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United States
General Accounting Office
Washington, D.C. 20548

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Resources, Community, and
Economic Development Division

B-279299

March 11, 1998

The Honorable Jeff Bingaman
United States Senate

The Honorable Dale Bumpers
United States Senate

Subject: Energy Policy: Natural Gas Prices During the Winter of 1996-97

As requested, we are providing you with information nationwide and for New Mexico on (1) whether natural gas prices for small consumers (i.e., residential consumers and small business) have become more volatile than in the past, particularly during the winter of 1996-97; (2) the factors that contributed to natural gas price volatility and price spikes, if any, during this period; and (3) the actions by the private sector and regulators to mitigate future natural gas price volatility and price spikes. We used this material to brief your staff on February 25, 1998 (see enc.I).

During the winter of 1996-97, while nationwide monthly residential prices for natural gas were less volatile than they had been during the previous winter, in New Mexico the prices were more volatile. During the 1996-97 winter, gas prices increased both nationwide and in New Mexico. Monthly U.S. residential gas prices for November 1996 through March 1997 were 10 to 19 percent higher than the same months of the previous winter. Residential gas prices in New Mexico were 68 percent higher in January 1997 than in December 1996 but remained below the national average.

According to experts on the natural gas industry and Department of Energy (DOE) officials, several factors contributed to the price increases for natural gas during the winter of 1996-97. Nationwide, the increases were largely attributed to cold weather and record low gas inventories. Across the United States, October and November 1996 were 6 percent and 18 percent colder than normal. In addition, inventories of natural gas were low nationwide after a cold 1995-96 winter, and they had not been fully replenished before the 1996-97 winter.

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In 1996, the expansion of pipeline capacity led to more New Mexico gas being transported eastward, thereby increasing gas prices in New Mexico. In previous years, the Public Service Company of New Mexico Gas Services (PNM), the largest public gas utility in the state, was able to purchase New Mexico gas at prices below the national average because pipeline constraints limited this gas from moving east.

Several actions may mitigate future natural gas price volatility and price spikes. In the United States, natural gas production and pipeline capacity have increased, and gas transportation and storage services have improved. These improvements should enable natural gas suppliers to respond more quickly to nationwide demand.

At the state level, regulators are allowing gas utilities to use futures contracts for natural gas, which the New York Mercantile Exchange had introduced in 1990. For example, in November 1997, the New Mexico Public Utilities Commission allowed their use by PNM. To mitigate price volatility and price spikes, PNM has also (1) made greater use of fixed-priced contracts to purchase natural gas, thereby guaranteeing the prices it will later pay for that gas; (2) offered its customers a billing option to pay the same amount each month; (3) offered those customers that are residents or small businesses a choice of buying gas from a supplier other than PNM; and (4) shortened billing cycles to no more than 32 days. While these actions can help stabilize prices, they can, however, also lead to higher prices to the extent they increase the costs of supplying or purchasing natural gas.

To prepare the information in this report, we reviewed natural gas studies and data from DOE, industry organizations, the Commodities Futures Trading Commission (CFTC), the New York Mercantile Exchange (NYMEX), the New Mexico Public Utilities Commission, and PNM. In addition, we interviewed officials from DOE, CFTC, and NYMEX; natural gas industry representatives and experts in the Washington, D.C., area; as well as state officials and industry participants and experts in New Mexico.

We provided DOE with a draft of the contents of this report and received comments from the Director and staff of the Energy Information Administration's Natural Gas Division. They concurred with our findings. We performed our review from December 1997 through February 1998 in accordance with generally accepted government auditing standards.

If you have any questions or need additional information, please call me at (202) 512-3841. Major contributors to this report include Charles W. Bausell, Jr., Timothy L. Minelli, and Philip Farah.

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Enclosure

ENCLOSURE I

GAO Resources, Community, and Economic Development Division

NATURAL GAS PRICES DURING THE WINTER OF 1996-97

GAO Objectives

- For the United States and New Mexico
  - Have natural gas prices for small consumers become more volatile, particularly during the winter of 1996-97?
  - What factors contributed to natural gas price volatility and price spikes?
  - What can mitigate future natural gas price volatility and price spikes?

GAO Scope and Methodology

- Reviewed data from the Energy Information Administration (EIA), the Public Service Company of New Mexico Gas Services (PNM), the New York Mercantile Exchange (NYMEX), and the Commodities Futures Trading Commission.
- Interviewed industry and government officials and experts in the Washington, D.C., area; New Mexico; and New York.

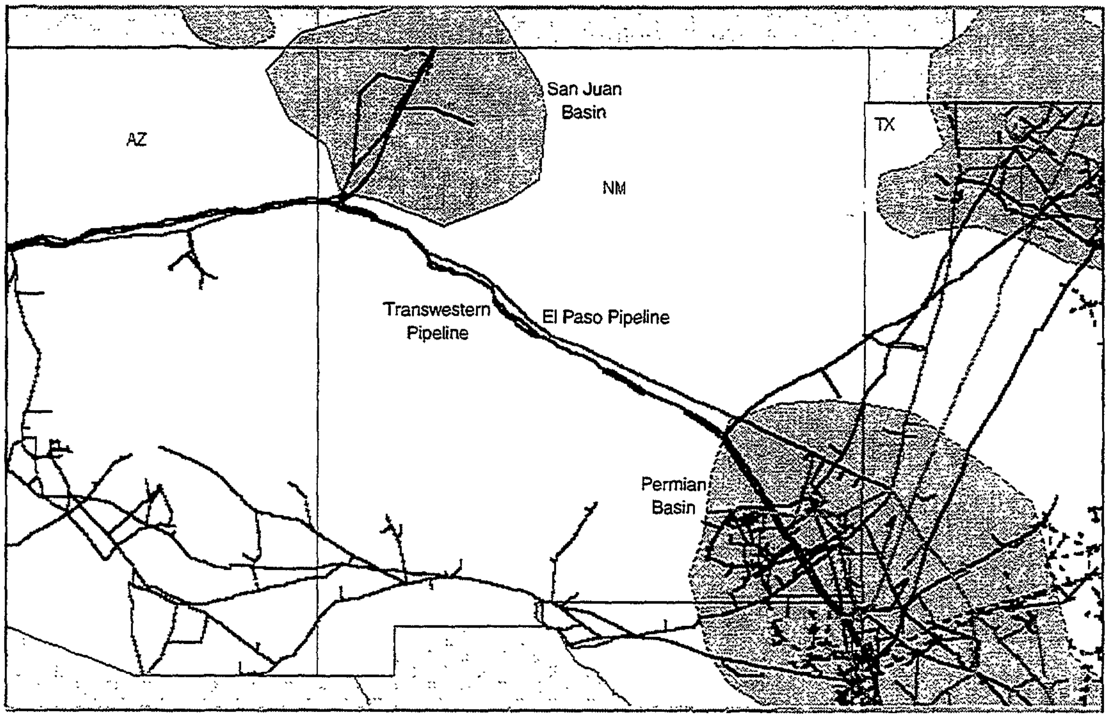
GAO Background

- The 1978 Natural Gas Policy Act began deregulation of the natural gas industry.
- Natural gas futures contracts, designed to help manage the risk of price uncertainty, were introduced by NYMEX in 1990.
- The price terms in many natural gas supply contracts are now indexed to futures and spot market prices.

GAO Background

- Gas demand is seasonal. About 60% of residential gas use occurs in the winter.
- In 1996, N.M. accounted for about 8% of national gas production.
  - The state has two gas-producing areas, the San Juan and the Permian Basins.
  - PNM Gas Services is the state's largest gas utility, serving over 400,000 customers.

GAO New Mexico San Juan and Permian Basins



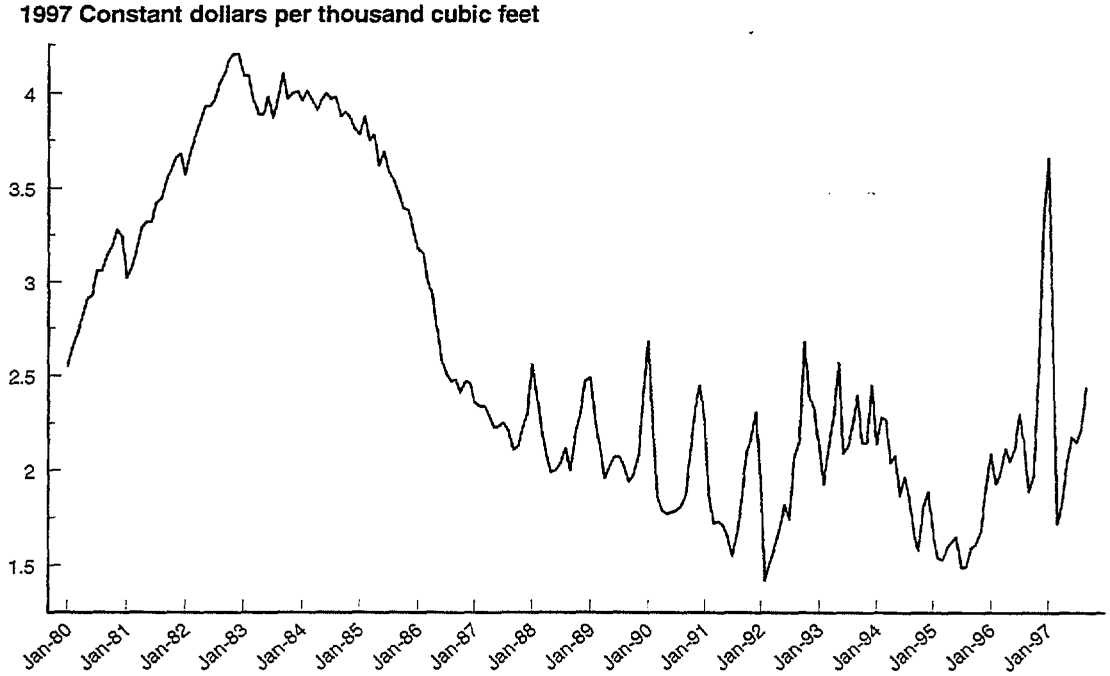
Source: EIA.

GAO Gas Price Volatility

- Since deregulation, natural gas prices have fallen and become more volatile.
- Daily spot prices for the Henry Hub during the 1995-96 winter were much more volatile than the 1996-97 winter; NYMEX prices were less volatile than spot prices during both winter seasons.
- Also, monthly delivered prices to U.S. residents during the 1996-97 winter were less volatile than 1995-96. In N.M. the opposite occurred.

Note:
- The Henry Hub is a gas transfer point and service center in Louisiana. It is the largest gas market center in the U.S.

GAO U.S. Average Gas Wellhead Prices, Jan. 1980 to Aug. 1997



Note: Wellhead prices are at the point of production, before gas is moved to other locations.
Source: Adapted by GAO from data provided by EIA.

GAO Volatility Measurements for Natural Gas Prices at the Henry Hub

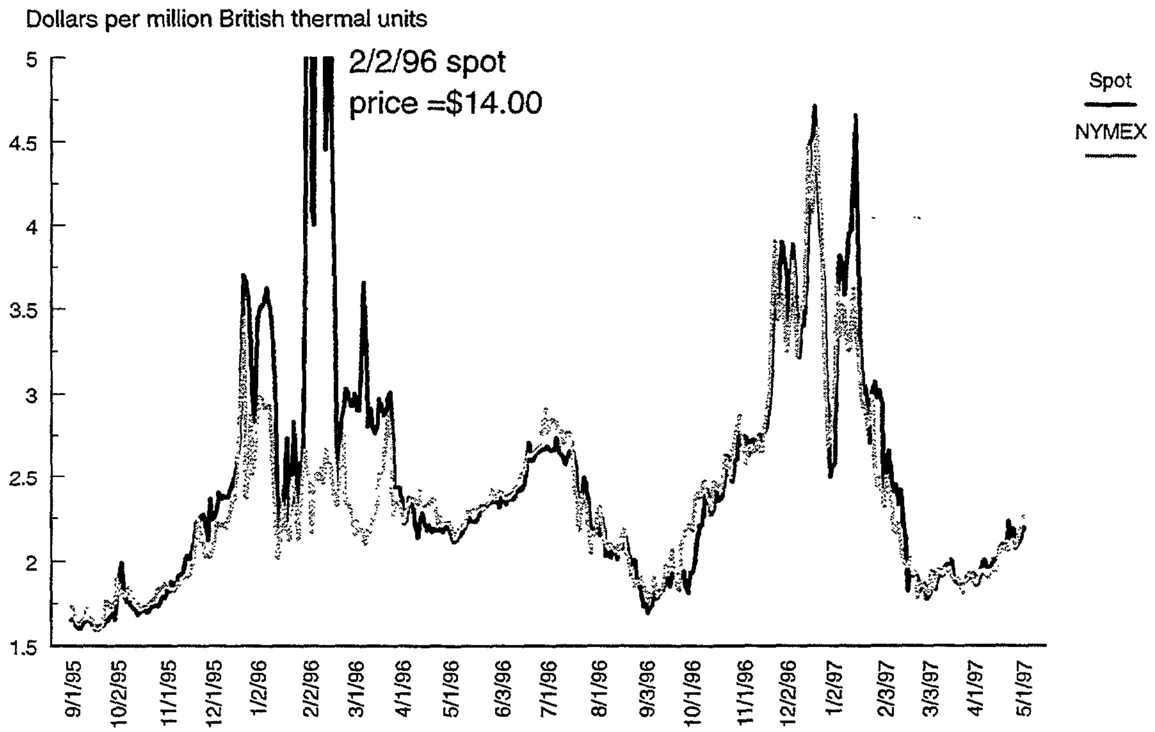
Price	1995-96	1996-97
NYMEX	19%	20%
Spot Market	56%	24%

Notes:

- Spot and NYMEX prices are for the Henry Hub.
- Volatility is a measure in percentage terms of how far a daily price can deviate from the average price.
- NYMEX prices are for late Sept. through late Jan. and are front-month settlement prices covering Nov. through Feb. contracts.
- Spot prices are for Nov. through Feb.

Sources: Adapted by GAO from data provided by EIA and NYMEX.

GAO Henry Hub Gas Prices: Spot vs. Futures, Sept. 1995 to May 1997

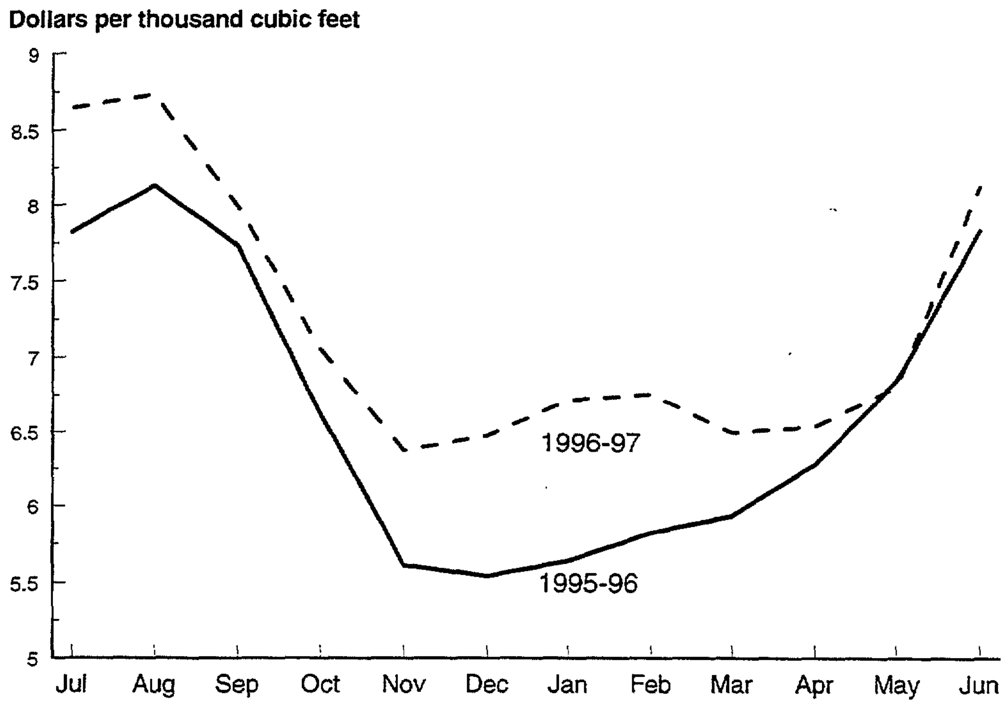


Note: Futures prices are NYMEX front-month settlement prices.
Sources: Adapted by GAO from data provided by EIA and NYMEX.

GAO Gas Prices Were Higher During the 1996-97 Winter

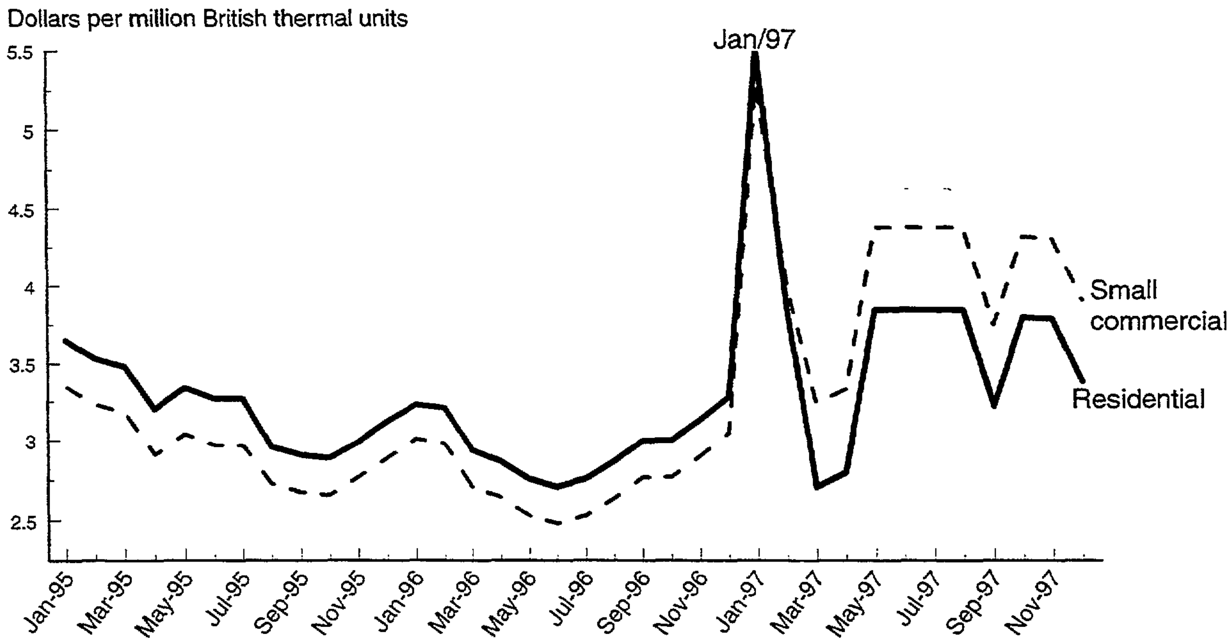
- Monthly U.S. residential prices for Nov. 1996 through Mar. 1997, averaging 66 cents a therm (100,000 British thermal units), were 10 to 19 percent higher than 1995-96.
- In N.M., residential prices rose to 55 cents a therm in Jan. 1997, a 68% increase from Dec. 1996.
- N.M. residents saw a larger percentage increase in their average gas prices during the 1996-97 winter than residents of many other states; however, N.M. residential rates were still lower than the national average.

GAO U.S. Average Residential Gas Prices, 1995-97



Source: Adapted by GAO from data provided by EIA.

GAO PNM Delivered Gas Prices for Residential and Small Commercial Customers, 1995-97



Source: Adapted by GAO from data provided by the Public Service of New Mexico Gas Services.

GAO Prices Were Higher in New Mexico

- The bigger percentage increase in N.M. was due partly to the cost of gas being a larger fraction of the delivered gas price there than in other states, which are farther from production. N.M. residents pay relatively low transportation costs for delivered gas.
- N.M. residents typically pay lower prices than elsewhere because of their proximity to gas-producing basins.

GAO Factors Causing Gas Price Volatility and Spikes During the 1996-97 Winter

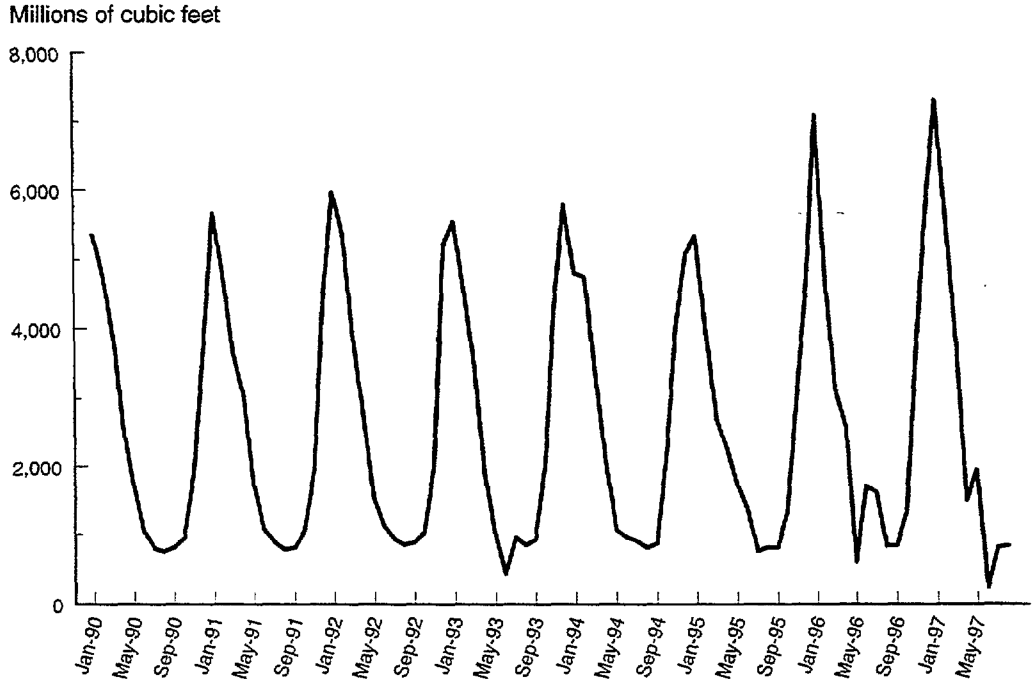
- Weather and capacity constraints
- Limited gas in storage
- A changing regulatory and business environment
- For N.M., greater pipeline capacity led to more out-of-state access and demand for N.M. natural gas
- Other issues

GAO Weather and Capacity Constraints

- Nationwide, Oct. and Nov. 1996 were 6% and 18% colder than normal. In N.M., a colder winter led to a 16% higher residential gas demand than in 1995-96.
- Also, variable weather can lead to substantial and hard-to-predict swings in gas demand and, thus, prices.
- Also, in unseasonable weather, storage and transportation constraints make it hard to increase gas supplies quickly.

ENCLOSURE I

GAO N.M. Residential Consumption of Gas, Jan. 1990 to July 1997



Source: Adapted by GAO from data provided by EIA.

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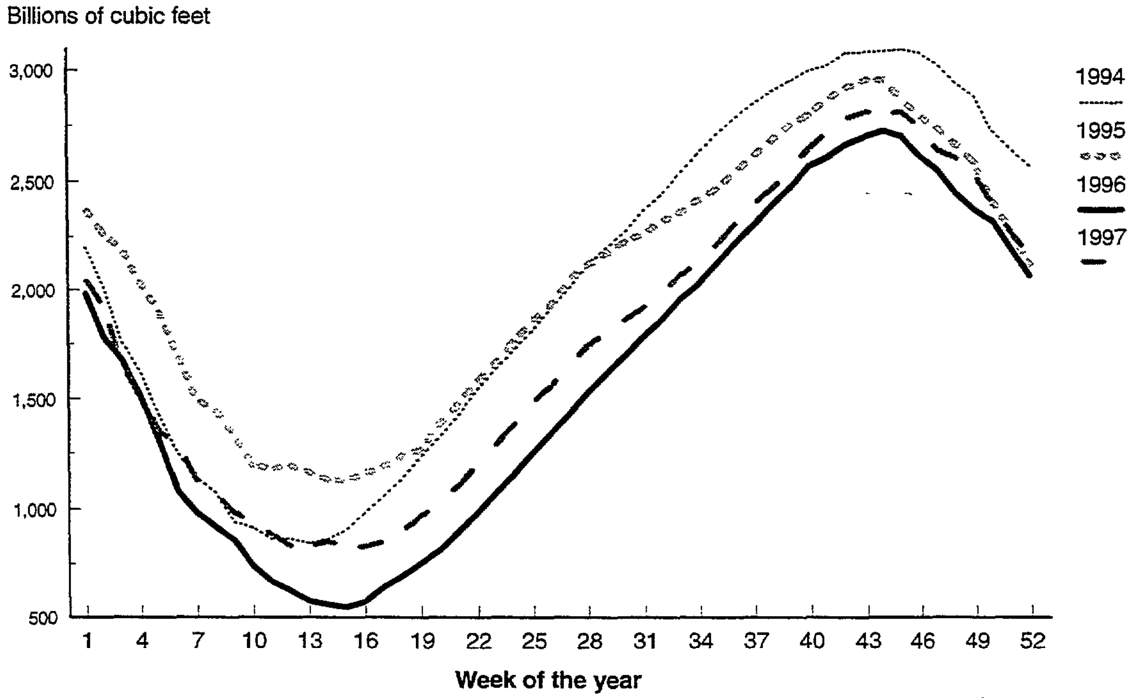
Gas in Storage Was Low at the Beginning of the 1996-97 Winter

- U.S. gas inventories were low after a cold 1995-96 winter and not fully replenished before the 1996-97 winter.
- As a result, gas managers, cautious about drawing down inventories early in the winter, purchased more spot market gas, driving up the spot price.
- In N.M., PNM had very little storage capacity because it is near natural gas supplies.

GAO U.S. Gas Storage, 1994-1997



Source: Adapted by GAO from data provided by the American Gas Association.

ENCLOSURE I

GAO Changing Regulatory and Business Environment

- Buyers began using indexed contracts as they saw prices fall with deregulation. For example, PNM bought 92% of its gas using indexed contracts last winter.
- However, when spot and futures prices rise, these contract prices also rise.
- As the industry has moved to just-in-time inventories to lower storage costs and the delivered price, the amount of gas that can be quickly delivered has fallen.

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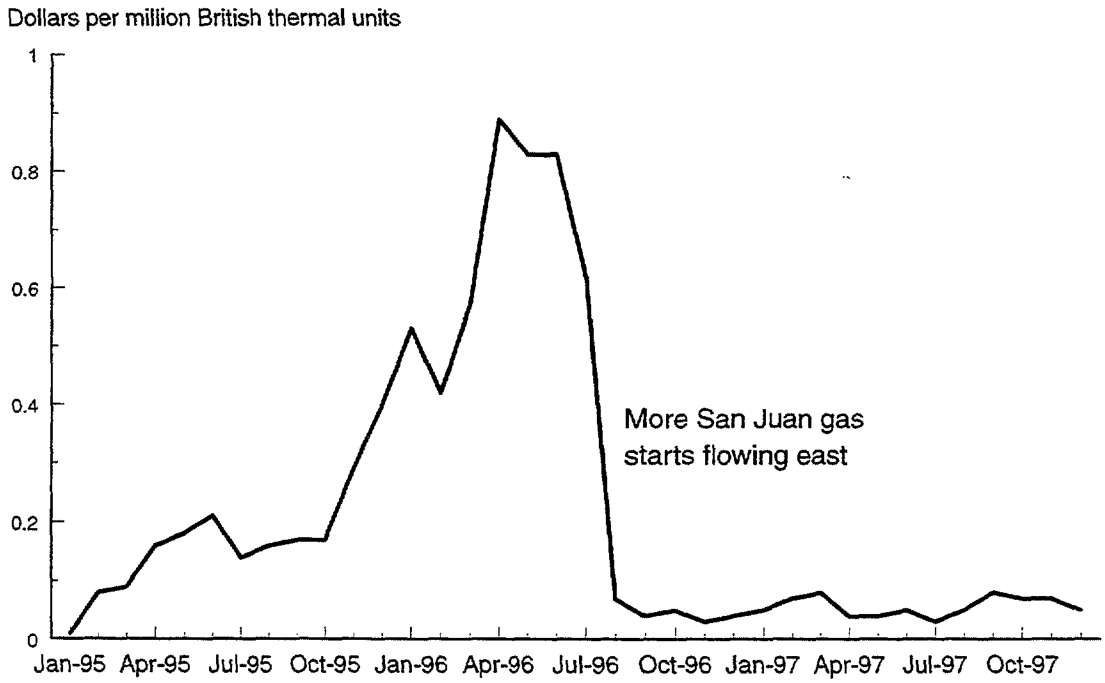
Increased Out-of-State Access and Demand for New Mexico Natural Gas

- Expanding pipeline capacity in 1996 allowed more San Juan gas to move east, resulting in higher prices in N.M. that approached national averages.
- This price increase caused a decline in the price gap between Permian (which historically had served markets east of N.M.) and San Juan Basin gas.
- Before expansion, N.M. gas prices were below U.S. averages.

GAO Price Difference Between Permian and San Juan Basin Gas, Jan. 1995 to Dec. 1997



Source: Adapted by GAO from data provided in *Inside FERC's Gas Market Report.*

GAO Other Issues: NYMEX Futures Trading and Market Concentration

- Gas futures trading was not dominated by a few traders.
- At NYMEX, the number of outstanding natural gas contracts held by the top four gas traders varied from 13% to 33% between Sept. 1996 and Apr. 1997.

GAO Actions to Mitigate Natural Gas Price Volatility and Price Spikes

- For the U.S., natural gas production and pipeline capacity have increased and gas transportation and storage services have improved.
- Also, there is more regulatory flexibility.
- Finally, other actions have been taken by N.M. regulators and service providers to mitigate natural gas price volatility and price spikes in that state.

GAO Increased Capacity and Services

- New gas production is slated for the Gulf of Mexico, and 16 pipeline projects have been proposed to increase imports from Canada by 78% by the year 2000.
- Since 1994, at least 27 market centers began operation, enhancing such services as transportation and storage.
- Greater use of "high deliverability" storage (salt caverns) has increased storage capacity and availability.

GAO Regulatory Flexibility

- State regulators are allowing gas utilities to manage against price risk by using futures and options contracts. For example, in Nov. 1997, the New Mexico Public Utilities Commission (NMPUC) allowed their use.
- To foster price competition, the NMPUC approved giving residents and small businesses the choice of buying gas from a marketer other than PNM.

GAO Other Actions to Mitigate Price Volatility and Price Spikes in N.M.

- PNM increased fixed-priced purchase contracts from 8% to 28% in 1997.
- NMPUC is reviewing PNM's request to offer residents a fixed-price contract.
- PNM offers a billing option for customers to pay the same amount each month.
- NMPUC increased PNM's monthly fixed service charge while decreasing the variable cost of service, thus reducing the variability of customer bills.

GAO Other Actions

- Since some customers were charged for 42 days in their Dec. 1996 gas bill (when gas prices spiked), NMPUC directed PNM to shorten billing cycles to no more than 32 days.
- PNM is reducing the monthly change in prices by recovering gas cost changes over several months rather than having the full effect occur in one month.

GAO Observations

- Various ways exist for suppliers, local distribution companies, small businesses, and residential customers to manage price risk.
- Attempts to reduce price volatility to residential customers caused by underlying demand and supply factors could result in higher, albeit more stable, prices.

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