Natural Gas Markets: National and Regional Perspective

Senate Committee on Energy and Telecommunications

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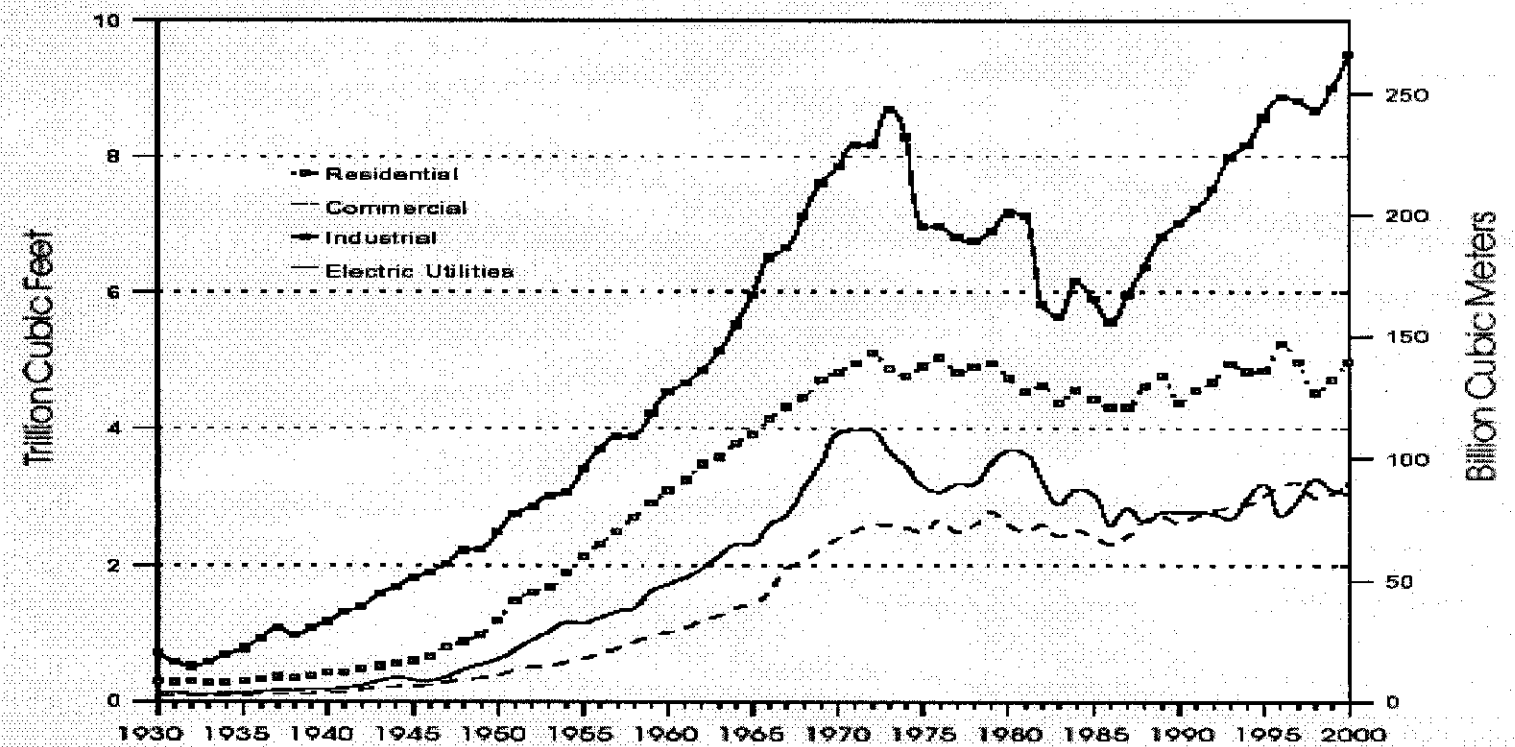
Natural Gas Markets: Major Assumptions

- Natural Gas is a commodity
- The interaction between supply and demand determines price (but it's all iterative in the end)

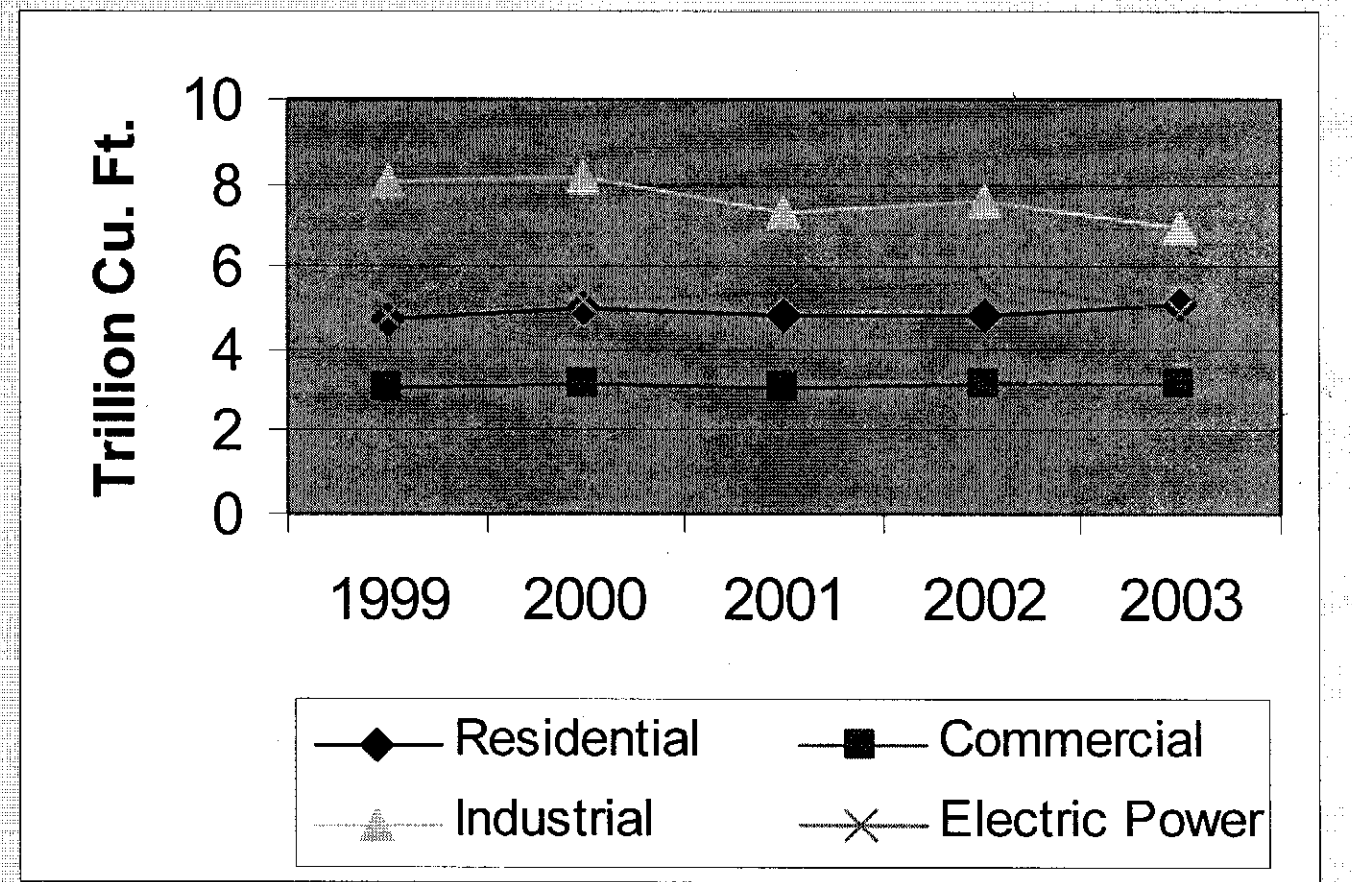
Figure 2. Natural Gas Delivered to Consumers in the United States, 1930-2000



Note: Beginning in 1996, consumption of natural gas for agricultural use was classified as industrial use. In 1995 and earlier years, agricultural use was classified as commercial use.

Sources: 1930-1975: Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. 1976-1978: Energy Information Administration (EIA), Energy Data Reports, *Natural Gas Annual*. 1979: EIA, *Natural Gas Production and Consumption, 1979*. 1980-present: Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," and Form EIA-759, "Monthly Power Plant Report."

Natural Gas Consumption by Sector, 1999-2003



Natural Gas Markets: Demand

- Demand has been affected by growth in population & number of households, income growth, substitution for other fuels or in new housing construction.
- Commercial sector – retail, restaurant, local, state and federal government, etc.
- Industrial/manufacturing sector. Largest sector in terms of consumption, but declining (by 4.9%, 368 Bcf, between 2002-2003). Sector is considered more price sensitive.
- Demand has been affected by its increasing use in electric generation (either for new generation or in replacement of existing generation). Now the second largest sector.
- Demand is responsive to weather, but that relationship has been changing.

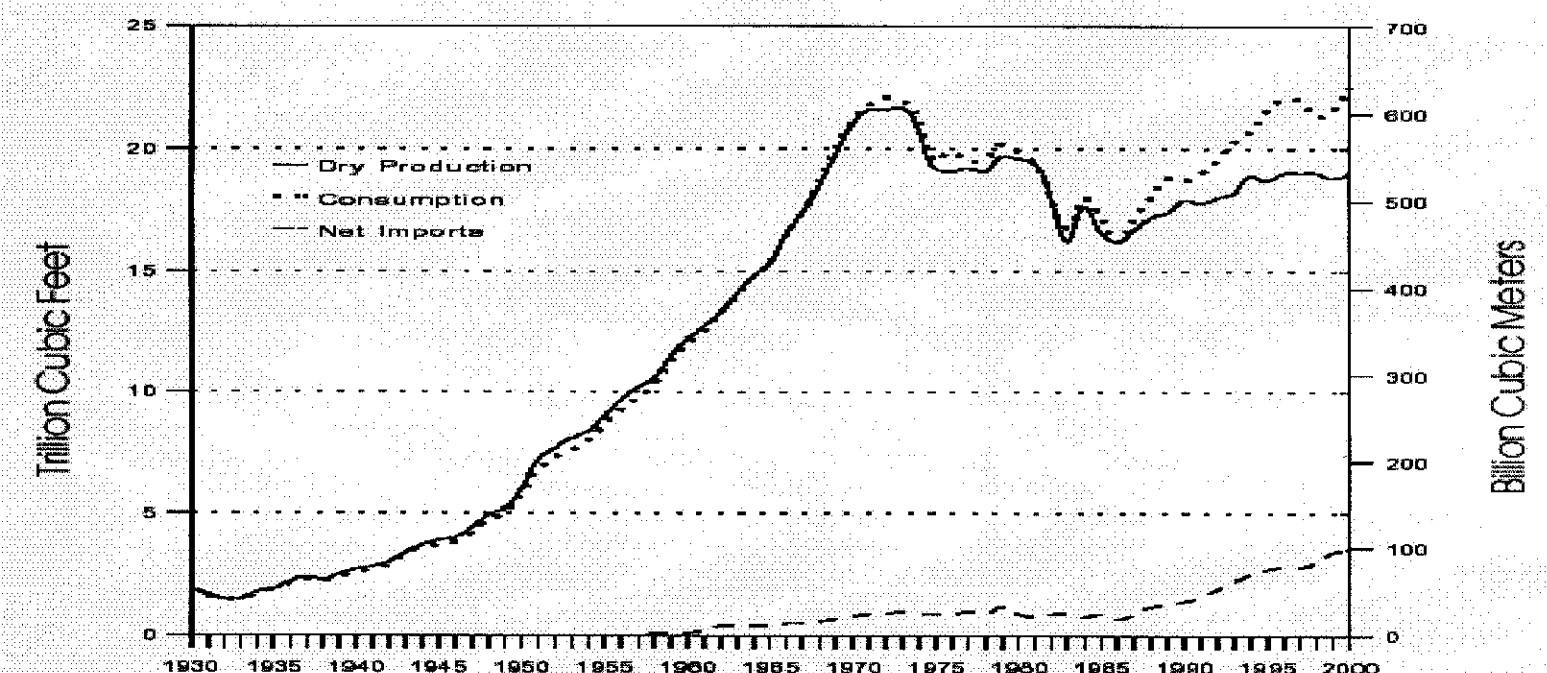
Natural Gas Markets: Demand

- Example: Xcel Energy Retrofit of Electric Generation - Metro Emissions Reduction Project

- 2001 Minnesota Legislature allowed cost recovery of retrofit costs

  - Retrofit 3 coal-fired plants – convert 2 to natural gas
    - High Bridge Plant, St. Paul(1924) – replace with high-efficiency, combined cycle NG combustion turbine. 268 MW to 511 MW. SO2, mercury, PM eliminated, Nitrogen oxide reduced by 97%. Online - May 2008.

Figure 1. Natural Gas Supply and Disposition in the United States, 1930-2000



Sources: 1930-1975: Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. 1976-1978: Energy Information Administration (EIA), Energy Data Report, *Natural Gas Annual 1979*; EIA, *Natural Gas Production and Consumption, 1979*. 1980-1994: EIA, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition"; Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production"; Form EIA-627, "Annual Quantity and Value of Natural Gas Report"; and Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." 1995: EIA, Form EIA-176, Form EIA-64A, Form EIA-627, and Office of Fossil Energy, U.S. Department of Energy, Natural Gas Imports and Exports. 1997-present: EIA, Form EIA-176, Form EIA-64A, Form EIA-895, "Monthly Quantity and Value of Natural Gas Report"; and Office of Fossil Energy.

Natural Gas Markets: Supply

- More recent developments:
  - Decline in domestic production since 2001 despite high prices and increased number of drilling rigs
  - Production declining in some areas, Gulf of Mexico and Michigan, offset by production increases in Rocky Mountain States and Texas
  - Imports from Canada flat or slightly declining due to increased demand in eastern Canada and flat production
  - US LNG imports grew 38% through third quarter of 2004 compared to the same period in 2003, moderating price increases
  - Infrastructure issues becoming issue in Northeast, pipeline congestion expected to be minimal elsewhere.

Alaska Natural Gas Pipeline

(primary mainline to lower-48)

Alaskan Natural Gas Pipeline Act

- **Public Law 108-324-Oct. 13, 2004**
- Part of the **Military Construction Appropriations and Emergency Hurricane Supplemental Appropriations Act**
- Key features:
  - FERC must issue regulations for Alaskan pipeline capacity open season within 120 days of date of enactment (Final rule issued Feb. 9, 2005)
    - Regulations must include procedure for the allocation of capacity
    - Regulations must include the criteria for and timing of any open seasons

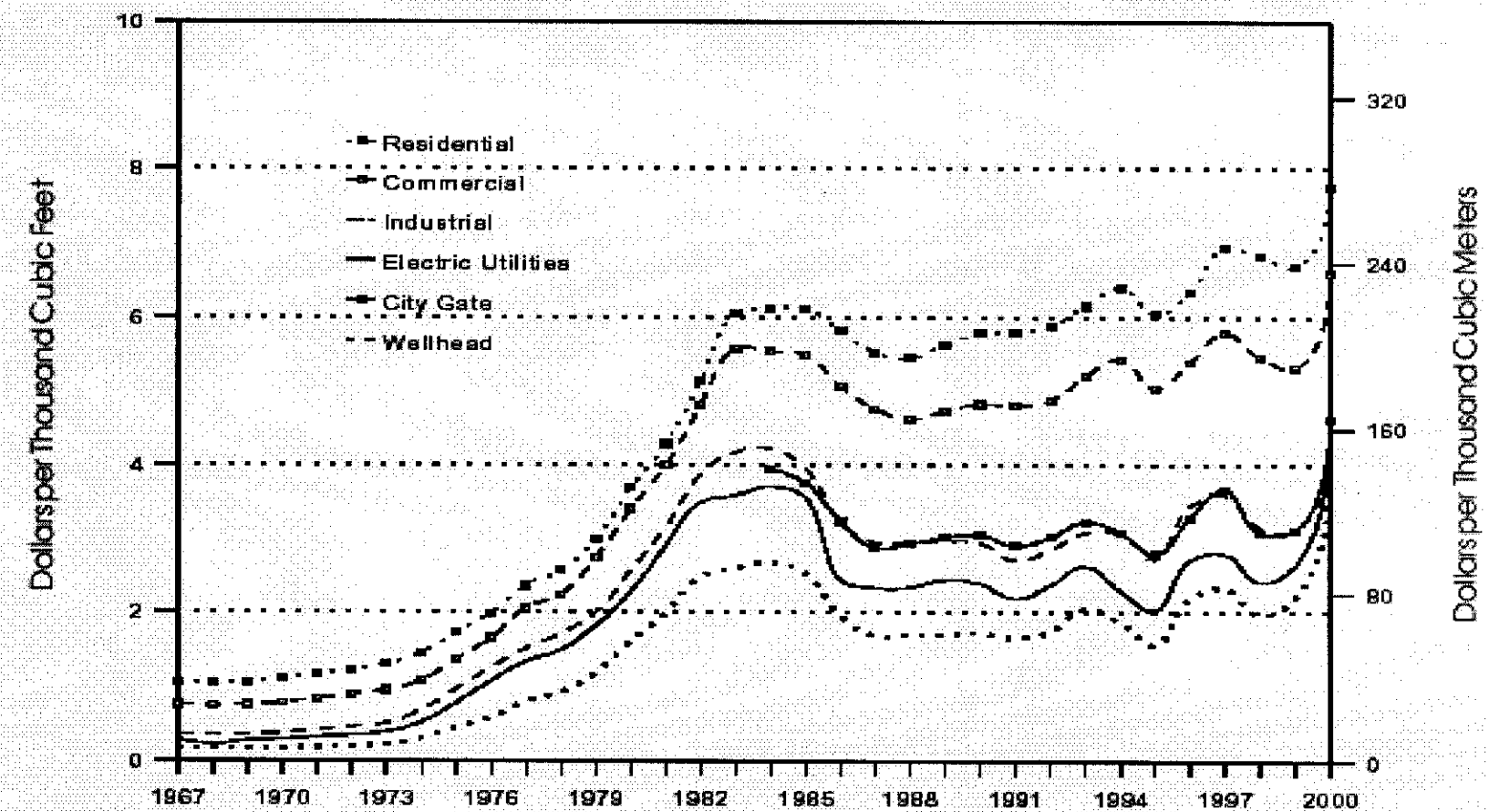
Alaskan Natural Gas Pipeline Act

- Key features (cont.)
  - Loan guarantee provisions – loans not to exceed 80% of capital cost (capped at $18B)
  - Create a federal coordinator
  - Designate FERC as lead agency for environmental review
  - Single environmental review
  - Expedited judicial review process of any challenges to the pipeline in the DC Court of Appeals.

Natural Gas Markets: Prices

- Higher than in recent past – especially in the intermountain west
- More volatile
- Not as seasonal as it used to be
- Behavior indicates a market with tight supplies relative to demand. Small increases in consumption or small supply losses can mean large price swings

Figure 3. Average Price of Natural Gas Delivered to U.S. Consumers, 1967-2000



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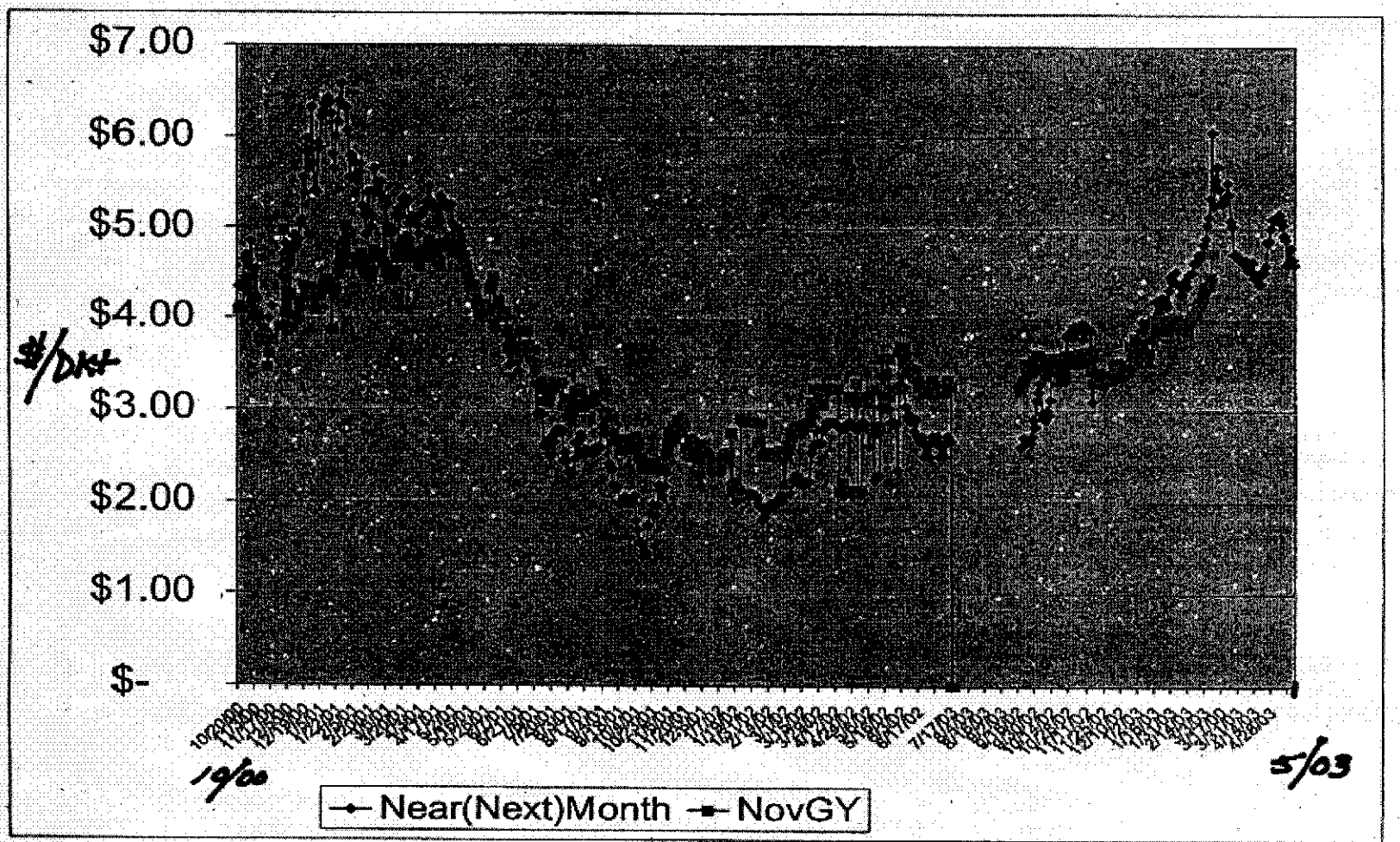
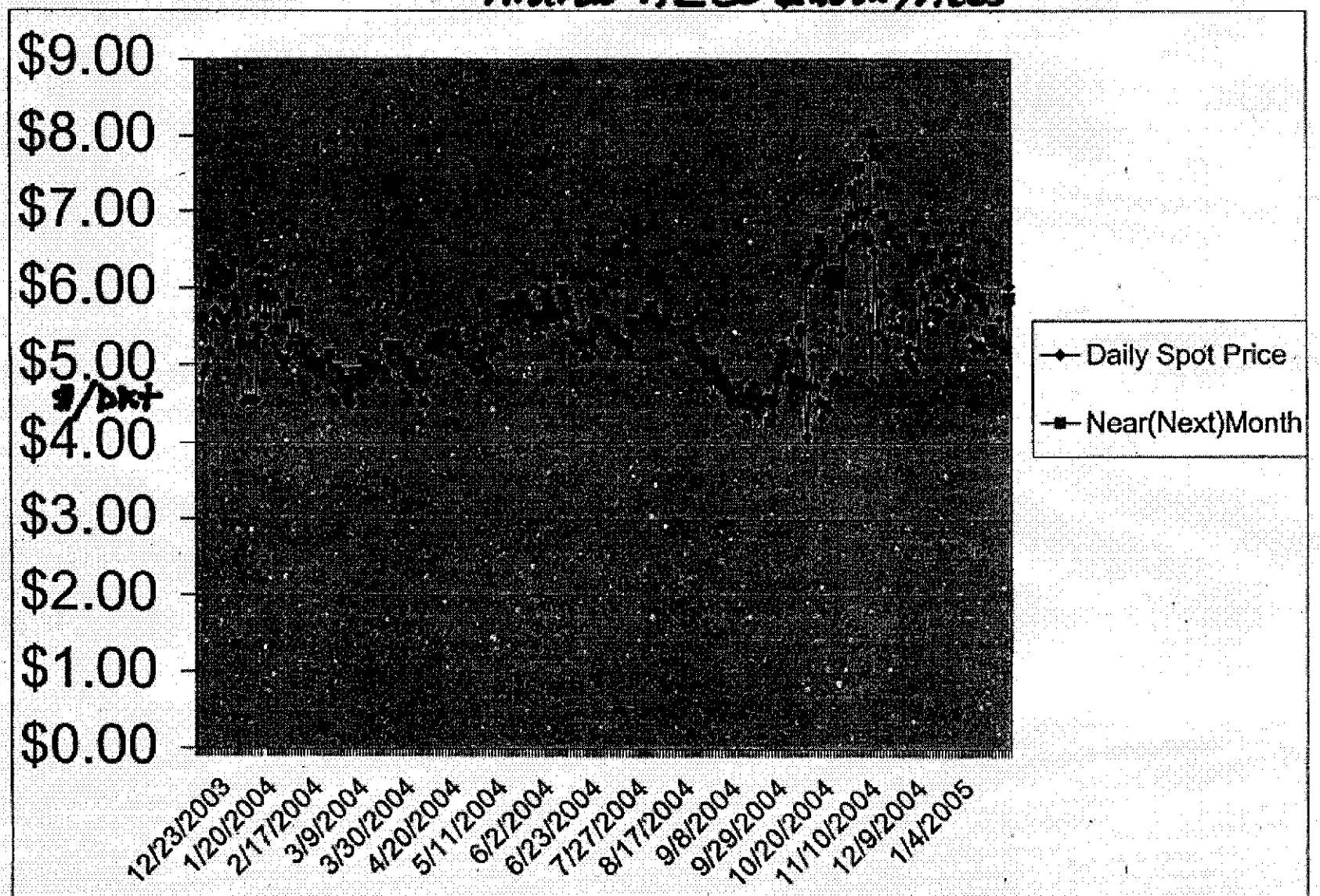
Sources: Electric Utilities: 1967-1977: Federal Power Commission (FPC). 1978-1993: Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report;" Federal Energy Regulatory Commission (FERC), Form FERC-423, "Cost and Quality of Fuels for Electric Utility Plants" and Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition." All other data: 1967-1976: Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. 1978-1979: EIA, Energy Data Report, *Natural Gas Annual 1979*. EIA, *Natural Gas Production and Consumption 1979*. 1980-present: EIA, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," and Federal Energy Regulatory Commission (FERC), Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants."

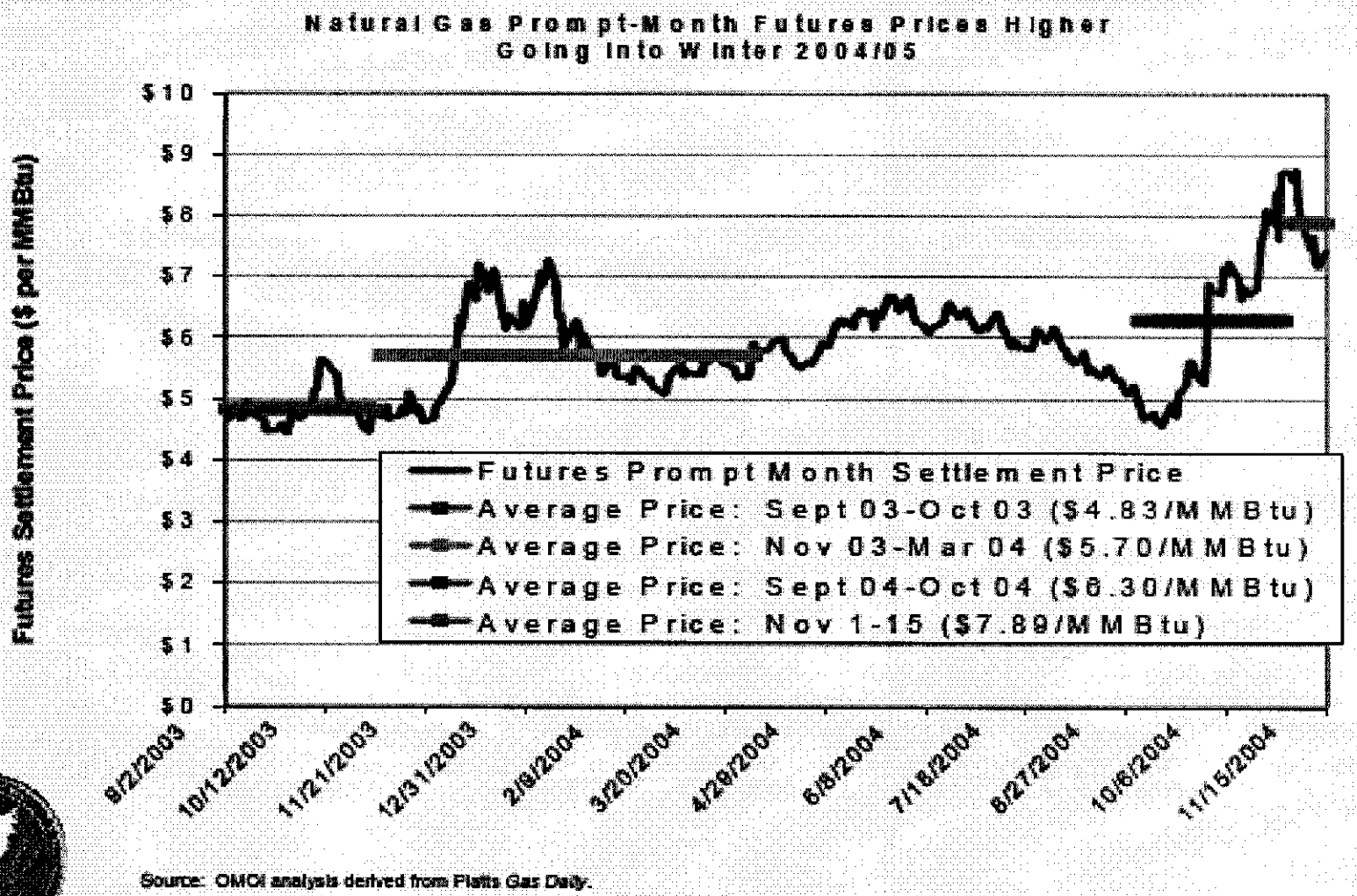
NATURAL GAS
Alberta / AECO Index Prices



NATURAL GAS
Alberta AECO Index Prices



Natural gas prompt-month futures prices reflect supply concerns



Source: OMOI analysis derived from Platts Gas Daily.