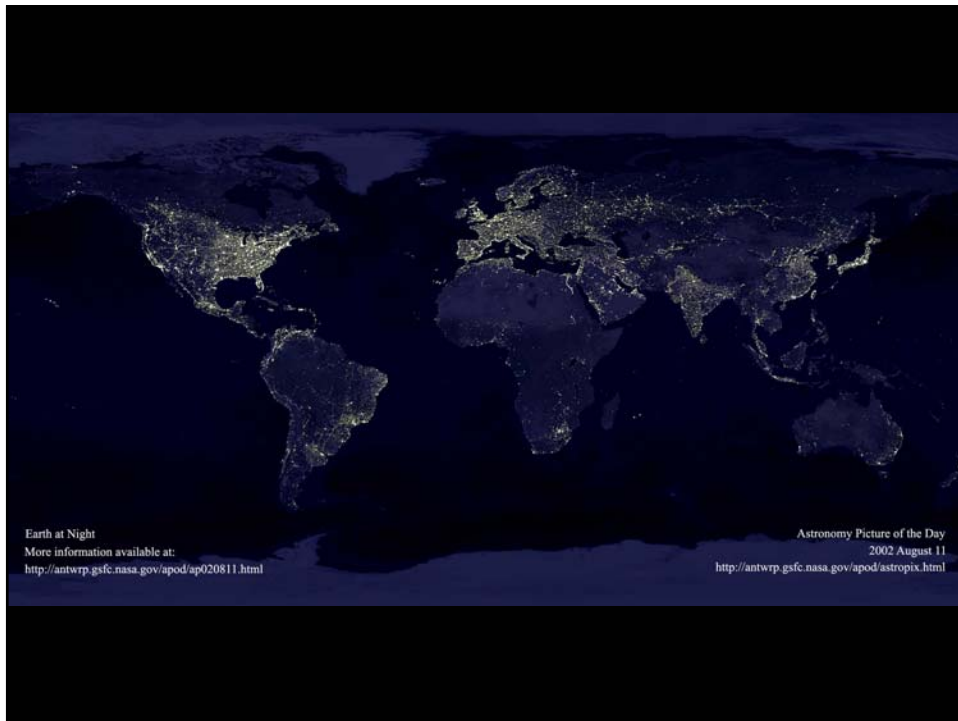


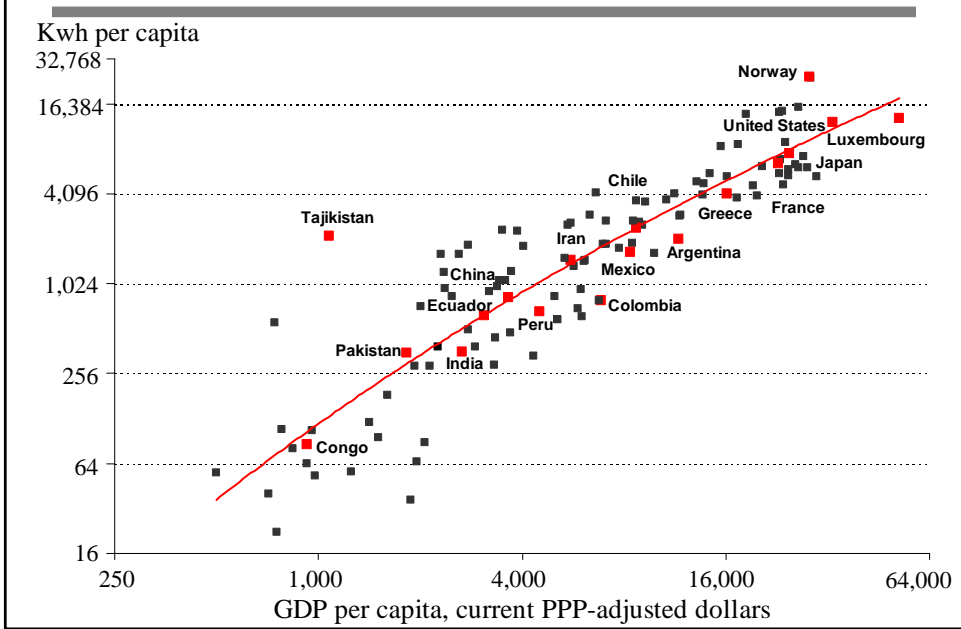


Looking Forward: Energy and the Economy

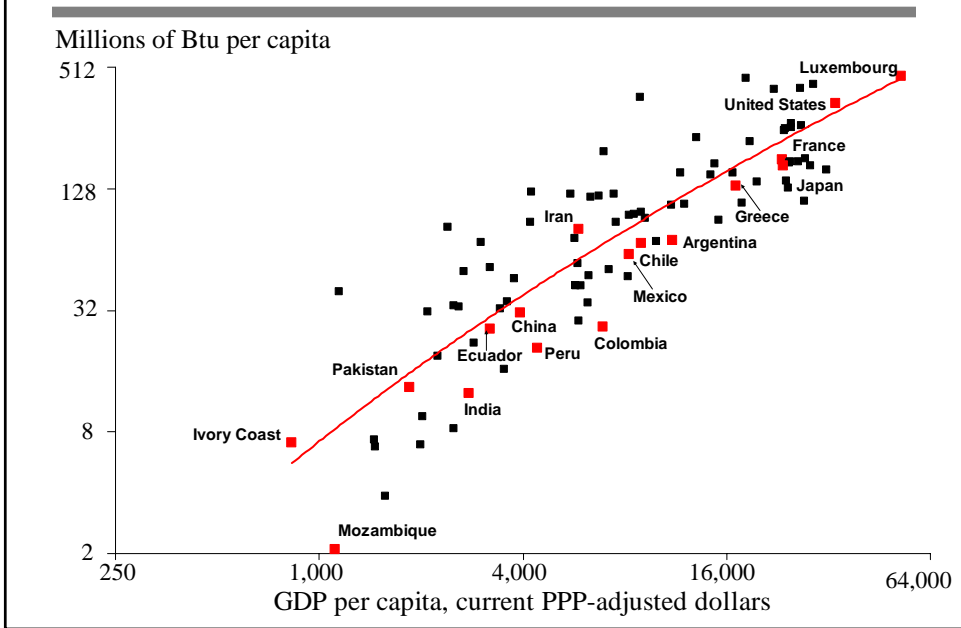
Stephen P. A. Brown
Federal Reserve Bank of Dallas



Electricity Use and GDP per Capita: 2000



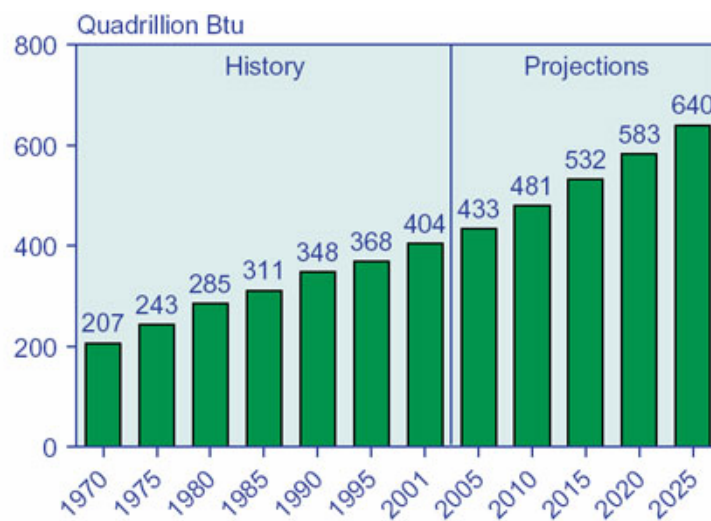
Total Energy Consumption and GDP per Capita: 2001



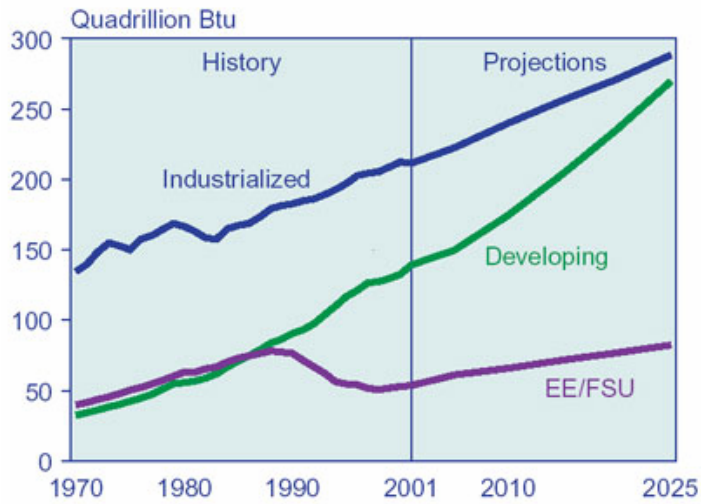
Overview

- Trends in world energy consumption
- World oil markets
 - prices, consumption, supplies
- U.S. and world natural gas markets
- Economic effects of higher energy prices

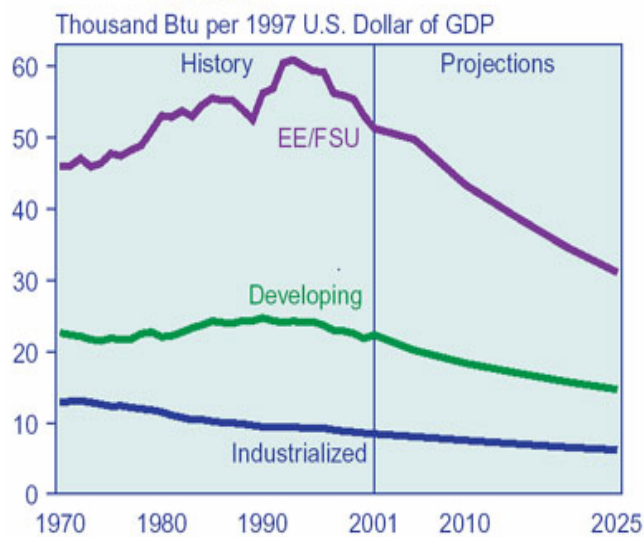
World energy consumption to grow



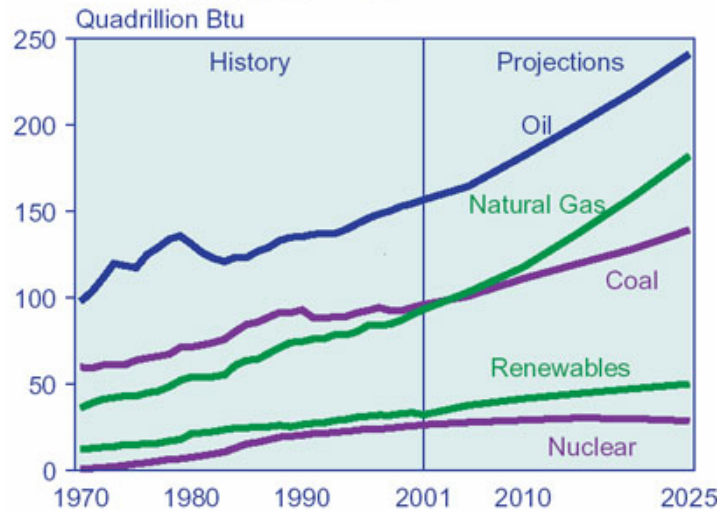
Energy consumption to grow in all regions



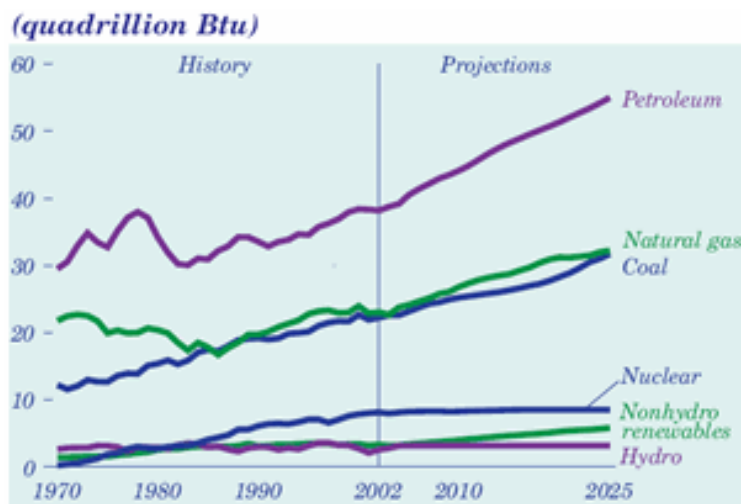
Energy efficiency improving



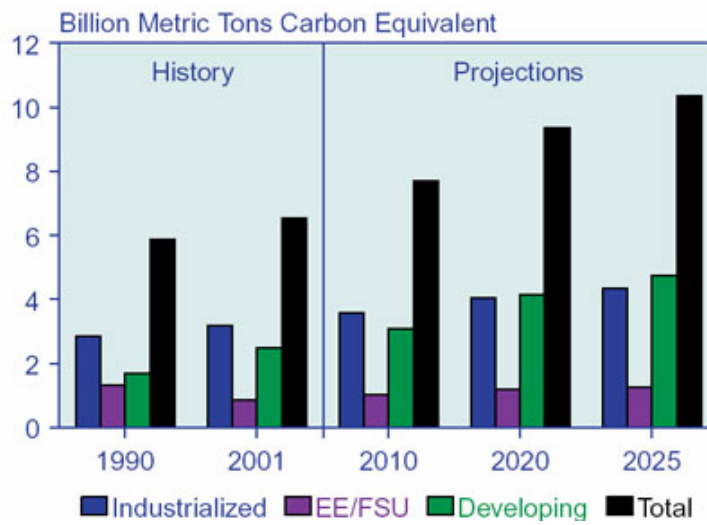
Energy consumption by source



U.S. energy consumption to grow

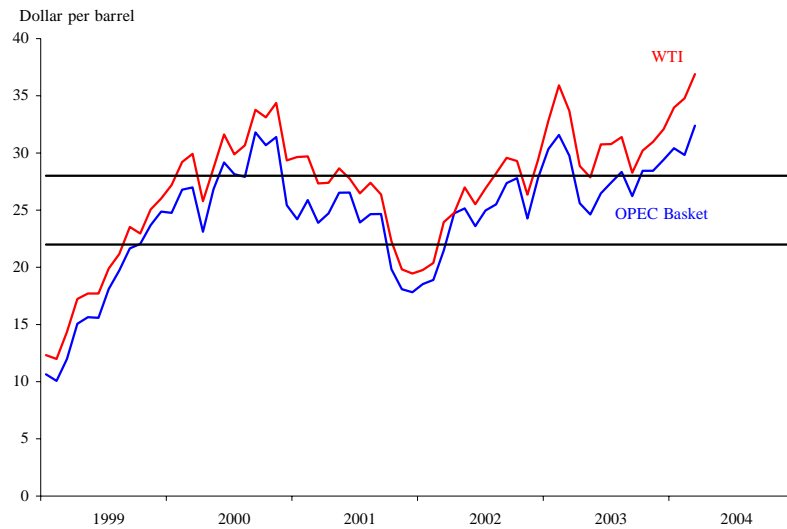


CO₂ emissions to rise



Near-Term Oil Price Outlook

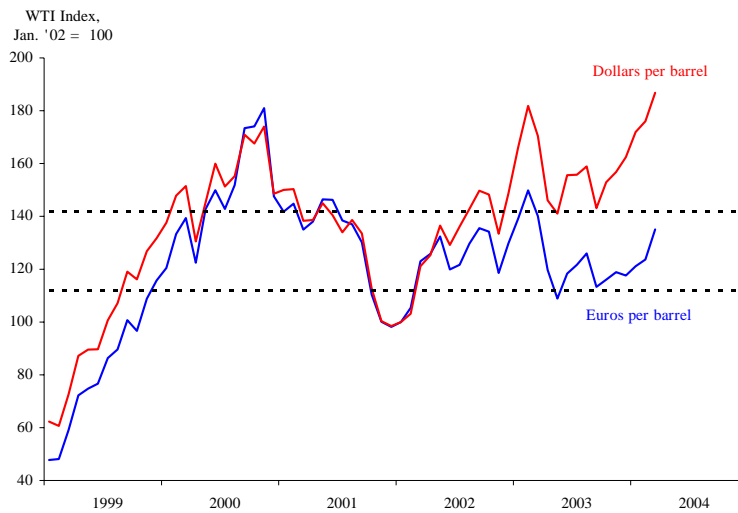
Crude oil prices above OPEC band



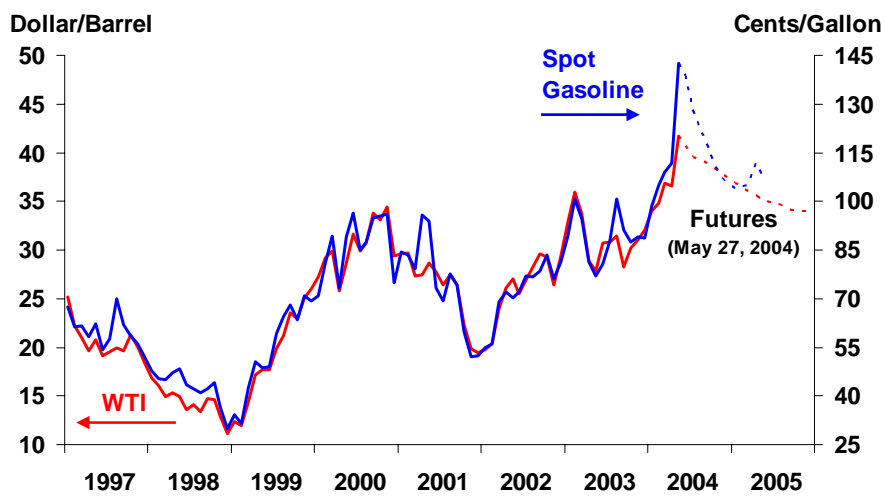
Why oil prices are higher

- Strong world oil demand
- Higher tanker rates
- OPEC stinginess in spring
- Weak U.S. dollar

Euro oil prices don't look as high

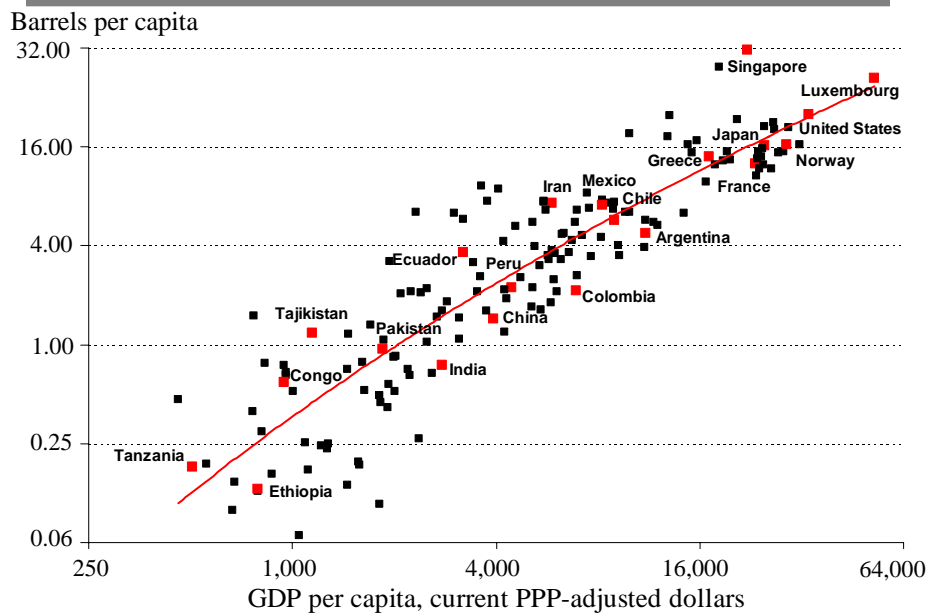


U.S. gasoline prices surge

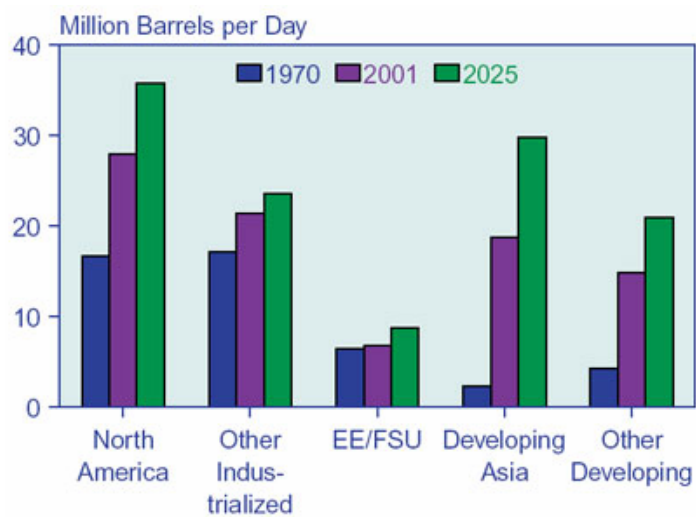


Longer-Term Oil Outlook

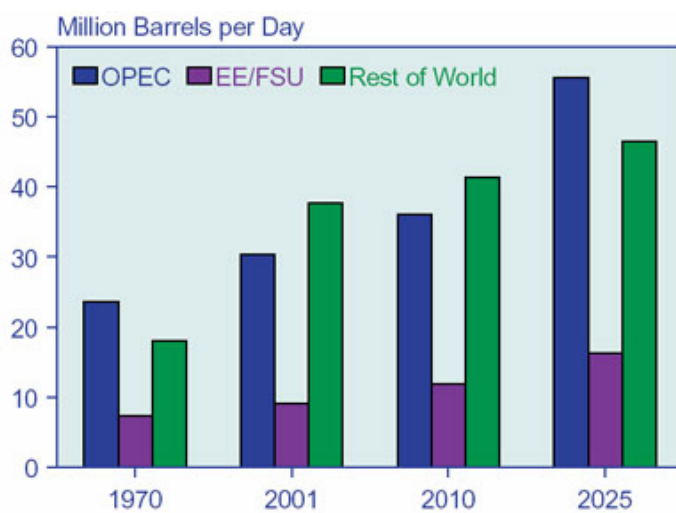
Petroleum Consumption and GDP per Capita: 2001



Oil consumption rising in all regions

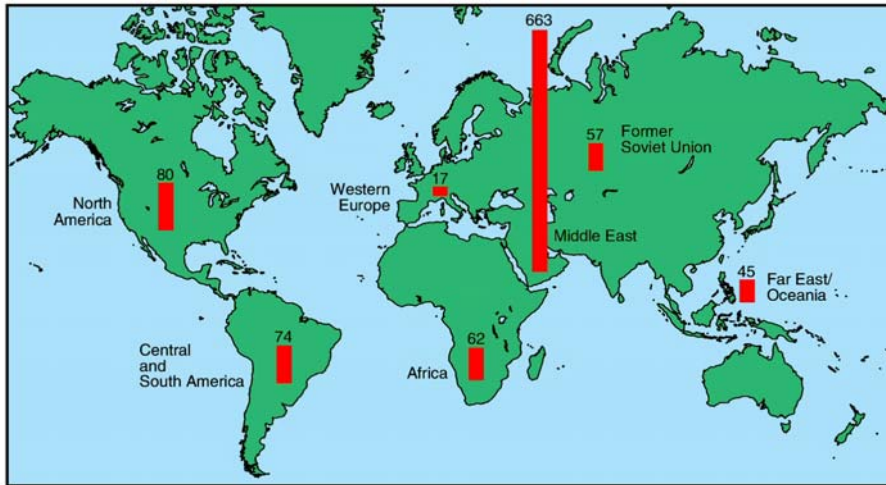


World becoming increasingly reliant on OPEC oil

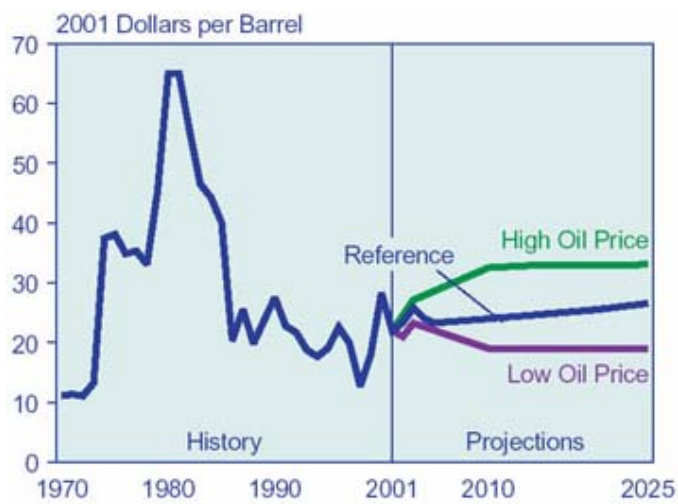


World Reserves

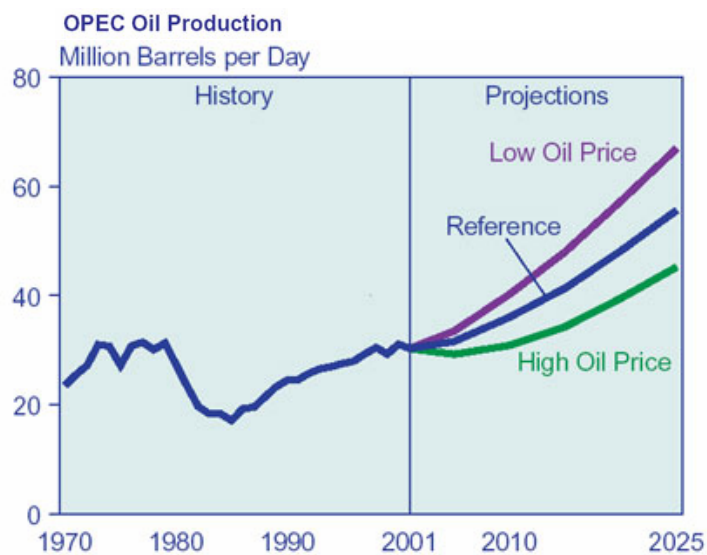
Billions of barrels



Oil price outlook uncertain

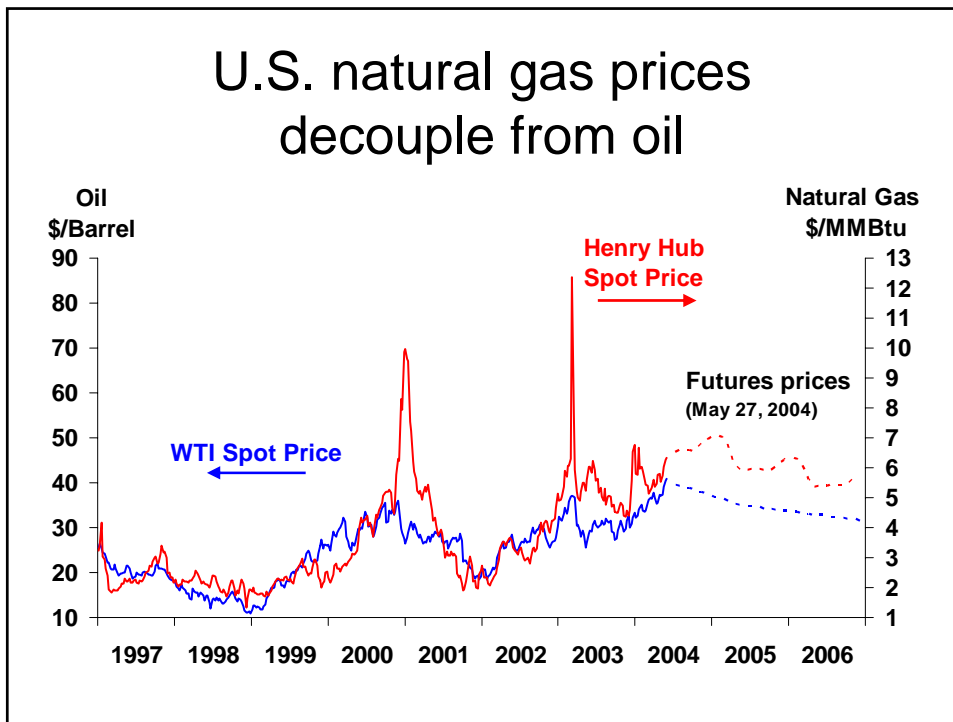


Price outlook depends on OPEC

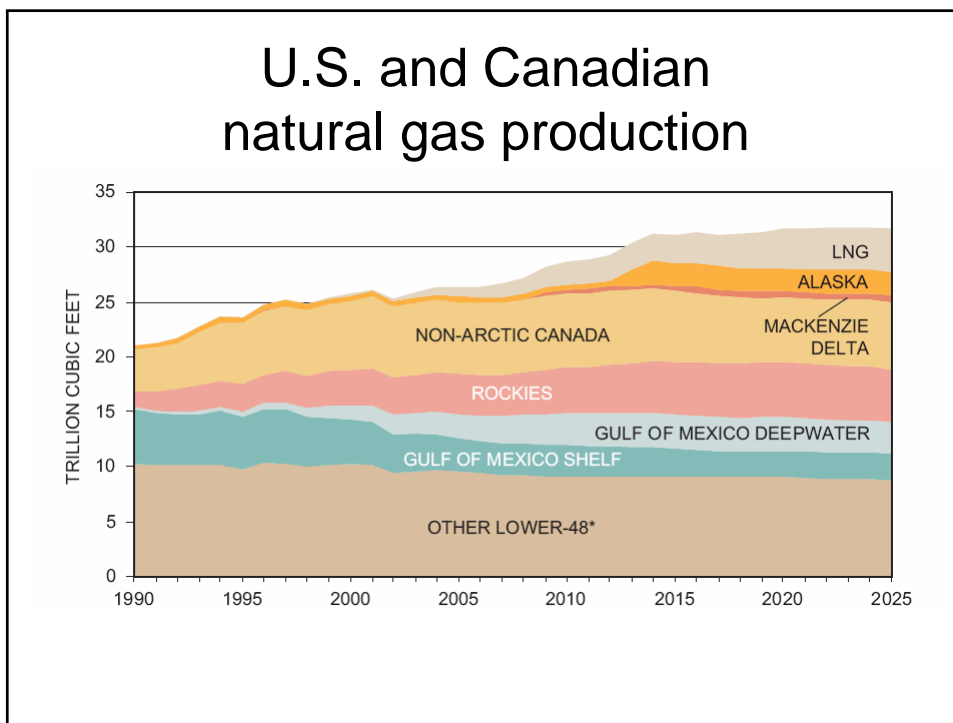


As high as oil prices are, U.S. natural gas prices are higher

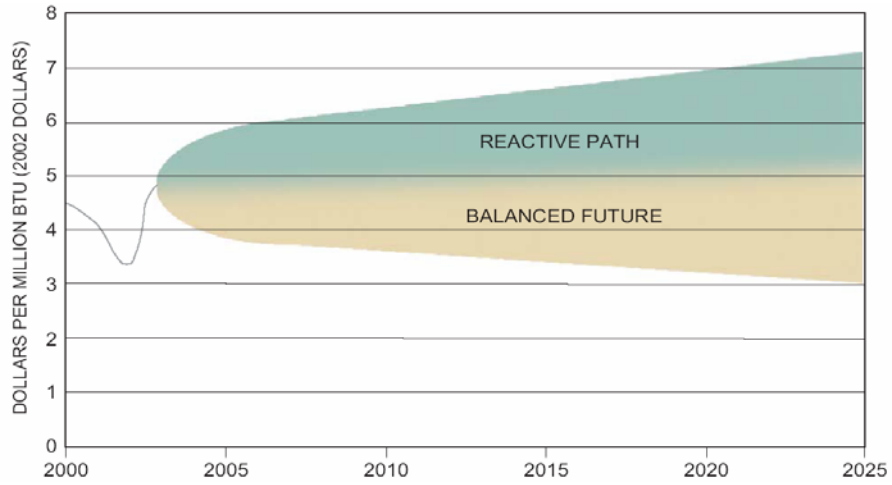
U.S. natural gas prices decouple from oil



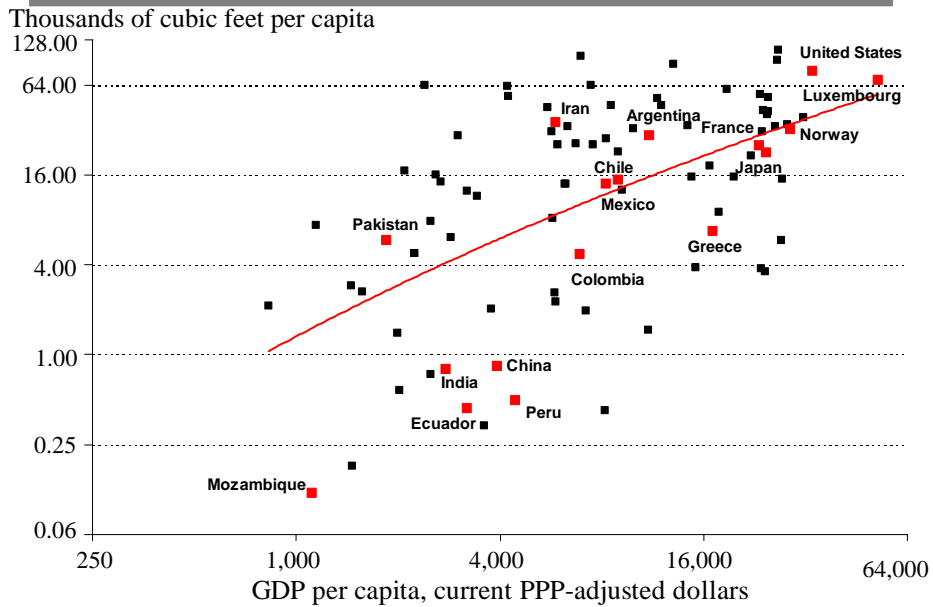
U.S. and Canadian natural gas production



Natural gas prices likely to remain elevated



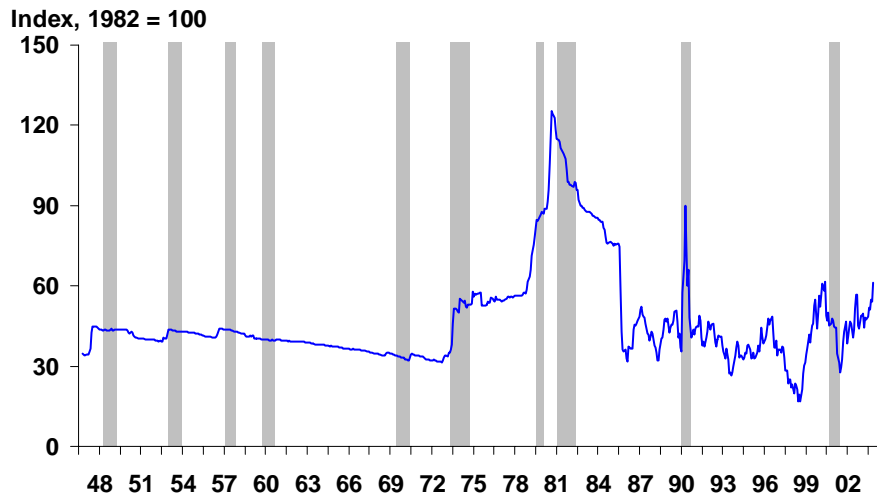
Natural Gas Consumption and GDP per Capita: 2001



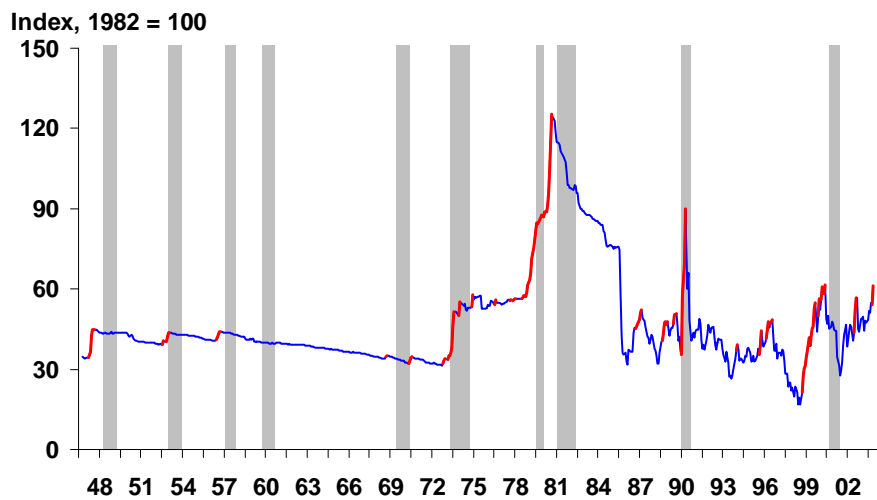
World natural gas markets to
become increasingly integrated
through pipelines and LNG

**Economic Effects
of Higher Energy Prices**

Oil price shocks and U.S. recessions

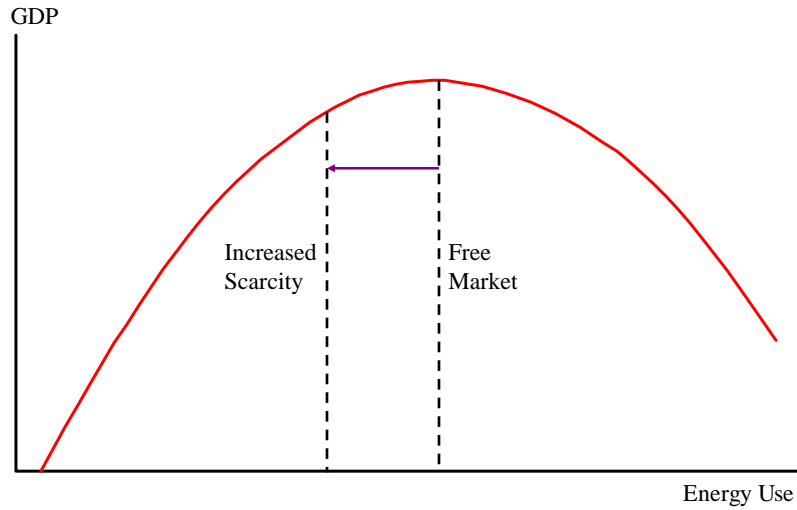


Oil price shocks and U.S. recessions



Energy use and GDP

(for a given technology)



An unfavorable supply shock

Input Scarcity (Higher Energy Prices)

GDP Growth Slows & Productivity Growth Slows

Price Level Rises

Wage Growth Slows

Interest Rate Rises

Unemployment Rate Rises

Economic effects of higher energy prices

Assumptions:

- U.S. oil prices 25 percent higher
- U.S. natural gas prices 40 percent above historical relationship with crude oil prices

Economic effects of higher energy prices

Estimates:

- U.S. GDP reduced 0.8 percent
 - 0.5 percent from oil & natural gas together
 - 0.3 percent from natural gas alone
- GDP deflator increased about 0.8 percent
- Slight upward pressure on short rates

Why only mild economic effects?

- Oil price increases moderate by historical standards
- Reduced energy-to-GDP ratio
- More experience with energy price shocks

Summary

- Energy consumption grows with world economy and population
 - energy efficiency improving
- Moderate oil prices depend on increased OPEC production
- U.S. natural gas prices to remain elevated
- Current energy-price shocks to have moderate economic effects

