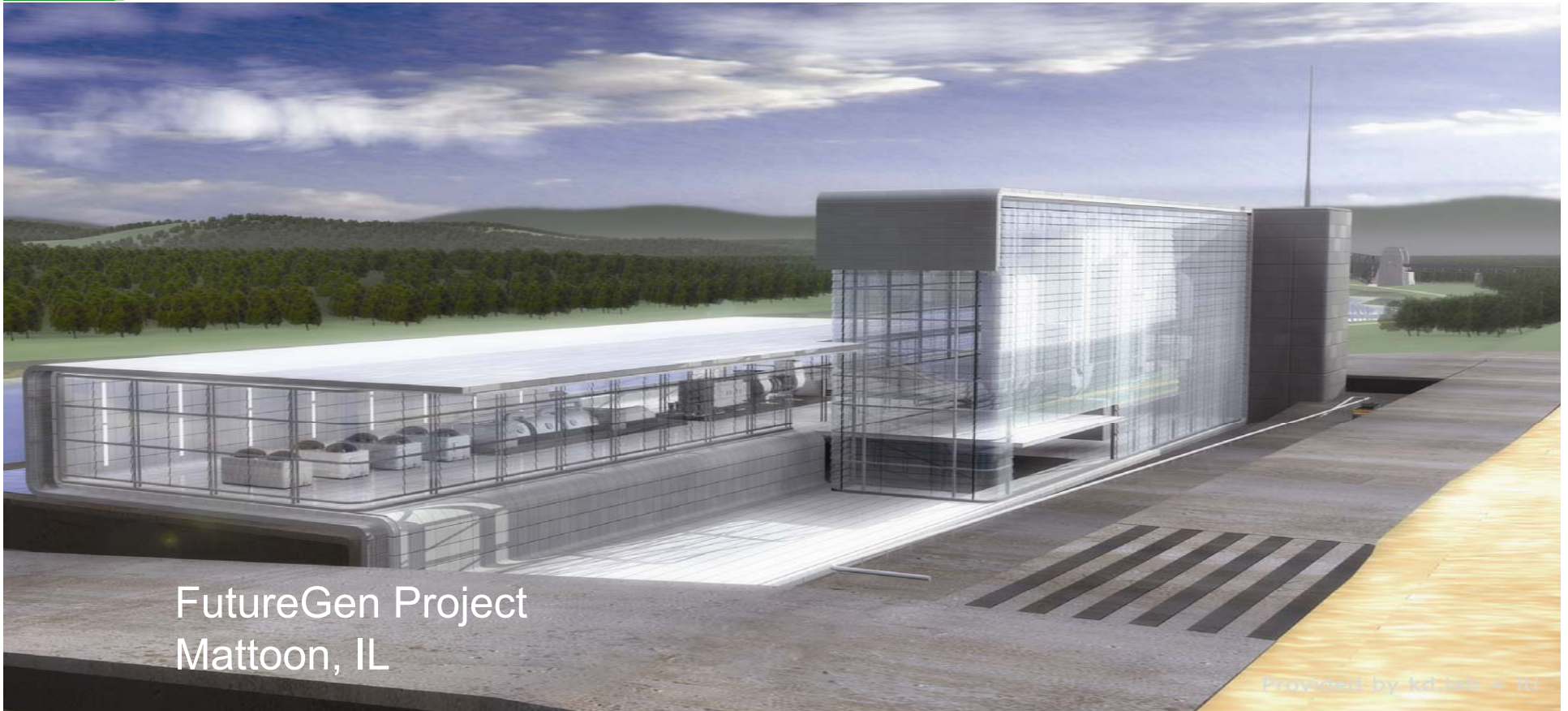


Peabody

Institute for Regulatory Policy Studies
Energy Economics, Energy Security & Environment
A Path Forward - Coal



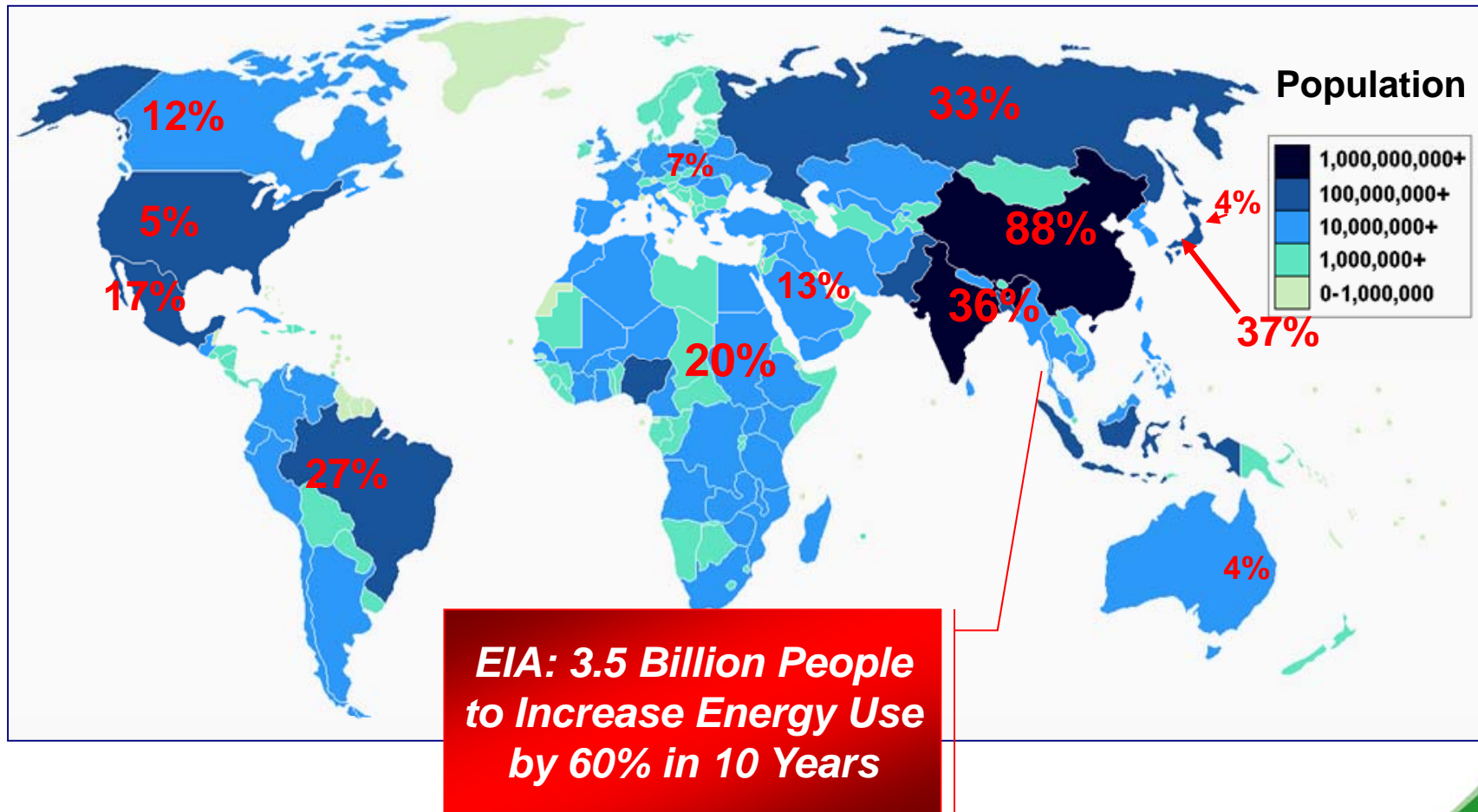
FutureGen Project
Mattoon, IL

Jacob Williams
Vice President – Global Energy Analytics
Peabody Energy

December 10, 2008

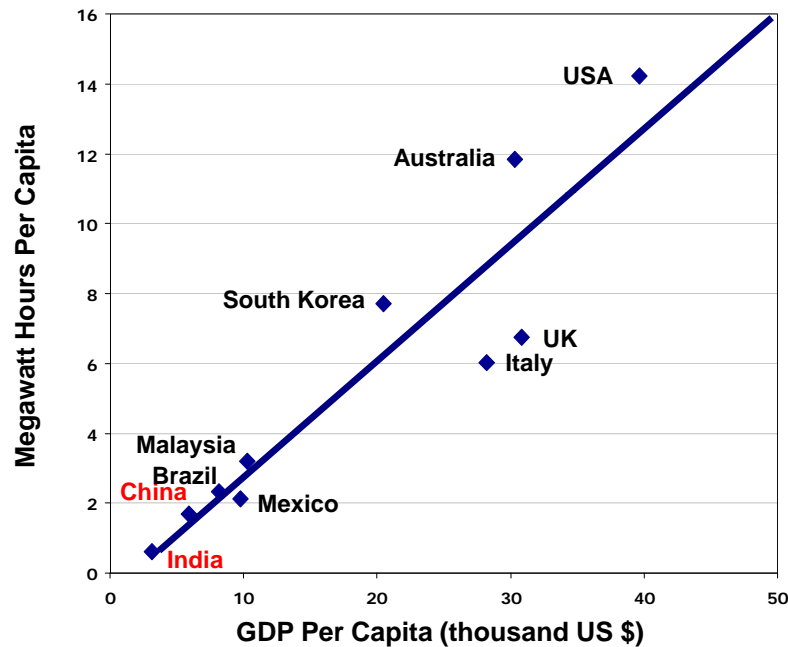
China and India Driving Global Demand Growth for Energy

Projected 10-Year Growth in Per Capita Energy Use

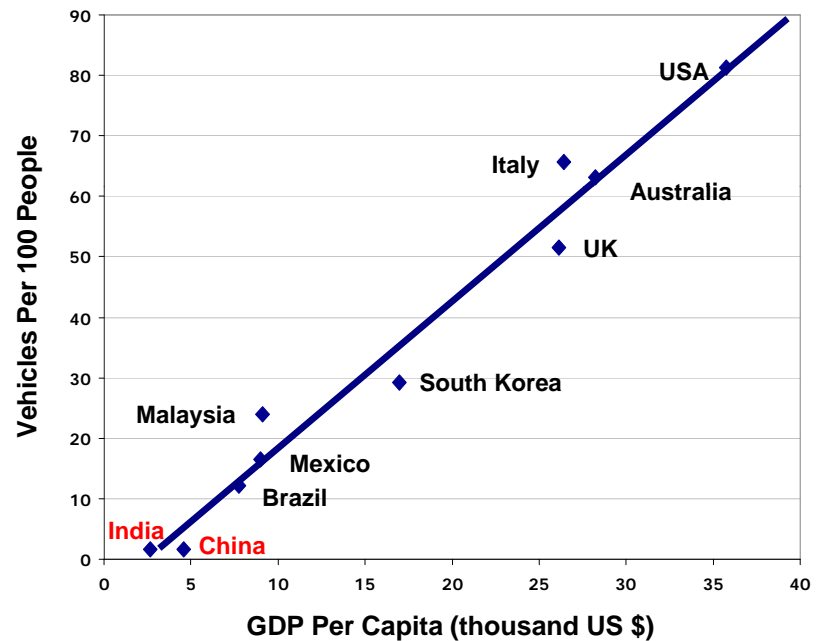


A Rising Tide as the World Awakens to Modern Energy

Electricity Usage per Capita



Passenger Vehicles per Capita

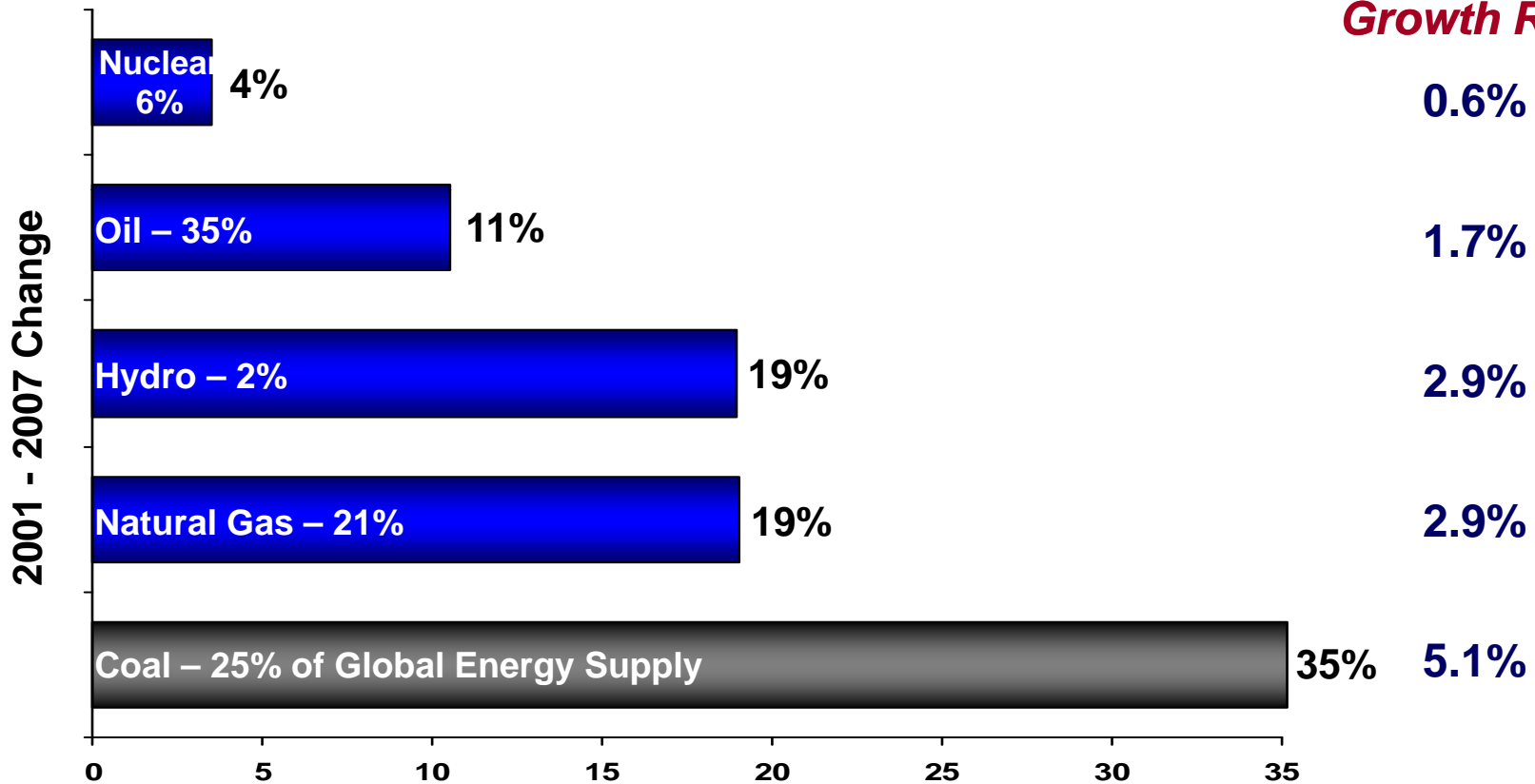


Per Capita Electricity Use Just 1/8th (China) and 1/25th (India) the U.S. Level

Coal Continues to be Fastest-Growing Fuel

Global Coal Demand Grows 1.5+ Billion Tons in 6 Years

Compound Annual Growth Rate



How Does the World Add 250 Million Tons of Supply Per Year?

Biomass and Waste 10% and Renewables 1% of Global Energy Supply

Source: BP Statistical Review of World Energy, June 2008.

U.S. Energy Options are Limited by Supply and Availability

All Energy Forms Needed for Diversity of Supply



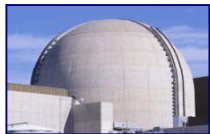
OIL

Persistent high prices; reserves declining; risky sources



ETHANOL

Clean but energy inefficient, strains food supplies, cellulosic years away



NUCLEAR

Valuable but constrained by cost, safety and waste disposal concerns



NATURAL GAS

Prices high; declining reserves, sources from volatile regions



RENEWABLES

No growth in hydro, low availability, still some public resistance

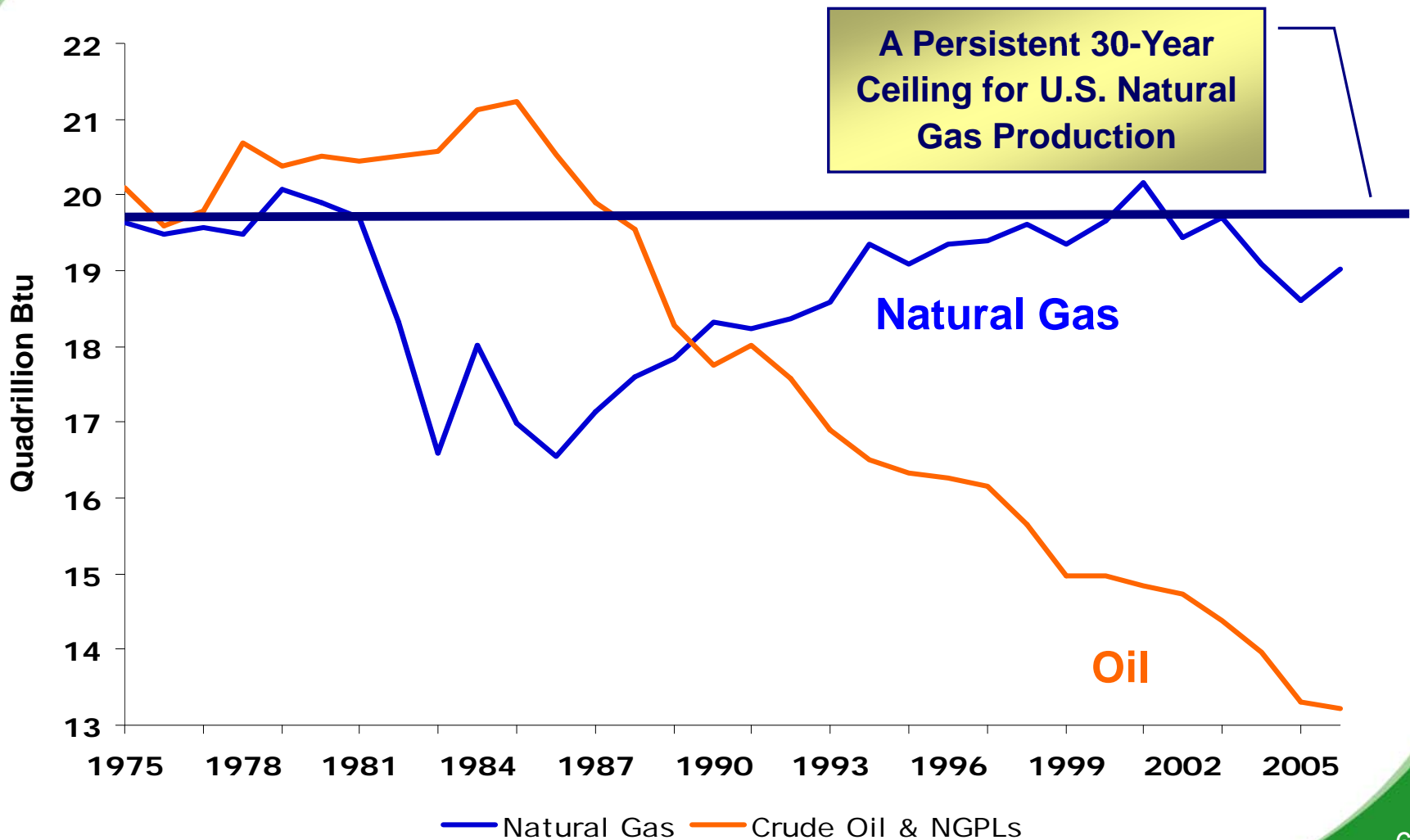


ENERGY EFFICIENCY

Greater use of green technologies, energy management and conservation

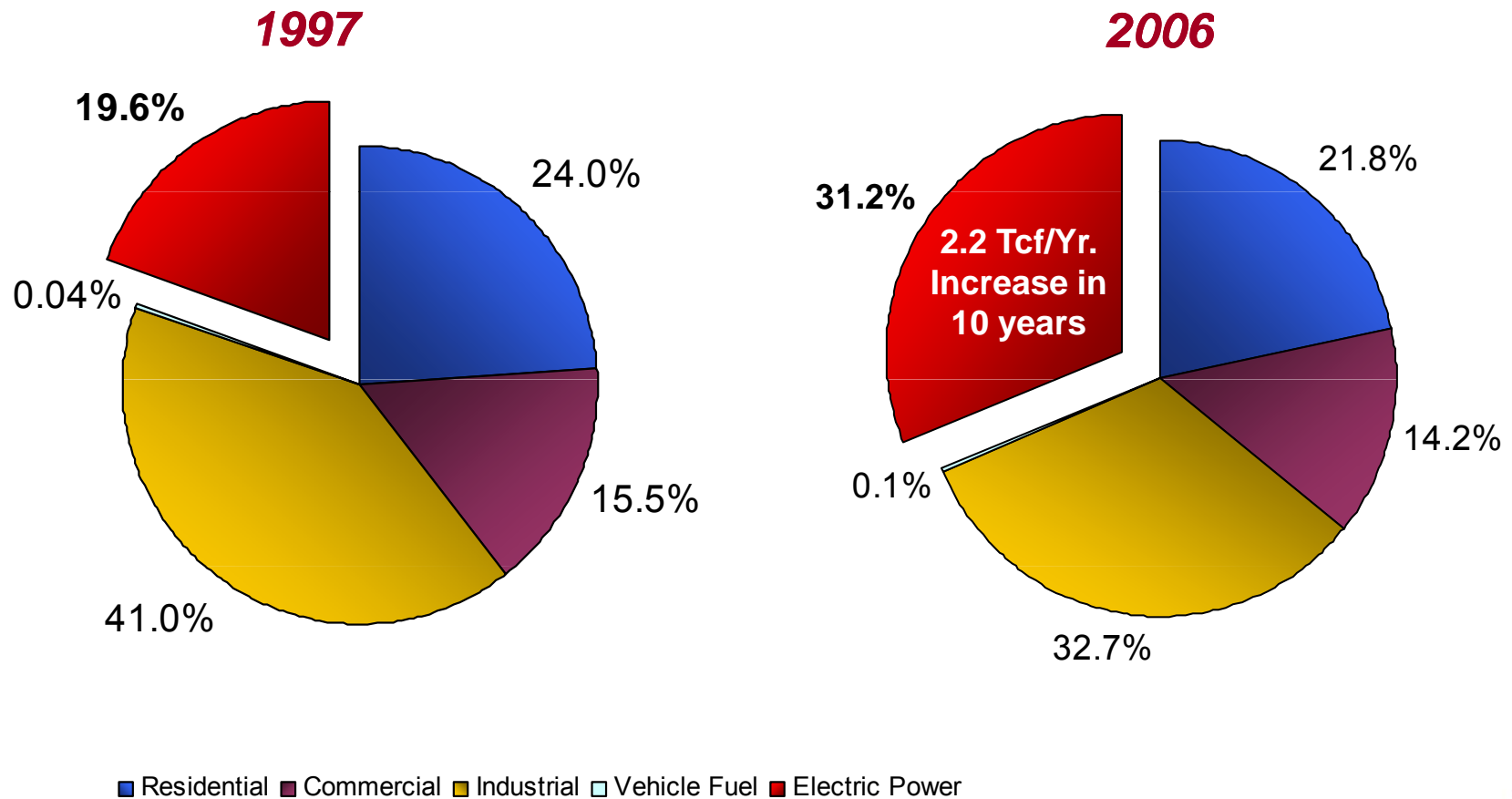
U.S. Natural Gas Has Peaked, or Nearly So

Fossil Fuel Production (1975 – 2005)



Electric Power Sector Dominates U.S. Natural Gas Consumption

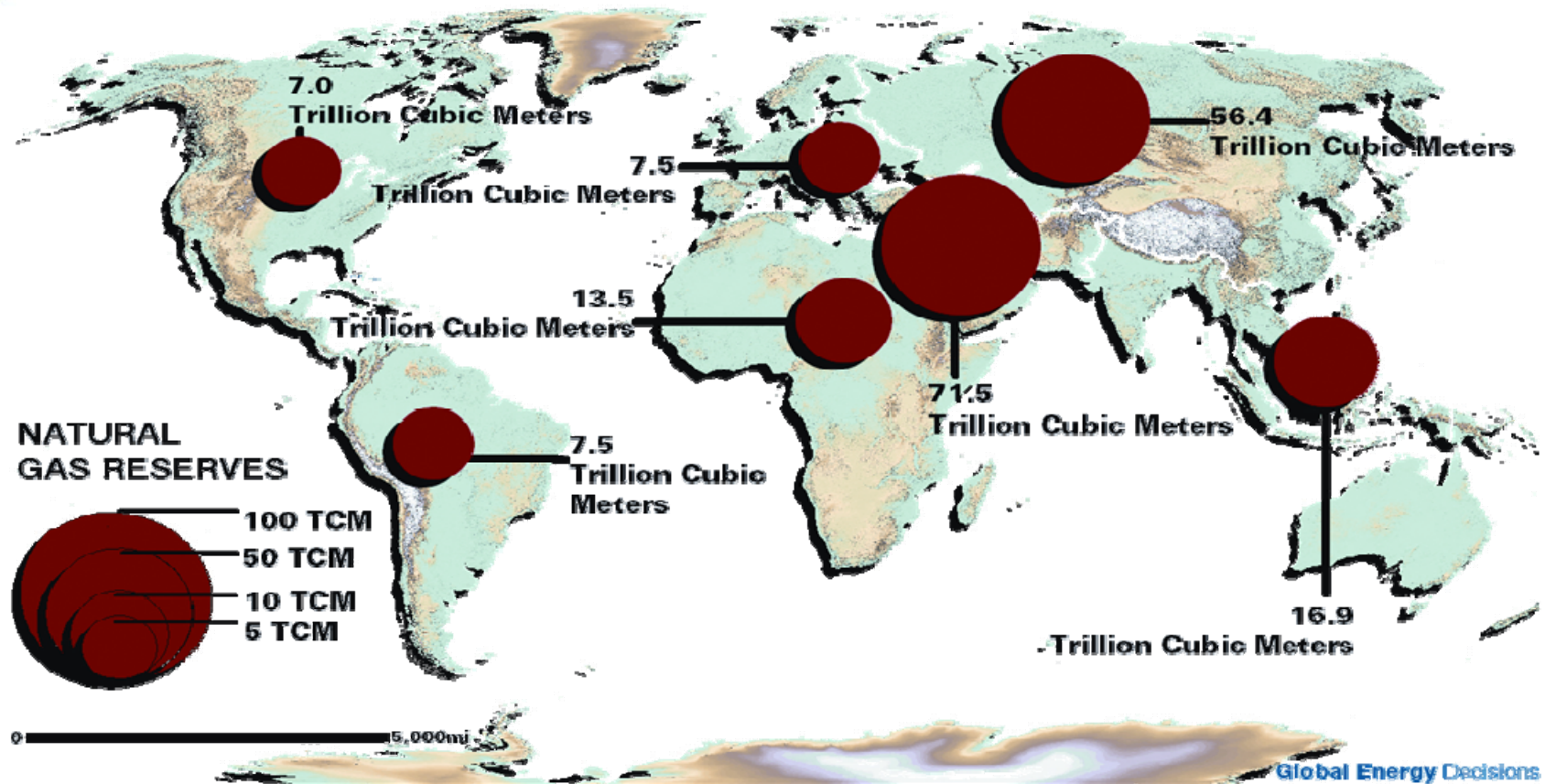
Percent of U.S. Natural Gas Consumption by Sector



Source: U.S. Energy Information Administration, 2007.

Iran, Russia, Qatar, Algeria and Indonesia Have Announced an LNG Cartel

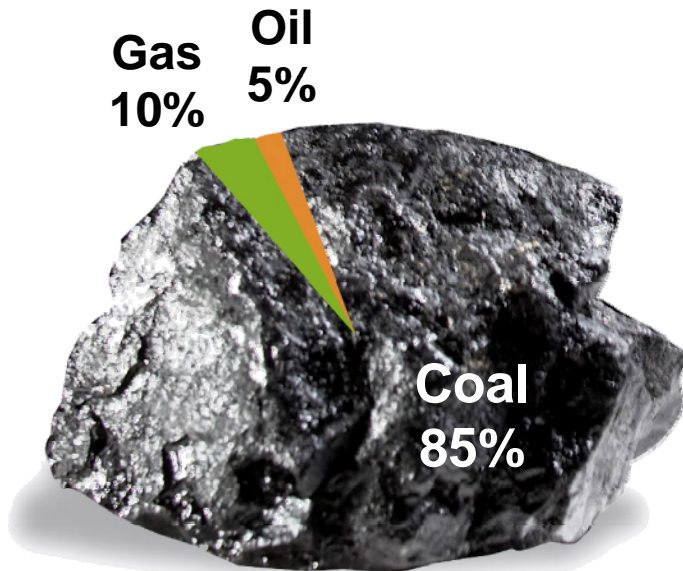
Most Gas Reserves are in the Middle East and Asia



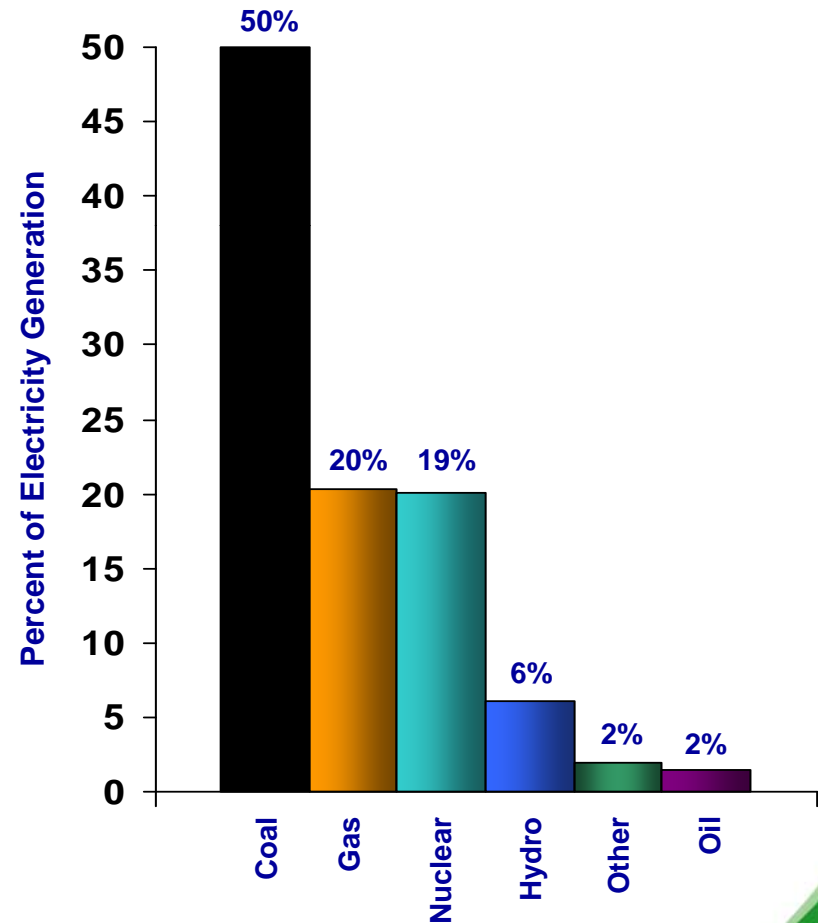
LNG is a Global Commodity, Priced Off of Oil Benchmarks

Coal is Our Mainstay Fuel for Electricity Generation

U.S. Fuel Resources



Electricity Fuel Sources



Ultimately recoverable demonstrated reserves on Btu basis. Source: USGS, National Assessment of United States Oil and Gas Resources, U.S. Coal Reserves; Energy Information Administration Monthly Energy Review, March 2008 Table 7.2b, 2007 data.

Coal is Our Enduring Fuel

***Resources Needed Just to Replace
U.S. Electricity from Coal***

SOLAR

4,000x More Solar Generation than Currently in Use

WIND

***750,000 1-MW Wind Turbines, Covering 59 Million Acres
(Indiana and Illinois)***

~250,000 miles of New Transmission

NUCLEAR

250 New Nuclear Plants

NATURAL GAS

17 tcf... Nearly Double U.S. Production

HYDRO

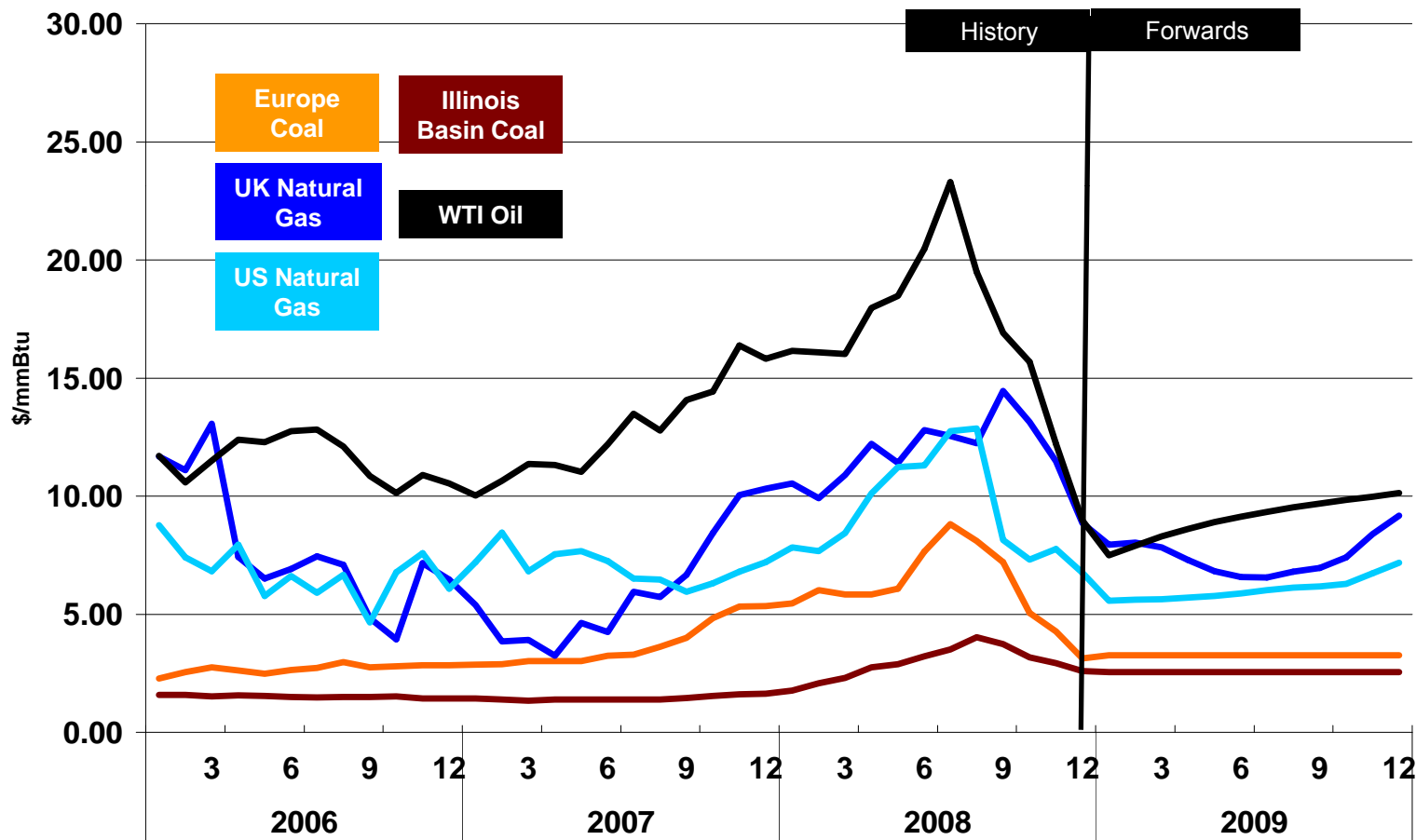
500 Facilities the Size of Hoover Dam

EFFICIENCY

U.S. Would Need to Reduce Electricity Consumption 50%

Global Energy Prices

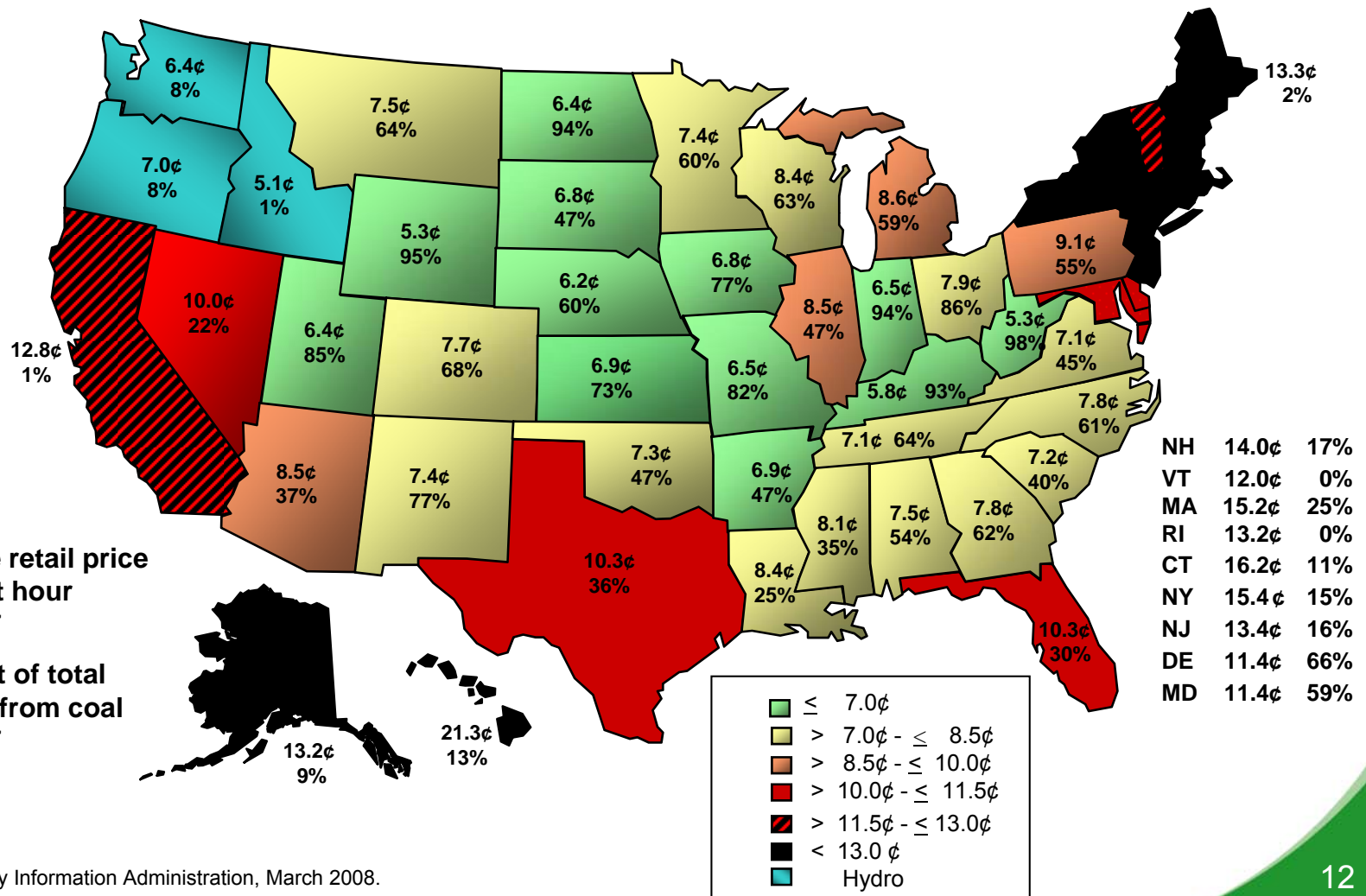
Coal is the Lowest Cost, Stable, Most Abundant Source of Energy



Source: ICE, NYMEX, Peabody as of 8 December 2008

Low-Cost Electricity from Coal

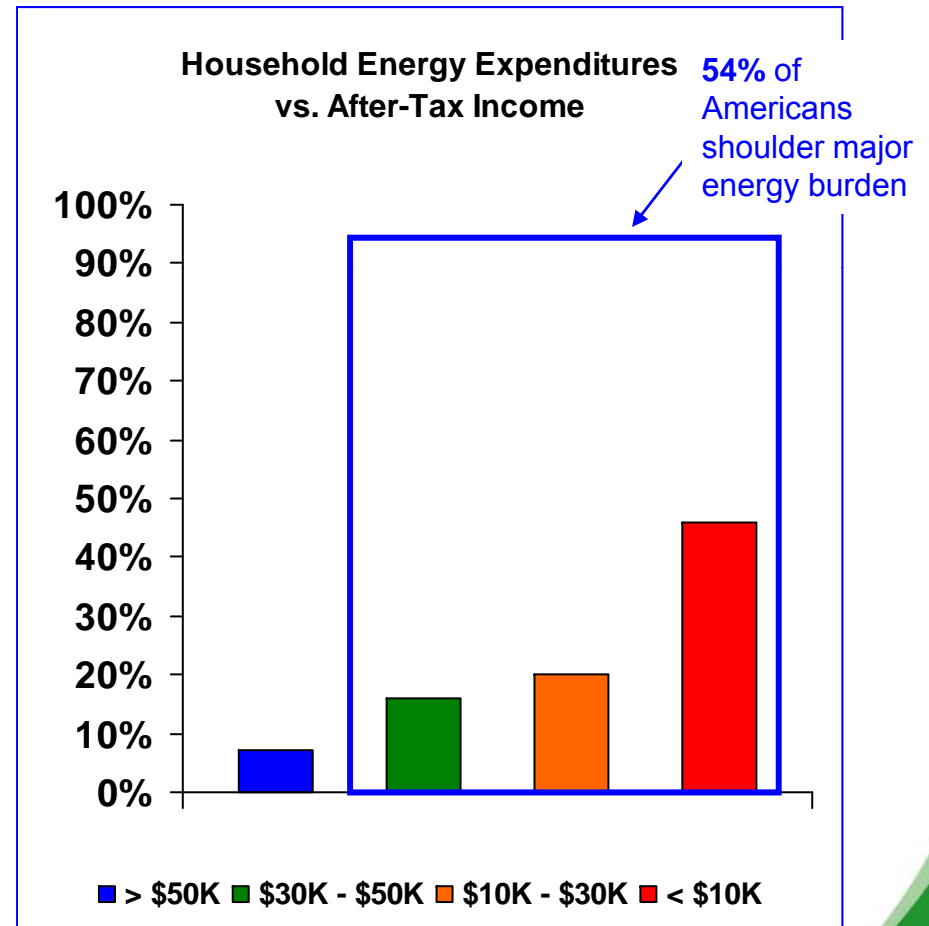
Retail Cost Per kWh & Percent of Coal Generation



Source: Energy Information Administration, March 2008.

Increases in Energy Prices Hit Low- and Fixed-Income Families the Hardest

- Families earning \$50K annually spend **4%** of their income on energy-related expenses
- Families earning \$10K or less spend **46%** on energy costs
- **54%** of households say rising energy costs are forcing them to make hard decisions on which bills to pay...
 - Energy?
 - Healthcare?
 - Child care?
 - Housing?
 - Food?



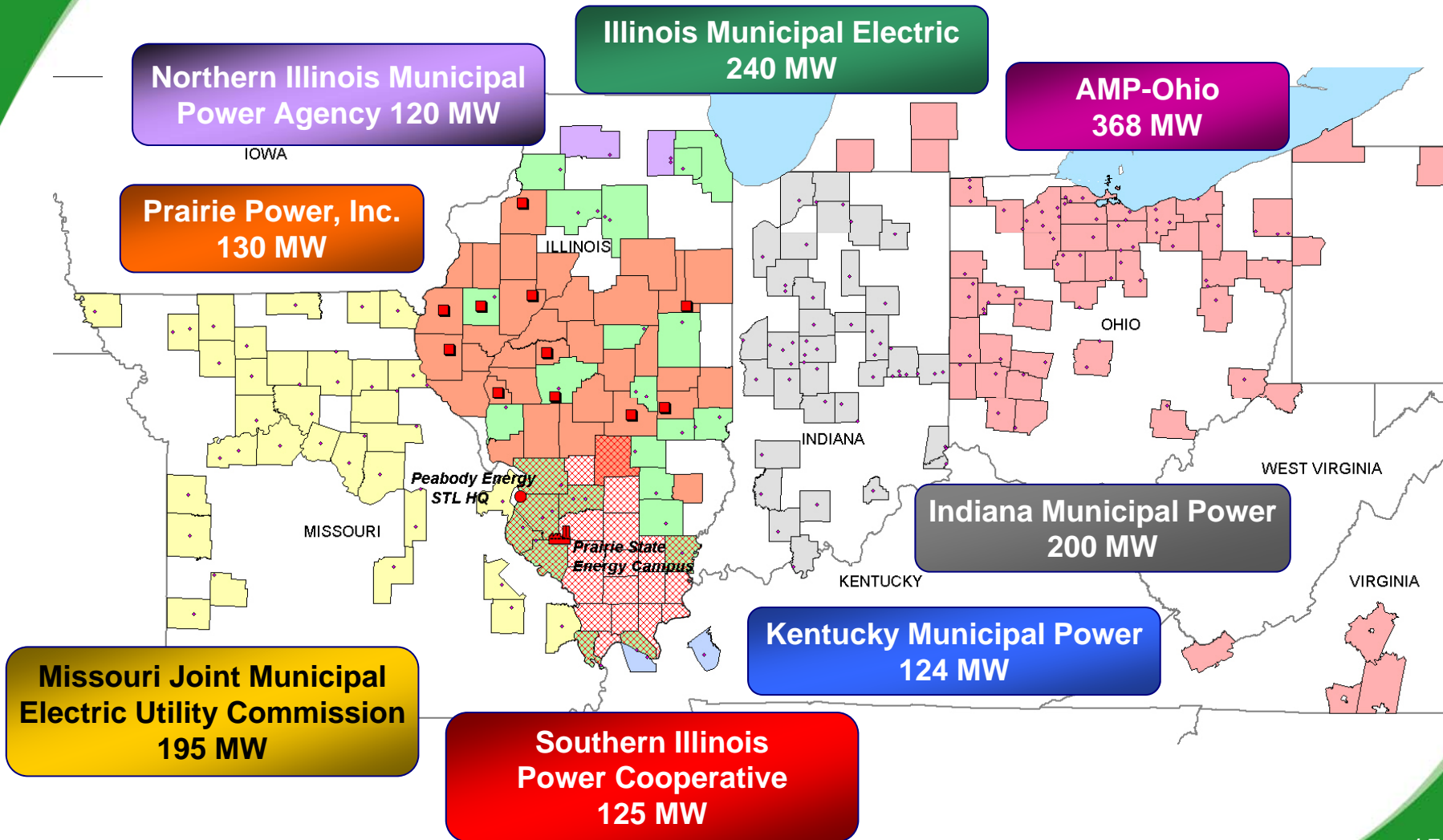
Economic Stimulus - Prairie State

1,200 Jobs Now; 2,500 Soon; Affordable Power 40+ Years



Source: U.S. Energy Information Administration (EIA), Bureau of Labor Statistics (BLS) 2007.

Prairie State Partners Serve More Than 2.5 Million People In Nine States



Clean Coal Technologies Provide the Path for Affordable & Adequate Energy Supplies



- **Coal-to-Liquids** – CTL with CCS can produce better fuels at the same rate of CO₂ emissions as imported oil. Adding biomass increases cost but improves CTL's carbon footprint.



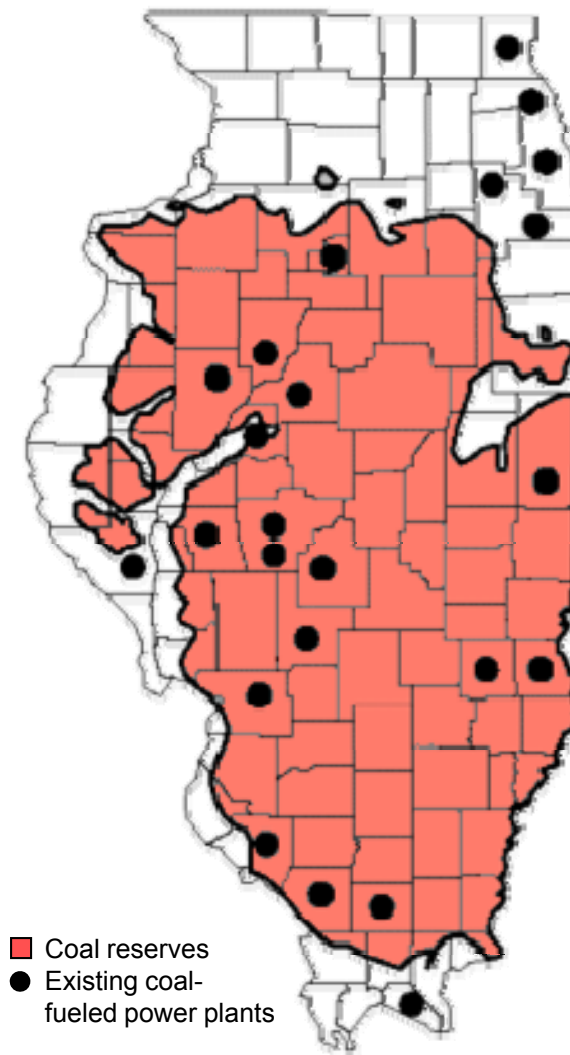
- **Coal-to-Gas** – Coal can be gasified to create NG for power plants and the CO₂ can be captured and stored. SNG from coal with CCS has better footprint than LNG.



- **Coal-to-Electricity** – New “supercritical” clean coal plants emit 15% less CO₂. FutureGen-type plants would have near-zero emissions.

Coal is a Cornerstone in an Illinois Energy Manufacturing Strategy

- Illinois has **38 billion tons** of recoverable coal reserves*
- More bituminous coal than any other state
- More recoverable coal reserves than all but 6 countries in the world
- More energy in coal resources than all the oil in Saudi Arabia, Iran, Iraq and Kuwait combined



*Source: Illinois State Geological Survey.

Illinois Energy Manufacturing Initiative (IEMI):

Coal as a Catalyst for Energy Independence



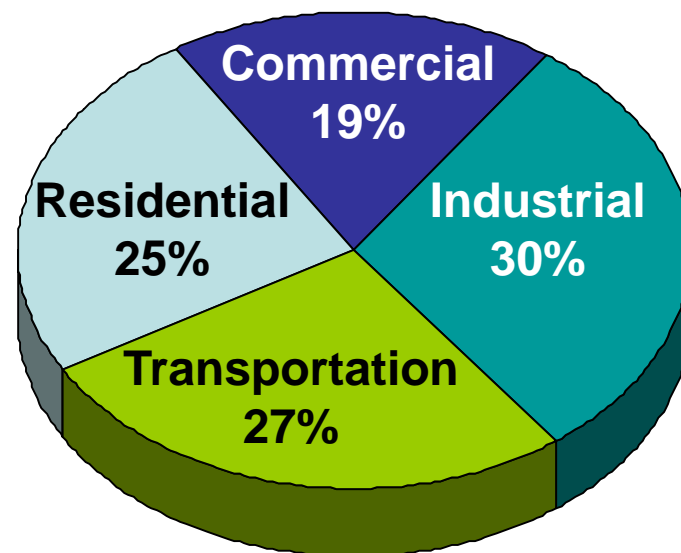
The impacts of a typical coal conversion plant:

- 3,000 jobs during construction
- 150 permanent jobs w/ 2,000 indirect & induced
- \$200 million in additional income
- \$3 billion gain in total output
- \$600 million in additional tax revenues (over life of plant)

Illinois Energy Consumption is Significant Compared to Other States

- #2 in residential consumption of natural gas
- #4 in transportation petroleum consumption
- #5 in commercial & industrial electricity demand
- #5 in total energy consumption

Percent of IL Energy Demand by Sector

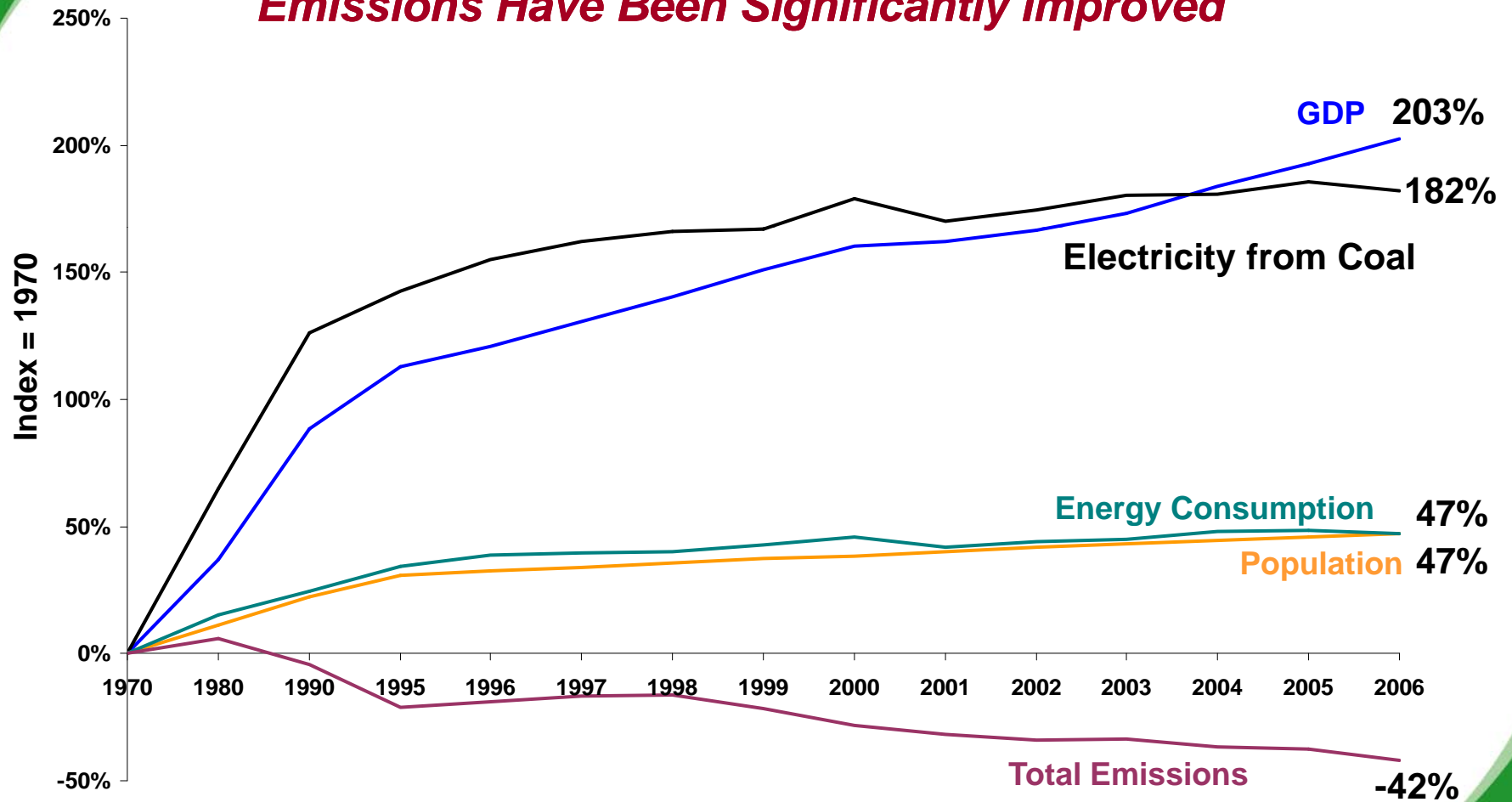


Energy Security, Economic Impact and Environmental Solutions

- The global energy crisis threatens U.S. security
- Oil and natural gas supplies face long-term decline
- U.S. electricity has avoided crisis due to abundant coal
- Electric reliability threatened if coal use is diminished
- Coal also an essential alternative fuel
- Technology is key to a carbon dioxide solution
- Technology development must be accelerated before CO₂ targets are implemented

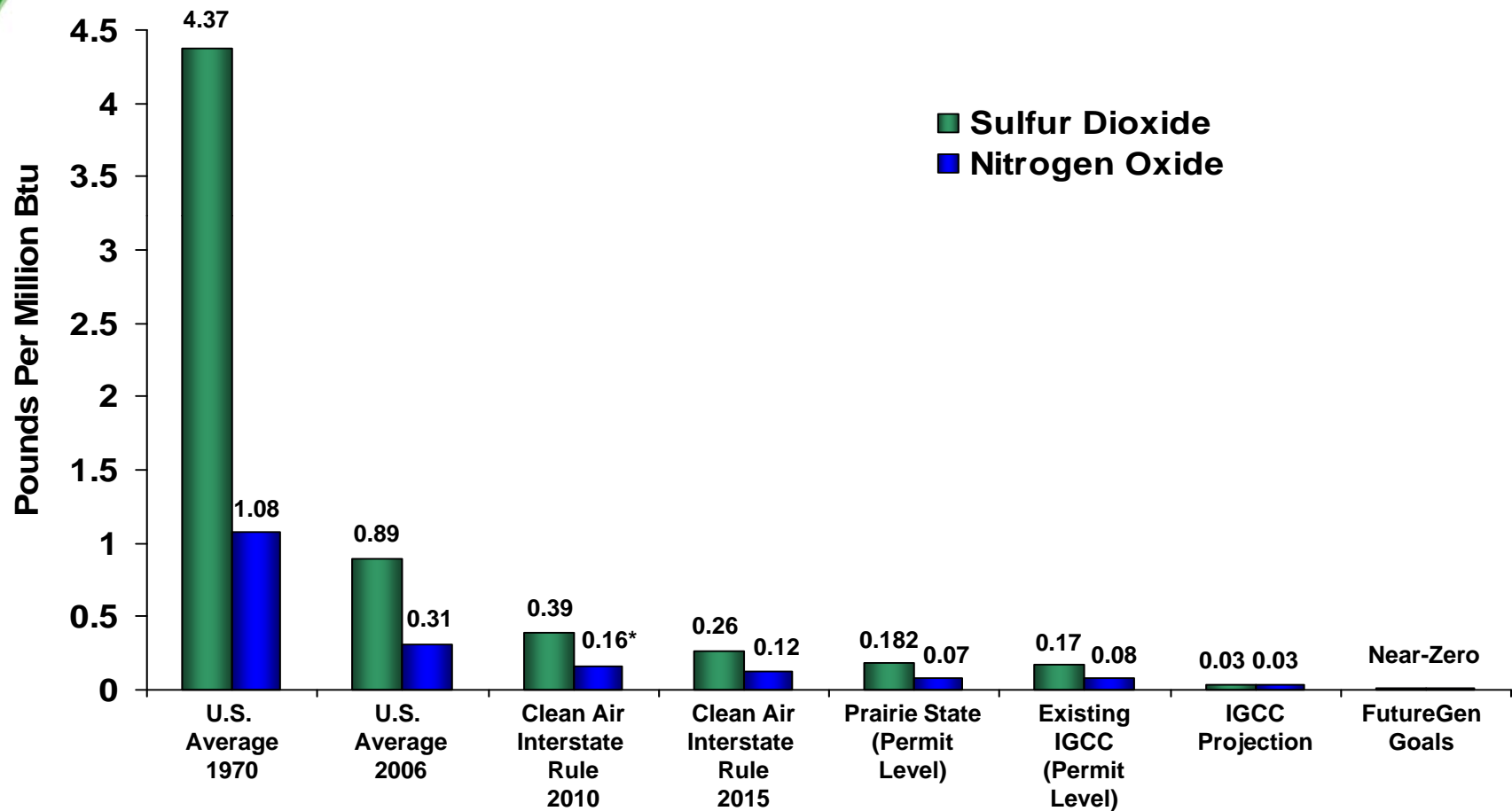
Technology is Driving Greater Coal Use and Economic Growth With Lower Emissions

Electricity from Coal Has Tripled Since 1970 While Emissions Have Been Significantly Improved



Source: Energy Information Administration, Annual Energy Review, June 2007; U.S. EPA Air Emissions Trends Data, July 2007.

Technology Offers the Roadmap to Near-Zero Emissions from Coal



* NOx reductions mandated by 2009.

Source: EPA's Clean Air Markets database, Sept. 2007; Energy Information Administration 2004 Annual Energy Outlook; GE Energy; SFA Pacific.

Clean Coal: Powerful Implications For an Energy-Short World

- **The age of saying “no” to any energy source is long past**
- **Coal is the best answer to relieve global energy shortages**
- **Carbon storage and other clean-tech options require increased investments**
- **The power most needed for energy security is willpower**

