

Natural Gas Winter Outlook 2000-2001

By James M. Todaro

This article is based on the Winter Fuels Outlook published in the 4th Quarter *Short-Term Energy Outlook* and discusses the supply and demand outlook from October 2000 through March 2001. For a more complete picture of the situation facing other heating fuels (heating oil and propane), see *Short-Term Energy Outlook* (October 2000, pages 1-16).

This winter is expected to bring significantly higher natural gas prices than those seen during the previous winter season. The main reasons for this projected outcome are: an expected increase in space heating demand compared to last winter (the warmest on record), a below average natural gas stock level, and prices at the wellhead and on the spot market in October that are close to double those of last year. In addition, compared to last year the NYMEX futures contracts for November and December delivery were trading at prices that were more than 60 percent higher in mid-October (see Figure HI5, page 5). Coupled with the prospect of a more normal winter season bringing colder temperatures than last winter, consumers are

likely to incur higher natural gas heating bills this winter compared to their bills in the previous heating season. Nonetheless, supplies of natural gas are expected to be adequate to meet winter demand.

Primarily because of the strong likelihood of higher natural gas prices this winter, expenditures by residential consumers for heating (or other energy uses) this winter are likely to be relatively large, especially in comparison to costs seen in the previous three winters. Table SR1 below assumes the return of normal weather and illustrates the impact of these higher natural gas costs on winter heating bills for a typical household in the Midwest.

Table SR1. Illustrative Midwest Consumer Prices and Expenditures per Household, for Natural Gas in a Normal Winter¹

	<u>1997-1998</u>	<u>1998-1998</u>	<u>1999-2000</u>	<u>2000-2001</u>
	Actual	Actual	Actual	Base Forecast
Natural Gas (Midwest)				
Consumption (mcf)	82.4	84.5	81.7	90.9
Average Price (\$/mcf)	6.56	6.27	6.61	8.58

¹ Normal degree-days, as defined for this analysis, are calculated by EIA on a month-to-month basis in such a way as to incorporate temperature trends identified through research done by the National Oceanographic and Atmospheric Administration.

Demand

A return to more normal winter weather will increase demand

Total natural gas demand is expected to move higher this winter, averaging 70.75 billion cubic feet (Bcf) per day, an increase of 5.5 percent compared to last year's daily average of 67.06 Bcf per day. Contributing to the growth in winter demand is the increase in gas space-heating customers (about 1 percent). Most of the increase is related to assumptions of a return to more normal weather patterns. Milder weather last winter resulted in gas-weighted heating degree-days that were almost 14 percent below normal nationally, while several Midwestern areas experienced weather as much as over 18 percent warmer than normal. As a result, winter consumption in residential and commercial markets is expected to average 21.2 and 12.2 Bcf per day, respectively, up about 11.1 percent and 8.5 percent from the previous winter's consumption (Figure SR1).

Supply

The level of natural gas in storage is below the 5-year average

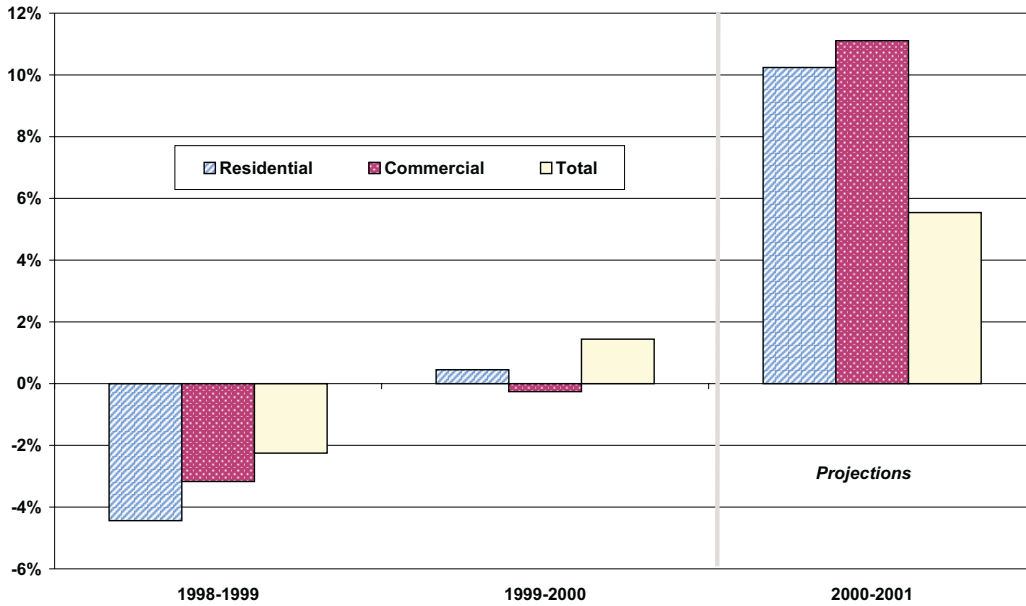
Domestic gas production is expected to average 51.84 Bcf per day during the heating season, up slightly from the 51.29 Bcf per day during the previous winter. Drilling activity for both oil and gas had dropped sharply in 1999 in reaction to the 1998 decline in the price of oil and natural gas. The monthly rig count in 1999 averaged 625 compared 943 in 1997. Rig counts have increased sharply in 2000 with rise in the price of crude oil and natural gas. By mid-October, the rig count had reached 1054, with 844, or 80 percent, of the rigs dedicated to natural gas exploration. The sharp drop in drilling last year and the lead time needed to bring properties to production has been a concern of many in the industry this past spring and summer.

Working gas storage at the beginning of the heating-season (November 1) is estimated to have reached 2,760 Bcf, about 7.5 percent below EIA's 5-year average of 2,985 bcf (Figure SR). Storage plays a critical role in meeting increased seasonal demand. The regional distribution associated with this estimated volume is East Consuming at 1,760 Bcf, Producing at 680, and West Consuming at 320 Bcf. The East Consuming region, which is most dependent on storage inventories during the heating season, is currently estimated to have 96 percent its active storage capacity already full. The Consuming West region, which contains only 15 percent of all active capacity compared to East's 56 percent, is 63 percent full. Comparing these current estimates with the previous 5-year average (1995-99) for the end of September, reveals that the East region is 112 Bcf or 6.5 percent below while the West is 57 Bcf or 16 percent below the earlier average. The producing region is estimated to be 88 percent (75 Bcf) below the 5-year average, storage activity in this region is oriented more to production operations, and this inventory does not serve as a prime gas source to satisfy peak load demand during the heating season.

During this heating season, net withdrawals are expected to average 9.07 Bcf per day. Due to lower level of working gas on hand at the beginning of this heating season, end-of-season stocks of working gas are projected to be 888 Bcf, which is substantially more than the record low of 758 Bcf of working gas that remained at the end of March 1996.

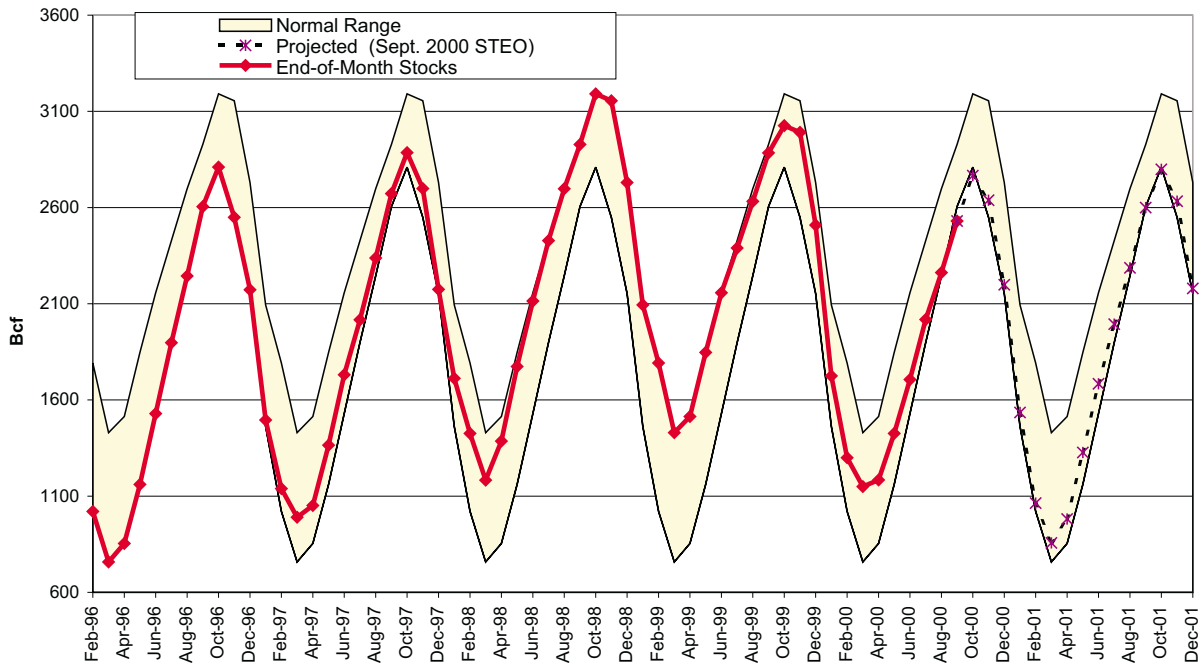
Natural gas imports are expected to average 10.51 Bcf per day, 14 percent of demand, compared to last year's 9.57 Bcf per day or 12 percent of demand. During the winter months, net imports are about 10 percent higher than flows during the rest of the year and usually increase to full pipeline capacity. That capacity, is scheduled to increase at the end of 2000 when the Alliance Pipeline will begin carrying gas from western Canada to the Midwest. However, this pipeline is not currently expected to reach its full capacity of 1.3 Bcf per day until later in the heating season.

Figure SR1. Change in Winter Natural Gas Demand



Source: Energy Information Administration Natural Gas Monthly (September 2000), and the Short-Term Energy Outlook (October 2000).

Figure SR2. End-of-Month Working Gas in Underground Storage



Source: History: EIA; Projections: Short-Term Energy Outlook, October 2000.

Price

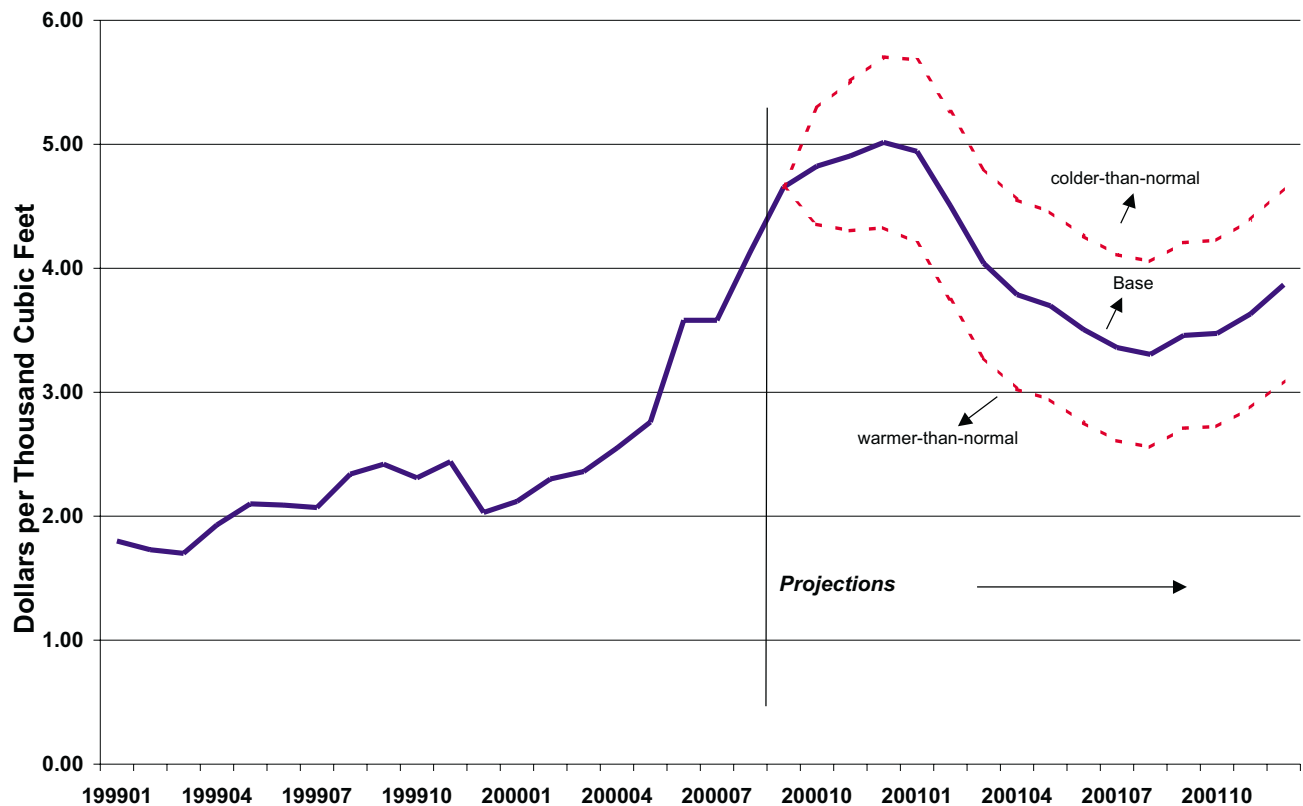
Much higher wellhead prices and normal weather will see residential expenditures rise

Natural gas wellhead prices are projected to rise sharply to an average of \$4.48 per million cubic feet (Mcf) this winter, almost double the \$2.26 per Mcf average price recorded during the 1999-2000 heating season (Figure SR 3). Several factors account for this sharp increase, including: below average stock levels resulting from lagging domestic production in the face of increasing demand from the strong U.S. economy (despite increases in rig counts), increases in summer power-generation demand, which has constrained the inventory build during the refill season, the influence of the rise in crude oil prices on fuel switching and, hence, prices; and inventories of other winter fuels (heating oil in the Northeast and propane in the Midwest) also being below average. It should be noted

that mild winter weather as well as higher inventories depressed wellhead prices during most of last year's heating season.

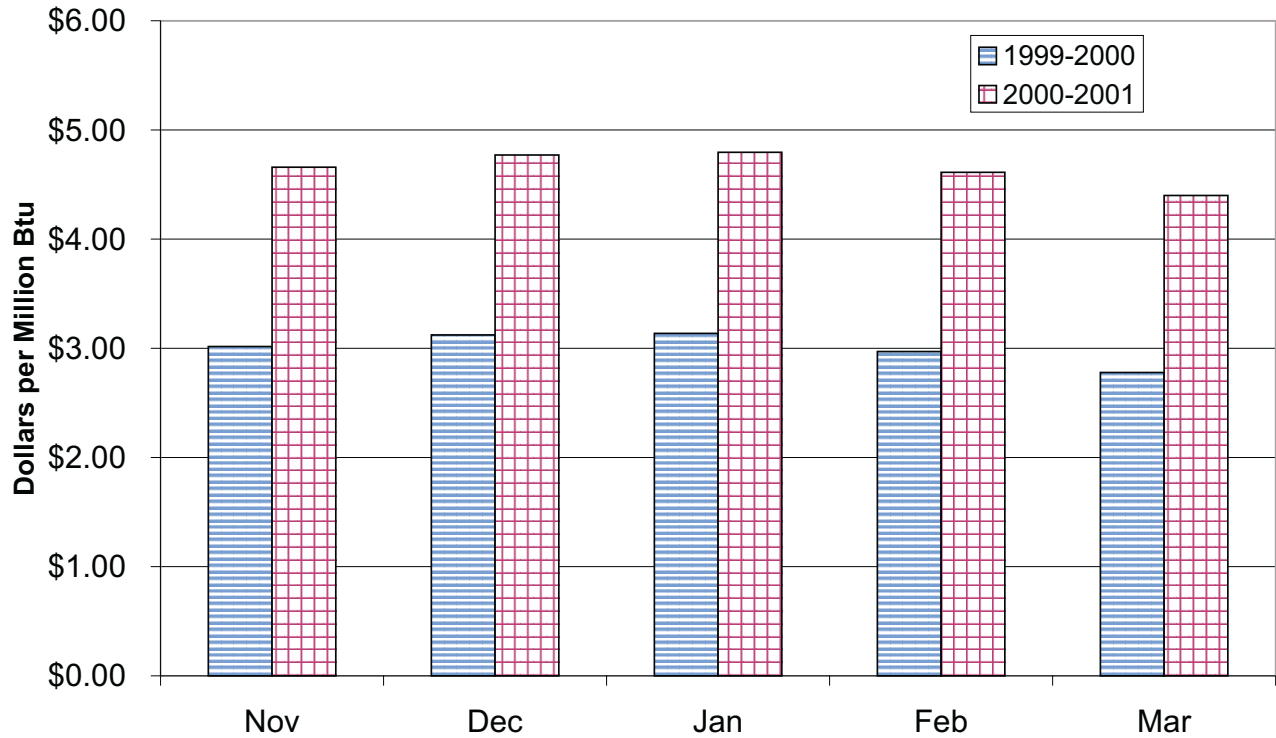
In mid-October of this year, natural gas prices on the NYMEX futures market for the upcoming winter season were trading at prices that were at least 60 percent above those of last year although prices recently have returned to less than \$5.00 per MMBtu (Figure SR4). Prices paid by residential consumers are expected to move up sharply, averaging \$8.58 per Mcf in the Midwest, up 30 percent from last winter's average of \$6.61 (Table SR1). This would be the largest percentage increase of major space-heating fuels to the residential sector and 34 percent above the previous 5-year average of \$6.40 per Mcf. Consumers could see slightly higher or lower prices during the winter, depending on whether abnormally cold or warm conditions develop.

Figure SR3. Natural Gas Wellhead Prices: Base Case and Weather Scenarios



Source: History: EIA; Projections: Short-Term Energy Outlook, October 2000.

Figure SR4. Natural Gas Futures Prices for Winter Months 1999-2000 and 2000-2001, on October 25, 1999 and 2000



Source: Futures Prices Commodity Futures Trading Commission, Division of Economic Analysis, 1999 and 2000.

Conclusion

The actual outcome regarding the demand, supply, and price of natural gas for this winter will depend very much on the weather. Natural gas commodity or wellhead prices, particularly spot and futures prices, can show high volatility on a daily basis and are very sensitive to shifts in working gas in storage, which is

critical for meeting winter demand peaks. For residential gas customers, increases in wellhead costs are usually passed on with a time lag that can significantly reduce the volatility seen in the commodity market because of monthly billing cycles and various state regulatory functions. Although the higher costs are recovered from residential users, the typical residential gas bill shows less severe price spikes compared to those of other fuel users.