Withdrawals from Working Natural Gas Stocks During Summer 2006

Weekly working natural gas stocks posted net declines of 7 and 12 billion cubic feet (Bcf) during the weeks ending July 21, 2006, and August 4, 2006. Working natural gas stocks tend to increase during the non-heating, or refill, season months (April-October), with weekly net injections averaging between 60 and roughly 100 Bcf from late April to mid-October (Figure 1). These withdrawals marked the first two times that working natural gas stocks experienced a weekly net decline during the months of May through September. Historically, the absence of net withdrawals in the Lower-48 States has also persisted through October. In fact, only once in the 12-year history covered in the Energy Information Administration (EIA) Weekly Natural Gas Storage Estimates Database has a weekly withdrawal been recorded in October, which was a 3-Bcf withdrawal on October 31, 1997.

A combination of electricity and fuel market developments accounts for the atypical working natural gas inventory behavior. Demand-side conditions include growing use of natural gas as a fuel for electricity generation, above-normal cooling demand for electricity, and increased fuel-switching to natural gas for the production of electricity. On the supply-side, working natural gas stocks are well above historical levels (Figure 2). These market factors were reflected in the backwardation[1] between the natural gas spot and near-month futures markets, as suppliers had economic incentives to break from the historical refill pattern and withdraw natural gas from storage.

Natural Gas Demand for Electricity Generation Increased in 2006.

According to EIA's *Monthly Flash Estimates of Electric Power Data*, natural-gas-fired generation increased by 11.5 percent from June 2005 to June 2006 and was up 4.9 percent from January through June 2006 compared with the same period in 2005. This suggests an overall pattern of rising natural gas consumption for electricity generation in 2006.

Exceptionally warmer-than-normal temperatures prevailed during the second to last week of July and the first week of August. According to the National Climatic Data Center, cooling degree-days were 36 and 42 percent above normal on average in the Lower-48 States during the weeks ended July 20 and August 3, respectively (Figure 3). During the week ended July 20, cooling degree-days were between 15 and 71 percent above normal in each of the Census Divisions contributing to high natural gas demand for electricity generation (Figure 4). Similarly, during the week ended August 3, cooling degree-days ranged between 13 and 105 percent above normal in each of the Census Divisions.

These warmer-than-normal temperatures likely contributed to increased demand for natural gas for air conditioning. According to the Edison Electric Institute, electricity consumption reached record highs during the week ended July 22, at 96,314

[1] Backwardation is a condition during which the spot price of a commodity exceeds the price of the futures contract for the commodity.

gigawatthours (GWh), which was surpassed during the week ended August 5 with 98,583 GWh of electricity (Table 1).

Another factor that likely contributed to increased natural gas demand for electricity generation at the margin was fuel-switching resulting from high global oil prices. Natural gas and petroleum liquids are largely used to meet peak demands for electricity generation. Petroleum-liquid-fired generation declined 52.7 percent this year (January through June 2006) compared with 2005, and dropped by 53.7 percent from June 2005 to June 2006.

Natural Gas Storage Factors Contributing to the Net Withdrawals

Heading into the 2006 refill season beginning in April working natural gas inventories were nearly 63 percent above the 5-year average. At 1,695 Bcf as of March 31, 2006, natural gas stocks were only 43 Bcf below the 5-year average level for June 9 of 1,738 Bcf. This meant that natural gas storage operators as of March 31, 2006, were roughly 10 weeks ahead of schedule in refilling their working natural gas inventories. This surplus with respect to the historical path of working natural gas inventories afforded increased flexibility in refilling their inventories.

Working natural gas stocks in excess of the 5-year average peaked on May 12, 2006, at 722 Bcf (Figure 5). Although the differential gradually declined, reaching 562 Bcf or 26 percent above the 5-year average as of July 14, 2006 (Figure 6), stocks were 323 Bcf, or 13 percent, above the highest level recorded for the report week in the 12-year history of the Weekly Natural Gas Storage Report Historical Database. Following the second week of record electricity consumption and net withdrawals from storage, the differential in working natural gas over the 5-year average still remained 374 Bcf as of August 4.

The majority of working natural gas inventory withdrawals observed during late July and early August 2006 occurred in the Producing Region[2] (Table 2). Working natural gas stocks in the Producing Region were 870 Bcf as of July 14, 2006, which is close to the 5-year average of 882 Bcf for the region at the start of the heating season. Furthermore, the Producing Region has a significant concentration of salt-dome working natural gas storage, which can change rapidly from injecting working natural gas to withdrawing inventories. These storage operators and customers have much more operational flexibility in the delivery and schedule of storage additions and withdrawals than users of conventional storage fields such as aquifers or depleted fields. With high levels of natural gas in storage and considerable operational flexibility, these storage operators and customers would be able to withdraw working natural gas to meet current demand and refill their working gas stocks when demand eased.

[2] As defined in the *Weekly Natural Gas Storage Report*, the Producing Region includes Alabama, Arkansas, Kansas, Louisiana, Mississippi, New Mexico, Oklahoma, and Texas. See http://tonto.eia.doe.gov/oog/info/ngs/notes.html.

Natural Gas Market Conditions Were Reflected in the Backwardation of the Henry Hub Spot and Futures Prices

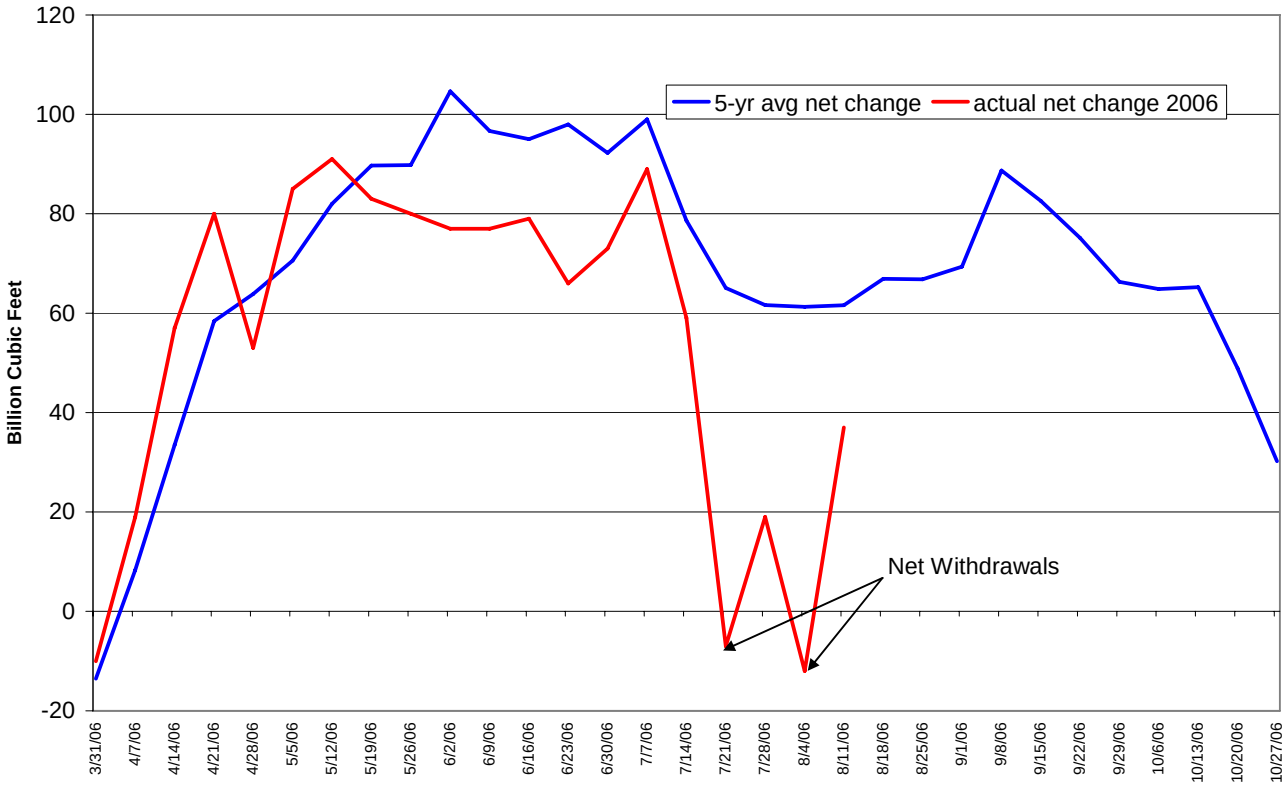
During the weeks ended July 20 and August 3, the Henry Hub spot price traded at a premium relative to the near-month futures contract, with the premium averaging 19 and 43 cents per million Btu each week, respectively. During each report week, the Henry Hub spot price traded at a premium relative to the near-month futures price in 4 out of 5 trading days (Figure 7). This likely reflected the expectation that spot prices were expected to fall after the heat wave subsided, giving natural gas suppliers an incentive to forego injecting natural gas into storage and possibly to withdraw natural gas from storage.

The decision to withdraw rather than to inject would be particularly attractive to natural gas storage users that utilized salt cavern storage fields such as those in the Producing Region. When the prevailing cash price reached higher levels, natural gas could be withdrawn quickly from this type of storage and sold. After the heat wave subsided and spot prices eased, the suppliers could resume injection practices and replace their withdrawn inventories.

Conclusion

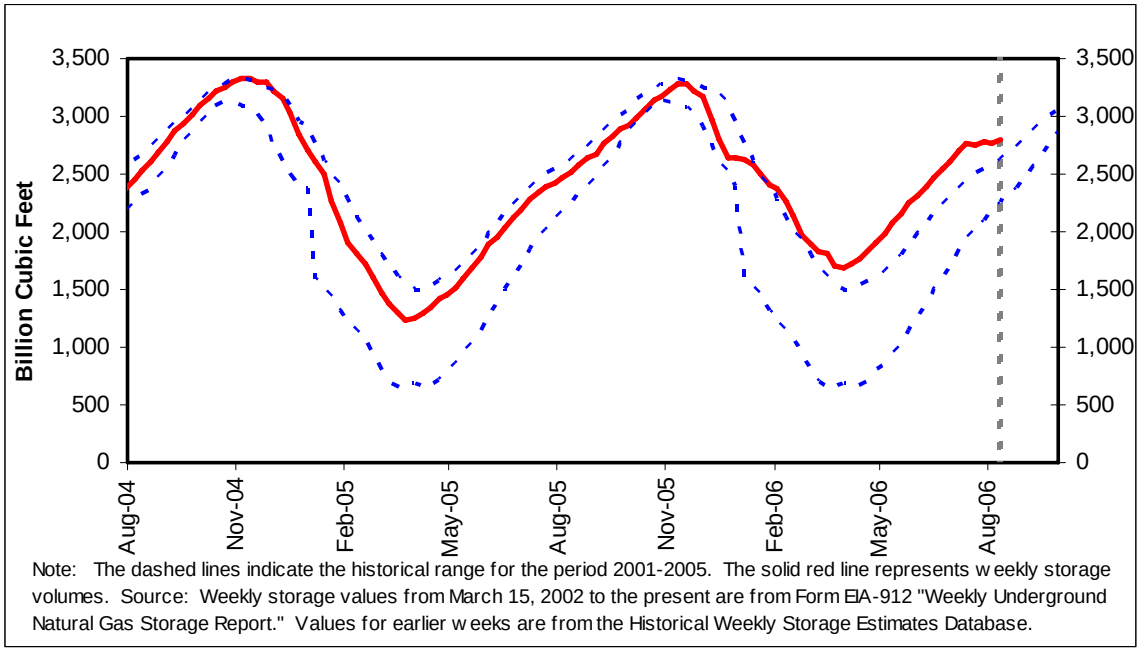
The overall trend toward increasing demand for natural gas for electricity generation was reinforced by fuel-switching and by the increase in overall electricity demand for natural gas resulting from the onset of the heat wave during the second week of July. The heat wave increased the consumption demand for natural gas and led to higher spot market natural gas prices, which reduced injection demand for natural gas and net injections into natural gas storage. With the extraordinarily high levels of working gas in storage, the marginal benefit of holding an additional unit of natural gas in storage was small. The increased temperature-driven demand, expected to be temporary, in combination with the high levels of working natural gas in storage, led to a net drawdown in working natural gas stocks. The Producing Region, which has many salt-dome working natural gas storage facilities and significant operational flexibility in conducting storage operations, was the focal point for the withdrawal activity. The market factors described above were reflected in the backwardation between the natural gas spot and near-month futures markets, as suppliers had economic incentives to break from the historical refill pattern and withdraw natural gas from storage.

Figure 1. Comparison of Weekly Natural Gas Net Storage Change (April-October 2006)



Source: Energy Information Administration

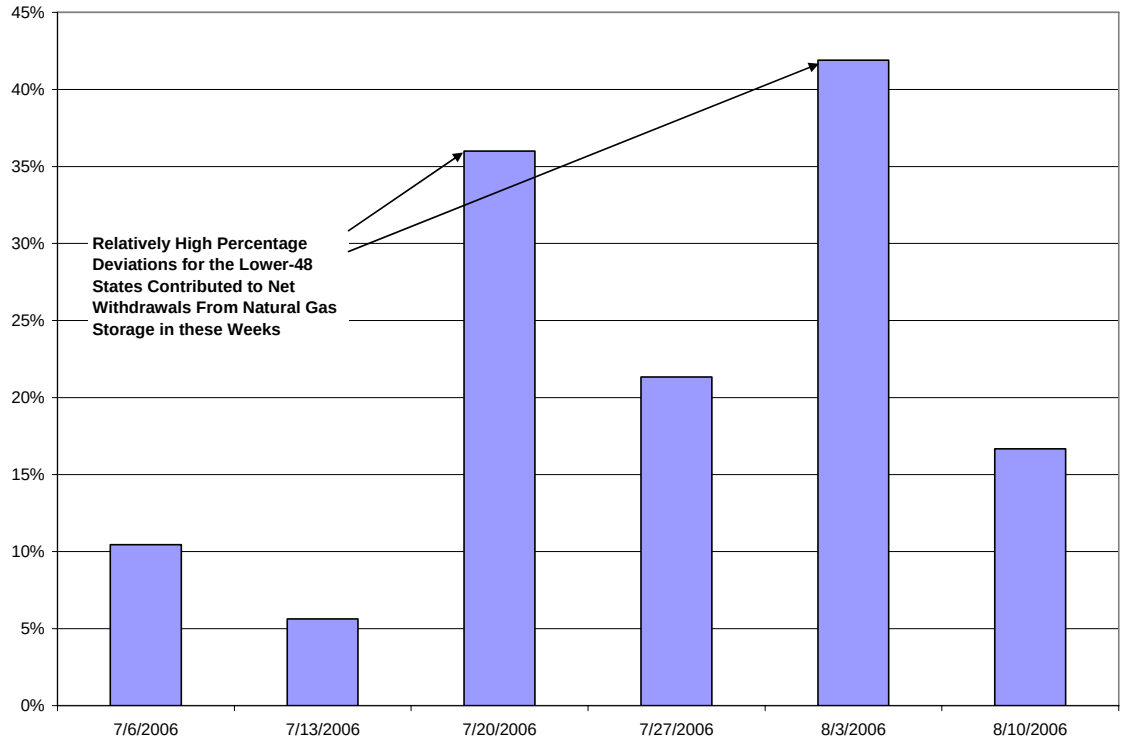
Figure 2. Working Natural Gas in Underground Storage Compared with the 5-Year Range



Note: The dashed lines indicate the historical range for the period 2001-2005. The solid red line represents weekly storage volumes. Source: Weekly storage values from March 15, 2002 to the present are from Form EIA-912 "Weekly Underground Natural Gas Storage Report." Values for earlier weeks are from the Historical Weekly Storage Estimates Database.

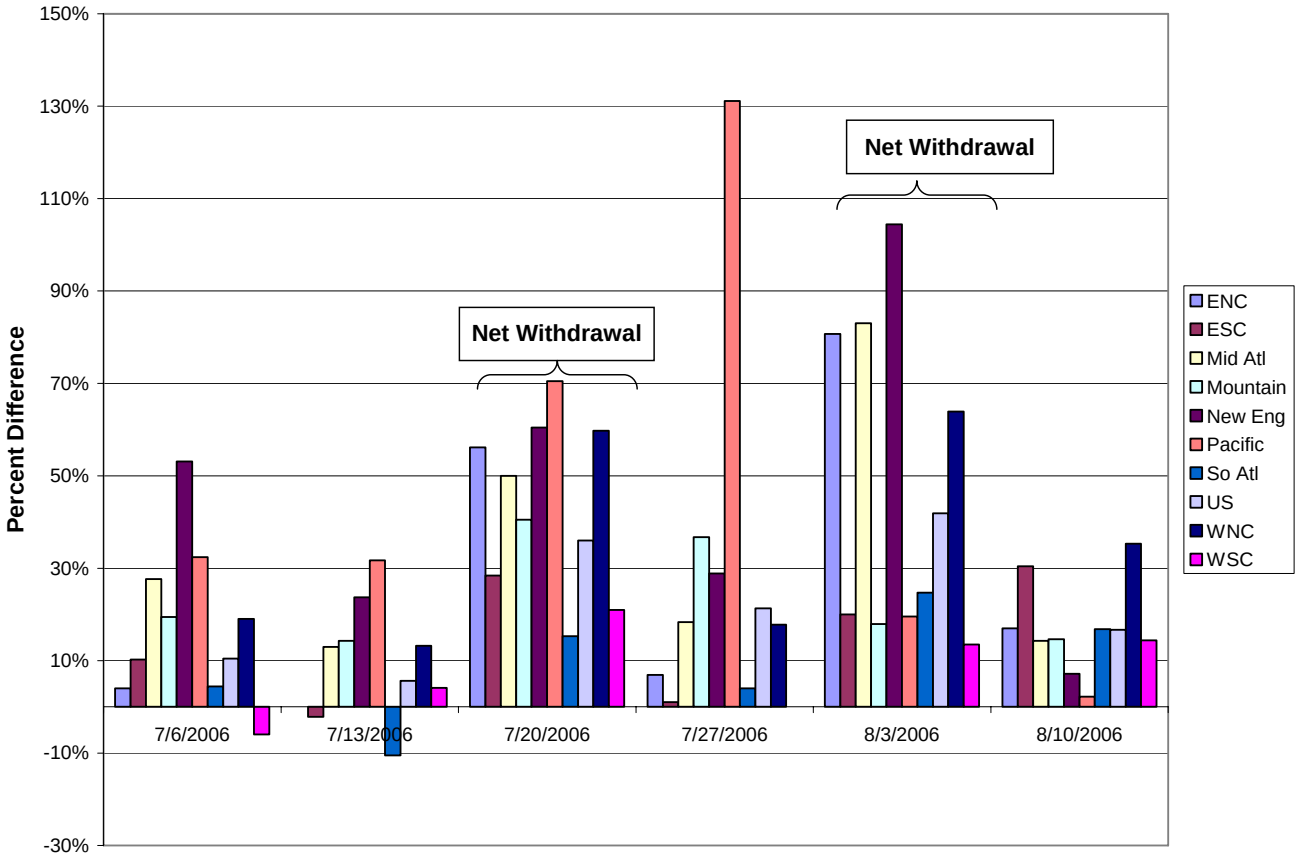
Source: Energy Information Administration

Figure 3. Cooling Degree-Days in the Lower-48 States: Percent Deviations From Normal (July 7 through August 10, 2006)



Source: National Climatic Data Center

Figure 4. Regional Cooling Degree-Days in the Lower-48 States: Percent Deviations From Normal (July 7 through August 10, 2006)



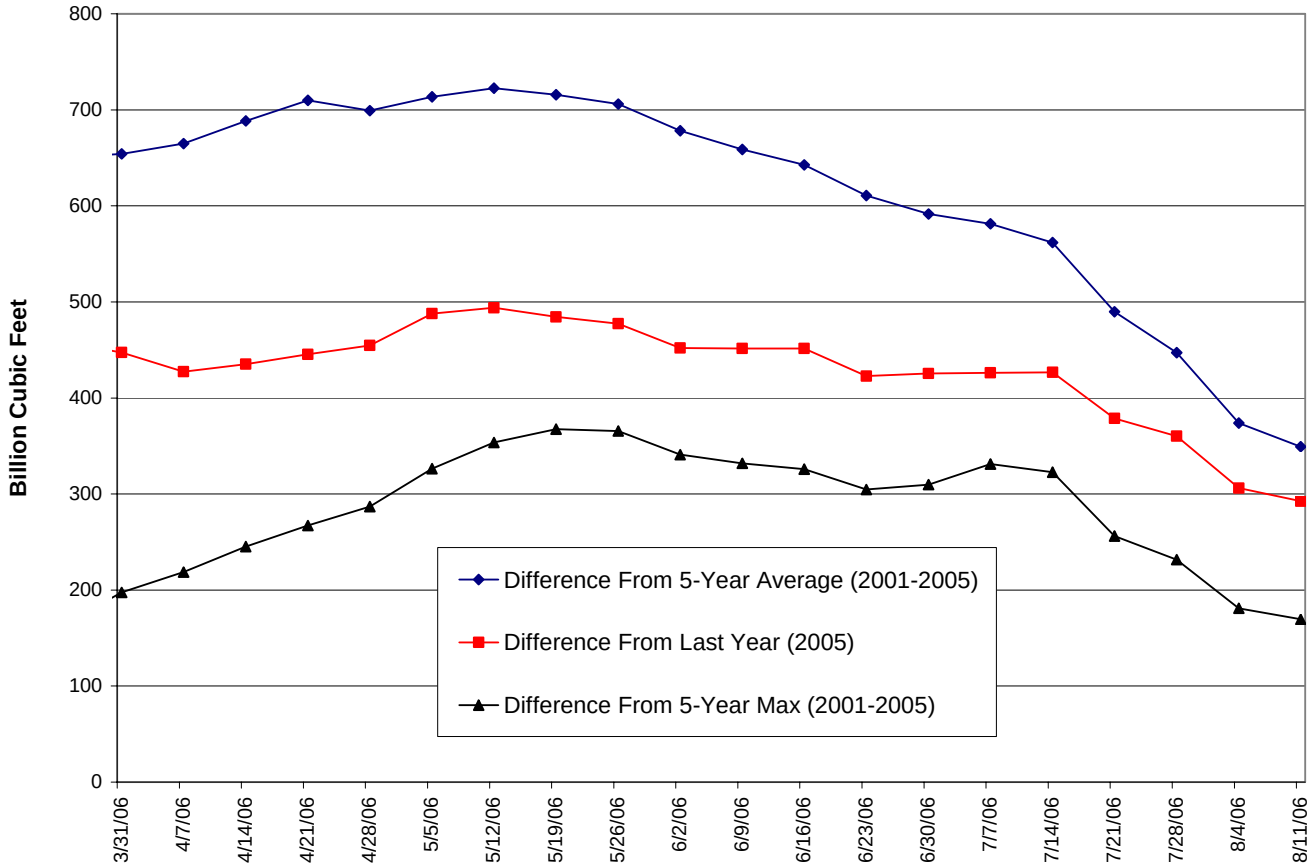
Source: National Climatic Data Center

Table 1. Weekly Electricity Output and 52-Week Cumulative Electric Output in Gigawatthours (July 22 through August 12, 2006)

Week Ended	2006	Week Ended	2005	Percent Increase (06/05)	52 Weeks Ended	2006	Percent Increase . (06/05)
Jul 22	96,314	Jul 23	95,259	1.1	Jul 22	4,012,236	3.0
Jul 29	93,102	Jul 30	92,697	0.4	Jul 29	4,012,641	2.7
Aug 05	98,583	Aug 06	93,022	6.0	Aug 05	4,018,202	2.6
Aug 12	92,651	Aug 13	92,933	-0.3	Aug 12	4,017,920	2.3

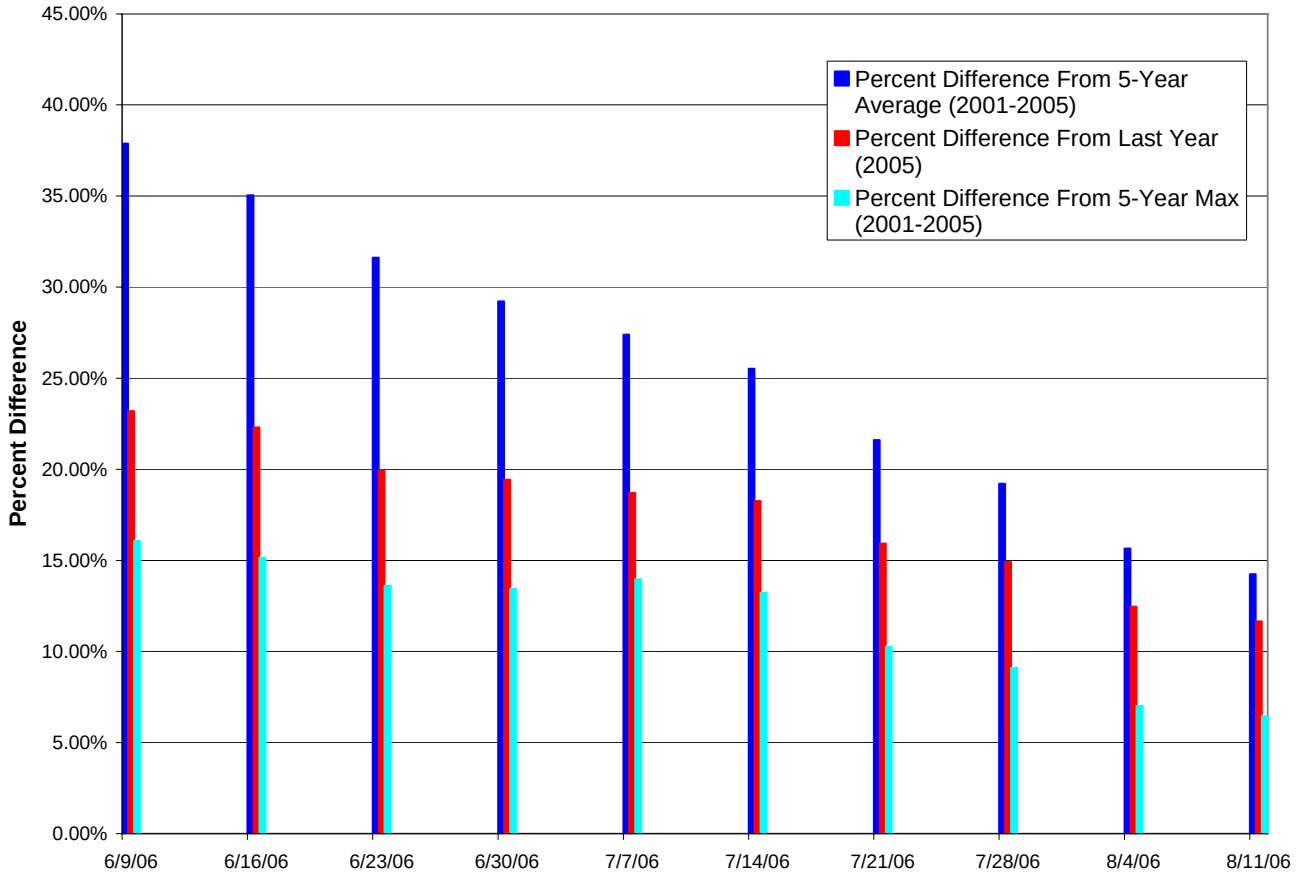
Source: Edison Electric Institute

Figure 5. Working Natural Gas Stocks: Absolute Differences from Historical Levels (June 9 through August 11, 2006)



Source: Energy Information Administration

Figure 6. Working Natural Gas Stocks: Percent Deviations from Historical Levels (June 9 through August 11, 2006)



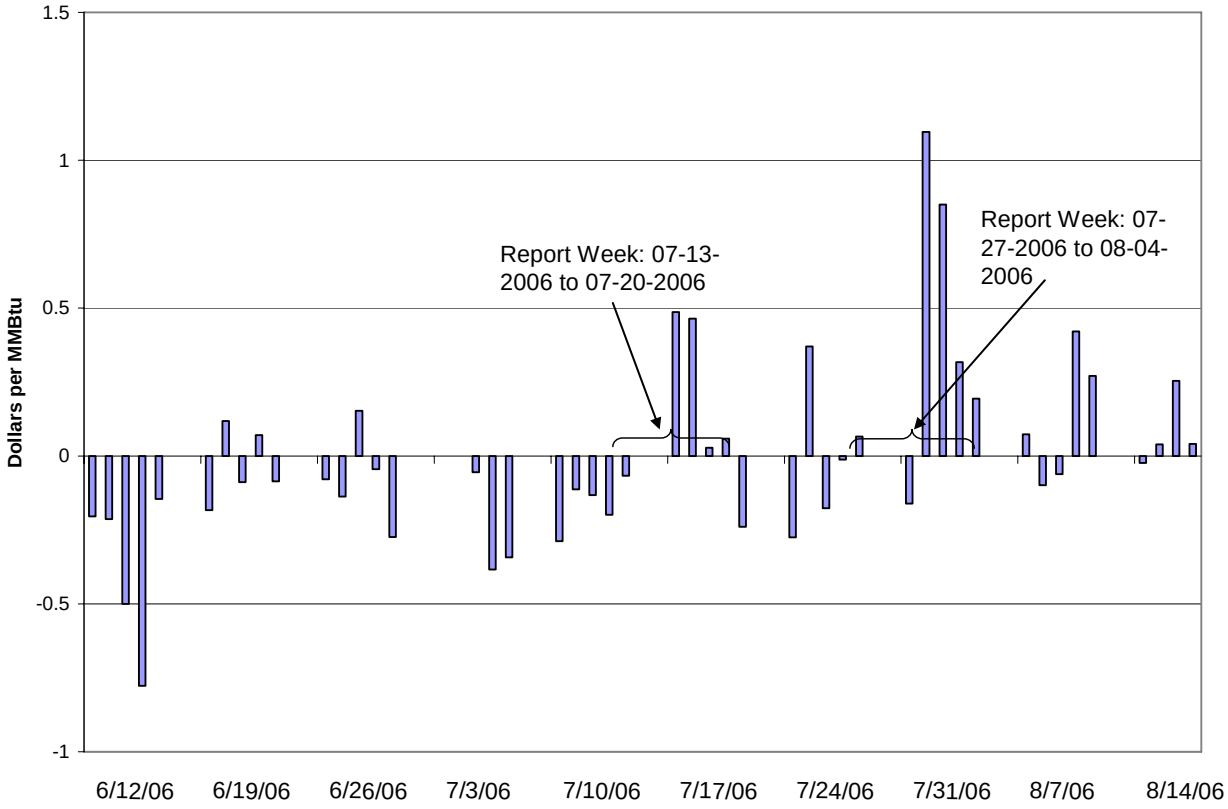
Source: Energy Information Administration

Table 2. Regional Net Changes in Working Natural Gas Storage (July 14-August 4)

Week ending	Consuming Region East	Consuming Region West	Producing Region	Total Lower 48
14-Jul-06	45	8	6	59
21-Jul-06	16	-3	-20	-7
28-Jul-06	30	-8	-3	19
04-Aug-06	-1	7	-18	-12

Source: Energy Information Administration
Notes: Regions are as defined in the *Weekly Natural Gas Storage Report*. For details, see http://tonto.eia.doe.gov/oog/info/ngs/notes.html.

Figure 7: Difference Between Near-Month NYMEX Henry Hub Spot Price and the Near-Month Futures Contract



Source: Energy Information Administration, derived from *NGI's Daily Gas Price Index*