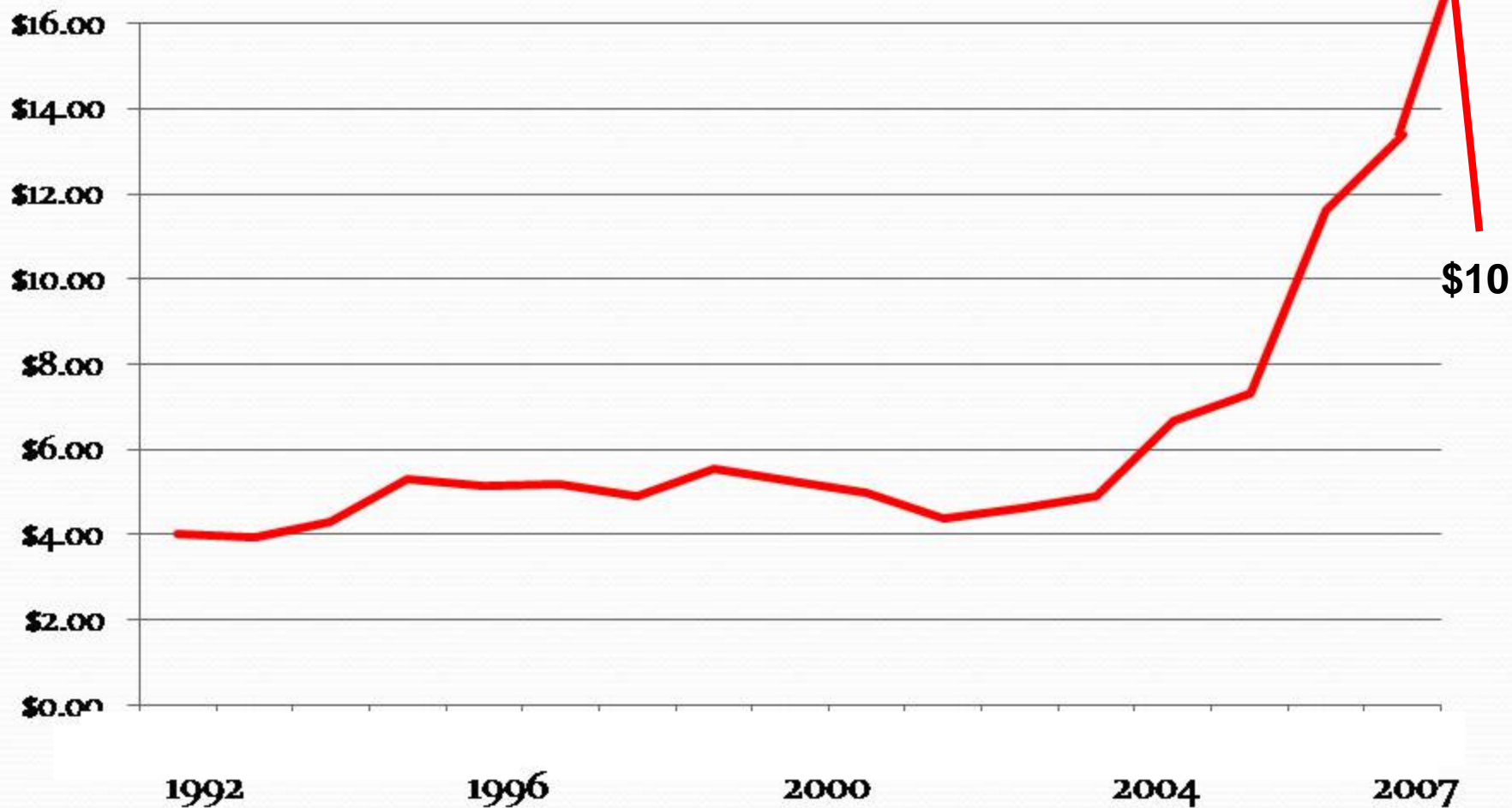
- Gold
- Silver
- Platinum

But these also have industrial uses

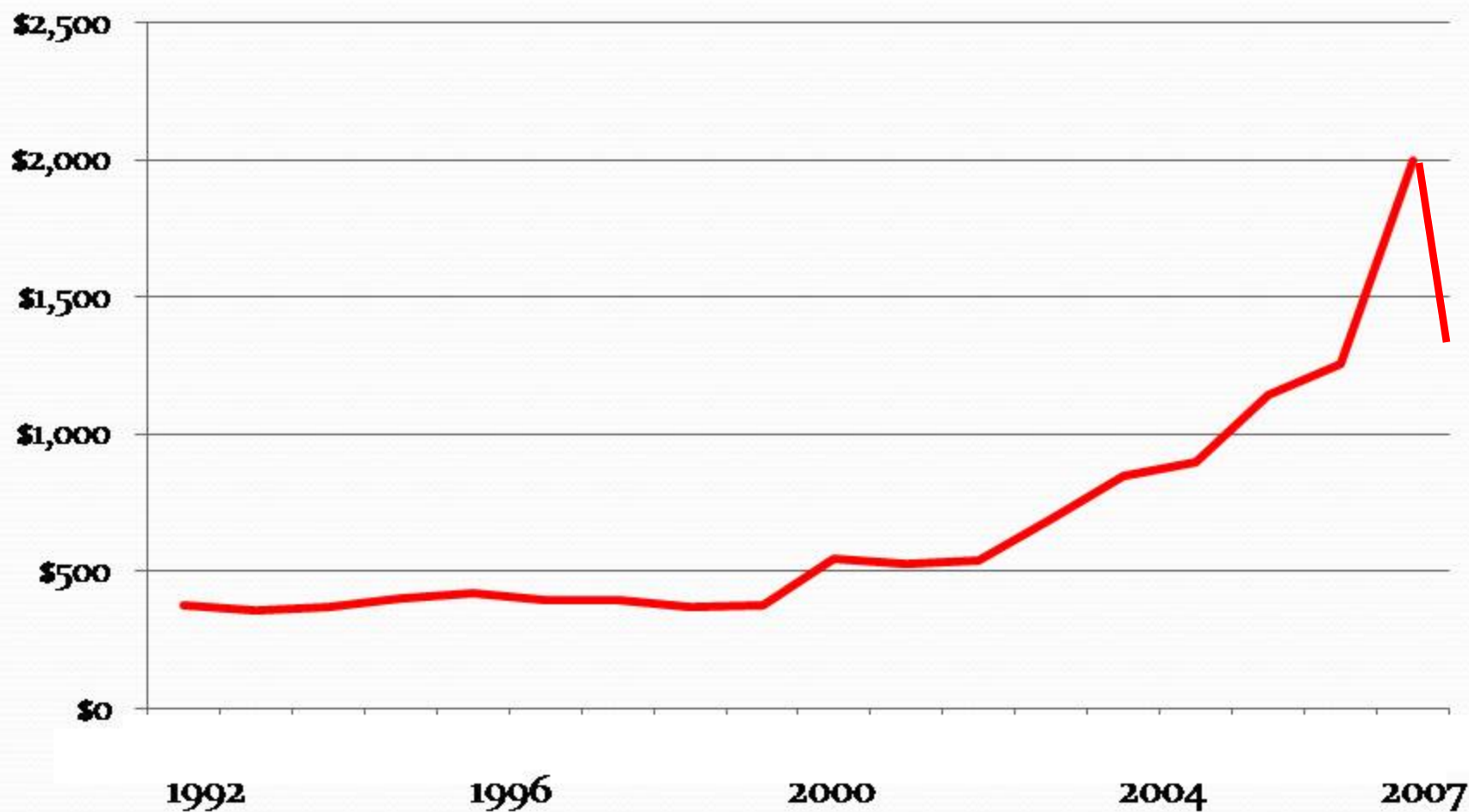
# Gold Jewelry, Electronics




# Silver Photography, Jewelry, Electronics



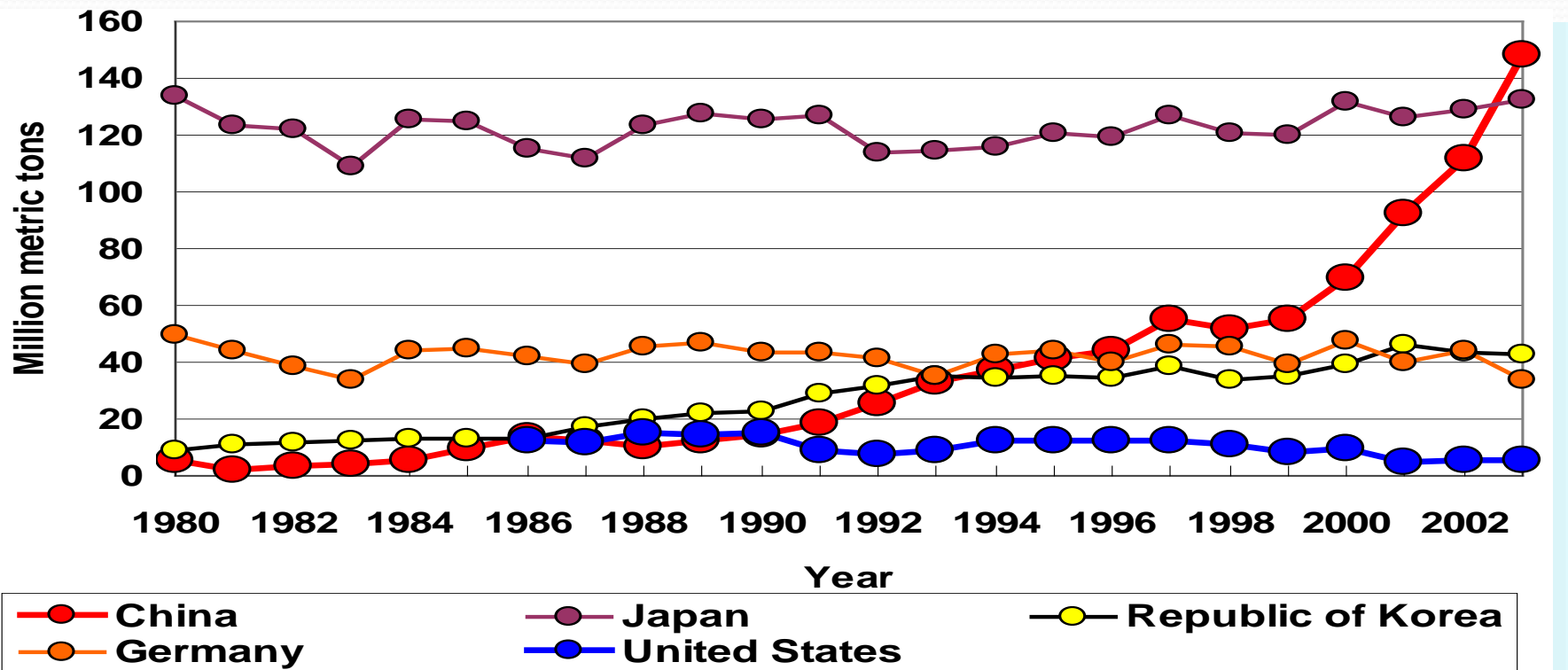
# Platinum Catalysts, Electronics





The run-up in prices for precious metals has gotten a lot of attention, but some of the industrial metals are showing the greatest percentage price increase

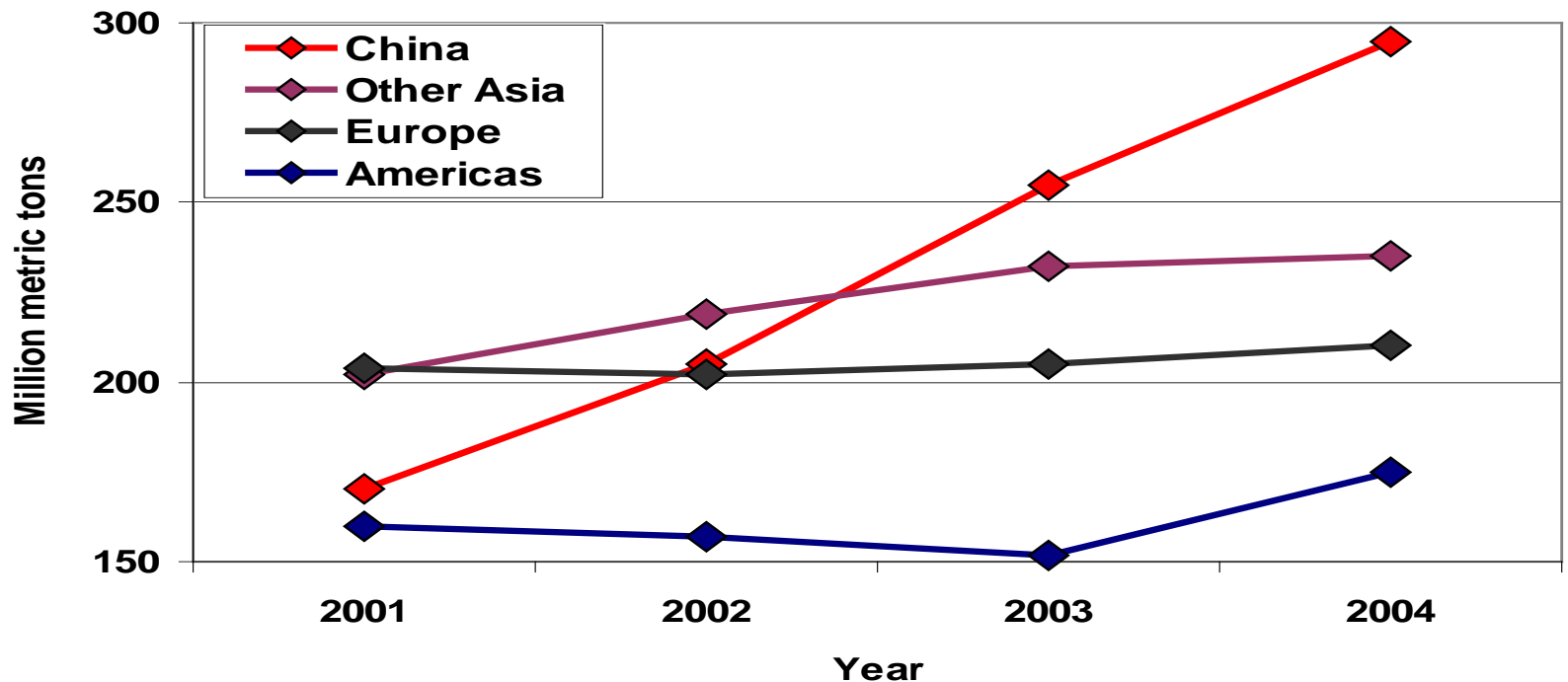
# China remains the #1 producer of iron ore



But has also become the #1 importer of iron ore

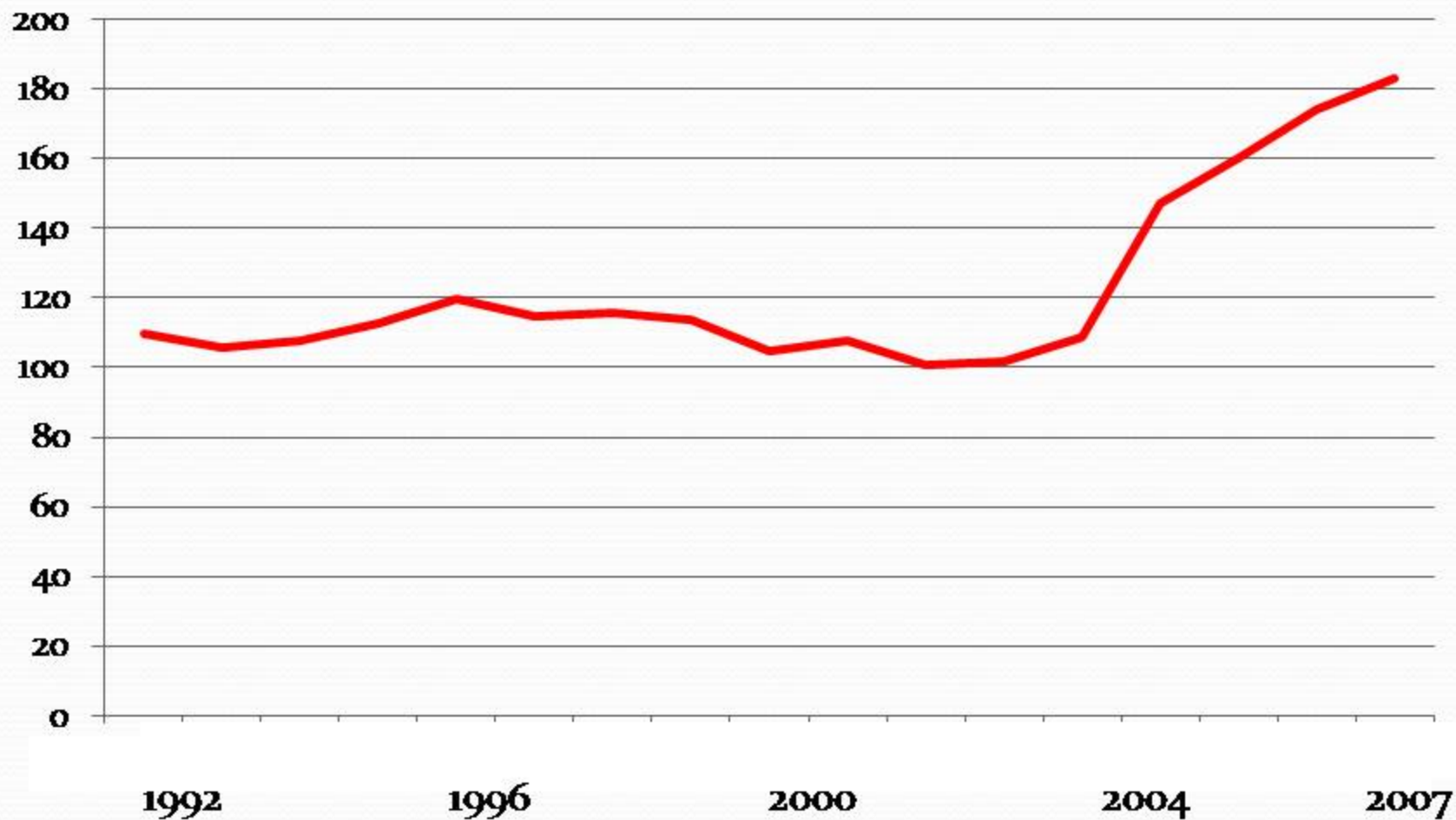


# Demand for Steel

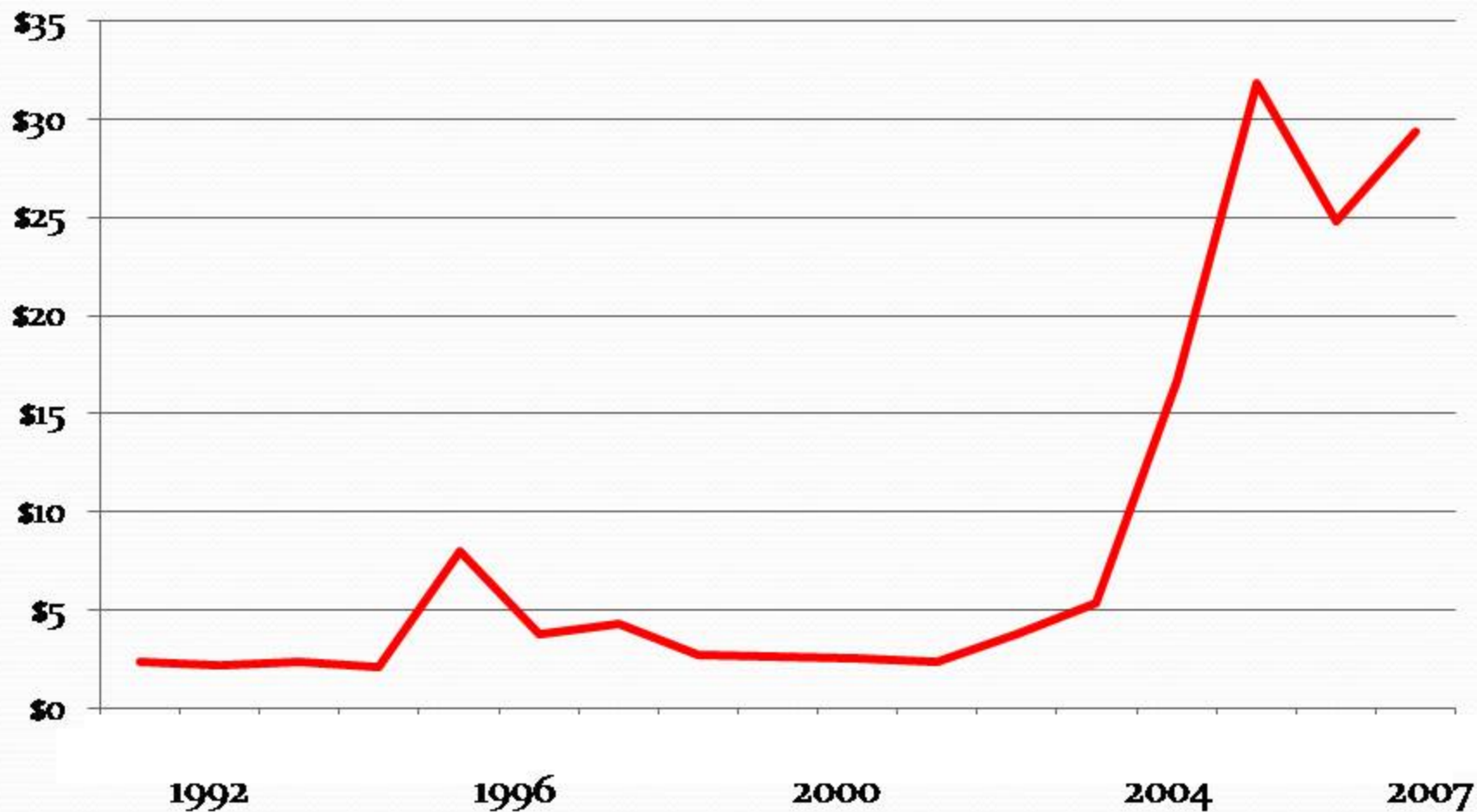


China's increase in demand for iron ore in the year 2005 was equal to half of all U.S. production

## Iron (producer price index, 1982=100)

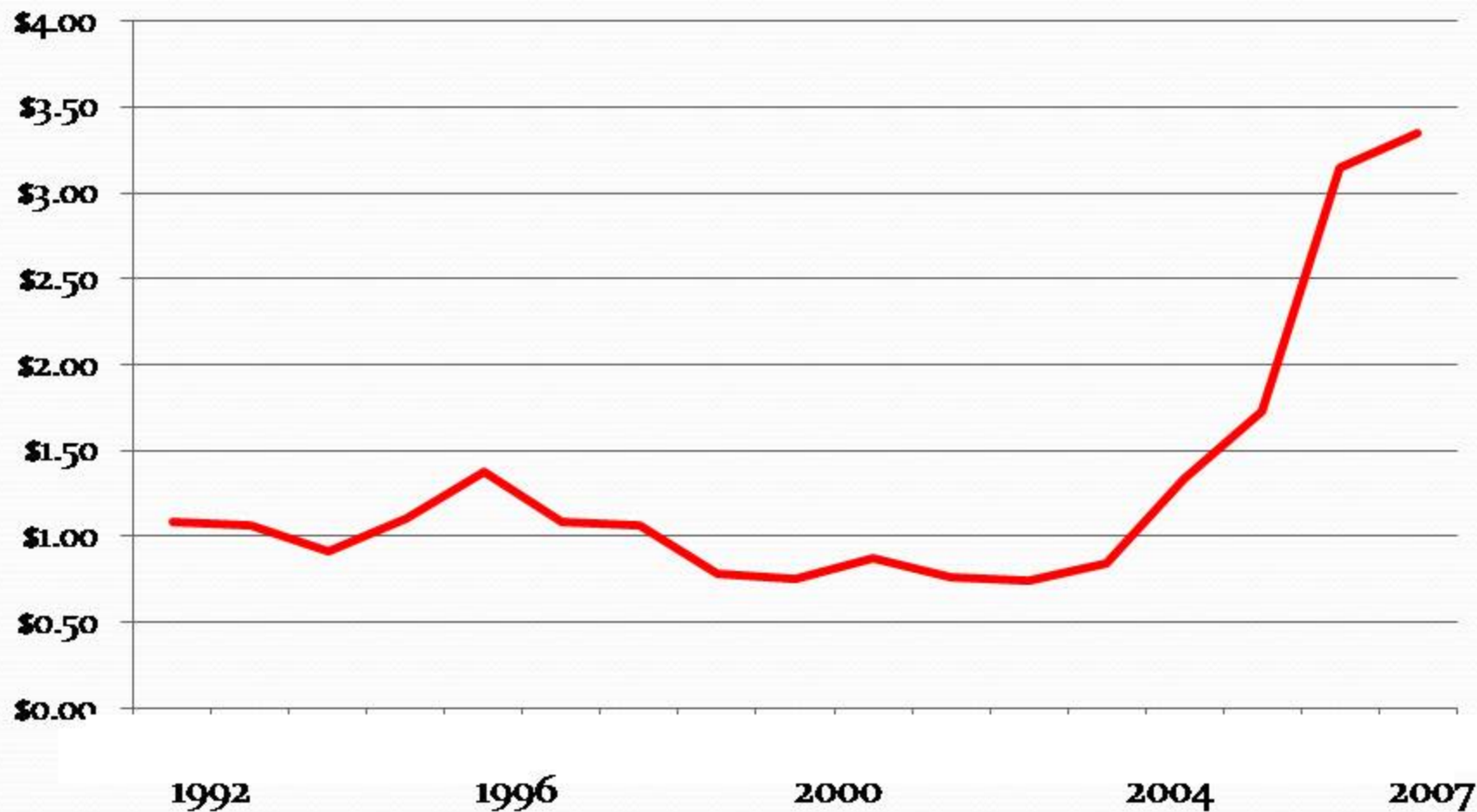


# Molybdenum Steel Alloys

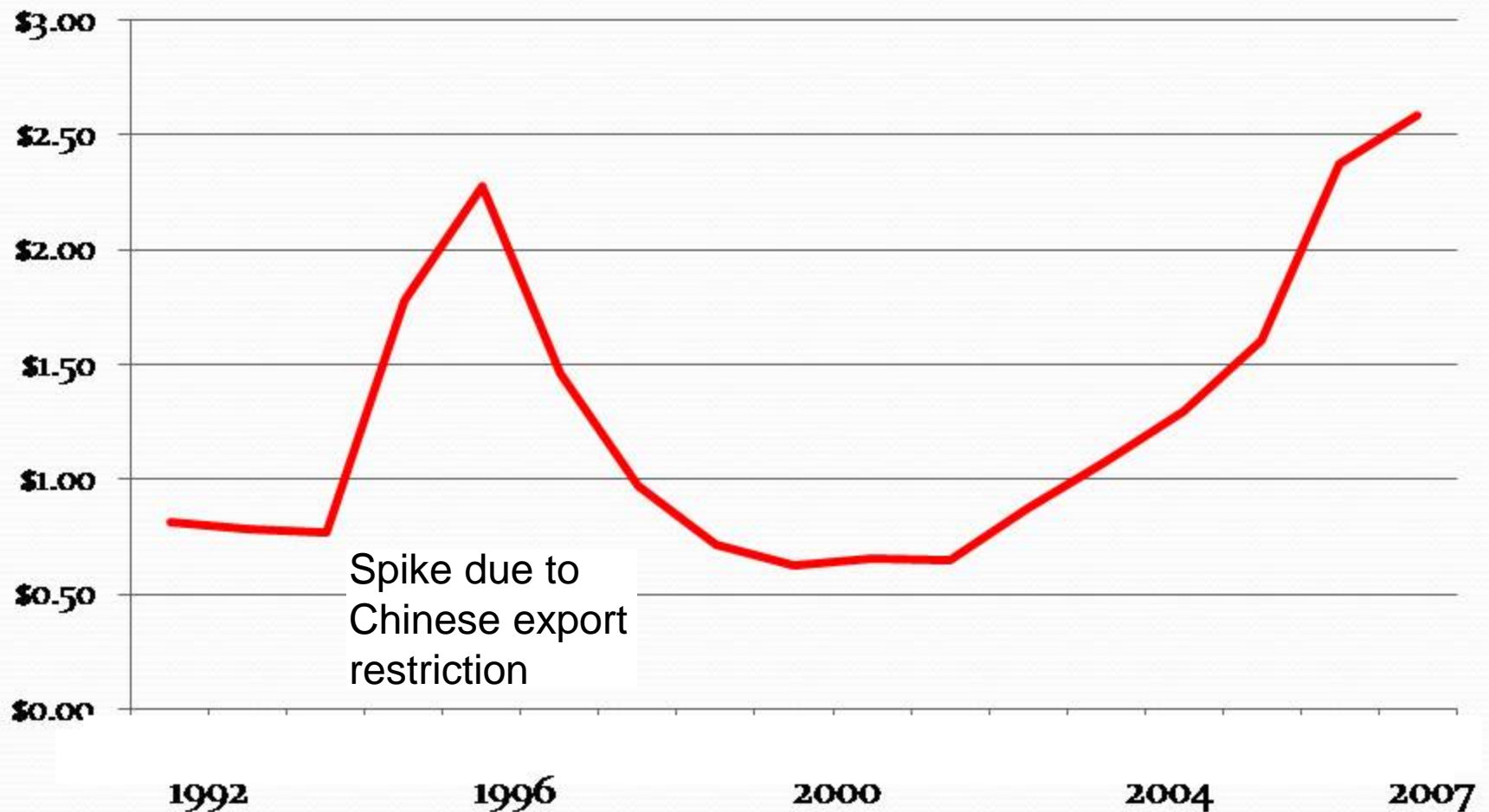


Copper

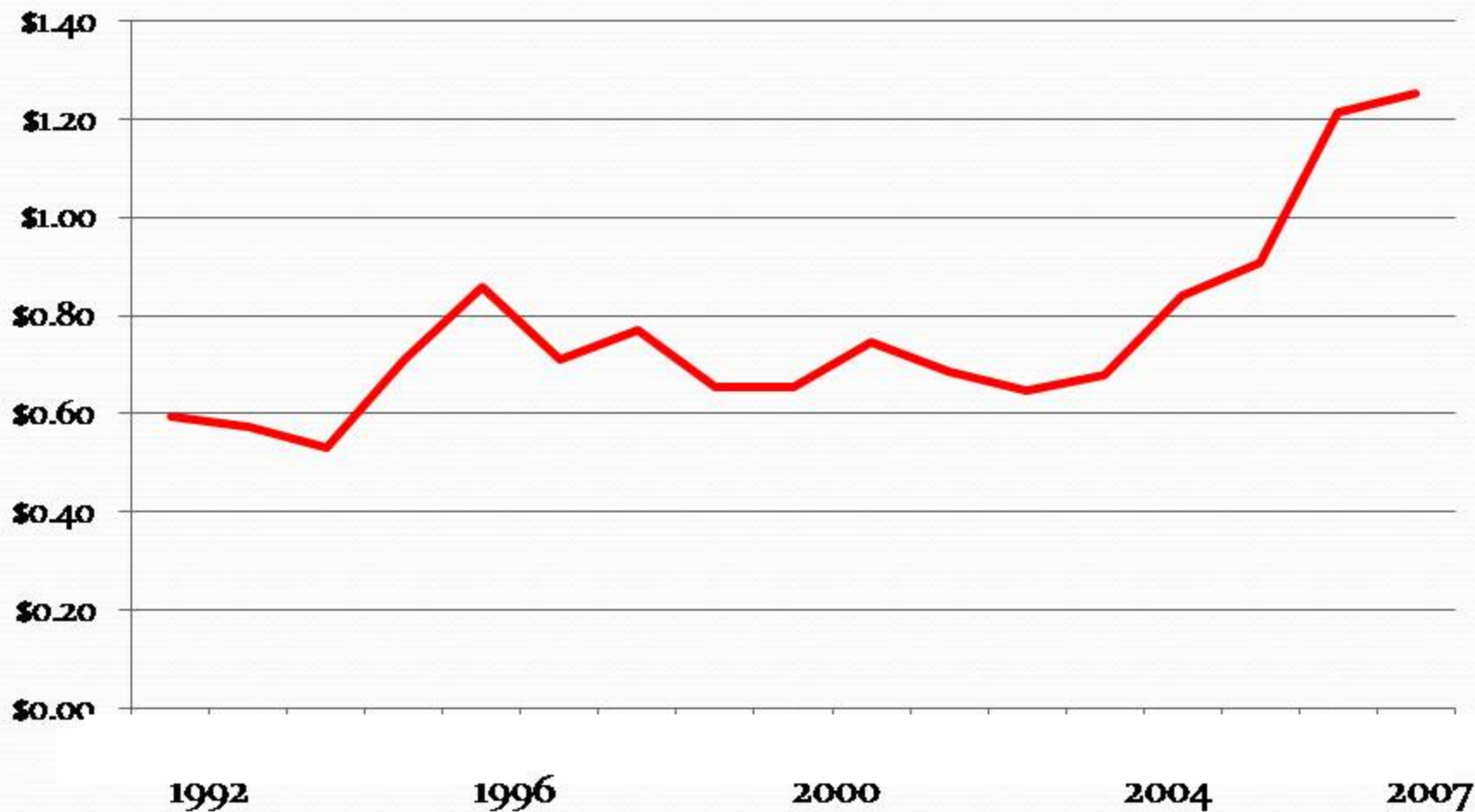
Electronics



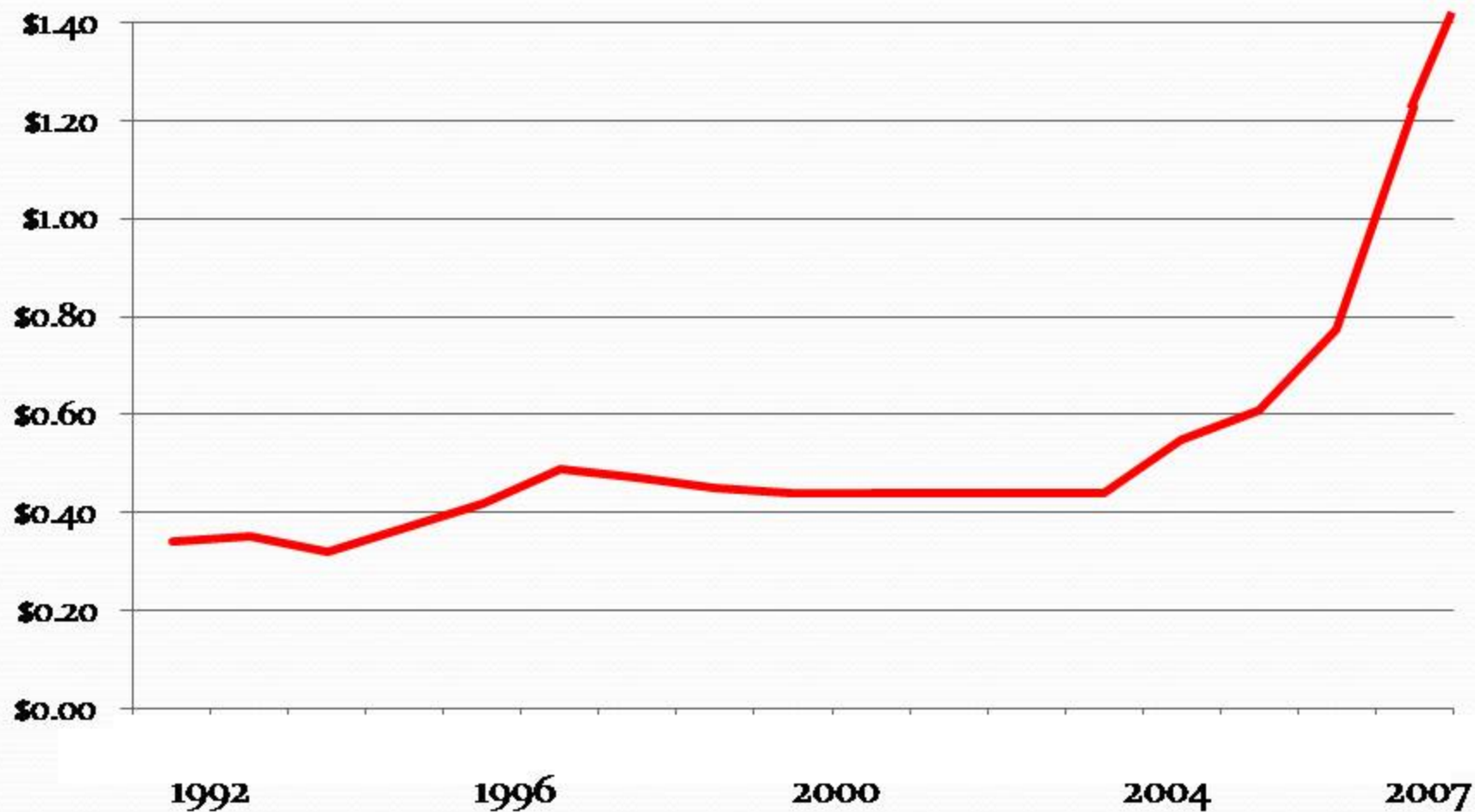
# Antimony Alloys, Flame Retardants



# Aluminum Transportation, Packaging

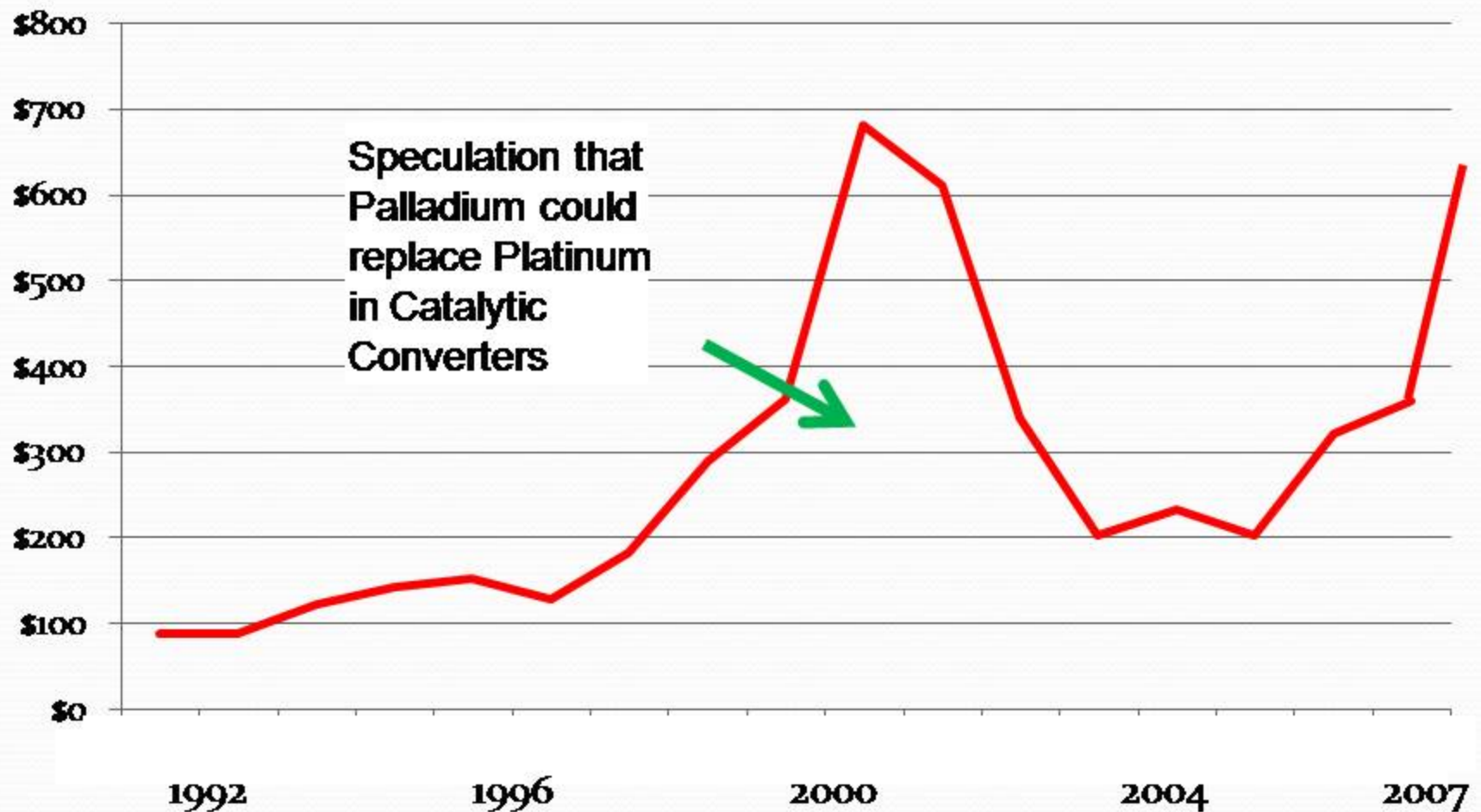


# Lead Batteries, Alloys



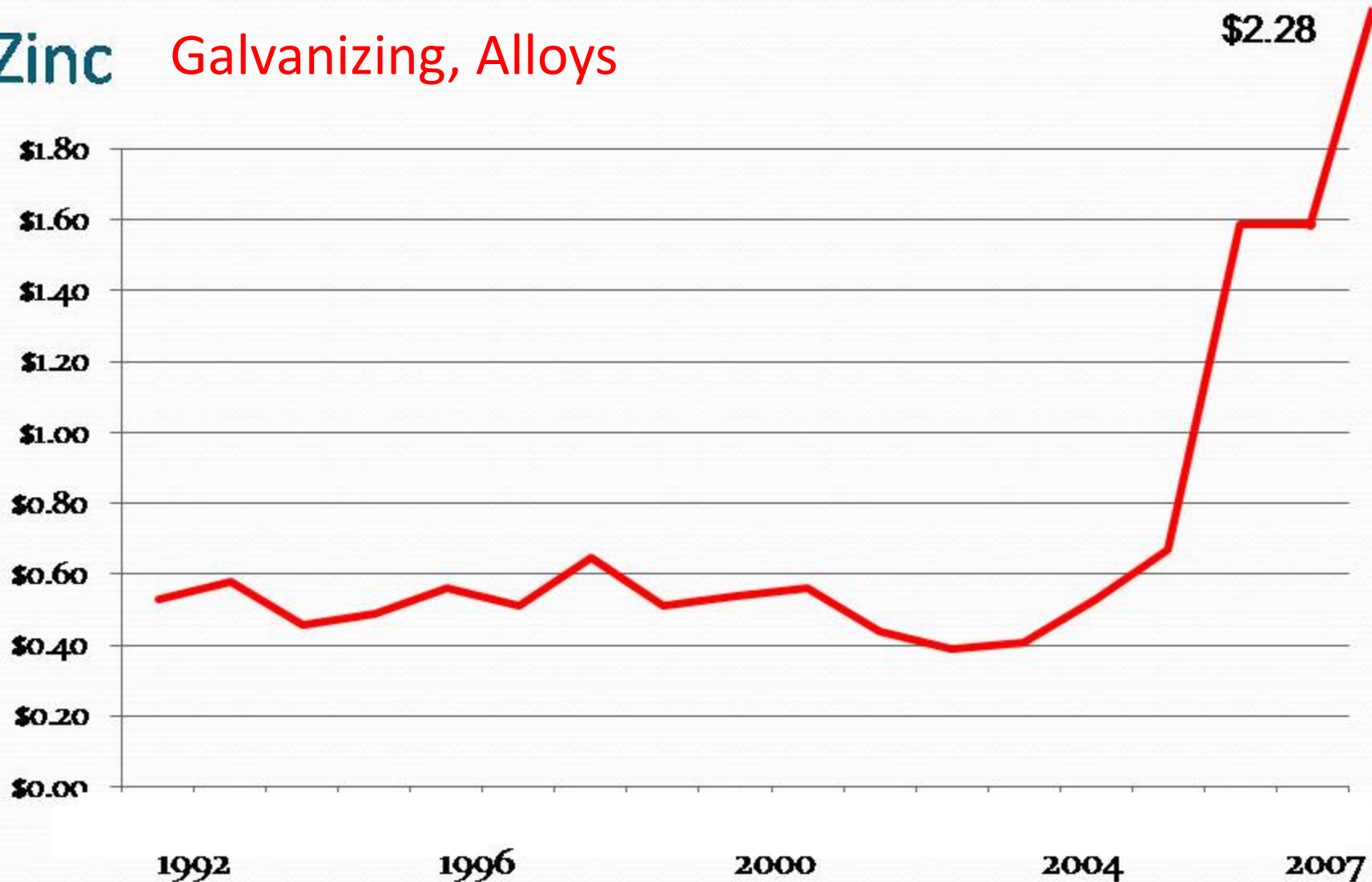


# Palladium Electronics, Jewelry, Hydrogen Storage

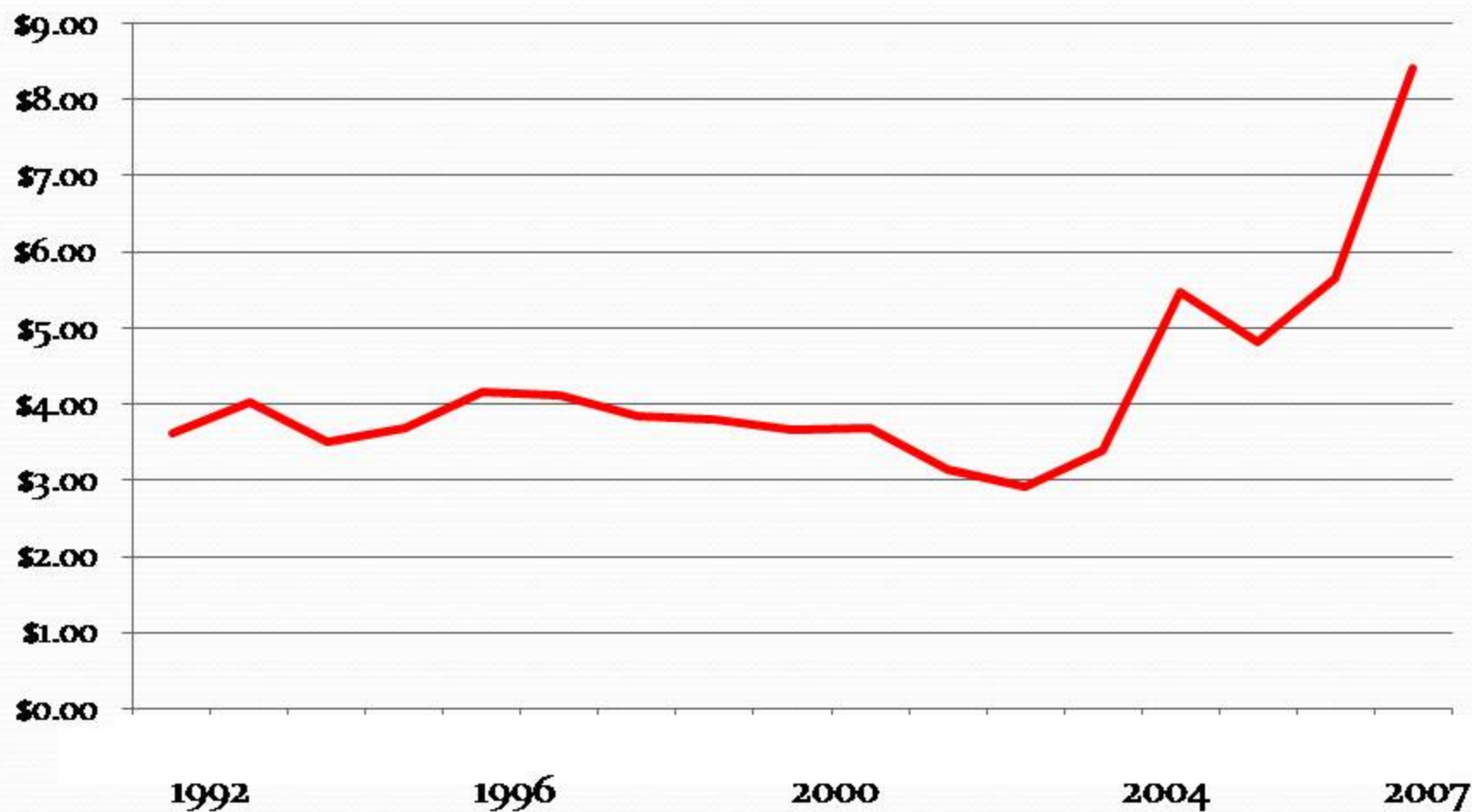




# Zinc Galvanizing, Alloys

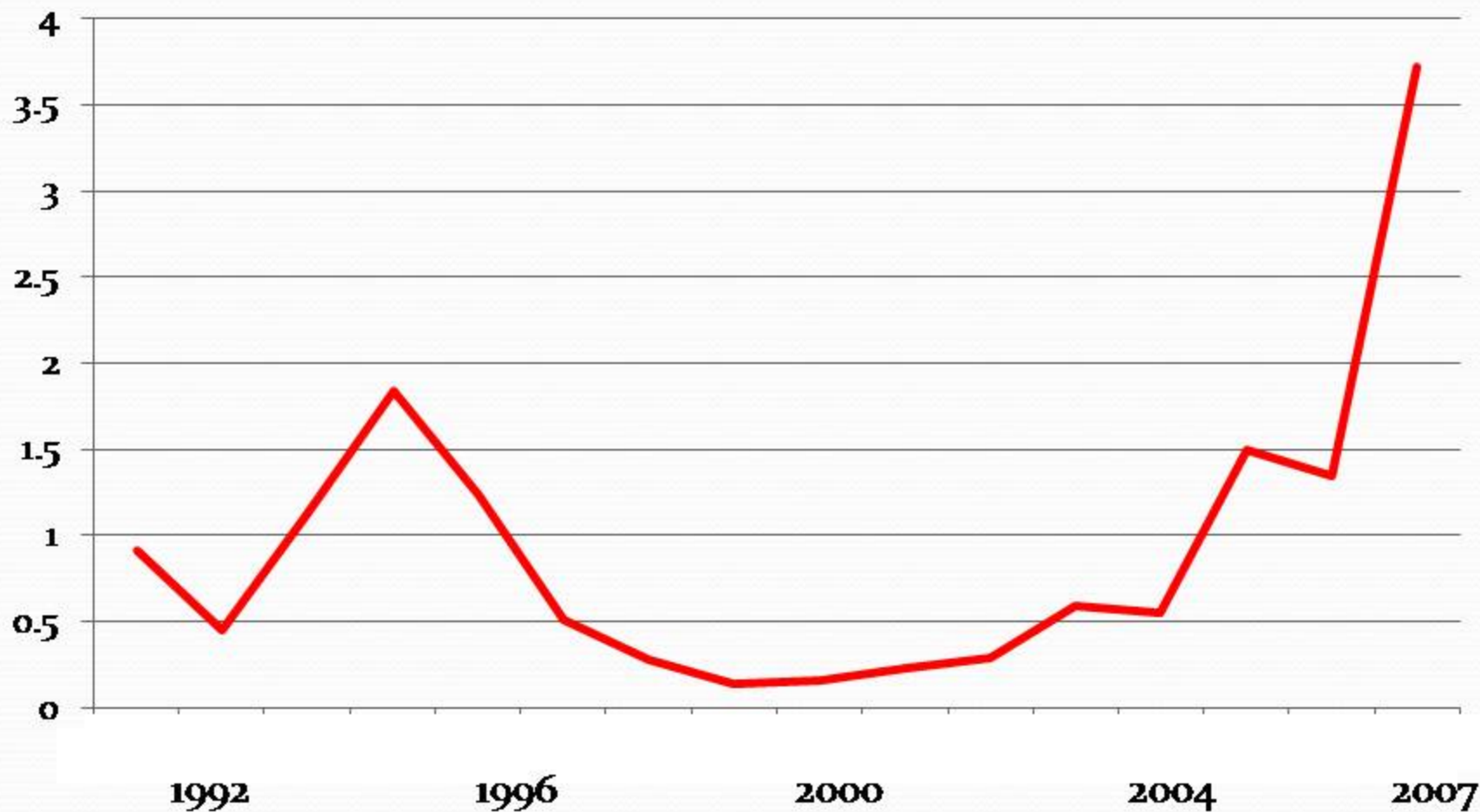


## Tin Coatings, Alloys

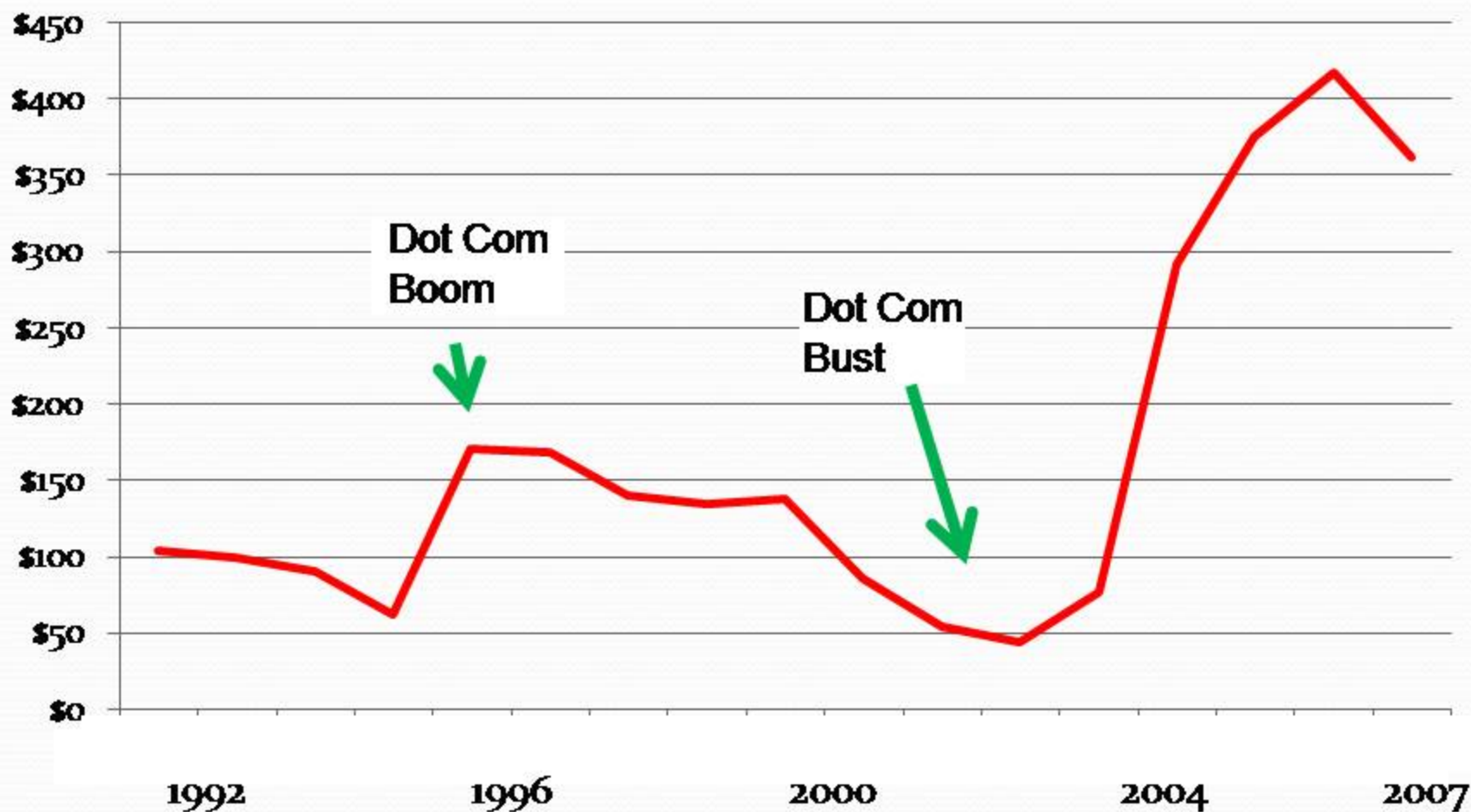


# Cadmium

Batteries, Paint, Plastics

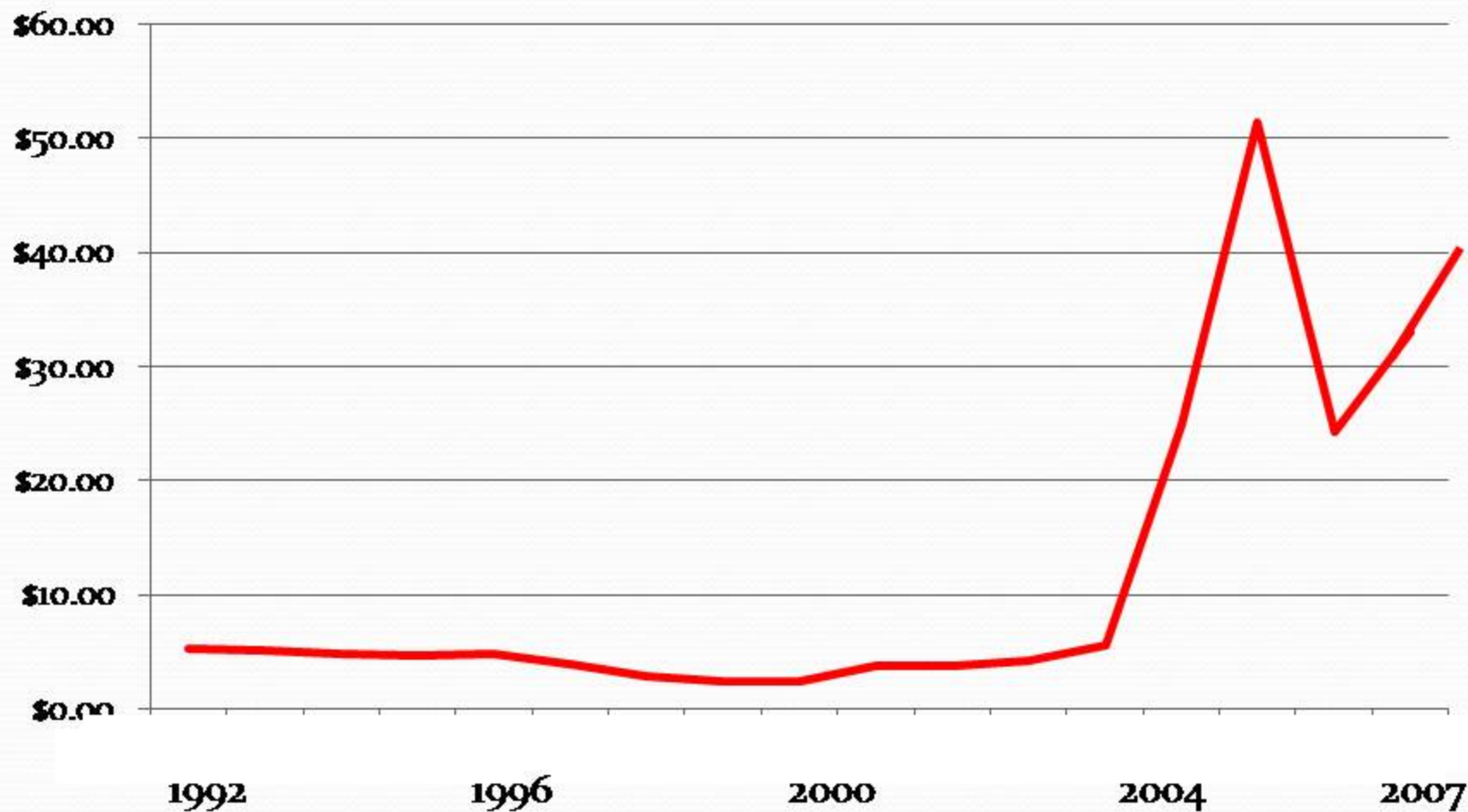


# Indium Thin Films (LCDs)



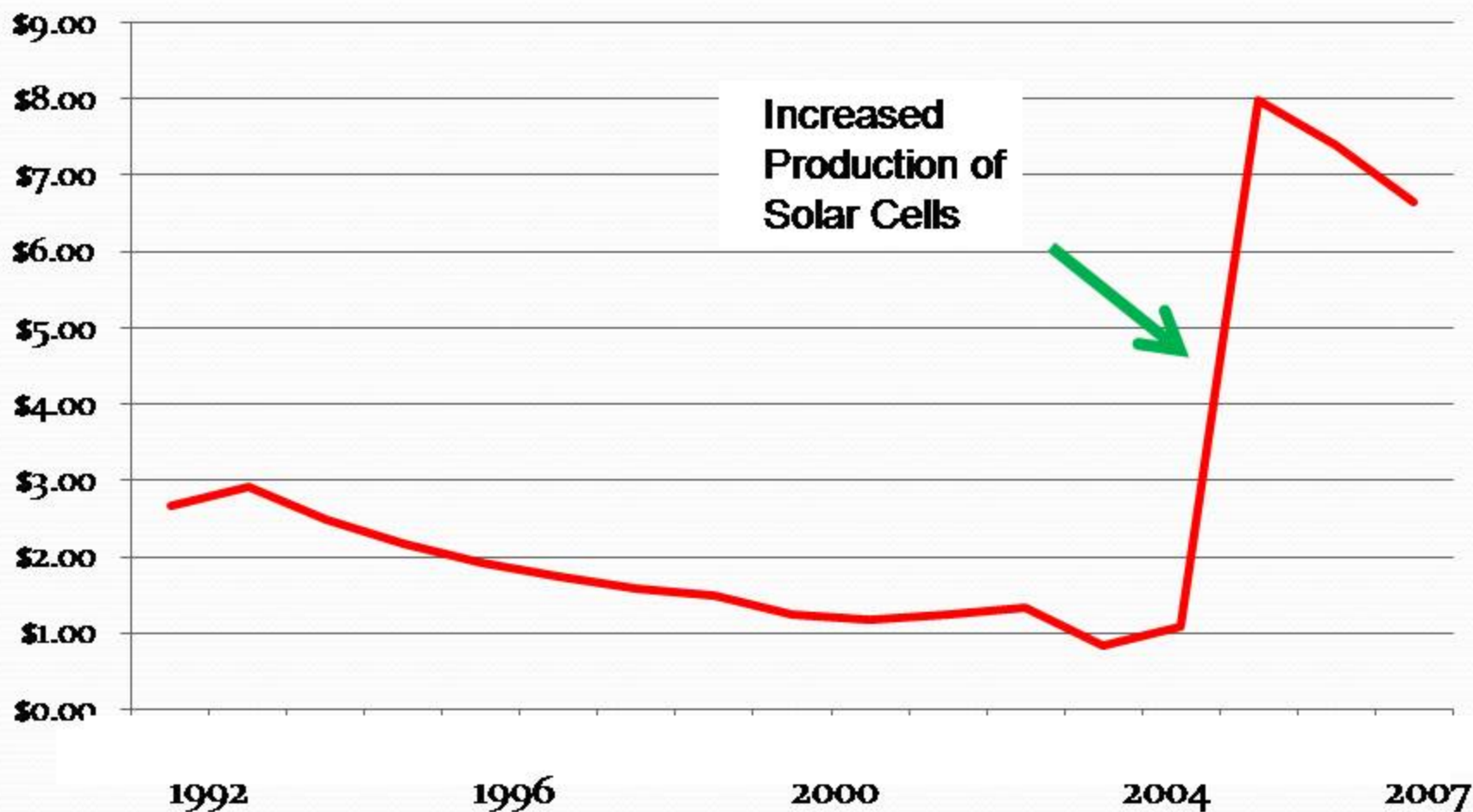
# Selenium

Glass, Alloys



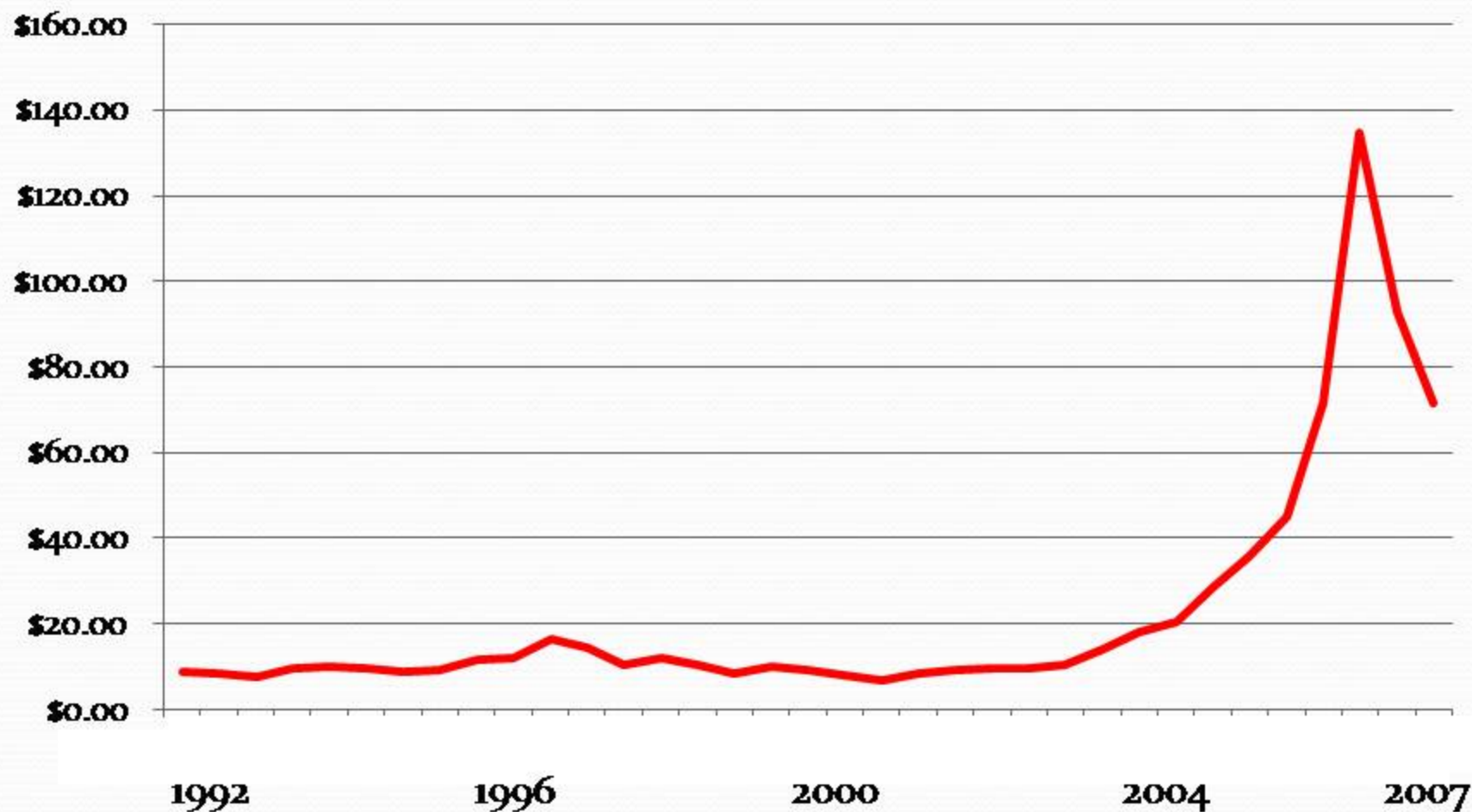
# Tellurium

Solar Cells, Alloys





# Uranium ( $U^{3}O^{8}$ )



# Summary

## A New Paradigm for Strategic Commodities:

- Prices will continue to fluctuate, but at a substantially higher price than was seen before 2003.
- Many U.S. manufacturing jobs have been lost and will not be restored.
- A global scramble is on for additional supplies
  - Foreign investors buying U.S. And other assets
  - Competition with oil companies for talent





# Summary

It's a new world out there.....

And we all need to be ready for it



Thank You