



U.S. Energy Outlook

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Overview: Energy Sector Transformation Underway

- The recession has hit energy demand hard, and aggregate energy demand is not expected to return to 2007 levels until 2018.
- Oil and natural gas prices will both rise over the long-term, but the price trends will diverge with natural gas prices rising slowly due to the development of shale gas.
- This forecast does not include a GHG cap-and-trade program. However, it is assumed that there will be continued improvement in equipment, appliance and building efficiencies that will reduce carbon emissions relative to past projections.
- The forecast also includes the more than 30 state-level programs to increase efficiency and reduce carbon emissions.



Overview: Energy Sector Transformation Underway

- Despite efficiency standards and demand-reduction programs, growth in electricity demand will grow faster than population – but not much faster: just 1.2% per year between 2010-30.
- The low rate of electricity demand growth combined with the federal renewable incentives and the state-level renewable standards results in significant renewable capacity additions and little additions of fossil fuel capacity.
- Yet, there is some increase in natural gas and coal generation.



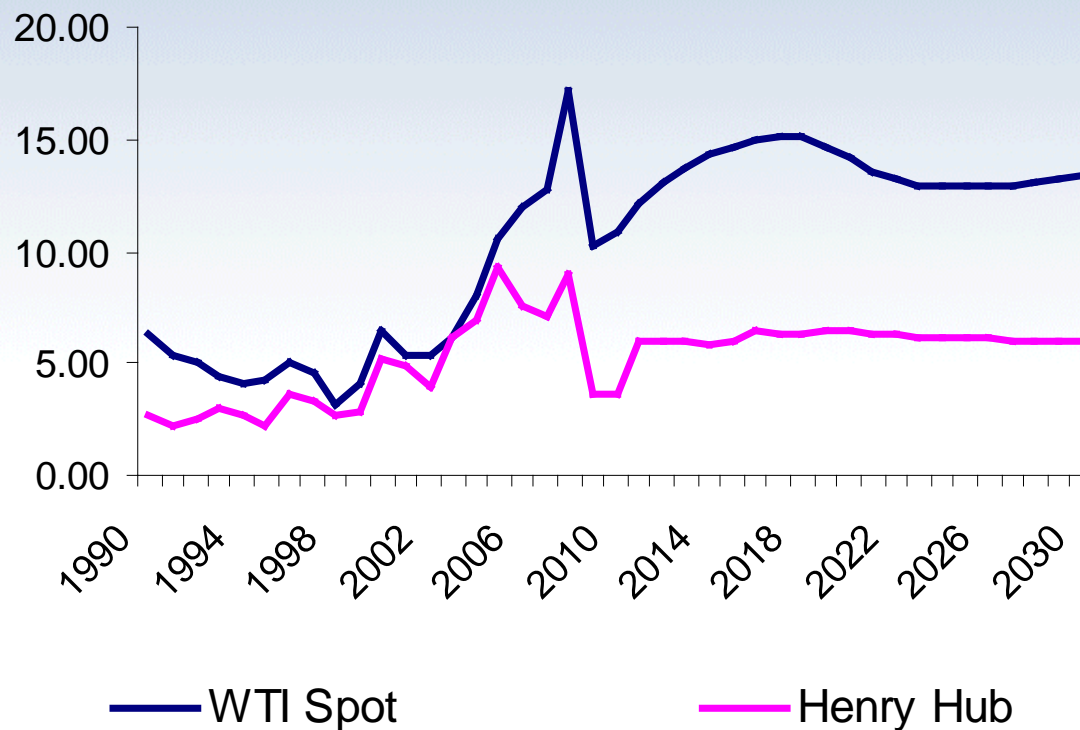
Overview: Energy Sector Transformation Underway

- **New CAFE standards are scheduled to come into effect in 2012. Additional standards have been proposed for post-2016. Much stronger standards have been assumed in the forecast.**
- **Biofuel use is assumed to meet the EISA standards.**
- **Higher CAFÉ standards and increased biofuel use in motor fuels is not sufficient to halt the rise of net oil imports.**
- **Domestic natural gas supply will rise through most of the next few decades, limiting LNG imports and delaying the development of the Alaska natural gas pipeline.**
- **Due to the continued addition of scrubbers to coal power stations, there will be increased use of high sulfur coal sourced from the Midwest that will limit the growth of western coals.**



Overview

WTI Spot Prices Rebound Through 2015 While the Henry Hub Price Flattens Over Long Term (2008 dollars per million Btu)

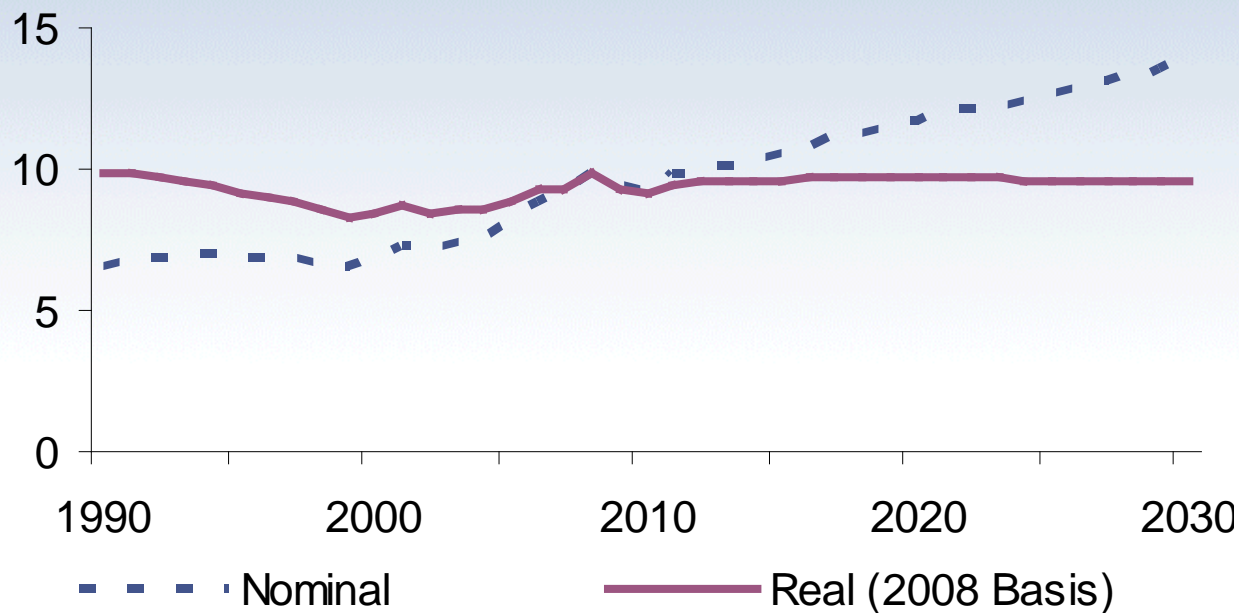




Overview

U.S. Average End-Use Electricity Price

(Cents per kilowatt hour)

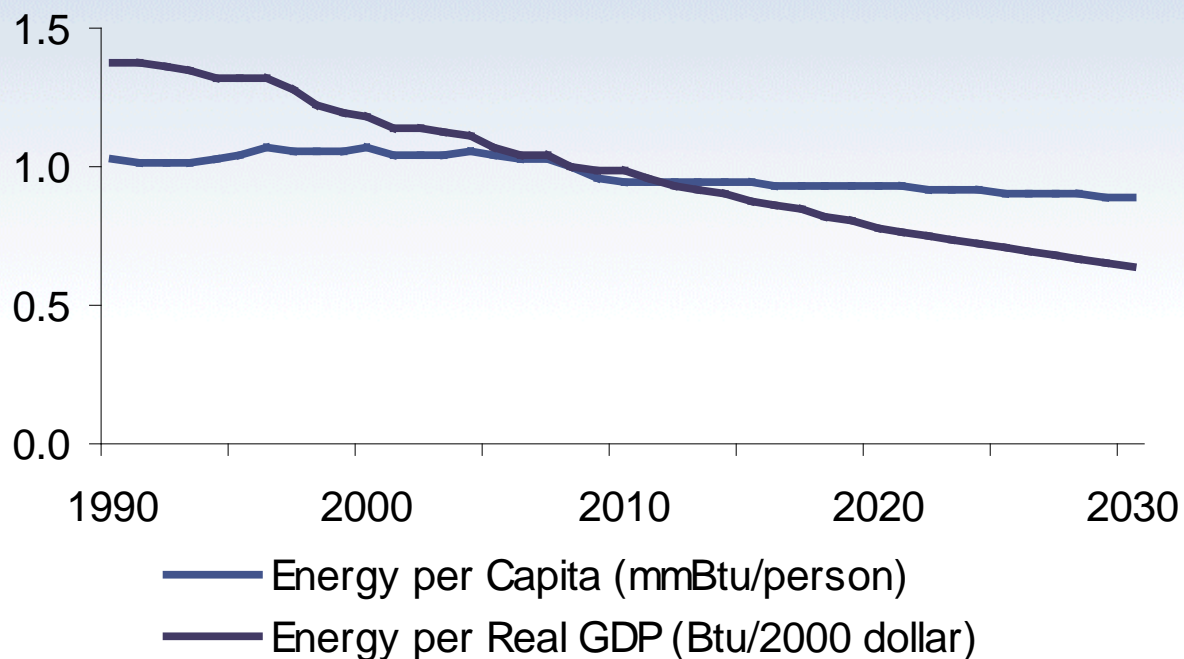




Overview

Primary Energy Demand Per Output Dollar Continues to Decline Steadily

(Index, 2008=1)

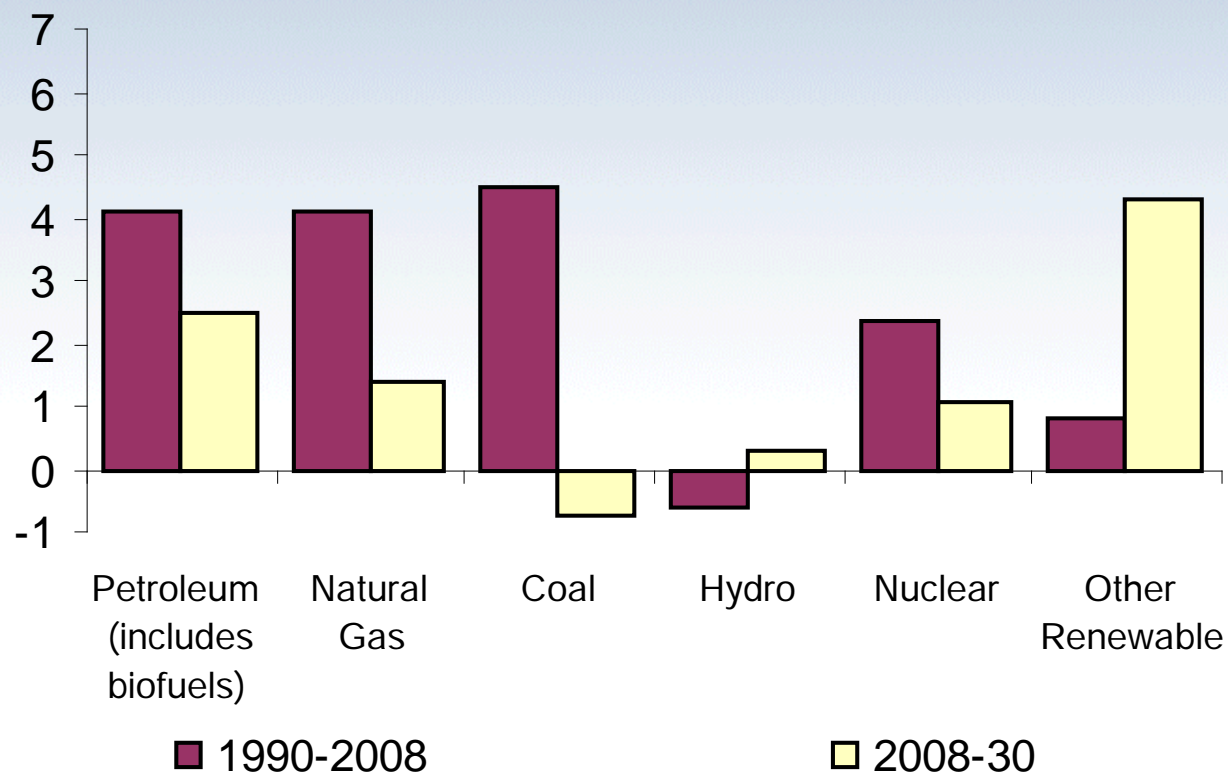




Overview

Primary Energy Demand Growth by Fuel

(Total change for period, quadrillion Btu)

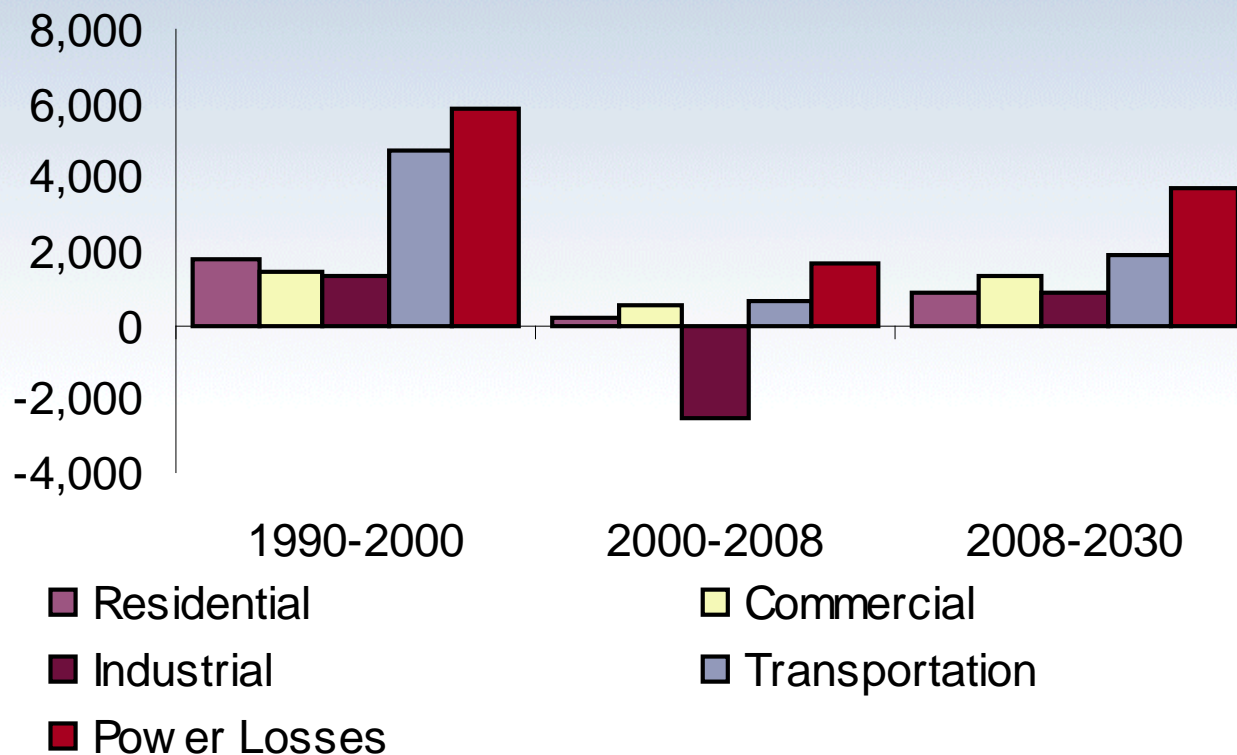




Overview

Energy Demand by Sector

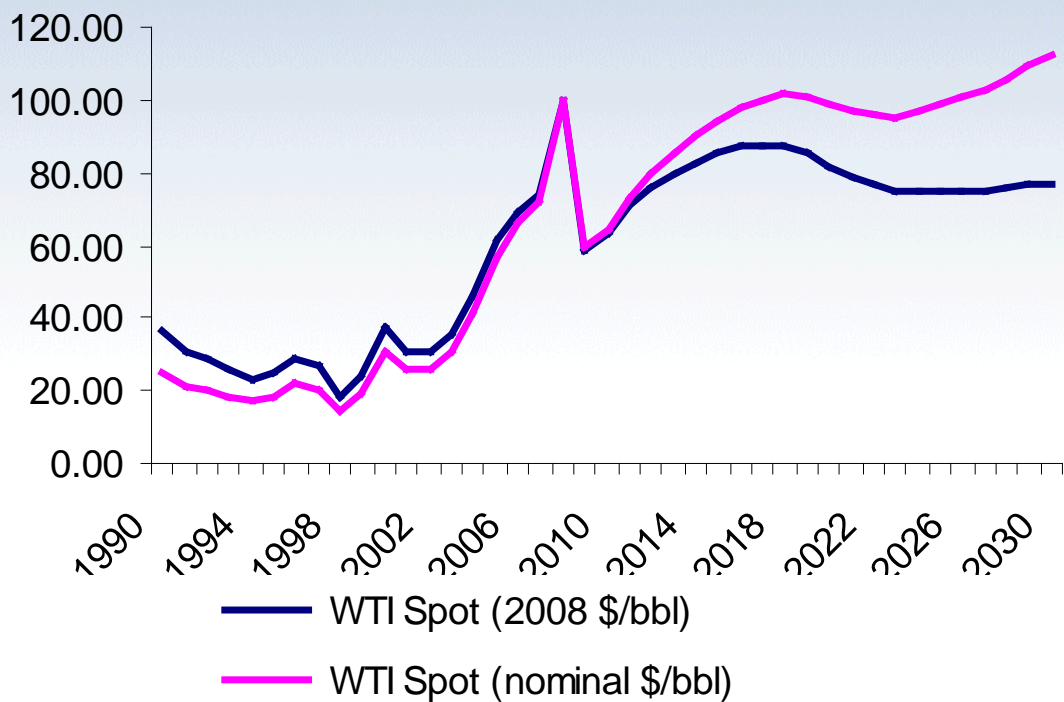
(Trillion Btu)





Oil Market

WTI Spot Prices Remain Well Above Earlier Levels

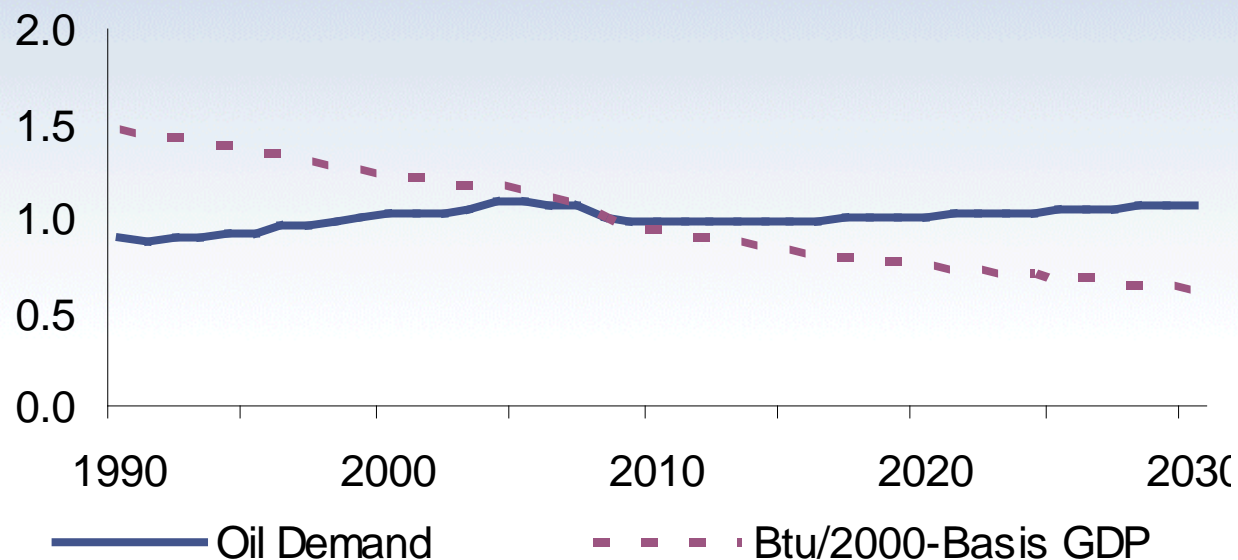




Oil Market

Decline in Oil Demand per GDP Accelerates

(Index, 2008=1.0)

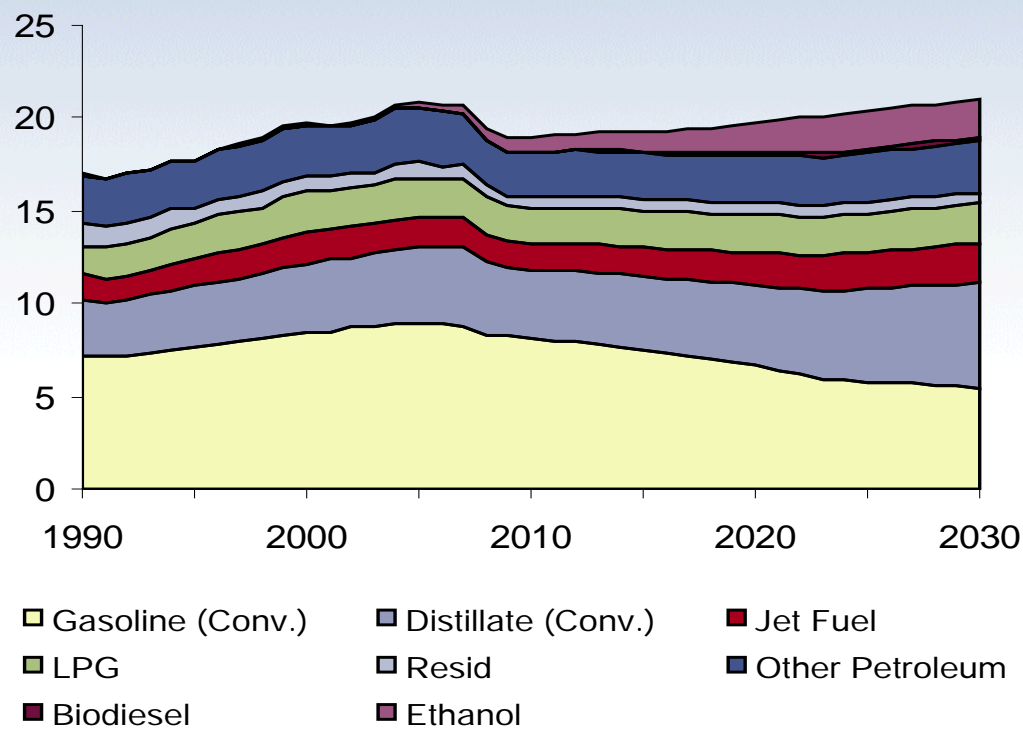




Oil Market

Demand Shares Expand for Products from the Middle of the Barrel

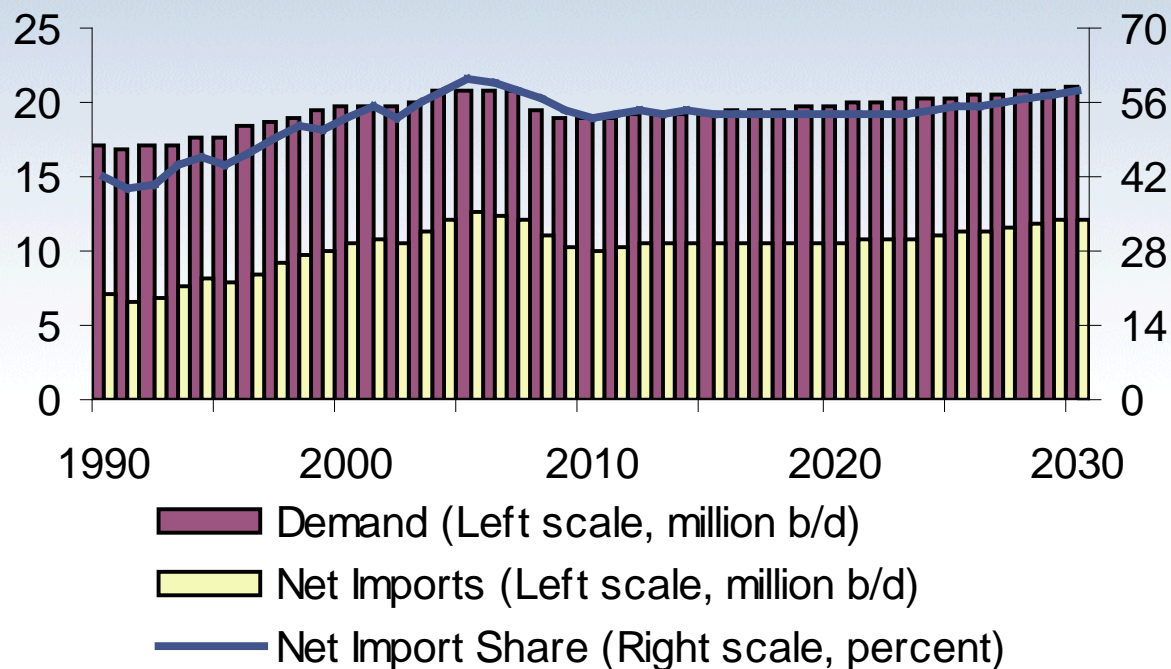
(Million barrels per day)





Oil Market

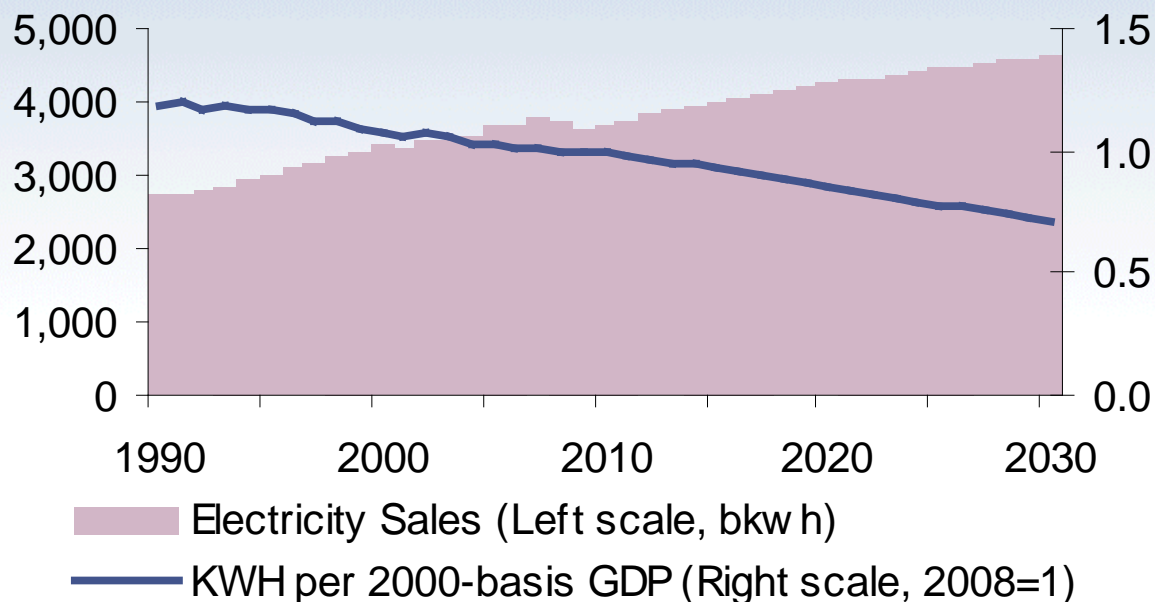
Growth in Net Oil Imports Slows





Power Market

Electricity Demand Will Increase at 40% of the Expected GDP Growth Rate

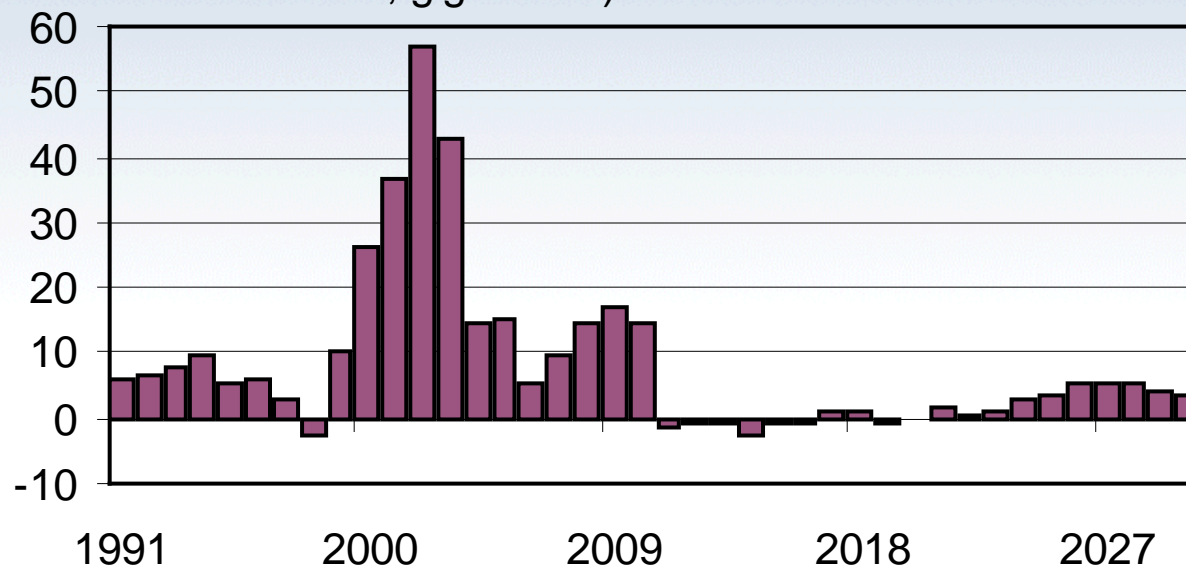




Power Market

Generating Capacity Expansion Will Slow Until Surplus is Absorbed

(Net annual additions, gigawatts)

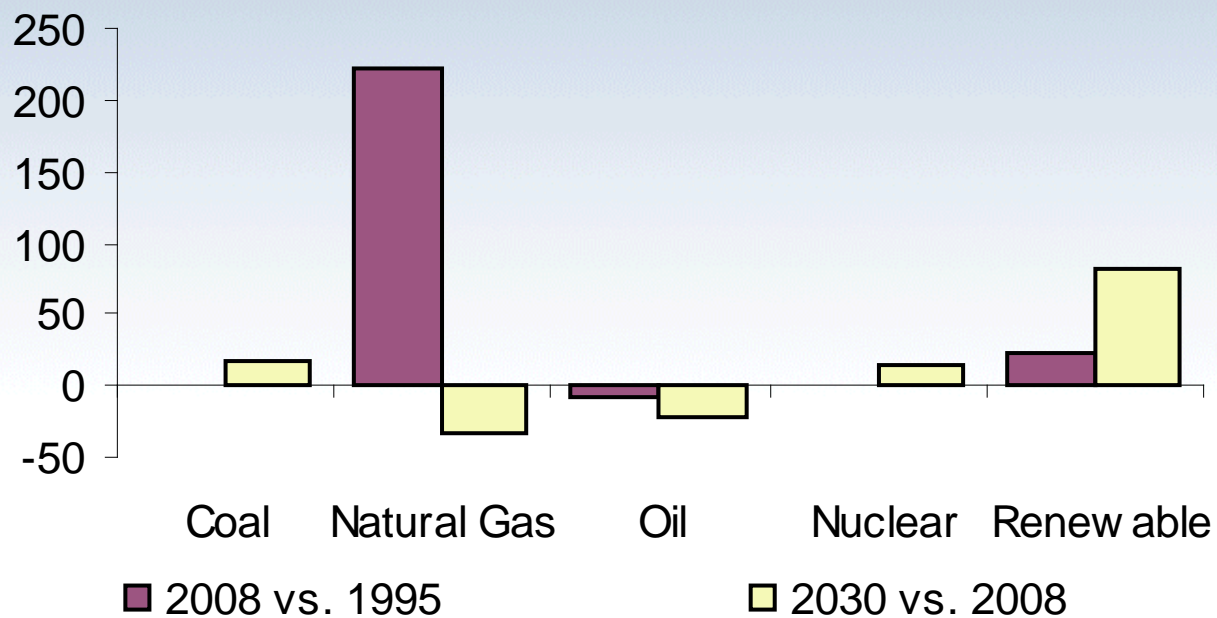




Power Market

Net Capacity Additions by Fuel Type

(Gigawatts)

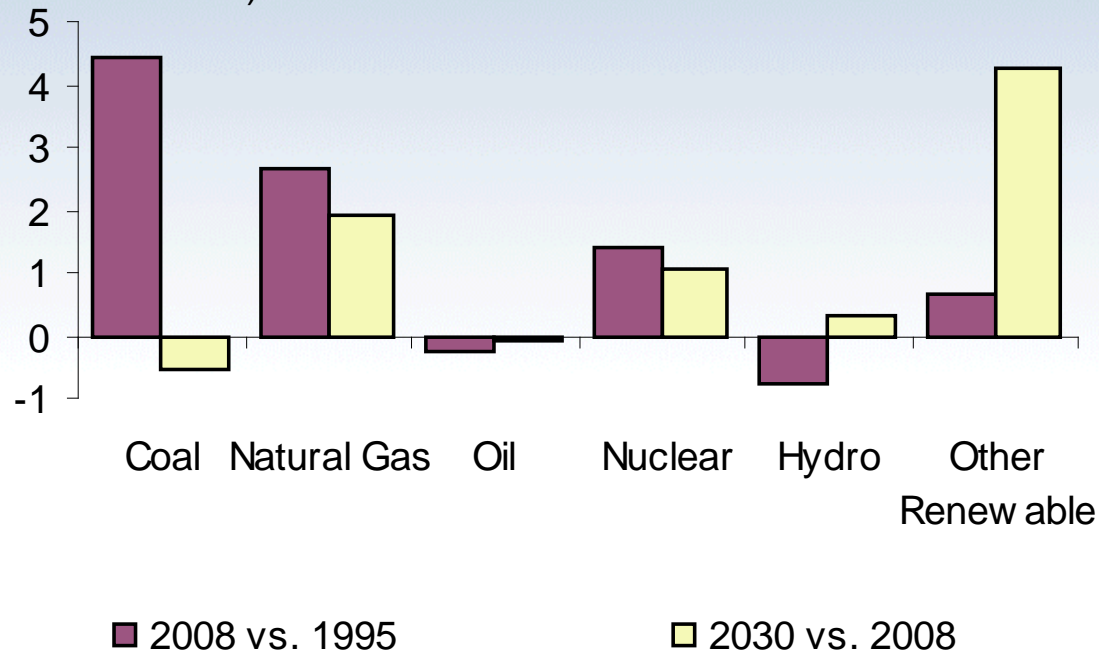




Power Market

No-Carbon Fuels Will Dominate Increase in Demand for Generating Fuels

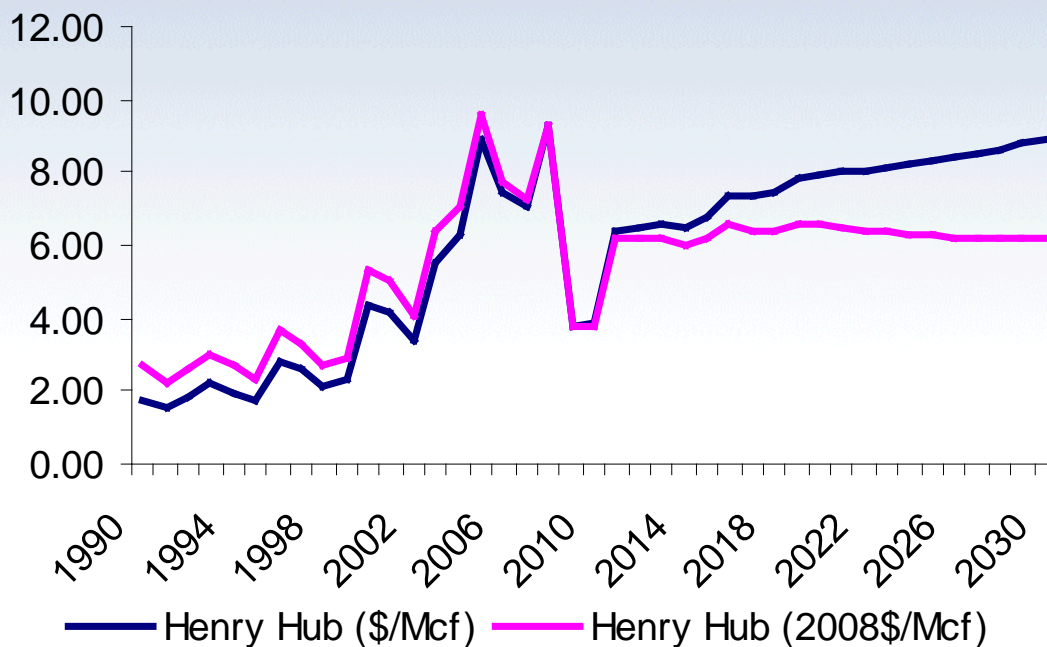
(Quadrillion Btu)





Natural Gas Market

**Henry Hub Prices Level Off Near
\$6/Mcf in Real Terms**

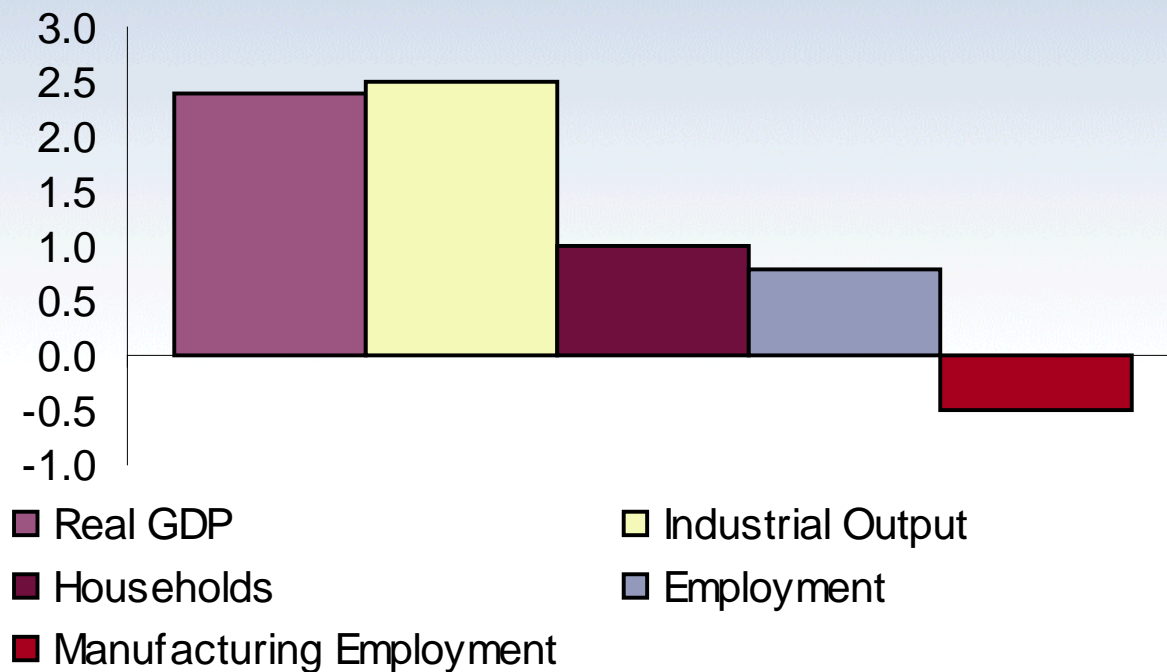




Natural Gas Market

Economic Drivers of Gas Demand, 2008-30

(Average annual percent change)

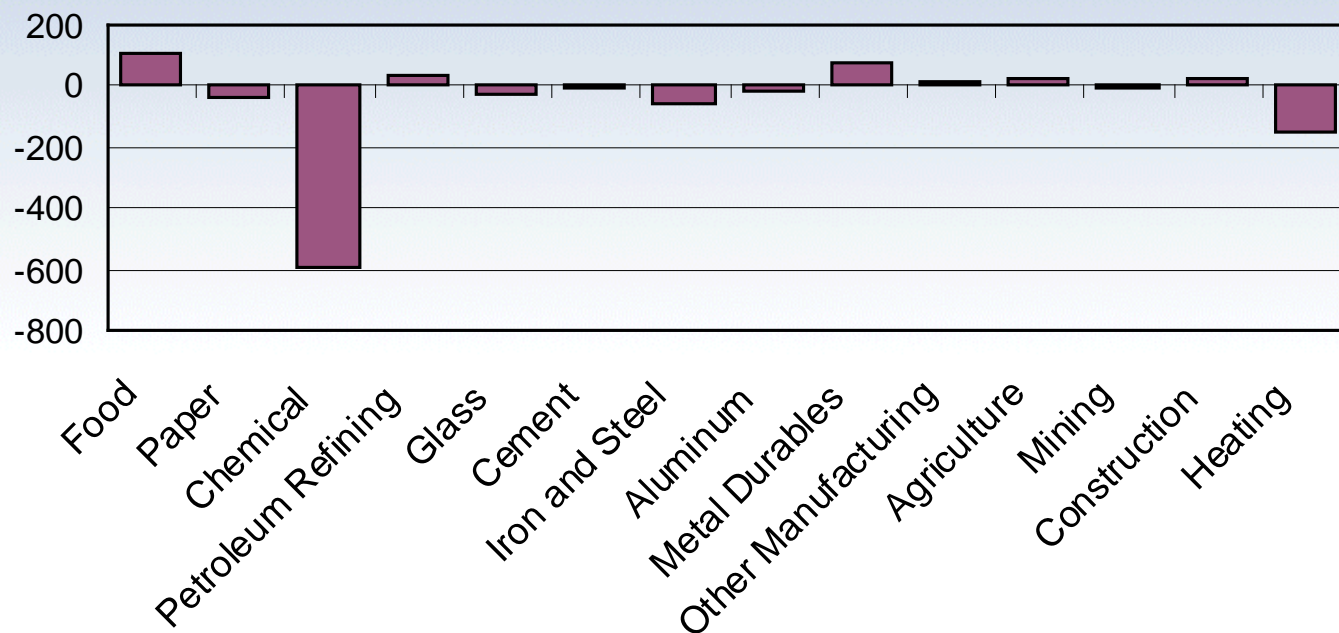




Natural Gas Market

Changes in Industrial Gas Demand 2008-2030

(Trillion Btus)

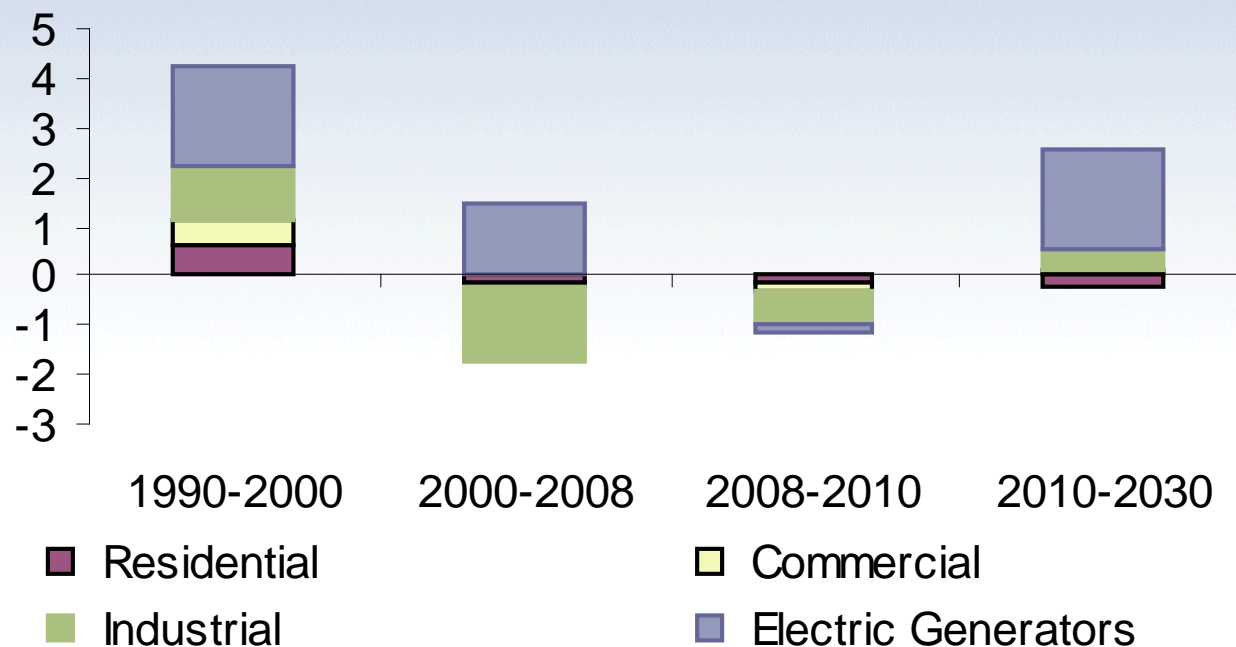




Natural Gas Market

Electric Generators Drive Demand Growth

(Trillion cubic feet)

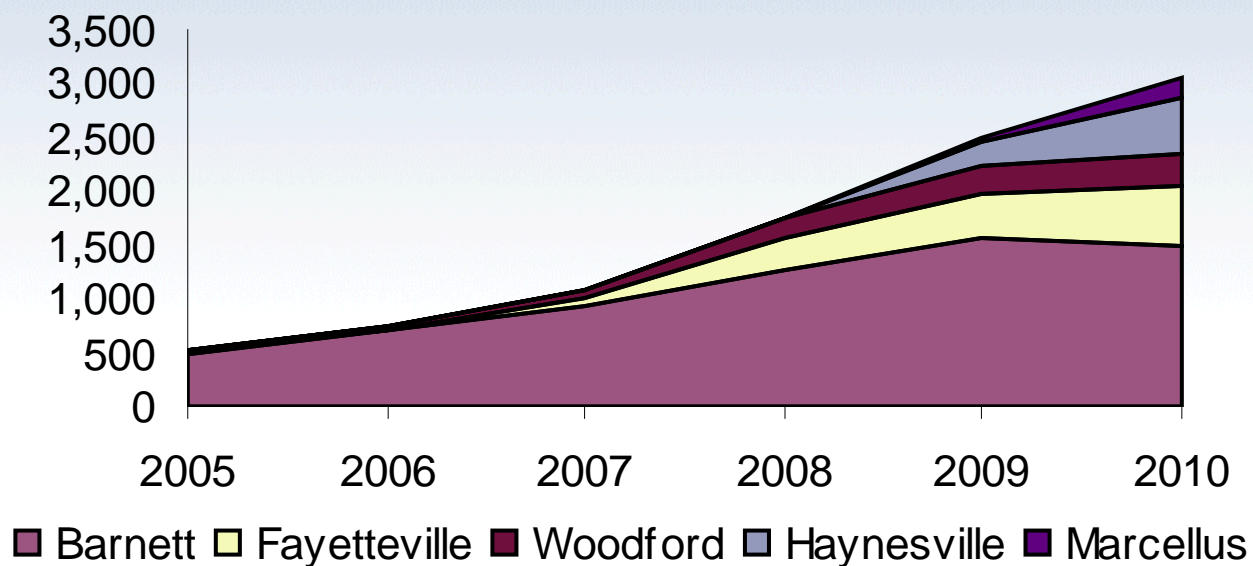




Natural Gas Market

Shale Gas Production Is Increasing Rapidly

(Billion cubic feet)

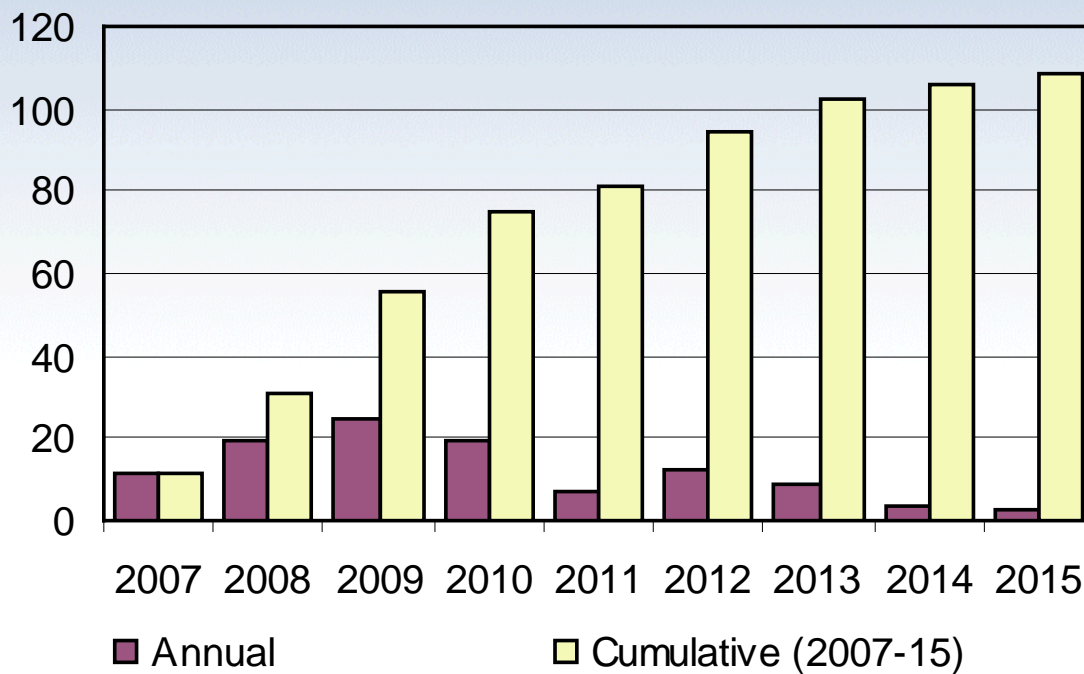




Coal Market

FGD Retrofits of Coal-Fired Units by Year

(Gigawatts)

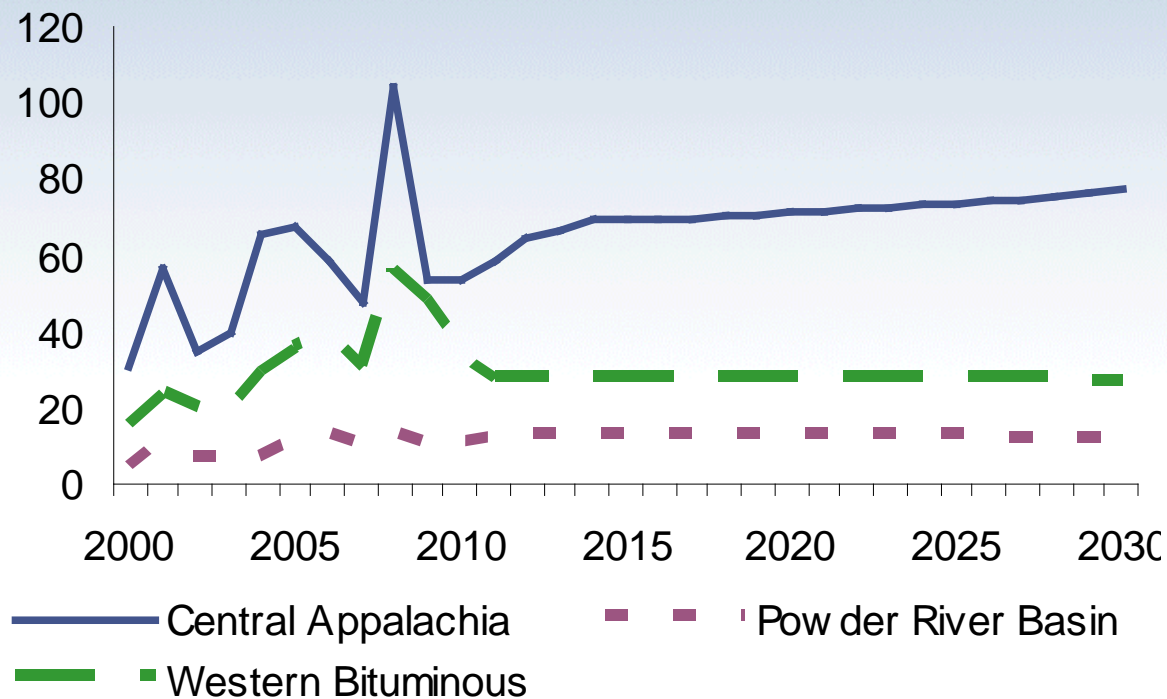




Coal Market

Mine-mouth Coal Prices in Low Sulfur Regions

(2008 dollars per ton)

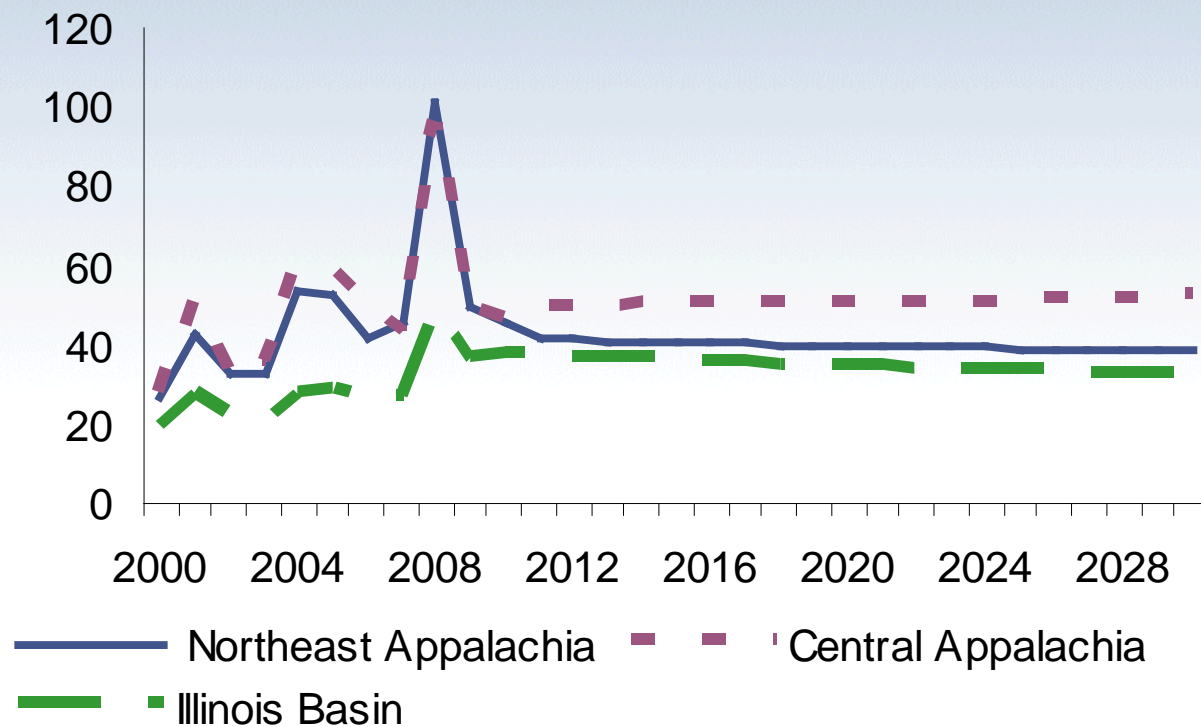




Coal Market

High Sulfur Coal Prices

(2008 dollars per ton)

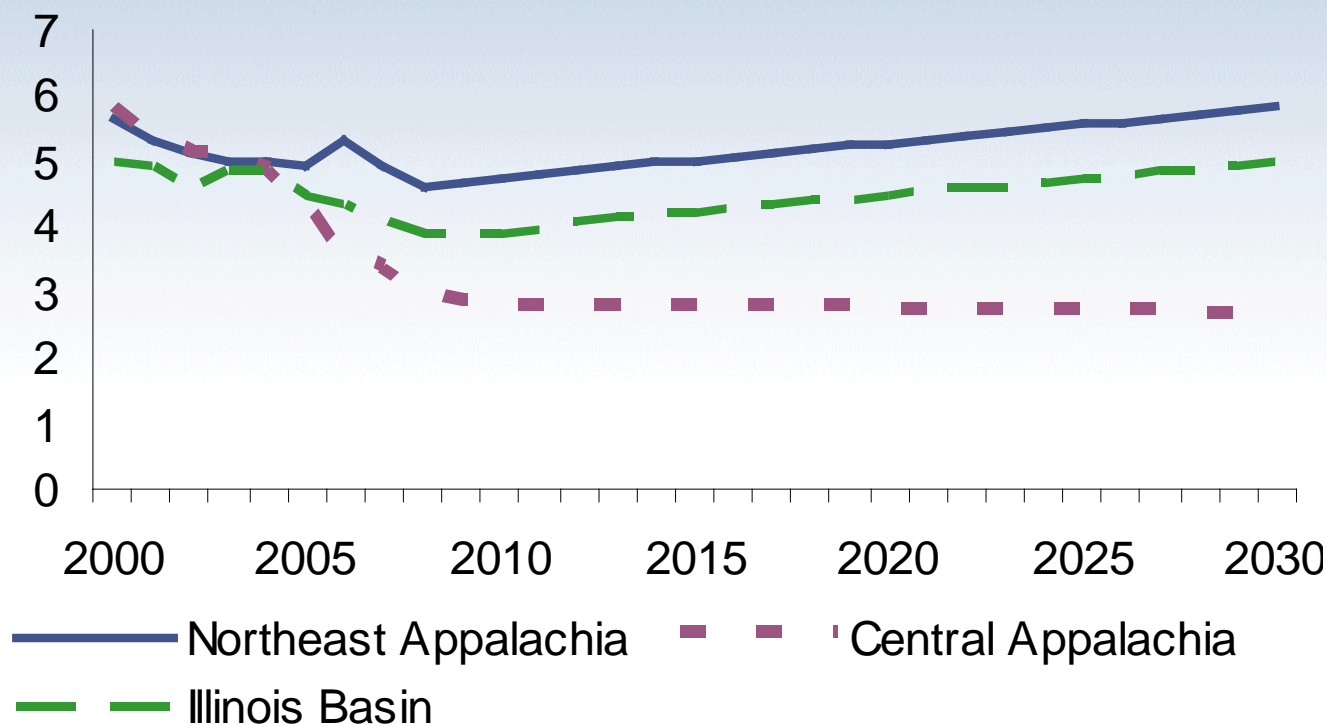




Coal Market

Productivity Trends in Underground Mining

(Tons per miner-hour)

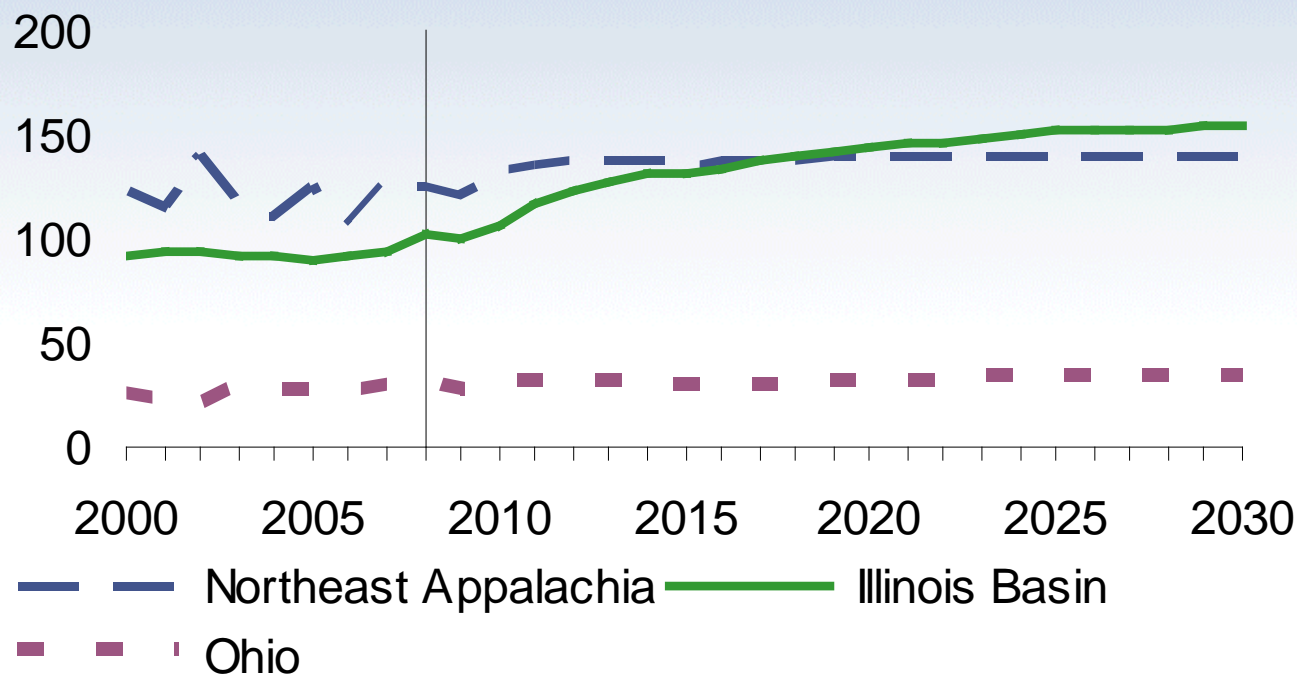




Coal Market

Steam Coal Production from High Sulfur Coal Regions

(Millions of tons)

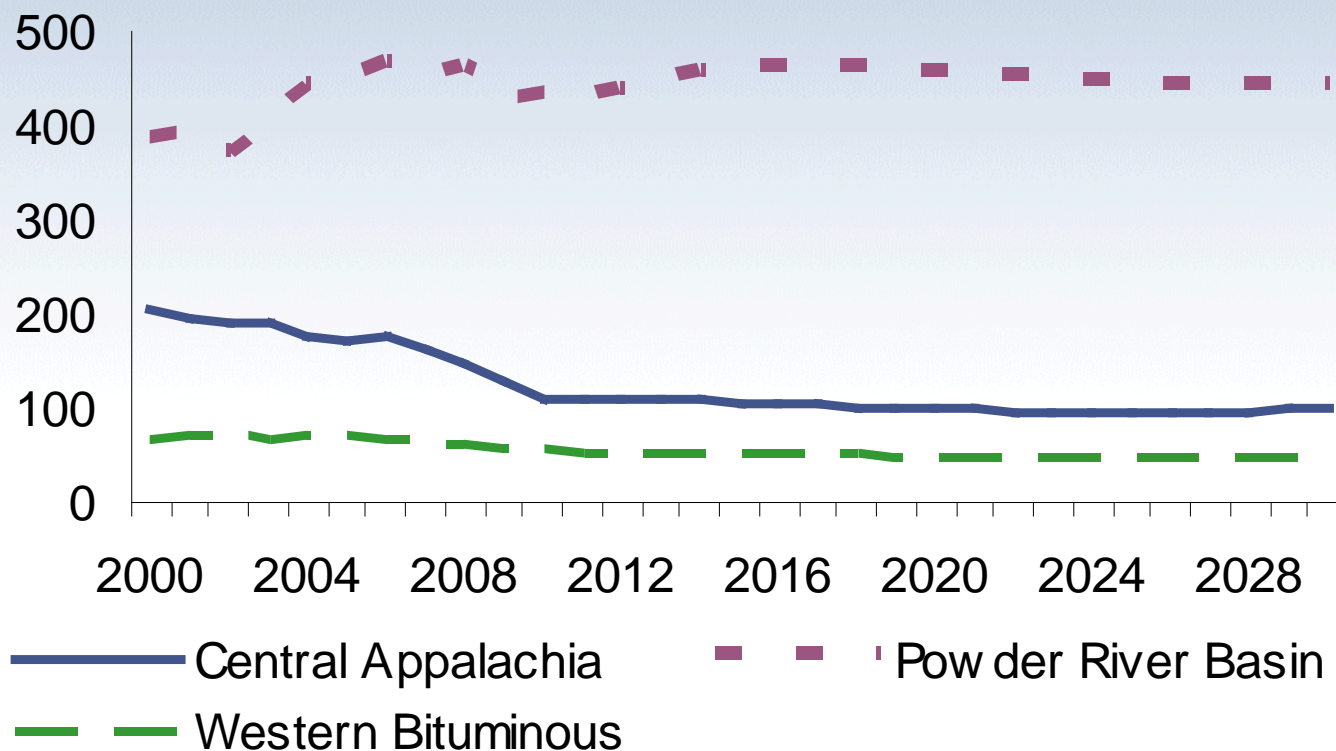




Coal Market

Production Outlook in Low Sulfur Coal Regions

(Million tons)





Thank you!

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