
**DOE Meeting on Balancing Natural Gas
Supply and Demand**

Natural Gas Demand Overview

December 19-20, 2005

Natural Gas Demand Overview

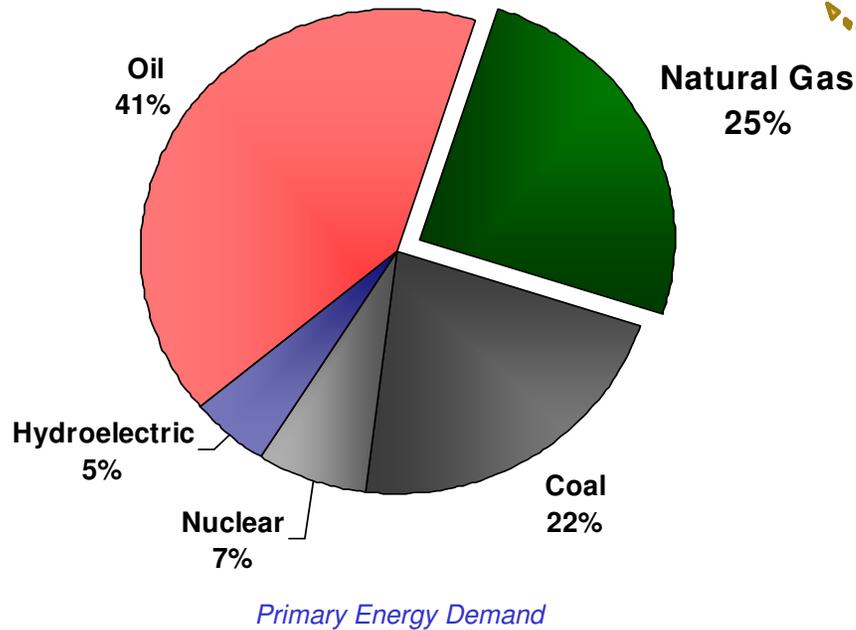
Overview of Presentation

- **NPC North American Demand Outlook**
- **Economic Considerations**
- **Industrial Demand**
- **Power Generation Demand**
- **Efficiency**
- **Key NPC Study Demand Recommendations**

Natural Gas Demand Overview

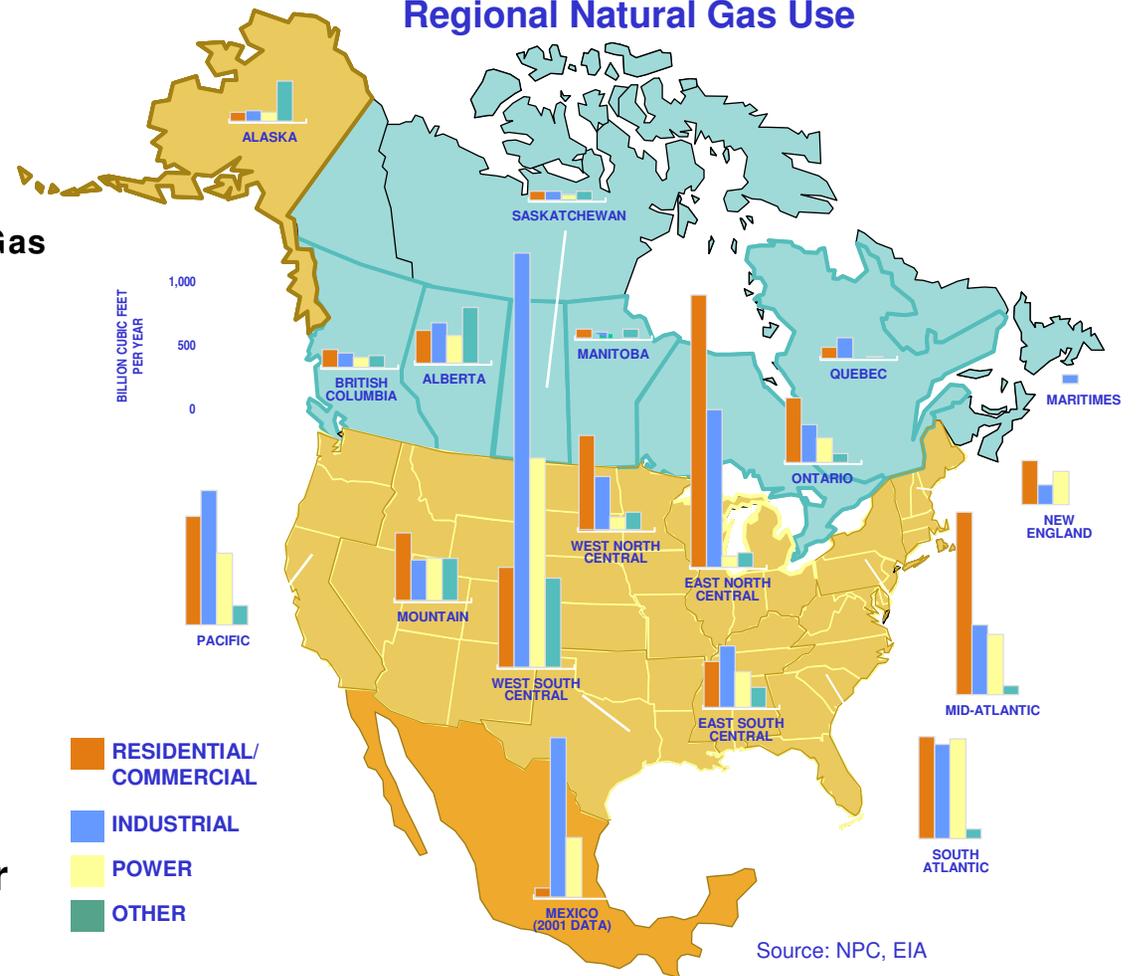
Economic Considerations

Sources of Energy



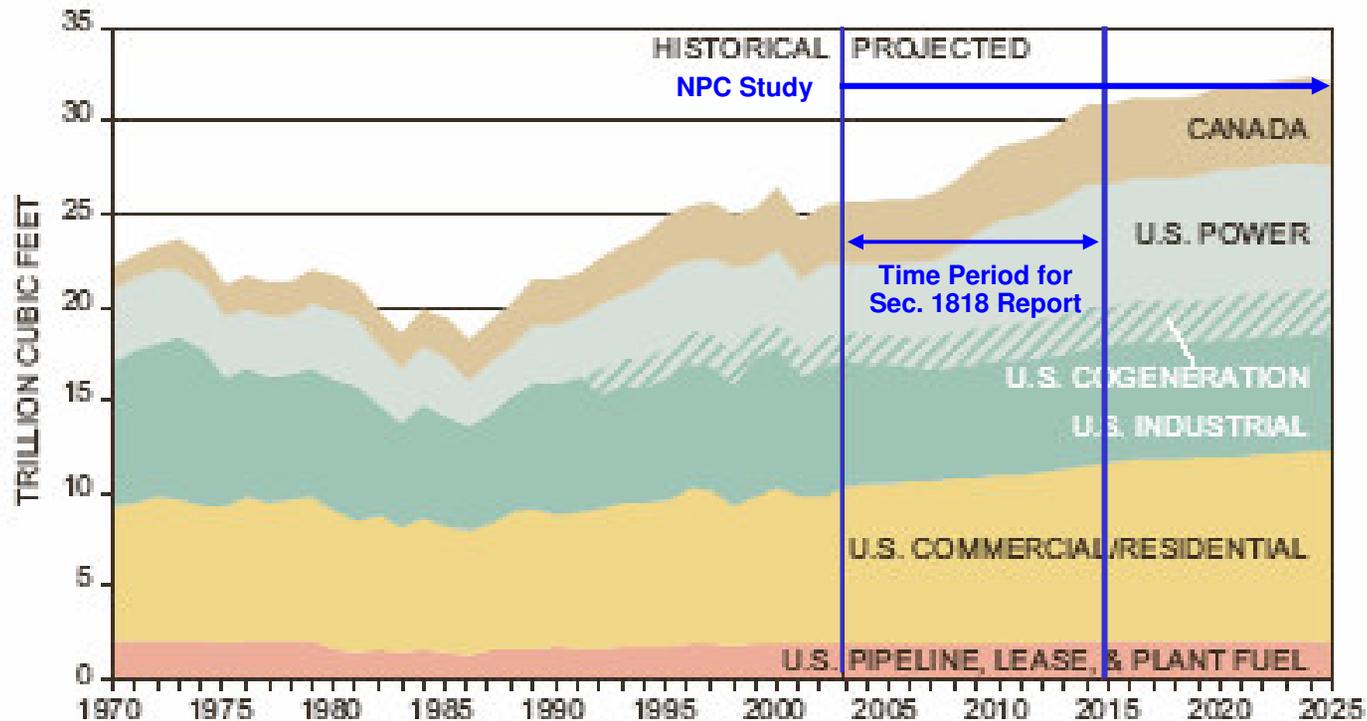
- Natural gas is a key fuel/feedstock for most sectors of the economy
- It is the dominant fuel for residential, commercial and industrial sectors
- Growing importance for power, the marginal energy source in most regions

Regional Natural Gas Use



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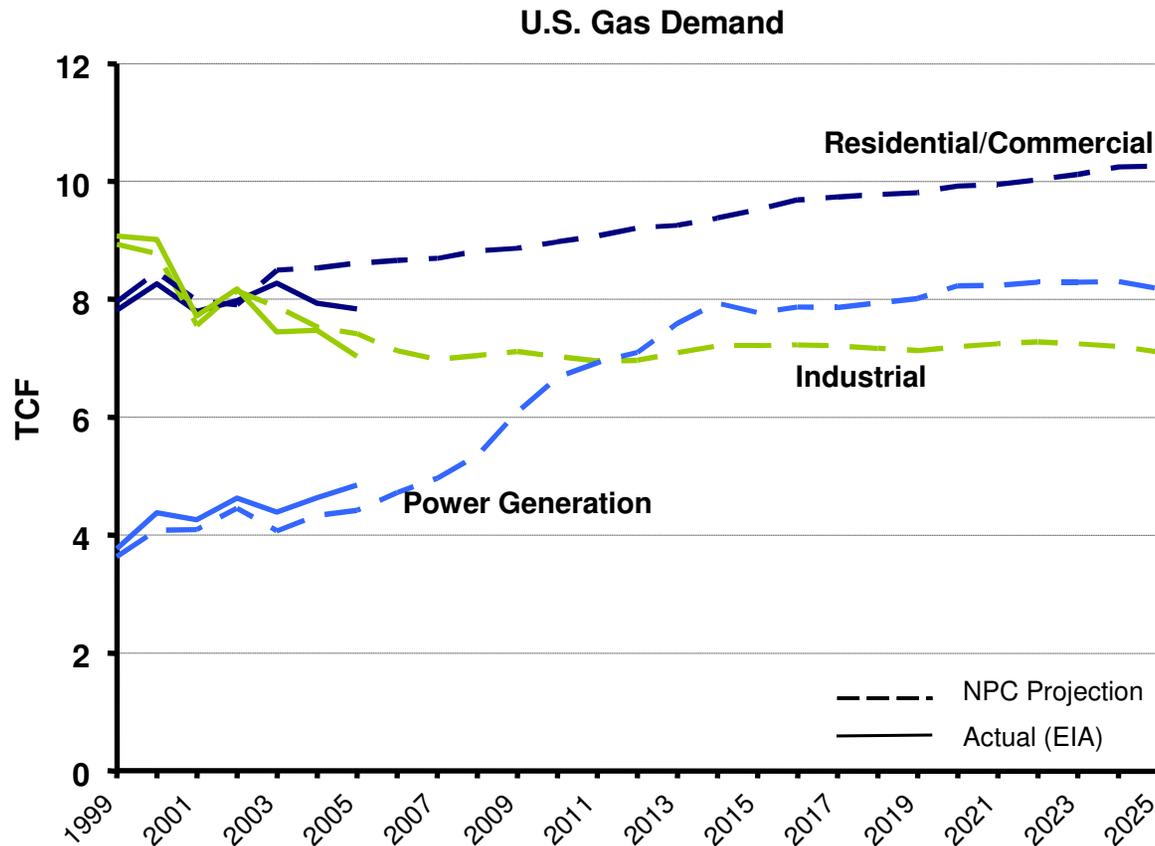
North American Demand Outlook – NPC 2003 Study (Reactive Path)



- Economics and environment have driven investment in natural gas-based technologies for power, industry, heating
- New, large-scale gas-fired power capacity will serve increasing power demand
- Fuel flexibility has continued to drop
- Industrial consumption flat or declining, long-term loss of some heavy industry
- Efficiency gains will mute demand growth
- Coal generation and renewable energy likely to see large growth
- CO₂, nuclear policies key uncertainties

Natural Gas Demand Overview

Demand Update – Overview



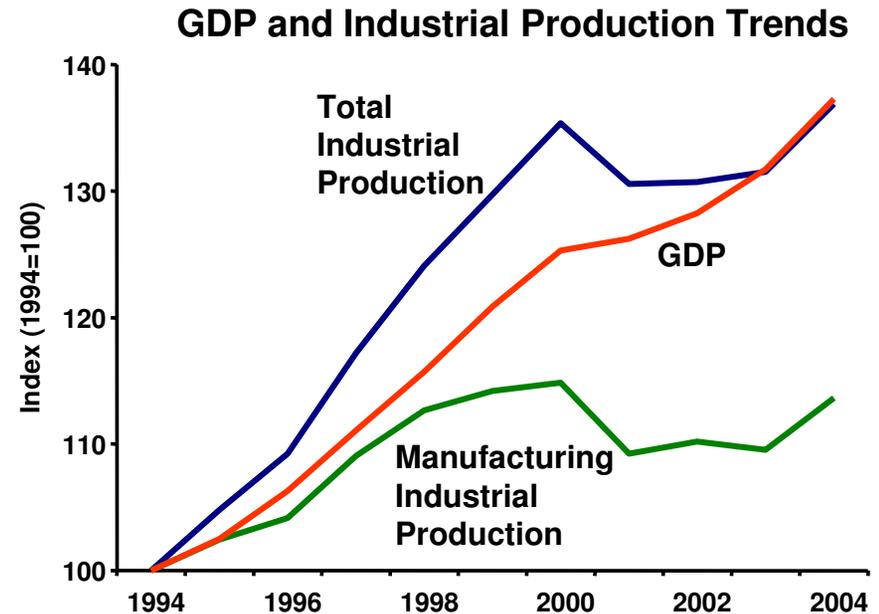
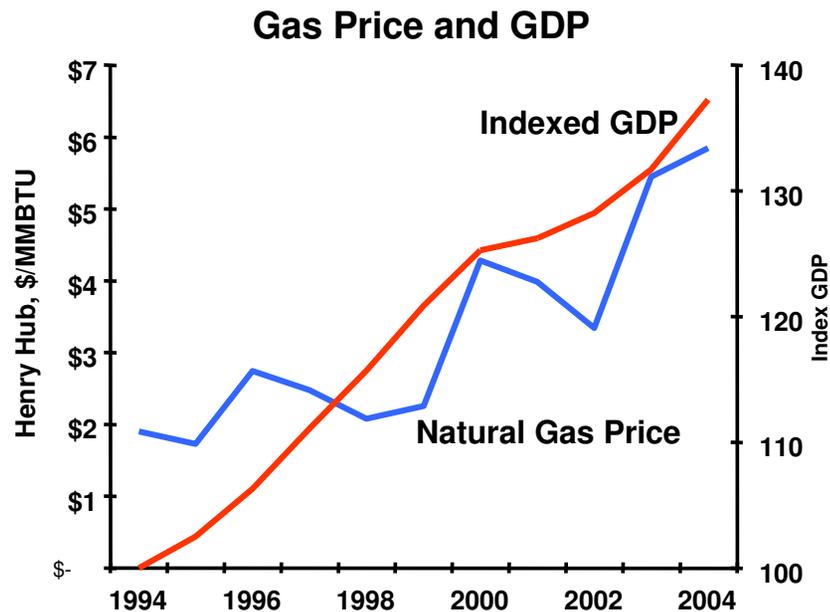
NPC Findings on Demand

- Greater energy efficiency and conservation are vital near-term and long-term mechanisms for moderating price levels and reducing volatility
- Power generators and industrial consumers are more dependent on gas-fired equipment and less able to respond to higher gas prices by utilizing alternate sources of energy
- Gas consumption will grow, but such growth will be moderated as the most price-sensitive industries become less competitive, causing some industries and associated jobs to relocate outside North America

- Overall, the NPC demand outlook has been fairly reflective of actual events
- Weather an important factor in short-term
- Consumption differences have been affected by limited supply and resulting prices
- Recent gas prices have been affected by oil prices and hurricanes

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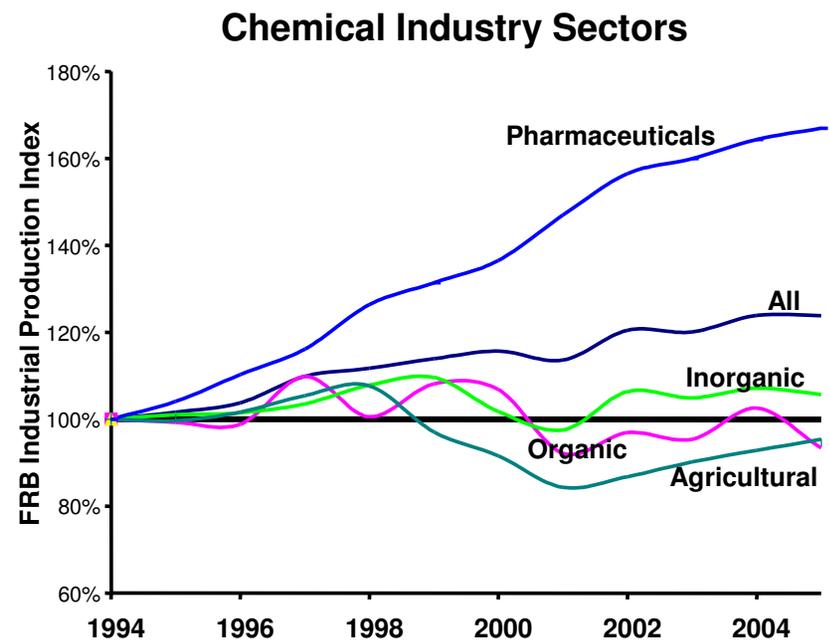
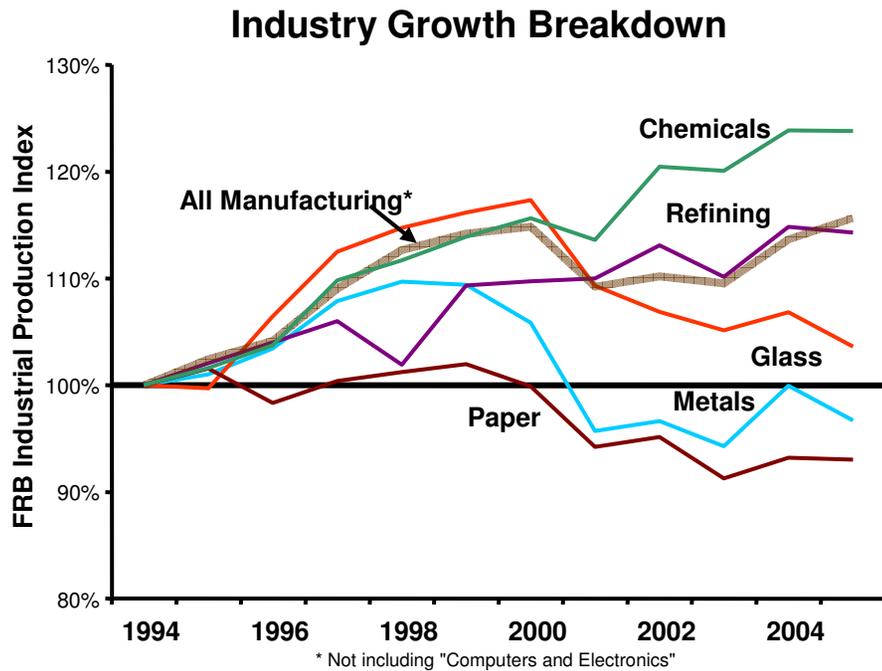
Industry – Gas Prices and the Economy



- GDP has shown little impact from increasing gas prices
- GDP is not a good indicator of overall industrial production trends
- Even FRB Industrial Production Index is dominated by the computer and electronics industries, which are not highly affected by gas prices
- Gas-intensive industries have reduced activity
- Competitiveness of gas-intensive industries with other areas of world “aided” by higher oil prices, but still at risk

Natural Gas Demand Overview

Industrial Consumers

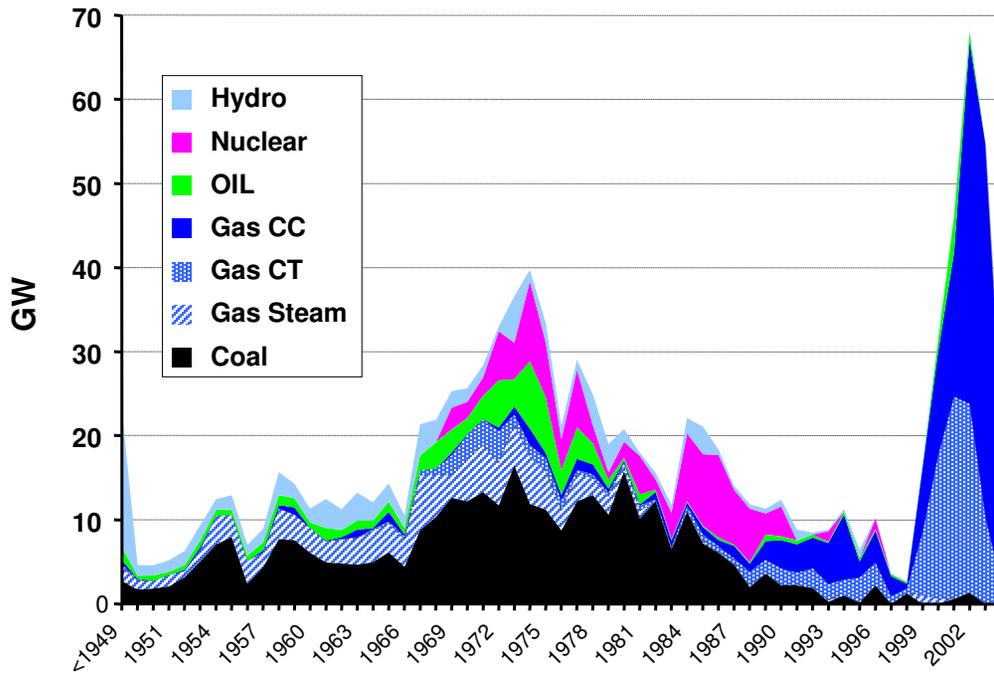


- Most energy/gas-intensive industries are lagging behind average industrial growth (adjusted to remove computers/electronics)
- The chemical industry shows strong overall growth, but primarily from non-energy-intensive segments such as pharmaceuticals. Other segments are declining

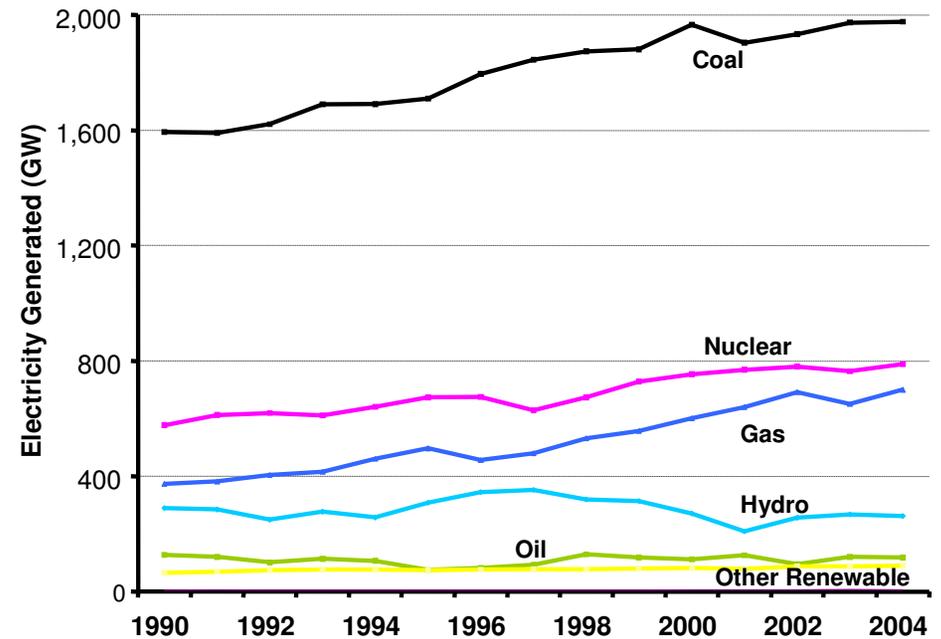
Natural Gas Demand Overview

Power Generation

Growth of U.S. Generating Capacity



Electricity Generated by Fuel/Energy Source

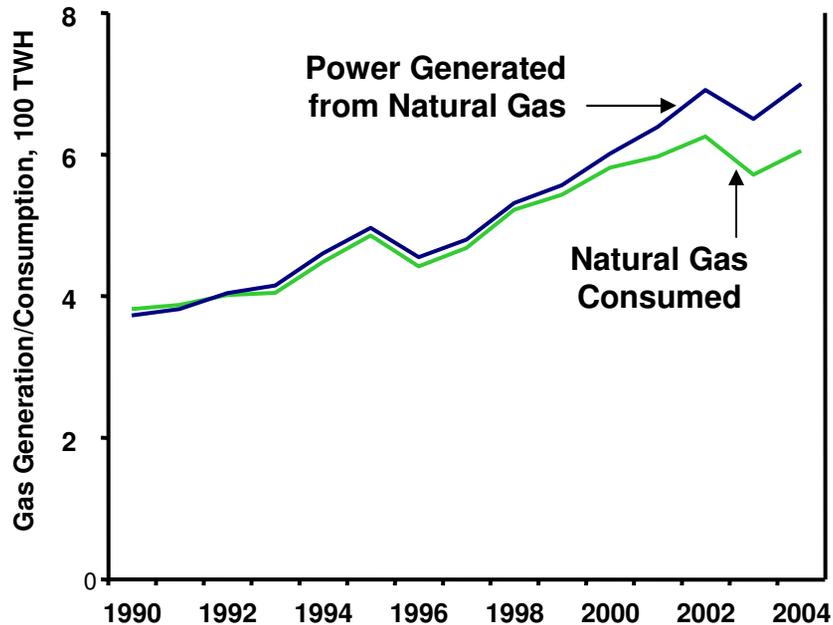


- 145 GW of gas combined cycle and 84 GW of gas peaking capacity have been constructed during the last five years
- Total growth in gas generation has not increased in pace with the new construction
- Retirements of coal-fired generation and oil/gas-switchable generation continue
- Renewable capacity added, but minor contributions to actual electricity generated

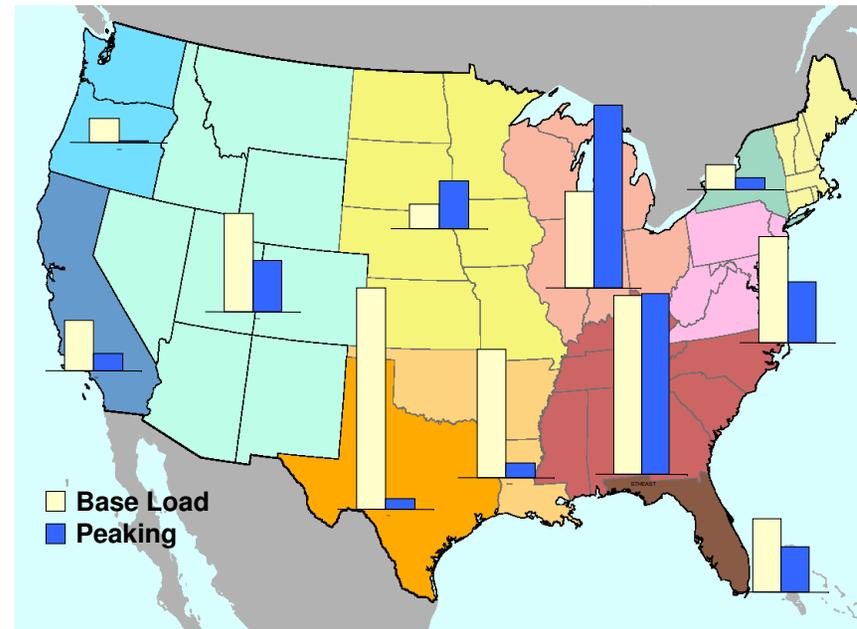
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Power Sector

Gas-Fired Generation



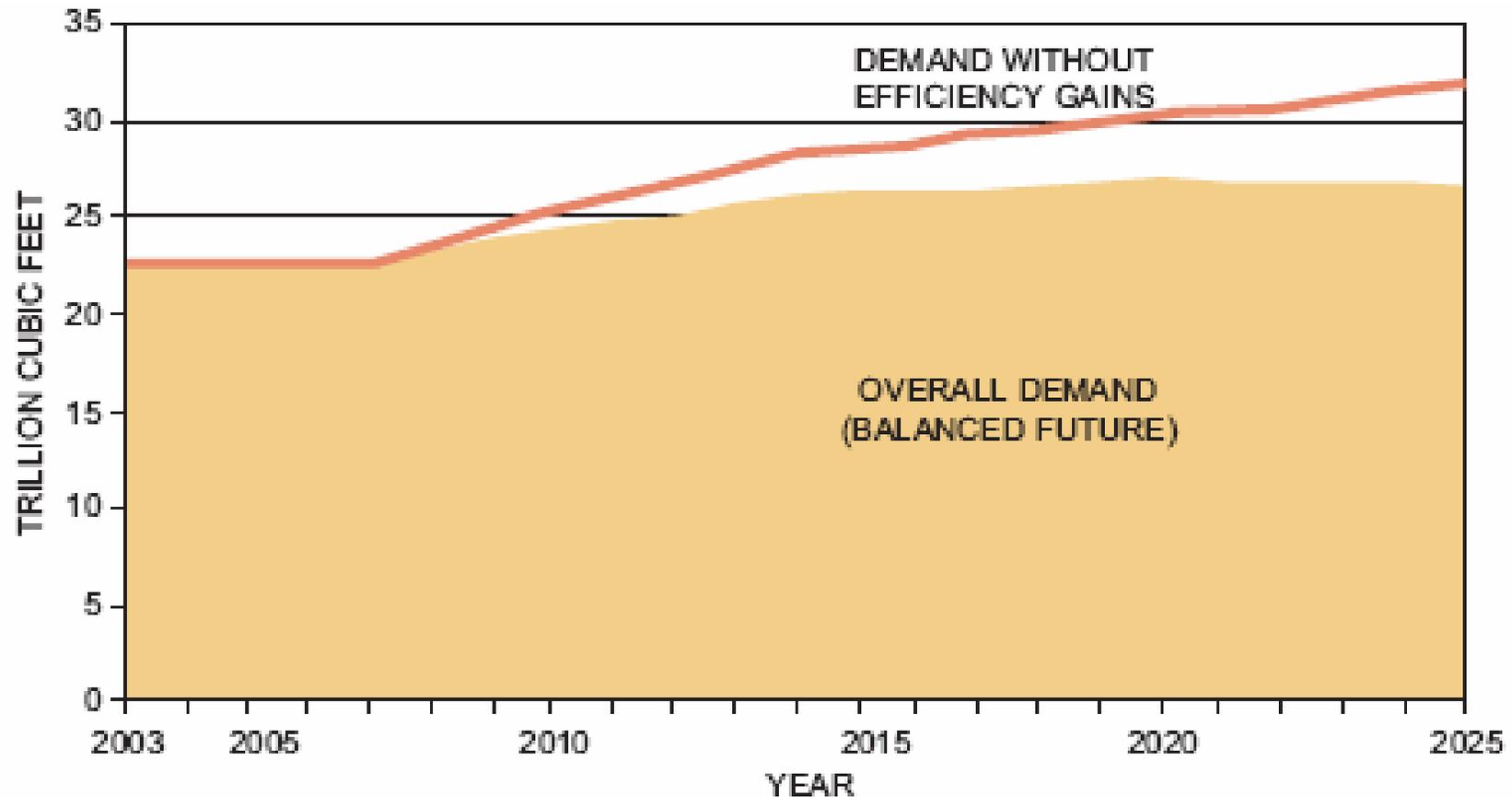
Distribution of New Gas Generation



- Some of the new combined cycle capacity has replaced older gas capacity:
 - Average efficiency of gas generation is improving, muted by continued inefficient dispatch in some areas, particularly without RTOs
 - Fuel switching capacity is declining
- Extent and impact of new construction varies significantly by region
- Outlook for alternative future sources of generation are still uncertain

Natural Gas Demand Overview

Efficiency



- NPC Study highlighted the importance of near-term and long-term efficiency
- Higher energy prices have provided greater driver for efficiency
- Efficiency is vital in ALL sectors, both through physical measures and by enhancing markets

Key NPC Study Demand Recommendations

Improve Demand Flexibility and Efficiency

- **Encourage increased efficiency and conservation through market-oriented initiatives and consumer education**
 - + EPACT measures for Energy Star, weatherization assistance, security-constrained dispatch
 - Inefficient dispatch facilitated by lack of organized power markets and regulatory compacts
 - Little commitment to retail gas markets or measures providing price signals to end-users
- **Provide certainty of air regulations to create a clear investment setting for industrial consumers and power generators, while maintaining the nation's commitment to improvements in air quality**
 - + Clarification of NSR standards, mercury regulations
 - Continued lack of coordination/symmetry/efficiency in emissions trading
- **Expedite hydroelectric and nuclear powerplant relicensing processes**
 - + FERC actions on hydroelectric relicensing
 - Continued uncertainty of nuclear waste responsibility
- **Take action at the state level to allow fuel flexibility**
 - Little progress in developing alternative fuel capability for gas-fired generation capacity
 - Continued retirements of flexible capacity