

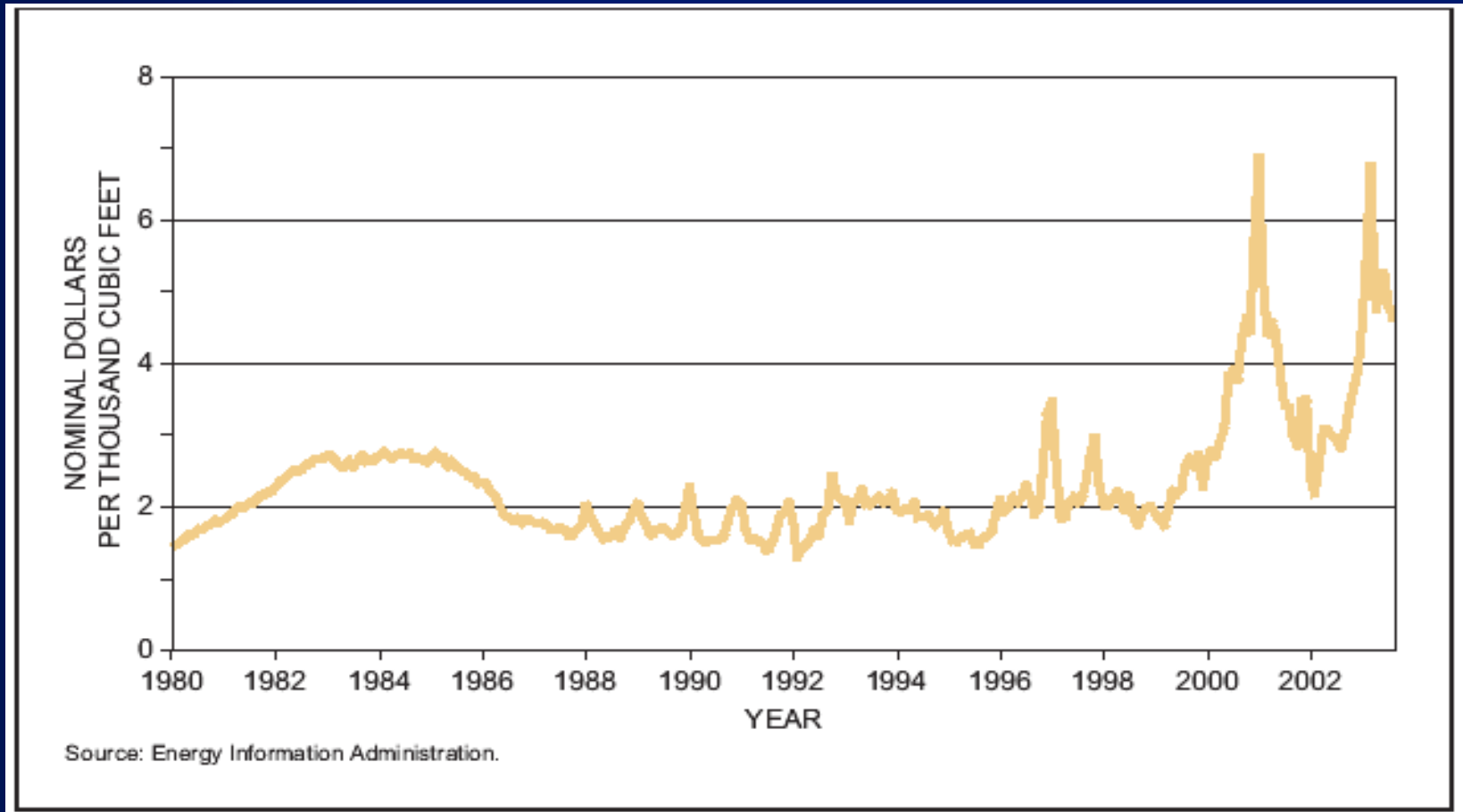
# **Natural Gas Markets Update for the Ethanol Industry**

**Identifying Market Fundamentals  
and Managing Price Risk**

# Presentation Outline

- **Natural Gas Market Update**
  - Demand Issues
  - Supply Issues
- **Implications for Ethanol Producers**
  - **Exposure to Price Risk**
    - › Costs for thermal processes
    - › Costs for electricity
  - **Risk Management Options**
    - › Hedging
    - › Combined Heat and Power

# Natural Gas Prices at the Wellhead have been High and Volatile



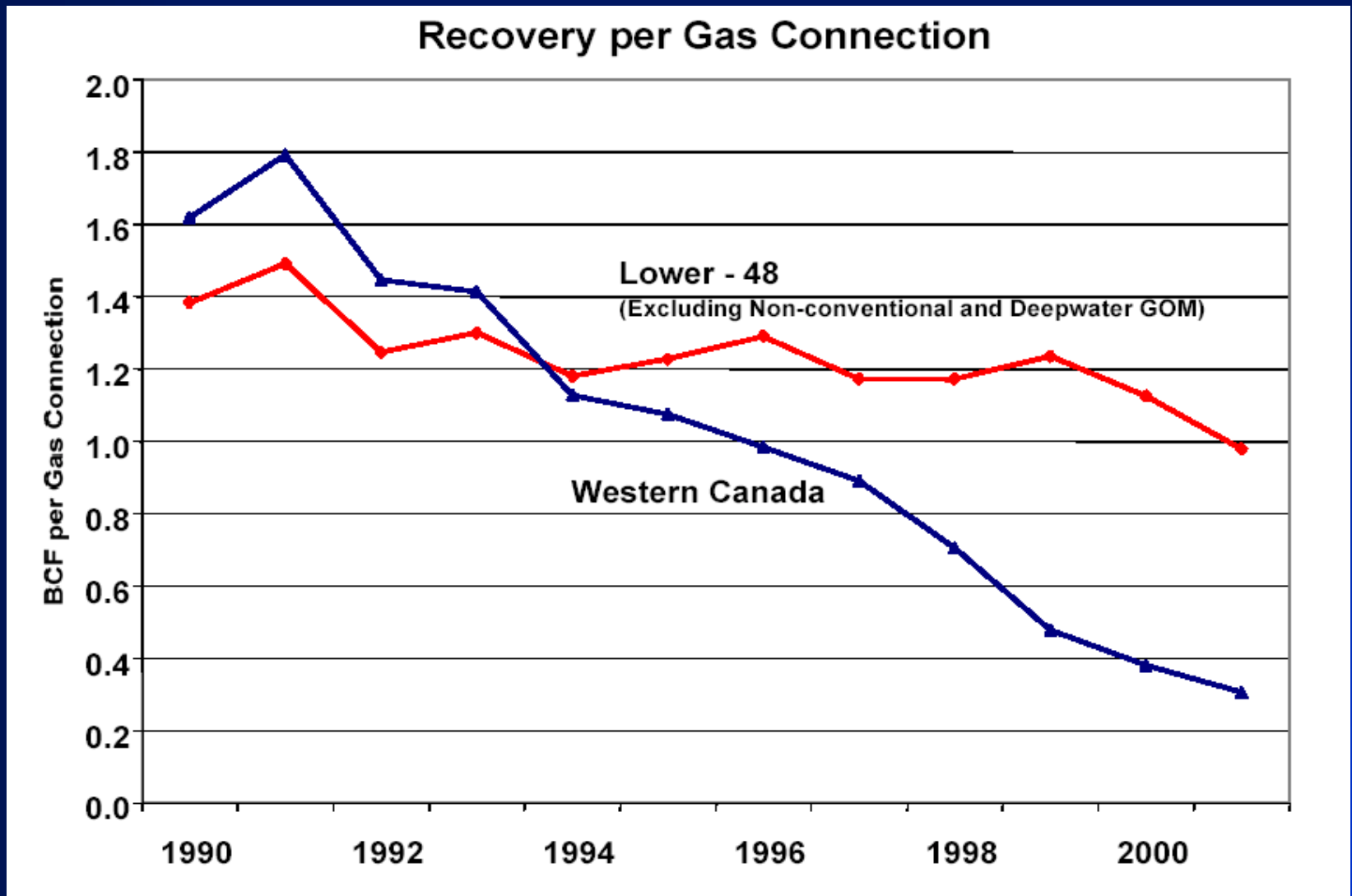
# Why?

- “There has been a fundamental shift in the natural gas supply/demand balance that has resulted in higher prices in recent years. This situation is expected to continue, but can be moderated.”
  - Key Finding of National Petroleum Council Report to Energy Secretary Spencer Abraham (September, 2003)

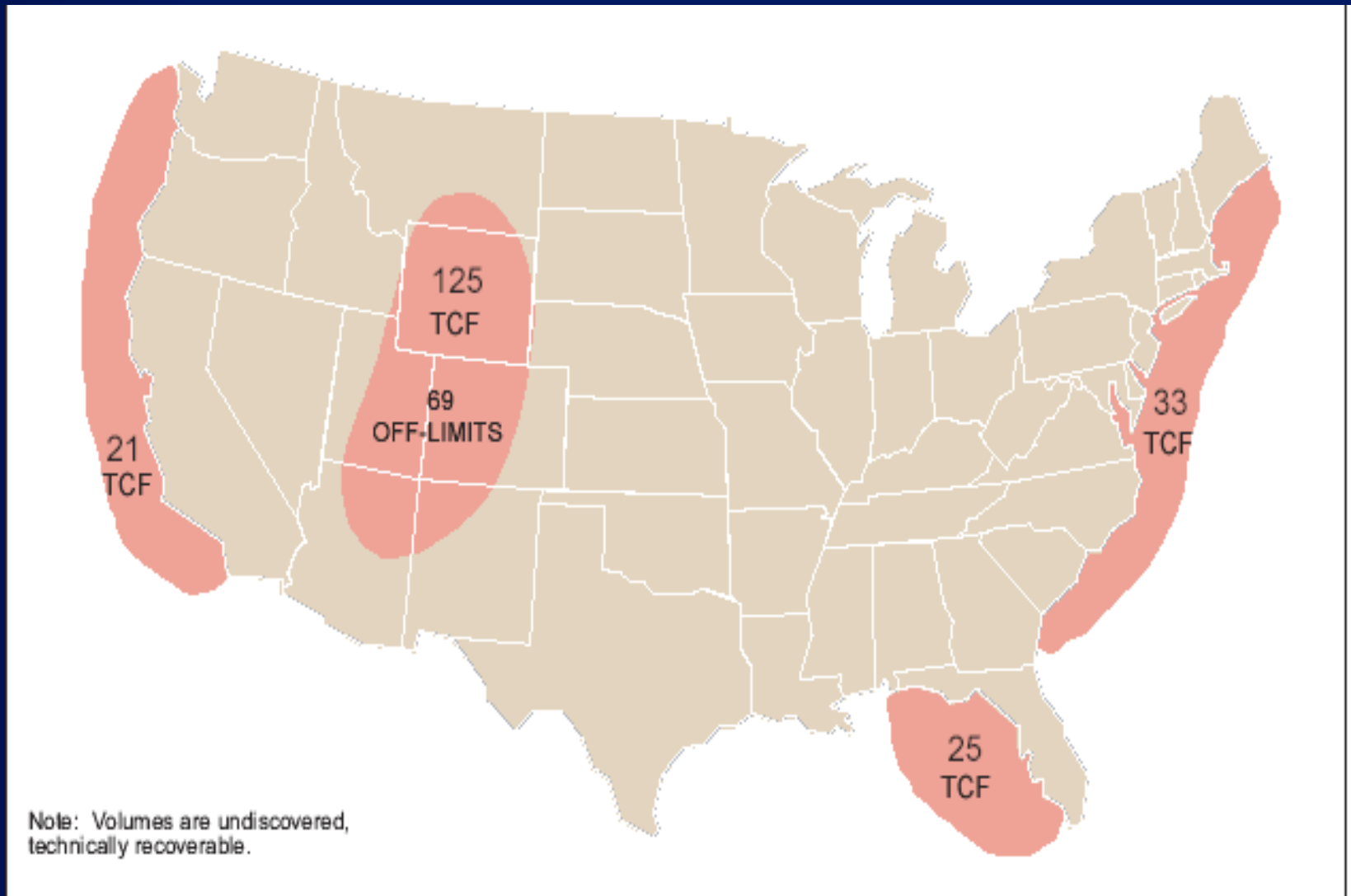
# Trends in Key Supply Variables

- **Productivity of existing North American reserves is dropping.**
- **Access to new reserves is limited.**
- **The ability to increase imports is also limited.**

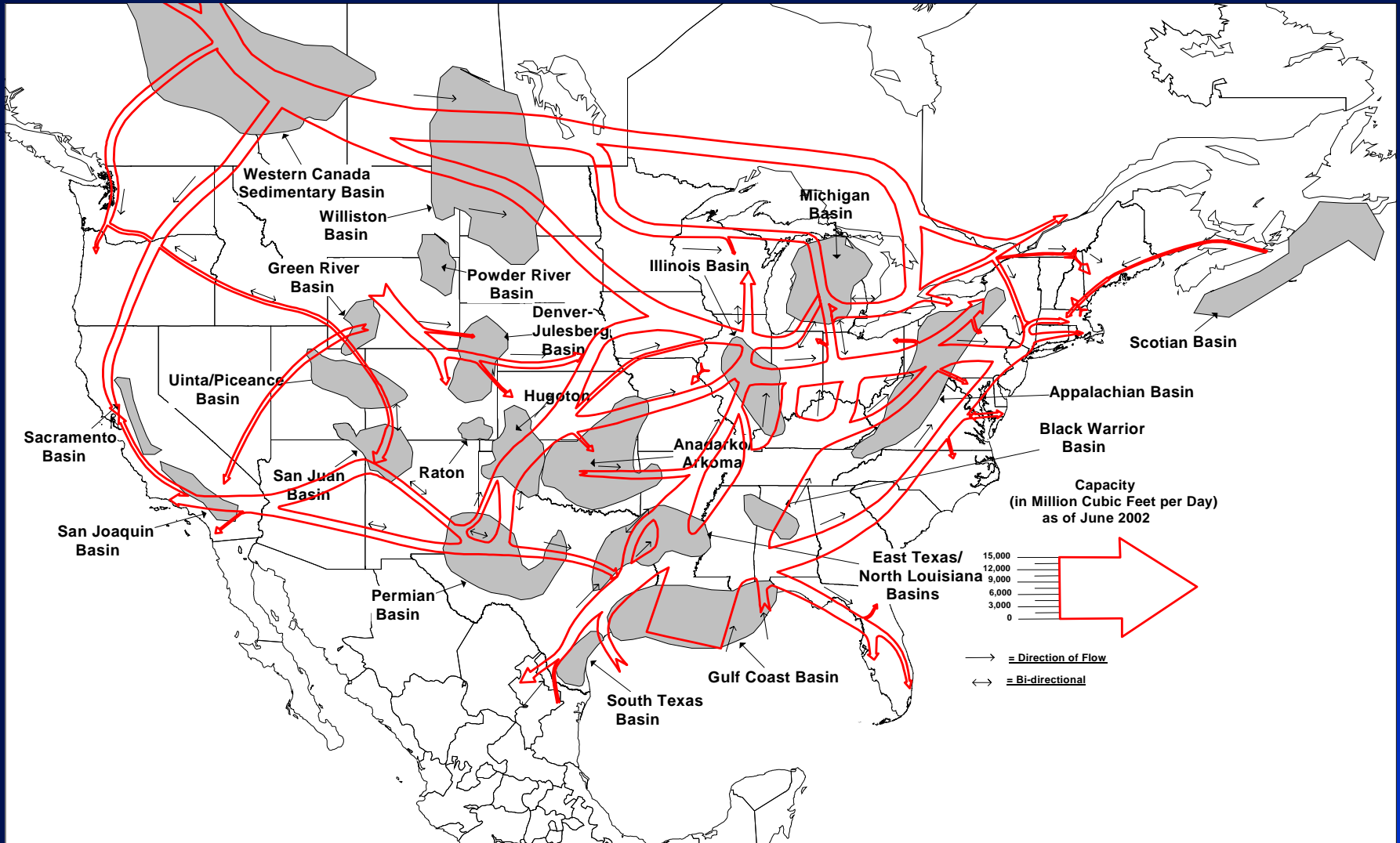
# Well Productivity: Wells located in mature basins are declining in output



# Access to new reserves is limited: Many potential domestic reserves are off-limits to development



# Available Reserves: Traditional Major Natural Gas Producing Basins and Pipeline Transportation Corridors in the U.S.



Source: Energy Information Administration, GasTran Gas Transportation Information System, 2003



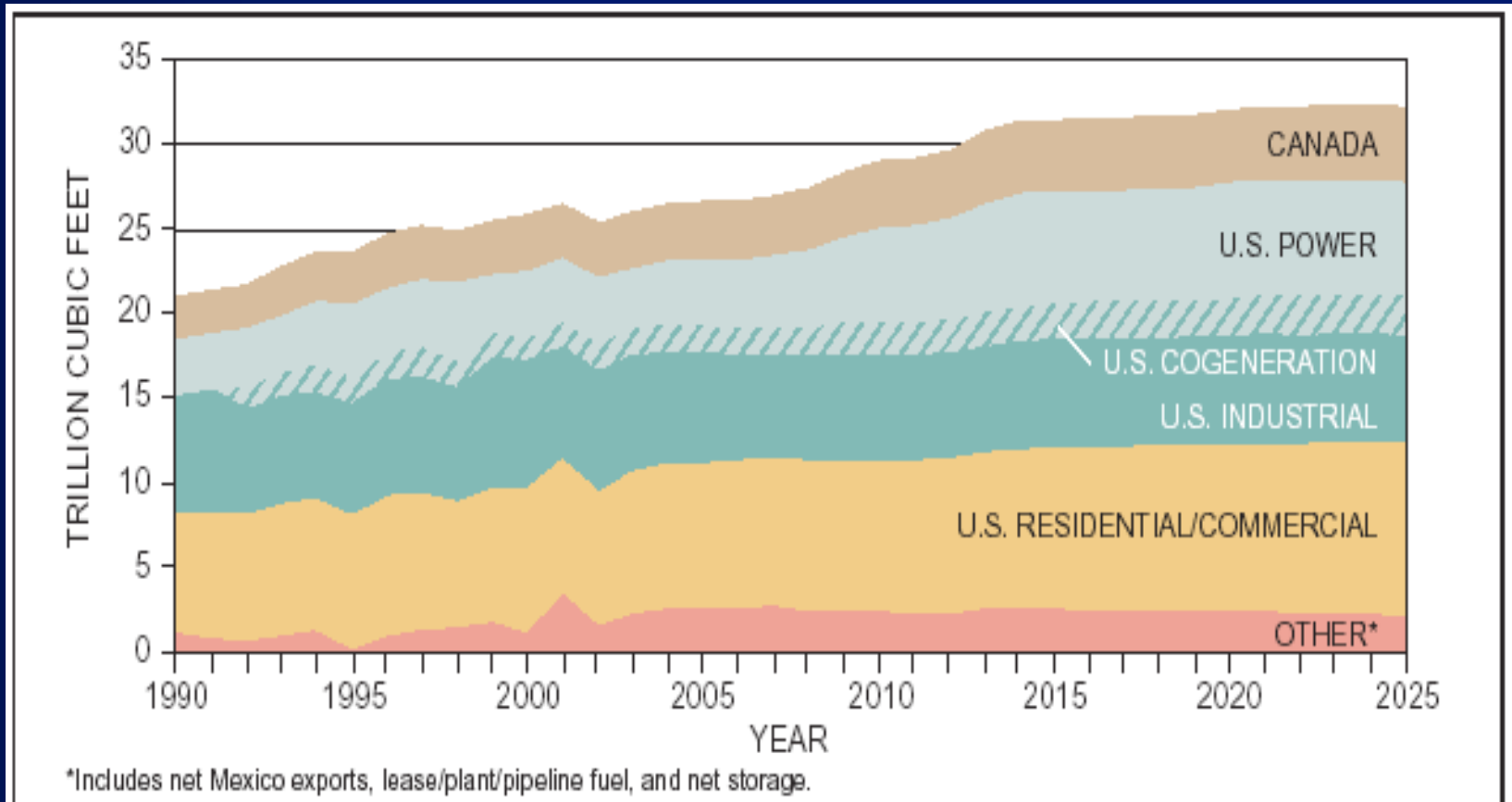
# Import Limitations: Existing LNG terminal have limited capacity, new terminals must still be built



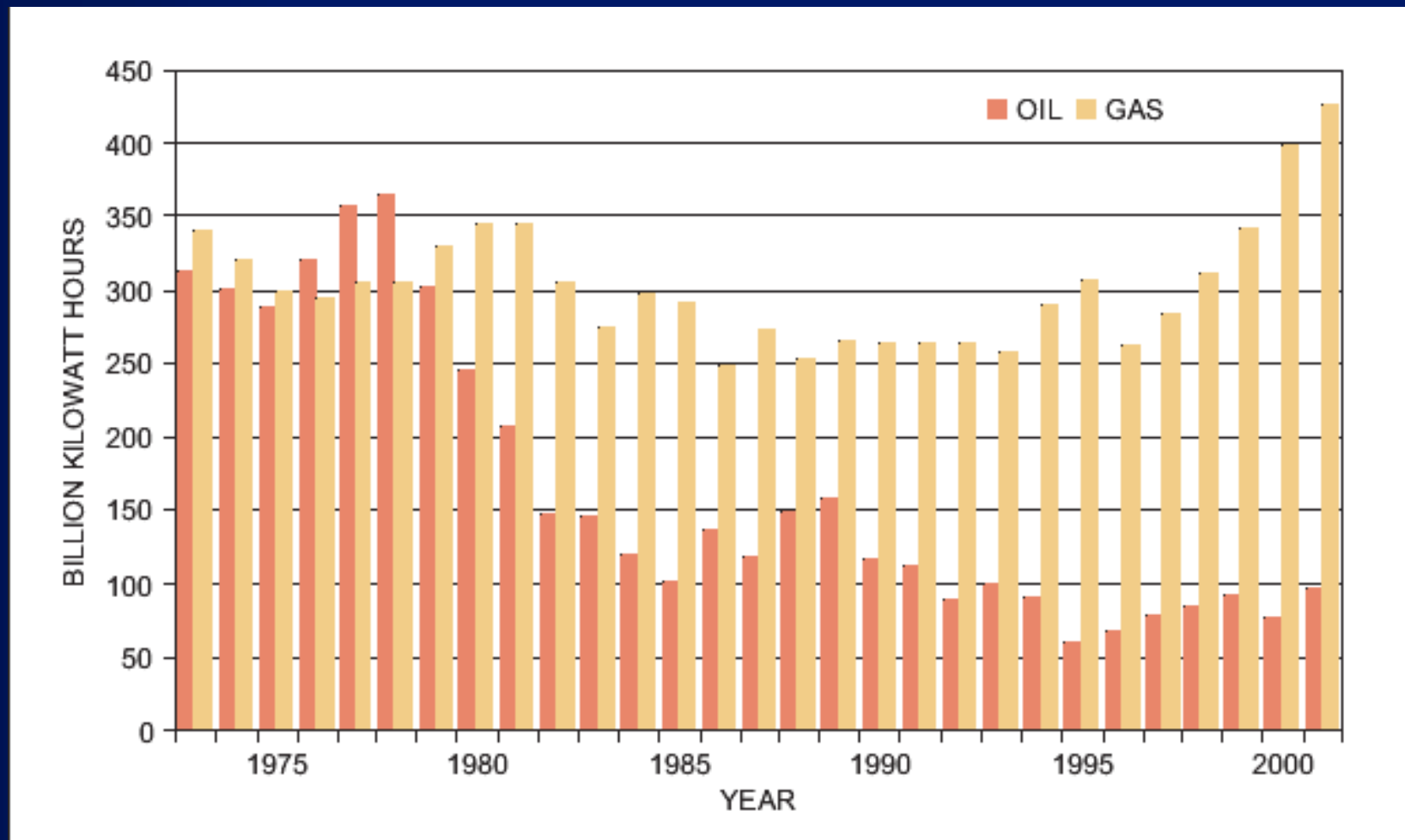
# **Trends in Key Demand Variables**

- **North America maintains a high level of utilization of natural gas.**
- **Reliance on natural gas for electricity generation is expected to grow**

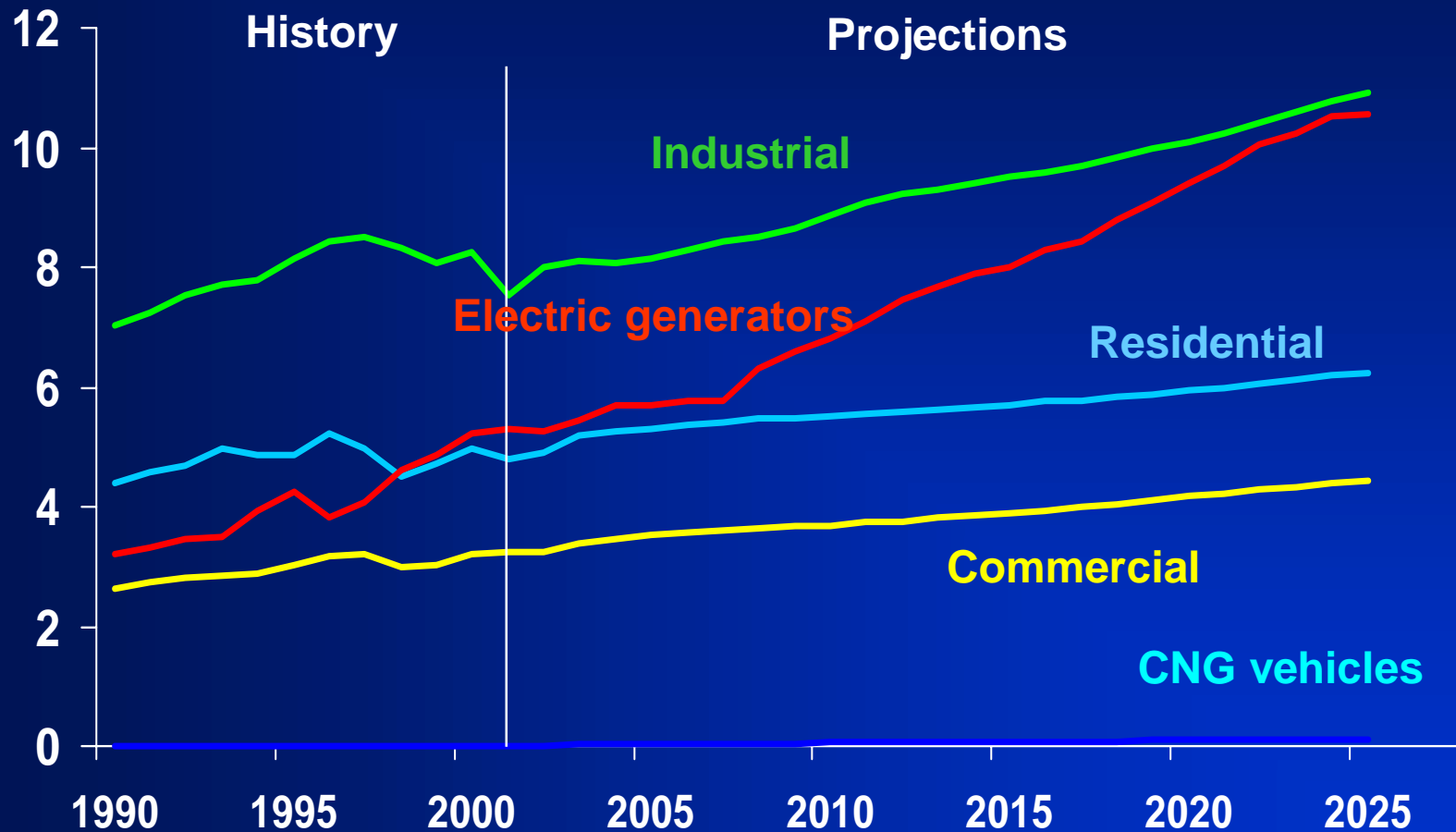
# High Utilization: Natural gas consumption has grown from 21 tcf in 1990 to 26 tcf in 2003.



# New Electric Demand: Most new generation capacity utilizes natural gas (primarily for environmental reason)

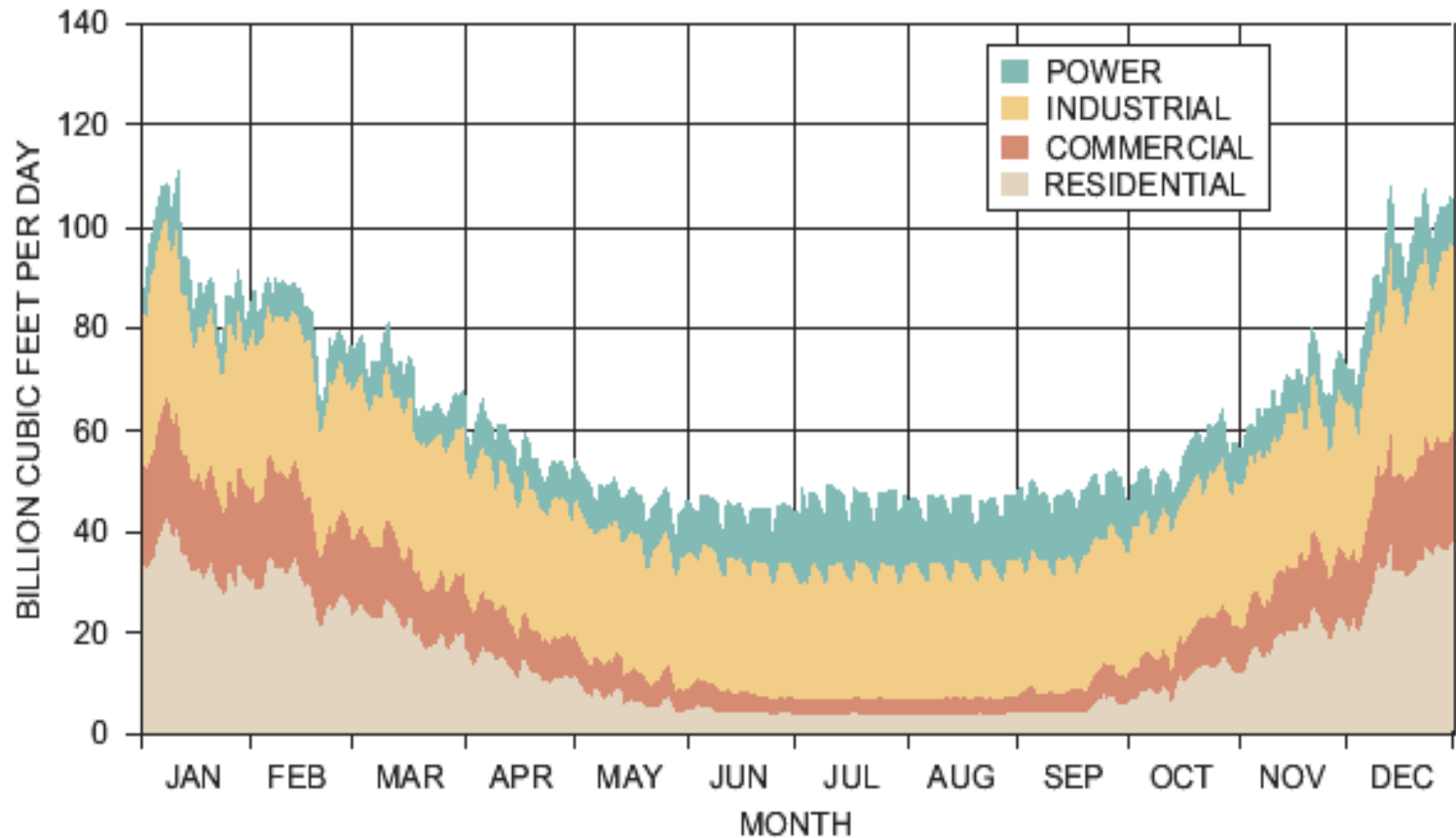


# New Electric Demand: Electric generation represents the highest sector demand growth for natural gas



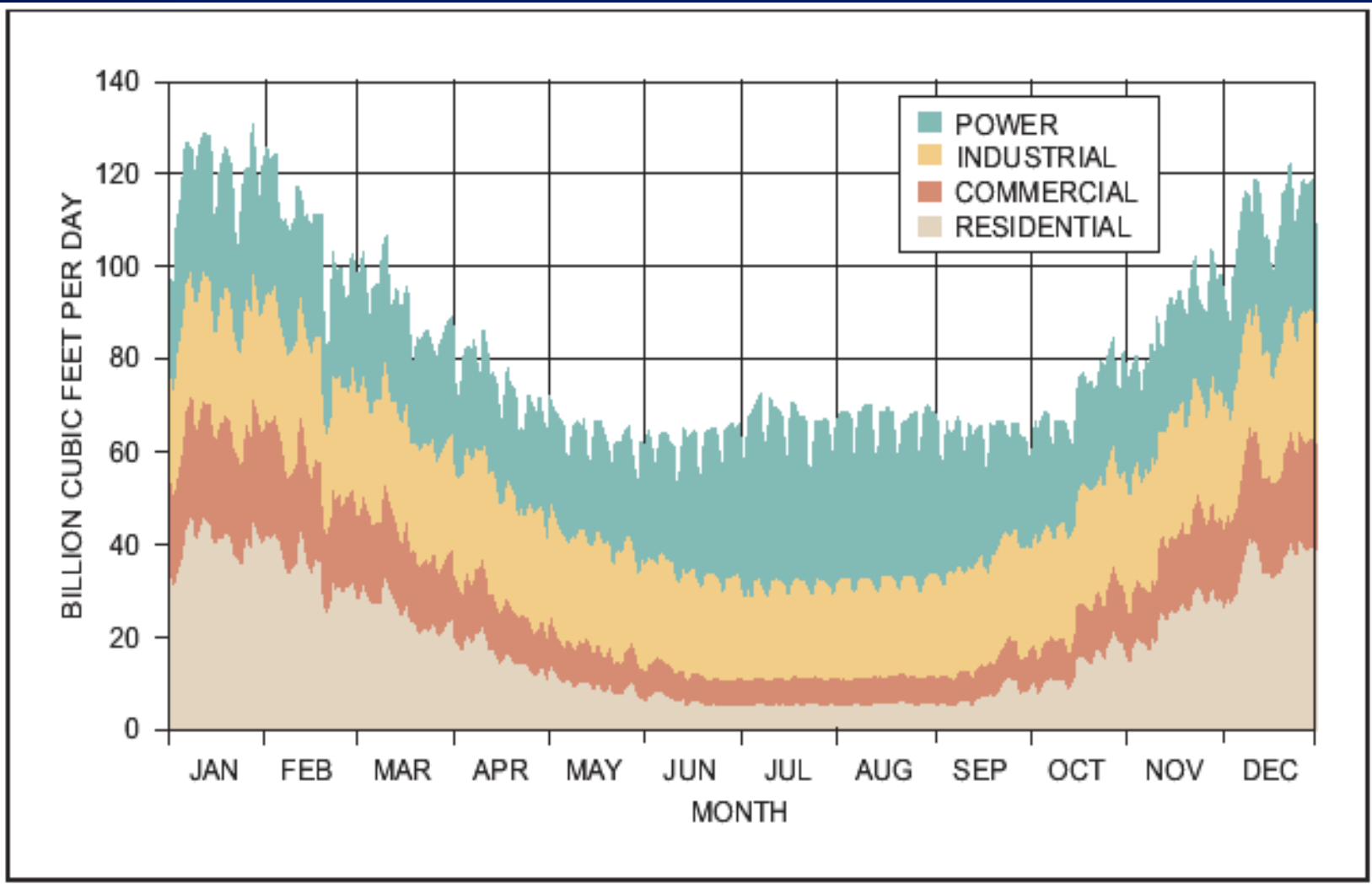
Source: Energy Information Administration, Annual Energy Outlook 2003

# New Electric Demand: 1997 Daily Gas Loads show dominant winter demand driven by weather.



Source: Energy and Environmental Analysis, Inc.

# New Electric Demand: Projected 2025 Daily Gas Loads demonstrate the impact of electricity generation



Source: National Petroleum Council, September 2003

# Implications for Ethanol Producers

- **Short Term**
  - Higher and variable net operating costs for thermal operations utilizing natural gas as the primary fuel
    - › Negative impact on cash flow projections
    - › Creditworthiness
- **Long Term**
  - Higher and variable net operating costs for electricity as natural gas pricing begins to drive electricity prices
    - › Negative impact on general asset valuation
    - › Increased perceived risk among investor community



# Risk Management Options

- **Commodity Hedging**
  - Execute purchases of natural gas and electricity when market prices are:
    - › **Marginally competitive**
    - › **Meet internal cost goals**
  - Types of hedging:
    - › **Physical Hedging**
      - Purchase natural gas and place into storage for use when spot prices are high
    - › **Financial Hedging**
      - Purchase electricity and natural gas through futures contracts to fix costs for portions of projected loads
- **Invest in CHP Assets**
  - Generate electric and thermal output simultaneously.
  - Benefits:
    - › **Higher level of reliability**
    - › **Greater efficiency of total energy portfolio**
    - › **Electric generation becomes an asset in deregulated markets**
    - › **Can serve as a type of ‘physical’ hedge for electricity**
      - End user can choose between generating or purchasing from grid.

# Conclusions

- **Natural Gas prices are expected to remain high and volatile for the next several years**
  - Volatility is being driven by perceived supply shortages in the face of increasing demand.
- **Electricity prices will eventually reflect natural gas price volatility.**
  - More electricity will be produced by natural gas-fired plants.
- **Hedging allows market participants to mitigate price risk.**
  - Purchasing commodities must be a planned activity.
- **CHP technologies**
  - Provides a more efficient use of total commodity portfolio.