

Purchasing  
Management  
Association of  
Rhode Island

**APICS** *The Association for  
Operations Management*  
*Providence Chapter*



# 4<sup>th</sup> Annual Strategic Sourcing Study

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## Energy Prices Reshaping the Supply Chain: Charting a New Course?

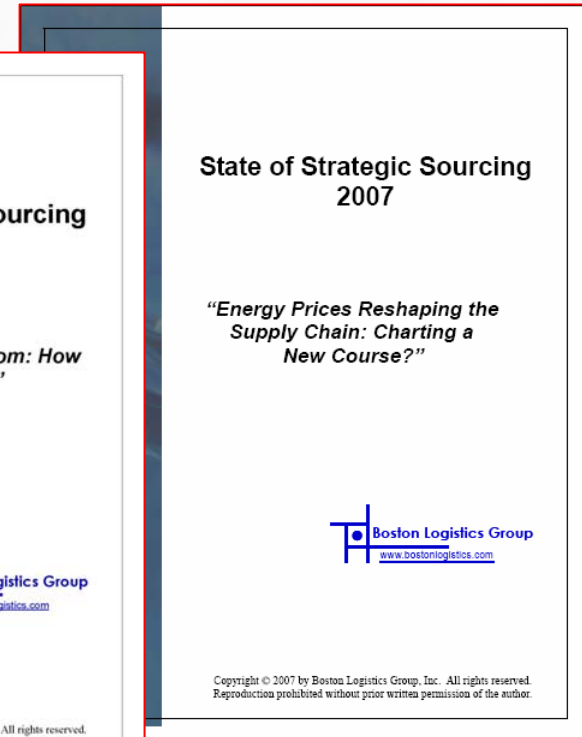
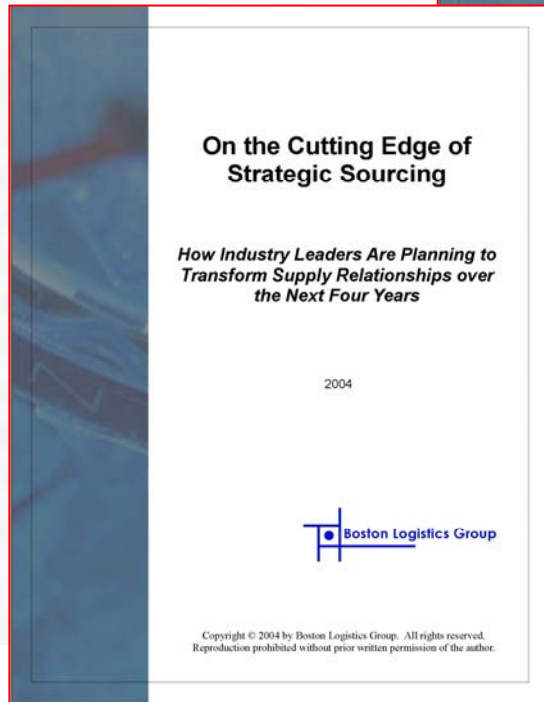
January 23, 2007

 **Boston Logistics Group**  
*Supply Chain Economists*

**CAMBRIDGE**  
SYSTEMATICS

# Who we are

- Supply Market Forecasts
- Supply Chain Return on Investment Briefs
- Supply Chain Consulting



# Agenda

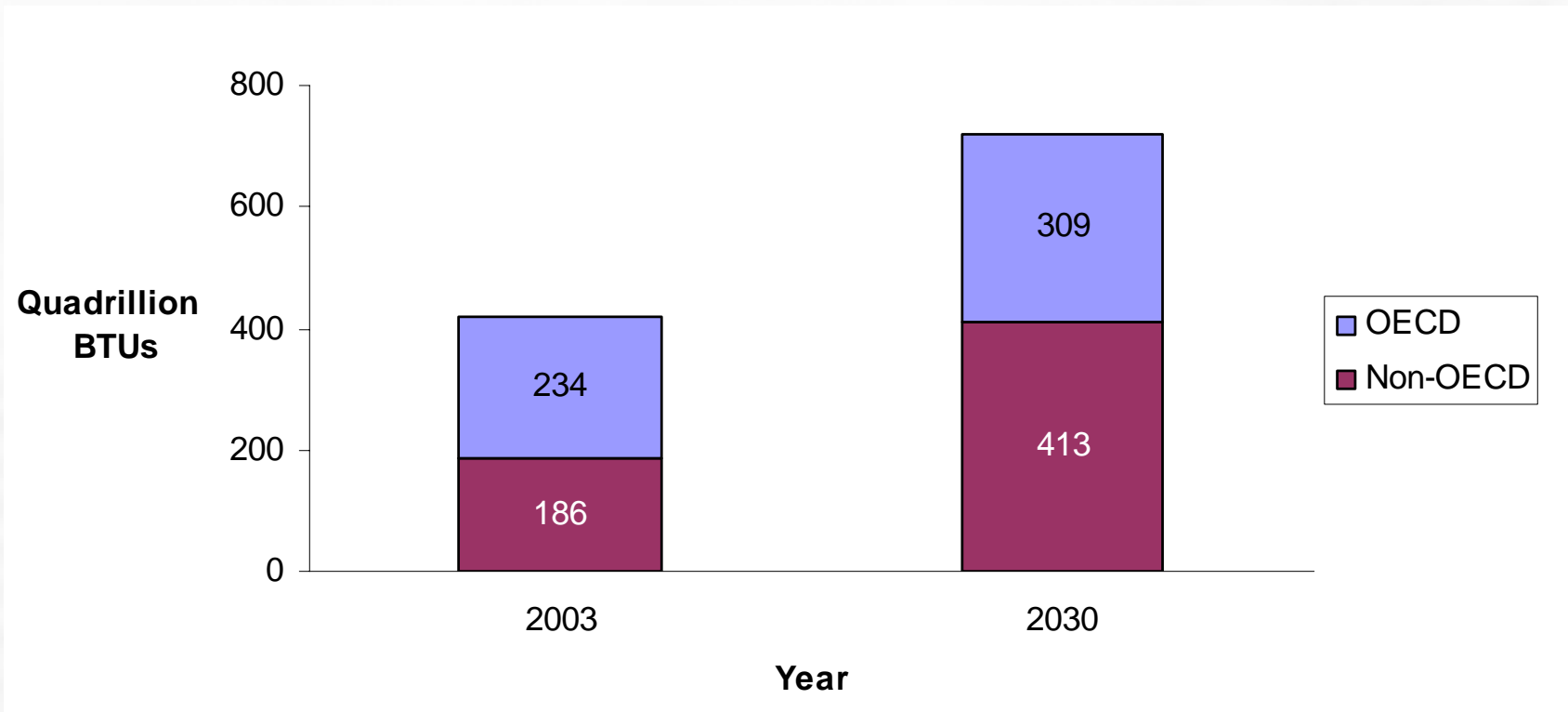
- High and Volatile
- Fragmented and Diffuse
- Supply Chain Impact
- Eight Buying Strategies
- Five Policy Issues
- The Bottom Line

**High and Volatile**

# World energy requirements increasing

- Energy consumption forecast to nearly double by 2030

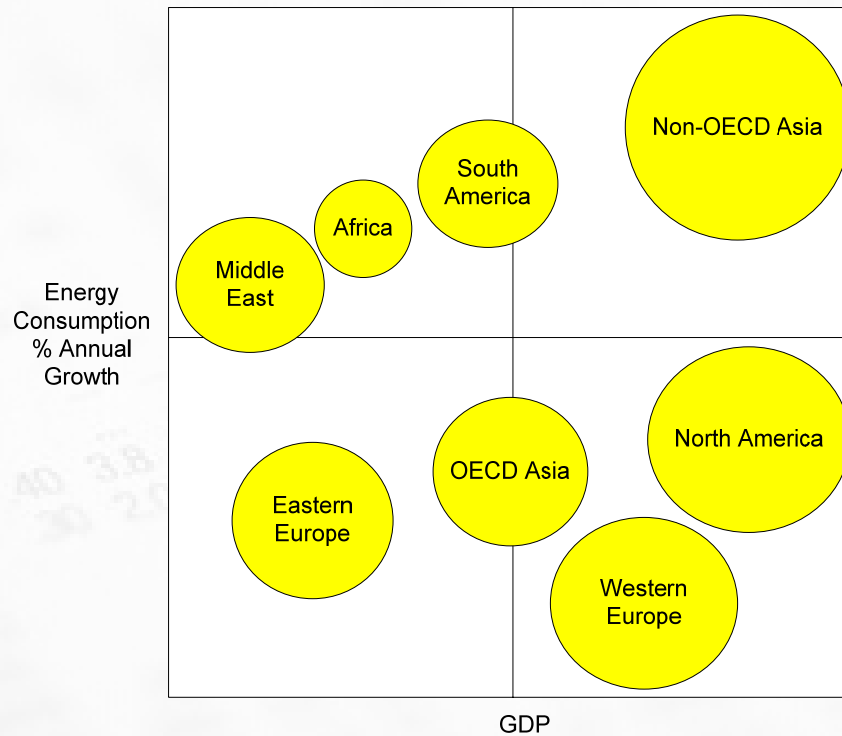
Growth in Global Energy Consumption, 2003 vs. 2030



# Asia leading the growth

- China accounts for most of the demand growth
- Developed economies growing at 1% or less

**Growth in Energy Consumption by World Area**

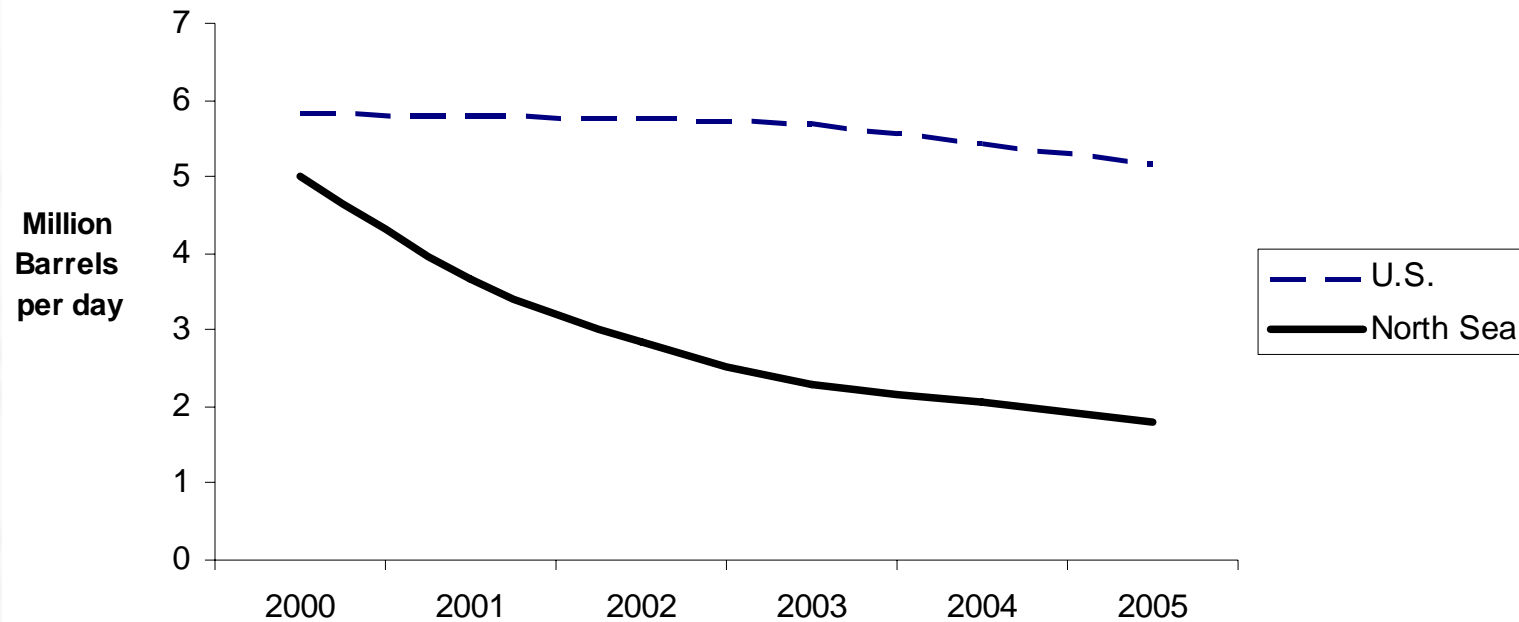


Note: Size of bubble proportional to actual energy consumption

# Production falling behind

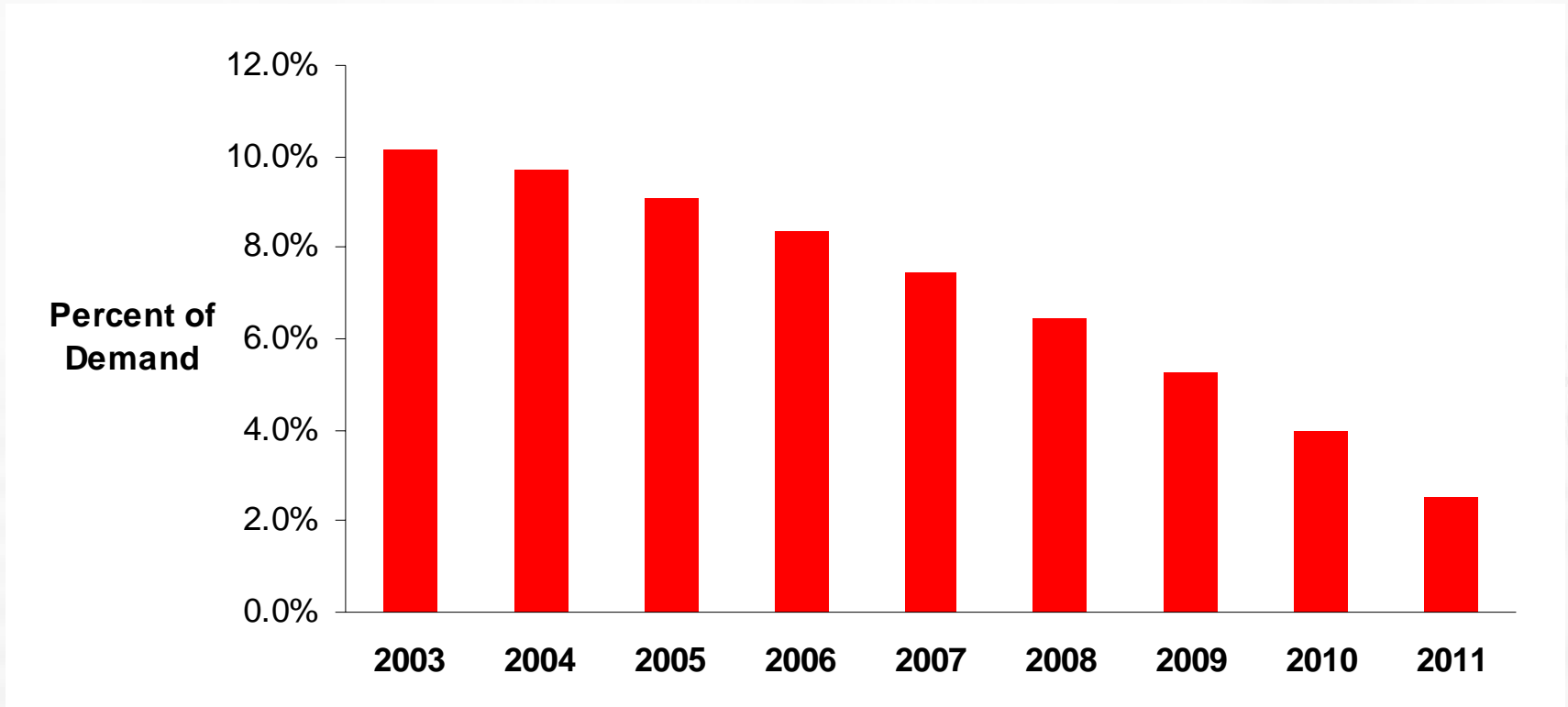
- Global oil production nearly flat at less than 1.5% per year
- Many locations declining in production

US and North Sea Oil Production



# Global oil supply vs. demand

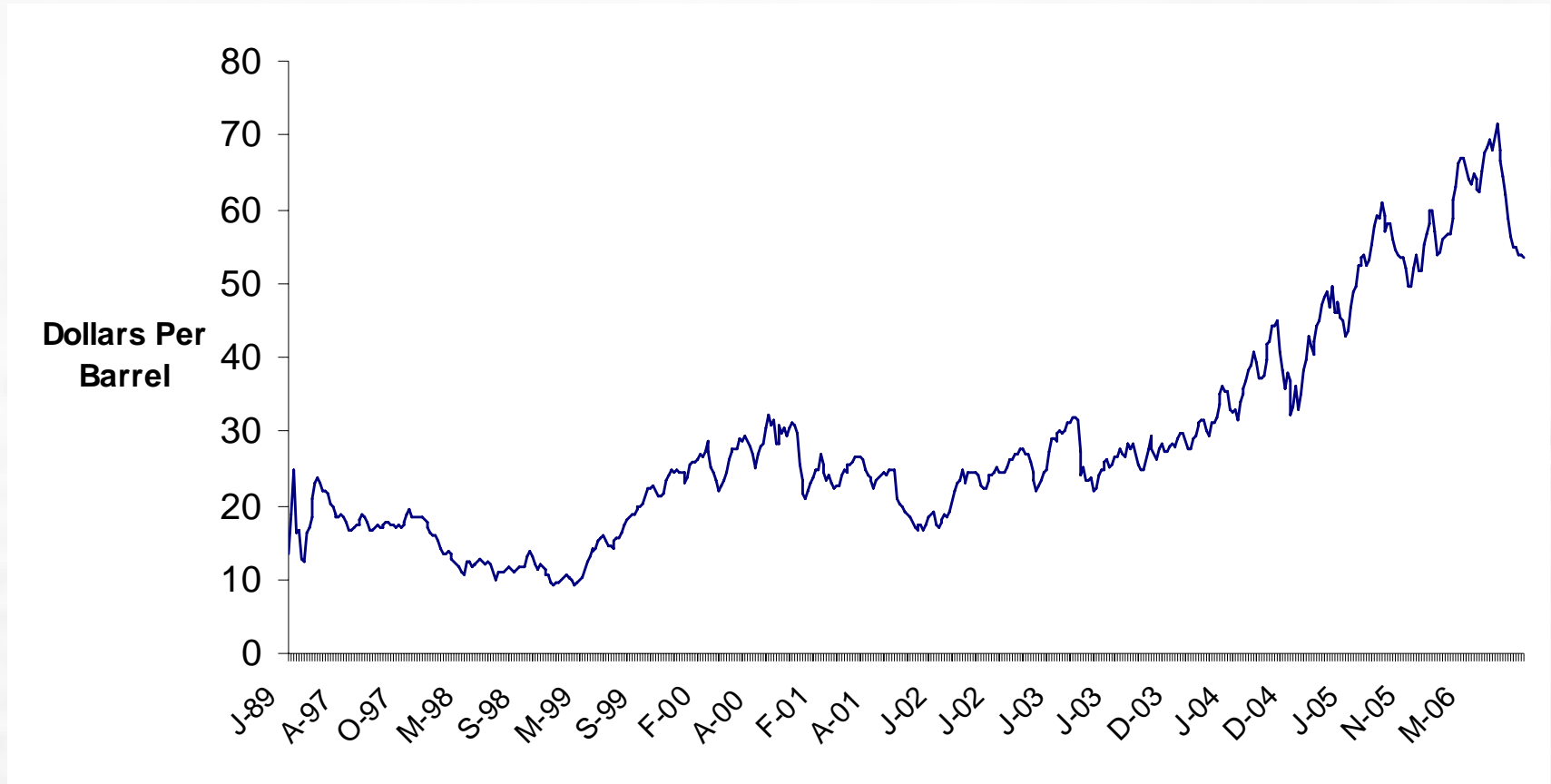
## Gap Between Oil Demand and Oil Available





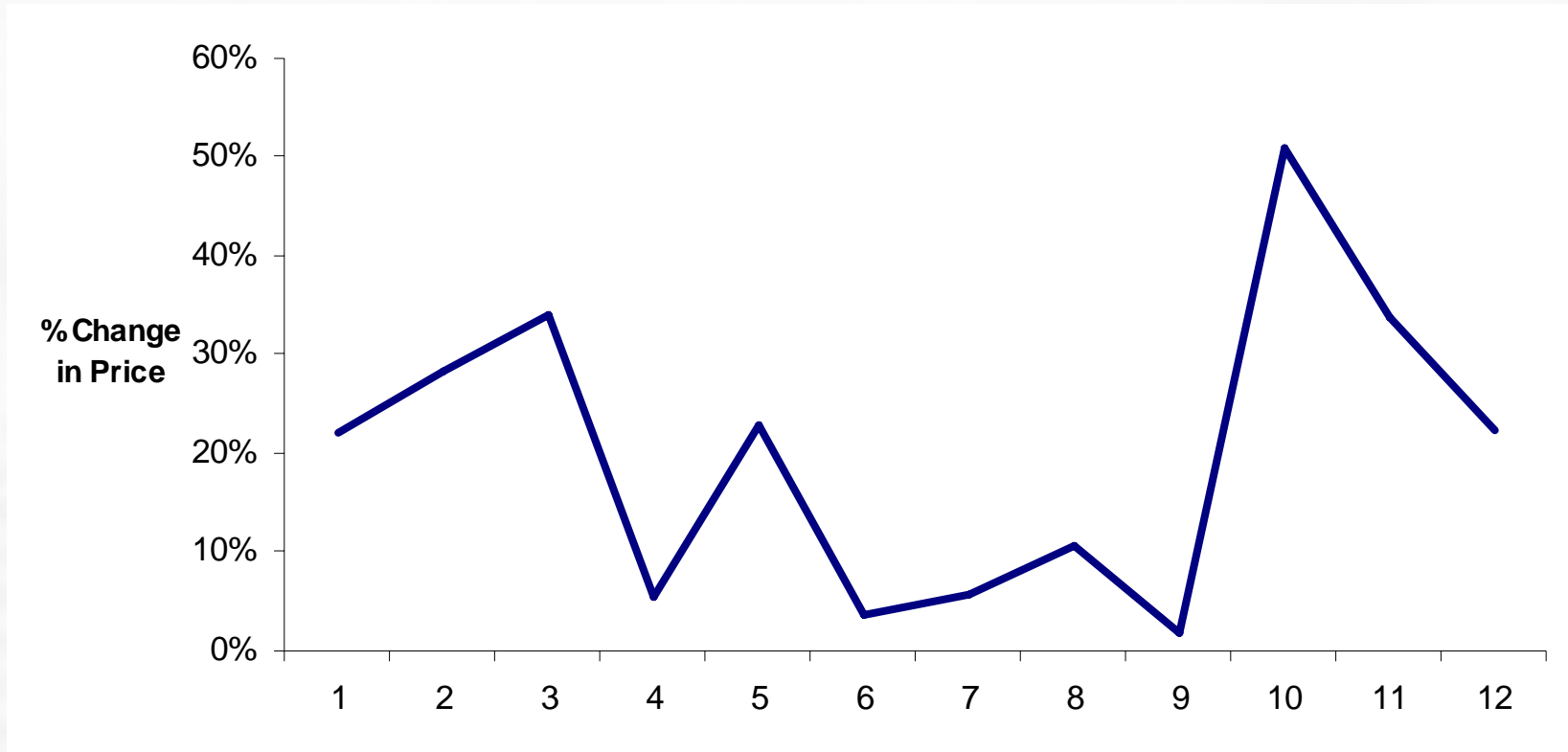
# Higher oil prices here to stay?

## Weighted Average World Oil Spot Prices 1989-2006



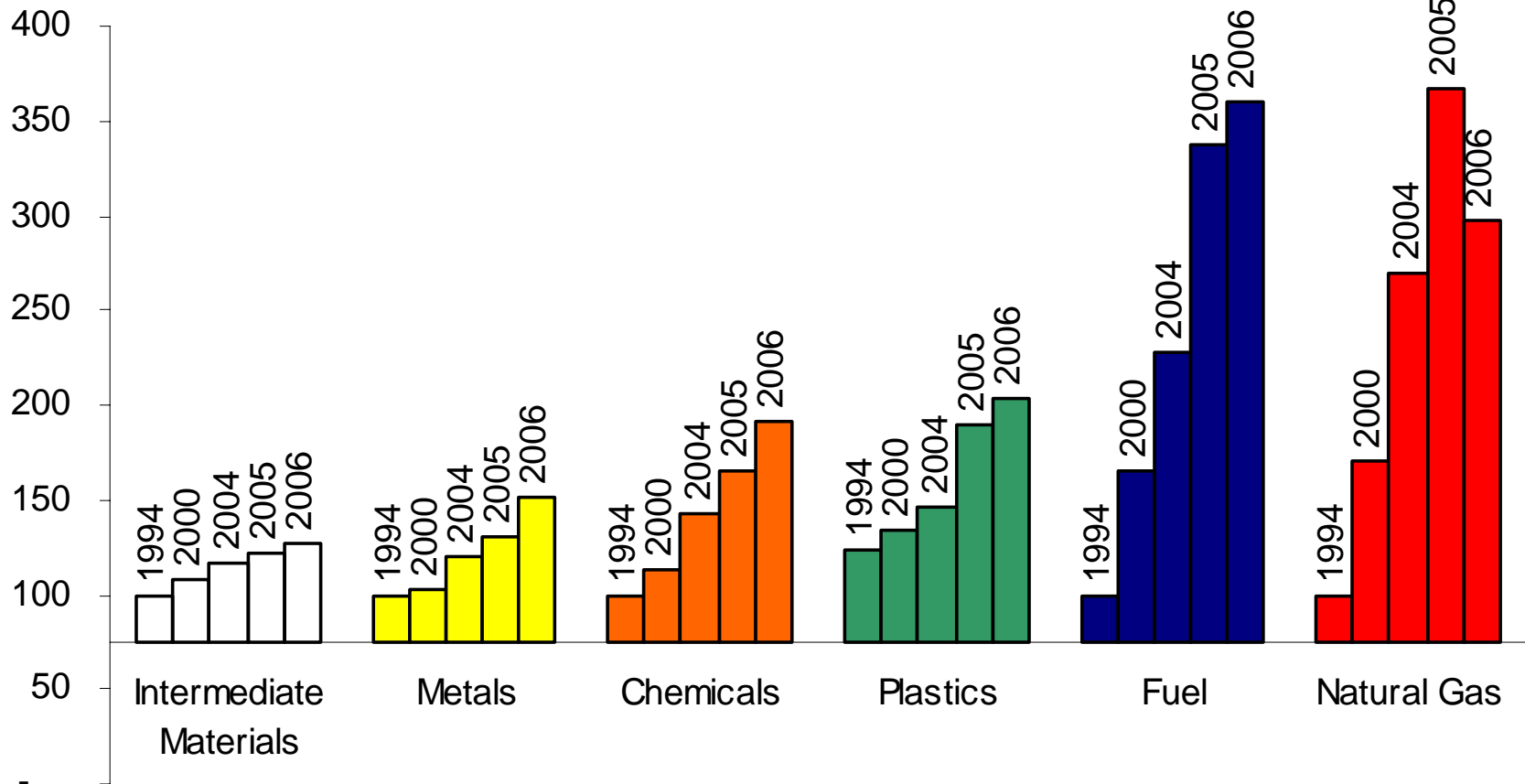
# Natural gas prices escalating and volatile

## Natural Gas Price, November 2005-October 2006



# Raw material prices gone wild

## Selected Producer Price Indices (1994=100)



# **The End of Lean?**

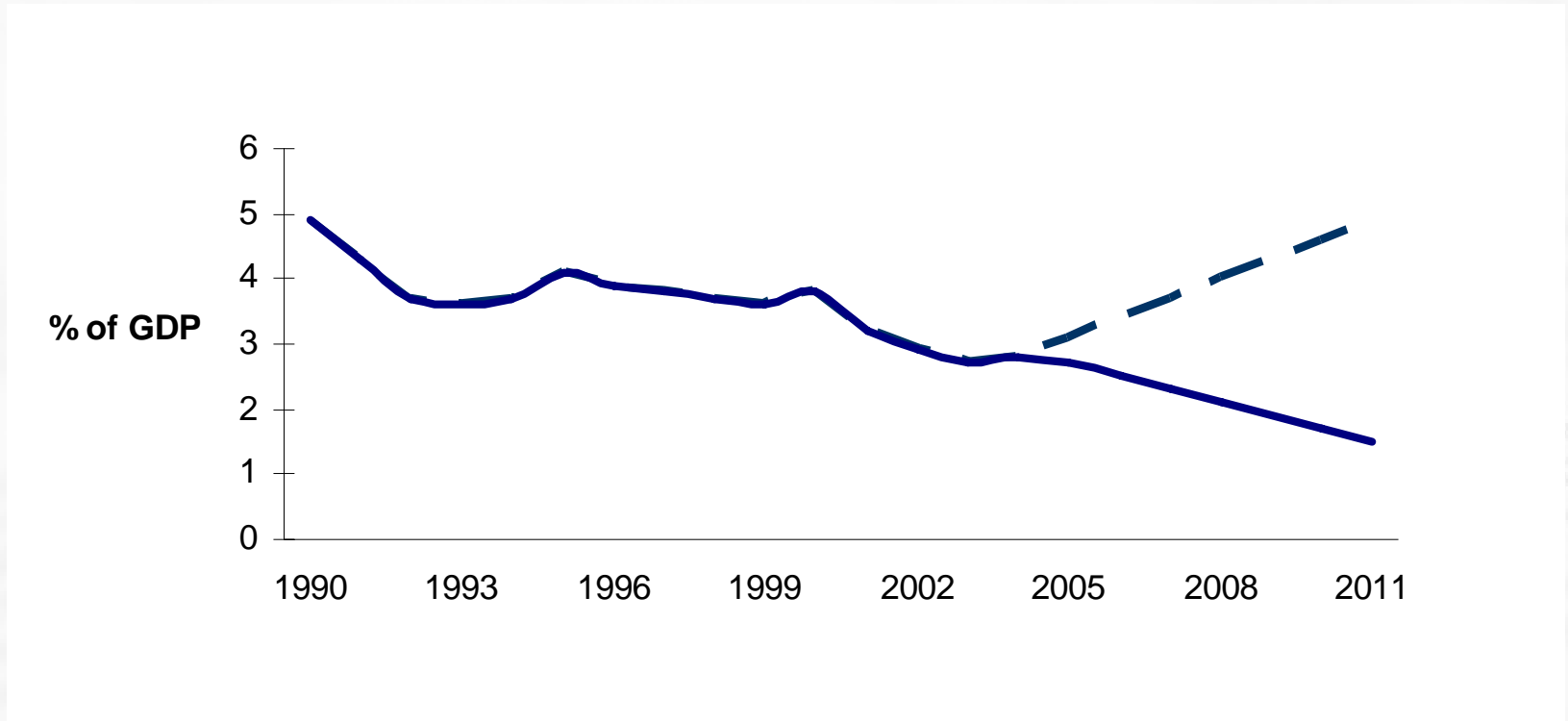
# Energy economics reversing lean?

- Decentralizing operations?
- Holding more buffer stock?
- Affecting off-shoring decisions?
- Indirect economic drag?



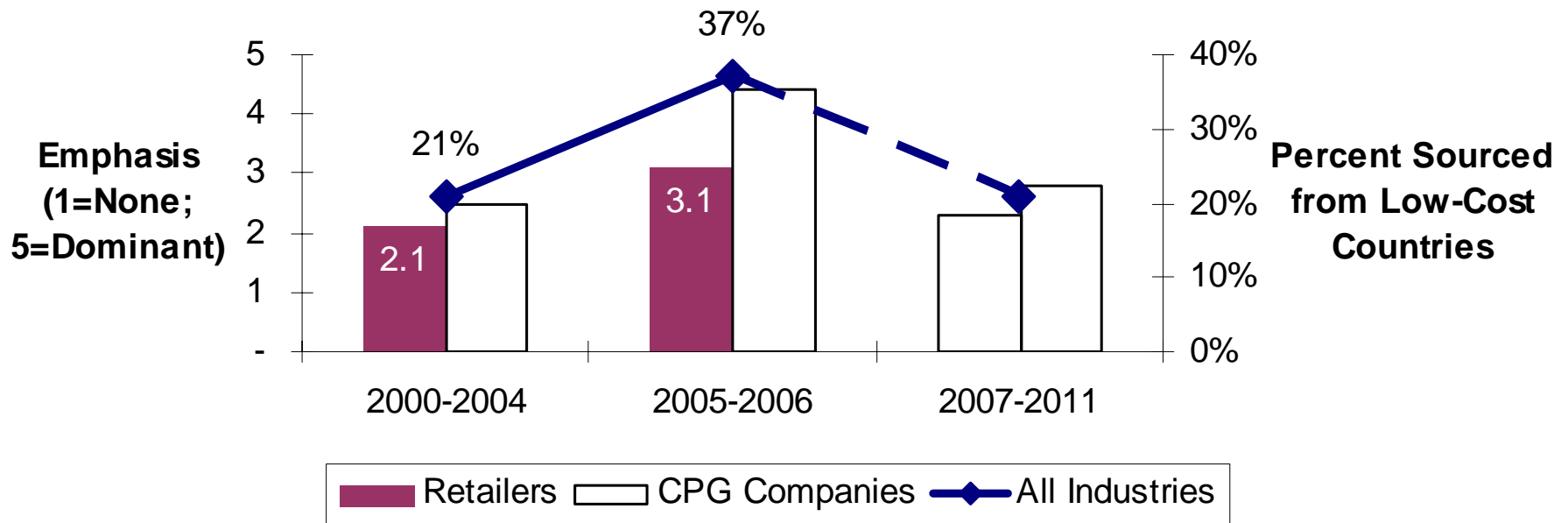
# Inventory: inflection point?

## Inventory as a Percent of GDP



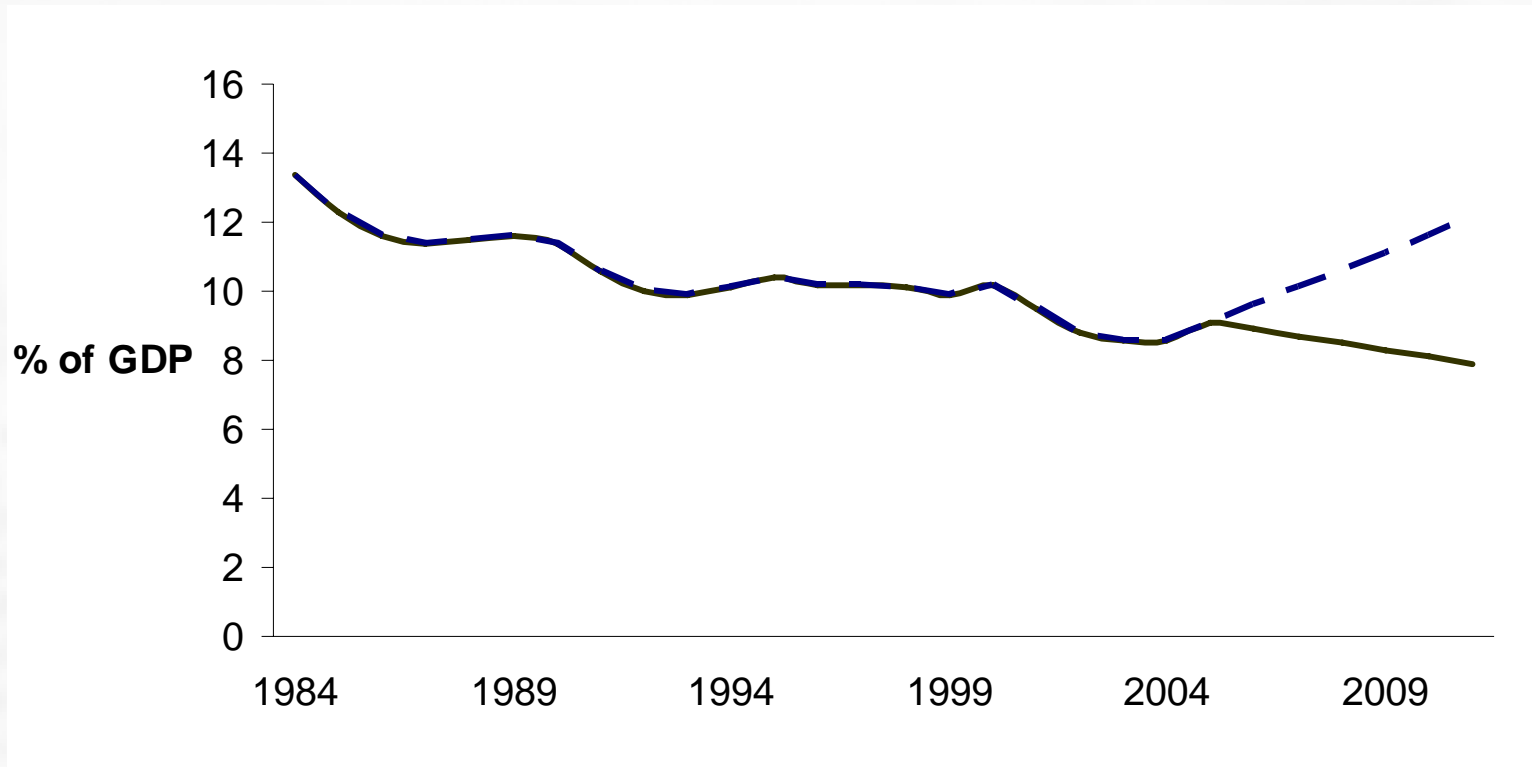
# Low-cost country sourcing reversion?

## Emphasis on Low-Cost Country Sourcing



# Logistics cost increasing consumer prices?

## Logistics Cost as a Percent of GDP



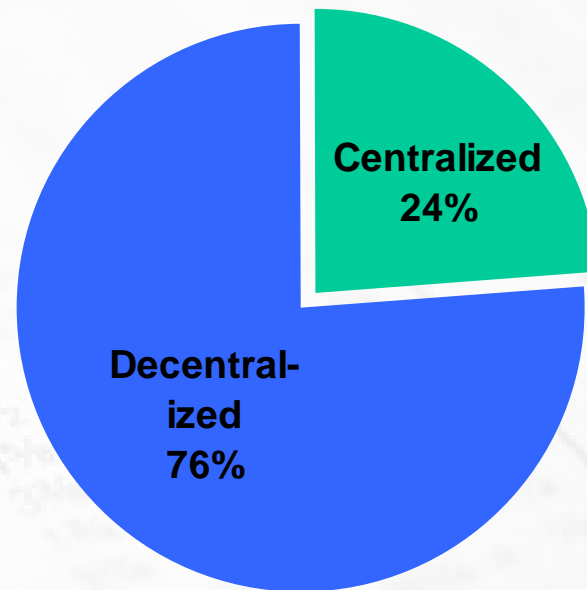


# **Fragmented and Diffuse**

# A fragmented buy

- Purchasing
- Transportation
- Materials
- Logistics
- Distribution
- Warehousing

**Percent of Companies  
Centralizing the Energy  
Buy**

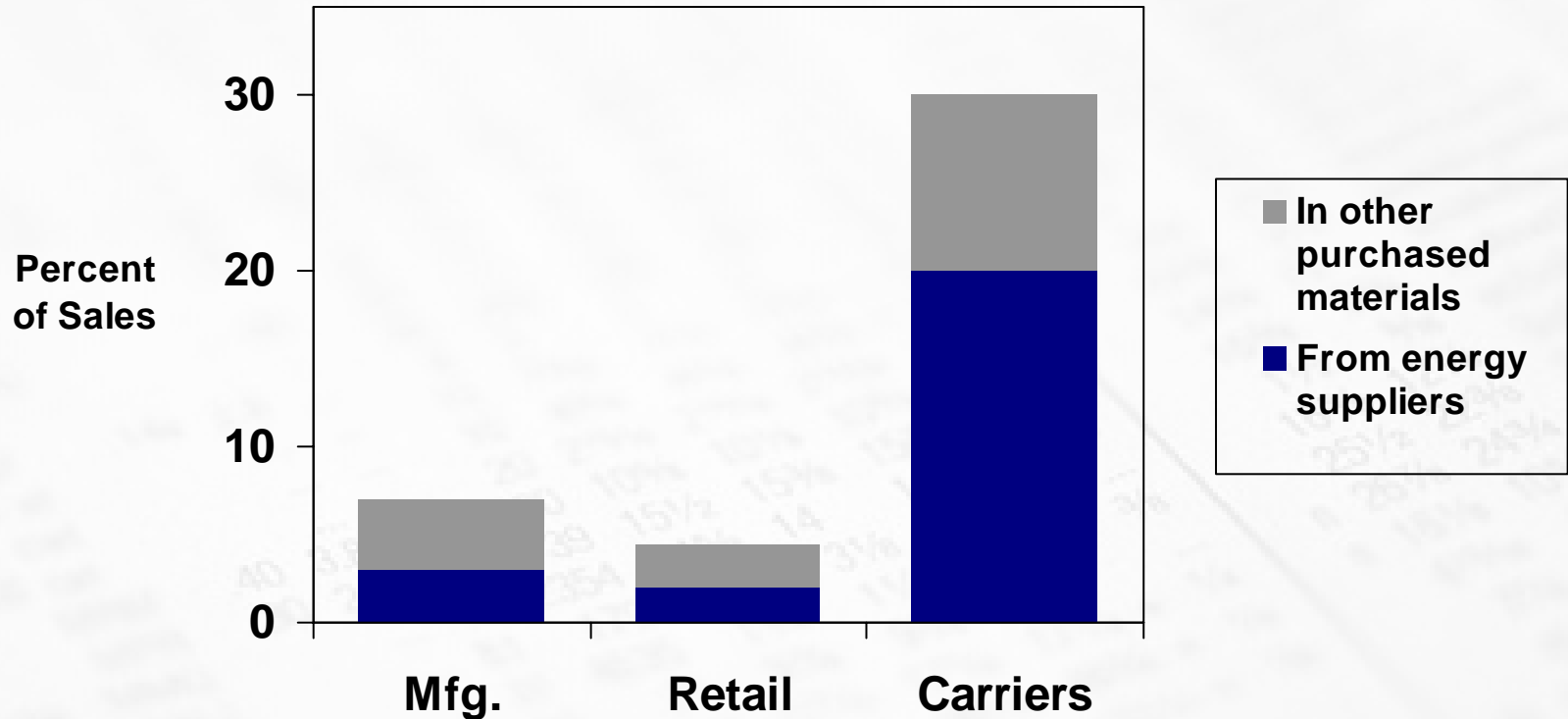


# Fragmented

- “[We have]18 regional business units in the US and each one is responsible for its own energy expenditures” – Bryan Warshofsky, Director of Purchasing Applications.
- “We found that we were spending 20% more at one manufacturing plant than at an identical one in another state.” – Jacques Lalauze, Gemalto
- “[There is] a lot of gray area. It is often fragmented among Facilities, Transportation, Indirect, Manufacturing, Logistics, and Operations.” – Corporate Purchasing Manager, US consumer electronics retailer
- “Each Plant Manages it Decentrally” – Henry Turner, Honda
- “Several folks manage power contracts” – Rich Walters, Air Products

# A large but invisible expenditure

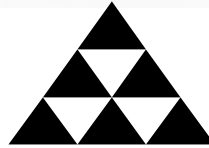
## Energy as a Percent of Sales



# **8 Buying Strategies**

# The options: the Boston Logistics diamond

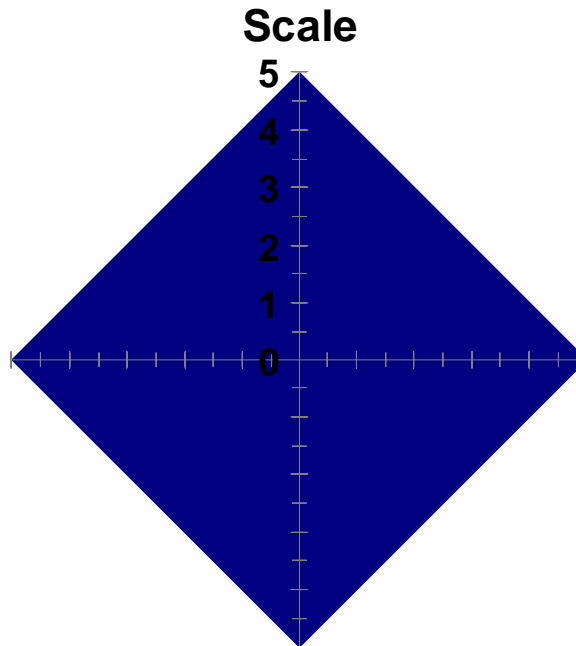
- Rationalization
- **Centralization of procurement**
- **Group purchasing**



- RFX
- Global sourcing
- Auctions
- Payment terms



Integration

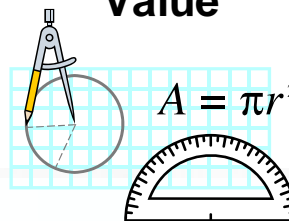


Competition



- E-Procurement
- **Long-term agreements**
- Supply chain integration
- Purchasing cards
- Portals

Value



- **Value engineering**
- Standardization
- Spec simplification

# Potential strategies

## Supply Chain Strategies

1. Centralize purchasing
2. Join a buying consortium
3. Sign long-term contracts at forecast rates
4. Reduce consumption (value engineering)

## Financial Strategies

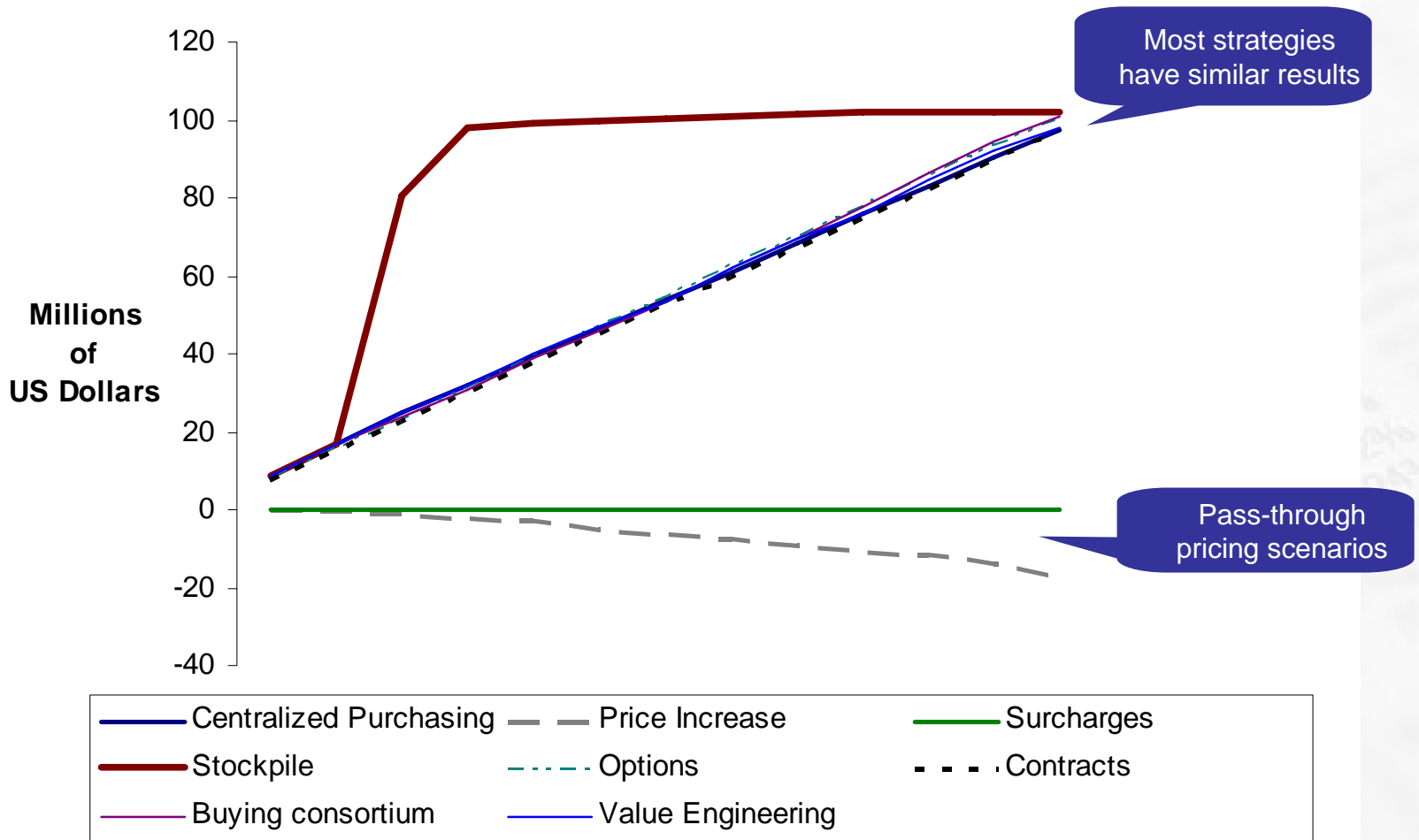
5. Buy in advance at the current price
6. Buy options

## Pricing Strategies

7. Pass costs on via a floating surcharge
8. Pass costs on and embed in the product price

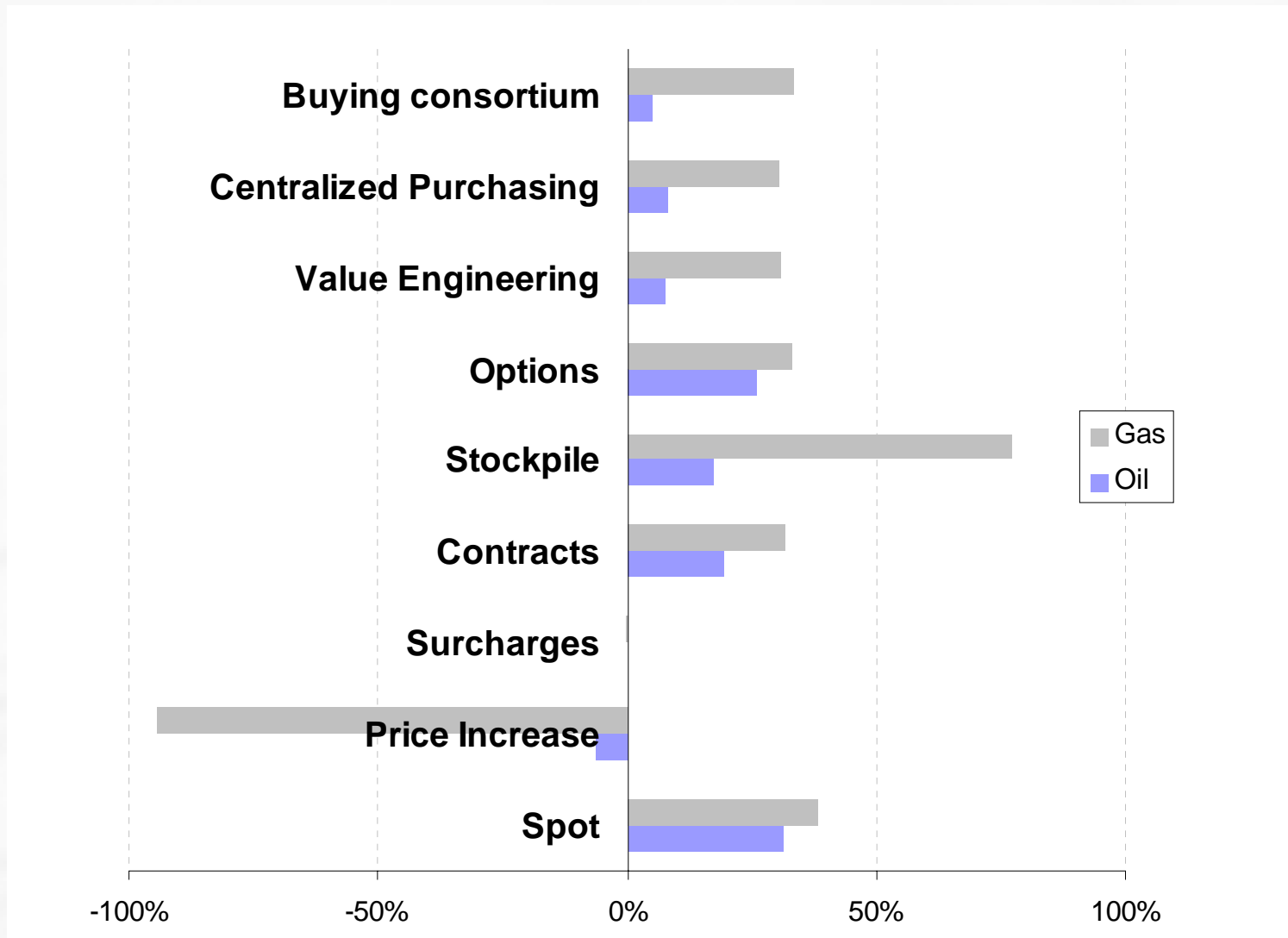
# Overall strategy performance

## Cumulative Cost of Each Strategy, October 2005-October 2006



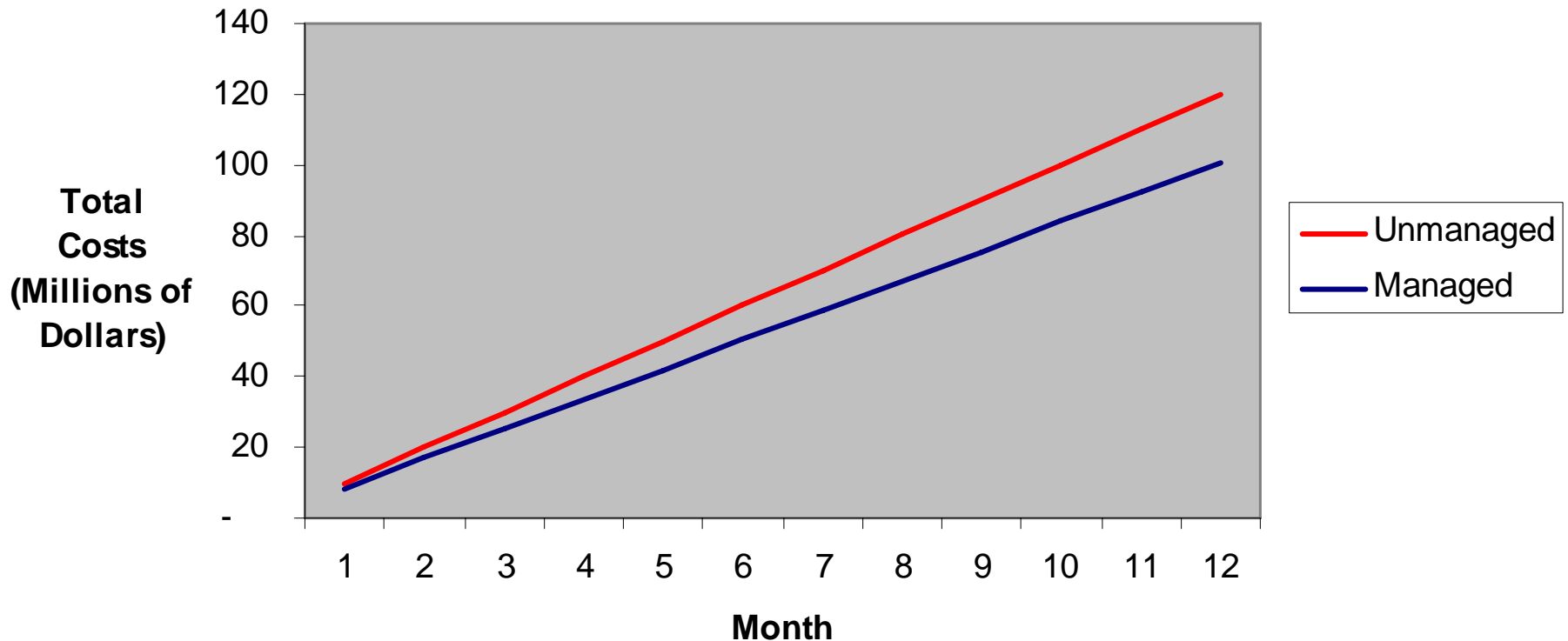


# The best strategies



# Hybrid strategy saves significantly

## Cumulative Difference Between Managed and Unmanaged Approaches



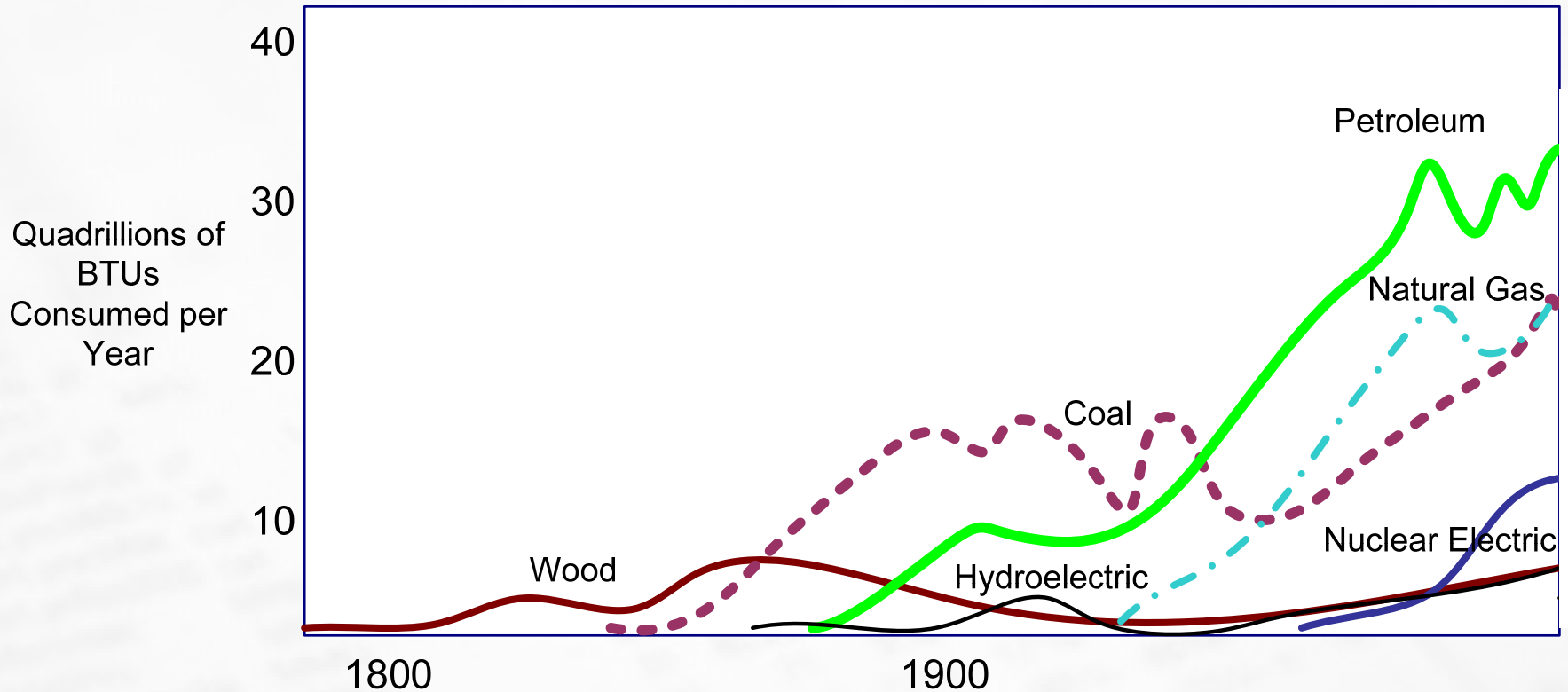
# Policy Issues

# Policy issues

- Alternative fuel vehicles
  - Could exert downward pressure on fuel prices
- Modal infrastructure subsidies
  - Provide cheaper but slower shipping
- CAFE standards
  - Trade-off between fuel economy and safety
- Funding trade-offs
  - Subsidizing new technologies comes at the cost of traditional infrastructure

# Policy supports adaptation to change

## Evolution of U.S. Energy



# **The Bottom Line**

# Shippers: stay lean and manage the spend

- Don't reverse lean
  - Energy costs dwarf vs. benefits of being lean
- Establish a program to manage energy spend
  - Any strategy 10-100% better than none
- Re-assess mode, frequency quarterly
  - Unpredictable fuel prices and surcharges need alerts
- When off-shoring, consider whether a doubling of oil prices would change the decision
  - Dual sourcing may become necessary at higher oil prices

# Carriers

- Don't rush to develop alternative fuel vehicles.
  - Most AFV technologies are in their infancies and many companies cannot justify investing in them at present.
- Actively manage fuel spend.
  - Carriers, especially airlines and ocean shipping lines, that proactively manage fuel expenditures, save 10-15% on fuel.
- Reduce dependence on petroleum.
  - Airports and airlines can cost-effectively modify or replace ground handling equipment to operate on LPG, ethanol, or electricity.
- Assess routes and services for profitability.
  - Carriers should analyze the profitability of routes and services to determine when, where, and how much to refuel based on regional fuel cost advantages.



# Policy makers

- Consider supply chain costs and benefits when setting policy for infrastructure and alternate fuel technology.
  - Policy affects, and could reduce, the efficiency, speed, and convenience of supply chains, engendering an unforeseen economic cost.
- Don't jeopardize infrastructure programs to fund alternative fuels.
  - Currently, US tax breaks for ethanol are funded at the expense of the Federal Highway Trust Fund, while highway infrastructure gaps cause increasing congestion.

# Control your destiny!

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Boston Logistics Group helps supply chain executives make critical supply chain decisions that involve investment and risk by forecasting the evolution of supply markets and technologies. Our mission is to help our clients develop globally competitive supply networks that maximize Supply Chain Value.™ Our products and services include:

- **Supply Market Forecasts** that help purchasing managers decide how, where, and when to buy critical externally-purchased materials and services
- **Return on Investment Reports** that help investors and policy makers quantify the benefit of emerging technologies and decide whether or not to invest in them
- **Custom Research and Planning** that supports high-stakes decisions such as acquisitions, outsourcing, off-shoring, and make-or-buy

## Industries Served:

- Discrete Manufacturing: Machinery, Equipment, Vehicles, Parts, Mechanical and Electrical Devices
- Process Manufacturing and Conversion: Paper, Pulp, Energy, Packaging, Processed Minerals/ Aggregates, Plastics, Metals, Chemicals
- Transportation: Railroads, Ocean Shipping Lines, Airlines, Trucking Companies, Package Delivery, Intermodal
- Logistics: Dedicated and Third Party Logistics, Ports, Stevedoring, Storage, Material Handling, Distribution, Maintenance, Retail