

Winter Fuels Outlook: 2003-2004

Introduction

This report summarizes the winter outlook for demand, supply and prices for natural gas, heating oil, electricity and propane, with emphasis on residential space-heating demand. The outlook, which includes severe- and mild-weather cases, is consistent with the October 2003 Short-Term Energy Outlook. For the purposes of the analysis, the winter season is defined as the period from October through March.

Highlights

- *Net changes in residential heating prices and expenditures compared to last winter are: Prices: almost no change for heating oil and propane; plus 9 percent for natural gas; plus 3 percent for electricity. Expenditures: minus 8 percent for heating oil; plus 5 percent for natural gas; plus 2 percent for electricity; minus 3 percent for propane.*
- *For the season as a whole, and under baseline (normal-weather) assumptions, residential consumption of heating fuels is expected to be slightly lower than it was during the 2002-2003 winter season. This follows from the fact that weather was colder than normal during the previous heating season. Declines in winter fuel demand would be most likely in the Northeast region.*
- *Heating fuel inventory levels are currently on track to reach normal or near-normal levels by the end of October. This situation should help keep the risks of substantial cost increases that may result from colder-than-normal weather at more or less typical levels. U.S. oil and gas markets remain tight, however, as indicated by relatively high prices for crude oil and natural gas, low stocks of crude oil domestically and relatively low petroleum stocks throughout the industrialized countries. Working natural gas storage, which finished the last winter season at record lows, has managed to recover to about normal at the outset of this season. Distillate and propane inventories are within their normal ranges but, on a regional basis, some deficits relative to normal levels remain at this time.*
- *The risk of sharply higher fuel prices under a colder-than-normal winter scenario is substantial. If heating degree-days exceed normal by 10 percent, national average residential prices for heating fuels would be expected to exceed the normal weather case by approximately 6 percent for heating oil, 5 percent for natural gas, and 8 percent for propane. Household heating expenditures would exceed the normal case by 17 percent for heating oil, 16 percent for natural gas, and 19 percent for propane.*

Overview

Heating fuel markets are poised to start the 2003-2004 heating season with near-average inventory levels. As a result, the status of heating fuel inventories is not expected to add unusually to the normal risk of sharp price spikes during the season. However, tight oil and natural gas markets have generated relatively high levels of crude oil and petroleum product prices during much of this year and natural gas spot prices are expected to average about \$5 per thousand cubic feet for all of 2003,

about 70 percent above the 2002 average. Average wholesale and retail prices of heating oil and propane are projected to be close to those observed last winter. Continued increases in residential prices are expected for natural gas, reflecting tightness in supplies for much of 2003 and lagged cost recovery by gas distribution companies in consumer bills. Residential electricity prices, which are much less volatile than natural gas or heating oil prices, are expected to be up slightly this winter from year-ago averages.

Overall demand for heating fuels is expected to decline this winter, given the relatively cold weather conditions seen last winter. Nationally, heating degree-days are projected to be 3 percent lower compared to last winter if normal weather conditions prevail. The decline would be about 8 percent in the Northeast, the most important market for heating oil.

Both natural gas and propane markets are expected to be reasonably well supplied under most circumstances, due primarily to the adequate availability of primary inventories. Inventories of these fuels accommodate the bulk of additional fuel requirements that would result from colder-than-normal weather. End-of-September working gas storage is estimated to be 2.84 trillion cubic feet. Although 200 bcf lower than last year's record high, that level is near the middle of the historical range for beginning-of-season stocks. Propane stocks at the end of September are estimated to be 66 million barrels, about 4 million barrels lower than last year but still within historical ranges. Imports of these fuels play an important, but secondary, role in meeting heating demand. Despite the appearance of normal or near-normal supply from the standpoint of inventories, persistently high spot prices (in historical terms), particularly for natural gas, are indicative of high marginal acquisition costs and are reminders of the fundamental tightness in fuel markets going into the winter heating season.

Total distillate fuel inventories are currently about average for this time of year. Beginning-of-October stocks are estimated to be 132 million barrels, 5 million higher than those of the previous winter, and very near the middle of the previous 5-year range. Heating oil stocks, which generally correspond to the high-sulfur portion of total distillate inventories, are somewhat below normal at this time. On the East Coast (PADD1) heating oil inventories (excluding the strategic reserve) are currently about 10 percent below the previous five-year average, although they are well above the low levels seen at the end of September 2000. Domestic production and imports are generally able to respond to distillate demand shifts more easily than other fuels such as natural gas. However, because of the general tightness of oil markets, which is likely to continue throughout the winter, incremental supplies might be costly and price responses to demand surges may be significant. Thus, a strong upward price risk emerges for heating oil if winter temperatures move well below normal.

Heating Bills

Table WF1 below summarizes historical and base case (normal weather) demand, total expenditure, and price projections for key heating fuels on a per-household basis. The calculations focus on particular regions of the country with respect to consumption and projected weather factors (i.e., changes in heating degree-days) however, they assume the national average consumer prices for heating fuels presented in the *Short-Term Energy Outlook*. Thus, heating bill calculations illustrate the magnitude of the expected changes in fuel bills rather than the actual expenditures incurred by individual consumers.

Table WF1. Illustrative Consumer Prices and Expenditures for Heating Fuels During the Winter

	2000-2001	2001-2002	2002-2003	2003-2004
	Actual	Actual	Actual	Base Forecast
Natural Gas (Midwest)				
Consumption (mcf)	99.1	81.3	95.2	91.8
Avg. Price (\$/mcf)	9.52	7.38	8.39	9.17
Expenditures (\$)	943	600	799	841
Heating Oil (Northeast)				
Consumption (gals)	731	589	757	696
Avg. Price (\$/gal)	1.37	1.10	1.33	1.33
Expenditures (\$)	999	648	1010	927
Propane (Midwest)				
Consumption (gals)	979	803	941	907
Avg. Price (\$/gal)	1.38	1.11	1.20	1.21
Expenditures (\$)	1348	888	1125	1094

Notes: Consumption based on typical per household use for regions noted.

Prices shown are national average delivered-to-household prices.

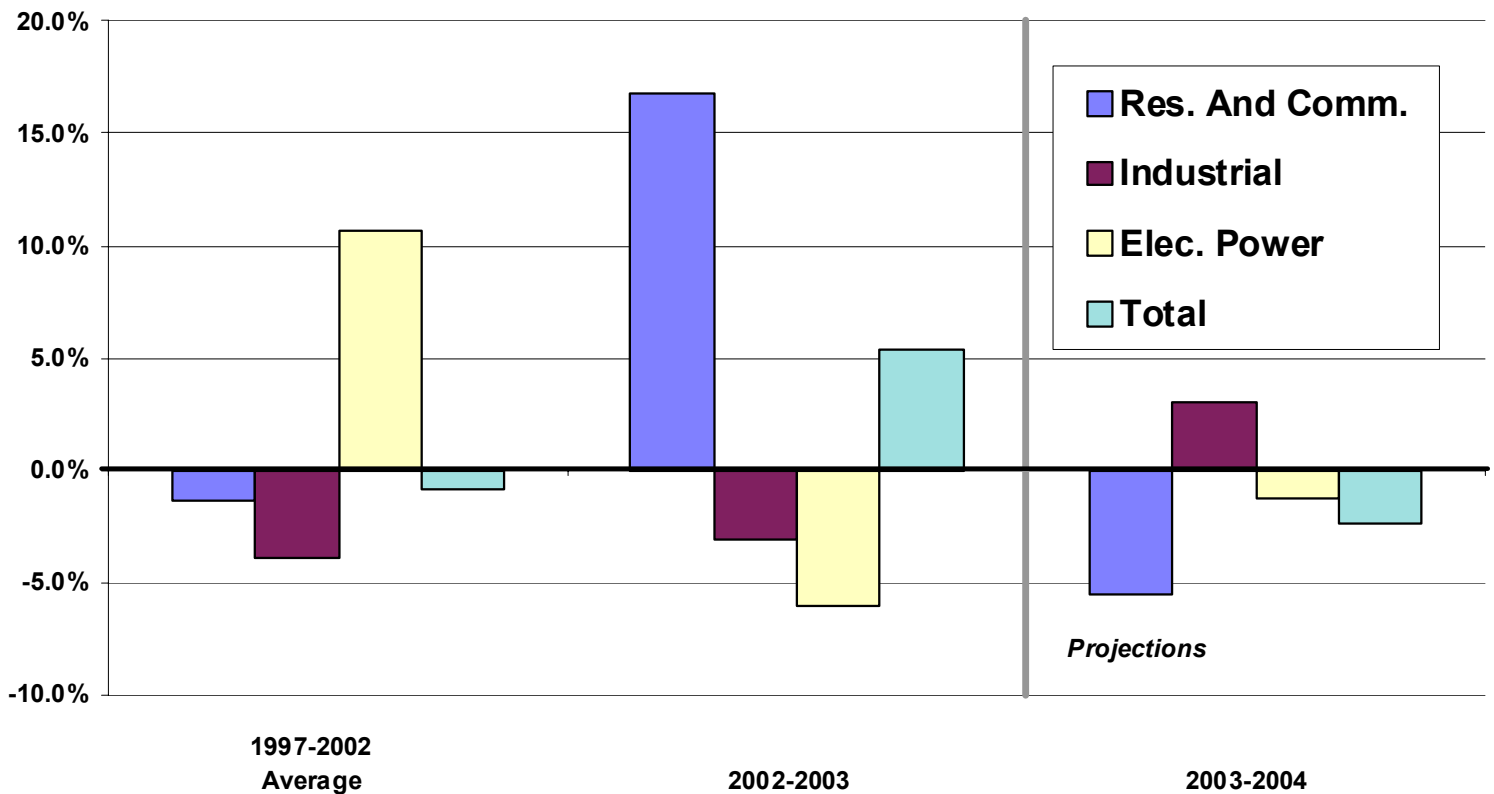
As the table shows, while demand for each of the fuels is projected to decline from that of the previous winter, the projected changes in average price and expenditures vary by fuel. In the base-case projections, shown above, per-household natural gas expenditures are projected to rise about 5 percent despite the projected drop in actual consumption. In contrast, heating oil expenditures are projected to decline by about 8 percent. Propane expenditures are projected to fall by 3 percent. It should be noted that these projections presume an absence of the cold-weather episodes that characterized the first quarter of 2003. Such occurrences would raise not only demand to levels above that of the previous winter season but prices as well (see discussion on extreme weather cases below).

Natural Gas

Demand

Total for the base case natural gas demand is expected to average 69.7 billion cubic feet (bcf) per day for the up-coming winter, down about 2 percent from last winter's average (Figure WF1 and Table WF2). This decline largely reflects the assumed return to normal winter temperatures from below-normal levels seen during the winter of 2002-2003. A typical residential customer in the Midwest is projected to see a 4-percent decline in natural gas consumption during this heating season compared to that of last winter (Table WF1). Another factor constraining natural gas demand is the continued firmness of wellhead and end-use natural gas prices, which have encouraged the displacement of natural gas in the price-sensitive electric power and industrial sectors.

**Figure WF1. U.S. Winter Natural Gas Demand Changes
(Change from Year Ago)**



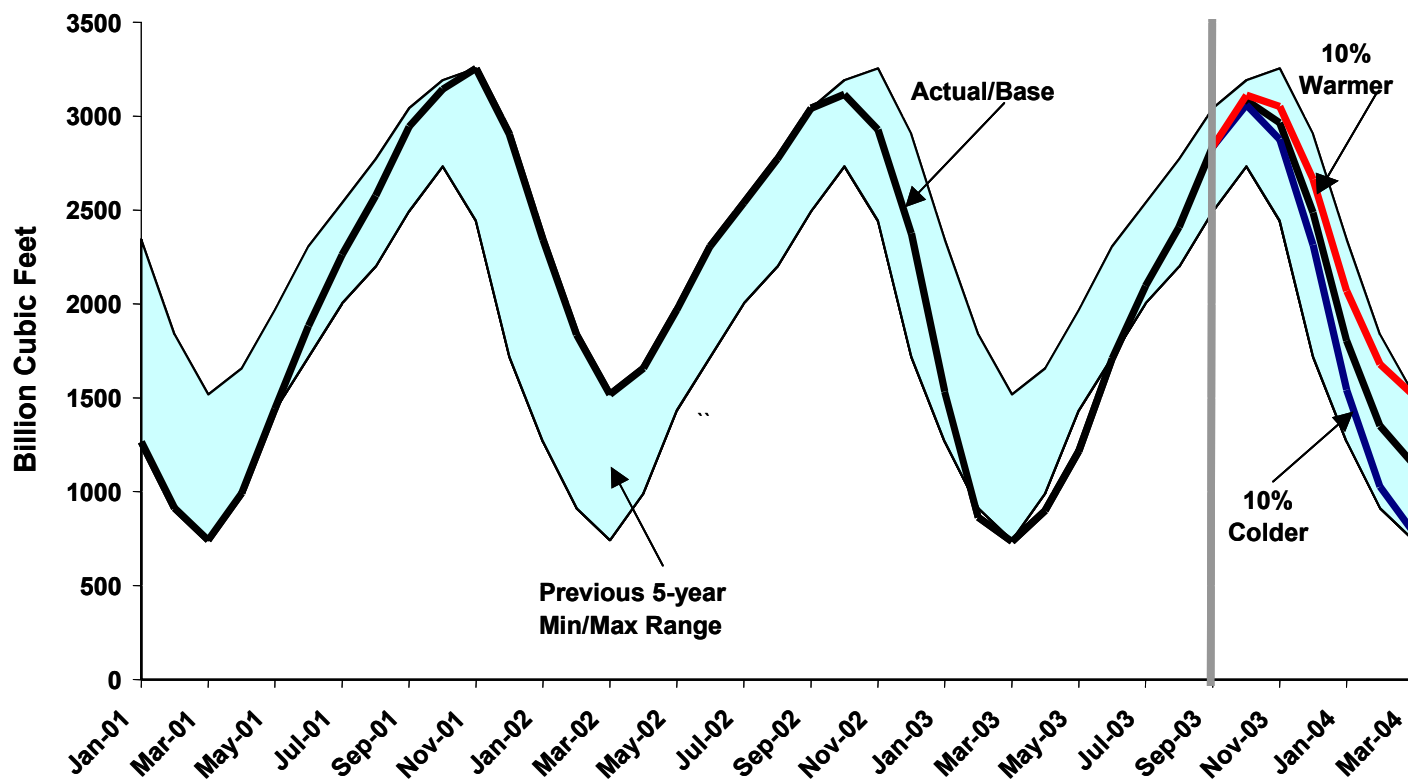
Supply

Domestic natural gas production during the upcoming winter is expected to average 52.8 bcf per day, close to last winter's average production. High prices and a strong drilling effort in 2003 have tended to keep total domestic dry gas output above levels seen in 2002. Due to the surge of production evident in the first quarter of 2003, however, winter output is not expected to exceed that of last year in the base case.

As in previous winters, natural gas inventories are expected to respond to changes in demand, especially those resulting from unanticipated changes in the weather. As of October 1, natural gas inventories are projected to be well within recent historical norms. Storage levels, which declined to an all-time low of 735 bcf at the end of last winter (less than half of the 1,518 bcf 2 years ago), managed to climb to an estimated 2,840 bcf of September 30. Although that storage position is about 200 bcf less than the record high at the outset of the previous season, the April-September rate of stock additions was one of the highest on record (Figure WF2). The rapid stockbuild underscored declines in natural gas demand brought about by firm natural prices, which induced fuel switching by power generators and reductions in industrial demand. Increases in hydroelectric generation also played a role. Winter season storage withdrawals are projected to average about 9.3 bcf per day, about 27 percent lower than

last winter's average. As a result, end-of-winter stocks are projected to be above 1,100 bcf, more than 400 bcf above that of the previous season's record low.

Figure WF2. Working Gas in Storage



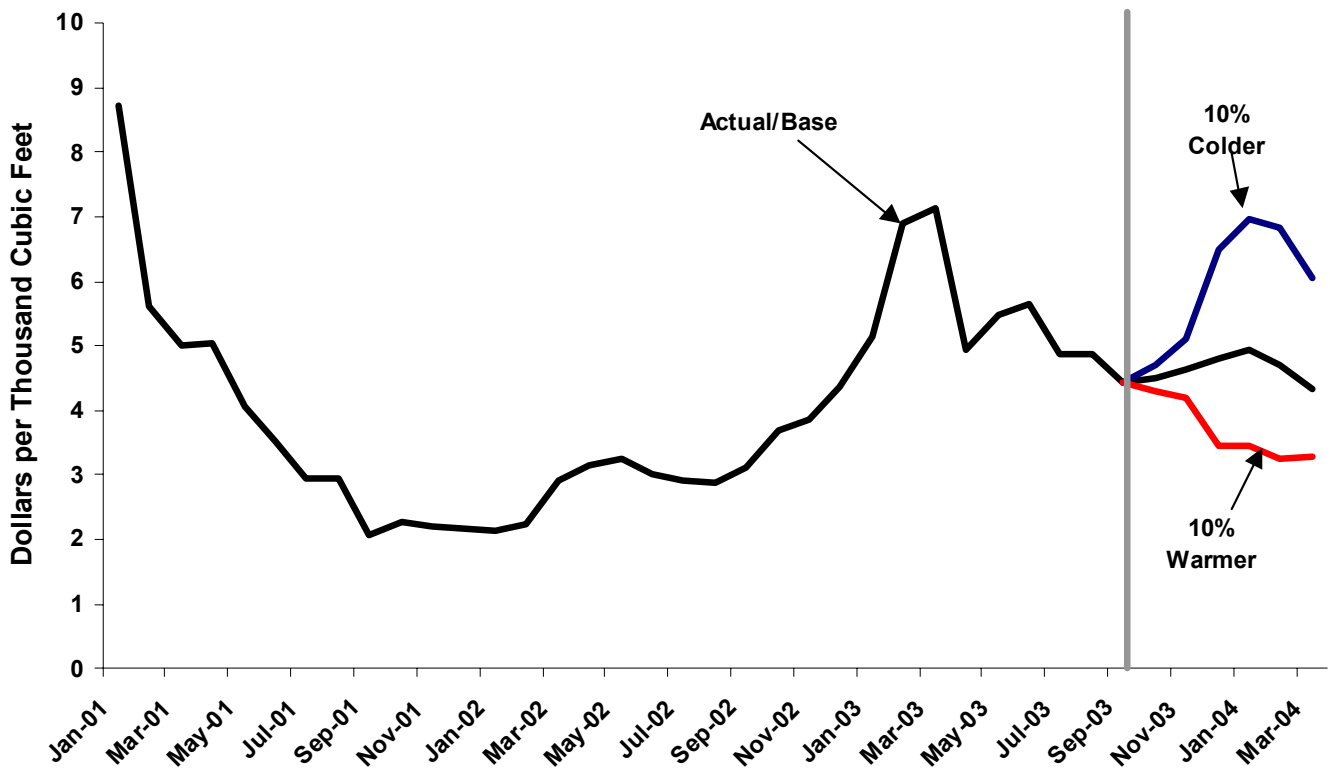
Net imports are projected to provide 10.4 bcf per day this winter in our base case, up from 9.2 bcf last winter. The vast majority of net imports come as natural gas shipped via pipeline from Canada. Since the completion of the Alliance Pipeline in late 2000, which added about 1.6 bcf per day of import capacity from Western Canada to the Midwest, little new pipeline capacity from Canada has been brought on line. Most of the improvement in projected net imports this winter is attributable to the growth in liquefied natural gas (LNG) imports into the United States.

Prices

Harsh winter weather (especially during the first quarter of the year), high oil prices, and limited production levels earlier in the year placed upward pressures on prices of natural gas during the 2002-2003 winter and beyond (Figure WF3). Weekly spot prices at the Henry Hub peaked at \$12 per million btu the week ending February 28, and a peak monthly average price of \$7.73 per million btu was seen in February 2003. Given the return to normal temperatures during the 2003-2004 winter season and modest growth in net new supply, the average base-case wellhead price, which includes both spot and long-term purchases, is projected to average about \$4.30 per mcf, down nearly 7 percent from last winter's average (Table WF2). But residential prices are projected to average \$9.17 per mcf, up 9 percent from the average \$8.39 last winter. Because changes in wellhead prices require some time to show up at the retail level for both economic and regulatory reasons, the recent decline in wellhead

prices is too small and too recent to offset the impact of the substantial spring-summer increase in wellhead prices on residential prices.

Figure WF3. Natural Gas Spot Wellhead Prices



Heating Oil

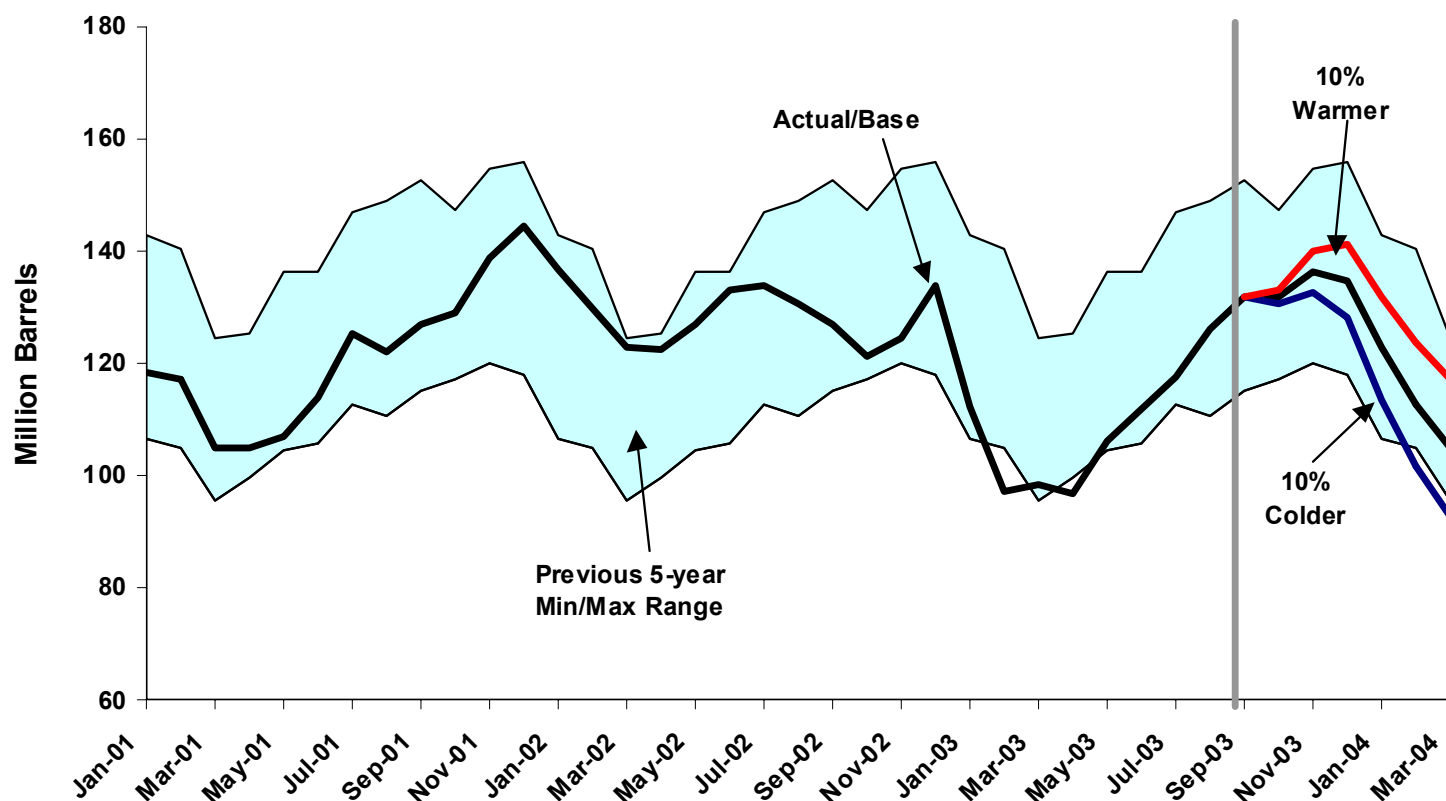
Supply and Demand

Last winter, heating oil consumers experienced the colder-than-normal winter and much higher retail prices than during the winter of 2001-2002, which was one of the warmest winters on record. The average household’s consumption of heating oil rose by 29 percent last winter, with the average per-gallon price rising by 21 percent. As a result, heating oil bills for that season rose by 56 percent on average (Table WF1). Last winter’s experiences are expected to be only partially reversed because of the continued general tightness of oil markets domestically and internationally. Heating oil demand in our base case is projected to be 8 percent lower than last winter, and prices are projected to average \$1.33 per gallon, the same as last year. As a result, base case heating oil bills are expected to be only about 8 percent lower than last winter.

Total distillate fuel demand this winter is projected to be about 4.1 million barrels per day, slightly above that of the previous winter. Total refinery distillate output is projected to average 3.69 million barrels per day, up 80,000 barrels per day from last winter. The average distillate yield is projected to be 24 percent, with an average refinery utilization of 90 percent, compared to 24 percent and 89 percent, respectively, last winter. With beginning of October inventories at an estimated 132 million

barrels, 5 million barrels higher than year-ago, an average inventory draw rate of 150,000 barrels per day is expected, similar to last winter's average but lower than that seen in previous recent winters (Figure WF4). End-of-season stocks are projected to be 105 million barrels, higher than the 99 million barrels seen at the end of last winter. Because refinery output is projected to increase despite lack of growth in consumption, net imports are expected to play a smaller role in meeting the winter distillate requirement under normal weather assumptions. Net imports, often the swing supplier of heating oil, are expected to average 240,000 barrels per day, down from 280,000 barrels per day last year.

Figure WF4. U.S. Distillate Fuel Stocks

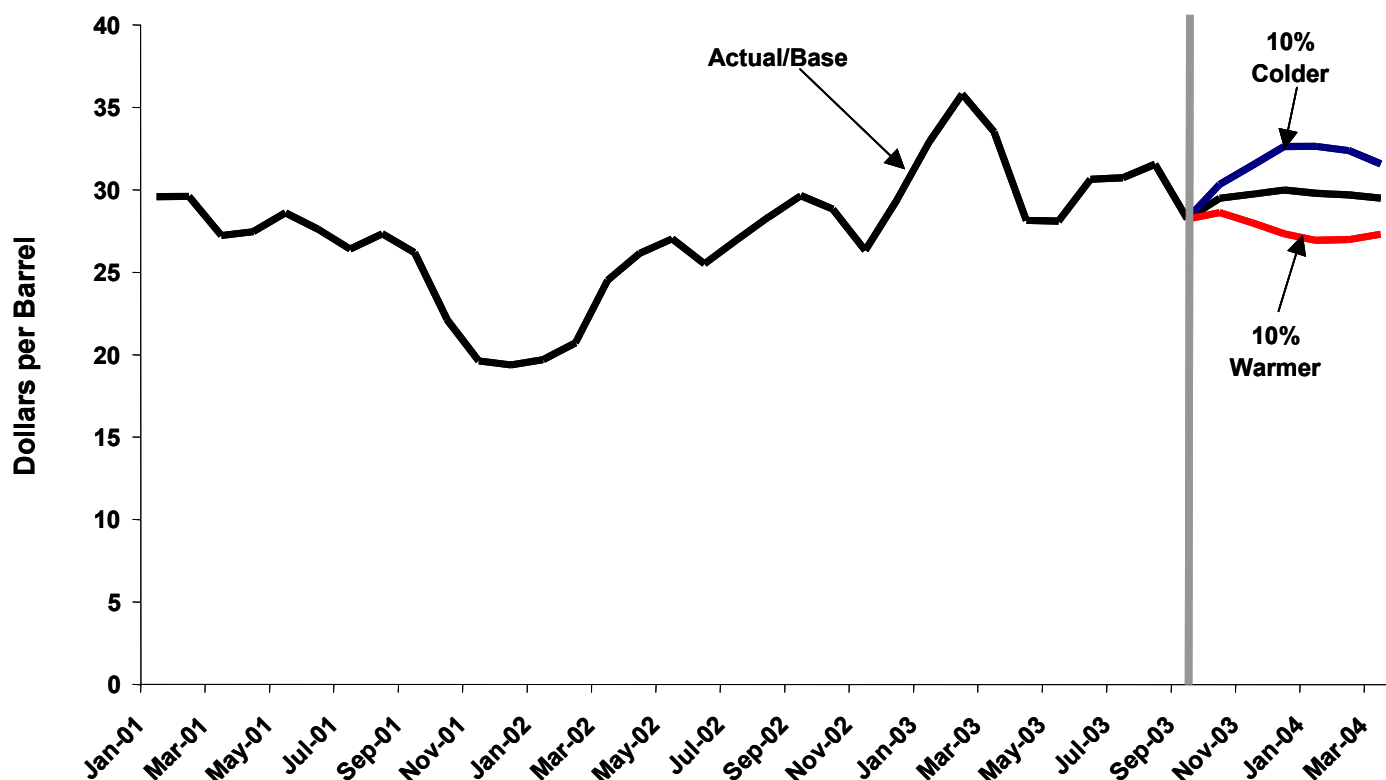


It should be noted that the base case forecast assumes no unusual demand spikes resulting from forced switching, unusual refinery disruptions, or unanticipated weather episodes.

Prices

During the winter season, the cost of imported crude oil to U.S. refineries is projected to average slightly more than \$27 per barrel (65 cents per gallon), down \$0.80 per barrel, (2 cents per gallon) from last winter. Figure WF5 depicts the base-case crude oil price projection (West Texas Intermediate) with a range expected under various winter weather scenarios. During the winter, crude oil prices are expected to remain near current levels. Very cold or mild weather conditions in the Northern Hemisphere could obviously move prices noticeably above or below the base case level.

Figure WF5. WTI Crude Oil Price



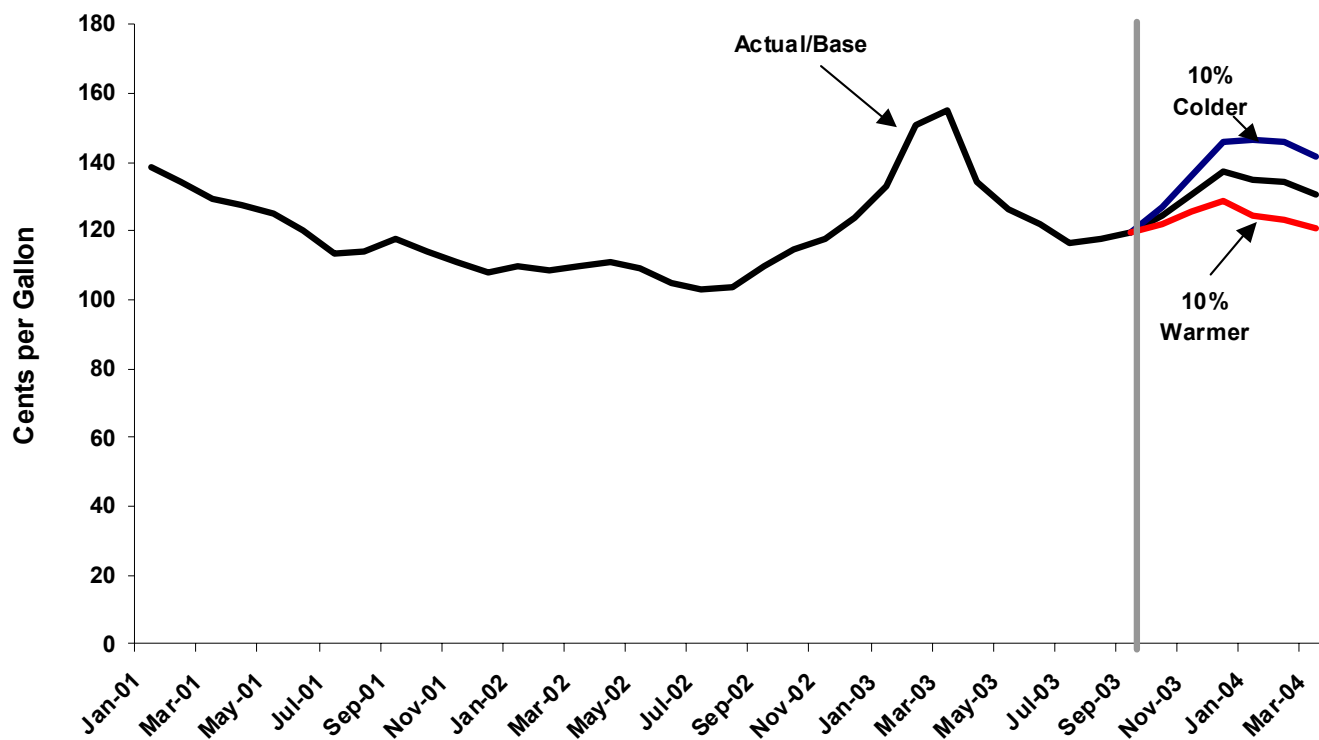
As mentioned above, for the upcoming winter season, retail heating oil prices are projected to average \$1.33 per gallon in the base case, the same as the previous winter season's average.

Figure WF6 summarizes the base case and +/- 10-percent weather (heating degree-days) cases for projected residential heating oil prices. The base case assumes normal weather patterns. The price range reflects not only direct impacts on prices from alternative weather patterns, but also impacts on crude oil prices from higher (or lower) overall petroleum demand.

Despite the perceived adequacy of distillate inventories this winter, heating oil prices would likely rise in response to an increase in demand from much colder than normal weather. But price sensitivities of heating oil to such demand surges are difficult to quantify. The price reaction to the cold weather scenario shown in Figure WF6 may be understated, particularly if the availability of imports is low (as would be the case if cold weather conditions extended simultaneously to Europe, which is implicitly assumed for the cold weather scenario). Thus, the high price case from Figure WF6 may be a conservative estimate of the impact of harsh weather on prices.

This discussion of distillate supplies assumes that the Northeast Heating Oil Reserve, which consists of a total of 2 million barrels of heating oil stored in terminals in New Jersey, Connecticut and Rhode Island, will remain untapped. The reserve is intended to provide enough additional heating oil into the Northeast in case of very cold weather to give suppliers an additional 20 days of coverage if shortages of commercial supplies materialize.

Figure WF6. Residential Heating Oil Price



Propane

Demand

Last winter's cold weather in the major propane-consuming regions in the Midwest and East Coast more than overcame the effects of the struggling U.S. economy to post a record 1.43 million-barrels per-day of propane demand during the 2002-2003 heating season, 3 percent above the prior year's heating season. This contrasts with the 2001-2002 heating season when warm weather more than offset the effects of the slowly recovering U.S. economy to show a decline in demand despite modest gains in petrochemical feedstock demand, the largest component of propane demand. But with recent economic data pointing to the prospect for more robust growth in the U.S. economy, it would be reasonable to expect that growth to translate into another strong propane demand season this winter, even assuming normal weather. Thus propane demand for the 2003-2004 season is expected to match or surpass last year's level unless winter temperatures are well above normal.

However, on a year-over-year basis, propane demand through the first half of 2003 averaged less than 1.3 million barrels per day, about 4 percent below the same period last year. Although cold weather contributed to bolster propane demand during the first quarter of the year, demand for propane to petrochemical feedstock use through the first half of 2003 remained about 15 percent below the same period last year. This, in part, contributed to the lower level of demand this year compared with last year. But the second half of 2003 may experience higher demand, compared with the first half of the

year, if the U.S. economy gains momentum as expected and demand for propane for crop drying during the fall harvest season reflects the record corn crop this year. The U.S. Department of Agriculture (USDA) forecasts the 2003/04 corn crop at a record 10.1 million bushels, about 12 percent above the prior year level. Consequently, with more ideal growing conditions this year (compared with drought-plagued conditions over much of the corn-belt last year) the prospects for a large corn harvest with a higher moisture content is much greater, leading to higher demand for propane for crop drying.

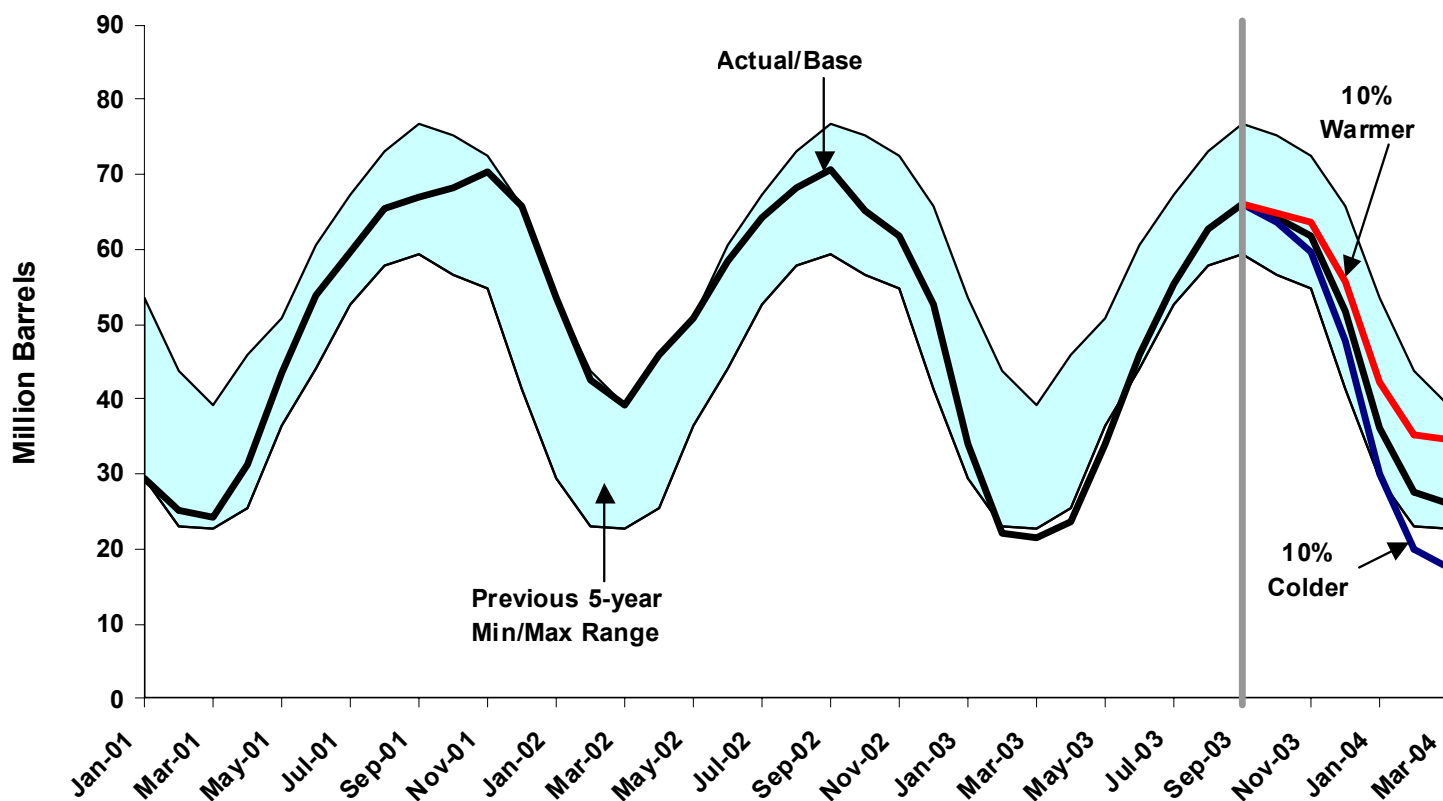
Supply

Given current inventory levels and projected supply and demand, the expectation for the 2003-2004 winter heating season is for adequate propane supplies with prices averaging about the same as last year. The base case projection assumes normal weather and the absence of any major supply disruptions.

Demand for propane is met by domestic production at gas processing plants and at refineries, inventory withdrawals, and net imports. Domestic production accounts for the largest share of supply during the heating season, accounting for up to 80 percent of propane supply. For the first half of the year, propane production averaged 1.06 million barrels per day, down 5.3 percent from the same period last year. Nearly the entire year-over-year decline in production was from gas processing plants, compared with refinery production that essentially remained flat during this same period. High natural gas prices earlier in the year caused some natural gas plant operators to either shut-down their plants or significantly reduce their yield of propane as a means of obtaining the higher Btu value from natural gas compared with that for extracted propane. Year-to-date production from natural gas plants through June 2003 was 56,000 barrels per day lower compared with the same period last year, while refinery production of propane was only 3,000 barrels per day below its prior year level during the same period. But expectations for some rebound in production of propane from natural gas plants and from refineries through the heating season appear warranted based on EIA projections for relatively stable prices for natural gas and for crude oil during this time.

Inventories provide the second largest source of propane during the heating season and help bridge the gap between current demand and current supply from production and imports. Although propane inventories began the 2002-2003 heating season at their highest level since 1998 with nearly 71 million barrels, the cold winter caused inventories to plunge a record 48.9 million barrels by the end of March 2003. As a result, inventories were drawn down to 21.6 million barrels, their lowest level for this month since 1970. However, over the course of the summer build season (which lasts from April through September), propane stockholders added 44.4 million barrels to primary inventories, a volume that moved U.S. inventories of propane to a level well within the average range prior to the start of the 2003-2004 winter heating season (Figure WF7). That stockbuild surpassed the roughly 36 million-barrel stockbuild averaged over the most recent 5-year period from 1998 through 2002. As a result, inventories at the beginning of the season are estimated to be 66 million barrels, 5 million barrels lower than last year but close to normal. Under the base-case scenario, inventories are projected to gradually decline, reaching a level of about 26 million barrels by the end of March 2004, 20 percent above last year.

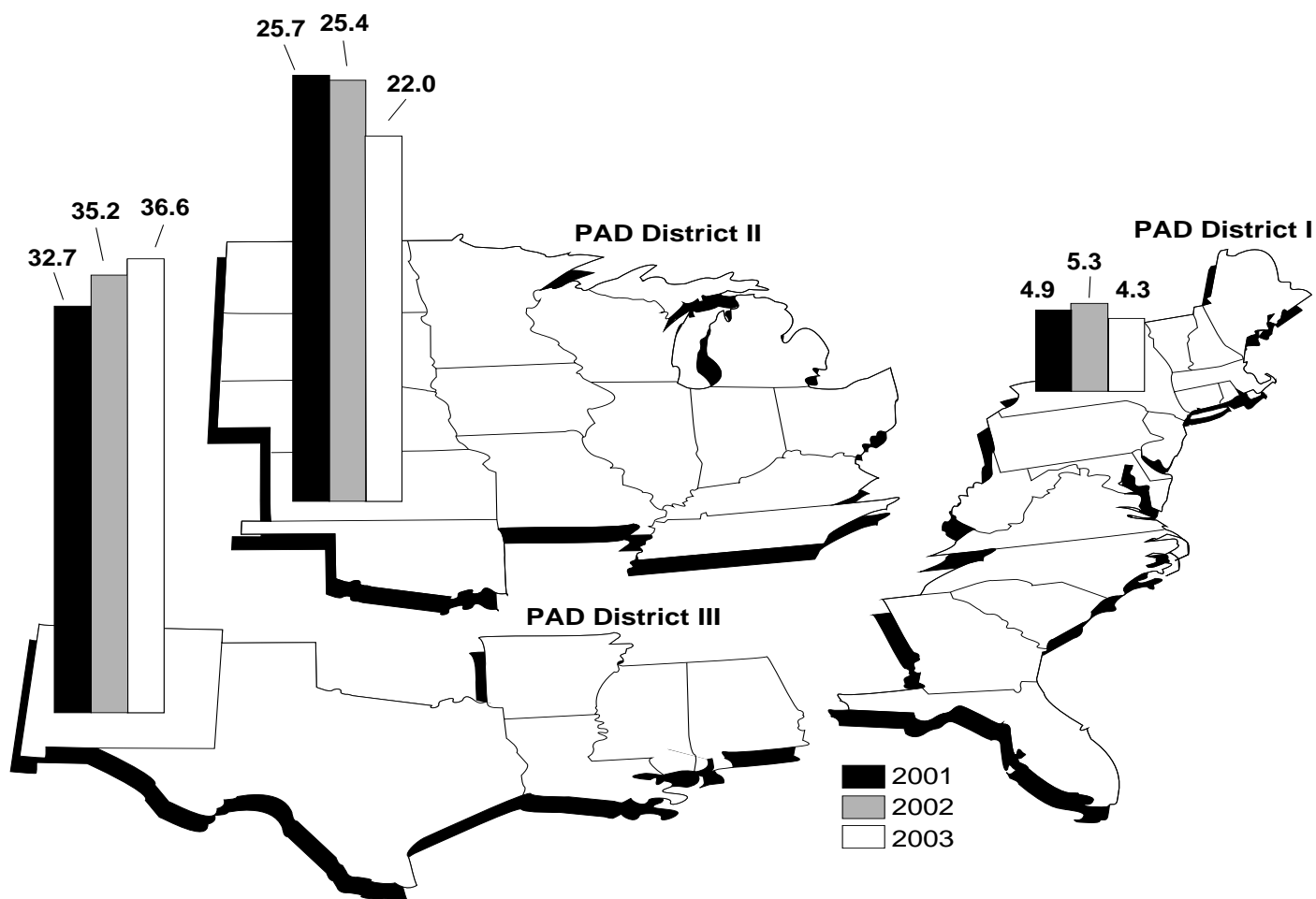
Figure WF7. U.S. Propane Stocks



Regional inventory gains were rather mixed during the summer build season with the Gulf Coast region accounting for most of the seasonal build with 24.6 million barrels, about 55 percent of the total summer build, followed by the Midwest region that added 15.5 million barrels, or nearly 35 percent during this same period (Figure WF8). The East Coast, which has very limited storage capacity, added 2.1 million barrels, or less than 5 percent, to total inventories over the summer build season, with the Mountain and West Coast regions accounting for the remaining 5 percent. By the start of the heating season, Gulf Coast inventories totaled 36.6 million barrels, a level above the average range for this time of year. This marks the second consecutive year that Gulf Coast inventories have remained above average levels prior to the start of the heating season, spurred in part by the relatively strong volume of waterborne imports during summer build season. While the Gulf Coast region is not overly dependent on propane for heating, the region continues to be a major supplier of propane to the major heating areas in the East Coast and Midwest. Comparatively, the Midwest region, which typically receives the largest volume of imports (via Canada), fell short this year due to supply constraints in that country and to problems on the main pipeline that transports most of the region's imports. Accordingly, the Midwest region begins the season with a below-average 22.0 million barrels, the lowest level for this month since 1990. Because of the low level of inventories in the region, coupled with the potential for both lower imports and significant crop drying demand, the Midwest region remains vulnerable to supply constraints and/or added market volatility during the winter heating season. With only limited storage capacity, the East Coast region maintains the lowest level of inventories of all the major propane

consuming areas in the nation, relying instead on a constant re-supply, via pipeline from the Gulf Coast and from imports. The East Coast region began the heating season with 4.3 million barrels of propane in primary storage, a level slightly below the average range for this period.

Figure WF8. U.S. Propane Inventories by PAD District (Million Barrels)



While small in volume, imports provide a crucial source of supply during periods when demand exceeds the available supplies from production and inventories. Through the first half of 2003, propane imports averaged 142,000 barrels per day, down about 2 percent from the 145,000 barrels per day averaged during the first half of 2002. Although the first six months of 2003 witnessed a relatively small 3,000 barrel decline from the same period last year, the source of the imports were somewhat changed from past trends. Typically, Canada supplies the largest share of propane imports to U.S. markets, accounting for about 87 percent of all imports during the first half of 2002. The rest of imports are mostly waterborne from regions in the North Sea, North Africa and the Middle East. During the first half of 2003, imports from Canada accounted for a very much reduced 64 percent share as primary stockholders in that country were faced with the same task of rebuilding inventories, which were severely depleted from the effects of last winter. At the same time, waterborne imports increased their share not only from traditional sources like Algeria, the second largest importer of propane to the U.S., but also from the North Sea, which has contributed rather limited imports over the past several years.

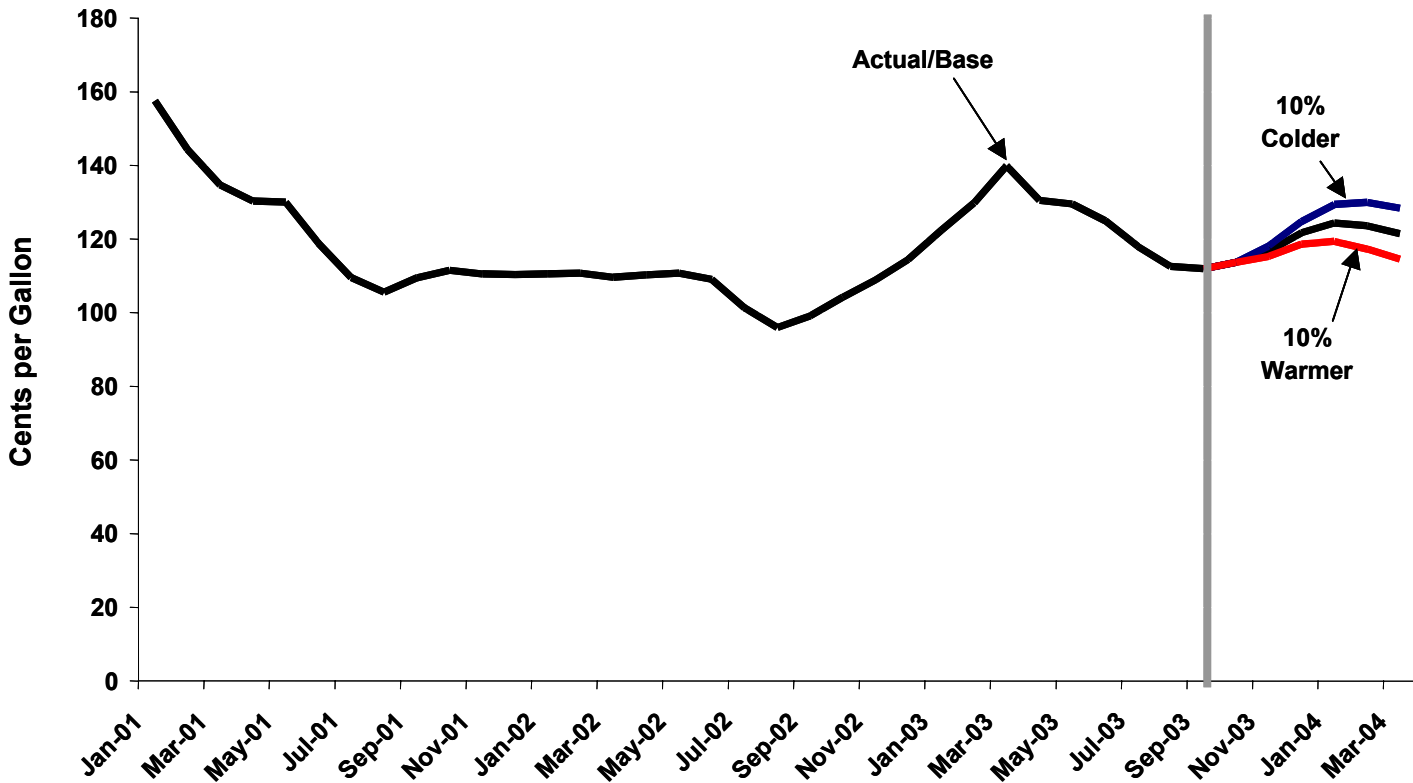
The expectation is for Canadian imports to slowly rise through the remainder of the year as normal storage levels are finally reached in that country, allowing for greater imports to the U.S. During this same period, non-contract waterborne imports would be expected to remain relatively strong as long as U.S. propane prices remain at a level that would be attractive to international suppliers.

Prices

The primary determinant of spot propane prices, as with most commodities, is the supply/demand balance, which can vary by region. Retail propane prices are influenced by price movements with other heating fuels, such as heating oil and natural gas during the winter months. Moreover, these prices are also influenced by crude oil prices, the prices of alternative petrochemical feedstocks, and intangible factors such as uncertainty about future supply/demand balances. Cold weather last winter and the war in Iraq kept both spot and retail propane prices above prior-year levels through most of 2003, although the strong summer stockbuild has contributed to the easing of these prices in recent months.

The average residential propane price for the upcoming winter season is expected to remain at about the prior year's level. Under the base-case scenario, residential prices are expected to average \$1.21 per gallon (Figure WF9).

Figure WF9. Residential Propane Prices: Base Case and Weather Cases

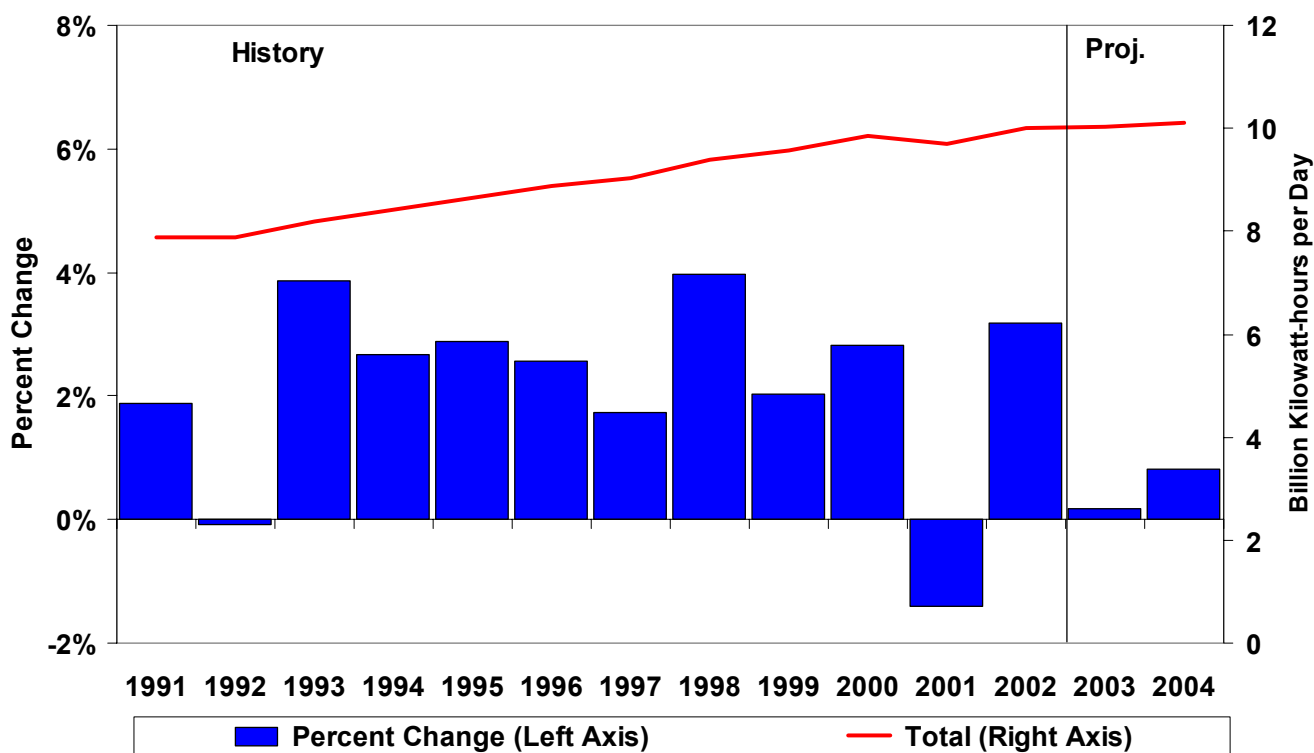


Electricity

Demand

Winter 2003-2004 total electricity demand is likely to be down by about 0.3 percent from last winter, due in part to the assumption of normal weather in contrast to last winter's 2.4 percent higher than normal heating degree-days (nationally) (Figure WF10). In addition, continued weakness in the demand for electricity from the industrial sector is expected, with little year-over-year growth in that sector likely to occur before the winter season is over. Residential sector demand for electricity is expected to be about flat compared with last winter due to the expected reduction in heating related demand under normal weather assumptions offsetting normal growth from new households and increased electricity use in existing homes.

Figure WF10. Total Electricity Demand Growth Patterns



Supply

Nuclear and hydropower for electricity generation are expected to be in greater supply this winter than they were last winter. Nuclear Regulatory Commission concerns regarding pressure vessel heads and corrosion, which caused many plants to be down for inspection, have been addressed. The only current major outage is with the Davis-Besse plant, which has experienced many delays and is now projected to resume operation in November 2003. Hydro generation is expected to rise significantly, by 22 percent, due to the return to normal levels of precipitation seen this year. Given the lack of growth in electricity demand expected for this winter compared to last winter, net imports of electricity are expected to be about level with or below last winter.

Prices

This winter, residential electricity prices are projected to be about 3 percent higher than last winter (Figure WF11). Household expenditures on electricity are projected to be about only 2 percent higher as a result of lower space-heating demand. Retail electricity prices appear to have a slight upward trend in recent periods. However, while retail costs may be somewhat higher, retail (delivered) electric prices are not very sensitive to demand/fuel price shocks that may occur in the winter. Increased costs of fuel and wholesale electricity would tend to be smoothed out in retail prices over a sequence of months or a year.

Figure WF11. Monthly Delivered Electricity prices by Sector

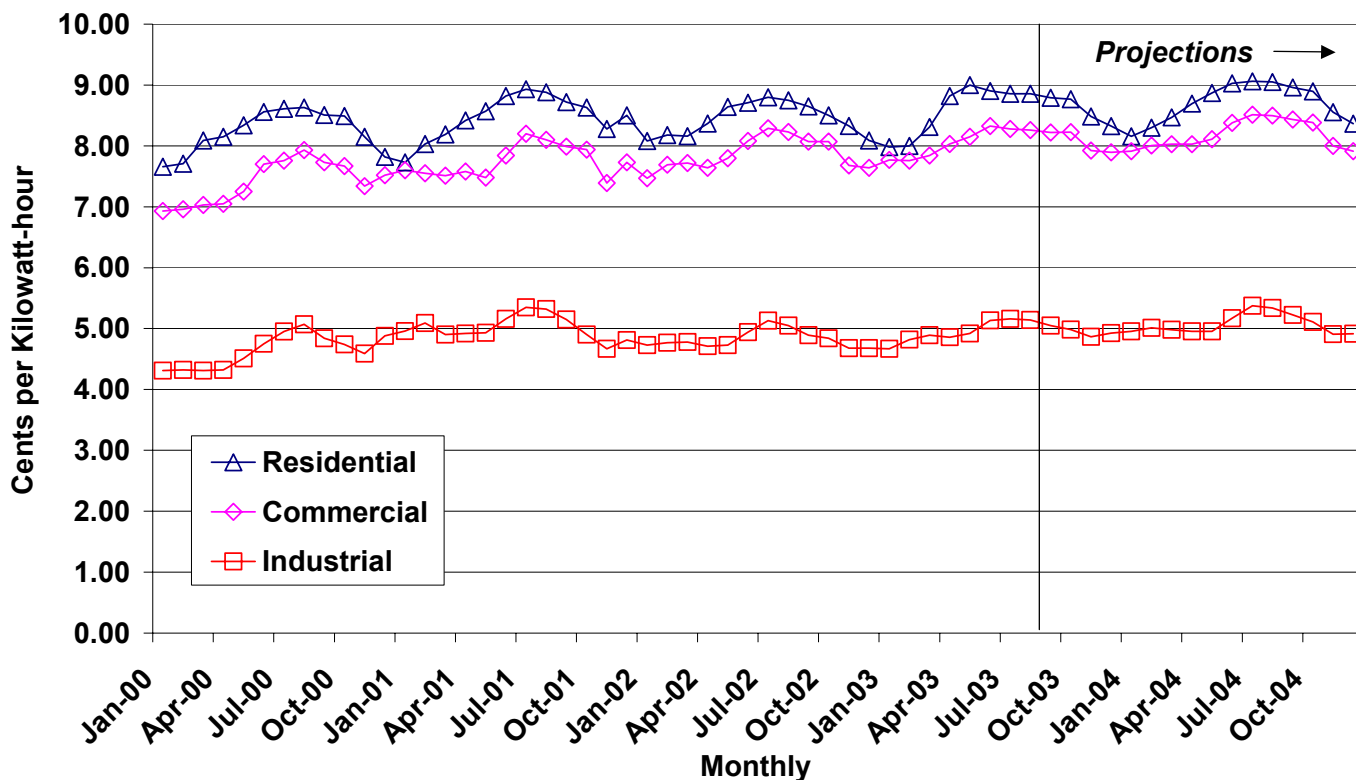


Table WF2. U.S. Winter Fuels Outlook: Base Case

(Energy Information Administration/Short-Term Energy Outlook -- October 2003)

	History			Base Case					
	2002-2003			2003-2004			Percent Change ^d		
	Q4	Q1	Winter	Q4	Q1	Winter	Q4	Q1	Winter
Demand/Supply									
Distillate Fuel (mill. barrels per day)									
Total Demand.....	3.89	4.22	4.05	<i>3.97</i>	<i>4.19</i>	<i>4.08</i>	<i>2.0%</i>	<i>-0.7%</i>	<i>0.6%</i>
Refinery Output.....	3.69	3.54	3.61	<i>3.74</i>	<i>3.64</i>	<i>3.69</i>	<i>1.4%</i>	<i>3.0%</i>	<i>2.2%</i>
Net Stock Withdrawal.....	-0.08	0.40	0.16	<i>-0.03</i>	<i>0.33</i>	<i>0.15</i>	<i>-58.6%</i>	<i>-16.3%</i>	<i>-5.5%</i>
Net Imports.....	0.28	0.29	0.28	<i>0.26</i>	<i>0.22</i>	<i>0.24</i>	<i>-7.0%</i>	<i>-23.4%</i>	<i>-15.3%</i>
Refinery Utilization (percent).....	90.4%	88.4%	89.4%	<i>90.2%</i>	<i>89.9%</i>	<i>90.1%</i>			
Natural Gas (bill. cubic feet per day)									
Total Demand.....	62.82	80.17	71.40	<i>61.51</i>	<i>78.08</i>	<i>69.70</i>	<i>-2.1%</i>	<i>-2.6%</i>	<i>-2.4%</i>
Production.....	52.23	53.78	53.00	<i>52.79</i>	<i>52.77</i>	<i>52.78</i>	<i>1.1%</i>	<i>-1.9%</i>	<i>-0.4%</i>
Net Stock Withdrawal.....	7.24	18.22	12.67	<i>3.80</i>	<i>14.91</i>	<i>9.30</i>	<i>-47.5%</i>	<i>-18.2%</i>	<i>-26.7%</i>
Net Imports.....	9.68	8.79	9.24	<i>10.60</i>	<i>10.09</i>	<i>10.35</i>	<i>9.5%</i>	<i>14.7%</i>	<i>12.0%</i>
Propane (mill. barrels per day)									
Total Demand.....	1.39	1.48	1.43	<i>1.38</i>	<i>1.48</i>	<i>1.43</i>	<i>-0.4%</i>	<i>0.4%</i>	<i>0.0%</i>
Net Stock Withdrawal.....	0.20	0.34	0.27	<i>0.15</i>	<i>0.29</i>	<i>0.22</i>	<i>-21.2%</i>	<i>-16.9%</i>	<i>-18.5%</i>
Stocks (ending period)									
Distillate Fuel (MMB) - Beg. ^a	127	134	127	<i>132</i>	<i>135</i>	<i>132</i>	<i>3.9%</i>	<i>0.5%</i>	<i>3.9%</i>
- End. ^a	134	99	99	<i>135</i>	<i>105</i>	<i>105</i>	<i>0.5%</i>	<i>6.6%</i>	<i>6.6%</i>
Working Gas (BCF) - Beg. ^b	3042	2375	3042	<i>2837</i>	<i>2487</i>	<i>2837</i>	<i>-6.7%</i>	<i>4.7%</i>	<i>-6.7%</i>
- End. ^b	2375	735	735	<i>2487</i>	<i>1145</i>	<i>1145</i>	<i>4.7%</i>	<i>55.8%</i>	<i>55.8%</i>
Propane (MMB) - Beg. ^a	71	53	71	<i>66</i>	<i>52</i>	<i>66</i>	<i>-6.5%</i>	<i>-1.4%</i>	<i>-6.5%</i>
- End. ^a	53	22	22	<i>52</i>	<i>26</i>	<i>26</i>	<i>-1.4%</i>	<i>20.7%</i>	<i>20.7%</i>
Prices									
Imported Crude Oil (c/g) ^c	60.5	72.8	66.4	<i>64.6</i>	<i>64.7</i>	<i>64.7</i>	<i>6.9%</i>	<i>-11.2%</i>	<i>-2.6%</i>
Retail Heating Oil (c/g).....	119.4	145.2	133.6	<i>132.8</i>	<i>133.6</i>	<i>133.2</i>	<i>11.2%</i>	<i>-8.0%</i>	<i>-0.3%</i>
Wellhead Gas (\$/mcf).....	3.60	5.55	4.58	<i>4.28</i>	<i>4.27</i>	<i>4.28</i>	<i>18.9%</i>	<i>-23.0%</i>	<i>-6.6%</i>
Resid. Gas (\$/mcf).....	7.98	8.63	8.39	<i>9.42</i>	<i>9.02</i>	<i>9.17</i>	<i>18.0%</i>	<i>4.5%</i>	<i>9.3%</i>
Resid. Propane (c/g).....	109.4	129.6	119.7	<i>117.7</i>	<i>123.3</i>	<i>120.6</i>	<i>7.5%</i>	<i>-4.8%</i>	<i>0.7%</i>
Market Indicators									
Manuf. Output (index, 1996=1.0).....	111.51	111.26	111.385	<i>112.57</i>	<i>114.16</i>	<i>113.369</i>	<i>1.0%</i>	<i>2.6%</i>	<i>1.8%</i>
Northeast HDDs per day.....	24.1	36.5	30.2	<i>22.4</i>	<i>33.3</i>	<i>27.8</i>	<i>-6.8%</i>	<i>-8.9%</i>	<i>-8.0%</i>
Gas-Weighted HDDs per day.....	19.3	27.4	23.3	<i>18.6</i>	<i>26.4</i>	<i>22.5</i>	<i>-3.4%</i>	<i>-3.7%</i>	<i>-3.6%</i>

^ambb = million barrels.

^bbcf = billion cubic feet.

^cRefiner acquisition cost (RAC) of imported crude oil.

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical data are printed in bold; forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System. Sources: Historical data: Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109; *Monthly Energy Review*, DOE/EIA-0035. Macroeconomic projections are based on Global Insight Forecast CONTROL0903.

Extreme Weather Cases

Table WF3. Winter Weather Scenarios: Warm (Mild), Normal (Base) and Cold (Severe) Cases

(Illustrative Household Heating Demand and Costs)

	Winter 2002-2003	Winter of 2003-2004			% Diff. From Base	
		Mild	Normal	Severe	Mild	Severe
Natural Gas (Midwest)						
Consumption (mcf)	95.2	82.6	91.8	101.0	-10.0%	10.0%
Avg. Price (\$/mcf)	8.39	8.77	9.17	9.67	-4.3%	5.5%
Expenditures (\$)	799	724	841	977	-13.9%	16.1%
Heating Oil (Northeast)						
Consumption (gals)	757	626	696	766	-10.0%	10.0%
Avg. Price (\$/gal)	1.33	1.25	1.33	1.42	-6.0%	6.3%
Expenditures (\$)	1010	785	927	1084	-15.4%	16.9%
Propane (Midwest)						
Consumption (gals)	941	816	907	998	-10.0%	10.0%
Avg. Price (\$/gal)	1.20	1.13	1.21	1.30	-6.6%	8.1%
Expenditures (\$)	1125	920	1094	1301	-15.9%	19.0%

Note: Scenarios involve assumptions of 10% greater and 10% lower heating degree-days in all regions.

Our extreme weather cases incorporate various demand and price scenarios in response to extreme cold and warm weather conditions. These extreme weather cases also include the usual uncertainties about key fuel supplies and prices, which in turn derive from the inherently unknown rate of future economic growth and the nature of estimating relationships, among other factors. Each extreme weather case focused on the likely consequences of overall deviations (higher or lower) of 10 percent from normal weather, measured in terms of aggregate heating degree-days, assuming base case values for real GDP and other key macroeconomic quantities.

Based on winter-season (October-March) data on heating degree-days from 1975 to 2001, EIA estimates that the nation faces a 13.2-percent chance that this winter's total heating degree-days will be at least 10 percent above or below the normal level. As a result, the probability that the winter will be 10 percent colder than normal is 6.6 percent.

A winter that is 10 percent colder throughout the season is assumed to result in an additional 10 percent in heating-related demand across fuels. A unit elasticity for the heating component of fuel demand with respect to heating degree-days conforms well with analytical estimates across fuels. For example, retail heating oil prices, in a cold weather scenario, would average \$1.42 per gallon, 6 percent above the base case average (Table WF3). As a result, the average residential cost of heating would be about 17 percent above that of the base case and 7 percent above the average cost of the preceding winter.

Under similar circumstances, residential natural gas prices may rise by 5-6 percent from the base case during the heating period itself. Some of the increased cost of gas that would stem from colder weather would be rolled into future gas bills extending (perhaps) through much of the rest of the year beyond the heating season. If the cumulative total effects on consumer expenditures is taken into

account, percent changes in average residential natural gas prices for the weather scenarios are about 1.5 to 2 times that indicated in Table WF3, which looks only at the heating season. Changes in propane prices are highly related to changes in natural gas prices. A severe winter would result in residential costs averaging \$1.30 per gallon, up 9 cents from the base case. As a result, total expenditures would rise 19 percent from base case expenditures and 16 percent from the previous winter's average expenditures.