



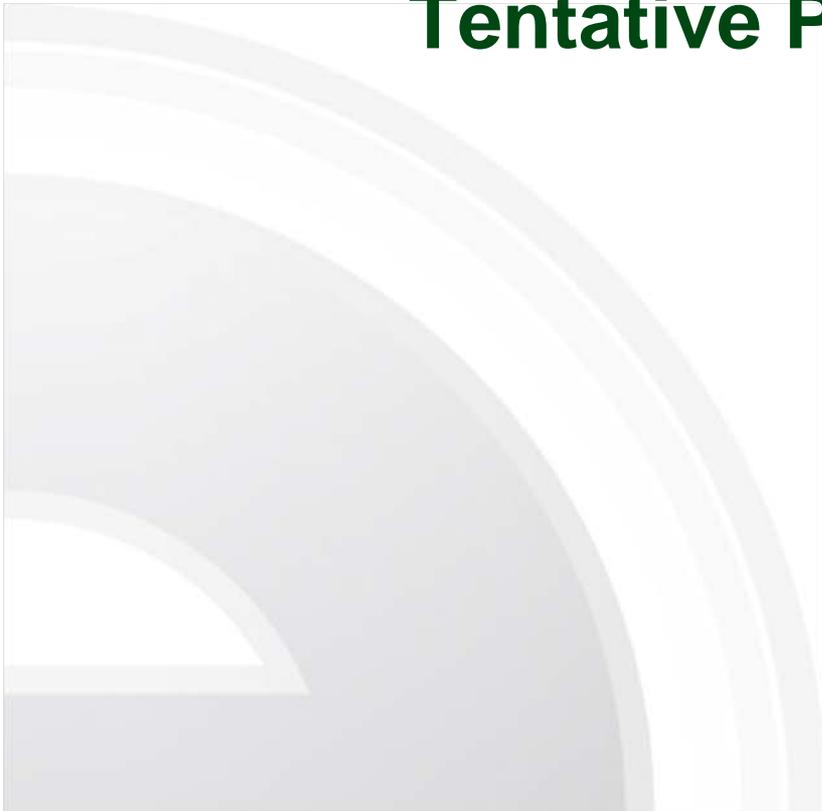
# Natural Gas Vehicle Technologies ARPA-E Workshop

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Advanced Research Projects Agency – Energy  
U.S. Department of Energy

Houston, TX  
January 26, 2012

[www.arpa-e.energy.gov](http://www.arpa-e.energy.gov)

# Tentative Program Timeline



# TENTATIVE PROGRAM TIMELINE



Conversion technologies workshop	Jan 13
<b>Vehicle technologies workshop</b>	<b>Jan 26</b>
Internal program review	Feb 06
<b>Federal opportunity announcement</b>	<b>Feb 10</b>
Concept paper due date	Mar 15
Request for full proposals	Apr 12
Full proposals due date	May 10
Selection	Jul 02
Contracts signed	Aug 06

Disclaimer: This schedule is tentative and subject to internal agency program approval and funding

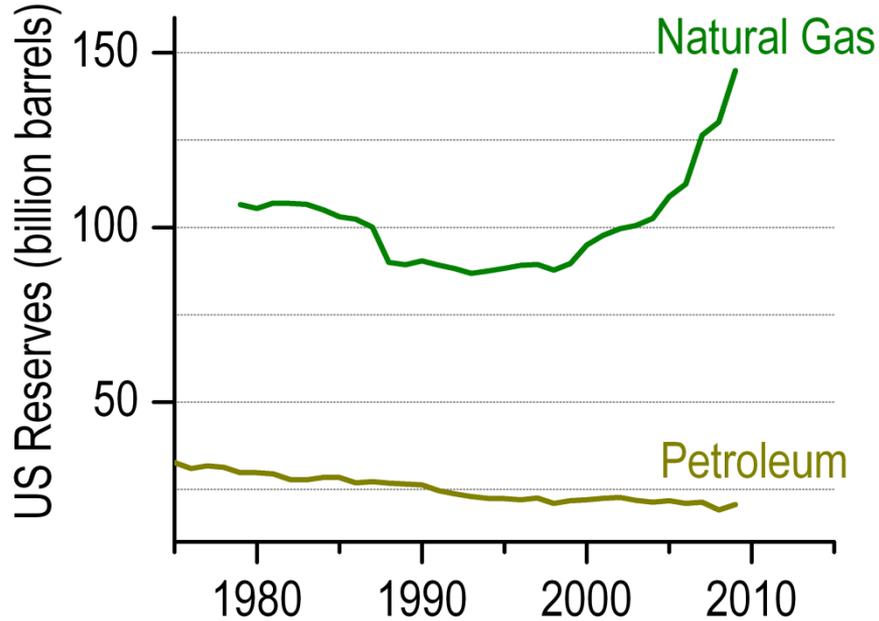
**Why natural gas? Why now?**



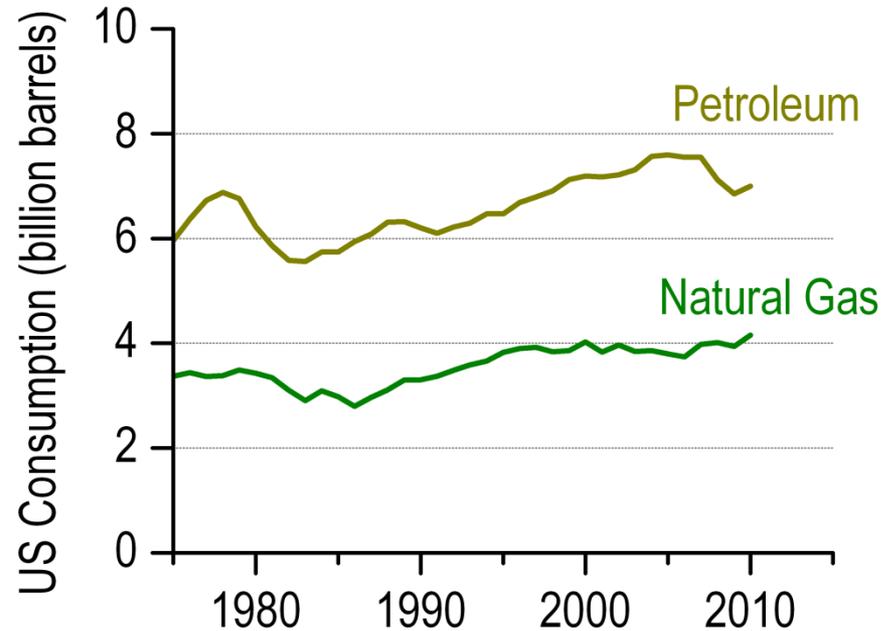
# U.S. SUPPLY AND DEMAND



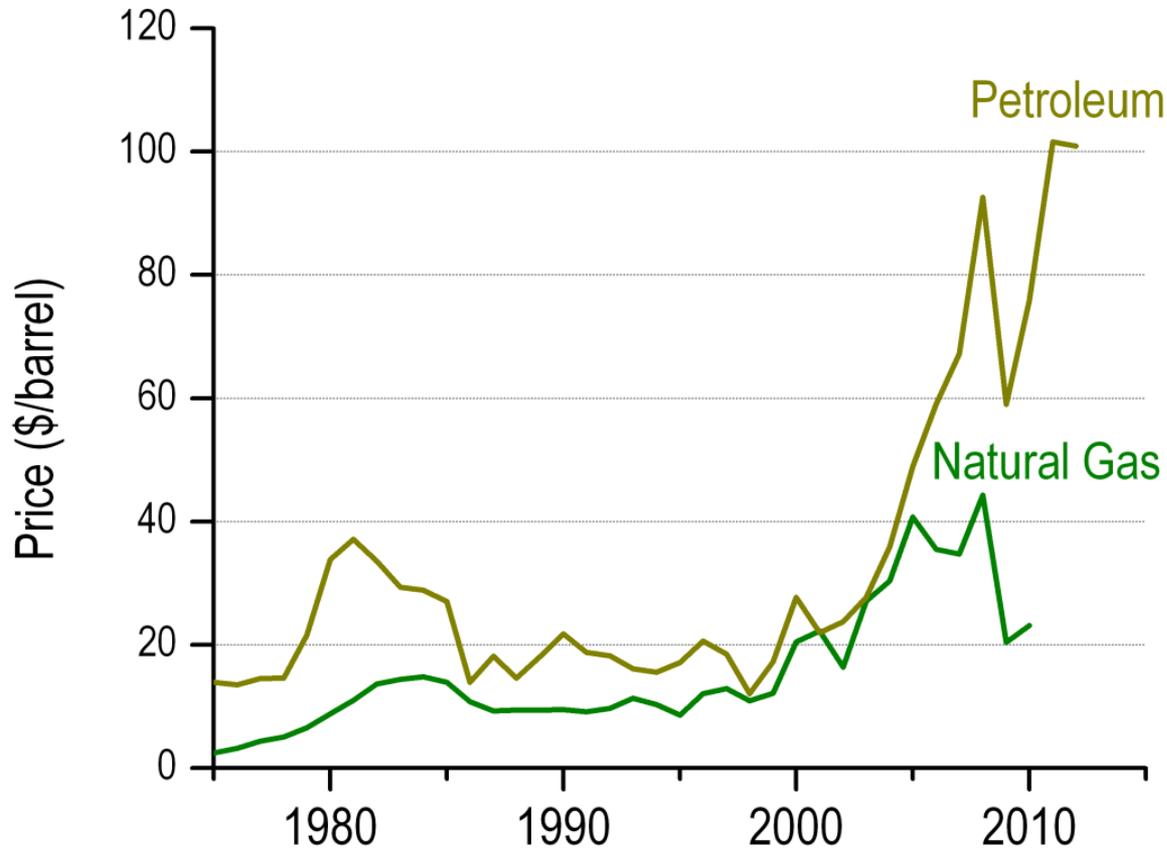
## U.S. Proven Reserves



## U.S. Annual Consumption



# U.S. ANNUAL NATURAL GAS & PETROLEUM PRICES



# NATURAL GAS – PETROLEUM ARBITRAGE OPPORTUNITY?

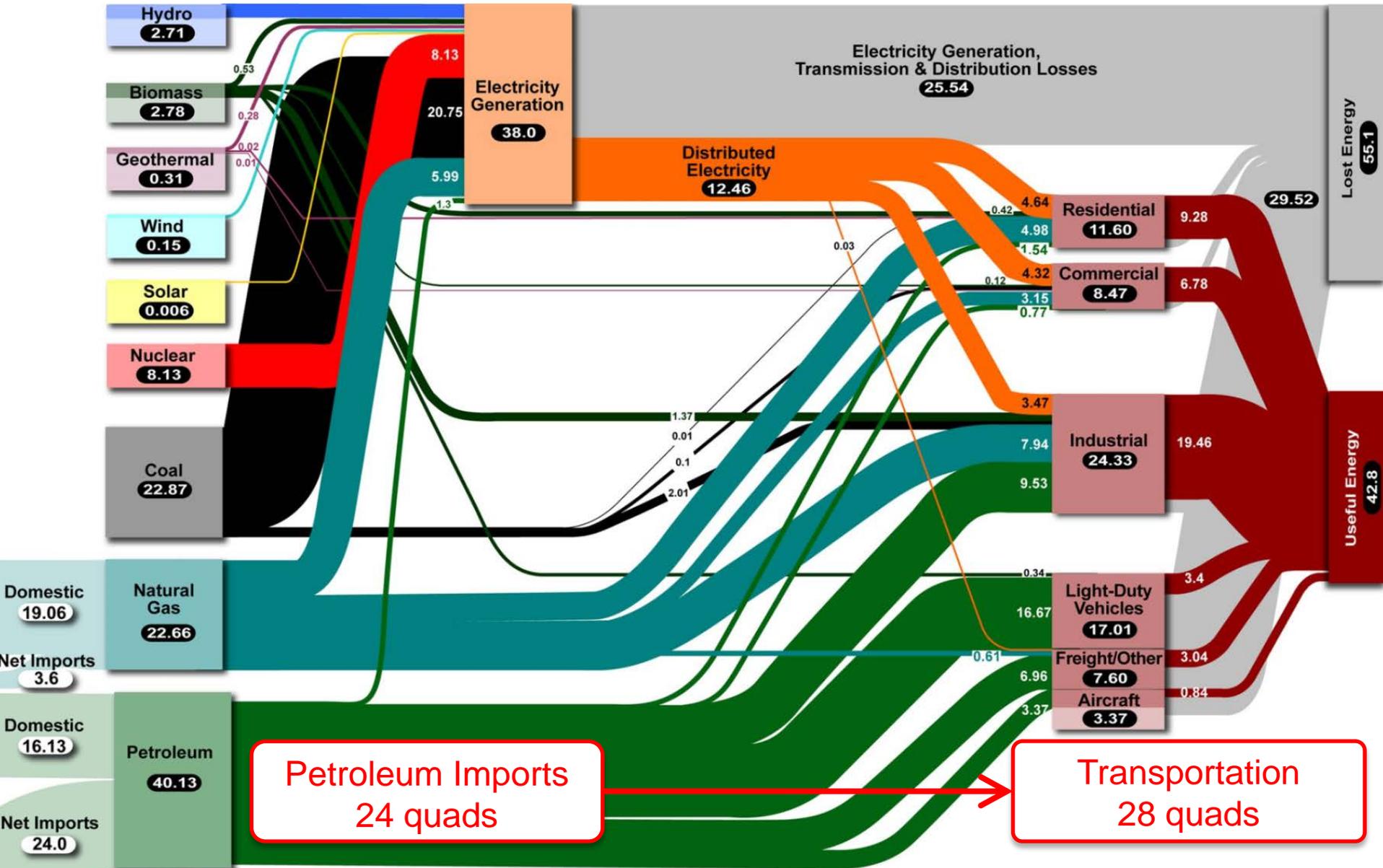


- Petroleum prices are nearly **5x more** than natural gas prices
- Is this a **short-term** arbitrage opportunity or **long-term** market trend?

**How can we use this domestic resource  
with the maximum benefit for our nation?**



# 2008 US ENERGY FLOWS (98 QUADS)



1 Quad = 1.06 EJ

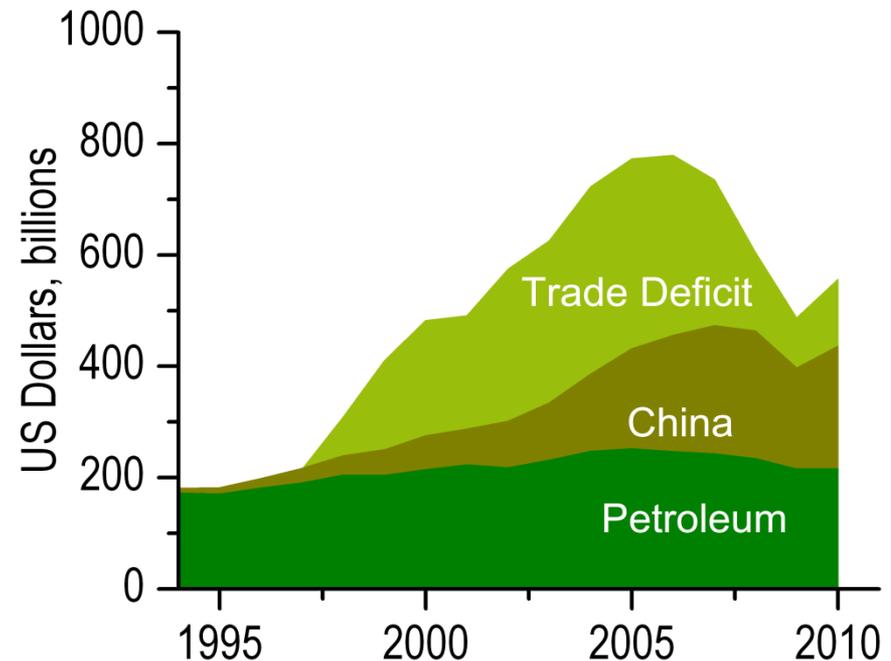
Source: LLNL, US DOE 2009

# ECONOMIC IMPACT



- Petroleum imports
  - energy dependence
  - 24 quads
- Transportation sector
  - petroleum demand
  - 28 quads
- Petroleum impact
  - 35% deficit
  - \$200BN/yr

Annual U.S. Trade Deficit



Source: US Census Bureau, 2011

**How do we get natural gas into the transportation sector?**



# NATURAL GAS FOR TRANSPORTATION

