



***Peak Oil Special Order
to the U.S. House of Representatives***

12:25 pm – 1:25 pm

February 28, 2008

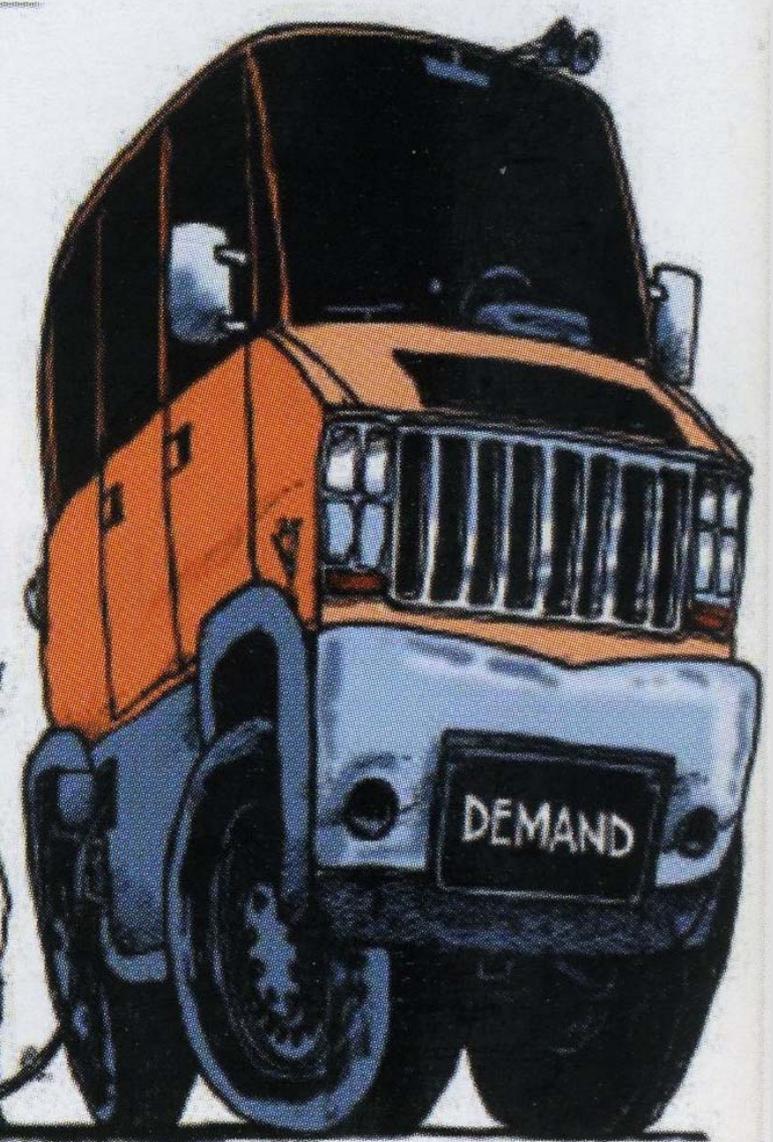
Congressman Roscoe Bartlett

www.bartlett.house.gov/EnergyUpdates

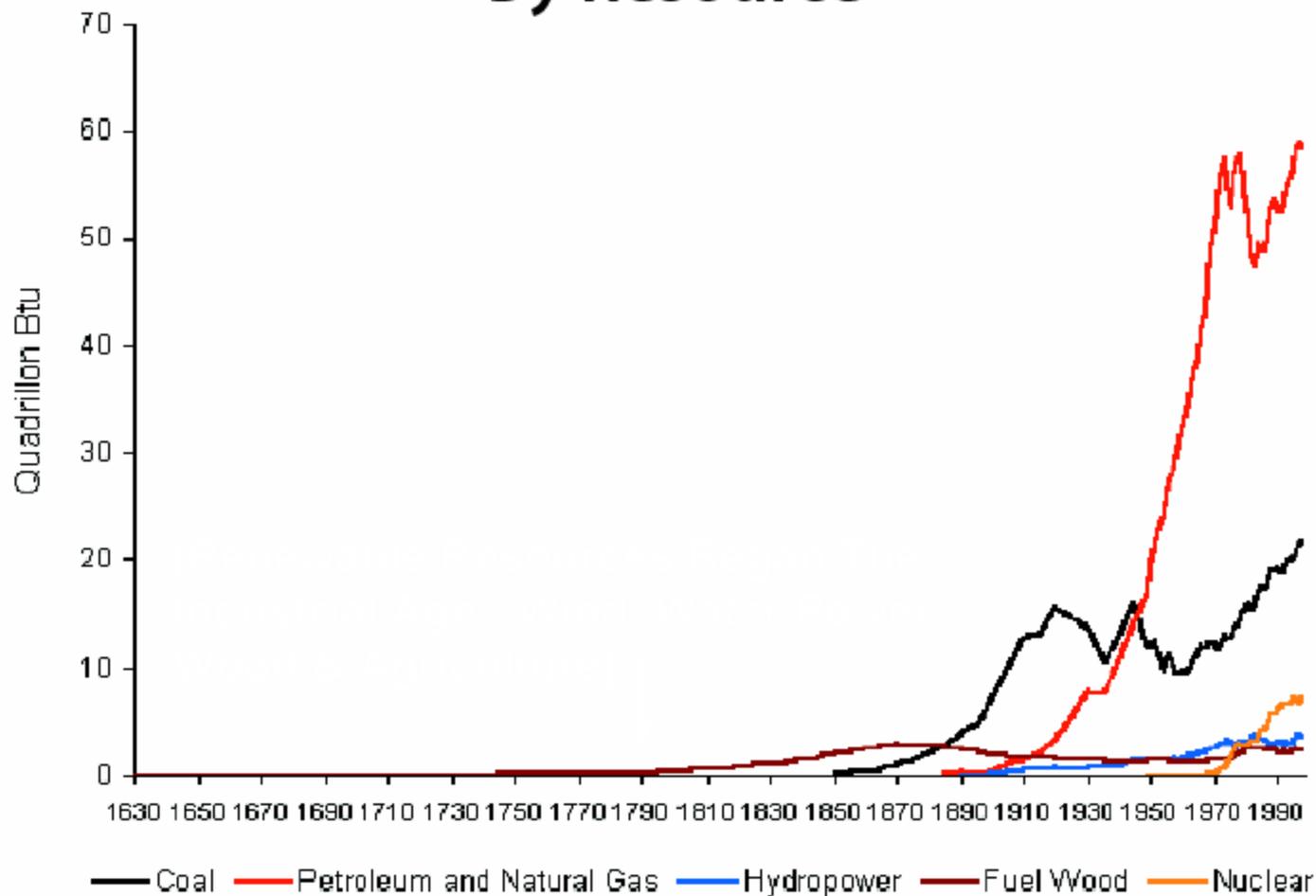


THE WALL STREET JOURNAL
Business Edition

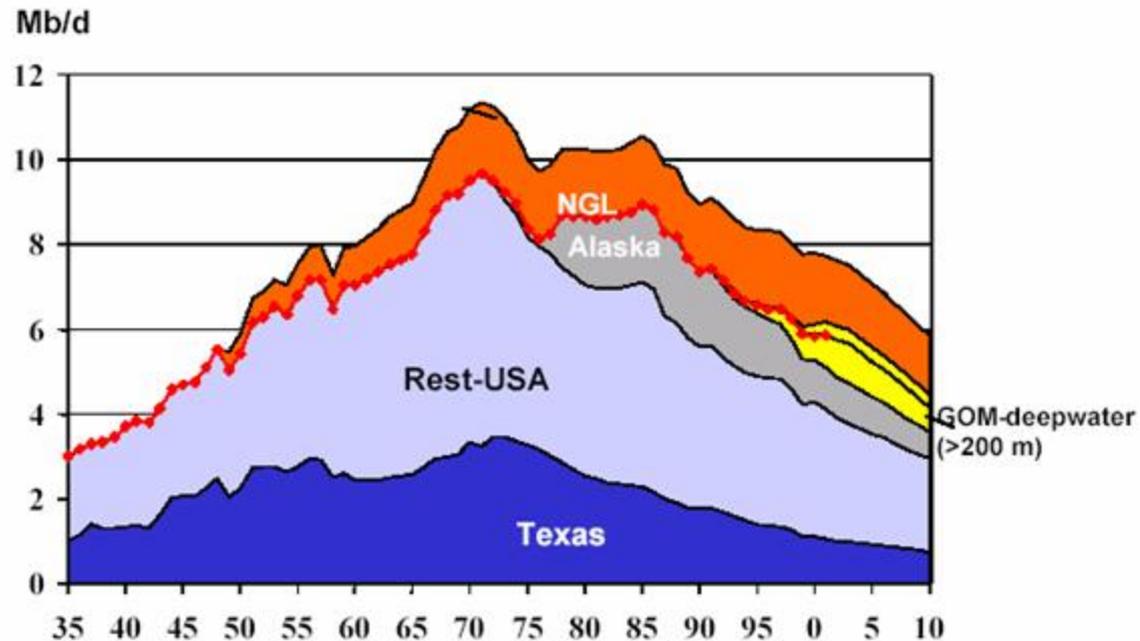
JUST WHY
IS GAS SO
EXPENSIVE?



US Consumption of Energy By Resource



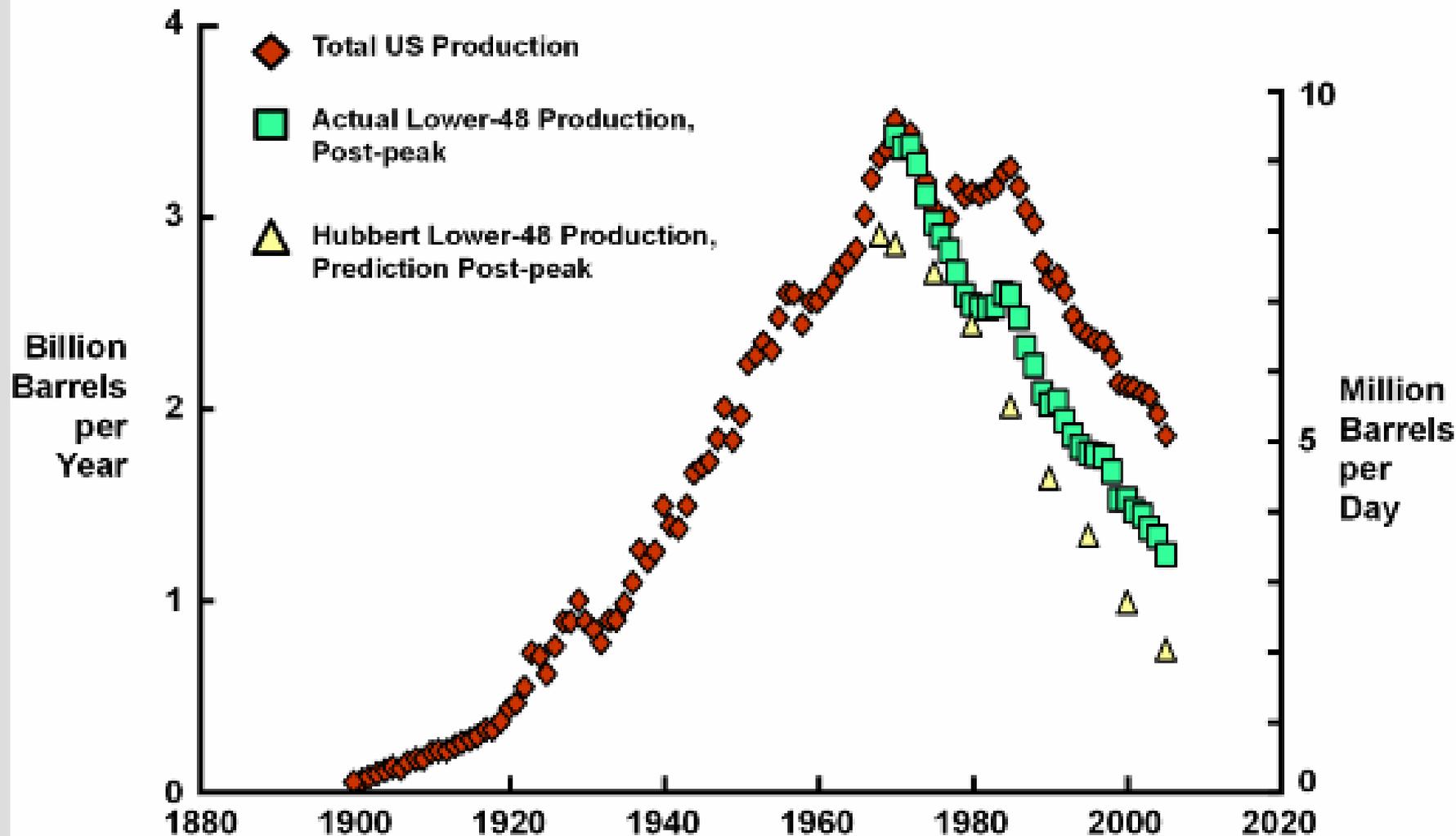
USA – Production forecast to 2010 incl. nc oil



Source: Texas Railroad Commission, US Energy Information Administration

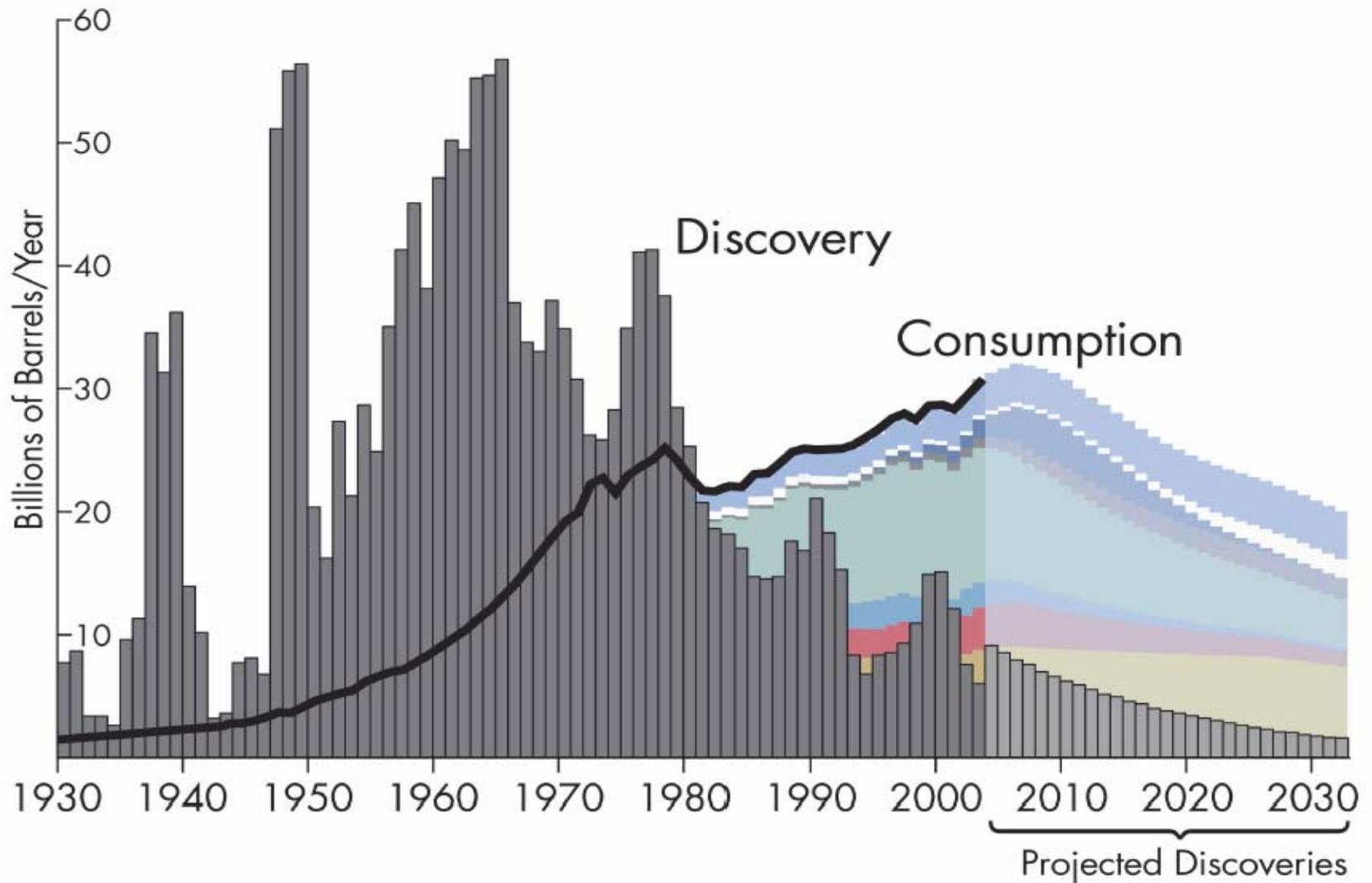
Figure 4: The future oil production profile for the declining oil regions of Texas and Rest of the USA is controlled simply by the physics of depletion, allowing a straightforward extrapolation of existing trends.

United States Production, Hubbert versus Actual



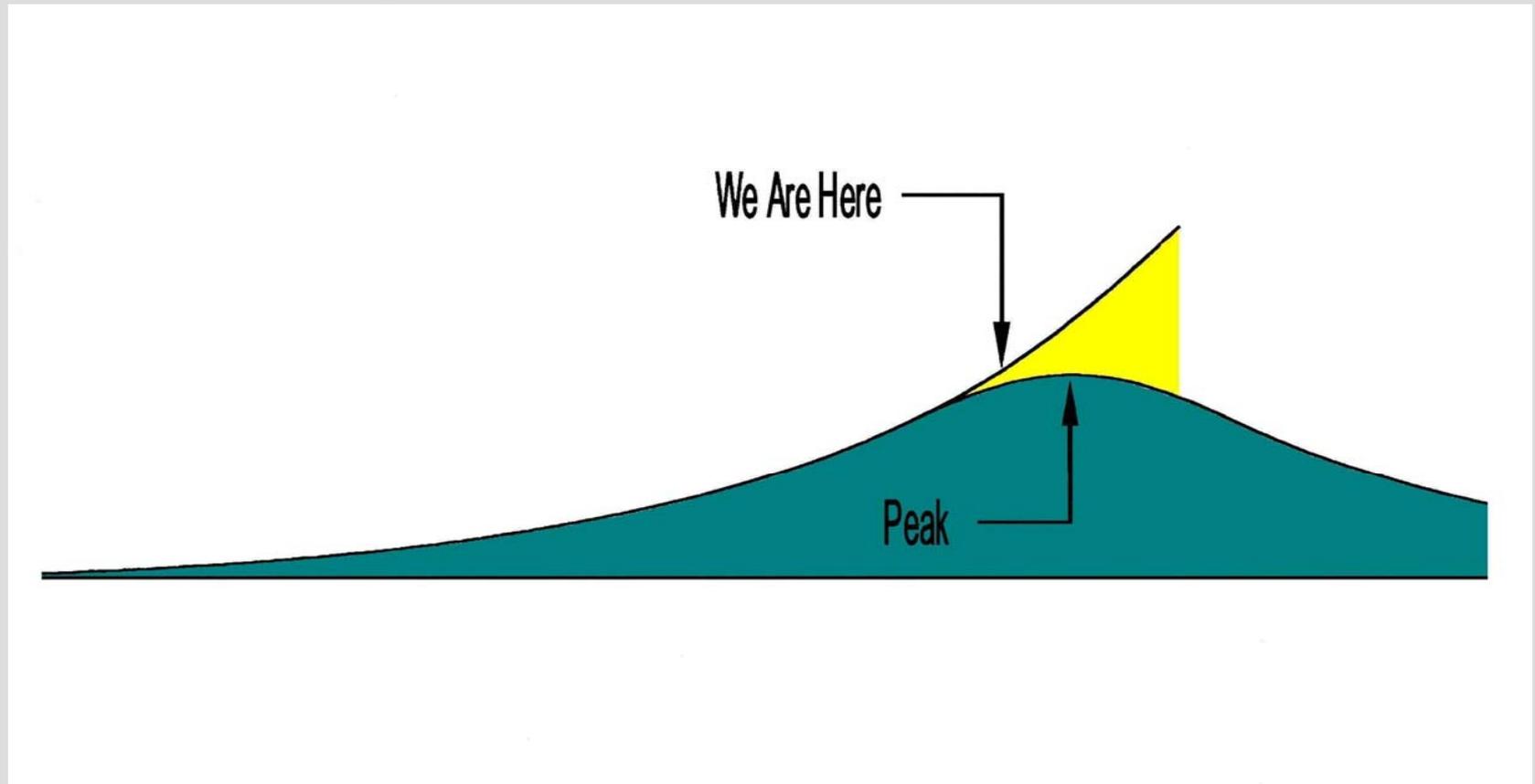
Source: Cambridge Energy Research Associates.

Peak Oil – The Growing Gap

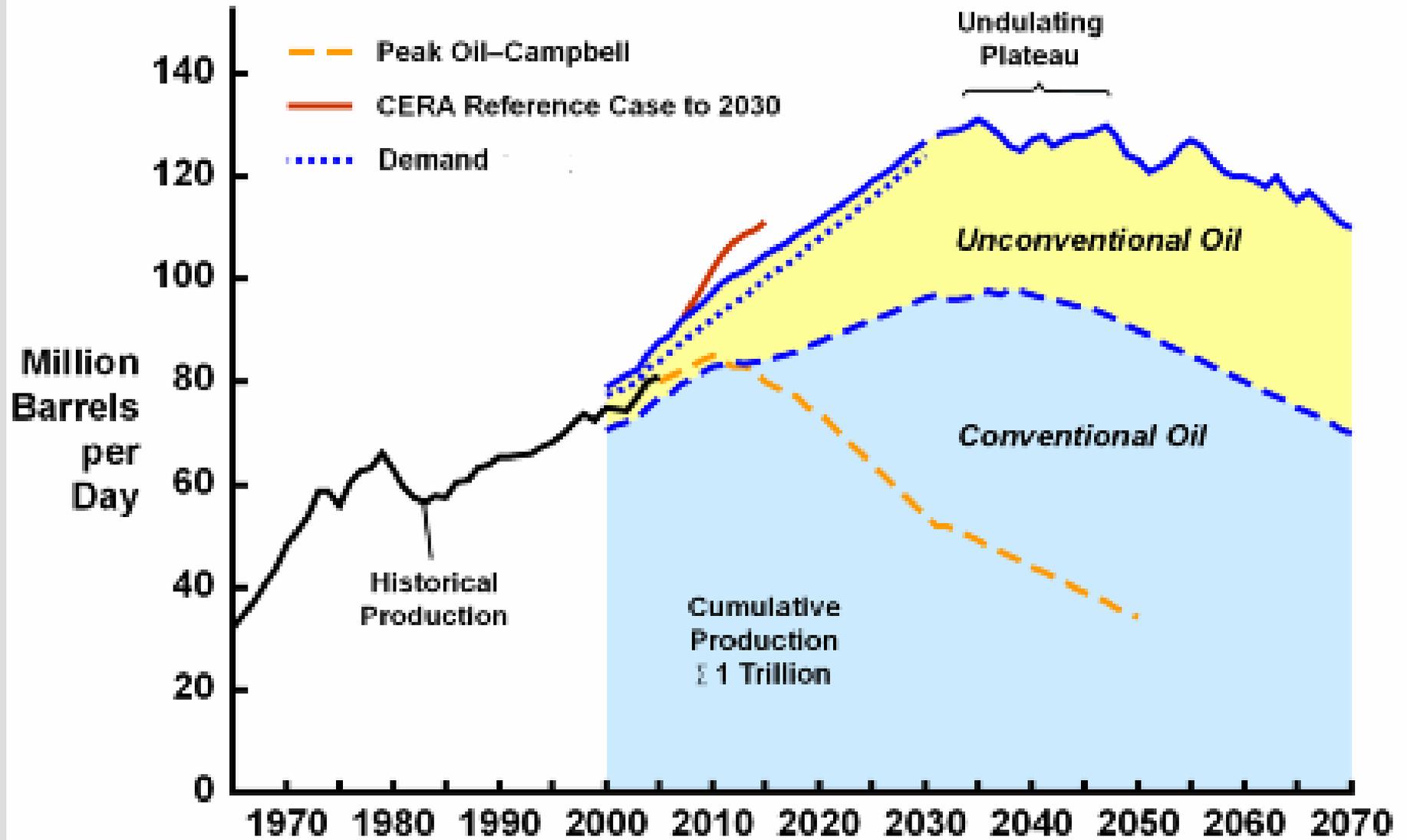


The Essence of the Problem

There is **NO Ready**
Liquid Fuel Substitute!

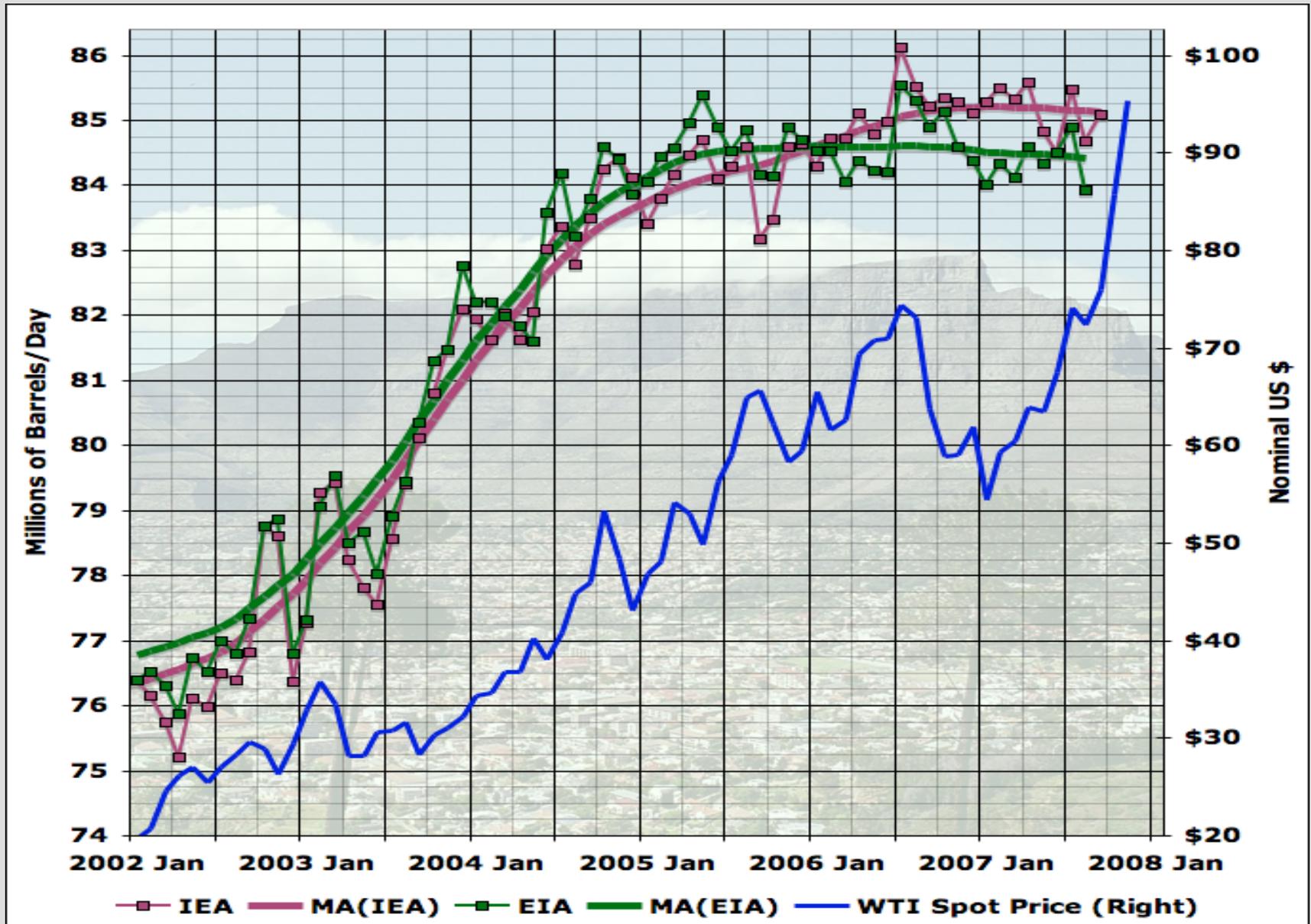


Undulating Plateau versus Peak Oil



Source: Cambridge Energy Research Associates.

Peak Oil – Are we there yet?



Shell Oil CEO Jeroen van der Veer on Jan. 22, 2008

“By the year 2100, the world’s energy system will be radically different from today’s... the world’s current predicament limits our maneuvering room. We are experiencing a step-change in the growth rate of energy demand...and **Shell estimates that after 2015 supplies of easy-to-access oil and gas will no longer keep up with demand. As a result, society has no choice but to add other sources of energy.”**

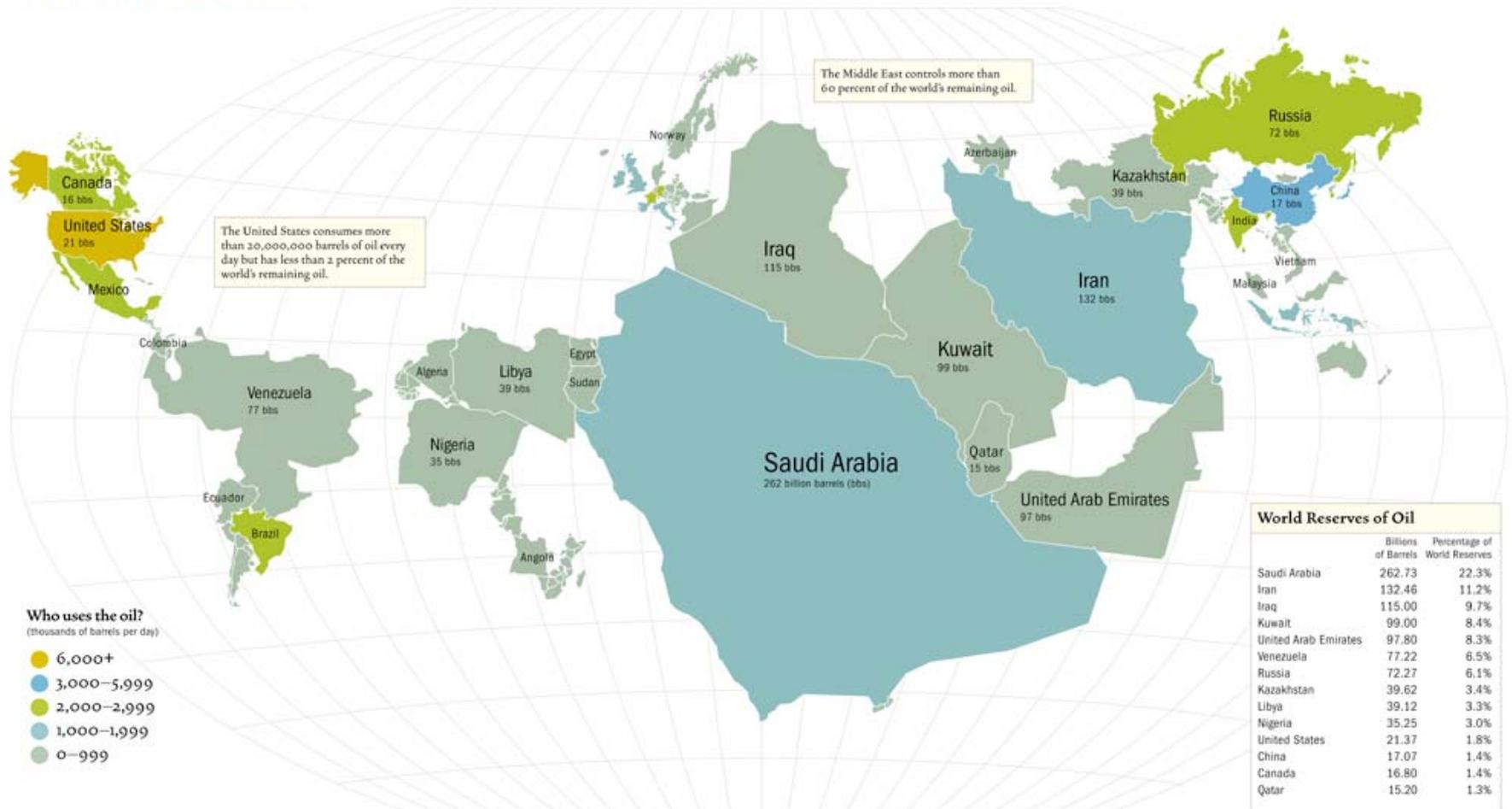
January 22, 2008 “Shell Energy Scenarios” letter/column by Jeroen van der Veer, Chief Executive, Shell Oil at http://www.shell.com/home/content/aboutshell-en/our_strategy/shell_global_scenarios/two_energy_futures/two_energy_futures_25012008.html

We do have to do *something* about the energy problem. I can tell you that nothing has really taken me aback more as secretary of State than the way that **the politics of energy is -- I will use the word **warping diplomacy** around the world.**

United States Secretary of State Condoleezza Rice before the Senate Foreign Relations Committee on April 5, 2006

The World According to Oil

Who has the oil?



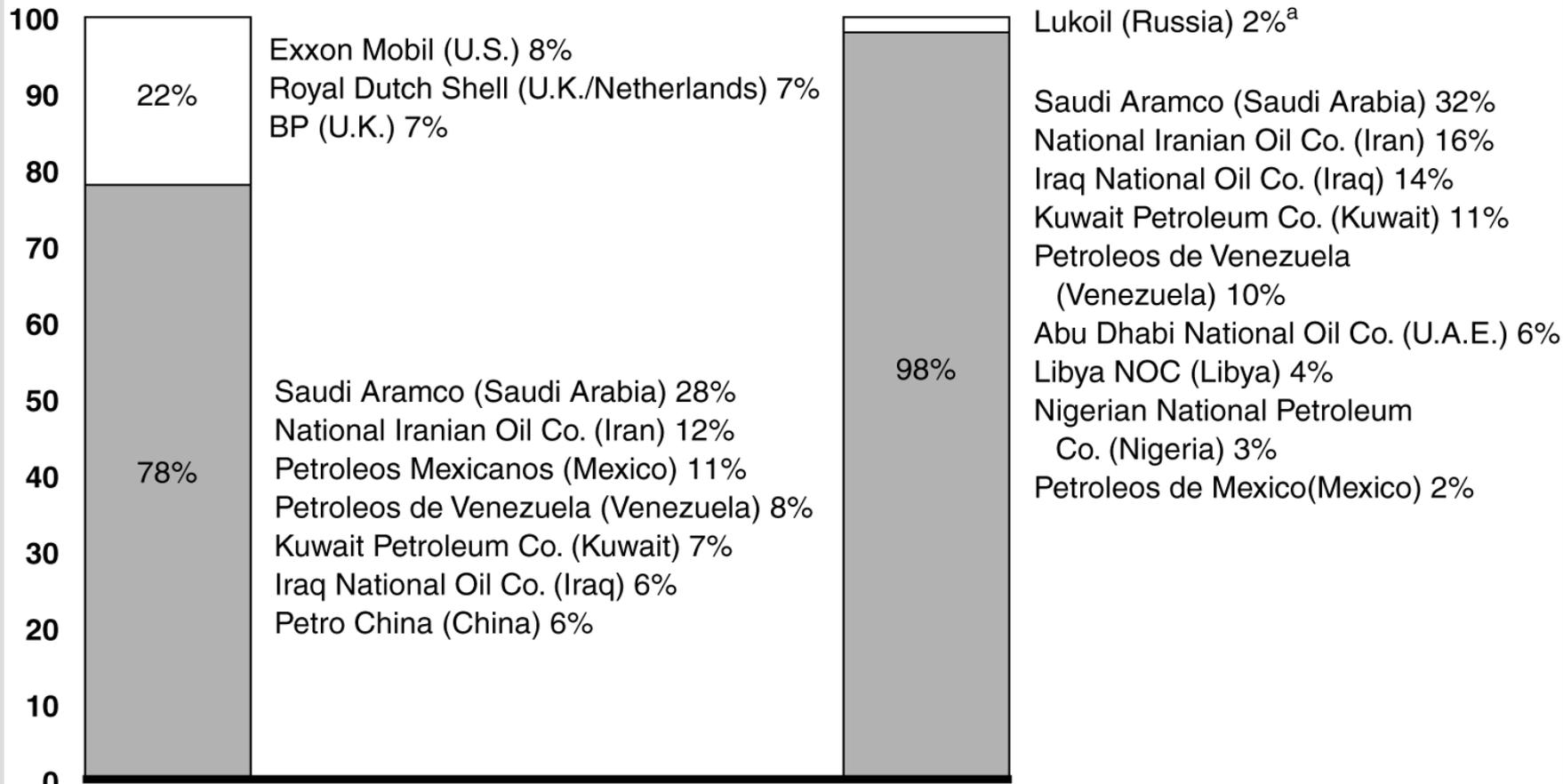
Each country's size is proportional to the amount of oil it contains (oil reserves); Source: BP Statistical Review Year-End 2004 & Energy Information Administration



The United States and Oil

- **2%** of World Reserves
- **8%** of World Oil Production
- **5%** of World's Population
- U.S. Consumes **25%** of World's Oil Production
- More than **60% imported**
- **70% of oil is used for transportation**
- **U.S. transportation is dependent upon oil for 98 percent of its energy – *a proportion virtually unchanged since 1974.***

Percentage



Top 10 oil and gas companies on the basis of oil production, 2004

Top 10 oil and gas companies on the basis of oil reserves holdings, 2004

International oil and gas company
 National oil and gas company

Source: GAO analysis of data from *Petroleum Intelligence Weekly* (Dec. 12, 2005).

...there is nothing man can do to rebuild exhausted fossil fuel reserves. They were created by solar energy 500 million years ago and took eons to grow to their present volume.

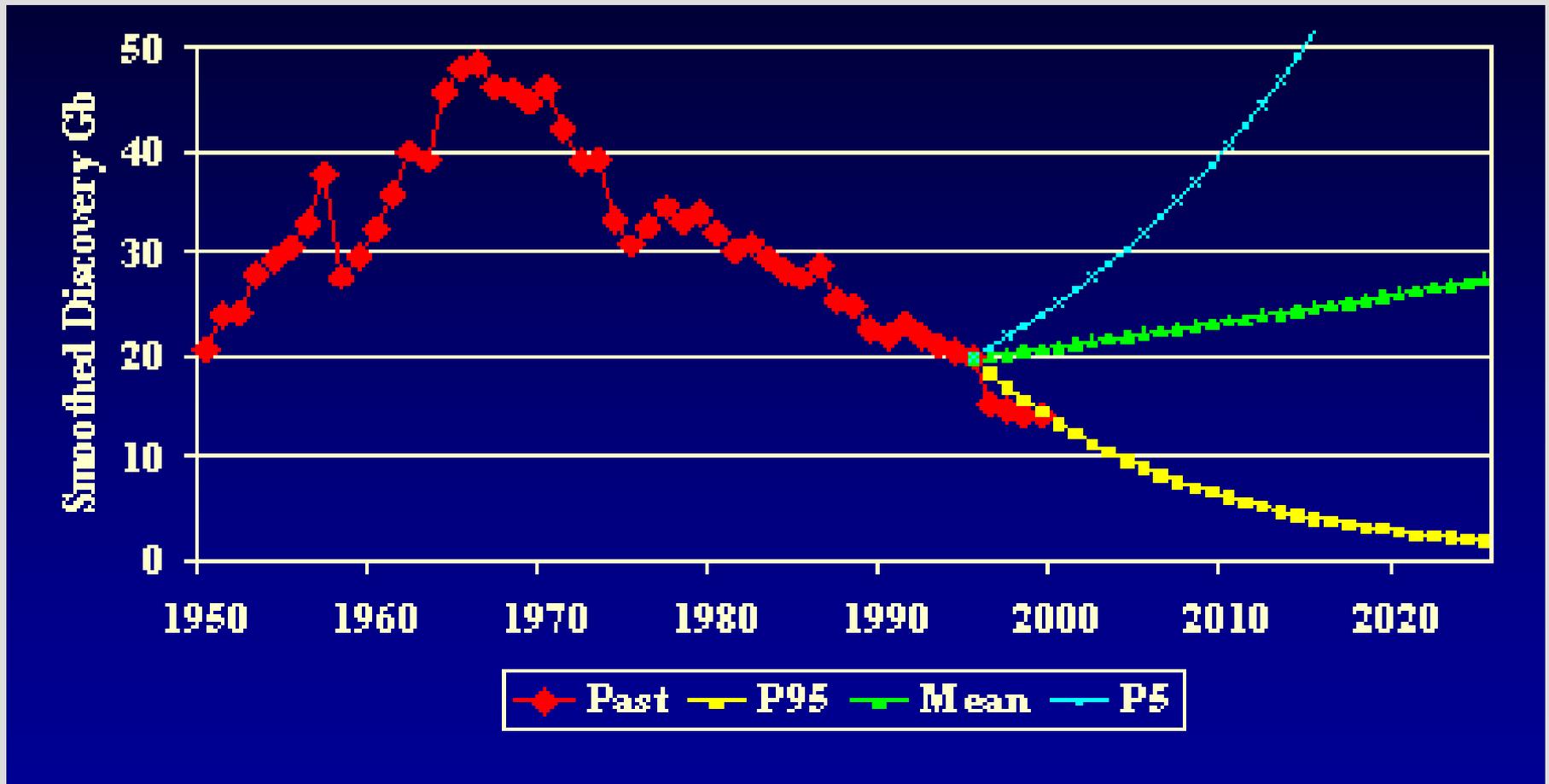
In the face of the basic fact that fossil fuel reserves are finite, **the exact length of time these reserves will last is important in only one respect: the longer they last, the more time do we have, to invent ways of living off renewable or substitute energy sources and to adjust our economy to the vast changes which we can expect from such a shift.**

“Fossil fuels resemble capital in the bank. A prudent and responsible parent will use his capital sparingly in order to pass on to his children as much as possible of his inheritance. A selfish and irresponsible parent will squander it in riotous living and care not one whit how his offspring will fare.”

“Energy resources and our future” - by Admiral Hyman Rickover, 1957



EIA Projections of Discovery



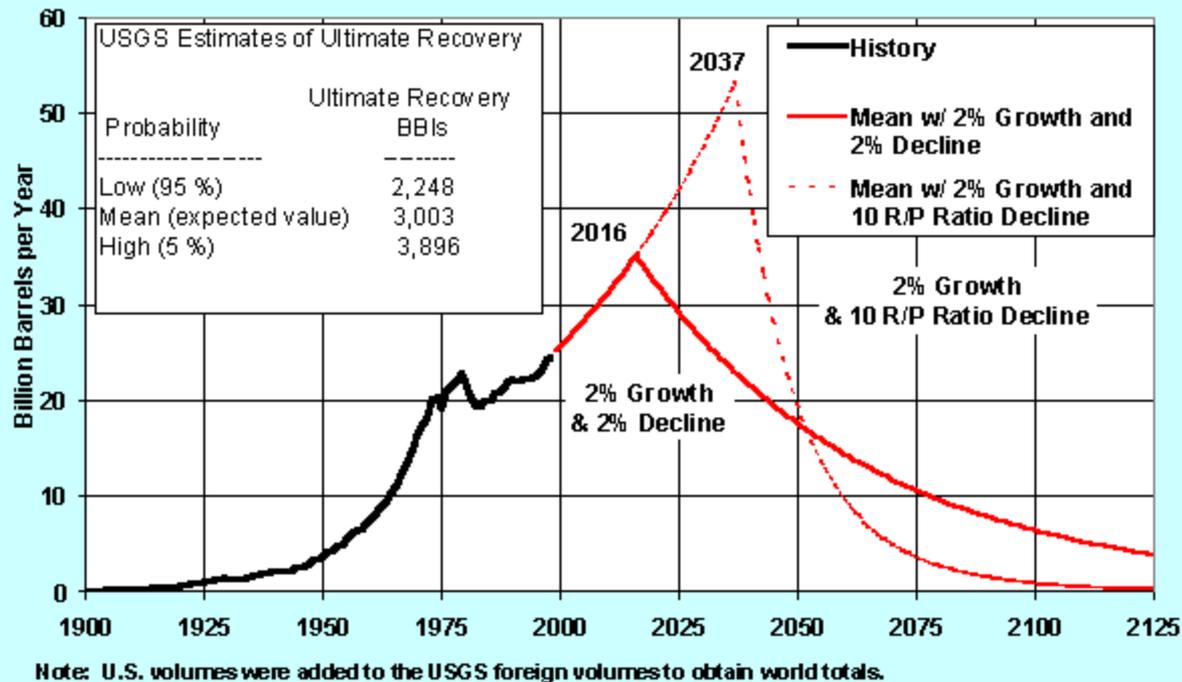
The USGS Estimate is “Utterly Implausible”

“Jean Laherrere made an assessment of the USGS report and concludes that:

The USGS estimate implies a five-fold increase in discovery rate and reserve addition, for which no evidence is presented. Such an improvement in performance is in fact utterly implausible, given the great technological achievements of the industry over the past twenty years, the worldwide search, and the deliberate effort to find the largest remaining prospects.”

“Energy Trends and Their Implications for U.S. Army Installations,”
U.S. Army Corps of Engineers, September 2005

Annual Production Scenarios with 2 Percent Growth Rates and Different Decline Methods



Two EIA oil production scenarios of the *probability* of USGS Estimates of ultimate world-recoverable oil *based on a mean (expected value)* of 3,003 billion barrels and a 2 percent annual world oil demand escalation. Hirsch Report #1: “Peaking of World Oil Production: Impacts Mitigation, and Risk Management,” Department of Energy, February 2005

Global Peak Oil will happen

- World production of conventional oil will reach a maximum and decline thereafter. That maximum is called the peak.
- **Oil Peaking Presents a Unique Challenge. The world has *never* faced a problem like this.**

Hirsch Report #1: "Peaking of World Oil Production: Impacts Mitigation, and Risk Management," Department of Energy, February 2005

Global peak presents “*an unprecedented risk management problem.*”

- **without timely mitigation, the economic, social, and political costs will be unprecedented.**
- ***Viabile mitigation options exist* on both the supply and demand sides, *but* to have substantial impact, *they must be initiated more than a decade in advance of peaking.***

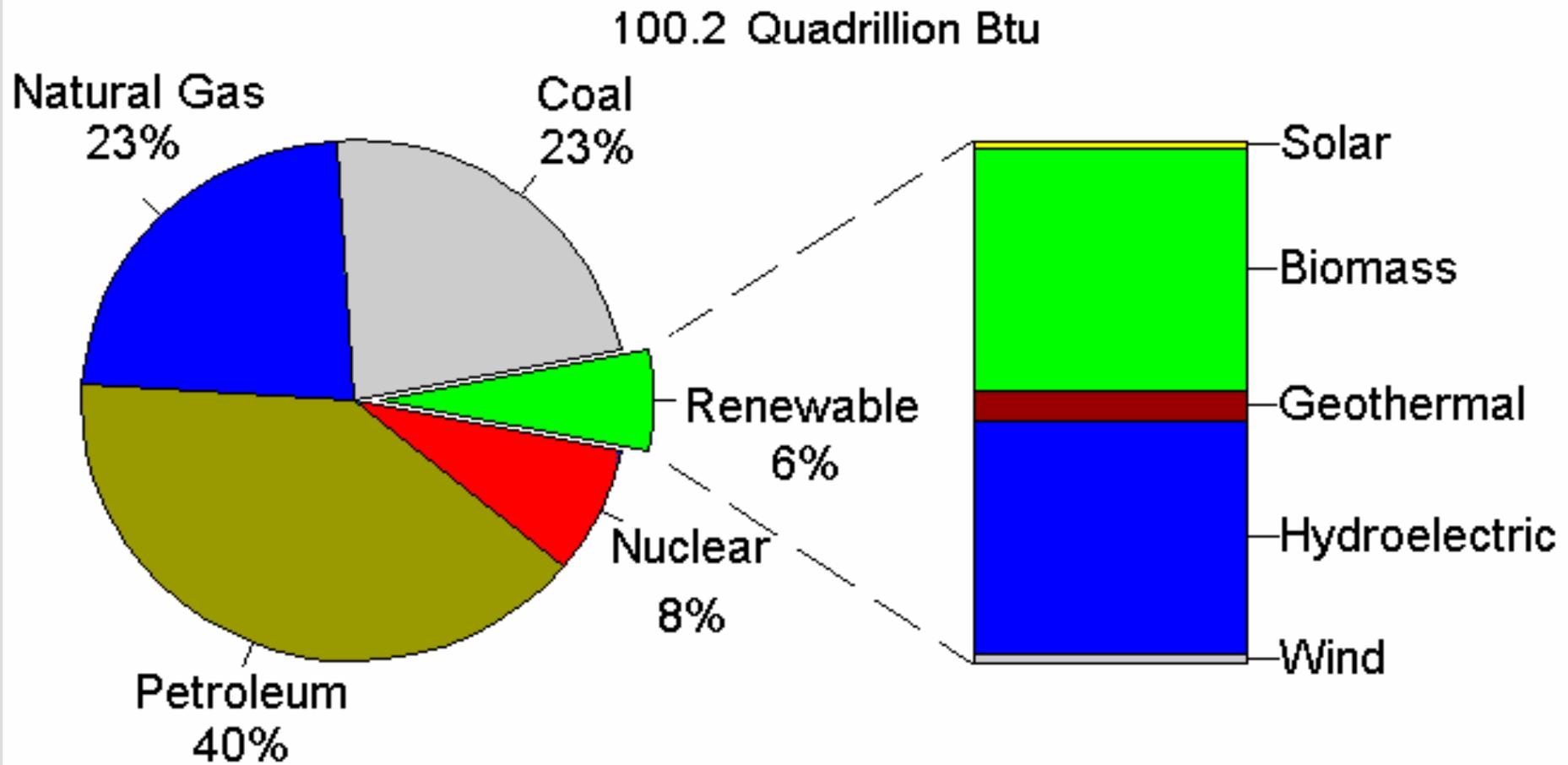
Hirsch Report #1: “Peaking of World Oil Production: Impacts Mitigation, and Risk Management,” Department of Energy, February 2005



Five Federal Government Peak Oil Reports

- **DOE Report #1 "Hirsch,"** February 2005
- **U.S. Army Corps of Engineers,** September 2005
- **DOE Report #2,** July 8, 2006
- **Government Accountability Office (GAO),**
March 29, 2007
- **National Petroleum Council,** Fall, 2007

2004 US Energy Consumption



Potential Alternatives to Oil

■ Finite Sources

Unconventional Oil

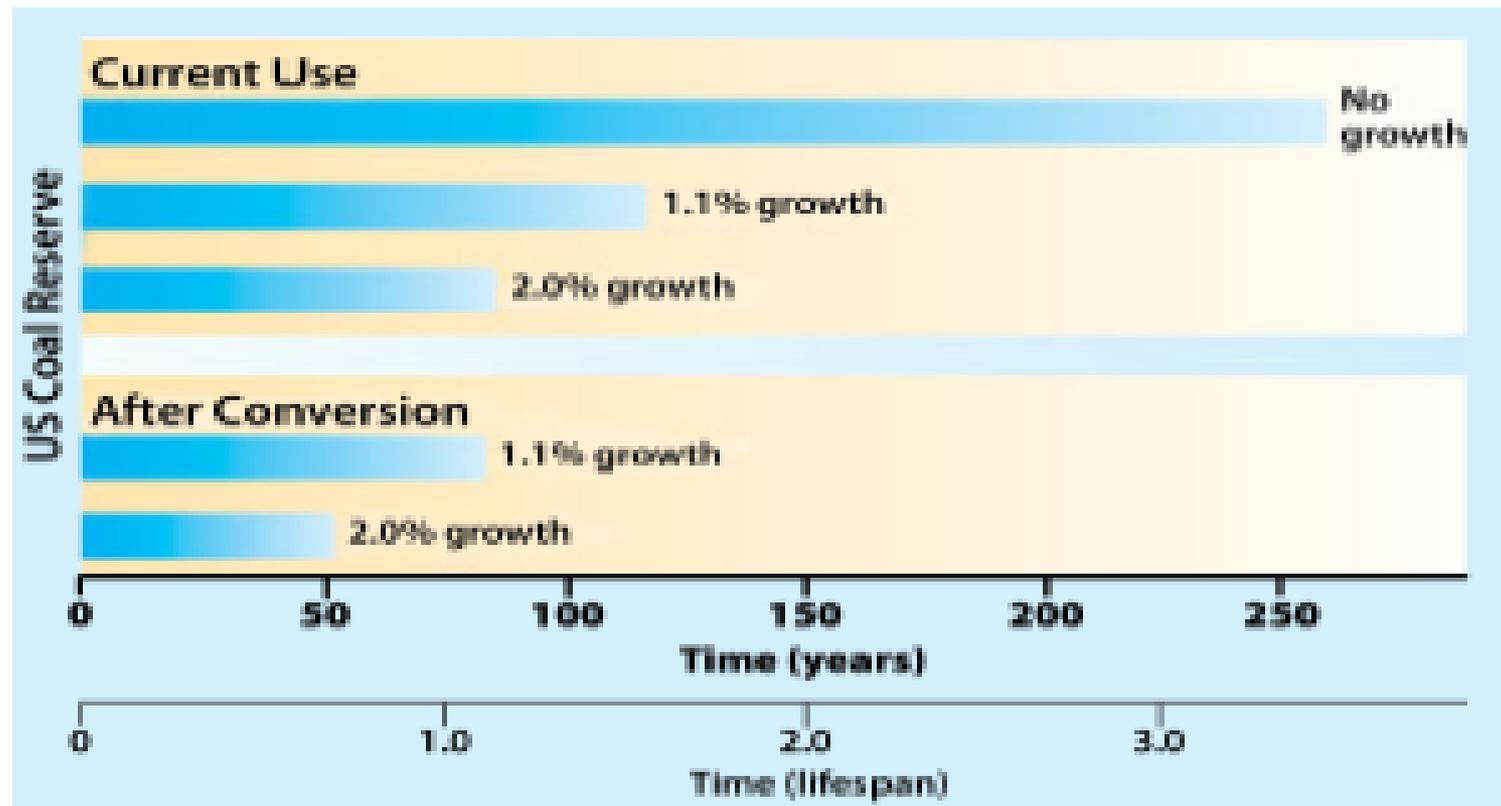
- Ultra Deep Water/Polar
- Tar Sands
- Shale Oil

Coal

Coal-to-Liquids or Natural Gas

Peak Oil

40 Years at 2% Growth



Potential Alternatives to Oil

■ Finite Sources

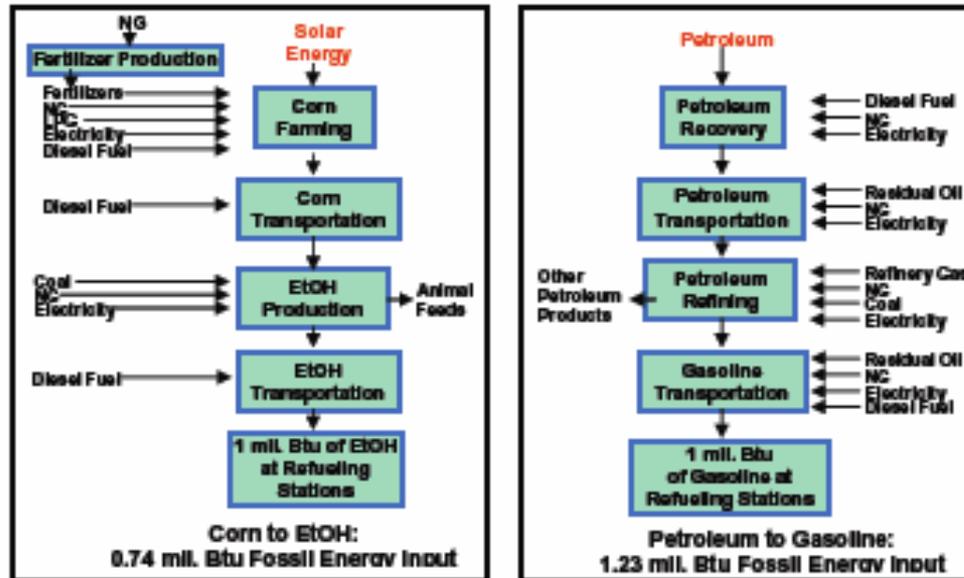
Nuclear

- Fission (light water reactors for electricity and naval propulsion)
 - Breeder reactors
 - Fusion
 - Potential district heating and cooling applications

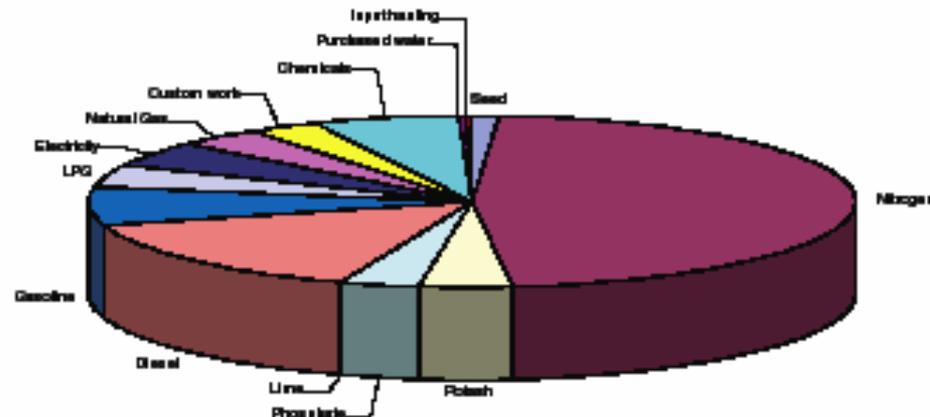
Potential Alternatives to Oil

- **Renewable Resources**
 - Hydroelectric
 - Waste to Energy
 - Solar
 - Wind
 - Geothermal
 - Ocean Energy (tides, OTEC, and currents)
 - Agricultural (biomass/biofuels; food vs. fuel trade-off and sustainability concerns)
 - Hydrogen (from renewables, but *not* an energy source, a “battery” as in fuel cells)
- **Convert Ground Transportation from Liquid Fuels to Electricity**

Peak Oil

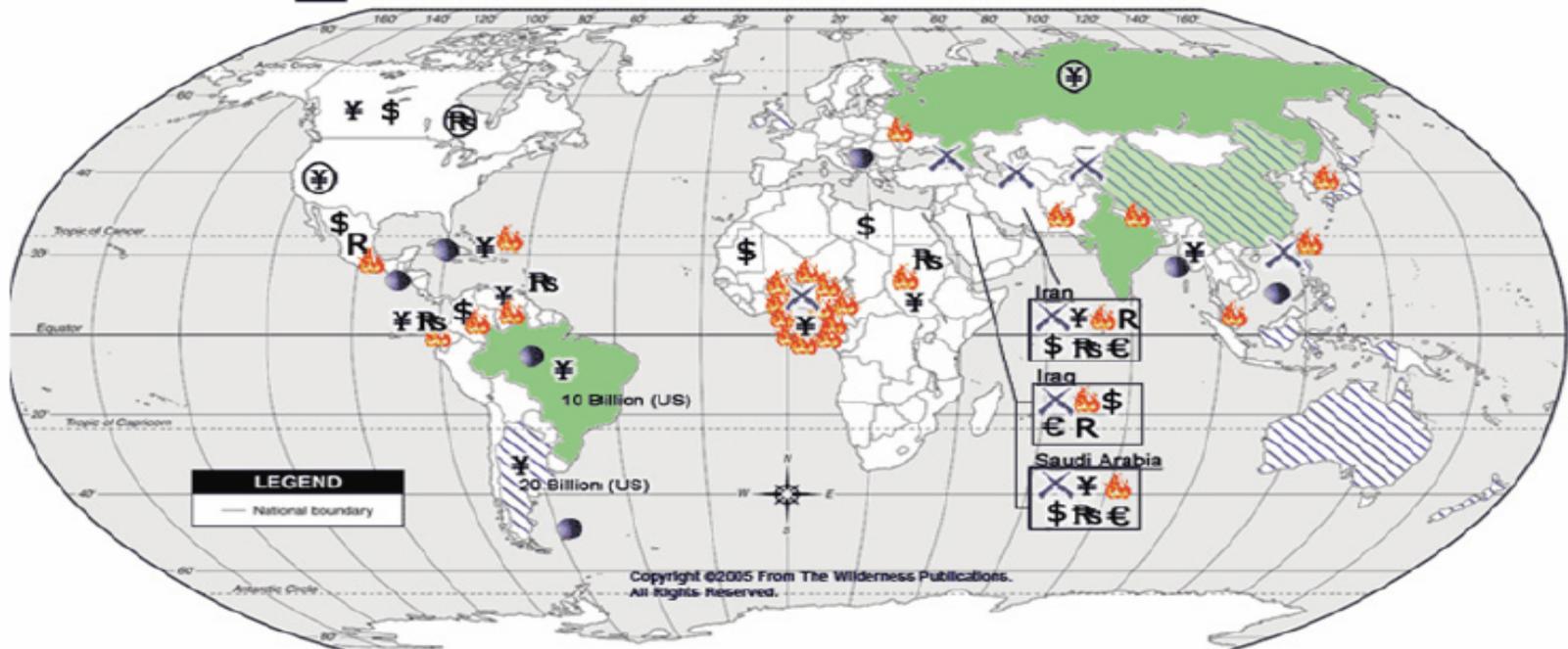
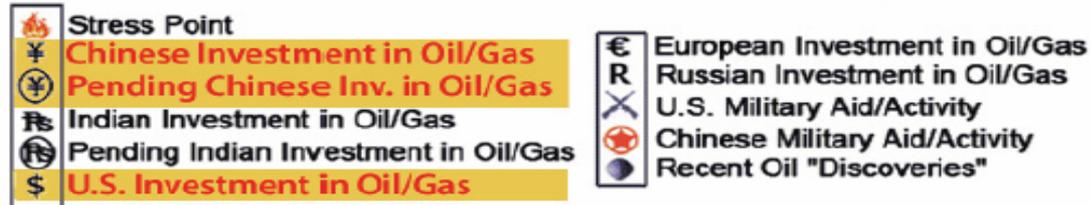


Total Energy Requirement of Farm Inputs, 9-State Weighted Average, Btu per Bushel of Corn, 2001



Peak Oil

World Energy Picture January 2005



 - Emerging Alliance  - Current Oil/Gas Shortages

China's "Post-Oil" Strategy

- Conservation
- Domestic Sources of Energy
- Diversify Sources of Energy
- Environmental Impact
- International Cooperation
(or confrontation)



What America Needs

- The total commitment of **WWII**
- The technology intensity and focus of the **Apollo Program** to land a man on the moon **\$275 billion** in 2006 dollars
- The urgency of the **Manhattan Project** to develop the atom bomb **\$1.1 trillion** in 2006 dollars
- **Mitigate Peak Oil** **\$3-4 trillion over 20 years BEFORE peak** in 2006 dollars (DOE #1 and #2)

We are all in the same boat!



For More Information

<http://www.bartlett.house.gov/EnergyUpdates>