

**Overcoming the Energy and Environment
Challenges of the 21st Century**

**OTEC Plantships for Production of Ammonia and
Desalinated Water Workshop**

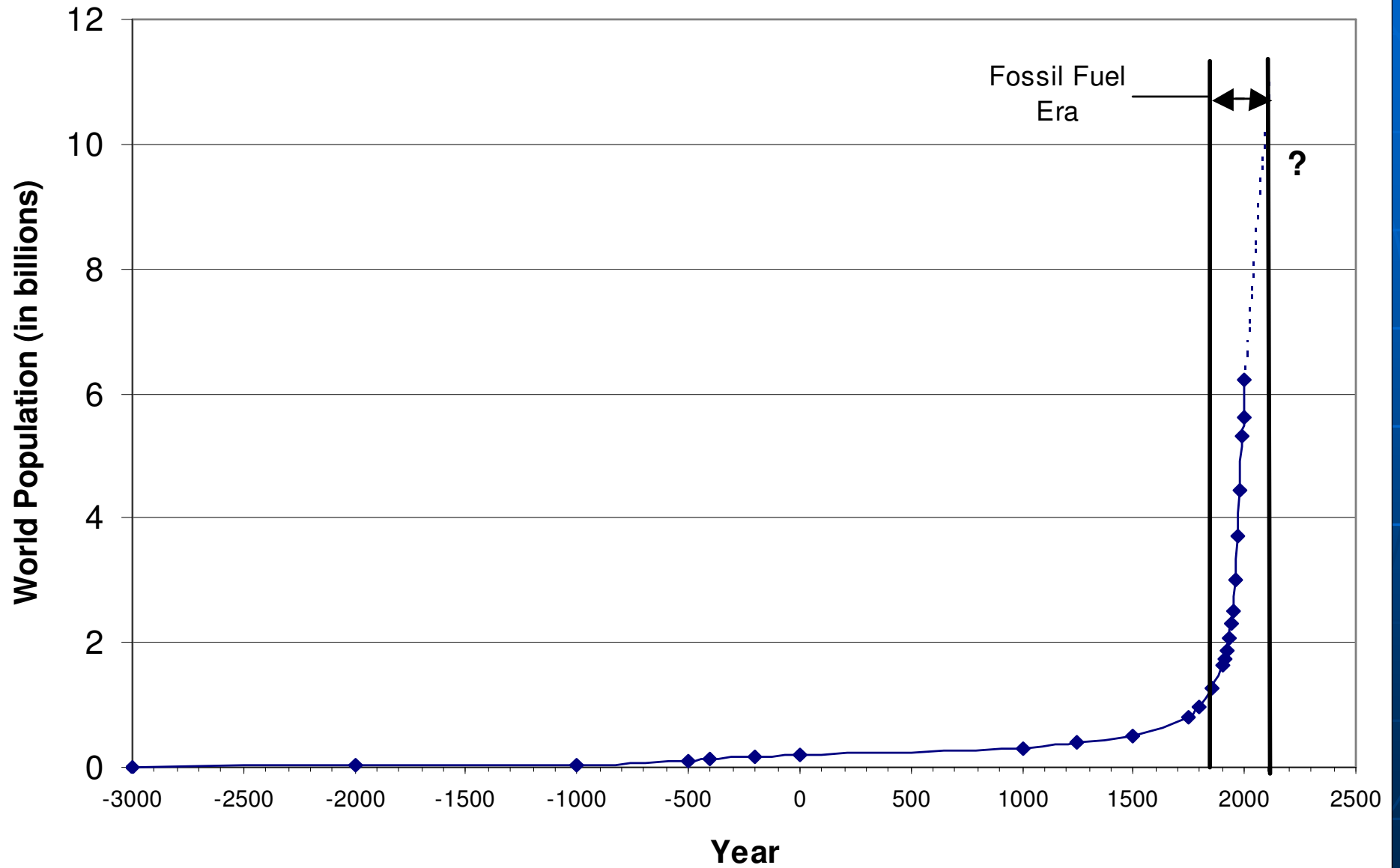
Washington, DC

September 11, 2007

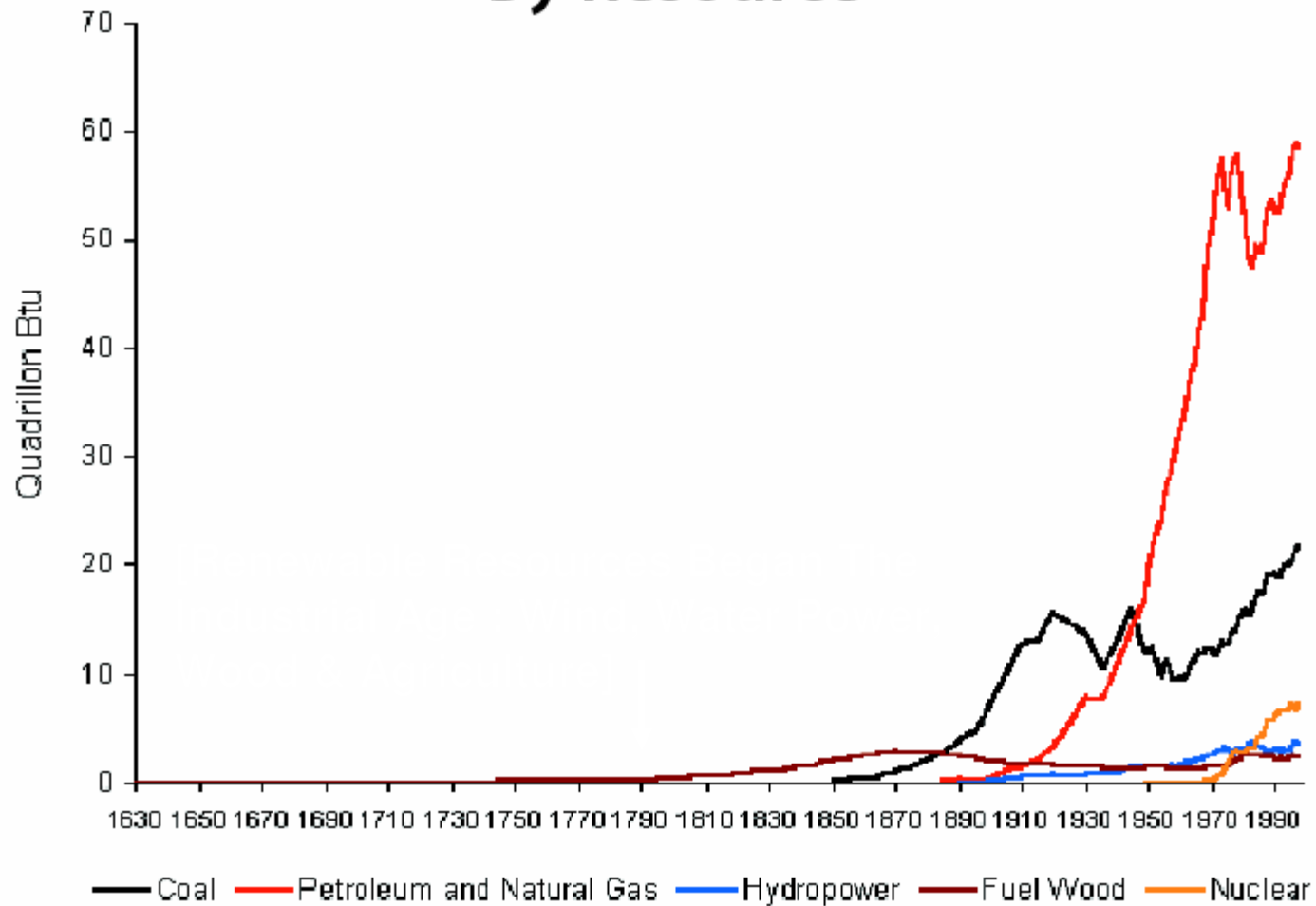
Congressman Roscoe Bartlett

www.bartlett.house.gov/EnergyUpdates

World Population (in billions)

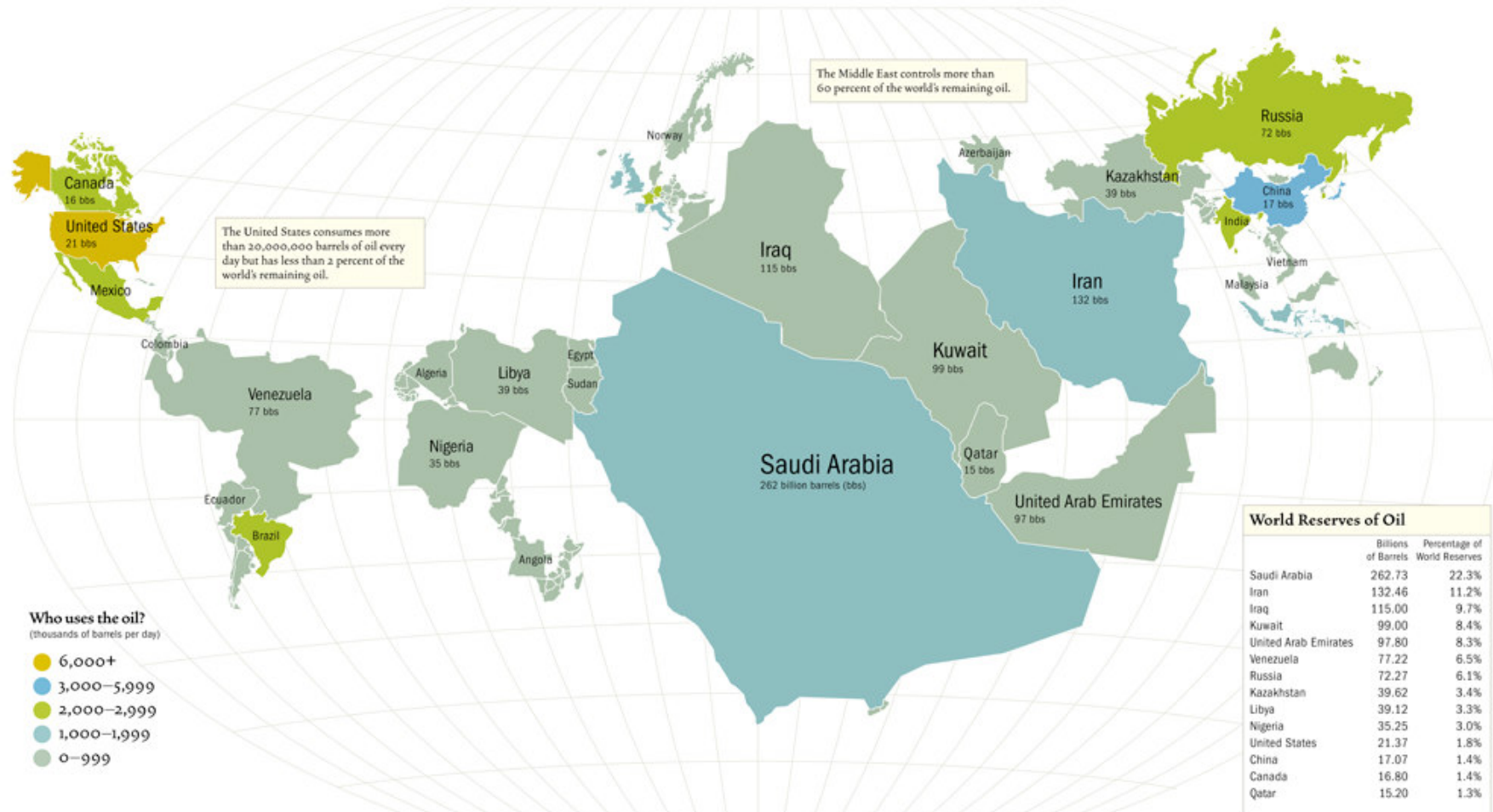


US Consumption of Energy By Resource



The World According to Oil

Who has the oil?



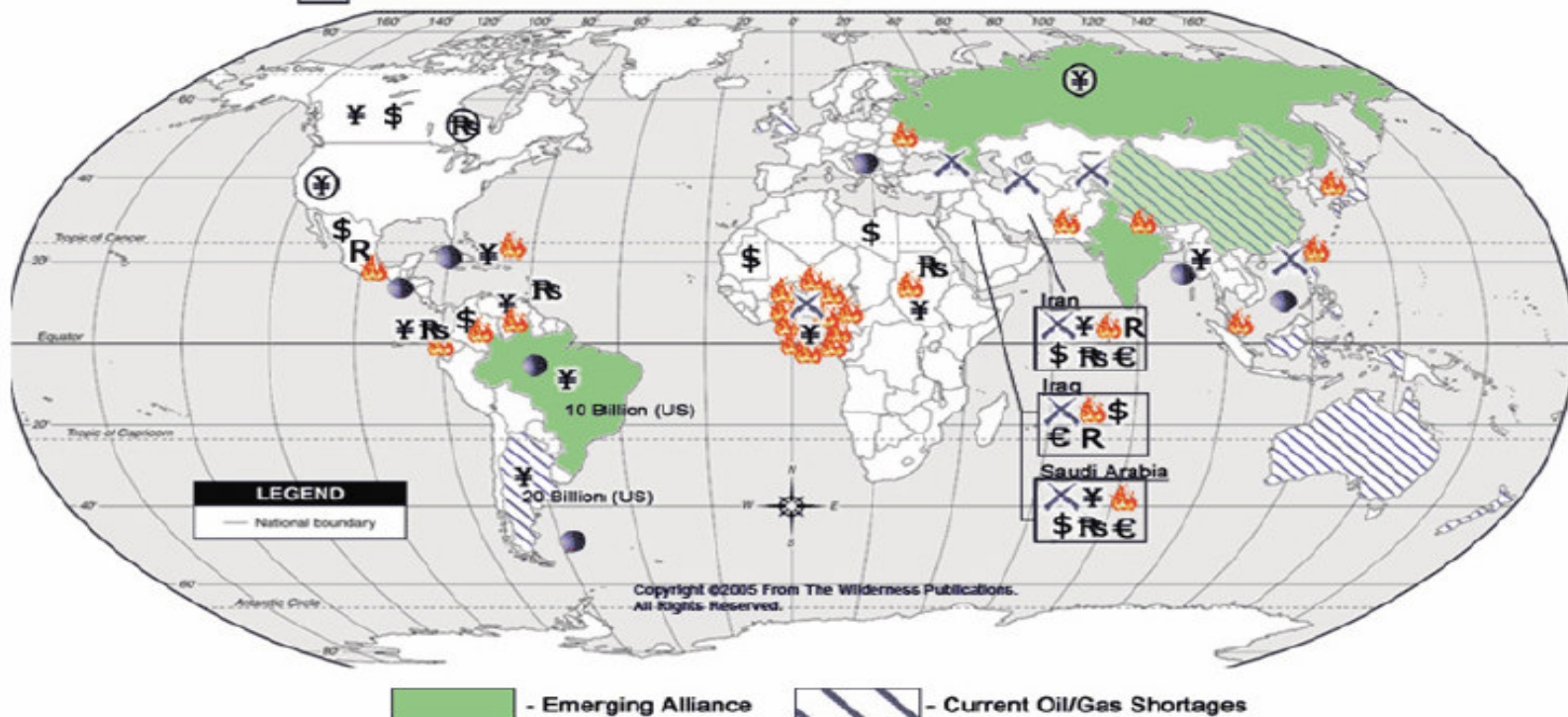
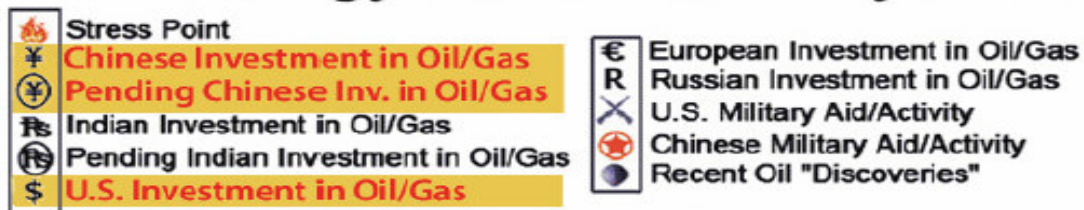
Each country's size is proportional to the amount of oil it contains (oil reserves); Source: BP Statistical Review Year-End 2004 & Energy Information Administration

The United States and Oil

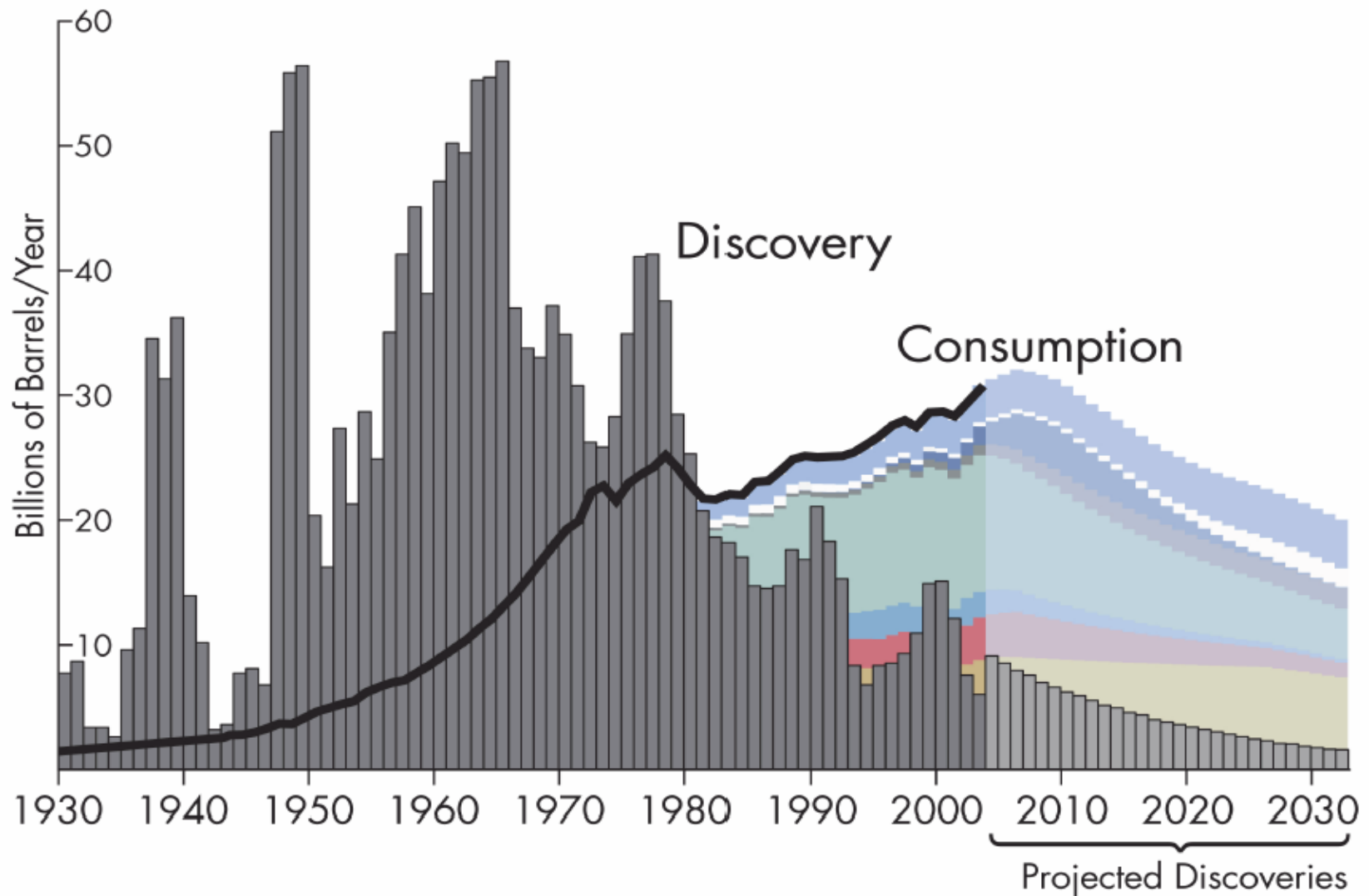
- **2%** of World Reserves
- **8%** of World Oil Production
- **5%** of World's Population
- U.S. Consumes **25%** of World's Oil Production
- **More than 66% Imported**
- **70% for transportation**
- **U.S. transportation is dependent upon oil for 97 percent of its energy needs.**

Peak Oil

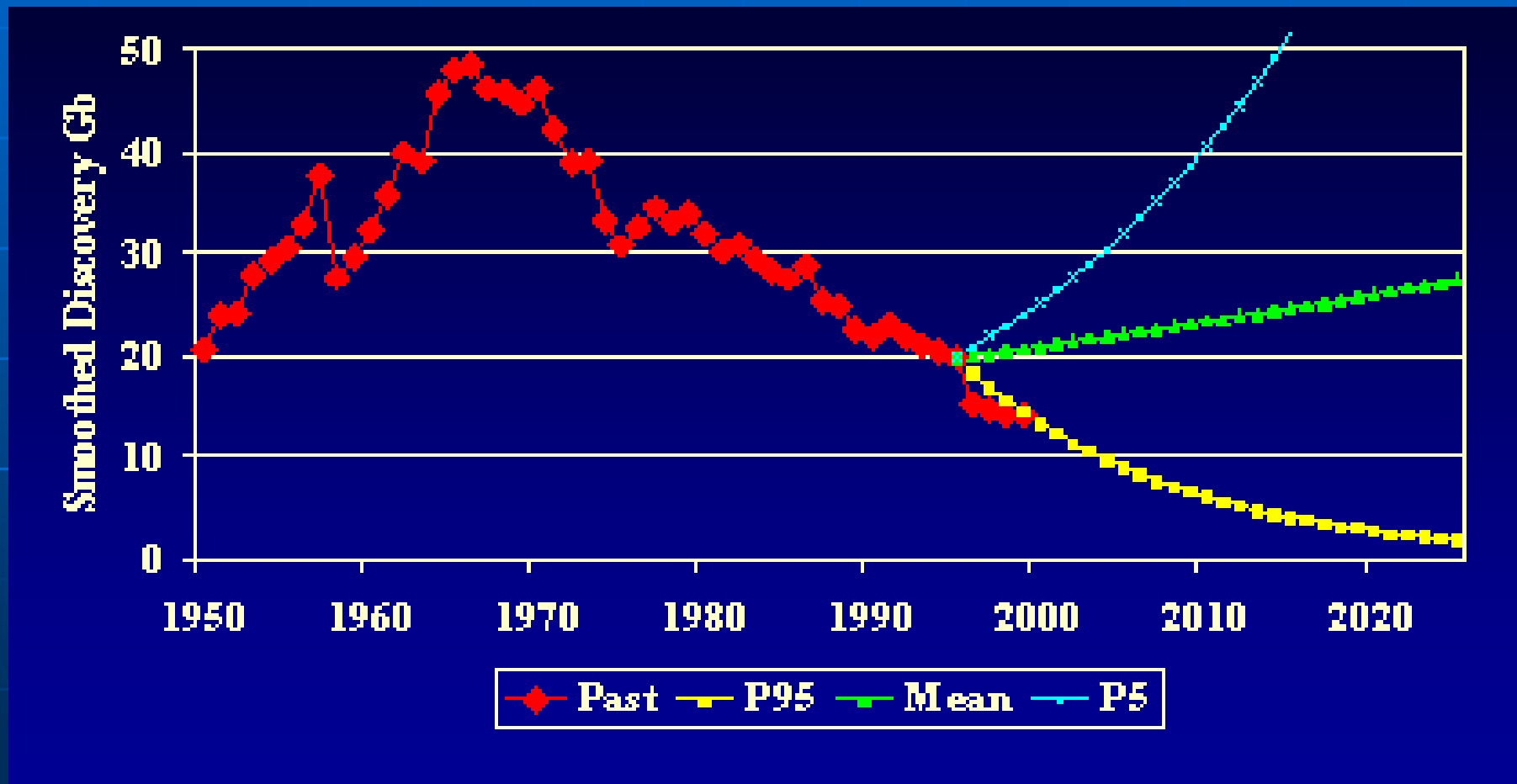
World Energy Picture January 2005



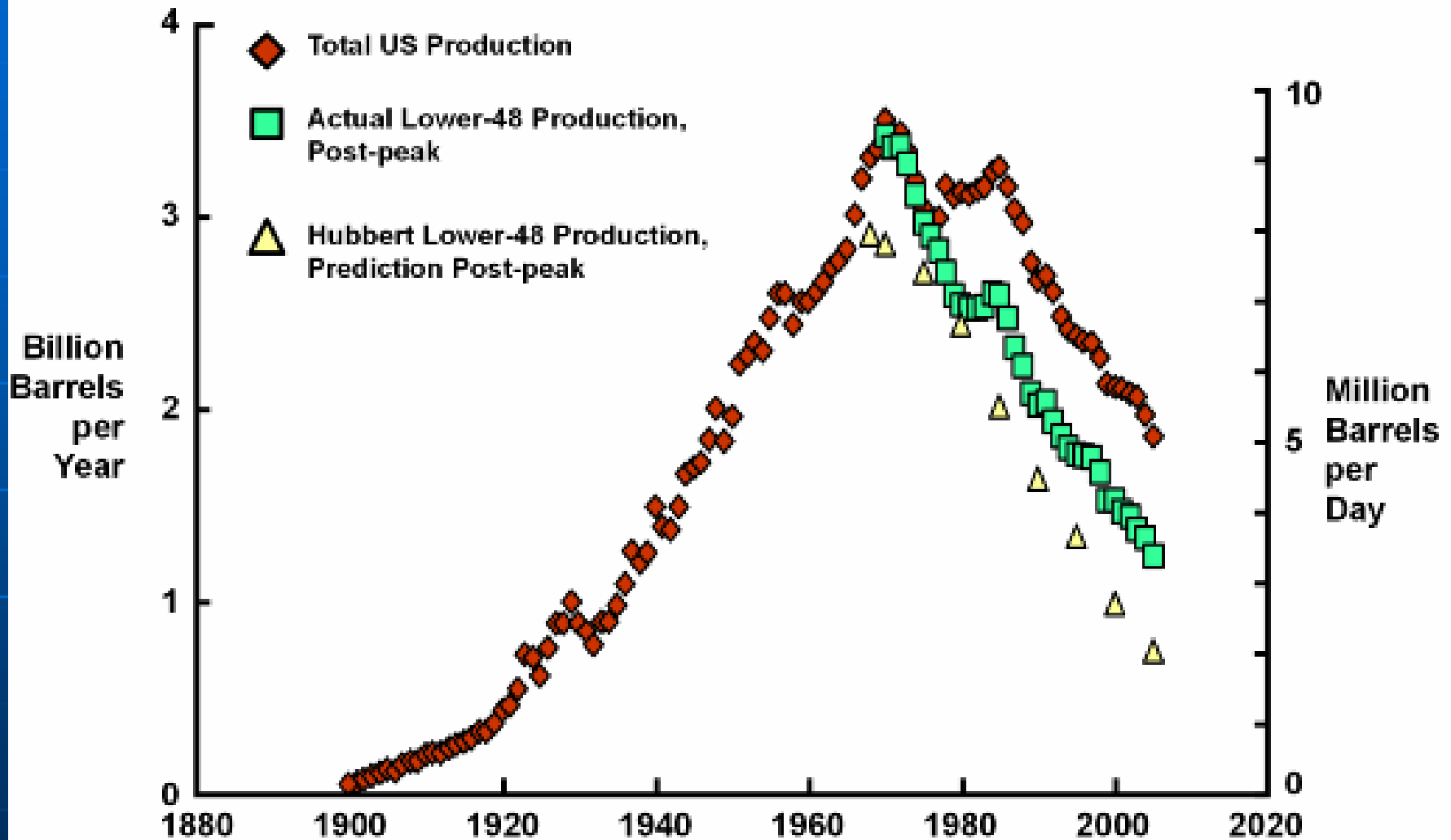
Peak Oil – The Growing Gap



EIA Projections of Discovery



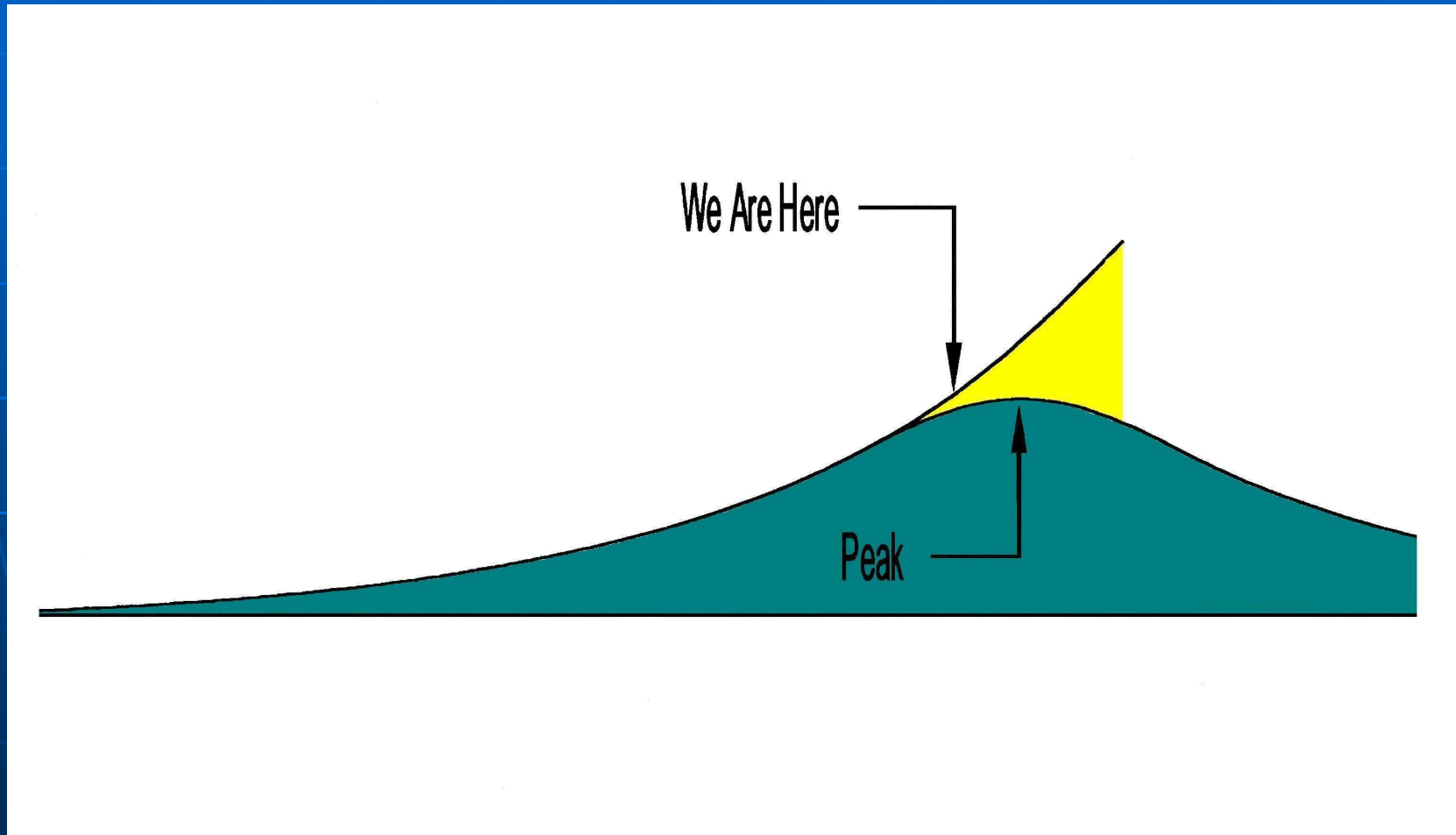
United States Production, Hubbert versus Actual



Source: Cambridge Energy Research Associates.

The Essence of the Problem

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



Five Federal Government Peak Oil Reports

- **DOE Report #1 “Hirsch”** “Peaking of World Oil Production: Impacts Mitigation, and Risk Management,” Department of Energy, February 2005
- “Energy Trends and Their Implications for U.S. Army Installations,” **U.S. Army Corps of Engineers**, September 2005

Five Federal Government Peak Oil Reports (cont.)

- **DOE Report #2**, "Economic Impacts of U.S. Liquid Fuel Mitigation Options," (DOE-NETL-2006/1237), Department of Energy, July 8, 2006
- "CRUDE OIL - Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production" (GAO-07-283), **Government Accounting Office**, March 29, 2007
- "Facing the Hard Truths About Energy," **National Petroleum Council**, *draft* – July, 18, 2007

Liquid Fuel Alternatives to Oil

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

Biofuels

Coal-to-Liquids

Electricity – Plug-in Hybrids

Potential Contributions by OTEC

Discussion of Potential Contributions by OTEC Plantships

- Renewable Resource
 - Solar-power derived electricity
 - Transport via undersea cables
 - Convert into a carrier for transport via cargo ships
 - Ammonia or Hydrogen for fuel cells
 - Manufacture energy-intensive product such as ammonia fertilizer
 - Produce desalinated water

Plug-in Hybrids (PHEV)

- Hybrids cut liquid fuel use 50% already. Plug-ins cut 50% of that.
 - “Researchers have shown .. (PHEV) offering.. electric range of 32 km will yield... 50% reduction..” (IEEE Spectrum, July/05). Shown in working Prius.



- Battery breakthroughs in China: from 10/07, 10kwh batteries (larger than) cost \$2,000. www.thunder-sky.com. Thus an extra \$2,000 per car can cut gas dependence in half.
- Gives economic security in case of sudden gasoline cutoff.

[http://www.werbos.com/US Action Needs Oil and CO2 May2007.pdf](http://www.werbos.com/US%20Action%20Needs%20Oil%20and%20CO2%20May2007.pdf)

China's "Post-Oil" Strategy

- Conservation
- Domestic Sources of Energy
- Diversify Sources of Energy
- Environmental Impact
- International Cooperation

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
- **Investment of Energy, Capital and Time** est. \$3-4 trillion in 2006 dollars over 20 years (DOE Reports #1 and #2)

We Need to Build a Coalition to Transition from Fossil Fuels to Renewable Sources of Energy

- **Reduce National Security Vulnerability from Dependence on Imported Oil**
- **Mitigate Against Global Peak Oil**
- **Address Climate Change**
- **Increase U.S. Manufacturing & Exports**
- **Improve the Environment**

Federal Energy Policy Changes

- **H.R. 2272**, the 21st Century Competitiveness Act of 2007, was signed into law by President Bush on August 9, 2007. **P.L. 110-69** includes the creation of ARPA-E modeled on DARPA.
- **270 bills on energy efficiency and renewable energy** have been introduced according to the Congressional Research Service (CRS).

Will There be a New Energy Law?

- **H.R. 3221, the House-approved omnibus energy bill promotes efficiency and renewable energy.** It includes a controversial Renewable Portfolio Standard (RPS) and a net tax increase but excludes increases in CAFÉ standards and biofuels volume mandate.
- **H.R. 6 (as amended), the Senate-approved omnibus energy bill promotes efficiency and renewable energy.** It includes increases in CAFÉ standards and a mandated volume increase in biofuels, but excludes an RPS and tax provisions.
- **President Bush threatens vetoes against the House and Senate bills.**

Will There Be a New Climate Law?

- A Narrow Bipartisan Majority in the Senate Environment and Public Works Committee
- A House bill with cap and trade will be introduced by Energy and Commerce Committee Chairman John Dingell (D-MI) and Energy and Air Quality Subcommittee Chairman Rick Boucher (D-VA)
- The Administration favors voluntary incentives. Many Republican members oppose mandates.

**We are all in the same
boat!**



For More Information

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