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Winter Fuels Report

Week Ending:
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Contacts

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Preface

The *Winter Fuels Report* is intended to provide concise, timely information to the industry, the press, policymakers, consumers, analysts, and State and local governments on the following topics:

- distillate fuel oil net production, imports and stocks for all PADD's and product supplied on a U.S. level;
- propane net production, imports and stocks for Petroleum Administration for Defense Districts (PADD) I, II, and III;
- natural gas supply and disposition, underground storage, and consumption for all PADD's;
- residential and wholesale pricing data for propane and heating oil for those States participating in the joint Energy Information Administration (EIA)/State Heating Oil and Propane Program;
- crude oil and petroleum price comparisons for the United States and selected cities; and
- U.S. total heating degree-days by city.

The distillate fuel oil and propane supply data are collected and published weekly. The data are based on company submissions for the week ending 7:00 a.m. for the preceding Friday. Weekly data for distillate fuel oil are published in the *Weekly Petroleum Status Report*. Monthly data for distillate fuel oil and propane are published in the *Petroleum Supply Monthly*.

The residential pricing information is collected by the EIA and the State Energy Offices on a semimonthly basis for the EIA/State Heating Oil and Propane Program. The wholesale price comparison data are collected daily and will be published weekly. Residential heating fuel prices are derived from price quotes for home delivery of No.2 fuel oil and propane. As such, they reflect prices in effect on the dates shown. Wholesale heating oil and propane prices are estimates using a sample of terminal quotes to represent average State prices on the dates given. The Computer Petroleum Corporation, Inc., defines these prices to be "prices f.o.b. terminal, excluding taxes, discounts, and hauling allowances." Wholesale prices for 1989 and 1990 are taken from terminal postings as published in the publication, *U.S. Oil Week*. The crude oil and petroleum product prices are from various industries sources as referenced on each table.

The natural gas data are collected and published monthly in the *Natural Gas Monthly*.

This report will be published weekly by the EIA starting the first week in October 1990 and will continue until the first week in April 1991. The data will also be available electronically after 5:00 p.m. on Thursday during the heating season through the EIA Electronic Publication System (EPUB). See page ii for details.

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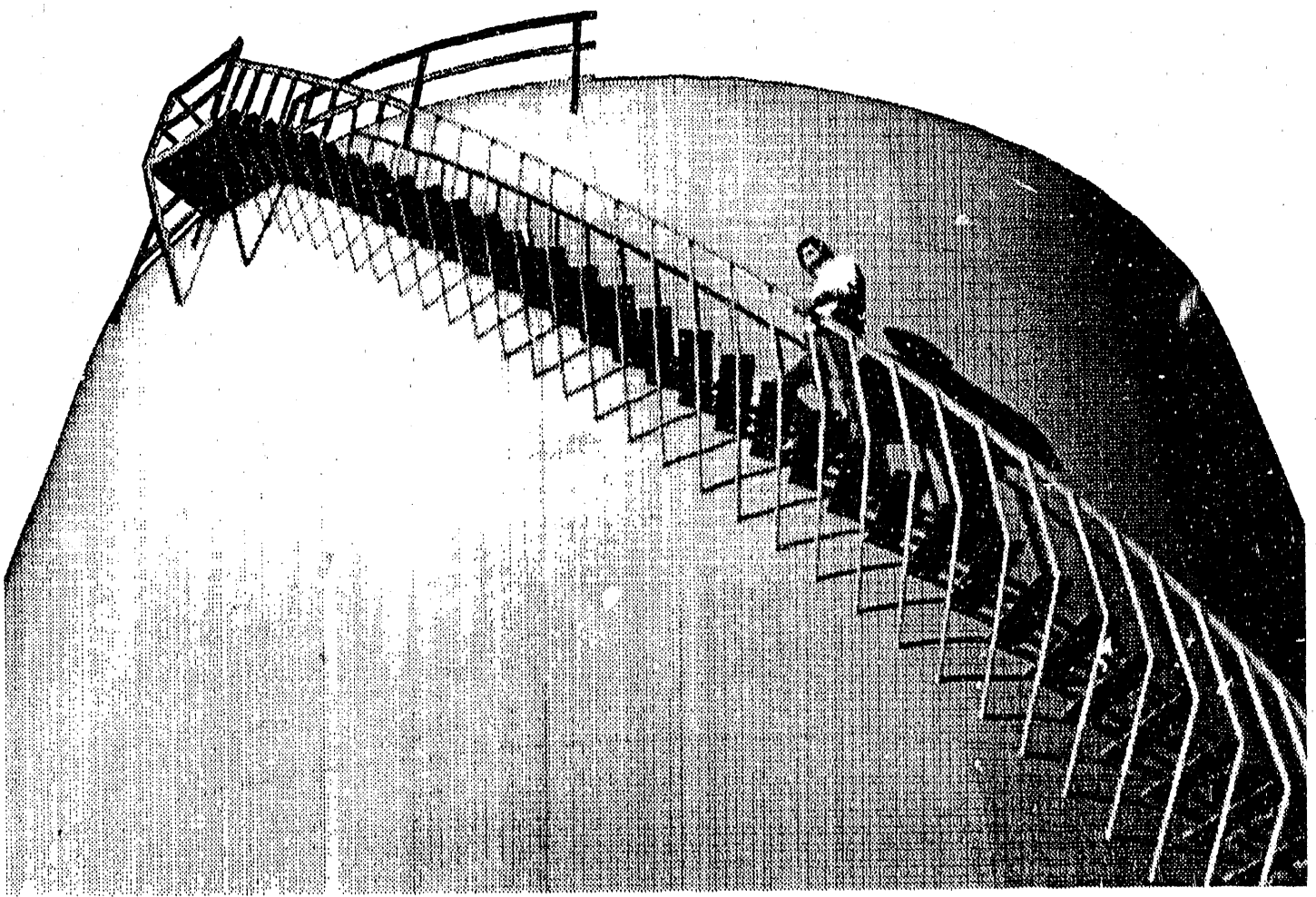


A refinery worker makes his way around a towering storage tank to check the tank level.

Heating Fuel Outlook: Winter 1990-91

by James M. Kendell

Because of the current uncertainty about energy markets over the next several months, the Energy Information Administration has examined three supply and demand scenarios reflecting alternative estimates of world oil market conditions. These scenarios each include the assumption of constant nominal crude oil prices beginning in September 1990, with values of $20, $25, and $30 per barrel. The results of the $30 case are presented in this article.

Iraq's invasion of Kuwait assured that distillate fuel oil and propane consumers would pay higher prices this winter than last winter. Unless the weather is significantly colder than normal or an unusual number of refinery breakdowns occur, the biggest problem distillate fuel oil consumers face is the possibility of tight crude oil supplies beginning toward the end of the year. Propane consumers, on the other hand, already face lower primary stocks this year than last year.

After reviewing events in the distillate and propane markets during the winter of 1989-90, this article presents current conditions in the distillate and propane markets and the *Short-Term Energy Outlook* estimates of distillate consumption, supply, and prices, assuming a $30 world oil price. The fourth section discusses some of the factors not considered by the short-term forecasting model. The final section shows where to find further official information.

Distillate Fuel Oil

During the winter of 1989-90, the Nation witnessed an extraordinary increase—and almost as extraordinary a decrease—in the prices of home heating and diesel fuel oils. December's cold weather drove consumption and prices to unexpectedly high levels, and pulled end-of-December inventories to unusually low levels. However, significant increases in domestic production and imports, combined with warm January and February temperatures, alleviated any threats of shortages and reduced prices to pre-season levels.

Consumption

Despite very cold December temperatures, U.S. distillate fuel oil consumption from October 1989 to March 1990 was slightly less than the preceding winter[1] (Table 1). Warm January and February temperatures prevented a disastrous winter for home heating oil users.

In the United States, distillate fuel oil is used primarily in the form of diesel fuel oil for transportation (Table 2). In calendar year 1988, 55 percent was consumed as transportation fuel, 18 percent in industrial facilities, 16 percent in homes, 9 percent in commercial buildings, and 2 percent in electric generating plants. Distillate fuel oil was the main heating fuel in 10.9 million or 12 percent of the Nation's households in 1987.[2]

U.S. consumption of distillate fuel oil in 1989-90 was lower than the previous winter in October, January, February, and March and higher than the previous winter in November and December (Table 3). These differences reflect colder November and December 1989 weather than in 1988, and warmer weather than the previous year in the other months. Normally, January is the coldest month of the winter, but this past heating season December was the coldest month. For the entire winter, 1989-90 heating degree days were 4.1 percent less than 1988-89. Temperatures in the winter of 1988-89 were closer to the weather pattern prevailing from 1951-80, than the winter of 1989-90.[3]

Nationally, cold weather pushed distillate fuel oil consumption 4 percent above November 1988 and 10 percent above December 1988 (Table 3). To the surprise of nearly everyone, December 1989 consumption was 354,000 barrels per day above December 1988 and the highest of any month since January 1981. Nationally, heating degree days were 8 percent above November in 1988, and 30 percent above the December 1988. December 1989 temperatures were the coldest since 1983. Some 46 cities reported their lowest December temperatures ever.[4]

[1] In this article, "winter" refers to the winter heating season from October 1 through March 31 and "consumption" refers to product supplied. Tables and graphs for this article were prepared with the assistance of Doris M. Ferguson.

[2] Energy Information Administration, *State Energy Data Report*, DOE/EIA-0214(88)(Washington, DC, April 1990); *Housing Characteristics 1987*, DOE/EIA-0314(87)(Washington, DC, May 1989), pp. 45, 48.

[3] National Oceanic and Atmospheric Administration, *Monthly State, Regional and National Heating/Cooling Degree Days Weighted by Population*, (Washington, DC).

[4] National Oceanic and Atmospheric Administration, *Monthly State, Regional and National Heating/Cooling Degree Days Weighted by Population*, (Washington, DC); telephone discussions with representatives of National Oceanic and Atmospheric Administration, June 28, and August 13, 1990.

Note: Unless otherwise cited, data in this article are from the following Energy Information Administration publications: *Petroleum Supply Annual 1989, Volume 1* or *Volume 2*, DOE/EIA-0340(89)/1 (May 1990) or /2 (June 1990) and predecessor publications; *Petroleum Supply Monthly*, DOE/EIA-0109(90/04) (June 1990) and predecessor publications; *An Analysis of Heating Fuel Market Behavior 1989-1990*, SR/OG/90-01 (June 1990); and *Short-Term Energy Outlook*, DOE/EIA-0202(90/3Q) (September 1990).

Table 1. U.S. Consumption, Supply, and Price of Distillate Fuel Oil, Winter 1988-90
(Thousand Barrels per Day)

	1988-89	1989-90	Percent Change
Consumption (Thousand Bbl/Day)	3352.9	3342.3	-0.3
Supply (Thousand Bbl/Day)			
Production	2882.6	2966.1	2.9
Net Imports	279.9	247.1	-11.7
Stock Changes	190.6	129.0	-32.3
Total	3352.9	3342.3	-0.3
Price (Dollars/Bbl)			
Wholesale	$20.97	$27.10	29.2
Residential	$34.41	$41.09	19.4

Note: "Winter" is the winter heating season from October 1 through March 31. Data are time-weighted averages of monthly data. "Product supplied" data are used to represent consumption. Supply components do not equal total supply because of independent rounding.

Sources: Calculated from Energy Information Administration, *Petroleum Supply Monthly* (June 1990); *Petroleum Marketing Monthly* (February 1989 through April 1990); *Petroleum Marketing Annual 1988* (October 1989).

The difference in heating degree days in January and February 1990 from the previous year nearly mirrored the differences in November and December from the previous years. Nationally, it was 8 percent warmer than 1989 in January, 22 percent warmer than 1989 in February, and 12 percent warmer than 1989 in March. January was the warmest since at least 1895.[5] However, warmer weather translated into only a 5-percent drop in consumption for January through March (Table 3), because less than half of distillate consumption is devoted to space heating (Table 2).

[5] National Oceanic and Atmospheric Administration, *Monthly State, Regional and National Heating/Cooling Degree Days Weighted by Population*, (Washington, DC); telephone discussion with representative of National Oceanic and Atmospheric Administration, June 28, 1990.

Table 2. U.S. Distillate Consumption by Sector and Region, 1988
(Thousand Barrels per Day)

	Petroleum Administration for Defense District					
Sector	I	II	III	IV	V	U.S.
Residential	392	85	0	3	18	499
Commercial	154	47	26	7	35	269
Industrial	114	179	164	33	82	573
Transportation	521	539	323	68	279	1730
Electric	31	10	3	1	6	51
Total	1212	861	517	111	420	3122

Source: Calculated from Energy Information Administration, *State Energy Data Report* (May 1990).

Table 3. U.S. Distillate Consumption and Production, 1988-90
(Thousand Barrels per Day)

	1988-89	1989-90	Percent Change
Consumption			
October	3218	3127	-2.83
November	3183	3311	4.02
December	3560	3914	9.94
January	3303	3177	-3.81
February	3427	3250	-5.16
March	3428	3265	-4.75
Production			
October	2827	2906	2.79
November	2909	3063	5.29
December	3068	3266	6.45
January	2974	3136	5.45
February	2797	2753	-1.57
March	2713	2655	-2.14

Note: "Product supplied" data is used to represent consumption.

Source: Energy Information Administration, *Petroleum Supply Monthly* (June 1990).

Distillate fuel oil consumption in 1989-90 was not only slightly less than 1988-89, it was also 2 percent less than expected under weather-adjusted consumption[6] (Figure 1). In November 1989, consumption was 2 percent more than the weather-adjusted estimate and in December it was 11 percent more than the weather-adjusted estimate. In the other 4 months consumption ranged from 1 percent less than the weather-adjusted estimate in October to 10 percent less than the weather-adjusted estimate in January.

Regional

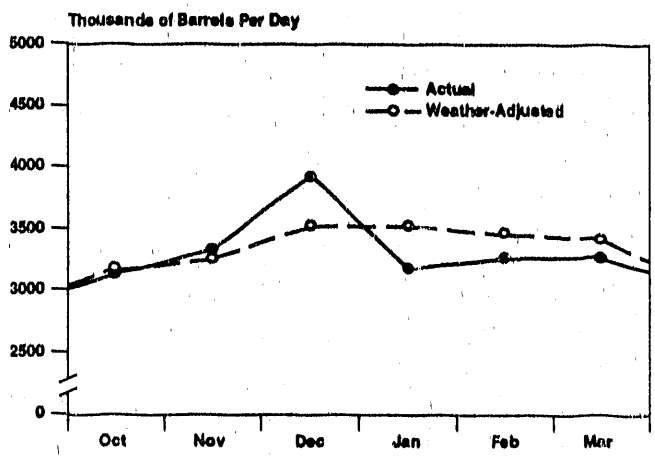
Forty-three percent of the distillate fuel oil used during the 1989-90 heating season was consumed on the East Coast (Petroleum Administration for Defense District (PADD) I), more than in any other region of the country. The Midwest (PADD II) was next, at 26 percent, followed by the Gulf Coast (PADD III), the West Coast (PADD V), and the Rocky Mountain region (PADD IV).[7]

As the Nation's largest consumer of distillate fuel oil, the East Coast has a disproportionate effect on total consumption. During the month of December, East Coast consumption was up 17 percent from 1988, while West Coast and Rocky Mountain consumption were actually down from the previous year. In the West, warmer December 1989 weather than 1988 and in the East, 34 percent colder weather than 1988 accounted for

[6] "Weather-adjusted" distillate consumption is an estimate of fuel oil consumption in the winter of 1989-90, **assuming weather follows historically normal patterns.** The estimate was made by the Energy Analysis and Forecasting Division with the Short-Term Integrated Forecasting System using 1951-1980 weather data from the National Oceanic and Atmospheric Administration.

[7] Consumption data in this paragraph and the next paragraph: Energy Information Administration, *Petroleum Supply Annual 1989, Volume 1*, DOE/EIA-0340/1 (Washington, DC, May 1990); *Petroleum Supply Monthly*, DOE/EIA-0109 (90/06).

Figure 1. U.S. Distillate Consumption, Actual and Weather-Adjusted, 1988-90



Note: "Weather-adjusted" distillate consumption is an estimate of fuel oil consumption, if weather had followed historically normal patterns. The estimate was made with the Short-Term Integrated Forecasting System using 1951-80 weather data from the National Oceanic and Atmospheric Administration.

Sources: Energy Information Administration, **Actual**: *Petroleum Supply Monthly* (June 1990); **Weather Adjusted**: Office of Energy Markets and End Use.

these consumption patterns. By February 1990, all regions of the country were warmer than in February 1989. The East Coast was 19 percent warmer and the Gulf Coast was 38 percent warmer.[8]

Weather has a significant impact on East Coast distillate fuel oil consumption, because residential consumption is the second largest end use on the East Coast, after transportation. In the New England and Mid-Atlantic subregions, residential consumers are the largest users of distillate fuel oil. According to the latest available data, 43 percent of East Coast consumption was devoted to transportation and 32 percent to residential uses in calendar year 1988 (Table 2). East Coast residential consumption was 79 percent of total U.S. residential distillate fuel oil consumption in calendar year 1988. Eight of the top 10 States in residential consumption were on the East Coast. Only 30 percent of diesel fuel consumed in the United States is consumed on the East Coast.[9]

The West Coast showed the largest variation in year-to-year consumption changes from last winter to the previous winter. January 1990 consumption was 5 percent less than 1989, while March 1990 consumption was 22 percent more than 1989. However, because the West Coast was the next to the smallest of five PADD regions, these variations had little effect on overall consumption.[10]

[8] National Oceanic and Atmospheric Administration, *Monthly State, Regional and National Heating/Cooling Degree Days Weighted by Population*, (Washington, DC).

[9] Energy Information Administration, *State Energy Data Report*, DOE/EIA-0214(88)(Washington, DC, April 1990).

[10] Energy Information Administration, *Petroleum Supply Annual 1989, Volume 1*, DOE/EIA-0340(89)/1 (Washington, DC, May 1990); *Petroleum Supply Monthly*, DOE/EIA-0190(90/03) (Washington, DC, May 1990).

Supply

Although overall consumption of distillate fuel oil was slightly less last winter than the winter before, domestic production increased, while net imports and supplies taken from inventory decreased (Table 1). By the end of December, cold weather sent inventories plunging to their lowest year-end level in nearly 40 years. To rebuild inventories, December production and January gross imports were the highest of any month in more than 10 years.

Domestic production is the largest source of distillate fuel oil; it made up 89 percent of consumption during the winter of 1989-90. But with refineries operating very close to their maximum capacity, supplies from imports and inventories were just as important. Net imports and inventories supplied 7 and 4 percent, respectively, of the Nation's needs.

Domestic Production

Distillate fuel oil production was up about 3 percent in the United States last winter, compared to the winter of 1988-89. Monthly rates of change ranged from an increase of over 6 percent to a decrease of 2 percent (Table 3). During each month last winter—except the crucial month of December—the rate of change in production grew faster or declined more slowly than consumption, when compared to the previous year.

During the last 2 weeks of December, at least 17 major refineries reduced distillate fuel oil production, because of fires or freezing weather.[11] These 17 represented more than one-quarter of U.S. refining capacity. Many of the affected refineries were on the Gulf Coast, the Nation's major oil-refining area, where heating degree days for December were 57 percent above 1988. Temperatures in Houston, Texas, reached a record low of 7 degrees above zero. Refineries along the Gulf Coast—designed to operate in a warm climate—reported frozen pipes, pumps, gauges, and valves.[12] The second largest U.S. refinery, the Exxon Baton Rouge plant, suffered a fire on Christmas Eve, which killed two workers and completely shut down operations for a week.[13] Gulf Coast refiners reported that production slipped 27 percent for the week ending December 29, 1989, compared to the previous week.[14]

Even though distillate fuel oil production failed to keep up with consumption in December, refiners—motivated by rapidly rising prices—made a concerted effort to do so. Domestic production for December reached 3.3 million barrels per day (Table 3), the highest since September 1979. During the week

[11] Telephone discussions with respondents to Form EIA-800, "Weekly Refinery Report."

[12] National Oceanic and Atmospheric Administration, *Monthly State, Regional and National Heating/Cooling Degree Days Weighted by Population*, (Washington, DC); telephone discussion with representative of National Weather Service, August 13, 1990.

[13] "Baton Rouge Refinery In Operation, Exxon Says," *Oil Daily* (Washington, DC, January 3, 1990), p. 1.

[14] Energy Information Administration, *Weekly Petroleum Status Report*, DOE/EIA-0208(90-02)(Washington, DC, December 29, 1989), p. 22.

ending December 22, production rose to 3.5 million barrels per day, the highest 1-week level in more than 10 years.[15] Distillate fuel oil yields were 23.8 percent in December, the highest since December 1985, because refiners produced distillate fuel oil instead of lighter products. For the entire winter, distillate fuel oil yields averaged 21.5 percent, compared to 21.1 percent during the winter of 1988-89.[16]

As with distillate fuel oil production, refinery utilization of operating capacity in 1989-90 exceeded that in 1988-89 in each month except December. Utilization of operating capacity was 87.6 percent in December 1989, but 91 percent in December 1988, reflecting the refinery problems on the Gulf Coast. Overall utilization of operating capacity was 89.7 percent last winter, compared to 88.7 percent the previous winter.[17]

Transportation problems also limited the ability of refiners to get their product to market in December. The Jones Act, which prohibits foreign ships from delivering cargoes from one U.S. port to another, prevented at least two ships from delivering oil to the East Coast during late December and early January. On the Mississippi River, low water and ice jams between mouth of the Missouri River and St. Louis, Missouri, caused suspension of navigation during the last half of December. (Ice jams normally close the mid-Mississippi in late January, but warm weather prevented formation of any jams during January 1990.) On the East Coast, icy conditions during December sometimes made it difficult to unload barges and to deliver fuel oil by truck.[18]

While no terminals or pipelines were consistently out of distillate fuel oil for days at a time, a few terminals in the Northeast ran out for a day or two. Some dealers reported waits of 3 to 4 hours to pick up distillate fuel oil. Exxon, Mobil, and Texaco reported temporary depletions at some of their terminals late in December. Mobil rationed heating oil to its dealers in 11 Northeastern States from December 20 through 31 and Colonial Pipeline pro-rated space for distillate fuel oil shipments late in December.[19]

Although each month's production exceeded the previous year's during the first 4 months of the winter of 1989-90, February and March 1990 production were lower than in 1989 (Table 3). High production in December and January and high imports in January and February, as well as warm weather, filled inventories to seasonal levels, brought down prices, and reduced production.

Foreign Trade

Net imports of distillate fuel oil during the winter of 1989-90 were down 12 percent compared to the previous winter (Table 1). Ties between the European and U.S. East Coast fuel oil markets were evident in this decline. High European prices drew supplies of distillate fuel oil to Europe that normally would have been sent to the United States. Some U.S. distillate fuel oil even went to Europe.

Gross distillate fuel oil imports for the 1989-90 heating season were lower than the previous heating season in each month, except January and February (Table 4). Month-to-month differences in imports from the previous year ranged from a gain of 45 percent to a loss of 36 percent. Exports were up for the first 3 months of the heating season and down for the last 3 months, compared to the previous year. Because exports are much smaller than imports, percentage differences in exports fluctuated even more wildly, from an increase of 262 percent (89,000 barrels per day) to a decrease of 60 percent (99,000 barrels per day).

A short-lived October cold spell in Northern Europe combined with several other factors[20] to increase European consumption of distillate fuel oil. October 1989 European consumption was 8 percent greater than October 1988, while November and December 1989 consumption were lower than November and December 1988.[21]

Higher European consumption raised relative European/U.S. prices, compared to 1988. The relatively high prices of European distillate fuel oil tended to reduce European exports to the United States and to draw other foreign supplies toward Europe instead of to the United States.[22] Although the United States received distillate fuel oil imports from four European nations and Saudi Arabia in November 1989, in December 1989 all U.S. distillate fuel oil imports came from the Western Hemisphere.[23]

Meanwhile, U.S. exports of distillate fuel oil to several European and Asian nations increased sharply in November and December. For example, Japan, Netherlands, Singapore, Italy, and even Venezuela[24] received significantly increased

[15] Energy Information Administration, *Weekly Petroleum Status Report*, DOE/EIA-0208(90-02)(Washington, DC, December 29, 1989), p. 22.
[16] Energy Information Administration, *Petroleum Supply Annual 1989, Volume 1*, DOE/EIA-0340(89)/1 (Washington, DC, May 1990); *Petroleum Supply Monthly*, DOE/EIA-0190(90/03)(Washington, DC, May 1990).
[17] Energy Information Administration, *Petroleum Supply Monthly*, EIA/DOE-0109, (Washington, DC, December 1989 and March 1990), Table H2.
[18] Telephone conversation, representative of U.S. Army Corps of Engineers, St. Louis, July 30, 1990; American Petroleum Institute, *Response 438* (December 27, 1989).
[19] Minutes from Government/Industry Meeting on Severe Weather Conditions at U.S. Department of Energy, December 23, 1989; Todd Smith, "Cold snap drains heating oil supply," *Washington Times* (Washington, DC, December 25, 1989), p. B5; T.C. DeLoach, Mobil Oil Corporation, to Robert Abrams, New York Attorney General, letter (January 17, 1990); David L. Langley, "Heating Fuel Price Increases," hearing before Robert Abrams and other New York officials, January 23, 1990.
[20] Low water on the Rhine River, coal strikes in the U.S.S.R., and European delays in filling heating oil tanks. "Cold Snap Warms Refiners' Hearts in Europe and US," *Petroleum Intelligence Weekly* (New York, NY, December 18, 1989), p. 3.
[21] International Energy Agency, *Monthly Oil and Gas Statistics* (Paris, France).
[22] Energy Information Administration, *An Analysis of Heating Fuel Market Behavior 1989-1990*, SR/OG/90-01 (Washington, DC, June 1990), p. 39-40.
[23] These data and data in the following three paragraphs are from: Energy Information Administration, *Petroleum Supply Annual 1989, Volume 1* (DOE/EIA-0340(89)/1 (Washington, DC, May 1990); *Volume 2* (DOE/EIA-0340(89)/2 (Washington, DC, June 1990); *Petroleum Supply Monthly*, DOE/EIA-0109(90/03) (Washington, DC, May 1990).
[24] Venezuela is the largest foreign supplier of distillate fuel oil to the United States.

Table 4. U.S. Distillate Foreign Trade, 1988-90
(Thousand Barrels per Day)

	Imports			Exports			Net Imports		
	1988-89	1989-90	Percent Change	1988-89	1989-90	Percent Change	1988-89	1989-90	Percent Change
October	336	261	-22.3	48	90	87.5	288	171	-40.6
November	327	307	-6.1	34	123	261.8	293	184	-37.2
December	409	324	-20.8	87	130	49.4	322	194	-39.8
January	346	501	44.8	110	62	-43.6	236	439	86.0
February	331	357	7.9	164	65	-60.4	167	292	74.9
March	439	280	-36.2	76	75	-1.3	363	205	-43.5

Source: Energy Information Administration, *Petroleum Supply Monthly* (June 1990).

quantities in November and December 1989, compared to 1988. With the early cold spell in Europe, Europeans and others were willing to pay higher prices than American buyers, thus drawing distillate fuel oil exports away from the United States.

As the December cold spell in the United States lengthened, prices soared and drew more imports toward the United States. Although December distillate fuel oil imports were 6 percent above the November 1989 level, the sharp December increases in imports of the past 2 years never materialized (Table 4). Gross imports were the equivalent of 8 percent of product supplied in December 1989, compared to 11 percent during the previous two Decembers.

Transportation lags and storms in the Atlantic Ocean delayed a surge in imports until after the cold spell had almost ended. Gross distillate fuel oil imports averaged more than half a million barrels per day in January, more than any month since March 1977. Although the United States received imports from only 4 countries in December 1989, imports came from 14 nations in January 1990. Most of the incremental supplies came from Eastern Hemisphere countries, such as the U.S.S.R, Algeria, and West Germany.[25]

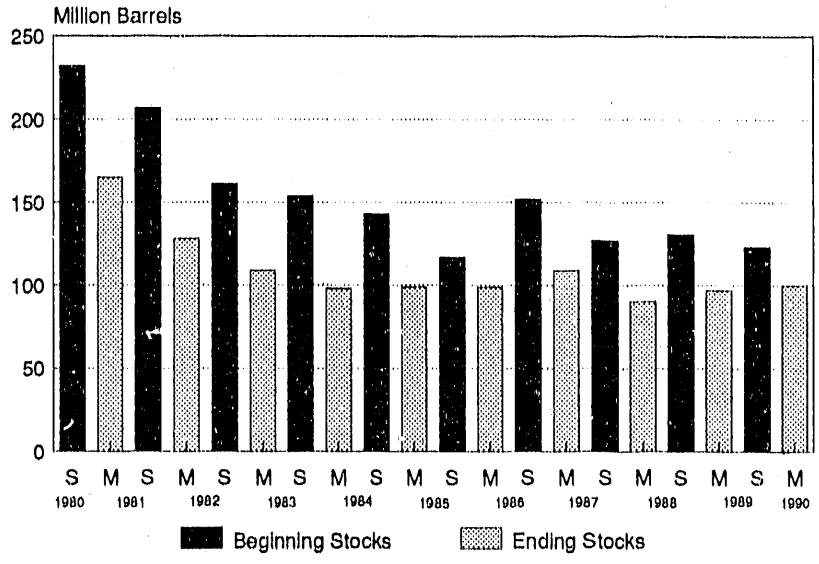
Net imports in January and February 1990 were higher than the same months in 1989, but by March 1990 imports had once again fallen below March 1989 (Table 4). Lower consumption in the first 3 months of 1990 than 1989, combined with ample inventories resulting from high January and February domestic production, made significant March imports unnecessary.

Inventories

Even though inventories of distillate fuel oil began the heating season at their lowest level in 4 years, significant domestic production and warm weather brought end-of-season stocks to their highest level in 3 years (Figure 2). Partly because distillate fuel oil stocks were lower during the 1989-90 heat-

[25] Energy Information Administration, *Petroleum Supply Annual 1989, Volume 1*, DOE/EIA-0340(89)/1 (Washington, DC, May 1990); *Petroleum Supply Monthly*, DOE/EIA-0190(90/03) (Washington, DC, May 1990).

Figure 2. U.S. Distillate Fuel Oil Stocks, Heating Season 1980-1990



Note: Beginning Stocks are as of September 30 (S); Ending Stocks are as of March 31 (M).
Source: Energy Information Administration, *Petroleum Supply Monthly*, (June 1990); *Petroleum Supply Annual 1989*, (May 1989) and predecessor publications.

ing season than the year before, absolute withdrawals from stocks were about one-third less last winter than the previous winter (Table 1).

During the winter of 1989-90, distillate fuel oil stocks were below the previous winter's level for the first 4 months of the season, but above the previous year's level at the end of February and March (Table 5). Stocks began the heating season at low levels, because of strong consumption of diesel fuel in the spring and summer, and increased summer exports of distillate fuel oil. Tight international supplies had raised prices in the summer, not only luring exports from the United States, but also reducing incentives to store distillate fuel oil for the winter.

In order to meet December's increased demand, stocks were drawn down to 106 million barrels (Table 5), the lowest year-end level since 1952. Distillate fuel oil stocks do not normally fall this low until February or March. The 14-million-barrel November-to-December 1989 withdrawal was the largest in

Table 5. U.S. Distillate Fuel Oil Stocks, 1988-1991
(Million Barrels)

	UNITED STATES					EAST COAST (PADD I)				
	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 / a	Percent Change (c-b*100) / b	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 / a	Percent Change (c-b*100) / b
June	110	100	109	-9	9	37	36	40	-3	11
July	120	115	126	-4	10	45	45	52	0	16
August	126	116	130	-8	12	52	48	56	-8	17
September	131	123	--	-6	--	57	50	--	-12	--
October	128	122	--	-5	--	57	52	--	-9	--
November	129	120	--	-7	--	55	50	--	-9	--
December	124	106	--	-15	--	49	35	--	-29	--
January	121	118	--	-2	--	47	44	--	-6	--
February	108	112	--	4	--	37	39	--	5	--
March	97	100	--	3	--	33	31	--	-6	--
April	99	99	--	0	--	33	30	--	-9	--
May	100	103	--	3	--	33	34	--	3	--

	MIDWEST (PADD II)					GULF COAST (PADD III)				
	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 / a	Percent Change (c-b*100) / b	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 / a	Percent Change (c-b*100) / b
June	30	27	30	-10	11	27	24	25	-11	4
July	31	29	32	-6	10	29	28	28	-3	0
August	31	29	32	-6	10	28	26	29	-7	12
September	30	31	--	3	--	29	29	--	0	--
October	29	29	--	0	--	29	28	--	-3	--
November	29	29	--	0	--	30	27	--	-10	--
December	31	31	--	0	--	28	25	--	-11	--
January	33	33	--	0	--	28	26	--	-7	--
February	31	33	--	6	--	26	25	--	-4	--
March	27	30	--	11	--	23	24	--	4	--
April	27	29	--	7	--	24	25	--	4	--
May	27	30	--	11	--	25	24	--	-4	--

Note: August 1990 data are preliminary.
Sources: Energy Information Administration, *Petroleum Supply Monthly*, (June 1990); *Petroleum Supply Annual 1989, Volume 2*, (June 1990) and predecessor publications; *Weekly Petroleum Status Report*, (September 7, 1990).

almost 2 years and represented a 12-percent drop in stocks. East Coast (PADD I) inventories declined 29 percent from November to December 1989, while Gulf Coast (PADD III) inventories fell 7 percent. In January, however, aided by warm weather, U.S. stocks increased by 12 million barrels, the fastest rise since August 1986.

Throughout the 1980's, high carrying costs and volatile prices have contributed to the gradual decline of beginning-of-season distillate fuel oil inventories. This past winter, in addition to the higher than normal pre-season demands, exports, and prices already mentioned, forecasts of warmer-than-normal weather and memories of costly high stock levels in the winter of 1988-89 also contributed to low beginning stocks.

Refiners, pipelines, and large terminal operators have little incentive to accumulate large inventories, unless they have good prospects of recovering their costs to store distillate fuel oil. In addition to the cost of investing capital in inventories for several months during a time of high interest rates, inventory holders must pay the cost of purchasing and maintaining tanks. During the 1980's, the prime interest rate averaged 11.8 percent, compared to 8.1 percent in the 1970's and just 5.3 percent in the 1960's.[26] These rising costs give inventory holders an incentive to take advantage of the computerized measuring, monitoring, and distribution methods that make it possible to control inventory—and costs—more carefully.

In the summer of 1989, strong diesel demand and strong international demand pulled prices upward. As a result, the spread between spot and futures market prices was rarely as high as 2 cents per gallon, averaging about 1.5 cents in August and less in September. This spread was probably insufficient to cover carrying costs. Meanwhile, the prime interest rate averaged 10.9 percent.[27]

Price volatility makes it risky to hold stocks inventories of distillate fuel oil. If retail prices rise, holders of inventory will benefit, but if prices fall, they will be forced to sell their product at a loss. During the 1980's wholesale prices were more volatile than during the 1970's.[28] Price volatility has increasingly forced the industry to hedge its purchases and sales on the commodity markets. A hedge may deprive a firm of profits from a price increase, but can insure a firm against losses in the event of a price decrease. Hedging itself has further reduced incentives to hold stocks, because it takes over much of the speculative function sometimes formerly performed by holding stocks.

Forecasts of warmer-than-normal weather complicated the inventory picture in 1989. At the end of October, the National Weather Service predicted a 60-percent chance of warmer-than-normal weather in much of New England and the Mid-Atlantic for November through January. As late as the end of November, the 90-day forecast showed a 60-percent probability for warmer-than-normal weather in lower New England and the Mid-Atlantic, and a 70-percent probability of warmer-than normal weather in Delaware, southern New Jersey, eastern Maryland, eastern Virginia, and eastern North Carolina.[29] On top of these forecasts, some dealers remembered that they had stocked up in 1988, only to end up selling at a loss or at a smaller profit than usual. Some consumers also remembered the warm weather and failed to stock up before the onset of winter.[30]

Even though end-of-December inventories dipped to historically low levels, stocks at the end of March were close to 100 million barrels (Figure 2). During the last 7 years, end-of-March stocks have only exceeded this level once.

Price

Distillate fuel oil prices responded to the winter heating season's unusual demand and supply conditions by increasing very rapidly and unexpectedly in late December and declining almost as rapidly in January. This rapid increase in prices gave inflation a temporary boost and resulted in increased low-income heating assistance, but did not significantly improve oil company profits during the heating season.

During the entire winter of 1989-90, both wholesale and retail distillate fuel oil prices were more than $6 per barrel higher than the previous winter (Table 1). Much of the year-to-year increase is attributable to increased refiner acquisition costs for crude oil, but part of it is attributable to declining stock levels at a time when high refinery utilization rates made it impossible to increase domestic production.

Changes in both supply and demand played a role in the rapid December escalation of prices. Distillate fuel oil supplies were restricted by cold weather on the Gulf Coast and by declining imports. This forced inventories to serve as the marginal source of supply—a role usually taken by imports. Demand increased sharply because of the cold, as well. A significant share of the weather-induced jump in consumption came from consumers of distillate fuel oil like utilities, hospitals, and schools, that normally rely on other fuels.

[26] Calculated from *Economic Report of the President* (Washington, DC, February 1990), p. 376.

[27] Energy Information Administration, *An Analysis of Heating Fuel Market Behavior 1989-1990*, SR/OG/90-01 (Washington, DC, June 1990), p. 37; calculated from *Economic Report of the President* (Washington, DC, February 1990), p 376.

[28] The standard deviation of monthly wholesale prices was never below 2 cents per gallon in any year of the 1980's, and was more than 10 cents per gallon in 1986, while the standard deviation occasionally slipped below 1 cent per gallon during the 1970's. With the significant runup in prices at the end of the year, 1989's standard deviation was 5.8 cents per gallon. Calculated from Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487(88) (Washington, DC, October 1989); *Petroleum Marketing Monthly*, DOE/EIA-0380(90/03) (Washington, DC, June 1990).

[29] National Oceanic and Atmospheric Administration, *Monthly & Seasonal Weather Outlook* (Washington, DC, October 31 and November 29, 1989).

[30] John M. Berry, "Heating Oil Prices Surge In Northeastern States," *Washington Post* (Washington, DC, December 22, 1989), p. A9; Minutes from Government/Industry Meeting on Severe Weather Conditions at U.S. Department of Energy, December 23, 1989.

Supply and demand played an equally important role in the rapid fall in prices during January. High domestic production in December and January and high imports during January and February restored inventories to seasonal levels and eased fears of shortages. In early January the cold wave broke and soon gave way to balmy February temperatures, reducing demand for distillate fuel oil.

As a result of this rapid rise and fall in prices, both wholesale and retail monthly average prices were more volatile in 1989-90 than the previous winter. Monthly retail prices varied less than 12 cents per gallon in 1988-89, but more than 28 cents per gallon in 1989-90. From November to December 1989, average retail prices increased 19.3 cents per gallon to $1.08 cents per gallon. This 22-percent increase was the largest 1-month increase recorded since the Department of Energy began retail price data collection in 1982. Prices peaked in January at $1.14 per gallon. Then, from January to February 1990, retail prices dropped 17.8 cents per gallon. This 16-percent drop was the largest 1-month decrease since data collection began.[31]

Average monthly wholesale prices did not move as rapidly as average monthly retail prices, but wholesale spot prices moved even more rapidly (Figure 3). From their November 15 low of $23.85 per barrel, prices more than doubled to $48.39 at their December 27 peak. By February 9, however, wholesale spot prices were back down to $23.14 per barrel. Wholesale prices went so high that during December and January the average monthly wholesale price of distillate fuel oil exceeded the wholesale price of finished gasoline for the first time in 4 years.[32]

The East Coast, the area of the country consuming the largest amount of distillate fuel oil, experienced the highest retail prices during the winter of 1989-90. Within this area, New England and the Mid-Atlantic States experienced average prices of more than $1.18 cents per gallon in January. Retail prices as high as $1.50 per gallon were reported in New Hampshire.[33] Unlike most parts of the country, high natural gas transportation costs make home heating oil generally cheaper than natural gas in New England. During December and January, however, natural gas was less expensive than heating oil.[34] Prices in the Nation's second largest consuming area, the Midwest, increased 16 percent from November to December; West Coast prices were minimally affected.[35]

The December rise in distillate fuel oil prices had a significant, though temporary, effect on consumer prices. Consumer prices rose 0.4 percent in December; only a small part of the increase was caused by heating fuel price increases. However, consumer prices rose 1.1 percent in January 1990, the largest

[31] Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487(88) (Washington, DC, October 1989); *Petroleum Marketing Monthly*, DOE/EIA-0380(90/03) (Washington, DC, June 1990). The Bureau of Labor Statistics reported a 25 percent increase in residential fuel oil prices from December 1989 to January 1990, the biggest monthly increase since it began collecting data in 1956.

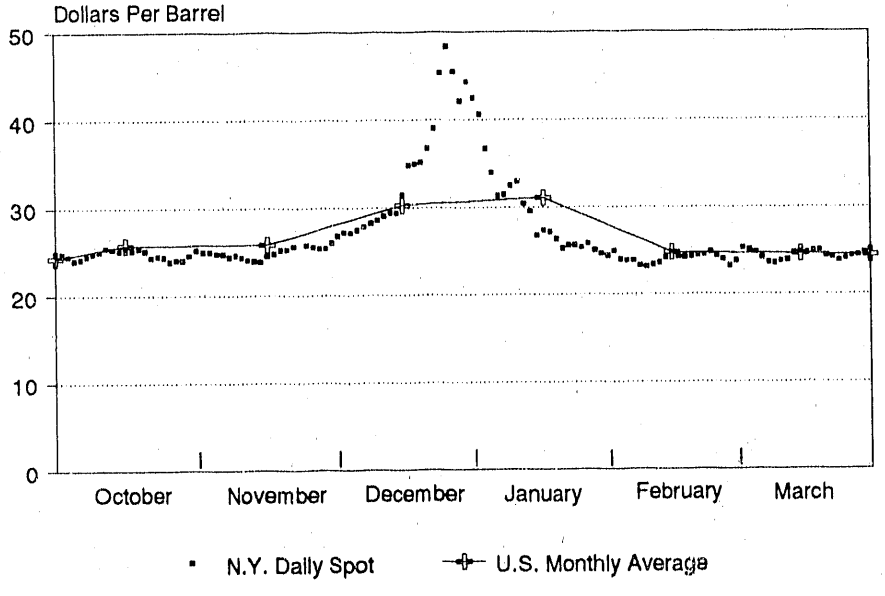
[32] Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487(88) (Washington, DC, October 1989); *Petroleum Marketing Monthly*, DOE/EIA-0380(90/03) (Washington, DC, June 1990).

[33] Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487(88) (Washington, DC, October 1989); *Petroleum Marketing Monthly*, DOE/EIA-0380(90/03) (Washington, DC, June 1990); State of New Hampshire, *Energy Supply Crisis Review Board Report* (Concord, NH, February 14, 1990), p. 11.

[34] Calculated from Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90-03) (Washington, DC, June 1990), pp. 99, 107, 124, 125.

[35] Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487(88) (Washington, DC, October 1989); *Petroleum Marketing Monthly*, DOE/EIA-0380(90/03) (Washington, DC, June 1990).

Figure 3. U.S. Wholesale Distillate Fuel Oil Prices, 1989-1990



Sources: **Spot**: Reuter's News Service; **Monthly Average**: Energy Information Administration, *Petroleum Marketing Monthly* (October through May 1990).

increase in more than 7 years. Energy and food costs increases accounted for more than 60 percent of the increase. Fuel oil costs alone soared a record 27 percent in January. The monthly increase in the Consumer Price Index was only 0.5 percent in February, and even less in March, as heating oil prices eased.[36]

Trucking companies, some of the largest users of distillate fuel oil, responded to the rise in diesel fuel prices with rate surcharges of their own or by indexing freight rates to fuel costs. According to a weekly survey of truckstops by the Interstate Commerce Commission, diesel prices remained around $1.15 per gallon from mid-October through mid-December. By January 8, however, prices increased 25 percent to an average of $1.44 per gallon. Individual truckers reported paying more than $2 per gallon in Connecticut and Massachusetts.[37]

Wholesale prices were similarly affected by heating oil prices. The January increase in the Producer Price Index was 1.8 percent. But the December increase in prices had little effect on economic growth. In a typical U.S. household the average monthly distillate fuel oil bill increased $14 from October through February—not enough to significantly depress consumer demand and economic growth.[38]

During the winter of 1989-90, the amount of Federal funds available to assist low-income persons with heating bills was significantly less than it had been at its peak 5 years before. In terms of current dollars, only about two-thirds of what had been available in 1985 was available; in terms of constant dollars, only 58 percent of the 1985 amount was available.[39]

Advocates of low-income energy assistance argued that the December price increases merited additional appropriations. Programs in the Northeast quickly ran short of money and requested the balance of their Fiscal Year 1990 money months in advance. Congress agreed to provide more money, and on May 25, 1990, President Bush signed into law an emergency supplemental appropriations bill providing an additional $50 million.[40]

[36] Hilary Stout, "Economy: Consumer Prices Climbed 1.1% During January," *Wall Street Journal* (New York, NY, February 22, 1990), p. A2; Energy Information Administration, *An Analysis of Heating Fuel Market Behavior 1989-1990*, SR/OG/90-01 (Washington, DC, June 1990), p. 15.

[37] Interstate Commerce Commission, "Diesel Fuel Prices," July 10, 1990; Lana Batts, "Heating Oil, Propane, and Diesel Fuel Price Increases," hearing before Subcommittee on Energy and Power of House Committee on Energy and Commerce, January 9, 1990.

[38] Hilary Stout, "Economy: Consumer Prices Climbed 1.1% During January," *Wall Street Journal* (New York, NY, February 22, 1990), p. A2. Energy Information Administration, *An Analysis of Heating Fuel Market Behavior 1989-1990*, SR/OG/90-01 (Washington, DC, June 1990), p. xi.

[39] Family Support Administration, "Summary Statistics on HHS Energy Assistance Programs, Fiscal Years 1981-1990" (March 15, 1990); Calculated from *Economic Report of the President* (Washington, DC, February 1990), p. 376.

[40] Lawrence Kelly, "Home Heating Fuels Crisis," hearings before the Senate Governmental Affairs Committee, January 16, 1990; U.S. House of Representatives, Committee Report 101-434; Family Services Administration, Low-Income Home Energy Assistance Action Transmittal No. FSA-AT-90-4, June 8, 1990.

While the December runup in prices undoubtedly helped the profits of refiners and marketers who were holding stocks at the time of the price increase, in fact, refinery profits fared rather poorly during the 1989-90 heating season. Among other problems, product prices tended to fall faster than crude oil prices during the first quarter of 1990, weather problems and the cost of quickly changing refinery product slates increased operating costs, and sales were down sharply in the first quarter of 1990.

Compared with the same quarters the previous year, profits from the major oil companies refinery and marketing operations were 70 percent less in the last quarter of 1989 and 48 percent less in the first quarter of 1990. Independent refiners suffered comparable declines of 57 percent and 32 percent in their net income.[41]

Propane

Because shortages lasting more than a day or two occurred in some places, propane prices were more volatile than distillate fuel oil prices during the 1989-90 heating season. Yet, overall consumption was about the same as during the previous winter heating season. Domestic production and inventory withdrawals declined while imports increased in 1989-90, compared to the previous winter season.

Consumers affected by price increases and shortages were primarily residents of rural areas and small towns. Natural gas utilities also use propane to maintain pressure in distribution lines during peak demand periods. Natural gas customers, whose supplies have been interrupted, sometimes use propane as a substitute.[42]

Although overall propane consumption has been stable during the last two heating seasons, month-to-month consumption varied sharply. During October, November, and December 1989, propane consumption increased 9, 10, and 20 percent, respectively, compared to 1988. However, in January, February, and March 1990, propane consumption was down 16, 18, and 8 percent, respectively, compared to 1989. The November through February increases and decreases in consumption largely reflect weather patterns.[43]

Domestic production, the most important source of propane, made up 76 percent of consumption during the 1989-90 heating season. Although both petroleum refineries and

[41] Energy Information Administration, *An Analysis of Heating Fuel Market Behavior 1989-1990*, SR/OG/90-01 (Washington, DC, June 1990), p. xi.

[42] Thomas W. Lipman and Alison Howard, "Cold Strains Nation's Energy Delivery System; Area Utilities, Faced with Record Usage, Ask Customers to Conserve," *Washington Post* (December 24, 1989); New Jersey Board of Public Utilities, An *Analysis of December 1989 Heating Oil Prices Increases* (February 5, 1990), pp. 7-8; Pennsylvania Energy Office, *Final Report: Heating Fuels Survey, 1989/1990 Heating Season* (Harrisburg, PA, April 16, 1990), p. 12.

[43] Data in this paragraph and the next four paragraphs: Energy Information Administration, *Petroleum Supply Annual 1989, Volume 1*, DOE/EIA-0340(89)/1 (Washington, DC, May 1990); *Volume 2*, DOE/EIA-0340(89)/2 (Washington, DC, June 1990); *Petroleum Supply Monthly*, DOE/EIA-0109(90/03) (Washington, DC, May 1990).

natural gas-processing plants produce propane, more propane typically comes from natural gas processing plants than from refineries. Withdrawals from existing stocks supplied 16 percent of consumption in 1989-90, and net imports supplied the rest. Compared with 1988-89, production declined 3 percent and stock withdrawals declined 4 percent. Net imports grew 24 percent in 1989-90, from 7 to 9 percent of total consumption.

Propane production in the United States was lower than the previous year in each month of the 1989-90 heating season, except February when it was up 6 percent. Production was off 7 percent in both October and the cold month of December, as well as down 3 percent in November and January. Declines in November through January production were caused primarily by weather-related operating problems. February production increased as the industry rebuilt stocks.

Propane stocks began the 1989-90 heating season at a lower level than the previous year and sank to very low levels at the end of December (Table 6). At the beginning of October 1989, propane stocks in primary storage were just over 59 million barrels, about 6 percent below October 1, 1988. In December 1989, however, stock withdrawals amounted to 16.7 million

Table 6. U.S. Propane Stocks, 1988-1991
(Thousand Barrels)

	UNITED STATES					EAST COAST (PADD I)				
	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 a	Percent Change (c-b*100) b	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 a	Percent Change (c-b*100) b
June	52196	49609	43990	-5	-11	3039	4030	3323	33	-18
July	58731	56517	48930	-4	-13	3726	4865	3365	31	-31
August	63594	60394	E 53000	-5	-12	4662	4823	E 3305	3	-31
September	63074	59047	--	-6	--	4901	4949	--	1	--
October	61771	53922	--	-13	--	4804	4858	--	1	--
November	59226	48224	--	-19	--	4916	4825	--	-2	--
December	50427	31528	--	-37	--	3847	1789	--	-53	--
January	45099	32979	--	-27	--	3868	2481	--	-36	--
February	36425	32171	--	-12	--	2921	2681	--	-8	--
March	32286	31103	--	-4	--	2298	2710	--	18	--
April	36734	31705	--	-14	--	2633	3009	--	14	--
May	43888	35584	--	-19	--	3049	3216	--	5	--

	MIDWEST (PADD II)					GULF COAST (PADD III)				
	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 a	Percent Change (c-b*100) b	1988-1989 (a)	1989-1990 (b)	1990-1991 (c)	Percent Change (b-a)*100 a	Percent Change (c-b*100) b
June	17965	16594	16083	-8	-3	30390	27926	23632	-8	-15
July	20430	19503	18009	-5	-8	33532	30820	26412	-8	-14
August	22926	20514	E 20942	-11	2	34766	33629	E 27921	-3	-17
September	22917	19596	--	-14	--	33795	33025	--	-2	--
October	21390	16768	--	-22	--	34024	30833	--	-9	--
November	21116	14781	--	-30	--	31824	27311	--	-14	--
December	17408	9498	--	-45	--	28026	19093	--	-32	--
January	15372	11364	--	-26	--	25081	18271	--	-27	--
February	10612	10616	--	0	--	22286	18177	--	-18	--
March	9139	10749	--	18	--	20182	17109	--	-15	--
April	11524	11396	--	-1	--	21718	16674	--	-23	--
May	14088	13561	--	-4	--	25707	18046	--	-30	--

E=Estimated
Sources: Energy Information Administration, *Petroleum Supply Monthly*, (June 1990); *Petroleum Supply Annual 1989, Volume 2*, (June 1990) and predecessor publications; *Weekly Petroleum Status Report*, (September 7, 1990).

barrels, pulling stocks down to 31.5 million barrels. This level of inventories was 37 percent below December 31, 1988. Because of good weather and high domestic production, stocks remained stable through the balance of the season, finishing at 31.1 million barrels, nearly 4 percent below March 31, 1989.

Imports of propane during the 1989-90 heating season were greater than or equal to imports in each month of the previous heating season. December 1989 imports were more than double December 1988 imports. Propane imports did not increase in all parts of the country, however. The East Coast, the area most dependent on propane imports, saw a more than 60-percent decrease in imports from December 1988 to December 1989.

Although no distillate fuel oil dealers were reportedly unable to buy fuel oil for more than a few hours during the winter of 1989-90, the same could not be said of propane. In late December, many propane suppliers could get no more of their product to sell. Shortages were reported in the Northeast, upper Midwest, and as far south as Tennessee and Kansas. Residential customers received the first supplies and lower-priority commercial and industrial customers—like construction sites—were cut off selectively. Dealers also allocated supplies to spread the shortage and refused to accept new customers. Emergency supplies had to be trucked several hundred miles in some cases.[44]

In late December, Governor Madeleine M. Kunin of Vermont restricted propane dealers to making deliveries to tanks that were less than 10 percent full. In neighboring New Hampshire, the State ran an emergency propane distribution program. Using 100,000 gallons of propane from EnergyNorth, Inc., and Northern Utilities, Inc., (local natural gas distribution companies), the State made 18 allocations of propane to dealers who were unable to serve their residential heating customers. Deliveries were limited to 100 gallons and could only be made to customers whose tanks were below 5 percent full.[45]

Propane prices were even more volatile than distillate heating oil prices during the winter of 1989-90. This volatility was unusual because propane prices had been fairly stable for the past 3 years.

At the beginning of the heating season, propane prices were near those of the previous season, and during October and November they remained relatively flat. On December 1, residential propane prices ranged from 66 cents per gallon in Indiana to $1.06 per gallon in Massachusetts. After that, however, propane prices began to rise steadily. During the first half of December, residential prices rose an average of less than 8 cents per gallon, though they rose 19 cents in Massachusetts.

During the last half of December, prices rose very rapidly. Residential prices increased 19 to 40 cents per gallon, with the largest increases in New England and the Mid-Atlantic area. Prices peaked just after the first of the year. Vermont residential consumers paid $1.54 per gallon on January 11, 1990. Prices declined in February, but by May 1 they were still 6 to 8 cents per gallon above December 1 levels.

Outlook

Because of the current uncertainty about energy markets over the next several months, the Energy Information Administration has examined three supply and demand scenarios reflecting alternative estimates of world oil market conditions. These scenarios each include the assumption of constant nominal crude oil prices beginning in September 1990, with values of $20, $25, and $30 per barrel. The results of the $30 case are presented in this article.

Higher distillate fuel oil and propane prices were assured by Iraq's invasion of Kuwait. The answers to several outstanding questions will determine how much higher prices will go: Will the weather be normal this winter, both in the United States and Europe? Can U.S. refineries continue to operate at high rates of capacity utilization? How long will the standoff with Iraq last? Can lost crude oil production be made up by December? and, Will the already low propane inventories be adequate for this winter?

Distillate Fuel Oil

If crude oil prices remain at about $30 per barrel, distillate fuel oil consumers would pay at least 23 cents more per gallon this winter than last winter. This projection, in the September *Short-Term Energy Outlook*,[46] assumes normal weather and sluggish economic growth.

In the $30 case, retail prices for heating oil average $1.24 per gallon during the October 1990 through March 1991 heating season, compared to 99 cents per gallon during the previous season. Diesel oil would sell at $1.31 per gallon.

Wholesale distillate fuel oil prices—covering both heating oil and diesel—would be 89 cents per gallon during the October to March heating season. Distillate fuel oil prices in the New York wholesale spot market closed $1.01 per gallon on September 26, 1990.[47] Higher distillate fuel oil prices largely reflect higher crude oil prices, which would rise from $19.31 per barrel in the winter of 1989-90 to $30 per barrel this winter.

In addition to an average refiner acquisition cost for crude oil at $30 per barrel, this case assumes: 1) normal weather, 2)

[44] "Big Freeze in US Adds Million BD to World Oil Demand," *Petroleum Intelligence Weekly* (New York, NY, January 1, 1990), p. 1.
[45] Thomas W. Lippman and Alison Howard, "Cold Strains Nation's Energy Delivery System; Area Utilities, Faced with Record Usage, Ask Customers to Conserve," *Washington Post* (Washington, DC, December 24, 1989); State of New Hampshire, *Energy Supply Crisis Review Board Report* (Concord, NH, February 14, 1990), p. 9.

[46] The full forecast appears in Energy Information Administration, *Short-Term Energy Outlook*, DOE/EIA-0202(90/3Q) (Washington, DC, September 1990).
[47] Reuters News Service.

average annual growth in real Gross National Product during the 1990-91 heating season of 0.7 percent, and 3) a 1.4 percent increase in the industrial production index, compared to that of the winter of 1989-90.

In the $30 price scenario, distillate fuel oil consumption (product supplied) averages 3.3 million barrels per day during the 1990-91 heating season. Although this level is exactly the same as the 1989-90 heating season, it actually represents a drop in consumption when compared to the weather-adjusted level for the 1989-90 heating season, because the 1990-91 consumption number is weather-adjusted, as well. As with other petroleum products, increasing prices tend to reduce consumption of distillate fuel oil. For the first 7 months of 1990 consumption of distillate fuel oil was 3.06 million barrels per day, down slightly from 1989.

It is possible, however, that the winter of 1990-91 could be colder than normal. In the past 50 years about one-third of the winters were 5 percent colder or warmer than normal. The most recent National Oceanic and Atmospheric Administration forecast indicates the next 3 months will have a 55 percent chance of being below normal from lakes Michigan and Hurron to the Ohio River and eastward to the coast of the Mid-Atlantic region. A cold winter would lead consumers to draw down domestic inventories and increase pressure on prices.[48]

As always, domestic refinery production will supply the largest share of distillate fuel oil consumption. In the $30 case, U.S. refiners produce about 2.80 million barrels of distillate fuel oil per day during the 1990-91 heating season, compared to 2.97 million barrels per day during the 1989-90 heating season. In other words, refiners would supply 86 percent of total product supplied from current production in the 1990-91 season. During the previous heating season, they supplied 89 percent of consumption. For the first 7 months of 1990 production was 2.89 million barrels per day, up 3 percent from 1989.

It is not known how long the refinery industry can sustain currently high utilization rates. If operating and maintenance problems begin to proliferate, production levels will fall. A substantial reduction in capacity utilization would reduce stocks and put additional upward pressure on prices.

Gross imports of crude oil were equivalent to 45 percent of the crude oil input to domestic refineries during the 1989-90 heating season. The equivalent of 43 percent of crude inputs would be imported during this coming heating season. It is possible, however, that crude oil imports might be constrained by the availability of supply, if increases in overseas crude oil production are insufficient to offset the loss of Iraqi and Kuwait supplies. In that case, domestic inventories would be drawn down further, and additional price pressure would build in domestic markets. An estimated 4.3 million barrels per day of crude oil was lost to the world market as a result of trade sanctions against Iraq—more than in either the 1973 or 1979 oil disruption.

The second most important source of supply, net imports, would provide 246,000 barrels per day of the total distillate fuel oil consumed during the upcoming heating season, if world oil prices remain about $30. This would be 8 percent of the total consumption. During the 1989-90 heating season, imports supplied 7 percent of consumption. During this past heating season, Venezuela, the Virgin Islands, and Canada were the principal sources of imports. For the first 7 months of 1990 net imports were 237,000 barrels per day, down 2 percent from 1989.

It is possible, however, that cold weather in Europe or insufficient foreign crude supplies could constrain distillate fuel oil imports. Cold weather in Europe would make distillate fuel oil more valuable in Europe than the United States, and tend to draw imports toward Europe and away for the United States. Insufficient foreign crude supplies would simply mean reduced distillate fuel oil production. Both conditions would reduce domestic inventories and increase upward pressure on prices.

Finally, by December 31, 1990, U.S. stocks would reach 123 million barrels, 16 percent above 1989's ending value of 106 million barrels. By March 31, 1991, stocks would fall to 88 million barrels, compared to 100 million barrels at the end of March 1990. Thus, stocks would finish the heating season above the Minimum Operating Inventory, the level at which local supply disruptions can be expected. Stock drawdowns would provide 7 percent of the distillate fuel oil consumed in the 1990-91 season. During the previous heating season stock drawdowns supplied 4 percent of consumption.

At the end of August 1990, U.S. inventories of distillate fuel oil were about 130 million barrels, some 12 percent above the end of August 1989. Distillate fuel oil stocks on the East Coast—which consumes more distillate than any other area—were at about 56 million barrels, up 16 percent from last year.[49] Although increased domestic production is the key factor in increased distillate fuel oil inventories, the rest of the difference in inventories between August 1989 and August 1990 is attributable to lower consumption.

Propane

Although EIA does not project propane supply and disposition, current inventory levels and prices of propane fuel indicate the possibility of significant problems during the forthcoming winter. Propane inventory levels have never fully recovered from last winter's sudden cold spell in December and remain substantially below even last year. Inventories of propane at the end of August 1990 were at a level of 53 million barrels compared to 60 million barrels a year earlier (Table 6). Propane inventories in August 1990 were the lowest for that month in 20 years.

[48] Energy Information Administration, *Short-Term Energy Outlook*, DOE/EIA-0202 (89/4Q) (Washington, DC, October 1989), p. 39.

[49] Energy Information Administration, *Weekly Petroleum Status Report*, DOE/EIA-0208 (90-38) (Washington, DC, September 7, 1990), p. 10.

More than three-quarters the decline in stocks was on the Gulf Coast. At the end of August propane stocks in PADD III were 27.9 million barrels, 5.7 million barrels or 17 percent below the end of August 1989. In the Midwest, the region most affected by propane shortages last winter, primary propane stocks were 20.9 million barrels at the end of August, 0.4 million barrels above the end of August 1989. East Coast stocks at the end of August were 31 percent lower than last year.

Although primary propane stocks are lower this year than last year, through the end of June production was essentially the same, imports were up, and demand was down. This leads to the conclusion that stocks held at secondary (distributor) and tertiary (end-user) facilities may well be above normal levels. The buildup of propane stocks may be held by end-users in petrochemical plants. It is estimated that at least 10 to 20 million barrels of propane have moved into end-user stocks since the beginning of spring.

Current wholesale prices of propane are twice the level of the same time last year. These prices reflect the current high prices of crude oil and will remain high as long as crude oil remains high in price. Additionally, the high crude oil prices have resulted in even higher prices for ethane, butane, and naphtha, traditionally the competing products to propane for use as petrochemical feedstocks. Petrochemical companies, therefore, are continuing to purchase propane for feedstocks use later into the fall than usual. This presence will result in a continued diversion of some propane to the petrochemical industry and provide significant price competition to the heating fuels market thus keeping retail propane prices high probably throughout the season.

Should the forthcoming winter be anything other than normal or warmer than normal, current and projected inventory levels could prove inadequate and lead to shortages and significant price increases.

Additional Factors Affecting the Outlook

Although this outlook takes most factors affecting distillate fuel oil demand, supplies, and prices into account, no model can incorporate every facet of the market. Three factors not considered in constructing the model on which this forecast is based are: competition with natural gas pipelines in the Northeast, temporary effects of the 1989 price spike, and hedging of heating oil prices.

Natural Gas Pipelines

Greater availability of Canadian natural gas might slightly reduce distillate fuel oil consumption in the Northeast next winter. Subject to approval by the Canadian Government, Phase II of the Niagara Import Point projects has the potential of reducing distillate fuel oil consumption in the Northeast by 8 million barrels, or about 2.9 percent of annual consumption.[50]

The Northeast United States, including New England and New York, is the last major area of the country where distillate fuel oil has a significant share of the market for heating fuels.[51] Natural gas pipelines, which until now have often brought gas from faraway Texas, have not yet fully penetrated the Northeast. In the past few years, however, a series of pipelines have been proposed that will bring natural gas to New England from the western Canadian province of Alberta. Although natural gas in New England is generally more expensive than distillate fuel oil, promoters of the pipeline projects believe they can supply "new" gas at competitive prices.[52]

On May 2, 1990, the Federal Energy Regulatory Commission issued a certificate approving construction of the second phase of the "Niagara Import Point" projects. Phase II will provide capacity to import 206.5 million cubic feet of natural gas per day, including 81.5 million cubic feet per day for electricity cogeneration projects presently under construction. The gas would enter the United States near Niagara Falls and be transported to Maryland, Massachusetts, New Jersey, New York, and Rhode Island. Tennessee Gas Pipeline Co., National Fuel Gas Supply Corp., CNG Transmission Corp., and Texas Eastern Transmission Corp. are sponsoring the project. Completion of the project is expected in November 1990.[53]

Price Spike Effects

The sudden December 1989 price increase for distillate fuel oil will also have an effect—probably temporary—on conversion from oil heat to other fuels. While many utility, industrial, and commercial users have the ability to burn more than one kind of heating fuel and can make a choice based on price, residential consumers are usually tied to only one fuel. A survey conducted in late February for the East Coast Energy Council, an organization promoting oil heat, found that the percentage of customers who were considering converting from oil to natural gas went from 8 percent in August 1989 to 16 percent in February. The percentage of customers who were definitely switching went from 2 to 4 percent. In addition, conversions appear to be running 10 to 15 percent above previous years.[54]

[50] Calculated from Foster Natural Gas Report, "FERC Certificates NIP Projects Despite Absence of Long-Term Export Licenses: Trabandt Outlines Rate Levelization Concept for Imported Gas" (May 10, 1990), p. 8, and Energy Information Administration, *State Energy Data Report*, DOE/EIA 0214(88)(Washington, DC, April 1990).

[51] Energy Information Administration, *Housing Characteristics 1987*, DOE/EIA-0314(87) (Washington, DC, May 1989), pp. 45-47.

[52] Calculated from Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90-03) (Washington, DC, June 1990), pp. 99, 107, 124, 125; "Conditional Order Granting Authorization to Import Natural Gas From Canada and Granting Intervention," DOE/FE Opinion and Order No. 368 (January 11, 1990).

[53] "FERC Certificates NIP Projects Despite Absence of Long-Term Export Licenses: Trabandt Outlines Rate Levelization Concept for Imported Gas," *Foster Natural Gas Report* (May 10, 1990), p. 8, and 51 FERC P61,113 (May 2, 1990).

[54] "Marketer Forum '90," *Fueloil & Oil Heat* (June 1990), p. 38ff.

Hedging

A third factor that the outlook does not take into account is hedging activity. Heating oil consumers responded to December 1989's sharp price increases by searching for ways to protect themselves against a recurrence of such events. So, for the coming heating season some fuel oil dealers offered heating oil at a fixed price, while others offered their customers price ceilings.[55]

Although some fuel oil dealers are using traditional methods to stabilize prices, an increasing number are using hedging tools. Traditionally, fuel oil dealers would hold down prices by purchasing oil relatively cheaply during the summer, storing it, and selling it at a fixed price during the winter. However, the high cost of oil storage has created incentives for dealers to purchase futures and options in the commodity markets. As defined by commodity traders, "hedging" is the use of futures or forward contracts in managing the risk associated with commodity ownership in order to maximize profits.[56]

During the January 1990 U.S. Senate hearings on heating oil price increases, at least two witnesses recommended that heating oil dealers and low income energy assistance programs purchase options or futures to protect their customers and clients from price increases. The National Association of Attorneys General recommended that Congress study whether low income energy assistance programs should be allowed to purchase futures contracts to lock in price and supply.[57] Favorable articles about futures have also appeared in the trade press.[58]

Three of the leading marketers of price "insurance," Global Petroleum Corp., Phibro Energy, Inc. and Northeast Petroleum Corp., report sharply increased interest in their products and some increased sales. Global's "Price Assurance Contract" offers a price cap, if prices increase, but requires dealers to pay higher-than-market prices, if prices fall. Phibro's "Energy Price Indexed Caps" offer a price ceiling, if prices increase. Northeast's program tailors contracts to the amount of risk the buyer wants to assume. All three programs are based on the use of options, or some combination of futures and options.[59]

Unlike stockpiling, the use of hedging offers fuel oil dealers some protection against falling prices. In addition, it offers aggressive oil dealers a way to increase their market share. However, traditionally, consumers have been unwilling to lock in prices at the beginning of the heating season, because prices might fall during the season. Dealers, too, have been unwilling to take on the complexities of commodity markets or construction of new storage facilities. Futures advocates also say that dealers benefit from existing price volatility, because they are able to fatten their profit margins when wholesale prices are falling.[60]

Although hedging offers an incentive to reduce inventories, hedging's effect on prices is less clear. Advocates of futures argue that they stabilize prices. If prices rise, futures or options would tend to reduce consumer prices; if prices fall, futures would tend to raise consumer prices. Futures advocates also argue that they tend to stabilize prices by spreading out fuel oil purchases over a longer time period.[61]

However, consumer groups argue that the reduced stocks brought on by the futures market tend to exaggerate price increases and decreases for those dealers and consumers not participating in the hedging process. They say that this increased volatility may end up costing consumers money.[61]

[55] Telephone discussion with representative of New York State Energy Office, June 12, 1990.
[56] Philip K. Verleger, Jr., "The Role and Impact of Commodity Market Institutions in the Determination of Oil Prices," *Annual Review of Energy* (Palo Alto, CA, 1988), p. 374.[57] Philip K. Verleger, Jr., and Rutherford Poats, "Home Heating Fuels Crisis," hearings before the Senate Governmental Affairs Committee, January 16, 1990; National Association of Attorneys General, *Preliminary Report on the December 1989 Energy Crisis* (March 18, 1990), p. 17.
[58] See for example: J. Richard Shaner, "For Some Fuel Oil Dealers, Price Spikes Are Bonanzas," *National Petroleum News* (April 1990), pp. 16-17 and "Price drop leads to flurry of market-related deals," *Oil Marketing Bulletin*, (Bethesda, MD), April 16, 1990).
[59] Telephone discussions with company representatives June 11 and June 14, 1990.
[60] Philip K. Verleger, Jr., "Home Heating Fuels Crisis," hearings before the Senate Governmental Affairs Committee, January 16, 1990; telephone discussion with representative of New York Mercantile Exchange, June 12, 1990.
[61] Telephone discussion with representative of Northeast Petroleum, June 14, 1990.
[62] Joan Claybrook, "Heating Oil, Propane, and Diesel Fuel Price Increases," hearing before Subcommittee on Energy and Power of House Committee on Energy and Commerce, January 9, 1990.

FOR ADDITIONAL OFFICIAL INFORMATION:

Weekly Petroleum Status Report: Weekly estimates of distillate fuel oil consumption, production, stocks, and imports. Weekly spot distillate fuel oil prices; monthly residential distillate heating oil prices. Publication lags estimates by 6 days.

Petroleum Supply Monthly: Monthly data on distillate fuel oil and propane consumption, production, stocks, and imports. Publication lags data by about 60 days.

Petroleum Marketing Monthly: Monthly data on wholesale and retail propane, heating oil, and diesel fuel prices.
Publication lags data by about 70 days.

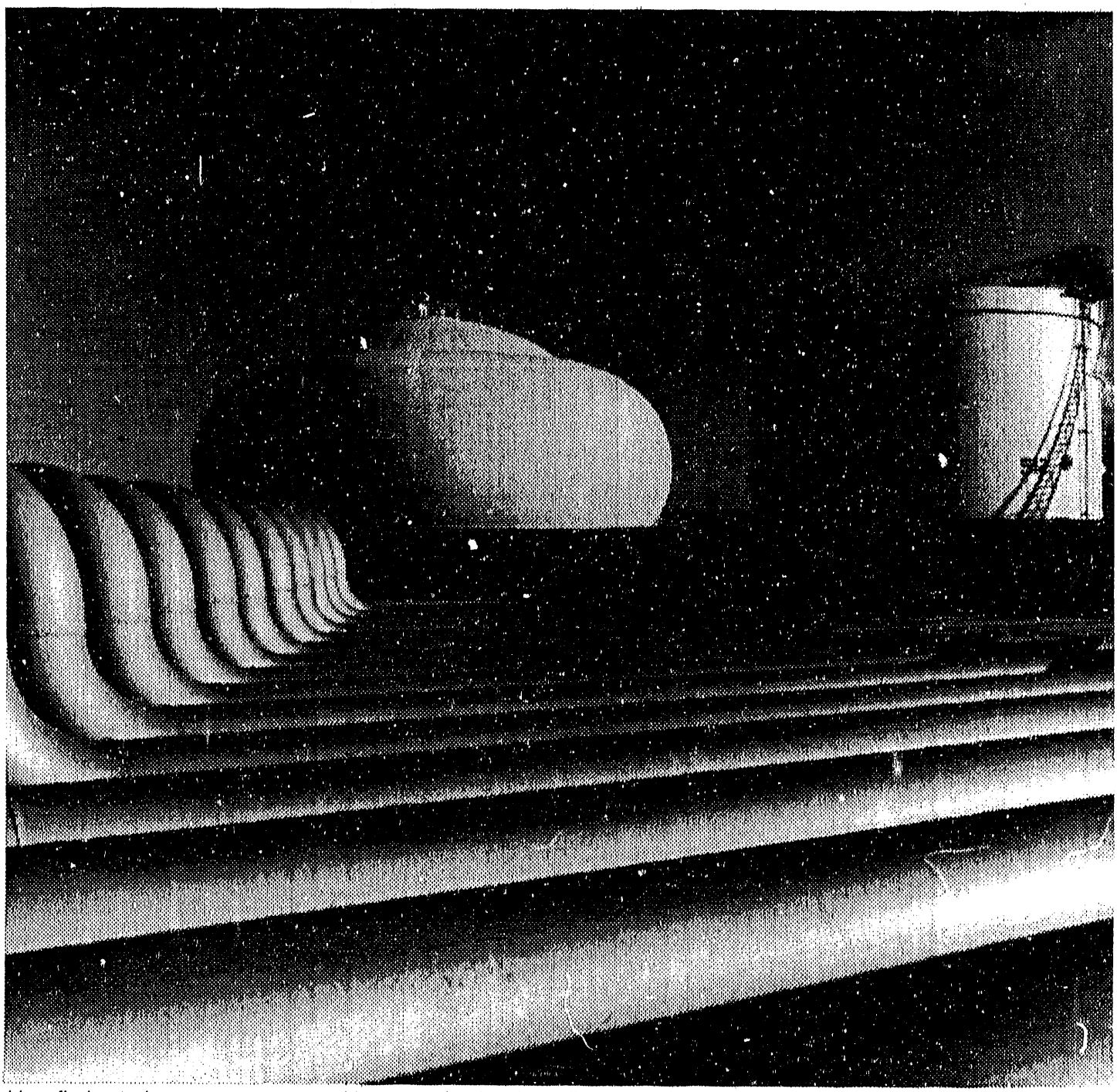
Short-Term Energy Outlook: Quarterly projections of distillate fuel oil consumption, production, stocks, imports, and heating oil and diesel prices. Publication normally lags the beginning of the quarter by 30 days.

Petroleum Marketing Annual: Annual data on distillate fuel oil sales by end use by state. Publication lags data by about 10 months.

Electronic Publication System: Data from the above publications and others in standard ASCII format. Free public access by dialing (202) 586-8658 at 300 to 2400 baud. Weekly estimates available at 5 p.m. Wednesday; monthly data available on the 20th of the month.

National Energy Information Center: Distributes above publications. Answers energy-related questions, including questions about propane and distillate fuel oil. Phone (202) 586-8800 between 8 a.m. and 5 p.m., Monday through Friday.

Highlights



Liquefied petroleum gases are stored in pressurized tanks while other products are stored in conventional tanks.

Highlights

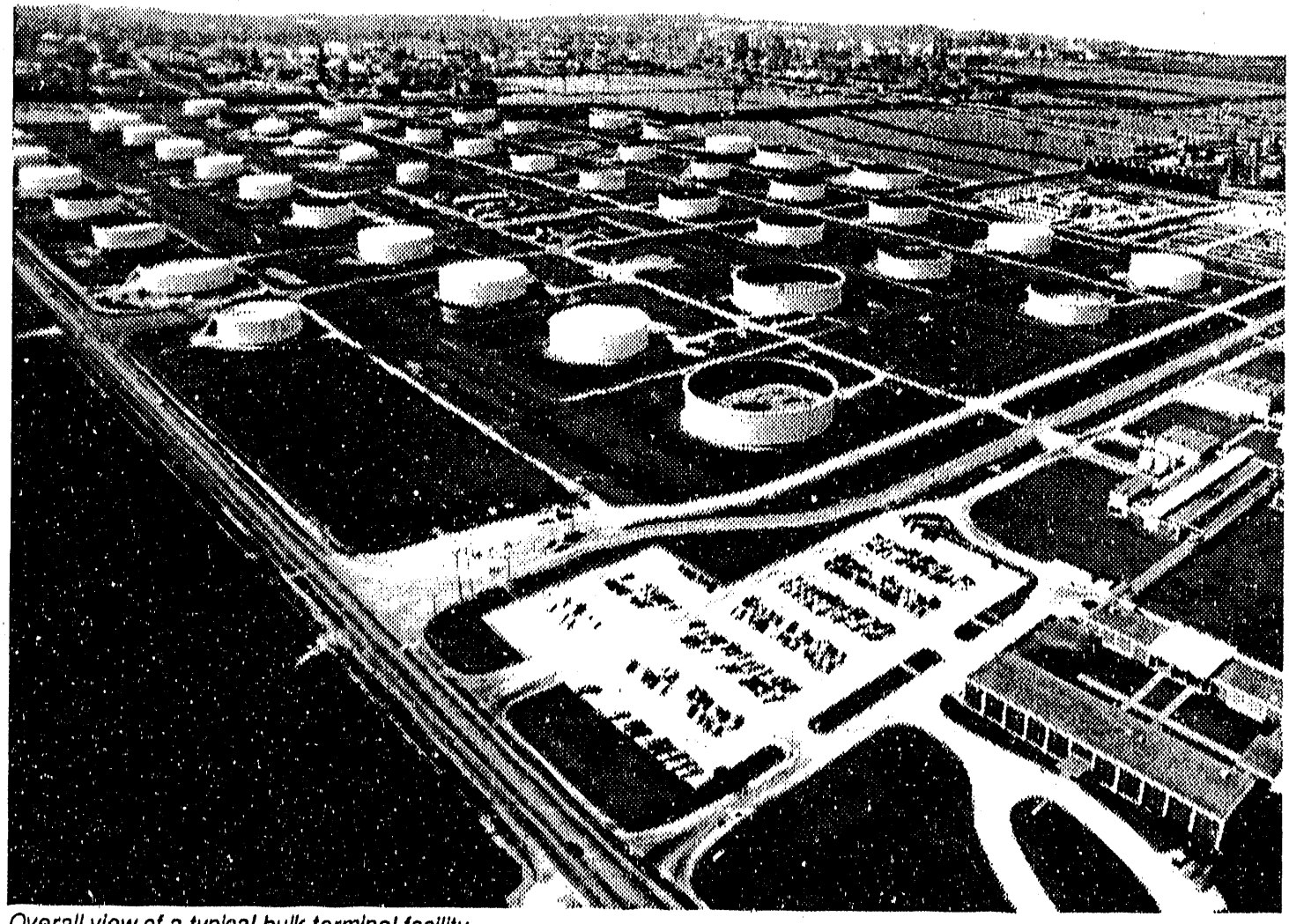
Propane stocks in the Eastern half of the nation have seen significant improvement during the last month. At the end of August stock levels in Petroleum Administration forDefenseDistricts (PADD) I, II, and III were 11.5 percent lower than they were a year earlier. On September 28, 1990, stock levels improved to where they were 5.1 percent lower than they were on September 30, 1989. Although improvement is noted continued surveillance of propane stocks is warranted particularly in PADD's I and III.

Table H1. Propane Stocks by Petroleum Administration for Defense Districts (PADD) I, II, and III
(Thousand Barrels)

PAD Districts	1989			1990		
	July	August	Sept	July	August	Sept
East Coast (PADD I)	4,865	4,823	4,949	3,365	E3,305	E3,591
Midwest (PADD II)	19,503	20,514	19,596	18,009	E20,942	E22,055
Gulf Coast (PADD III)	30,820	33,629	33,025	26,412	E27,921	E29,013
Total (PADD I-III)	55,188	58,966	57,570	47,786	E52,168	E54,659

E= Estimated data.
Source: Energy Information Administration (EIA), Monthly Petroleum Supply Reporting System and Form EIA-807, "Propane Telephone Survey."

Distillate Fuel Oil



Overall view of a typical bulk terminal facility.

Table 1. Monthly and Weekly Net Production[a], Imports, and Stocks of Distillate Fuel Oil by Petroleum Administration for Defense District (PADD) and Product Supplied for the United States
(Thousand Barrels per Day, Except Where Noted)

District/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total U.S.												
Production												
1988	3,008	2,666	2,705	2,865	2,935	2,891	2,783	2,847	2,777	2,826	2,908	3,067
1989	2,974	2,707	2,713	2,789	2,750	2,809	2,848	2,907	2,952	2,906	3,063	3,266
1990	3,136	2,753	2,655	2,802	2,873	2,995	3,006					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	2,943	3,111	3,081	3,111	3,046	2,974	3,003	2,915	2,908			
Imports												
1988	424	383	247	210	253	222	222	279	307	336	327	409
1989	346	331	439	301	290	233	334	254	249	261	307	324
1990	501	357	280	308	207	257	229					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	313	208	323	248	288	233	329	184	264			
Stocks (Million Barrels)												
1988	128.1	110.3	89.8	95.0	104.9	110.4	120.0	125.7	131.5	128.2	128.8	123.5
1989	120.6	107.6	96.7	98.5	99.6	99.6	115.0	116.3	123.2	121.7	119.8	105.7
1990	117.9	112.2	99.7	99.5	102.8	109.4	125.3					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	122.1	123.0	124.9	126.3	129.7	134.4	136.0	138.0	136.9			
Product Supplied												
1988	3,558	3,557	3,539	2,864	2,795	2,854	2,640	2,873	2,821	3,218	3,183	3,560
1989	3,303	3,427	3,428	2,975	2,954	3,002	2,596	2,966	2,889	3,127	3,311	3,914
1990	3,177	3,250	3,265	3,059	2,897	2,949	2,693					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	3,224	3,122	3,051	3,075	2,765	2,451	3,029	2,728	3,297			
East Coast (PADD I)												
Production												
1988	346	330	303	284	315	331	327	350	359	331	332	391
1989	401	344	321	284	309	338	368	385	370	387	389	448
1990	423	370	313	313	317	343	385					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	422	393	381	331	339	313	445	398	354			
Stocks (Million Barrels)												
1988	48.1	44.4	33.0	30.0	34.9	37.4	44.7	52.3	57.0	56.7	54.6	49.2
1989	46.6	37.2	33.3	33.2	33.1	35.7	44.6	48.4	50.2	51.7	49.7	35.1
1990	44.3	39.5	30.9	30.0	33.6	40.1	51.7					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	51.2	53.4	54.5	54.1	56.1	58.4	60.7	63.2	63.8			

See footnotes at end of table.

Table 1. Monthly and Weekly Net Production[a], Imports, and Stocks of Distillate Fuel Oil by Petroleum Administration for Defense District (PADD) and Product Supplied for the United States(Continued)
(Thousand Barrels per Day, Except Where Noted)

District/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
New England (PADD IX)												
Stocks (Million Barrels)												
1988	8.8	8.2	6.5	4.7	4.9	5.4	7.3	10.6	11.7	11.5	9.8	7.1
1989	8.6	15.8	5.4	4.7	4.6	4.5	8.2	8.8	9.2	9.4	7.7	4.4
1990	5.4	4.7	3.9	4.0	4.4	5.0	8.8					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	9.2	9.2	9.3	9.0	9.9	9.8	9.5	9.8	11.3			
Central Atlantic (PADD IY)												
Stocks (Million Barrels)												
1988	26.5	23.6	16.7	14.6	17.0	20.1	23.8	28.9	33.5	32.6	30.7	28.2
1989	23.9	20.3	17.4	18.2	18.0	21.0	24.3	28.6	28.4	30.0	28.4	19.4
1990	26.2	22.2	16.3	15.3	17.1	22.4	30.1					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	30.5	32.8	34.2	33.8	34.P	36.0	38.3	40.5	39.2			
Lower Atlantic (PADD IZ)												
Stocks (Million Barrels)												
1988	12.9	12.7	9.8	10.7	13.0	12.0	13.5	12.8	11.8	12.5	14.1	13.9
1989	14.0	11.2	10.6	10.4	10.5	10.1	12.0	11.0	12.6	12.3	13.6	11.4
1990	12.7	12.6	10.6	10.8	12.2	12.6	12.7					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	11.9	11.8	11.3	11.4	11.5	12.8	12.9	13.0	13.1			
Midwest (PADD II)												
Production												
1988	672	622	617	690	698	684	638	669	665	679	685	733
1989	713	687	661	658	625	677	662	670	698	650	710	797
1990	735	659	637	701	725	751	757					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	689	724	725	714	739	735	664	663	765			
Stocks (Million Barrels)												
1988	34.4	29.8	23.3	26.6	28.9	29.7	30.6	31.0	30.5	28.7	29.2	31.3
1989	32.7	31.3	27.2	27.4	27.2	27.0	28.8	29.0	31.1	28.7	28.9	30.7
1990	33.2	32.6	30.1	29.4	29.9	30.0	31.6					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	30.9	30.3	31.1	30.6	31.5	32.6	32.3	32.3	30.9			

See footnotes at end of table.

Table 1. Monthly and Weekly Net Production[a], Imports, and Stocks of Distillate Fuel Oil by Petroleum Administration for Defense District (PADD) and Product Supplied for the United States (Continued)

(Thousand Barrels per Day, Except Where Noted)

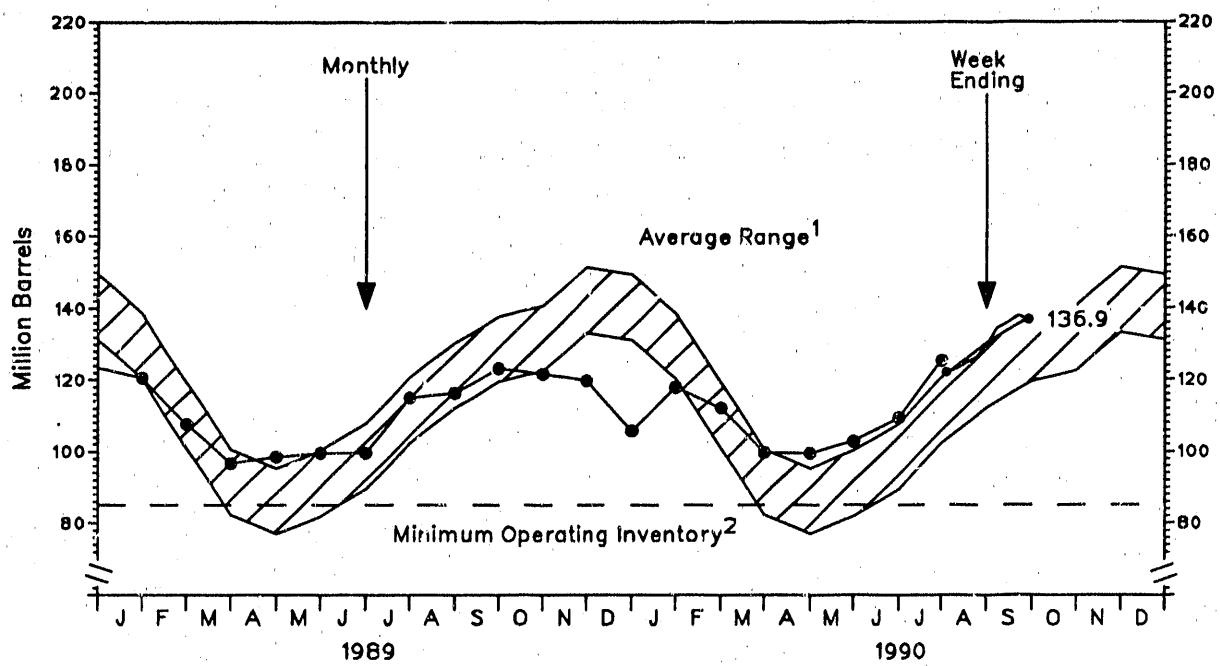
District/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gulf Coast (PADD III)												
Production												
1988	1,475	1,232	1,251	1,332	1,325	1,297	1,271	1,279	1,183	1,280	1,319	1,391
1989	1,324	1,257	1,240	1,291	1,268	1,227	1,227	1,278	1,309	1,305	1,401	1,444
1990	1,442	1,170	1,157	1,248	1,254	1,376	1,314					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	1,275	1,363	1,350	1,435	1,331	1,320	1,280	1,253	1,211			
Stocks (Million Barrels)												
1988	31.7	23.1	21.8	24.7	25.4	27.3	29.2	28.5	28.9	28.8	29.9	28.2
1989	27.7	26.2	22.8	23.9	25.3	23.9	27.7	26.1	28.5	27.6	27.0	25.0
1990	25.8	24.8	23.6	25.5	24.0	24.9	28.5					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	27.5	26.8	27.3	29.0	28.5	29.2	29.5	29.1	28.8			
Rocky Mountain (PADD IV)												
Production												
1988	108	104	114	120	130	132	120	125	124	111	121	117
1989	111	105	113	122	123	116	127	130	139	127	130	126
1990	112	124	116	122	132	129	136					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	123	132	138	133	126	133	139	129	123			
Stocks (Million Barrels)												
1988	3.3	3.2	2.3	2.4	2.9	3.2	3.2	3.0	2.7	2.5	2.7	2.8
1989	2.8	2.7	2.3	2.4	2.8	2.4	2.6	2.6	2.7	2.5	2.8	3.3
1990	3.2	3.2	2.7	2.7	2.9	3.1	3.1					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	3.0	2.6	2.5	2.2	2.6	2.6	2.7	2.5	2.5			
West Coast (PADD V)												
Production												
1988	407	377	419	439	466	449	427	425	446	424	451	436
1989	426	406	378	434	424	451	465	444	436	436	433	452
1990	425	431	432	419	446	396	414					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	435	500	488	498	512	473	475	472	455			
Stocks (Million Barrels)												
1988	10.6	9.7	9.5	11.3	12.8	12.7	12.3	10.9	12.3	11.6	12.4	12.0
1989	10.8	10.3	11.1	11.7	11.2	10.6	11.3	10.2	10.7	11.1	11.3	11.6
1990	11.5	12.2	12.3	11.9	12.4	11.3	10.4					
Week Ending												
1990	08/03	08/10	08/17	08/24	08/31	09/07	09/14	09/21	09/28			
	9.6	9.9	9.6	10.4	11.1	11.7	10.9	11.0	11.0			

[a] Net production equals gross production minus input. Negative production will occur when the amount of product produced during the month is less than the amount of that same product reprocessed (input) or reclassified to become another product during the same month.

Notes: • Totals may not equal sum of components due to independent rounding. • Sum of PADD's IX, IY, and IZ may not equal PADD I because of independent estimation.

Source: Energy Information Administration, Weekly and Monthly Petroleum Supply Reporting Systems.

Figure 1. U.S. Distillate Fuel Oil Stocks

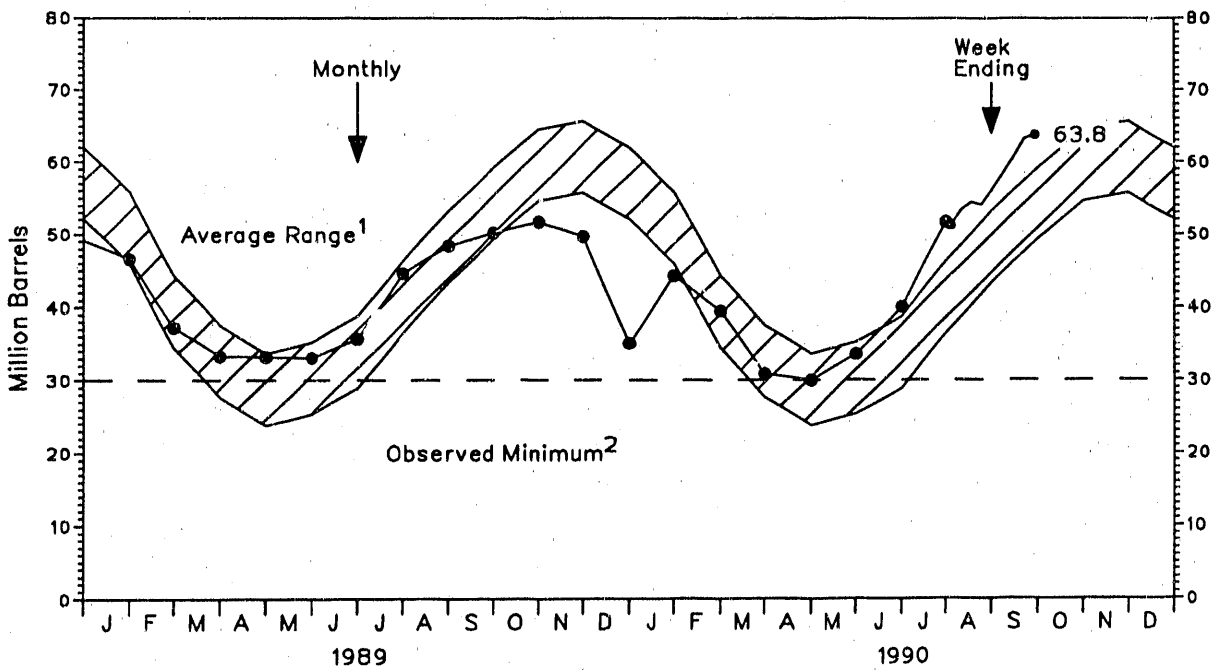


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The National Petroleum Council (NPC) defines the Minimum Operating Inventory as the inventory level below which operating problems and shortages would begin to appear in a defined distribution system. In its 1988 study, the NPC estimated this inventory level for distillate fuel oil to be 85 million barrels.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on weekly data collected on Forms EIA-800, -801, and -802.

Figure 2. PADD I (East Coast) Distillate Fuel Oil Stocks

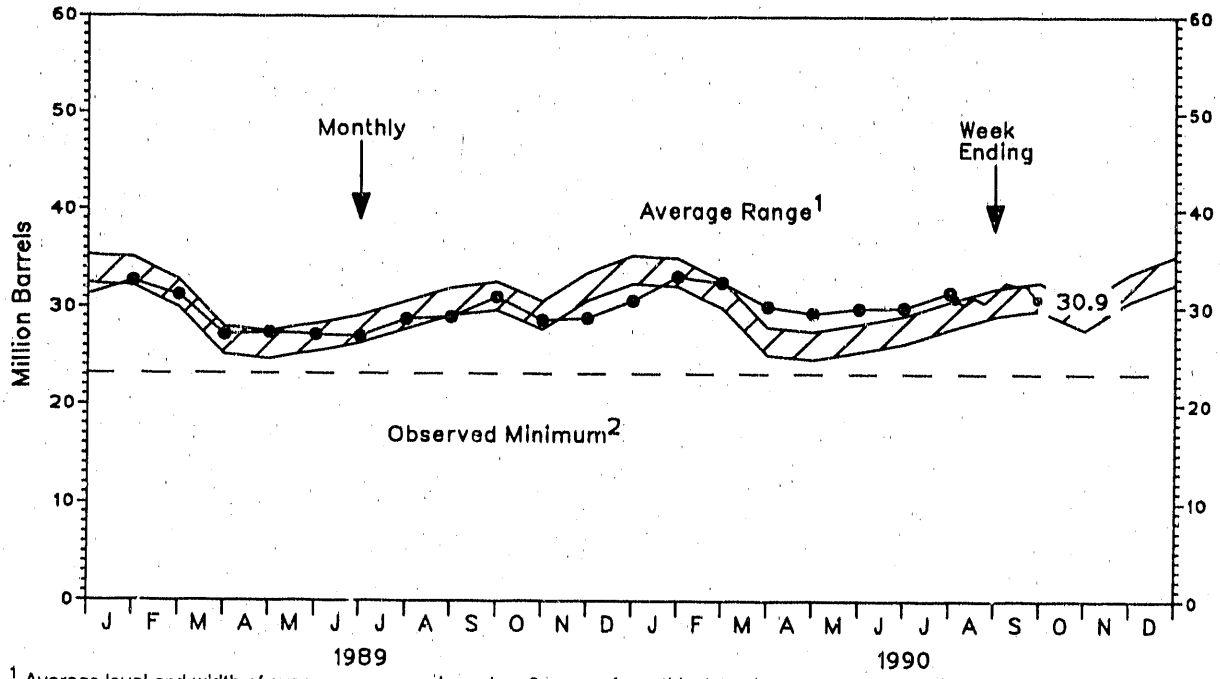


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for distillate fuel oil stocks in the last 36 month period was 30.0 million barrels, occurring in April 1988.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on weekly data collected on Forms EIA-800, -801, and -802.

Figure 3. PADD II (Midwest) Distillate Fuel Oil Stocks

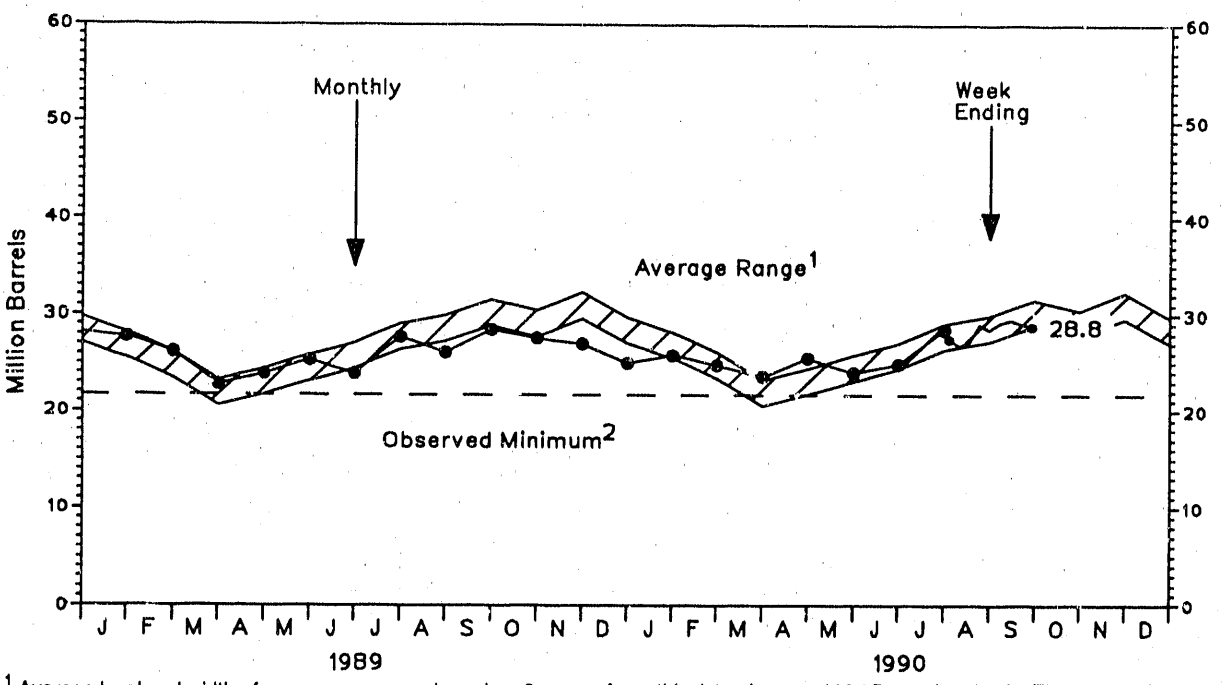


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for distillate fuel oil stocks in the last 36 month period was 23.3 million barrels, occurring in March 1988.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on weekly data collected on Forms EIA-800, -801, and -802.

Figure 4. PADD III (Gulf Coast) Distillate Fuel Oil Stocks

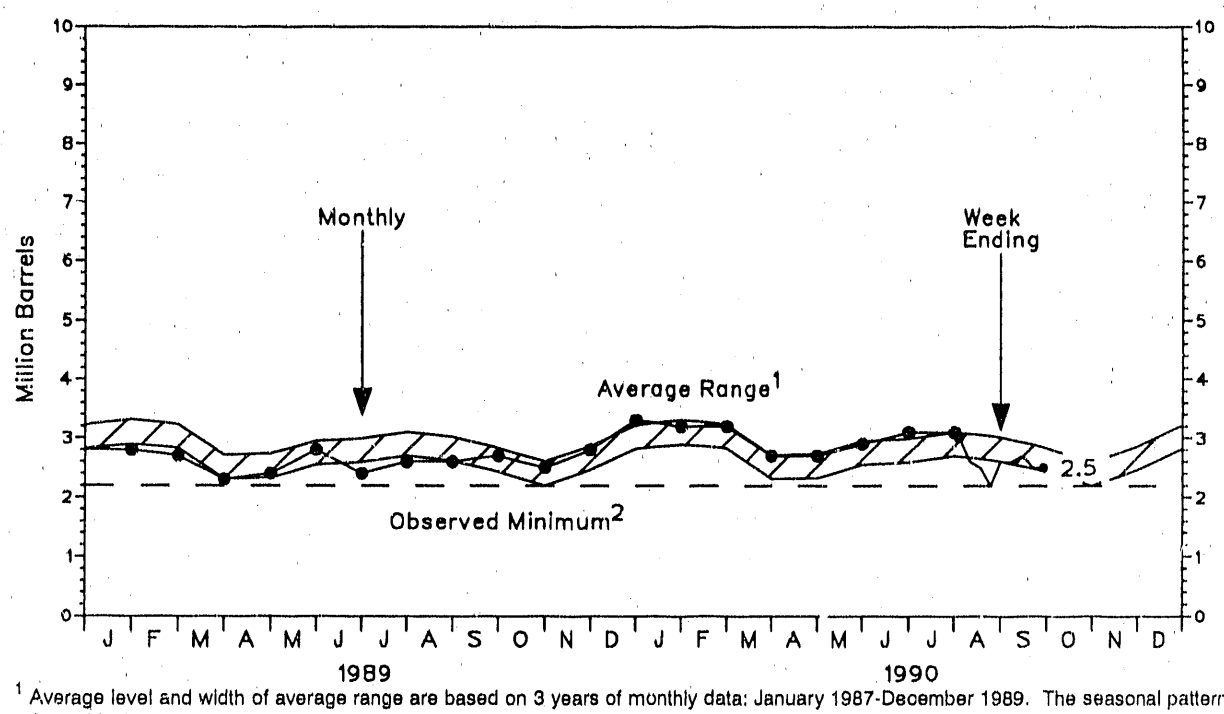


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for distillate fuel oil stocks in the last 36 month period was 21.8 million barrels, occurring in March 1988.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on weekly data collected on Forms EIA-800, -801, and -802.

Figure 5. PADD IV (Rocky Mountain) Distillate Fuel Oil Stocks

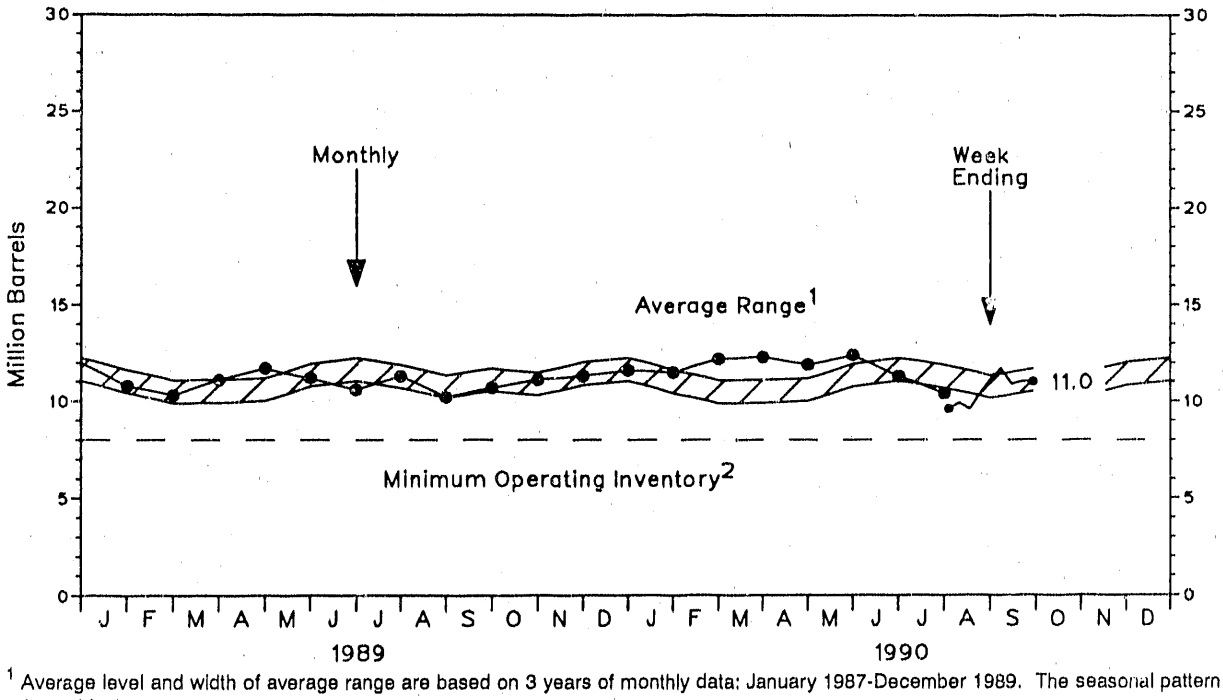


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for distillate fuel oil stocks in the last 36 month period was 2.2 million barrels, occurring in March 1989.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on weekly data collected on Forms EIA-800, -801, and -802.

Figure 6. PADD V (West Coast) Distillate Fuel Oil Stocks

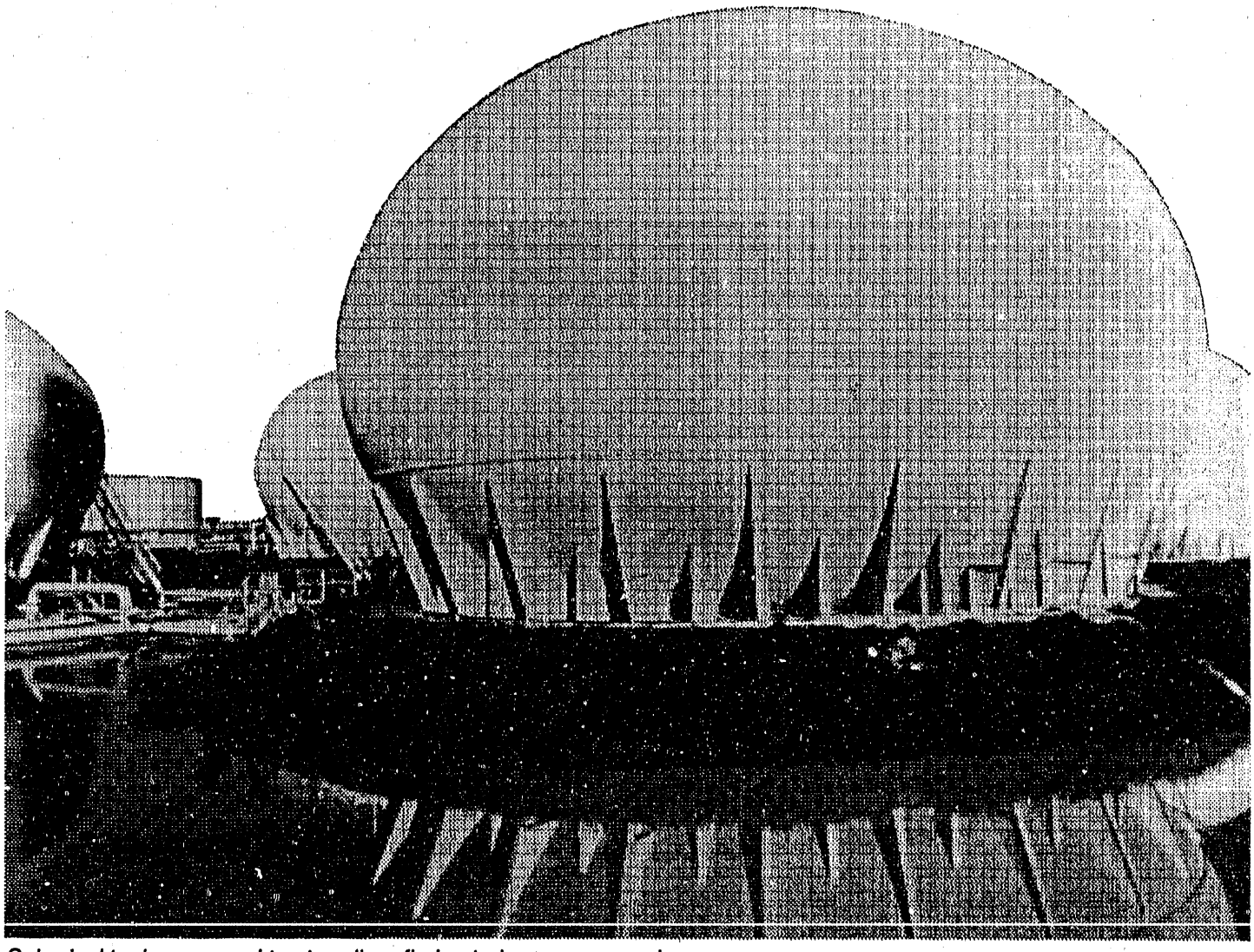


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The National Petroleum Council (NPC) defines the Minimum Operating Inventory as the inventory level below which operating problems and shortages would begin to appear in a defined distribution system. In its 1988 study, the NPC estimates this inventory level for distillate fuel oil to be 8 million barrels.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1988, EIA, *Petroleum Supply Annual;* 1990, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on weekly data collected on Forms EIA-800, -801, and -802.

Propane



Spherical tanks are used to store liquefied petroleum gases under pressure.

Table 2. Monthly and Weekly Net Production[a], Imports, and Stocks of Propane[b] by Petroleum Administration for Defense Districts (PADD) I, II, and III

(Thousand Barrels per Day, Except Where Noted)

District/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
East Coast (PADD I)												
Production												
1988	55	58	57	47	46	50	54	54	57	57	57	56
1989	60	60	55	54	46	49	52	53	56	53	53	51
1990	59	55	44	46	39	36	40	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E53								
Imports												
1988	22	48	24	19	18	5	28	17	19	13	29	29
1989	41	37	22	19	16	19	21	4	17	9	23	12
1990	64	49	40	28	31	25	20	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E4								
Stocks (Million Barrels)												
1988	2.6	2.5	2.1	2.5	2.9	3.0	3.7	4.7	4.9	4.8	4.9	3.8
1989	3.9	2.9	2.3	2.6	3.0	4.0	4.9	4.8	4.9	4.9	4.8	1.8
1990	2.5	2.7	2.7	3.0	3.2	3.3	3.4	E3.3				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E3.6								
New England (PADD 1X)												
Production												
1988	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E0								
Imports												
1988	16	30	16	15	8	2	25	9	11	8	22	25
1989	27	27	17	15	8	17	14	1	10	5	18	6
1990	42	22	35	21	20	21	1	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E**								
Stocks (Million Barrels)												
1988	0.2	0.4	0.4	0.4	0.5	0.3	0.4	0.6	0.7	0.3	0.7	0.4
1989	0.4	0.2	0.3	0.4	0.2	0.6	0.7	0.4	0.3	0.1	0.3	*
1990	0.2	0.1	0.3	0.1	0.2	0.5	0.3	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E0.2								

See footnotes at end of table.

Table 2. Monthly and Weekly Net Production[a], Imports, and Stocks of Propane[b] by Petroleum Administration for Defense Districts (PADD) I, II, and III (Continued)
(Thousand Barrels per Day Except Where Noted)

District/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Central Atlantic (PADD 1Y)												
Production												
1988	45	46	45	35	34	39	43	42	44	46	47	44
1989	46	46	42	41	36	40	41	40	43	39	40	39
1990	46	42	32	34	28	29	34	NA				
Week Ending												
1990	**09/07**	**09/14**	**09/21**	**09/28**								
	NA	NA	NA	E46								
Imports												
1988	5	10	7	4	3	3	3	3	3	4	5	5
1989	9	6	5	4	3	3	3	3	3	4	5	6
1990	10	23	4	7	5	4	19	NA				
Week Ending												
1990	**09/07**	**09/14**	**09/21**	**09/28**								
	NA	NA	NA	E8								
Stocks (Million Barrels)												
1988	1.7	1.3	0.8	1.0	1.4	1.8	2.2	2.8	3.0	3.2	2.9	2.4
1989	2.2	1.7	1.1	1.3	1.6	2.2	2.6	3.0	3.2	3.1	2.6	0.9
1990	1.2	1.7	1.2	1.2	1.4	1.6	1.6	NA				
Week Ending												
1990	**09/07**	**09/14**	**09/21**	**09/28**								
	NA	NA	NA	E2.4								
Lower Atlantic (PADD 1Z)												
Production												
1988	10	13	14	13	13	11	12	13	14	12	14	14
1989	14	14	13	14	9	9	12	12	13	14	13	12
1990	13	13	13	12	11	7	7	NA				
Week Ending												
1990	**09/07**	**09/14**	**09/21**	**09/28**								
	NA	NA	NA	E7								
Imports												
1988	5	5	0	3	0	0	0	5	5	3	0	0
1989	4	4	0	0	5	0	4	0	4	0	0	0
1990	11	4	0	0	6	0	0	NA				
Week Ending												
1990	**09/07**	**09/14**	**09/21**	**09/28**								
	NA	NA	NA	E0								
Stocks (Million Barrels)												
1988	0.6	0.8	0.9	1.0	1.0	1.0	1.2	1.2	1.3	1.3	1.4	1.0
1989	1.2	1.1	1.0	1.0	1.2	1.3	1.5	1.4	1.5	1.7	1.9	0.9
1990	1.1	0.9	1.1	1.7	1.5	1.3	1.5	NA				
Week Ending												
1990	**09/07**	**09/14**	**09/21**	**09/28**								
	NA	NA	NA	E0.9								

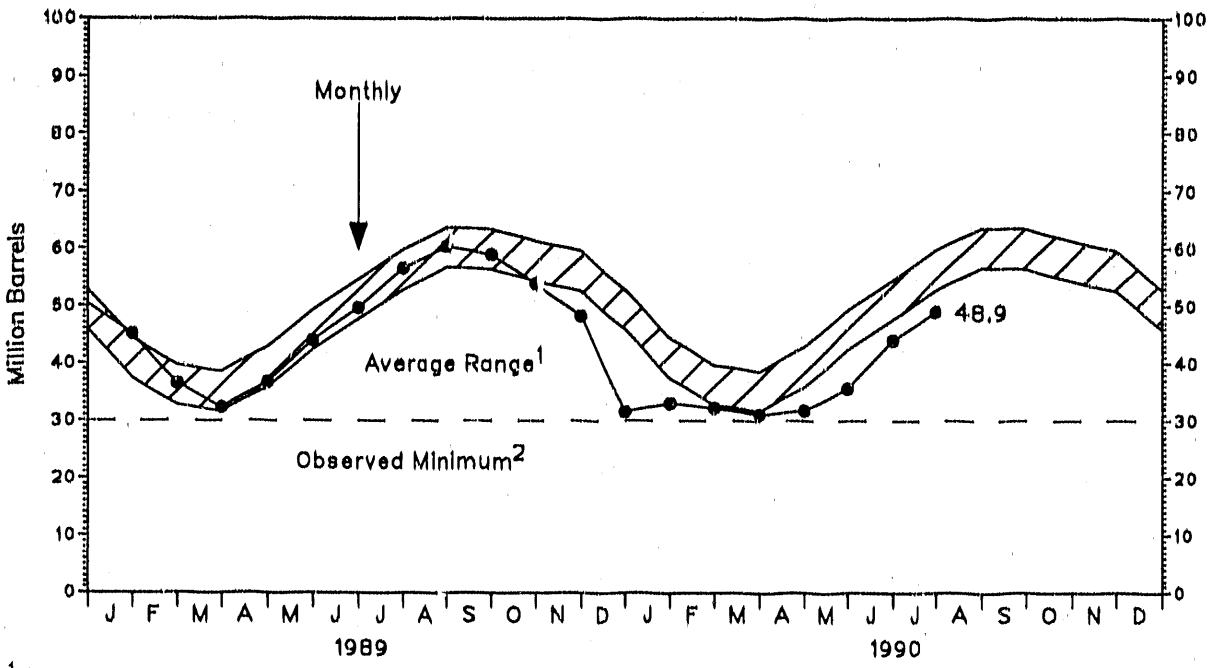
See footnotes at end of table.

Table 2. Monthly and Weekly Net Production[a], Imports, and Stocks of Propane[b] by Petroleum Administration for Defense Districts (PADD) I, II, and III (Continued)
(Thousand Barrels per Day Except Where Noted)

District/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Midwest (PADD II)												
Production												
1988	192	202	205	204	210	190	195	199	194	192	200	206
1989	214	205	200	204	200	203	202	194	191	179	193	197
1990	214	217	208	201	200	193	206	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E180								
Imports												
1988	80	78	52	48	42	60	37	53	68	53	76	53
1989	103	84	70	60	49	68	43	55	62	73	75	86
1990	80	76	46	54	62	39	35	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E31								
Stocks (Million Barrels)												
1988	14.1	11.4	10.9	13.3	15.8	18.0	20.4	22.9	22.9	21.4	21.1	17.4
1989	15.4	10.6	9.1	11.5	14.1	16.6	19.5	20.5	19.6	16.8	14.8	9.5
1990	11.4	10.6	10.7	11.4	13.6	16.1	18.0	E20.9				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E22.1								
Gulf Coast (PADD III)												
Production												
1988	512	503	501	518	512	496	513	520	512	533	522	508
1989	532	503	538	545	545	518	523	509	507	500	505	468
1990	497	537	527	521	520	520	526	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E516								
Imports												
1988	10	0	5	16	13	6	57	46	15	30	0	11
1989	**	8	0	8	11	13	38	43	20	21	5	13
1990	19	17	18	29	38	32	32	NA				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E0								
Stocks (Million Barrels)												
1988	19.2	16.4	16.3	21.8	26.5	30.4	33.5	34.8	33.8	34.0	31.8	28.0
1989	25.1	22.3	20.2	21.7	25.7	27.9	30.8	33.6	33.0	30.8	27.3	19.1
1990	18.3	18.2	17.1	16.7	18.0	23.6	26.4	E27.9				
Week Ending												
1990	09/07	09/14	09/21	09/28								
	NA	NA	NA	E29.0								

[a] Net production equals gross production minus input. Negative production will occur when the amount of product produced during the month is less than the amount of that same product reprocessed (input) or reclassified to become another product during the same month.
[b] Includes propylene.
R=Revised data. E=Estimated data.
* Less than 50,000 barrels. ** Less than 500 barrels per day.
NA=Not available.
Note: This table presents weekly data, derived from a cut-off sample of refineries and fractionators that produce propane and from companies that import or store propane, which have been extrapolated to the universe of companies reporting in PADD's I, II, and III.
Source: Energy Information Administration (EIA), Monthly Petroleum Supply Reporting System and data collected on Form EIA-807, "Propane Telephone Survey."

Figure 7. U.S. Propane Stocks

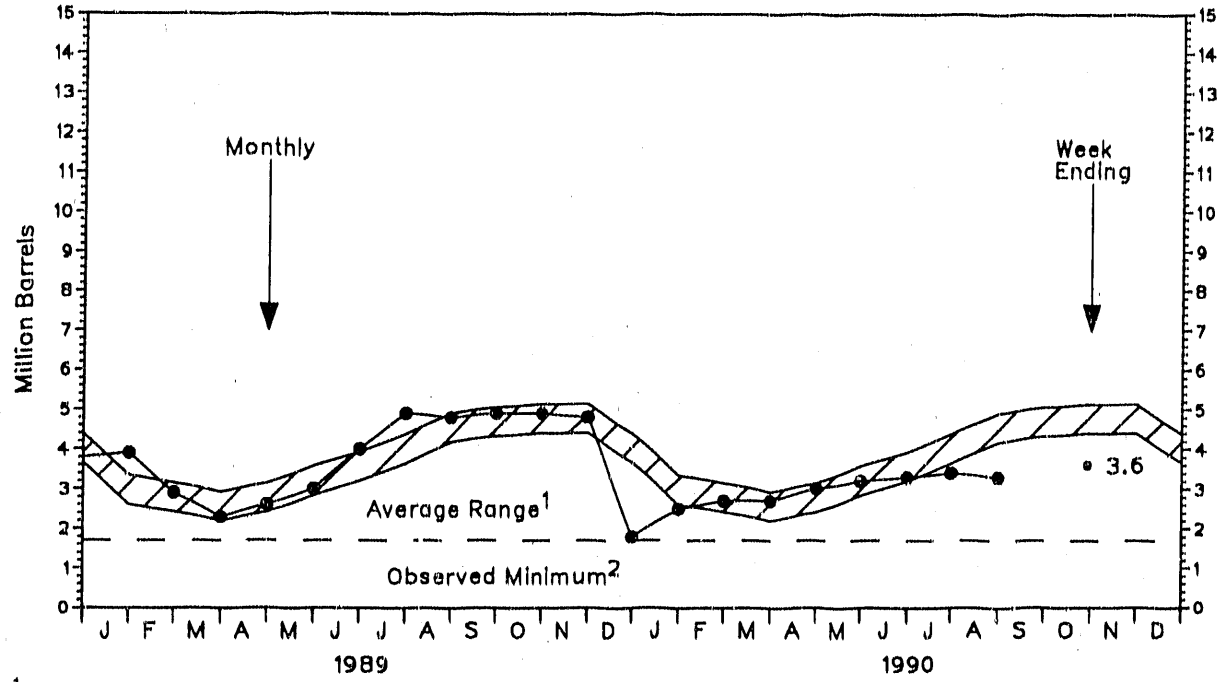


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for propane stocks in the last 36 month period was 30.0 million barrels, occurring in March 1988.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, EIA, *Petroleum Supply Monthly.*

Figure 8. PADD I (East Coast) Propane Stocks

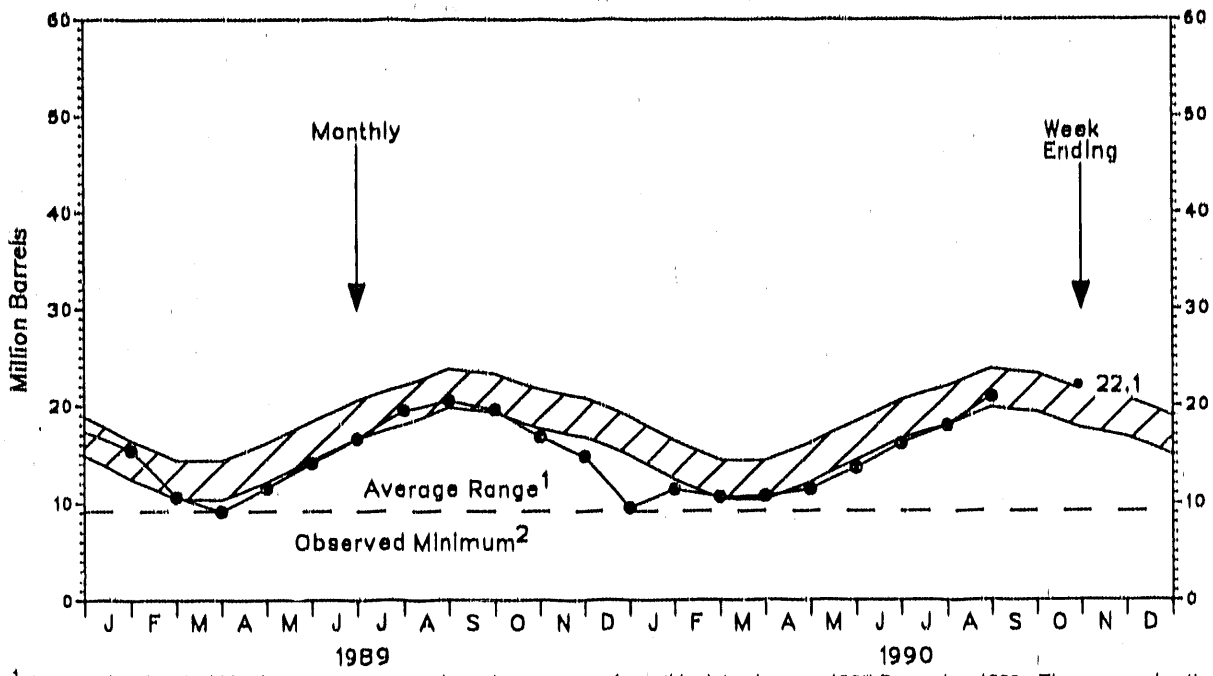


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for propane stocks in the last 36 month period was 1.8 million barrels, occurring in December 1989.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, EIA, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on data collected on Form EIA-807, "Propane Telephone Survey."

Figure 9. PADD II (Midwest) Propane Stocks

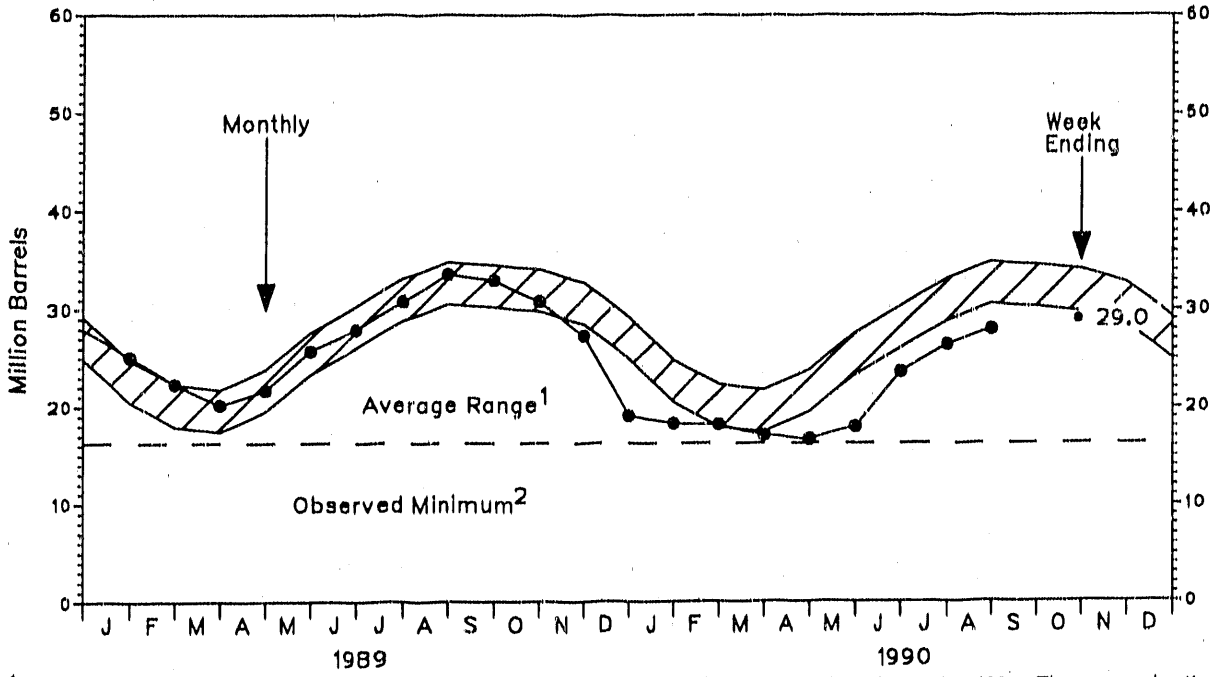


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for propane stocks in the last 36 month period was 9.1 million barrels, occurring in March 1989.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, EIA, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on data collected on Form EIA-807, "Propane Telephone Survey."

Figure 10. PADD III (Gulf Coast) Propane Stocks

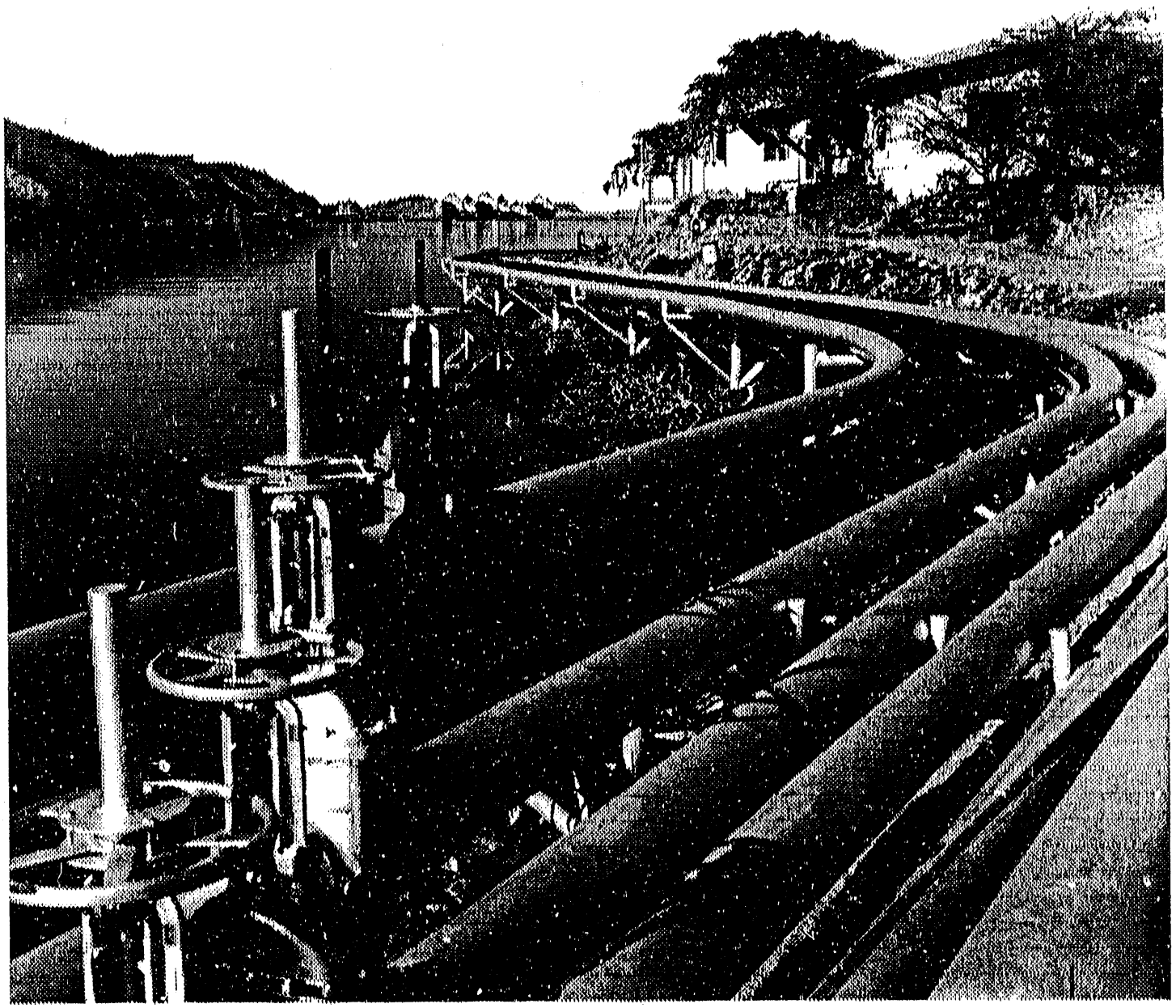


[1] Average level and width of average range are based on 3 years of monthly data: January 1987-December 1989. The seasonal pattern is based on 7 years of monthly data.

[2] The Observed Minimum for propane stocks in the last 36 month period was 16.3 million barrels, occurring in March 1988.

Source: • Data for Ranges and Seasonal Patterns: 1982-1988, Energy Information Administration (EIA), *Petroleum Supply Annual;* 1989, EIA, *Petroleum Supply Monthly.* • Monthly Data: 1989, EIA, *Petroleum Supply Annual;* 1990, EIA, *Petroleum Supply Monthly.* • Week-Ending Stocks: Estimates based on data collected on Form EIA-807, "Propane Telephone Survey."

Natural Gas



Pipelines carry natural gas across geographic regions.

Table 3. Supply and Disposition of Dry Natural Gas
(Billion Cubic Feet)

Year and Month	Supply				Total Supply/ Disposition[b]	Disposition			
	Total Dry Gas Production	Withdrawals from Storage[a]	Supplemental Gaseous Fuels	Imports		Additions to Storage[a]	Exports	Consumption[c]	Unaccounted For[d]
1984 Total	17,392	2,099	110	843	20,443	2,295	55	17,951	143
1985 Total	16,382	2,307	126	950	19,955	2,103	55	17,291	350
1986 Total	15,991	1,937	113	750	18,692	1,994	91	16,221	427
1987 Total	16,536	1,905	101	993	19,534	1,911	54	17,211	359
1988									
January	R 1,581	586	12	139	R 2,318	47	5	R 2,187	R 79
February	R 1,439	462	R 11	117	R 2,029	50	5	R 2,038	R -64
March	R 1,501	259	R 10	113	R 1,883	99	9	R 1,867	R -89
April	R 1,374	93	8	96	R 1,570	105	8	R 1,404	R -85
May	R 1,407	46	R 7	94	R 1,554	200	4	R 1,302	R -40
June	R 1,338	36	7	93	R 1,474	280	8	R 1,170	R 16
July	R 1,355	42	R 7	100	R 1,504	300	5	R 1,177	R 22
August	R 1,374	52	7	94	R 1,527	288	8	R 1,222	R 11
September	R 1,297	46	R 6	95	R 1,444	314	7	R 1,099	R 24
October	R 1,409	92	8	106	R 1,615	202	6	R 1,232	R 175
November	R 1,436	159	R 9	121	R 1,725	117	7	R 1,453	R 148
December	R 1,513	397	R 11	127	R 2,048	62	9	R 1,820	R 157
Total	R 17,020	2,270	101	1,294	R 20,691	R 2,211	74	R 18,030	R 370
1989									
January	R 1,527	R 420	R 11	119	R 2,083	R 53	7	R 2,023	R 0
February	R 1,412	R 614	R 10	110	R 2,146	R 32	7	R 2,009	R 99
March	R 1,496	R 369	R 10	113	R 1,988	R 106	11	R 1,945	R -74
April	R 1,426	R 138	R 8	110	R 1,682	R 184	11	R 1,580	R -93
May	R 1,445	R 44	R 8	108	R 1,605	R 320	8	R 1,348	R -77
June	R 1,386	R 20	R 7	104	R 1,517	R 381	9	R 1,200	R -73
July	R 1,410	R 20	R 8	101	R 1,548	R 377	9	R 1,220	R -58
August	R 1,397	R 29	R 8	108	R 1,542	R 362	9	R 1,216	R -45
September	R 1,333	R 30	R 7	117	R 1,496	R 325	9	R 1,181	R -19
October	R 1,405	R 90	R 9	123	R 1,633	R 225	10	R 1,337	R 61
November	R 1,459	R 227	R 9	123	R 1,818	R 105	8	R 1,567	R 138
December	R 1,563	R 821	R 12	145	R 2,541	R 52	8	R 2,156	R 325
Total	R 17,260	R 2,852	R 107	1,362	R 21,599	R 2,529	107	R 18,780	R 182
1990									
January	R 1,598	R 339	16	149	R 2,102	R 91	R 9	R 2,089	R -95
February	R 1,422	R 324	14	118	R 1,878	R 70	R 9	R 1,784	R 16
March	R 1,495	R 258	14	115	R 1,880	R 124	R 10	R 1,749	R -3
April	R 1,427	R 140	13	122	R 1,702	183	8	R 1,550	R -39
May	R 1,442	R 45	11	108	R 1,606	R 269	R 9	R 1,357	R -48
June	E 1,373	R 42	11	R 114	R 1,540	R 327	R 9	R 1,253	R -49
July	E 1,408	27	12	122	1,569	325	9	1,201	-25
1990 YTD	10,165	1,173	91	848	12,277	1,409	59	11,042	-233
1989 YTD	10,102	1,840	82	765	12,589	1,459	82	11,324	-276
1988 YTD	9,995	1,523	62	752	12,332	1,229	39	11,205	-141

[a] Monthly and annual data for 1984 through 1989 include underground storage and liquefied natural gas storage. Data for January 1990 forward include underground storage only.

[b] "Total" data for 1984 through 1989 do not equal equivalent data in Table 1 of the 1989 *Natural Gas Annual* due to the exclusion of intransit receipts and deliveries in the *Natural Gas Monthly*.

[c] Consists of pipeline fuel use, lease and plant fuel use, and deliveries to consuming sectors.

[d] Represents quantities lost and imbalances in data due to differences among data sources.

E = Estimated Data.

R = Revised Data.

Notes: Data for 1984 through 1989 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding. Full explanations of all survey processing, estimation procedures, and computations are provided in the publications listed under "Sources".

Sources: *Natural Gas Annual* and *Natural Gas Monthly*.

Table 4. Underground Natural Gas Storage (All Operators)
(Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[a]	Volume	Percent	Injections	Withdrawals	Net[c]
1984 Total[a]	3,930	2,876	6,700	201	10.0	2,252	2,064	188
1985 Total[a]	3,942	2,607	6,449	-270	-9.4	2,120	2,359	-231
1986 Total[a]	3,919	2,749	6,567	142	5.5	1,952	1,812	140
1987 Total[a]	3,792	2,756	6,548	7	.3	1,987	1,981	6
1988								
January	3,792	2,220	6,020	-52	-2.3	47	579	-531
February	3,791	1,827	5,618	-101	-5.1	50	450	-400
March	3,790	1,682	5,473	-107	-10.5	99	255	-156
April	3,790	1,769	5,559	-109	-8.7	162	92	71
May	3,790	2,027	5,818	-170	-8.1	202	46	236
June	3,792	2,293	6,086	-144	-5.9	274	36	238
July	3,793	2,567	6,359	-99	-2.8	294	42	252
August	3,791	2,835	6,626	-1	--	282	52	230
September	3,791	3,120	6,911	71	2.3	308	46	262
October	3,792	3,243	7,035	137	4.4	198	92	105
November	3,803	3,171	6,974	112	3.7	117	157	-40
December	3,800	2,850	6,650	94	3.4	82	391	-329
Total	--	--	--	--	--	2,174	2,244	-69
1989								
January	3,798	2,809	6,307	201	12.0	R 53	R 418	R -365
February	3,801	1,994	5,796	168	9.2	R 32	R 602	R -570
March	3,801	1,778	5,578	94	5.6	R 106	R 362	R -256
April	3,801	1,823	5,624	54	3.0	R 181	R 138	R 43
May	3,802	2,062	5,863	34	1.7	R 321	R 44	R 277
June	3,802	2,374	6,176	82	3.6	R 375	R 20	R 355
July	3,802	2,644	6,446	77	3.0	R 371	R 29	R 341
August	3,802	2,938	6,740	103	3.6	R 358	R 29	R 328
September	3,802	R 3,187	R 6,990	R 67	R 2.2	R 320	R 39	R 281
October	R 3,792	R 3,268	R 7,061	R 25	R .8	R 221	R 96	R 124
November	R 3,809	R 3,199	R 7,008	R 28	R .9	R 105	R 223	R -118
December	3,812	R 2,513	R 6,325	R -337	R -11.8	R 52	R 805	R -752
Total	--	--	--	--	--	R 2,493	R 2,804	R -311
1990								
January	3,818	R 2,205	R 6,023	R -243	R -9.7	R 91	R 339	R -248
February	3,814	R 2,013	R 5,827	R 19	R .9	R 70	R 324	R -253
March	R 3,818	R 1,978	R 5,695	R 101	R 5.7	R 124	R 256	R -131
April	R 3,839	R 1,932	R 5,771	R 109	R 6.0	183	R 140	R 43
May	3,823	2,159	R 5,982	97	4.7	R 289	R 45	R 245
June	R 3,844	R 2,454	R 6,297	R 79	R 3.3	R 327	R 42	R 285
July	3,850	2,747	6,597	103	3.9	325	27	298

[a] Total as of December 31.

[b] Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1984 - 8,043; 1985 - 8,007; 1986 - 8,145; 1987 and 1988 - 8,124; and 1989 - 8,124. Current total capacity is 8,125.

[c] Positive numbers indicate the volume of injections in excess of withdrawals. Negative numbers indicate the volume of withdrawals in excess of injections.

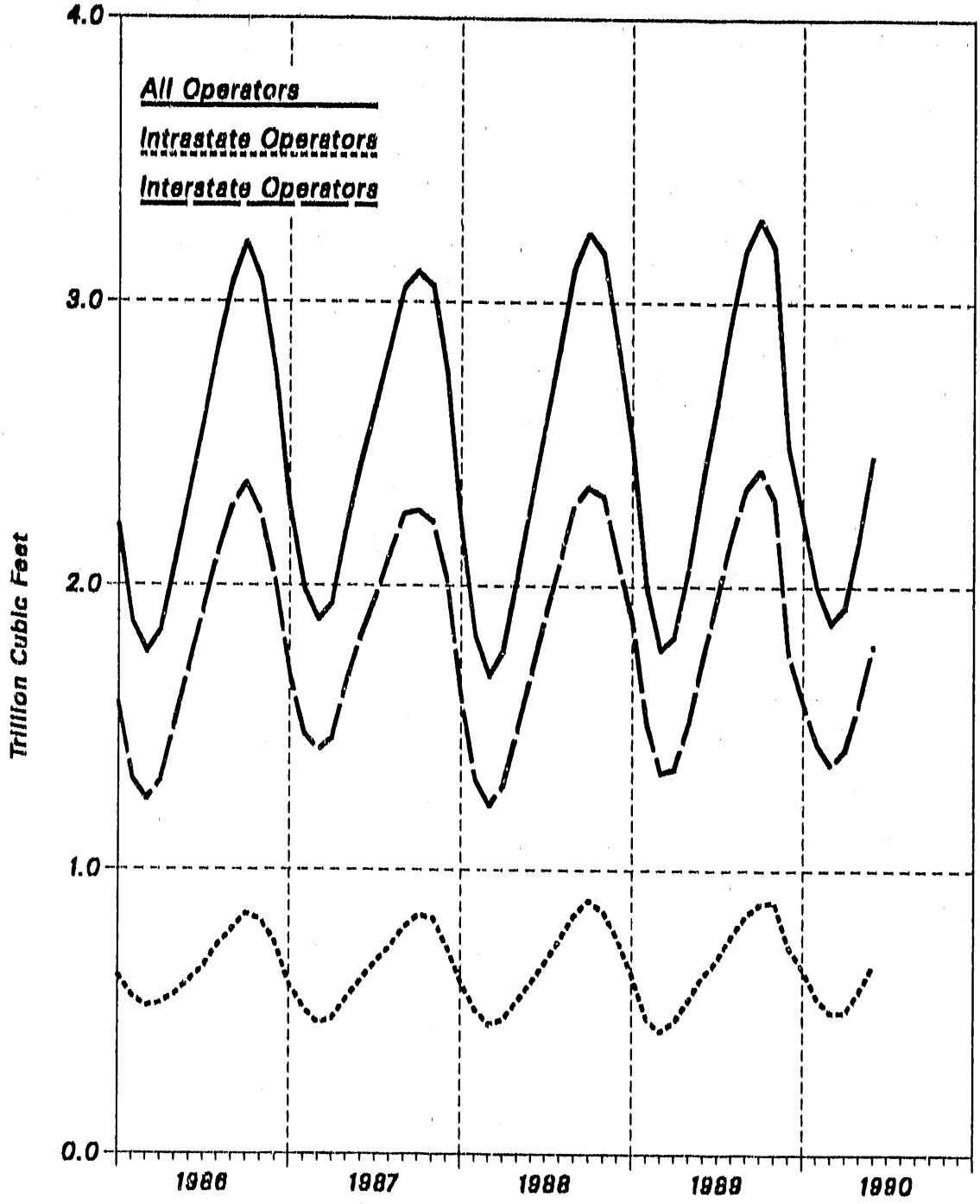
R = Revised Data.

-- = Not Applicable.

Notes: Data for 1984 through 1989 are final. All other data are preliminary unless otherwise noted. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia. Full explanations of all survey processing, estimation procedures, and computations are provided in the publications listed under "Sources".

Sources: Form EIA-191/FERC-8, "Underground Gas Storage Report", *Natural Gas Annual* and *Natural Gas Monthly*.

Figure 11. Underground Natural Gas Storage in the United States



Source: *Natural Gas Annual*, Form EIA-857, and Form EIA-759.

Table 5. Natural Gas Consumption by Petroleum Administration for Defense District (PADD)
(Billion Cubic Feet)

Year and Month	New England				Central Atlantic			
	Residential	Commercial	Industrial	Electric Utilities	Residential	Commercial	Industrial	Electric Utilities
1988								
January	28	13	5	0	156	72	47	7
February	27	13	5	0	145	69	46	11
March	24	12	5	0	124	59	46	13
April	16	9	5	1	84	41	40	15
May	12	7	5	2	60	29	39	23
June	7	4	5	6	30	18	35	31
July	5	4	4	4	24	16	33	36
August	4	4	5	5	22	17	34	37
September	5	4	5	1	24	16	34	17
October	8	5	5	1	46	26	38	10
November	15	9	6	1	80	42	41	7
December	22	11	5	0	117	57	42	3
Total	174	93	60	21	907	462	476	210
1989								
January	28	14	5	0	146	68	46	4
February	26	13	5	0	137	65	45	6
March	27	13	6	2	133	65	49	23
April	19	10	6	6	99	46	45	31
May	12	7	6	6	58	31	41	31
June	6	5	5	7	31	21	38	34
July	R 5	4	4	7	25	19	36	35
August	4	4	5	6	23	19	37	33
September	R 5	4	5	6	24	20	38	27
October	8	6	6	10	42	27	40	25
November	13	7	6	2	73	41	43	13
December	27	13	5	0	151	71	46	5
Total	180	100	65	54	931	493	508	268
1990								
January	31	14	5	0	151	67	43	6
February	24	12	5	1	120	56	43	9
March	23	11	6	1	111	53	44	21
April	18	9	6	6	85	43	42	22
May	11	6	6	9	47	26	37	21
June	7	4	6	5	31	22	35	27
1990 YTD	114	56	36	22	545	265	245	106
1989 YTD	118	62	34	21	592	290	265	130
1988 YTD	116	58	30	9	594	288	255	101

See footnotes at end of table.

Table 5. Natural Gas Consumption by Petroleum Administration for Defense District (PADD) (Continued)
(Billion Cubic Feet)

Year and Month	Lower Atlantic				PAD District I			
	Residential	Commercial	Industrial	Electric Utilities	Residential	Commercial	Industrial	Electric Utilities
1988								
January	R 50	30	34	11	R 234	115	86	18
February	R 48	29	38	9	R 220	110	89	20
March	R 39	24	42	12	R 186	96	93	25
April	R 22	17	39	15	R 124	67	84	30
May	13	12	40	17	81	48	85	42
June	8	10	39	R 20	45	33	80	R 57
July	7	9	37	21	36	29	74	61
August	6	10	40	21	32	30	78	64
September	7	10	38	16	36	30	77	34
October	14	13	41	8	69	44	84	19
November	24	17	39	5	118	67	85	13
December	R 40	25	37	7	R 179	93	84	10
Total	278	208	464	R 161	1,359	763	1,000	R 392
1989								
January	43	27	42	12	218	109	93	16
February	42	26	39	11	204	104	89	17
March	35	24	44	15	195	102	99	40
April	23	18	44	17	131	74	95	54
May	13	13	43	19	81	50	90	56
June	8	10	41	21	45	36	85	62
July	7	10	39	21	37	33	79	63
August	6	9	41	20	34	32	83	60
September	7	10	39	20	37	34	82	54
October	12	12	44	17	63	45	91	52
November	24	17	43	14	111	65	92	28
December	53	29	34	10	231	113	85	15
Total	275	205	493	196	1,386	799	1,064	518
1990								
January	51	30	43	12	233	111	92	18
February	33	23	40	13	177	90	88	22
March	29	21	43	15	164	85	93	37
April	21	18	40	16	123	70	90	44
May	11	12	42	18	69	44	85	48
June	8	10	39	17	46	36	81	49
1990 YTD	154	114	248	91	813	436	528	219
1989 YTD	164	118	253	95	874	475	552	246
1988 YTD	180	123	232	83	889	469	517	193

See footnotes at end of table.

Table 5. Natural Gas Consumption by Petroleum Administration for Defense District (PADD) (Continued)
(Billion Cubic Feet)

Year and Month	PAD District II				PAD District III			
	Residential	Commercial	Industrial	Electric Utilities	Residential	Commercial	Industrial	Electric Utilities
1988								
January	R 377	187	177	17	R 84	48	245	R 99
February	R 341	174	176	15	R 73	43	235	86
March	R 266	137	170	17	R 54	34	251	97
April	R 173	88	137	16	R 33	25	222	97
May	R 94	53	128	17	R 19	18	225	119
June	R 53	36	121	R 25	R 15	16	220	137
July	R 43	36	114	R 28	R 14	17	225	R 160
August	R 40	36	119	32	R 13	17	251	R 179
September	R 45	34	119	18	R 13	14	229	133
October	R 109	61	134	16	R 16	16	224	98
November	R 182	96	149	R 15	R 27	20	235	93
December	R 284	143	165	18	R 55	36	245	76
Total	2,005	R 1,081	1,709	R 234	416	305	2,807	1,373
1989								
January	318	157	171	17	66	40	254	74
February	329	162	171	17	72	41	246	92
March	286	144	172	17	60	37	250	103
April	180	90	150	20	33	26	249	107
May	105	54	135	23	19	19	244	132
June	54	34	123	21	15	17	249	122
July	45	32	120	27	14	19	254	150
August	42	33	120	26	13	17	258	156
September	54	34	121	19	14	15	249	121
October	105	56	139	17	18	17	255	111
November	193	99	155	16	32	23	279	86
December	371	176	178	19	75	41	295	99
Total	2,083	1,072	1,756	238	431	311	3,083	1,354
1990								
January	314	170	171	16	102	51	257	73
February	264	136	154	14	63	37	234	63
March	222	120	158	17	54	35	255	89
April	165	90	146	16	38	29	275	94
May	97	53	136	20	25	24	284	131
June	55	35	123	27	19	24	264	168
1990 YTD	1,117	604	888	111	301	200	1,569	619
1989 YTD	1,272	643	922	114	265	179	1,492	631
1988 YTD	1,302	674	910	108	278	184	1,398	635

See footnotes at end of table.

Table 5. Natural Gas Consumption by Petroleum Administration for Defense District (PADD) (Continued)
(Billion Cubic Feet)

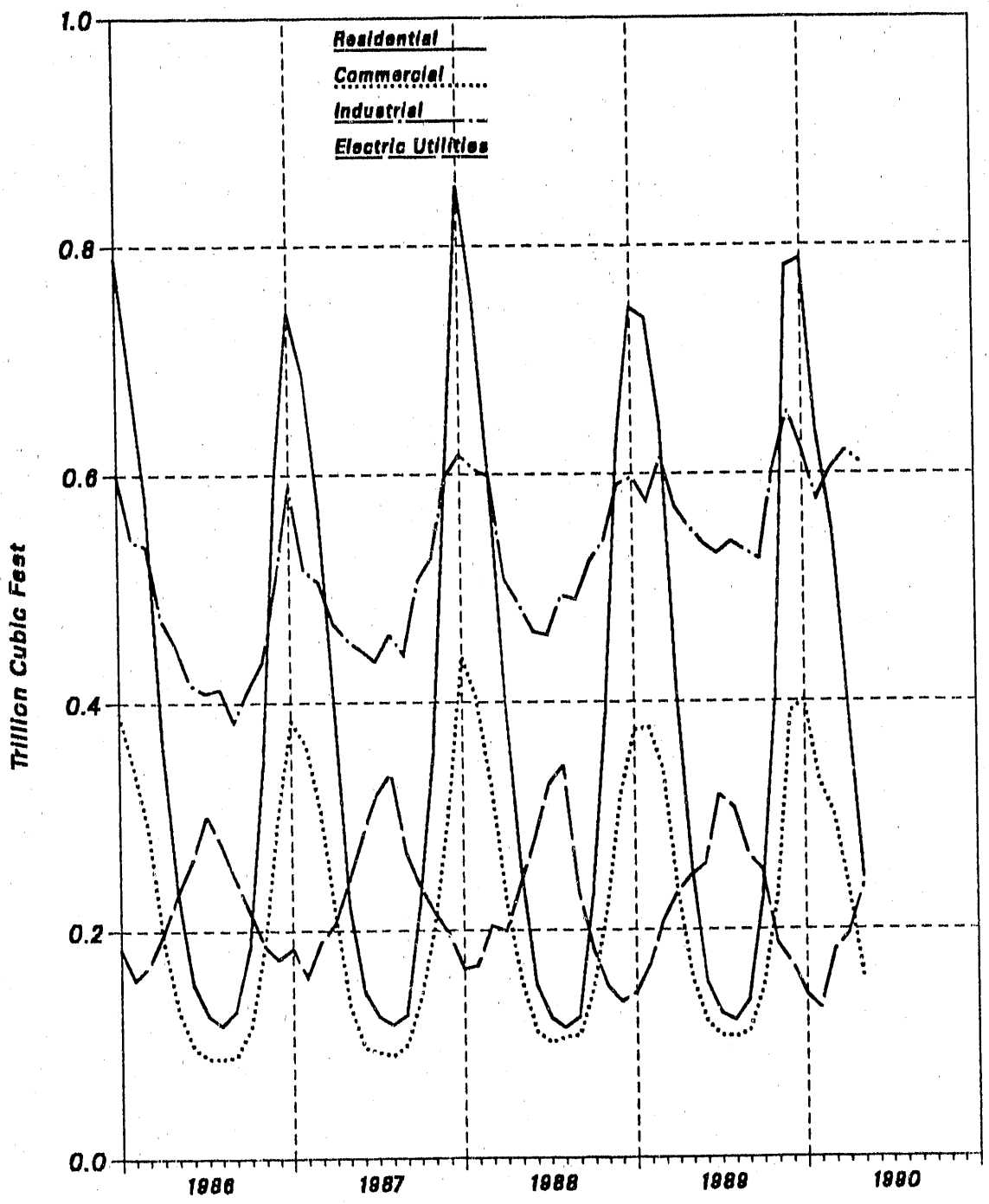
Year and Month	PAD I: District IV				PAD. District V			
	Residential	Commercial	Industrial	Electric Utilities	Residential	Commercial	Industrial	Electric Utilities
1988								
January	R 44	27	19	3	112	47	51	31
February	R 40	25	18	0	81	39	55	48
March	R 31	20	17	1	60	34	65	64
April	R 23	14	16	R 1	47	29	47	56
May	14	9	16	R 1	50	30	53	61
June	R 8	6	14	R 1	31	27	53	60
July	R 6	4	14	2	25	22	53	78
August	R 5	4	15	2	24	26	50	68
September	R 6	5	16	1	24	30	58	R 48
October	R 10	7	16	1	29	27	64	48
November	R 18	12	16	1	47	29	57	29
December	R 33	20	17	2	90	29	66	32
Total	240	152	194	R 15	610	370	672	R 622
1989								
January	41	25	20	2	109	45	60	37
February	41	25	19	1	97	47	44	42
March	36	21	19	1	69	37	61	48
April	22	14	17	1	48	30	52	50
May	14	8	15	1	37	27	59	37
June	9	6	15	0	32	29	58	54
July	7	4	13	1	26	22	59	78
August	6	4	16	1	26	23	62	66
September	7	5	15	1	28	25	65	70
October	10	7	17	1	33	27	67	72
November	19	12	17	1	50	33	90	56
December	33	20	18	1	79	40	65	36
Total	244	152	201	12	633	385	713	646
1990								
January	41	25	20	0	95	45	55	35
February	35	22	18	0	91	44	50	32
March	31	19	18	1	74	39	48	38
April	23	14	17	1	45	31	54	41
May	16	10	16	1	37	25	49	39
June	10	6	16	1	30	22	51	50
1990 YTD	155	96	106	4	372	207	308	236
1989 YTD	162	99	104	7	391	215	335	268
1988 YTD	162	101	100	7	382	207	324	319

R = Revised Data.

Notes: Data for 1984 through 1989 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding. Full explanations of all survey processing, estimation procedures, and computations are provided in the publications listed under "Sources".

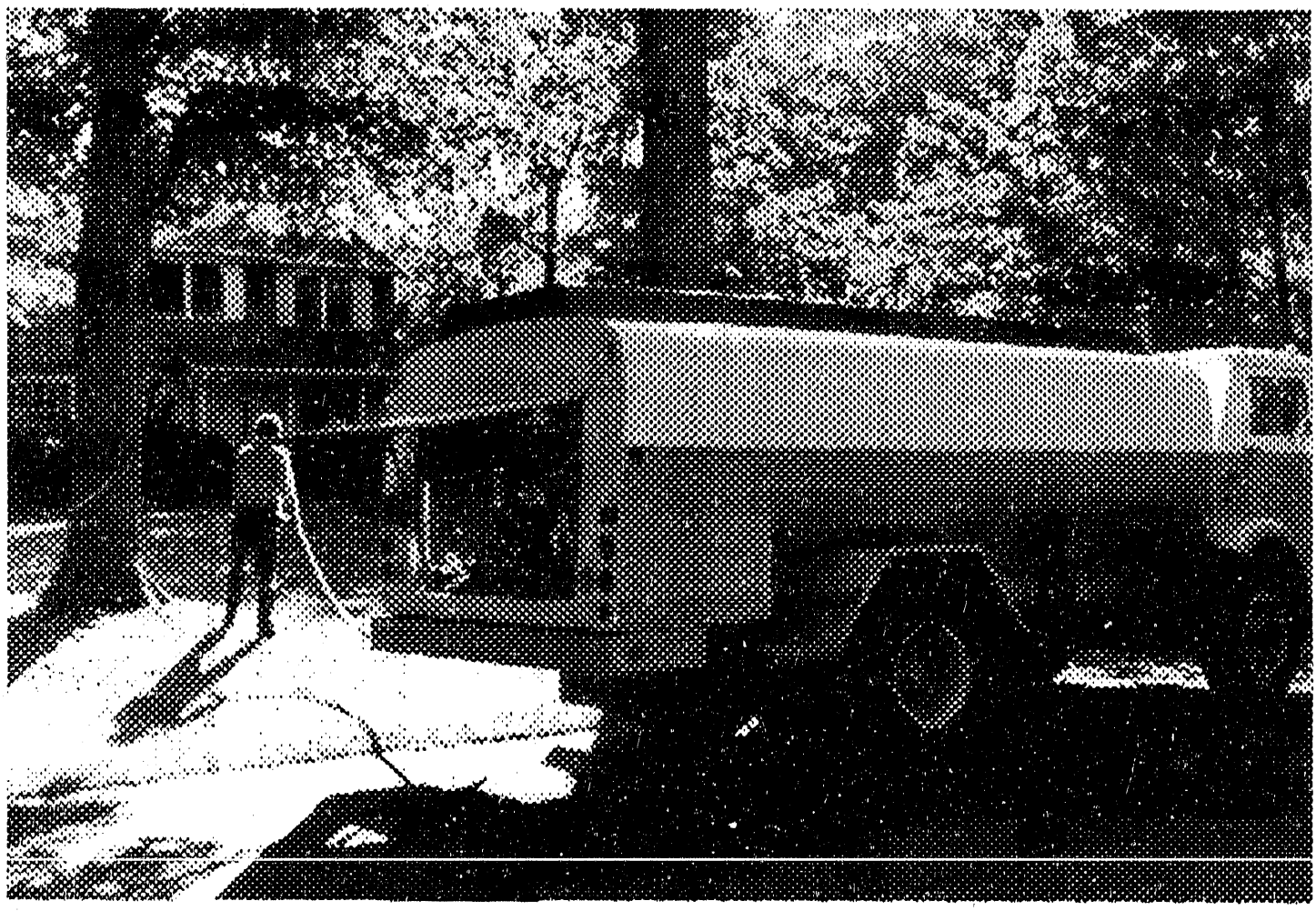
Sources: *Natural Gas Annual* and *Natural Gas Monthly*.

Figure 12. Natural Gas Deliveries to Consumers



Source: Form EIA-191, Form FERC-8, and Form EIA-176.

Prices



Distillate fuel oil and propane are the primary sources of residential heating in the United States.

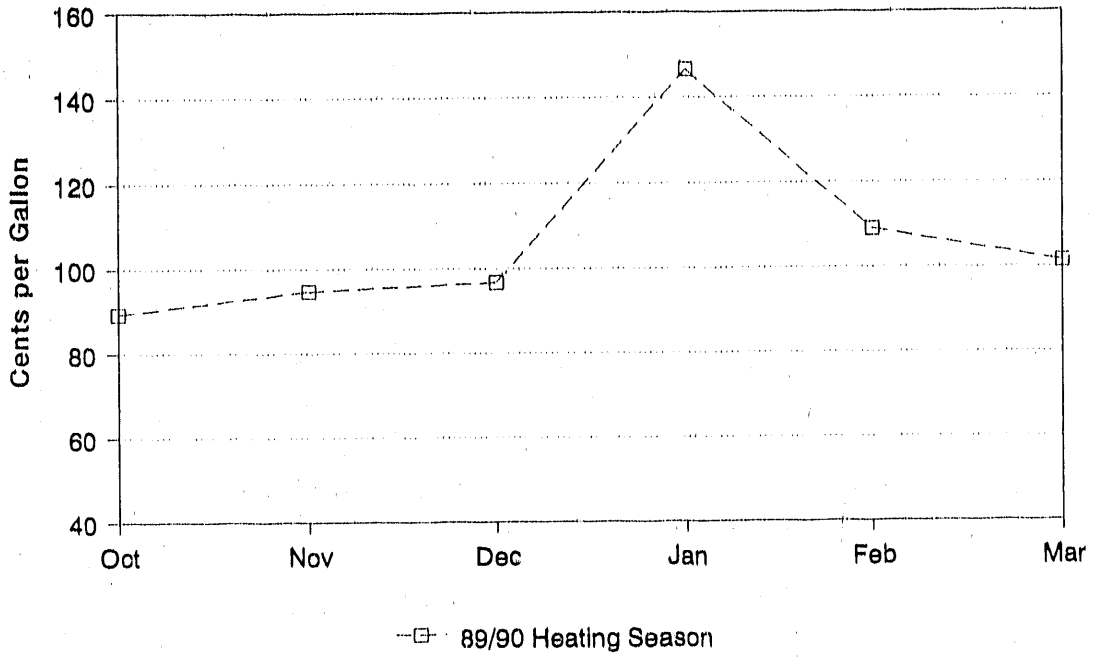
Table 6. Residential Heating Oil Prices by Region and State
(Cents per Gallon)

Region/State	Heating Season						
	1989/90						1990/91
	October	November	December	January	February	March	
Average	**86.6**	**90.4**	**92.8**	**134.4**	**102.9**	**97.2**	
East Coast (PADD I)	**88.1**	**92.4**	**94.8**	**142.2**	**106.1**	**100.1**	
New England (PADD IX)	**89.3**	**94.7**	**96.7**	**146.5**	**109.0**	**101.3**	
Connecticut	92.0	94.6	97.2	142.8	114.7	105.2	
Maine	81.9	96.6	97.5	153.9	99.7	93.4	
Rhode Island	92.8	94.5	96.8	149.1	105.8	101.0	
Vermont	88.8	89.9	91.4	143.4	106.1	100.5	
Central Atlantic (PADD IY)	**90.3**	**93.7**	**96.4**	**137.3**	**108.0**	**102.6**	
Delaware	82.4	85.8	90.2	140.3	102.0	95.5	
New Jersey	91.8	94.4	97.1	137.5	108.9	103.7	
New York	95.2	98.1	100.8	141.6	112.0	106.7	
Pennsylvania	80.0	85.3	87.7	128.8	99.8	94.2	
Lower Atlantic (PADD IZ)	NA	NA	NA	NA	NA	NA	
Midwest (PADD II)	**82.5**	**85.1**	**87.4**	**113.4**	**94.2**	**89.5**	
Michigan	85.5	89.0	90.4	117.8	97.3	92.4	
Ohio	81.0	85.1	86.4	114.5	93.9	87.9	
Wisconsin	81.0	81.5	85.3	108.7	91.6	88.0	

Source: Based on data collected by State Energy Offices.

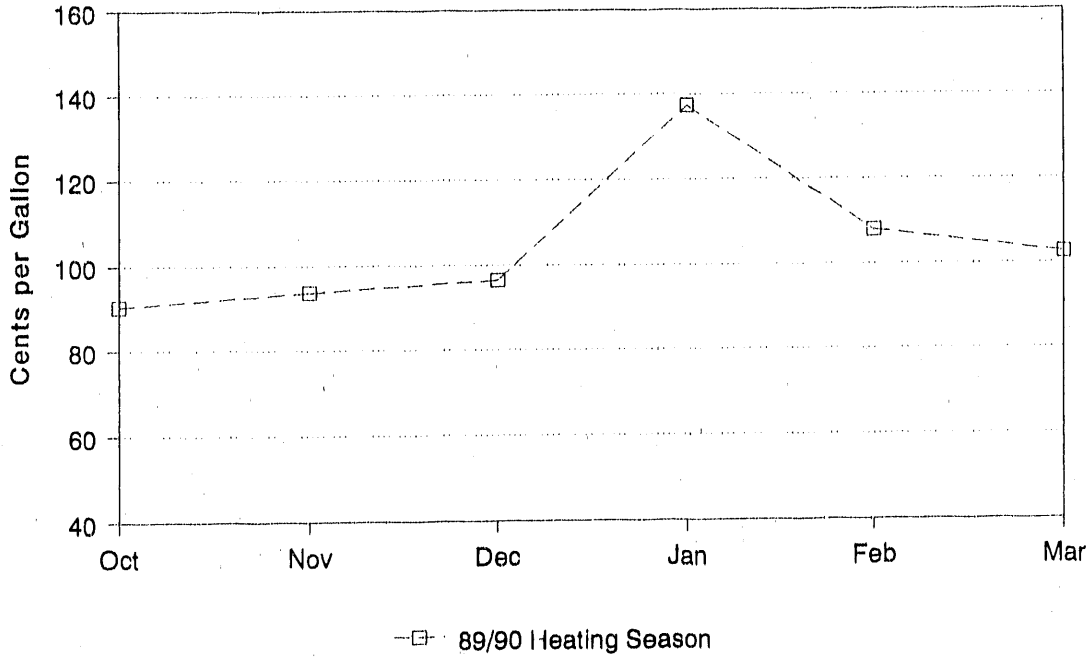
Semimonthly residential and wholesale prices are not scheduled for publication until October 11, 1990.

Figure 13. Residential Prices of Heating Oil, New England



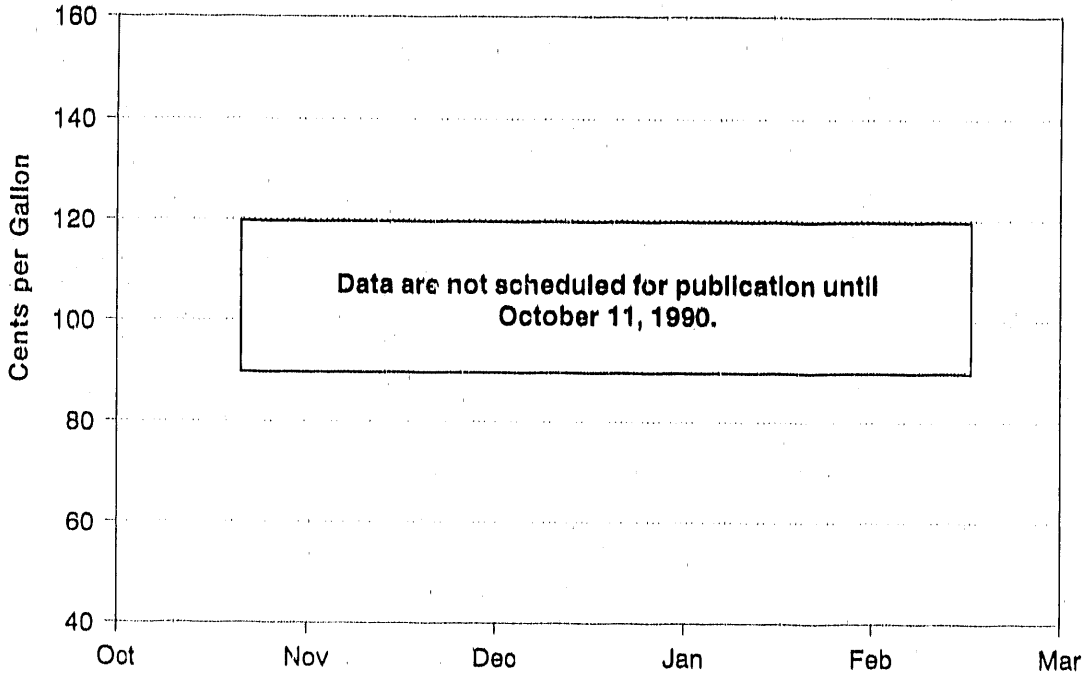
Source: Based on data collected by State Energy Offices.

Figure 14. Residential Prices of Heating Oil, Central Atlantic



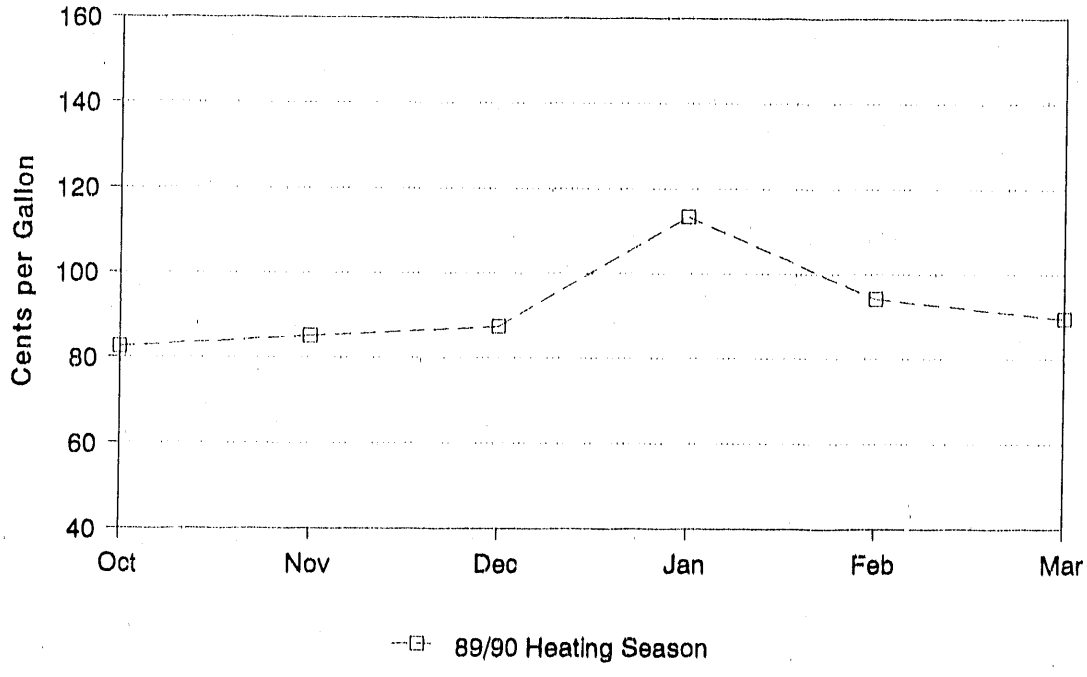
Source: Based on data collected by State Energy Offices.

Figure 15. Residential Prices of Heating Oil, Lower Atlantic



Source: Based on data collected by State Energy Offices.

Figure 16. Residential Prices of Heating Oil, Midwest



Source: Based on data collected by State Energy Offices.

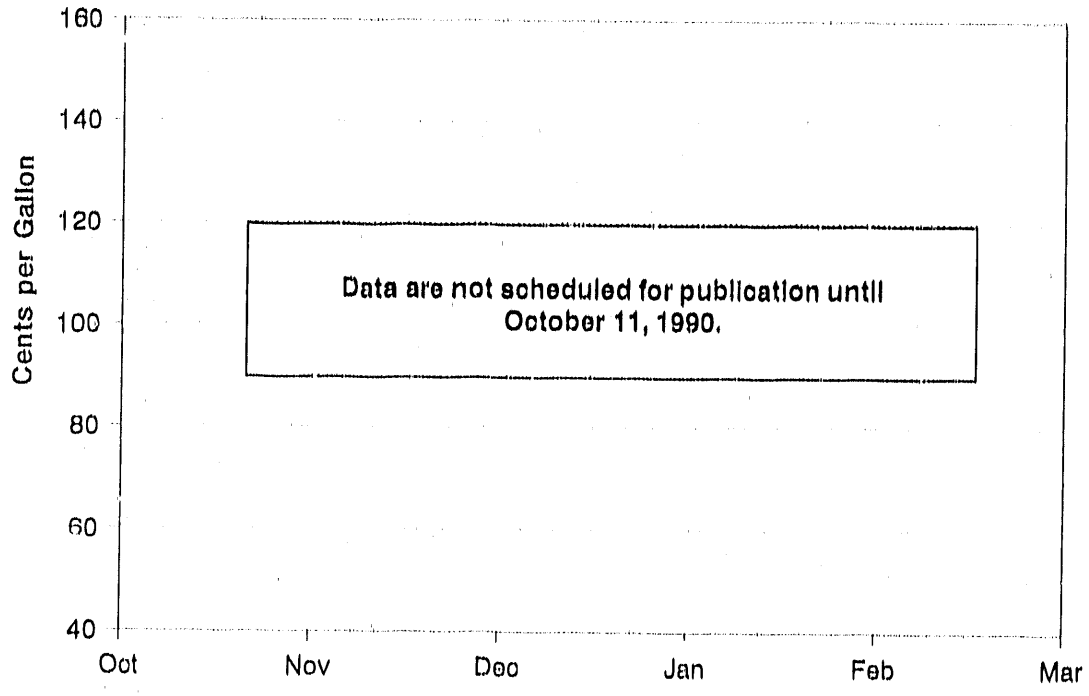
Table 7. Residential Propane Prices by Region and State
(Cents per Gallon)

Region/State	1990/91 Heating Season											
	10/01	10/15	11/05	11/19	12/03	12/17	01/07	01/21	02/04	02/18	03/04	03/18

Source: Based on data collected by State Energy Offices.

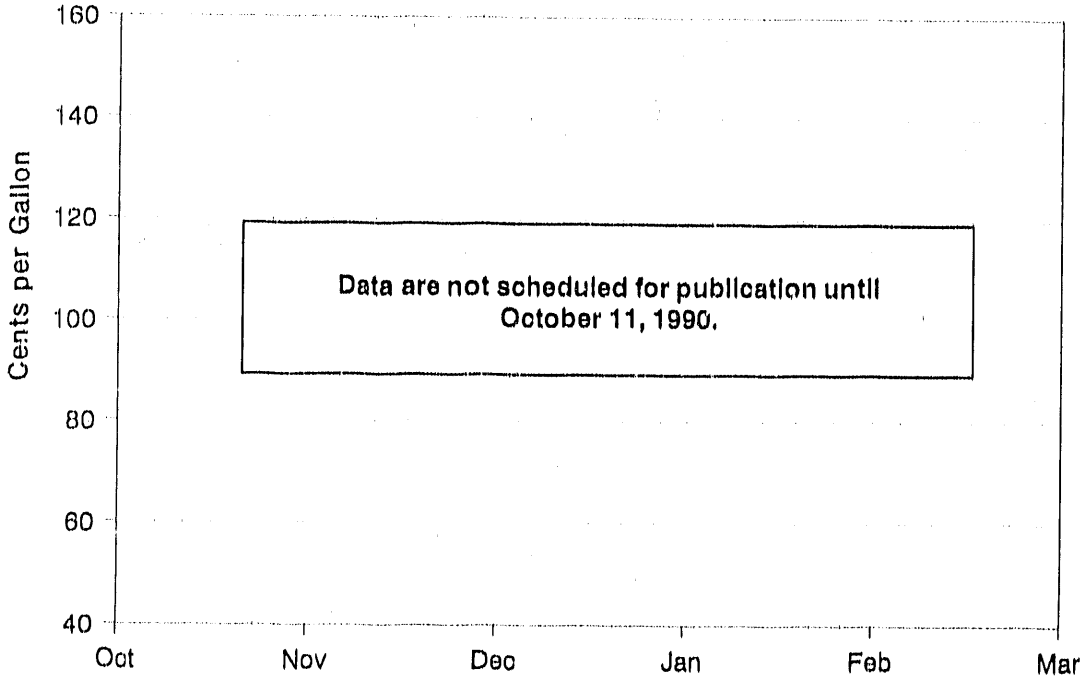
Data are not scheduled for publication until October 11, 1990.

Figure 17. Residential Prices of Propane, New England



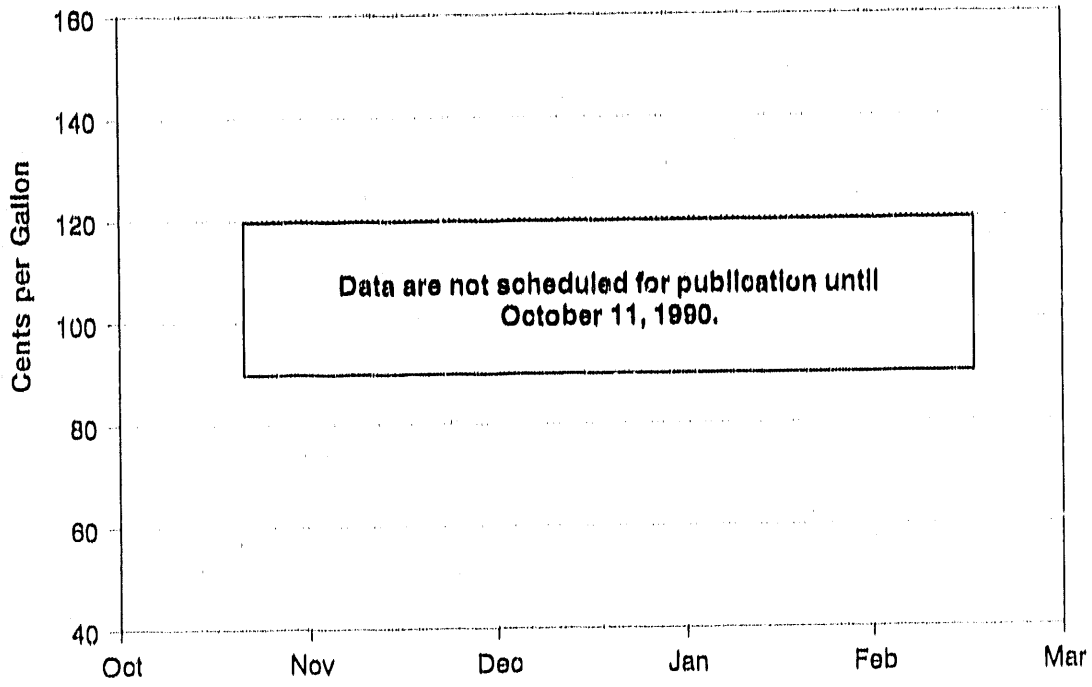
Source: Based on data collected by State Energy Offices.

Figure 18. Residential Prices of Propane, Central Atlantic



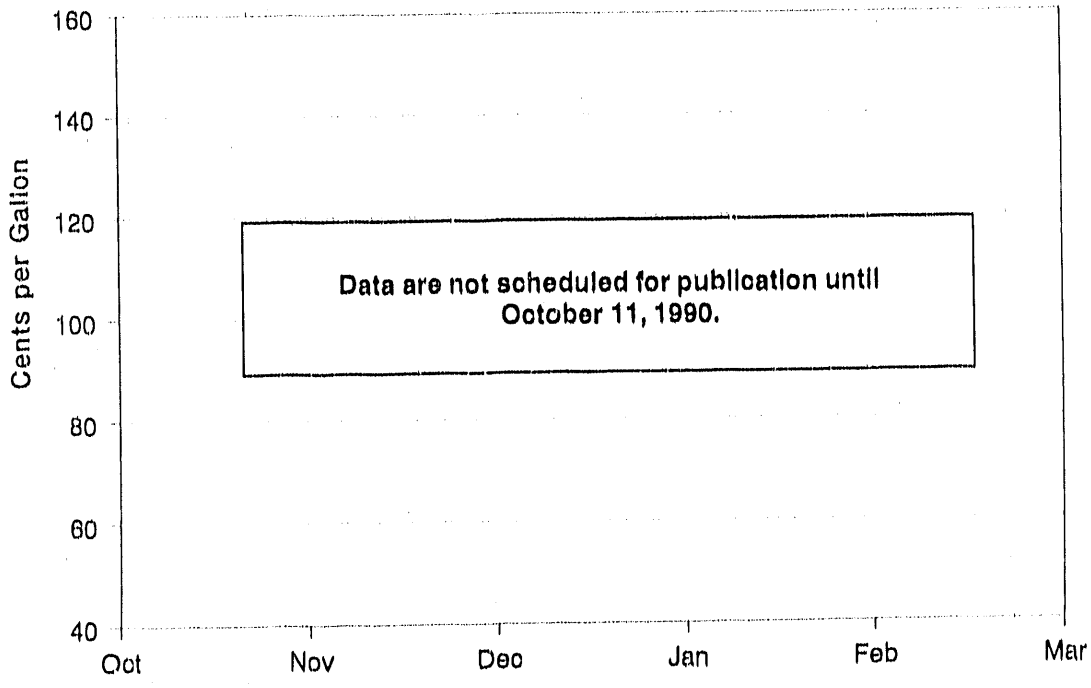
Source: Based on data collected by State Energy Offices.

Figure 19. Residential Prices of Propane, Lower Atlantic



Source: Based on data collected by State Energy Offices.

Figure 20. Residential Prices of Propane, Midwest



Source: Based on data collected by State Energy Offices.

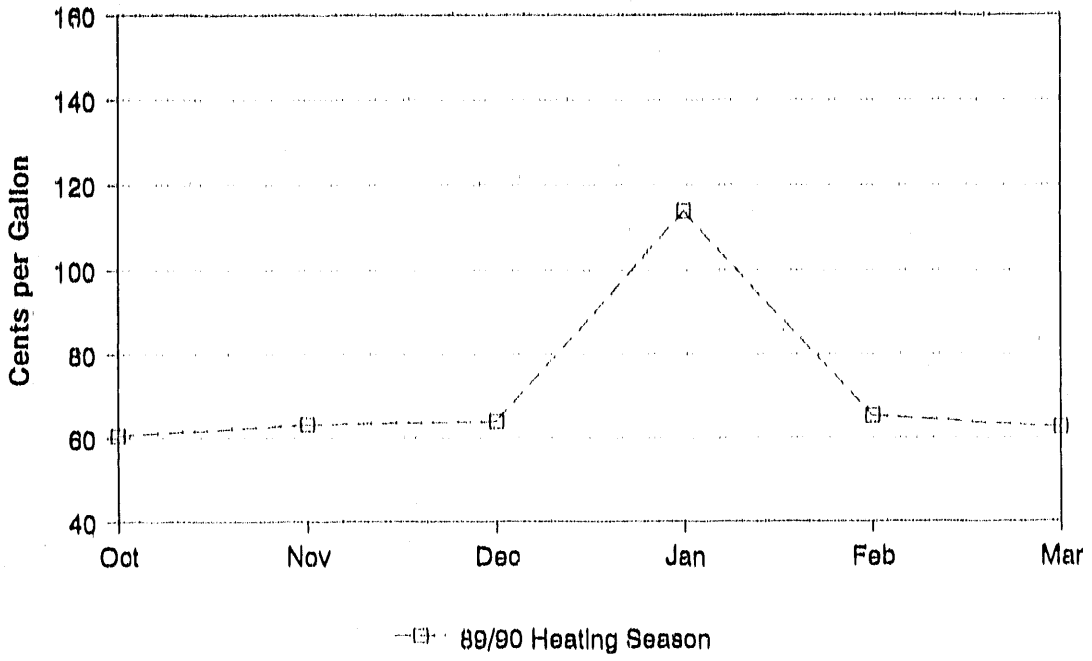
Table 8. Wholesale Heating Oil Prices by Region and State
(Cents per Gallon)

Region/State	Heating Season						
	1989/90						1990/91
	October	November	December	January	February	March	
Average	59.3	62.1	62.6	102.8	61.9	60.1	
East Coast (PADD I)	60.0	61.0	62.4	107.2	63.7	60.5	
New England (PADD IX)	60.6	63.1	64.0	113.6	65.4	62.6	
Connecticut	60.4	63.1	63.7	113.0	65.5	62.8	
Maine	60.8	63.1	63.9	115.2	64.8	62.0	
Rhode Island	60.4	63.2	64.0	114.3	65.1	62.1	
Vermont	61.8	63.7	66.6	110.9	67.8	64.3	
Central Atlantic (PADD IY)	58.9	61.9	62.4	107.8	63.6	60.4	
Delaware	58.9	59.3	61.3	107.8	67.3	58.3	
District of Columbia	58.6	61.0	61.6	95.8	64.0	60.0	
Maryland	58.7	61.0	62.3	100.7	64.3	59.5	
New Jersey	58.7	61.8	62.5	114.5	63.9	59.9	
New York	60.4	63.5	62.7	102.1	63.7	62.1	
Pennsylvania	57.5	60.5	61.9	104.9	62.4	59.7	
Lower Atlantic (PADD IZ)	58.1	60.3	60.9	96.1	61.6	58.4	
North Carolina	57.9	60.2	61.0	96.2	61.8	58.4	
Virginia	58.3	60.3	60.8	96.1	61.5	58.4	
Midwest (PADD II)	59.9	62.6	63.0	99.4	57.2	58.9	
Illinois	58.9	62.9	61.3	89 3	55.2	56.4	
Indiana	58.9	61.3	62.9	91.9	58.9	58.1	
Iowa	60.9	62.3	64.2	96.0	57.4	60.1	
Kansas	60.2	61.7	62.8	95.6	56.5	59.1	
Michigan	59.6	63.6	62.7	90.9	55.2	57.2	
Minnesota	62.5	63.9	64.8	97.8	58.5	60.8	
Missouri	58.7	61.6	62.0	95.6	57.3	57.9	
Nebraska	60.8	62.3	63.9	95.2	57.4	60.2	
North Dakota	63.1	65.0	65.8	97.3	59.1	61.5	
Ohio	60.2	62.9	63.7	91.5	60.1	60.6	
South Dakota	61.4	63.5	64.5	95.2	58.2	60.2	
Wisconsin	58.9	61.9	61.9	90.2	54.3	56.9	

Sources: • The 1989/90 heating season data are based on quotes at representative terminal locations as published in the *U.S. Oil Week*. • The 1990/91 heating season data are based on terminal quotes collected by the Computer Petroleum Corporation, Inc.

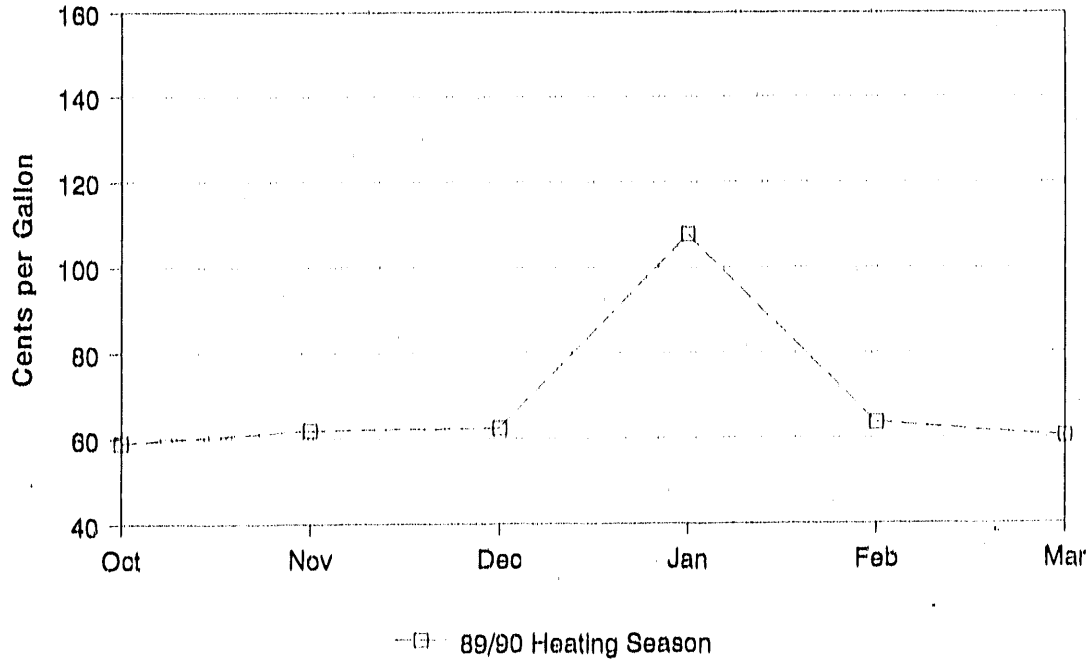
Semimonthly residential and wholesale prices are not scheduled for publication until October 11, 1990.

Figure 21. Wholesale Prices of Heating Oil, New England



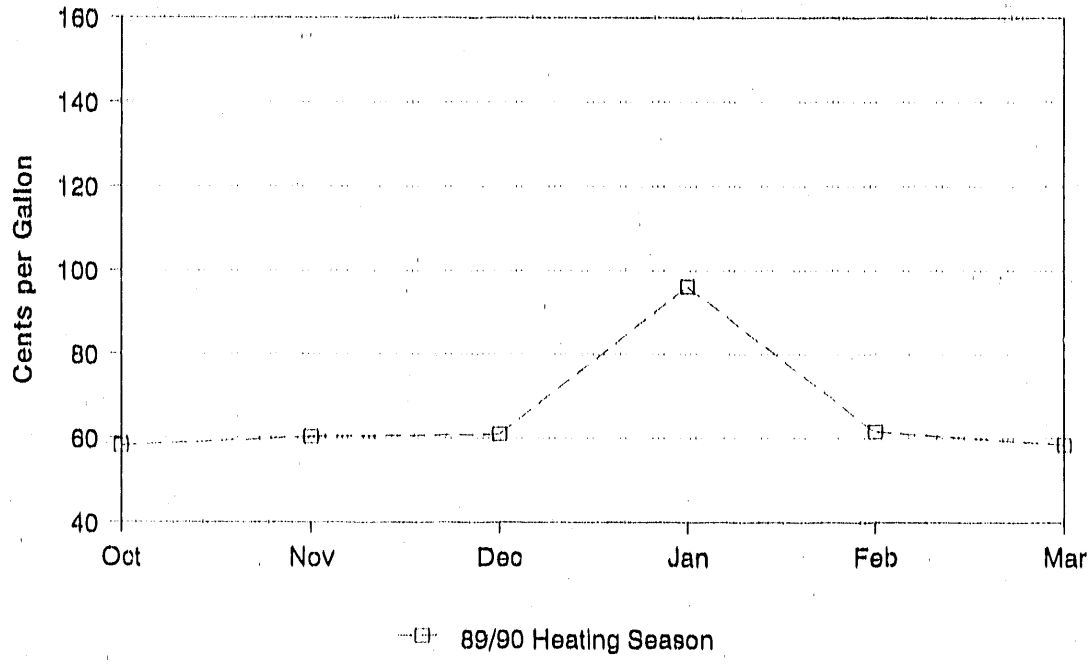
Sources: • The 1989/90 heating season data are based on quotes at representative terminal locations as published in the *U.S. Oil Week*. • The 1990/91 heating season data are based on terminal quotes collected by the Computer Petroleum Corporation, Inc.

Figure 22. Wholesale Prices of Heating Oil, Central Atlantic



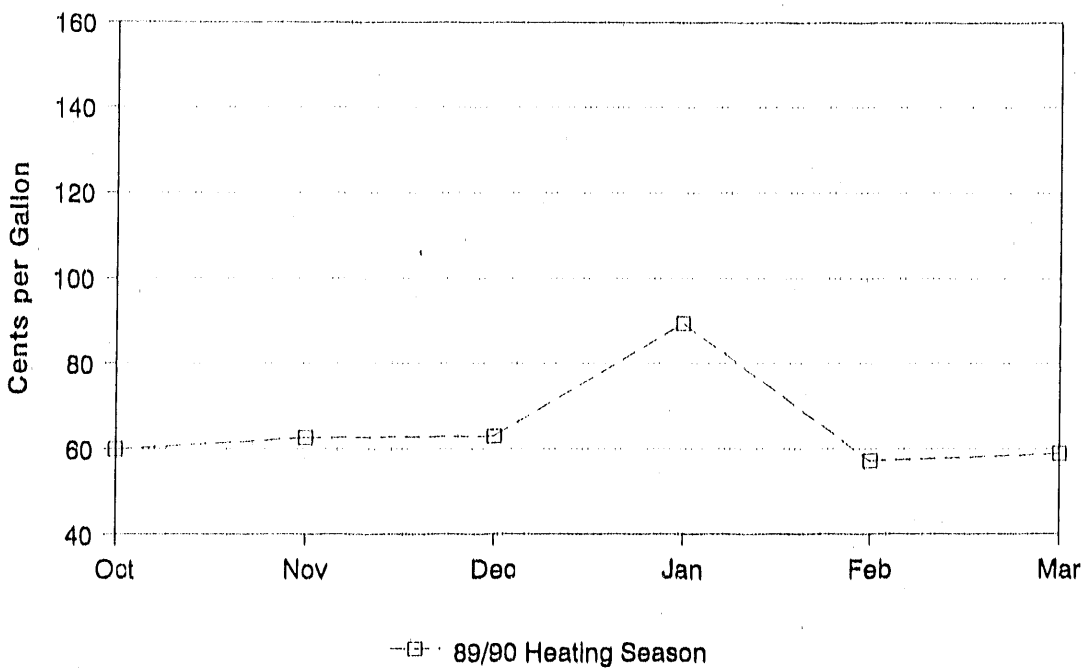
Sources: • The 1989/90 heating season data are based on quotes at representative terminal locations as published in the *U.S. Oil Week*. • The 1990/91 heating season data are based on terminal quotes collected by the Computer Petroleum Corporation, Inc.

Figure 23. Wholesale Prices of Heating Oil, Lower Atlantic



Sources: • The 1989/90 heating season data are based on quotes at representative terminal locations as published in the *U.S. Oil Week*. • The 1990/91 heating season data are based on terminal quotes collected by the Computer Petroleum Corporation, Inc.

Figure 24. Wholesale Prices of Heating Oil, Midwest



Sources: • The 1989/90 heating season data are based on quotes at representative terminal locations as published in the *U.S. Oil Week*. • The 1990/91 heating season data are based on terminal quotes collected by the Computer Petroleum Corporation, Inc.

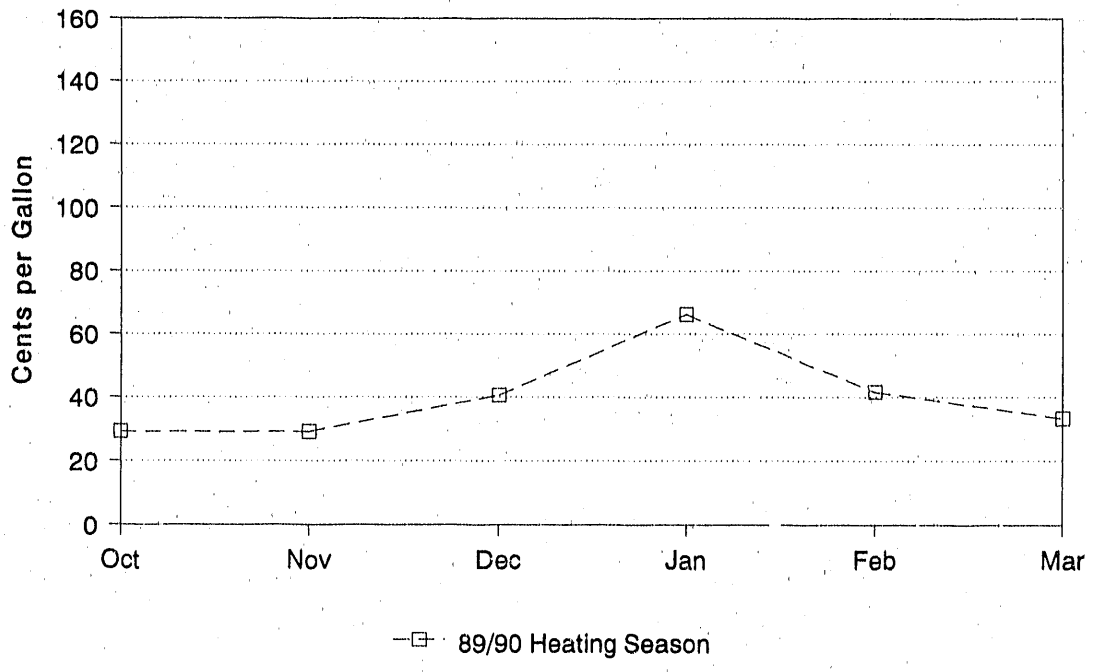
Table 9. Wholesale Propane Oil Prices by Region and State
(Cents per Gallon)

Region/State	Heating Season						
	1989/90						1990/91
	October	November	December	January	February	March	
Average	**26.0**	**26.0**	**41.4**	**66.0**	**34.0**	**27.2**	
East Coast (PADD I)	**28.9**	**28.9**	**39.3**	**62.7**	**42.0**	**32.8**	
New England (PADD IX)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	
Central Atlantic (PADD IY)	**29.2**	**29.1**	**40.6**	**66.2**	**41.6**	**33.3**	
New York	29.4	29.5	39.7	66.5	42.5	33.5	
Pennsylvania	29.0	28.8	41.3	66.0	41.0	33.1	
Lower Atlantic (PADD IZ)	**28.7**	**28.6**	**38.0**	**59.2**	**42.3**	**32.4**	
North Carolina	29.1	28.8	38.1	59.5	42.5	32.6	
South Carolina	27.7	28.3	37.9	58.7	41.9	31.9	
Midwest (PADD II)	**25.1**	**25.1**	**42.0**	**67.0**	**31.7**	**25.5**	
Illinois	26.6	26.8	44.5	70.3	30.8	25.8	
Indiana	26.8	26.3	43.1	66.4	34.7	28.1	
Kansas	22.7	22.5	39.4	65.9	28.5	22.0	
Minnesota	22.3	22.3	35.6	67.7	32.5	24.6	
Missouri	25.5	24.8	48.9	69.7	28.8	24.1	
Nebraska	25.6	25.0	44.6	67.6	29.7	24.3	
North Dakota	24.7	25.2	38.8	62.6	32.9	26.9	
Ohio	28.0	27.8	40.1	64.4	39.7	31.7	
South Dakota	26.3	25.7	44.8	68.6	30.4	25.0	
Wisconsin	25.3	27.8	41.1	65.3	31.7	26.7	

NA=Not available.
Source: These data are average prices collected by the Computer Petroleum Corporation, Inc.

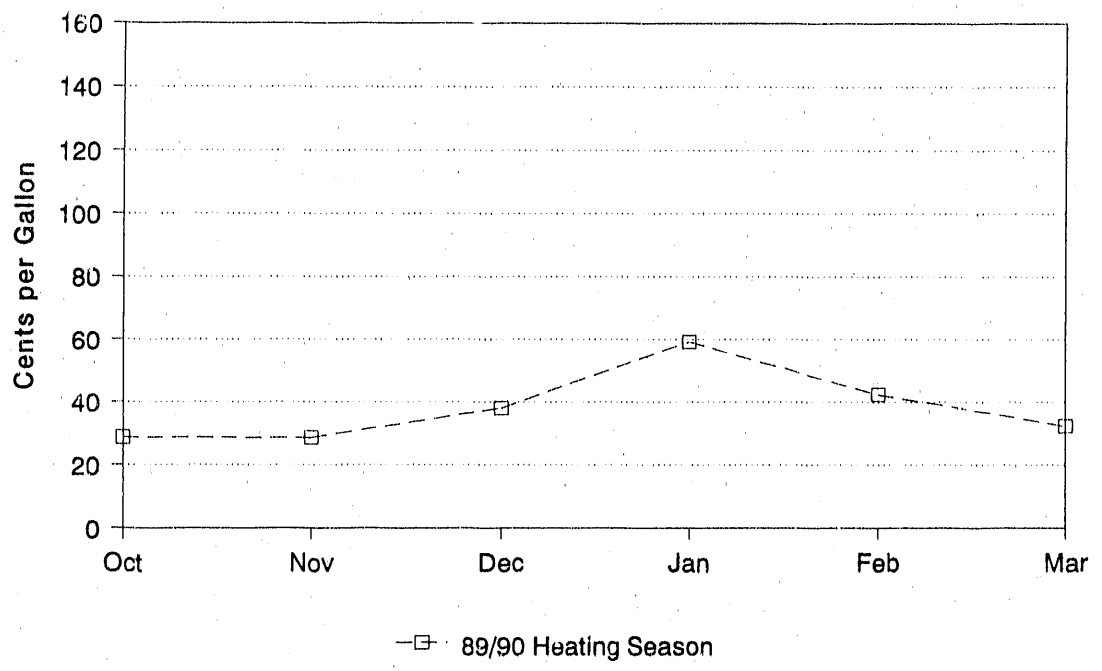
Semimonthly residential and wholesale prices are not scheduled for publication until October 11, 1990.

Figure 25. Wholesale Prices of Propane, Central Atlantic



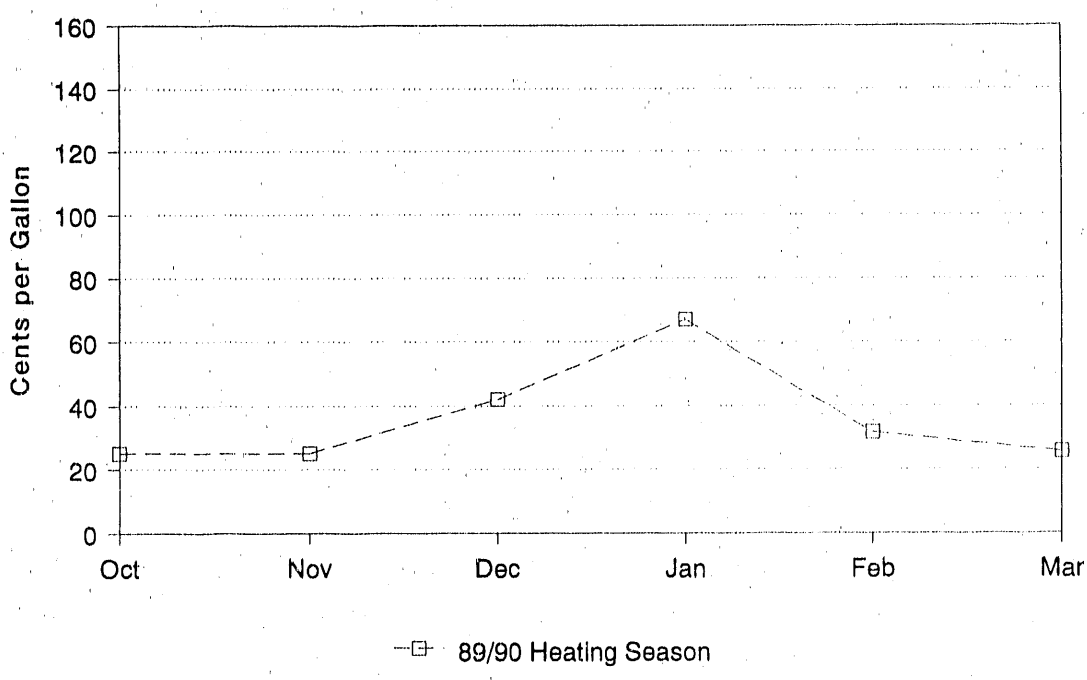
Source: These data are average prices collected by the Computer Petroleum Corporation, Inc.

Figure 26. Wholesale Prices of Propane, Lower Atlantic



Source: These data are average prices collected by the Computer Petroleum Corporation, Inc.

Figure 27. Wholesale Prices of Propane, Midwest



Source: These data are average prices collected by the Computer Petroleum Corporation, Inc.

Table 10. U.S. Crude Oil and Petroleum Product Prices
(Cents per Gallon, Except Where Noted)

Report Period	Crude WTI[a] (Dollars/ Barrel)	No. 2 Distillate				Propane	
		Spot [a]	Terminal [b]	Residential [c]	Diesel Retail [d]	Spot [e]	Residential [c]
Monthly							
1/90	22.86	72.7	75.1	114.0	127.9	45.0	94.5
2/90	22.09	57.5	58.2	96.3	120.8	27.6	81.2
3/90	20.39	58.0	58.5	94.7	116.6	23.9	71.5
4/90	18.43	58.5	58.6	93.1	115.0	23.0	68.5
5/90	18.20	53.9	56.3	90.7	114.9	22.3	54.8
6/90	16.70	48.1	51.4	86.4	113.7	24.0	58.7
7/90	18.69	53.3	52.5	NA	111.9	28.0	NA
Week Ending							
8/3/90	21.98	60.2	60.7	NA	NA	32.6	NA
8/10/90	27.32	72.1	75.7	NA	125.0	37.5	NA
8/17/90	27.28	74.2	77.2	NA	NA	37.6	NA
8/24/90	30.27	87.7	84.5	NA	129.9	42.3	NA
8/31/90	27.13	74.9	86.7	NA	NA	37.4	NA
9/7/90	30.23	82.9	85.8	NA	134.6	40.4	NA
Daily							
9/10/90	30.83	84.4	87.2	NA	NA	40.3	NA
9/11/90	30.29	80.4	87.0	NA	NA	39.8	NA
9/12/90	30.85	80.6	86.6	NA	NA	40.1	NA
9/13/90	31.20	81.4	86.1	NA	NA	41.4	NA
9/14/90	31.79	80.1	85.9	NA	NA	42.1	NA
9/17/90	33.73	82.6	85.8	NA	NA	43.9	NA
9/18/90	33.48	83.2	85.9	NA	NA	44.1	NA
9/19/90	33.18	86.6	85.5	NA	NA	43.8	NA
9/20/90	34.44	89.9	86.7	NA	NA	45.6	NA
9/21/90	36.21	95.6	87.9	NA	NA	48.3	NA
9/24/90	39.05	102.7	91.4	NA	NA	54.3	NA
9/25/90	38.33	99.6	96.5	NA	NA	54.0	NA
9/26/90	39.12	101.4	98.1	NA	NA	55.3	NA
9/27/90	39.77	103.0	99.3	NA	NA	56.3	NA
9/28/90	39.53	103.5	101.1	NA	NA	59.8	NA

NA=Not available.

[a] Source: Spot West Texas Intermediate (WTI) at Cushing, Oklahoma; No. 2 distillate in New York Harbor from Reuters.

[b] Source: Computer Petroleum Corp. rack prices.

[c] Source: Residential No. 2 distillate and propane prices from Energy Information Administration (EIA), *Petroleum Marketing Monthly*, and State Heating Oil and Propane Program starting October 1, 1990.

[d] Source: Diesel Retail prices from *Lundberg PS*.

[e] Source: Mt. Belvieu, Texas, spot propane prices from *Platts' Oilgram Price Report*.

Table 11. Petroleum Product Prices for Selected Cities
(Cents per Gallon)

Report Period	Chicago				Houston			
	No. 2 Distillate			Propane	No. 2 Distillate			Propane
	Spot [a]	Terminal [b]	Diesel Retail [c]	Terminal [d]	Spot [a]	Terminal [b]	Diesel Retail [c]	Terminal [d]
Monthly								
1/90	60.0	69.2	140.4	72.5	61.5	76.3	130.6	54.4
2/90	52.2	54.3	128.4	31.3	54.1	56.9	124.4	32.5
3/90	54.8	56.5	123.3	25.8	52.7	55.7	115.9	25.7
4/90	54.2	56.2	122.7	26.1	52.2	54.5	113.6	25.3
5/90	59.4	54.0	121.8	26.4	48.8	51.6	112.7	24.1
6/90	55.1	48.6	120.8	29.4	45.9	47.5	111.3	24.7
7/90	54.9	51.1	119.1	32.4	51.3	51.7	109.9	27.9
Week Ending								
8/3/90	57.2	61.0	NA	36.2	58.6	61.1	NA	31.0
8/10/90	73.1	76.4	133.8	42.1	69.7	75.7	120.8	36.0
8/17/90	74.5	76.1	NA	43.1	72.7	76.1	NA	38.1
8/24/90	85.9	84.4	137.9	48.0	86.6	84.5	127.7	40.1
8/31/90	76.3	83.7	NA	48.1	74.2	83.7	NA	46.4
9/7/90	81.7	82.3	139.0	47.8	81.9	82.4	131.9	44.0
Daily								
9/10/90	82.8	83.7	NA	48.8	83.4	84.4	NA	41.0
9/11/90	81.0	83.6	NA	48.7	80.5	84.2	NA	41.3
9/12/90	80.8	83.5	NA	48.2	80.3	83.8	NA	41.3
9/13/90	81.0	83.0	NA	48.0	80.8	83.2	NA	41.3
9/14/90	81.8	82.9	NA	48.2	80.2	83.1	NA	41.6
9/17/90	82.8	82.8	NA	48.6	82.4	83.5	NA	42.0
9/18/90	83.8	83.1	NA	49.6	83.2	83.4	NA	42.2
9/19/90	85.3	83.8	NA	49.8	85.4	84.0	NA	42.2
9/20/90	87.9	84.4	NA	50.2	88.9	84.6	NA	43.4
9/21/90	92.8	86.7	140.0	50.8	94.0	86.3	134.0	45.0
9/24/90	99.3	90.4	NA	53.4	100.7	90.3	NA	47.1
9/25/90	96.3	96.2	NA	57.8	98.5	95.6	NA	50.4
9/26/90	97.3	97.4	NA	58.4	99.6	97.6	NA	52.8
9/27/90	99.5	98.6	NA	59.2	102.7	98.9	NA	52.8
9/28/90	99.5	100.8	NA	62.9	102.9	100.9	NA	54.6

See footnotes at end of table.

Table 11. Petroleum Product Prices for Selected Cities (Continued)

(Cents per Gallon)

Report Period	Los Angeles				New York			
	No. 2 Distillate			Propane	No. 2 Distillate			Propane
	Spot [a]	Terminal [b]	Diesel Retail [c]	Terminal [d]	Spot [a]	Terminal [b]	Diesel Retail [c]	Terminal [d]
Monthly								
1/90	58.5	65.6	114.8	48.9	72.7	86.9	141.1	67.9
2/90	54.7	58.3	114.0	45.2	57.5	61.2	129.1	43.5
3/90	55.4	56.6	113.5	41.3	58.0	61.0	124.6	34.1
4/90	55.2	57.3	113.0	32.7	58.5	61.7	120.9	32.6
5/90	51.6	55.9	113.1	28.3	53.9	59.2	120.7	31.3
6/90	47.6	50.4	112.7	27.0	48.1	52.3	123.6	31.7
7/90	49.6	50.4	112.1	27.6	53.3	55.1	123.1	34.4
Week Ending								
8/3/90	61.0	57.7	NA	29.4	60.2	62.4	NA	38.1
8/10/90	70.6	71.3	124.0	31.7	72.1	75.0	132.9	43.6
8/17/90	77.7	76.2	NA	34.1	74.2	76.9	NA	45.7
8/24/90	90.5	86.2	134.0	34.2	87.7	84.7	137.5	47.5
8/31/90	77.5	91.5	NA	34.9	74.9	86.9	NA	49.0
9/7/90	85.6	91.2	140.4	35.8	82.9	85.4	140.5	48.6
Daily								
9/10/90	84.0	90.8	NA	36.2	84.4	86.7	NA	49.3
9/11/90	83.5	89.9	NA	37.2	80.4	86.1	NA	49.7
9/12/90	80.8	89.1	NA	37.2	80.6	86.1	NA	49.3
9/13/90	82.0	87.5	NA	37.0	81.4	85.5	NA	49.3
9/14/90	82.3	86.8	NA	37.0	80.1	85.4	NA	49.6
9/17/90	83.9	85.9	NA	37.8	82.6	85.1	NA	49.9
9/18/90	85.8	85.9	NA	37.8	83.2	85.7	NA	50.8
9/19/90	87.5	86.0	NA	38.2	86.6	86.6	NA	51.3
9/20/90	90.3	85.7	NA	38.2	89.9	87.4	NA	51.5
9/21/90	97.5	86.0	141.9	38.4	95.6	89.2	143.2	52.4
9/24/90	104.3	88.7	NA	38.4	102.7	92.3	NA	54.9
9/25/90	99.5	94.3	NA	39.2	99.6	98.5	NA	57.6
9/26/90	103.8	97.0	NA	40.6	101.4	99.0	NA	60.7
9/27/90	103.8	97.8	NA	40.6	103.0	101.7	NA	61.8
9/28/90	104.0	100.8	NA	41.2	103.5	103.0	NA	63.3

NA=Not available.

[a] Source: No. 2 distillate spot prices in Chicago, Houston, and Los Angeles, are from Telerate; New York spot prices are from Reuters.

[b] Source: No. 2 distillate terminal prices in Chicago, Houston, Los Angeles, and New York, are from Computer Petroleum Corp.

[c] Source: Diesel Retail self-serve prices in Chicago, Houston, Los Angeles, and Long Island, New York, are from *Lundberg PS*.

[d] Source: Propane terminal prices in Lemont, Illinois; Mt. Belvieu, Texas; Los Angeles, California; and Selkirk, New York, are from Computer Petroleum Corp.

Weather Summary

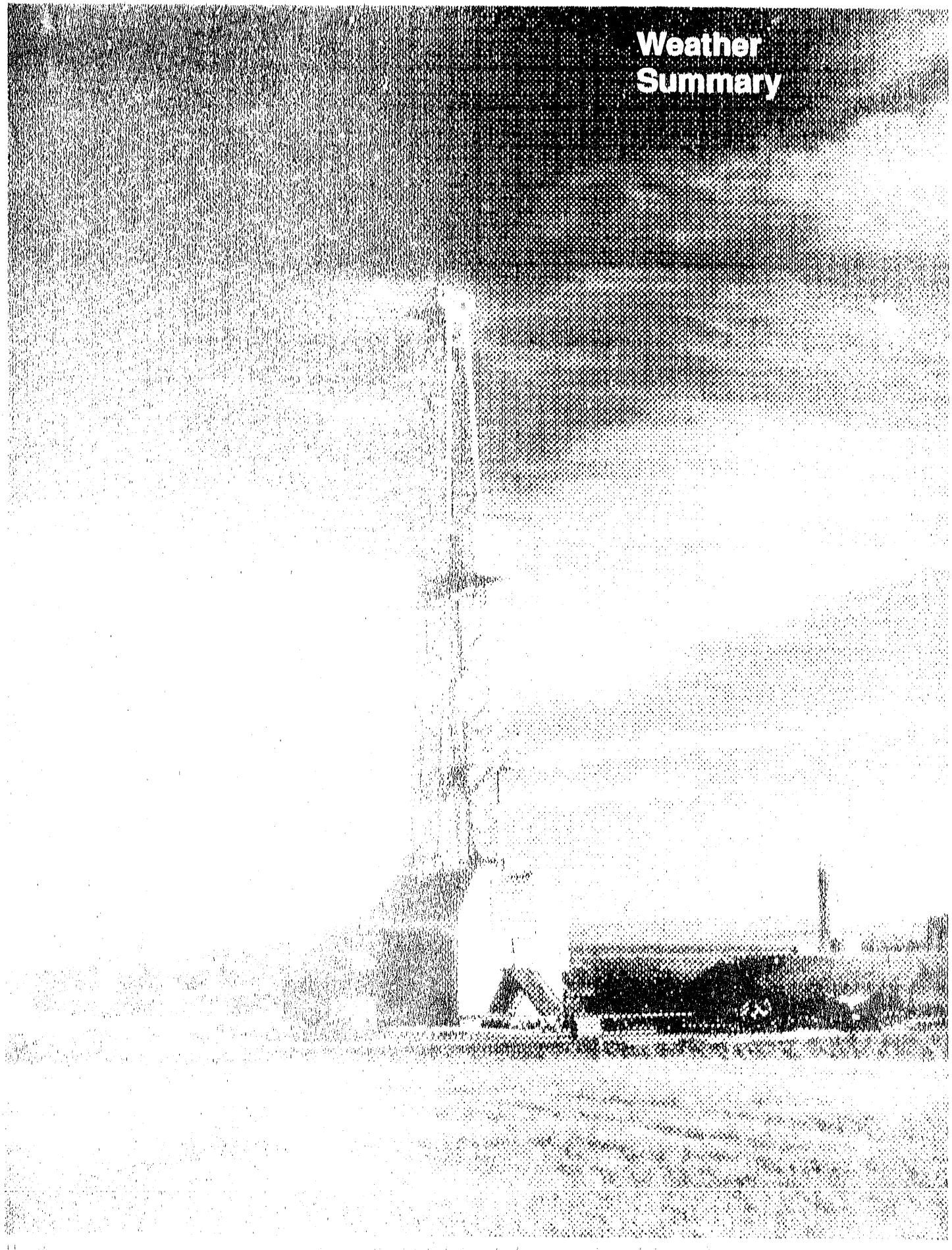


Table 12. U.S. Total Heating Degree Days by City

(Population Weighted Heating Degree-Days[a], Except Where Noted)

City	1990	1988-1989	Normal	Percent Change: 1990 vs. 1988-1989	Percent Change: 1990 vs. Normal
July 1 - June 30	--	4,582	4,689	--	--
July 1 - September 29	84	103	85	-18	-1
Albuquerque	8	10	10	****	****
Amarillo	11	91	25	****	****
Asheville	58	82	51	****	****
Atlanta	13	29	7	****	****
Billings	75	194	242	-61	-69
Boise	40	118	151	-66	-74
Boston	93	91	81	****	****
Buffalo	142	193	165	-26	-14
Cheyenne	219	254	285	-14	-23
Chicago	106	132	78	****	****
Cincinnati	64	81	48	****	****
Cleveland	125	111	123	13	2
Columbia, SC	9	10	0	****	****
Denver	72	145	127	-50	-43
Des Moines	77	144	75	****	****
Detroit	107	156	127	-31	-16
Fargo	187	240	281	-22	-33
Hartford	119	120	103	-1	16
Houston	0	0	0	****	****
Jacksonville	0	0	0	****	****
Kansas City	38	137	38	****	****
Las Vegas	0	0	0	****	****
Los Angeles	0	3	56	****	****
Memphis	11	24	8	****	****
Miami	0	0	0	****	****
Milwaukee	111	173	151	-36	-26
Minneapolis	132	164	177	-20	-25
Montgomery	6	13	0	****	****
New York	45	36	31	****	****
Oklahoma City	9	78	13	****	****
Omaha	68	138	68	****	****
Philadelphia	60	44	29	****	****
Phoenix	0	0	0	****	****
Pittsburgh	114	115	106	-1	8
Portland, ME	206	192	266	7	-23
Providence	114	95	94	****	****
Raleigh	18	32	7	****	****
Richmond	34	42	21	****	****
St. Louis	25	73	37	****	****
Salem, OR	63	147	235	-57	-73
Salt Lake City	16	57	91	****	****
San Francisco	52	204	269	-75	-81
Seattle	97	129	334	-25	-71
Shreveport	6	17	0	****	****
Washington, DC	39	35	12	****	****

[a] See Glossary.

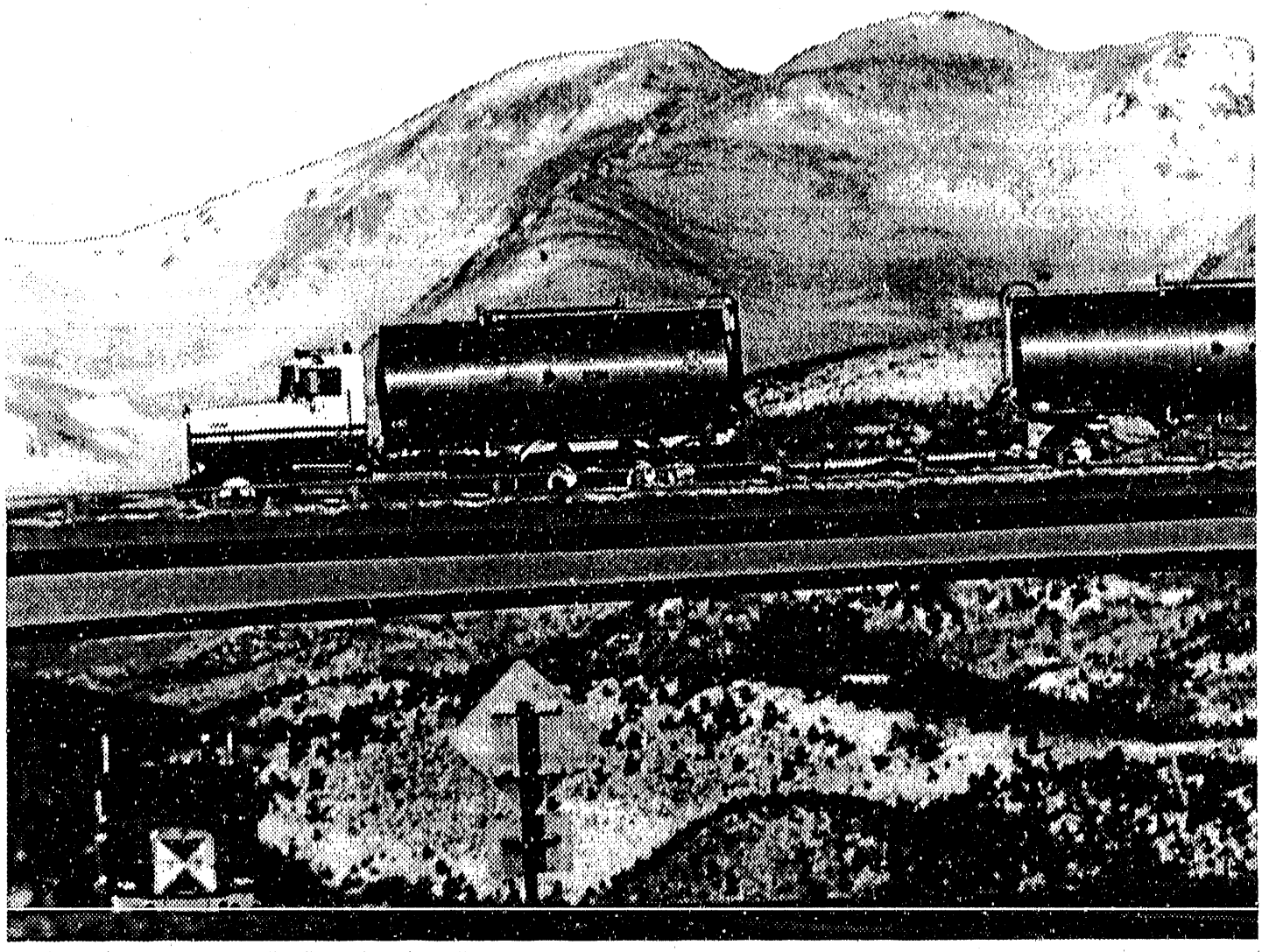
**** = Normal heating degree days 100 or less or ratio incalculable.

Note: The weather for the Nation, as measured by population-weighted heating degree-days from July 1, 1990 through September 29, 1990, has been 2 percent warmer than last year and 1 percent warmer than normal.

Source: Weather data reported in the *Winter Fuels Report* are taken directly from a computerized system implemented by the National Oceanic and Atmospheric Administration, Department of Commerce. The National Oceanic and Atmospheric Administration (NOAA)/NWS, as a U.S. Government Agency, does not endorse any consumer information services.

Appendix A

District Descriptions and Maps



Tank trucks are used to distribute heating oil to remote areas.

Appendix A

District Descriptions and Maps

The following are the Refining Districts which make up the Petroleum Administration for Defense (PAD) Districts.

PAD District I

East Coast: District of Columbia and the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, and the following counties of the State of New York: Cayuga, Tompkins, Chemung, and all counties east and north thereof. Also the following counties in the State of Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.

Appalachian No. 1: The State of West Virginia and those parts of the States of Pennsylvania and New York not included in the East Coast District.

Sub-PAD District I

New England (PADD 1X): The States of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Central Atlantic (PADD 1Y): The District of Columbia and the States of Delaware, Maryland, New Jersey, New York, and Pennsylvania.

Lower Atlantic (PADD 1Z): The States of Florida, Georgia, North Carolina, South Carolina, Virginia, and West Virginia.

PAD District II

Indiana-Illinois-Kentucky: The States of Indiana, Illinois, Kentucky, Tennessee, Michigan, and Ohio.

Minnesota-Wisconsin-North and South Dakota: The States of Minnesota, Wisconsin, North Dakota, and South Dakota.

Oklahoma-Kansas-Missouri: The States of Oklahoma, Kansas, Missouri, Nebraska, and Iowa.

PAD District III

Texas Inland: The State of Texas except the Texas Gulf Coast District.

Texas Gulf Coast: The following counties of the State of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.

Louisiana Gulf Coast: The following Parishes of the State of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Saint Helena, Tangipahoa, Washington, and all Parishes south thereof. Also the following counties of the State of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson. Also the following counties of the State of Alabama: Mobile and Baldwin.

North Louisiana-Arkansas: The State of Arkansas and those parts of the States of Louisiana, Mississippi, and Alabama not included in the Louisiana Gulf Coast District.

New Mexico: The State of New Mexico.

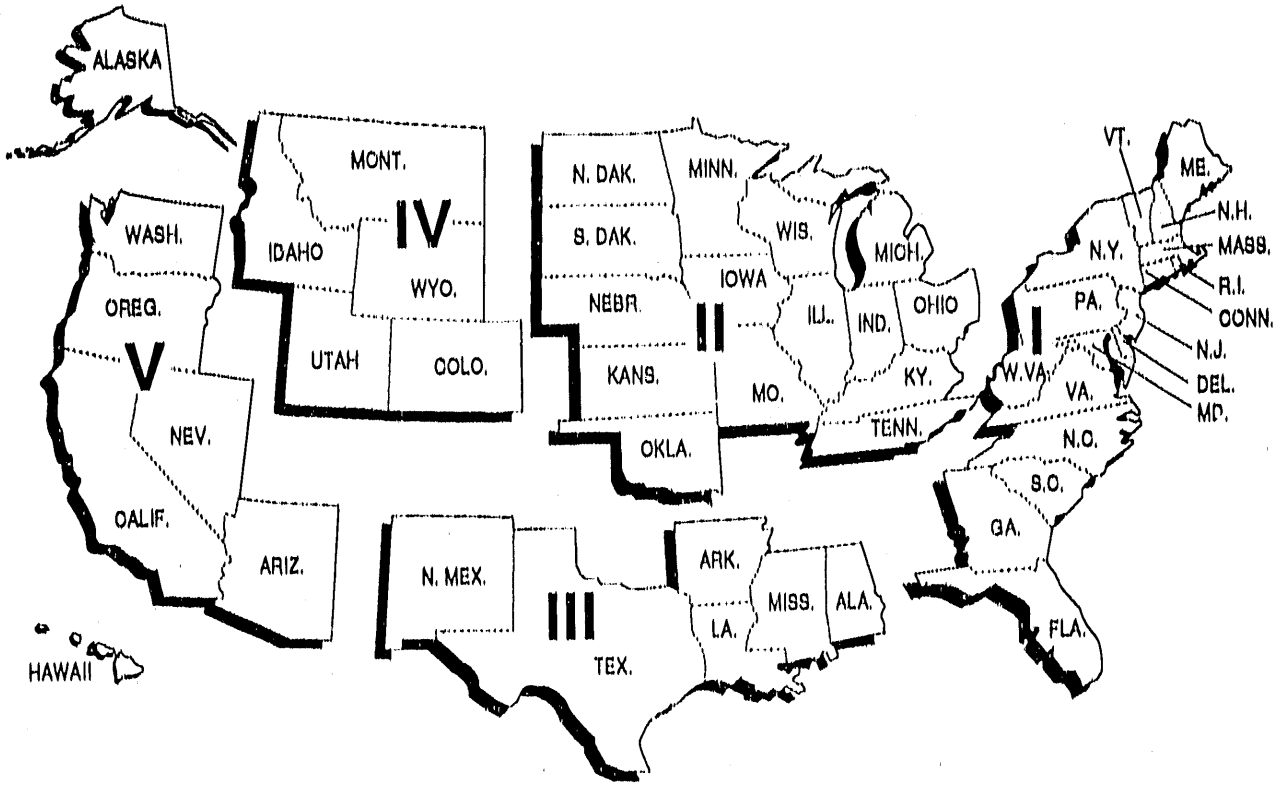
PAD District IV

Rocky Mountain: The States of Montana, Idaho, Wyoming, Utah, and Colorado.

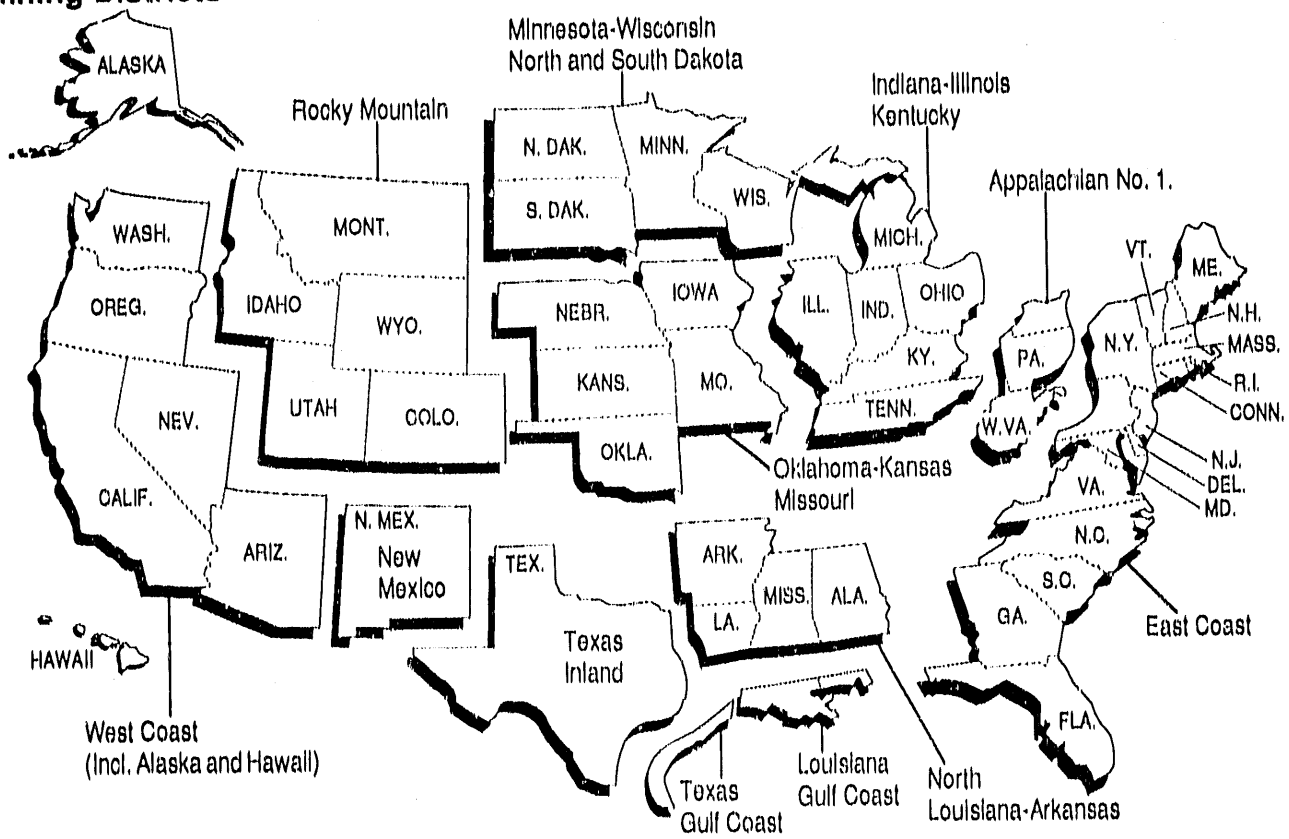
PAD District V

West Coast: The States of Washington, Oregon, California, Nevada, Arizona, Alaska, and Hawaii.

Petroleum Administration for Defense (PAD) Districts

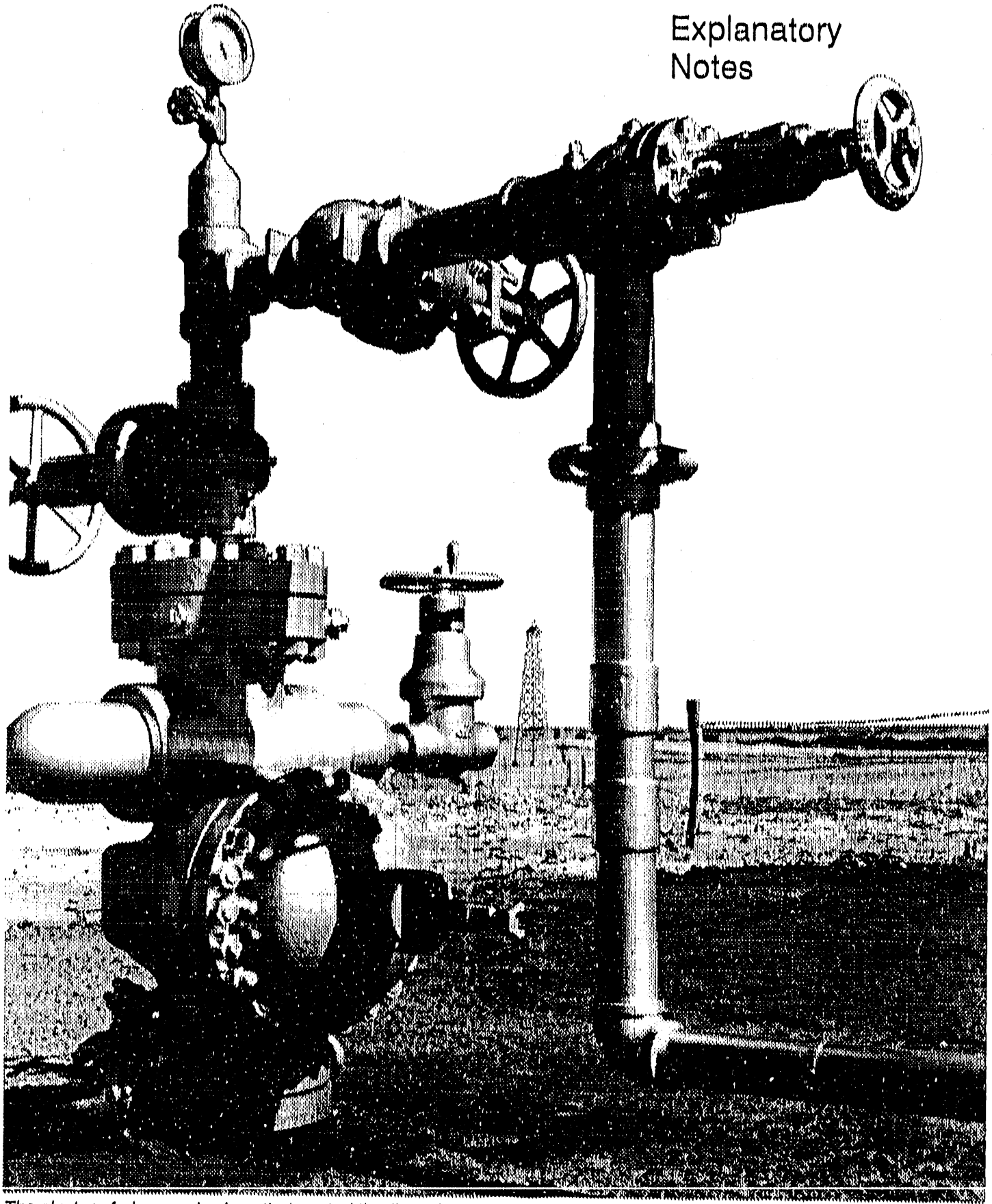


Refining Districts



Appendix B

Explanatory Notes



The cluster of pipes and valves that control the flow of oil at the mouth of an oil well is what oilmen call a "Christmas Tree."

Appendix B

Explanatory Notes

Note 1. Overview

The following Explanatory Notes are provided to assist in understanding and interpreting the data presented in this publication.

- Note 2. Monthly Data
- Note 3. Weekly Data
- Note 4. Price Data
- Note 5. Interpretation and Derivation of Average Inventory Levels

Note 2. Monthly Data

Data for distillate fuel oil and propane are extracted from selected surveys in the Monthly Petroleum Supply Reporting System (MPSRS). Refer to the *Petroleum Supply Monthly* for a detailed discussion of the MPSRS.

The forms that comprise the monthly data are:

Form Number	Name
EIA-810	*Monthly Refinery Report*
EIA-811	*Monthly Bulk Terminal Report*
EIA-812	*Monthly Product Pipeline Report*
EIA-814	*Monthly Imports Report*
EIA-816	*Monthly Natural Gas Liquids Report*

Note 3. Weekly Data

Distillate Fuel Oil

Data collected from the Weekly Petroleum Supply Reporting System (WPSRS) are used to develop estimates for distillate fuel oil.

The forms that comprise theWPSRS are:

Form Number	Name
EIA-800	*Weekly Refinery Report*
EIA-801	*Weekly Bulk Terminal Report*
EIA-802	*Weekly Product Pipeline Report*
EIA-803	*Weekly Crude Oil Report*
EIA-804	*Weekly Imports Report*

A sample of all petroleum companies report weekly data to the Energy Information Administration (EIA) on crude oil and petroleum products stocks, refinery inputs and production, and crude oil and petroleum product imports. The sample of companies that report weekly is selected from the universe of companies that report on the comparable monthly surveys.

Sampling

The sampling procedure used for the weekly system is the cut-off method. In the cut-off method, companies are ranked from largest to smallest on the basis of the quantities reported during some previous period. Companies are chosen for the sample beginning with the largest and adding companies until the total sample covers about 90 percent of the total, for each item and each geographic region for which weekly data are published.

Estimation and Imputation

After the company reports have been checked and entered into the weekly data base, explicit imputation is done for companies which have not yet responded. The imputed values are exponentially smoothed means of recent weekly reported values for this specific company. The imputed values are treated like reported values in the estimation procedure, which calculates ratio estimates of the weekly totals. First, the current week's data for a given product reported by companies in a geographic region are summed. (Call this weekly sum, W_*.) Next, the most recent month's data for the product reported by those same companies are summed. (Call this monthly sum, M_*.) Finally, let M_t be the sum of most recent month's data for the product as reported by all companies. Then, the current week's ratio estimate for that product for all companies, W_t, is given by:

$$W_t = \frac{M_t}{M_*} \cdot W_*$$

This procedure is used directly to estimate total weekly inputs to refineries and production. To estimate stocks of finished products, the preceding procedure is followed separately for

refineries, bulk terminals, and pipelines. Total estimates are formed by summing over establishment types.

Weekly imports data are highly variable on a company-by-company basis or a week-by-week basis. Therefore, an exponentially smoothed ratio has been developed. The estimate of total weekly imports is the product of the smoothed ratio and the sum of the weekly reported values and imputed values.

Propane

Data collected on the Form EIA-807, "Propane Telephone Survey" are used to develop estimates for propane.

Sampling

The sampling procedure used for Form EIA-807 is the cut-off method. In the cut-off method, establishments were ranked from largest to smallest on the basis of quantities reported (propane production, propane imports, propane stocks) during October 1989. Companies were chosen for the sample beginning with the largest and adding companies until the total sample covered about 80 percent of the total for each item and each geographic region (Petroleum Administration for Defense Districts I, IX, IY, IZ, II and III) for which data are published.

Estimation and Imputation

After the company reports have been checked and entered into the EIA-807 data base, imputation is done for companies which have not yet responded. The imputed values are equal to the latest reported data for a particular reporting unit. Response rates are over 90 percent so very little imputation is done.

After the data files have been edited and corrected, aggregation is done for net production, imports, and stocks by each geographic region. Estimation factors, which were derived from 1989 reported data, are then applied to each cell to generate published estimates.

Note 4. Price Data

The residential No. 2 heating oil and propane prices for a given State are based on the results of telephone surveys of a sample of marketers and refiners.

Sampling Methodology and Estimation Procedures

To estimate aggregate propane and No. 2 heating oil price data for a State, the sample weight and volume sales data were applied to the reported price, summed and divided by the sum of the weighted volume:

$$\sum_{j=1}^{s} \sum_{i=1}^{n_j} w_{ij} \, v_{ij} \, p_{ij} \Big/ \sum_{j=1}^{s} \sum_{i=1}^{n_j} w_{ij} \, v_{ij},$$ where i = respondent, n_j = sample size of stratum j, and s = number of strata, to obtain a volume weighted price.

Residential No. 2 Heating Oil

For the No. 2 heating oil price data, a sample design similar to that used for the Energy Information Administration (EIA) Form EIA-782B, "Resellers'/Retailers' Monthly Petroleum Product Sales Report" sample design was used. The sampling frame was an extract of approximately 11,000 companies from the Form EIA-863, "Petroleum Product Sales Survey" conducted in 1989 and containing 1988 sales volume information. A one-way stratified sample design using No. 2 residential distillate frame sales volumes by State, for each of the 27 States to be sampled, was used. Stratum boundaries were determined by the Dalenius-Hodges procedure. Sample weights were calculated as the inverse of the probability (N/n). Certainty strata were established based on sales volumes and the number of States in which the company has sales. The expected price coefficient of variation is one to two percent.

Residential Propane

Since no volume sales information existed to predetermine the volume sales of propane dealers, two strata for propane dealers was used. A certainty stratum of the known, large, multi-State dealers was created. These companies were identified using establishment lists obtained in deriving the frame. All other dealers were in a second stratum and a random sample from this stratum was selected. Sample weights were calculated as the inverse of the probability (N/n). The name and address list sampling frame was constructed by first extracting from the Form EIA-863, "Petroleum Product Sales Identification Survey," companies who marked the box on the survey indicating they sell propane. This was augmented by companies on the Office of Oil and Gas Master File who have the words propane or liquefied petroleum gas (LPG) in their name. In addition, companies who file the Form EIA-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report," and report retail propane or the Form EIA-782C, "Monthly Report of Petroleum Products Sold into States for Consumption," and report propane, as well as companies that were active on the Form EIA-174, "Liquefied Petroleum Gas Survey," prior to its discontinuance, were included.

After unduplicating these companies, the initial frame file contained approximately 5,100 companies. Additional com-

panies were obtained from an extract of a current Dun and Bradstreet file of SIC code 5984(9903), primary and secondary retail propane dealers, containing 3,283 names and addresses. Removal of duplicates within this file and between it and the initial frame file was performed using tailored automated match programs with manual review, and resulted in approximately 1,000 potential adds to the initial file. Similarly, additional names and addresses were furnished by industry associations and journals and by State Energy Offices, yielding another 7,429 names. Again, removal of duplicates through the match programs yielded an approximate potential add of 900 companies. Another 800 companies were identified as residing on the Master File but not previously selected as potential propane sellers. Further matching, merging and unduplicating reduced the final total frame count to approximately 6,000 companies. Reseller/retailer propane price data were unavailable to calculate a target coefficient of variation. However, it was expected that residential propane price variances were similar to heating oil. Increases in variances were expected as a result of lack of detailed stratification, but were only expected to reach three to four percent.

Note 5. Interpretation and Derivation of Average Inventory Levels

The national inventory (stocks) graphs for distillate fuel oil and propane include features to assist in comparing current inventory levels with past inventory levels and with judgments of critical levels. Methods used in developing the average inventory levels and minimum operating levels are described below.

Average Inventory Levels

The charts displaying inventory levels of distillate fuel oil and propane (Figures 1 through 10) provide the reader with actual inventory data compared to an "average range" for the most recent 3-year period running from January through December or from July through June. The ranges also reflect seasonal variation for the past 7 years.

The seasonal factors, which determine the shape of the upper and lower curves, are estimated with a seasonal adjustment technique developed at the Bureau of Census (Census X-11). The seasonal factors are assumed to be stable (i.e., unchanging from year to year) and additive (i.e., the series is deseasonalized by subtracting the seasonal factor for the appropriate month from the reported inventory levels.) The intent of deseasonalization is to remove only annual variation from the data. Thus, deseasonalized series would contain the same trends, cyclical components, and irregularities as the original data. The seasonal factors are updated annually in October, using the 7 most recent year's final monthly data.

The seasonal factors are used to deseasonalize data from the most recent 3-year period (January-December or July-June). The average of the deseasonalized 36-month series determines the midpoint of the "average range." The standard deviation of the deseasonalized 36 months is then calculated after adjusting for extreme data points. The upper curve of the "average range" is defined as average plus the seasonal factors plus the standard deviation. The lower curve is defined as the average plus the seasonal factors minus the standard deviation. Thus, the width of the "average range" is twice the standard deviation. The ranges are updated every 6 months in April and October.

Glossary

Downstream processing units are used to upgrade petroleum products.

Definitions of Petroleum Products and Other Terms

Degree-Day Normals. Simple arithmetic averages of monthly or annual degree-days over a long period of time (usually the 30-year period 1951-1980). These may be simple degree-day normals or population-weighted degree-day normals.

Distillate Fuel Oil. A general classification for one of the petroleum fractions produced in conventional distillation operations. It is used primarily for space heating, on-and-off-highway diesel engine fuel including railroad engine fuel and fuel for agricultural machinery, and electric power generation. Included are products known as No. 1, No. 2, and No. 4 fuel oils; No. 1, No. 2, and No. 4 diesel fuels.

No. 1 Fuel Oil. A light distillate fuel oil intended for use in vaporizing pot-type burners. ASTM Specification D396 specifies for this grade maximum distillation temperatures of 400 degrees F at the 10-percent recovery point and 550 degrees F at the 90-percent point, and kinematic viscosities between 1.4 and 2.2 centistokes at 100 degrees F.

No. 2 Fuel Oil. A distillate fuel oil for use in atomizing-type burners for domestic heating or for moderate capacity commercial-industrial burner units. ASTM Specification D396 designates minimum and maximum distillation temperatures at the 90-percent recovery point of 540 degrees F and 640 degrees F, and kinematic viscosities between 2.0 and 3.6 centistokes at 100 degrees F.

No. 1 and No. 2 Diesel Fuel Oils. Distillate fuel oils used in compression-ignition engines, as designated in the ASTM Specification D975:

No. 1-D. A volatile distillate fuel oil with a maximum distillation temperature of 550 degrees F at the 90-percent recovery point for use in high-speed diesel engines generally operated under variations in speed and load. Includes type C-B diesel fuel used for city buses and similar operations. Properties are defined in ASTM Specification D975.

No. 2-D. A gas oil type distillate of lower volatility with minimum and maximum distillation temperatures at the 90-percent recovery point of 540 and 640 degrees F for use in high-speed diesel engines generally operated under uniform speed and load conditions. Includes Type R-R diesel fuel used for railroad locomotive engines, and Type T-T for diesel-engine trucks. Properties are defined in ASTM Specification D975.

No. 4 Fuel Oil. A fuel oil for commercial burner installations not equipped with preheating facilities. It is used extensively in industrial plants. This grade is a blend of distillate fuel oil and residual fuel oil stocks that conforms to ASTM Specification D396 or Federal Specification VV-F-815C; with minimum and maximum kinematic viscosities between 5.8 and 26.4 centistokes at 100 degrees F. Also included is No. 4-D, a fuel oil for low and medium-speed diesel engines that conforms to ASTM Specification D975.

Heating Degree-Days. The number of degrees per day the daily average temperature is below 65 degrees F. The daily average temperature is the mean of the maximum and minimum temperature for a 24-hour period.

Population-Weighted Degree-Days. Heating or cooling degree-days weighted by the population of the area in which the degree-days are recorded. To compute national population-weighted degree-days, the Nation is divided into nine Census regions comprised of from three to eight States which are assigned weights based on the ratio of the population of the region to the total population of the Nation. Degree-day readings for each region are multiplied by the corresponding population weight for each region and these products are then summed to arrive at the national population weighted degree-day figure.

Propane. A normally gaseous straight-chain hydrocarbon, (C_3H_8). It is a colorless paraffinic gas that boils at a temperature of -43.67 degrees F. It is extracted from natural gas or refinery gas streams. It includes all products designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial propane and HD-5 propane.

Propylene. An olefinic hydrocarbon, (C_3H_6), recovered from refinery processes or petrochemical processes.

Report Dates. The official report dates for the residential and wholesale price surveys are the first and third Mondays. The official day for the primary stock survey is 7 a.m. on the Friday preceding the report date.

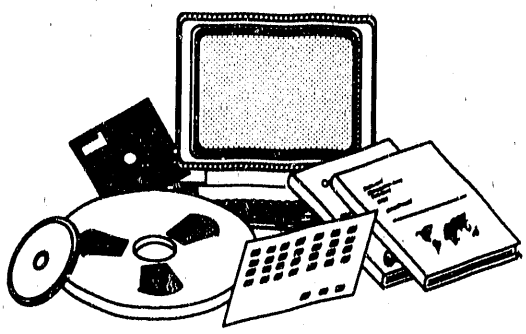
Residential Heating Oil Price. The price charged for home delivery of No. 2 heating oil, exclusive of any discounts such as those for prompt cash payment. Prices do not include taxes paid by the consumer.

Residential Propane Price. The "bulk keep full" price for home delivery of consumer grade propane intended for use in space heating, cooking, or hot water heaters in residences.

United States. For the purpose of this report, the 50 States and the District of Columbia. Data for the Virgin Islands, Puerto Rico, and other U.S. territories are not included in the U.S. Totals.

Wholesale Price. The rack price charged for No. 2 heating oil; that is, the price charged customers who purchase No. 2 heating oil free-on-board at a supplier's terminal and provide their own transportation for the product.

Your Entrée to Federal Statistics!



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