MASTER

**Analysis of No. 2 Heating
Oil Prices for
the 1977-78 Heating Season**
June 30, 1978

MASTER

U.S. Department of Energy
Economic Regulatory Administration
Office of Fuels Regulation

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

Available from:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

Price: Printed copy: ~~\$6.00~~ ^{5.25}
Microfiche: \$3.00

Analysis of No. 2 Heating Oil Prices for the 1977-78 Heating Season

June 30, 1978

U.S. Department of Energy
Economic Regulatory Administration
Office of Fuels Regulation
Washington, D.C. 20461

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

TABLE OF CONTENTS

	<u>PAGE</u>
EXECUTIVE SUMMARY	
Prices	2
Margins	2
Analytical Constraints	4
I. <u>INTRODUCTION</u>	I-1
II. <u>1977-1978 HEATING OIL PRICES</u>	
Residential Customer Prices	II-1
Wholesale Prices to Wholesalers and Retailers	II-3
Refiner Prices to Wholesalers	II-3
III. <u>1977-1978 HEATING OIL GROSS MARGINS</u>	
Retail Gross Margins	III-3
Wholesale Gross Margins	III-7
Refiners Gross Margins	III-9
IV. <u>THE WHOLESALE AND RETAIL BENCHMARK AND THE REFINER INDEX SYSTEMS</u>	
Wholesaler and Retailer Benchmark	IV-2
Wholesaler and Retailer Data Limitations	IV-5
Refiner Index	IV-8
Refiner Index Methodology Limitations	IV-8
Refiner Index Data Limitations	IV-10

APPENDIX A
Middle Distillate Supply and Demand

APPENDIX B
Rationale for Alternative Refiner Index

APPENDIX C
Retail and Wholesale Benchmark Methodology

EXHIBITS

	<u>PAGE</u>
I-1 Structure of the Heating Oil Industry	I-3
I-2 Department of Energy Regional Structure	I-6
II-1 Prices to Residential Customers	II-2
II-2 Wholesalers' Prices to Resellers and Retailers	II-4
II-3 Refiners' Prices to Wholesalers	II-5
II-4 National Average Refiner Price to Wholesalers Compared to Refiner Index	II-8
II-5 Calculation of Net Under-Recovery by Refiners for the Period July 1977 Through March 1978 Using the May Base Scenario	II-9
III-1 Comparison of Actual Retail Gross Margins to Benchmarks	III-4
III-2 Comparison of Retail (Residential) Margins to Benchmarks	III-5
III-3 Comparison of Actual Wholesaler Gross Margins to Benchmarks	III-8
III-4 Comparison of Wholesale Margins to Benchmarks	III-10
III-5 Refiners' Gross Margins for Wholesale Sales	III-11
IV-1 Sample Wholesale Operation Heating Oil Gross Margins	IV-7

PAGE

IV-2	Example of Effect of Different Cost Allocations	IV-12
B-1	Refiners' Indexes and Actual U.S. Average Prices to Non-ultimate Consumers	B-4
C-1	Retail Seasonality Factors	C-2

ANALYSIS OF HOME HEATING OIL PRICES
FOR THE 1977-1978 HEATING SEASON

EXECUTIVE SUMMARY

JUNE 30, 1978

This report presents the factual findings of DOE's Office of Fuels Regulation (OFR)^{1/} regarding No. 2 heating oil price data for the 1977-1978 heating season. OFR's analysis was based on data gathered by the Energy Information Administration (EIA) in connection with the current program to monitor the prices of home heating oil.

Following the exemption of middle distillates from price and allocation controls on July 1, 1976, the Department of Energy (DOE), then the Federal Energy Administration, monitored home heating oil prices, first with a retail price trigger (in the 1976-1977 heating season), then with a refiner index and wholesale/retail benchmarks (in the 1977-1978 season). For the 1977-1978 season, a subcommittee of the Fuel Oil Marketing Advisory Committee, composed of representatives of consumer groups and the home heating oil industry, was created to advise DOE's OFR on the index and benchmarks, as well as on the market behavior of No. 2 heating oil.

^{1/} OFR is an office within the Economic Regulatory Administration (ERA) of DOE.

OFR analyzed average prices and gross margins and compared them to the appropriate index and benchmarks designed for that purpose. In addition, OFR also assessed the refiner index and benchmark methodologies.

Prices

The price findings address all levels of the heating oil distribution chain.^{2/} Specifically, from the month of June 1977 through March 1978, OFR found that:

- The average price paid by residential customers increased 5.2 percent;
- The average increase in the prices wholesalers charged other wholesalers and retailers was 1.6 percent;
- The average increase in prices that wholesalers paid refiners was 1.4 percent; and
- The refiner index was marginally exceeded twice during the heating season and, on average, refiner prices to wholesalers were below the guideline.

Margins

Average gross margins (selling price minus purchase price) were analyzed for retailers, wholesalers, and refiners.

In addition, the average retail and wholesale margins were compared to guideline benchmarks. For the period from June 1, 1977 through March 31, 1978, OFR found that:

^{2/} The main report discusses OFR's findings in detail, and contains appropriate exhibits showing the data used.

Retail Gross Margins

- On a national basis, average retail gross margins increased 1.3 cents per gallon, or 13.3 percent.
- On a regional basis, retail gross margin increases approximated the national average, with the exception of Region 3, where the increase was 1.8 cents per gallon.
- At the retail level, average gross margins generally conformed to retail benchmarks, with the exception of Region 10, in which the benchmark was exceeded during the entire heating season.

Wholesale Gross Margins

- On a national basis, average wholesale gross margins remained relatively constant, actually decreasing by 0.2 cents per gallon.
- On a regional basis, average wholesale gross margins exhibited significant variations compared with benchmark calculations.
- At the wholesale level, average gross margins did not correspond to benchmarks as consistently as they did at the retail level. Average gross margins in Region 1 exceeded the benchmark in three of the five heating season months, and gross margins in Region 3 exceeded the benchmark in every month. The national average exceeded the benchmark twice, in January and February.

Refiners Gross Margins

- On a national basis, refiners average gross margins remained stable, showing a slight decline from June 1977 through March 1978.
- For the majority of regions, refiners average gross margins fluctuated between an increase and a decrease of 0.6 cents per gallon from the base margin.

Analytic Constraints

The usefulness of the index and the benchmarks is limited by methodological and data problems -- some of which are inherent in the calculation of averages.

The index is limited by:

- Several methodological constraints (e.g., base month distortion, purchased product cost allocations, inventory cost accumulation timing), which combine to limit its single-month comparison value; and
- The lack of refinery yield data and non-product cost data, which limit the use of the index for single-month comparisons.

The benchmarks are limited by:

- An inability to disaggregate gross margin data into individual nonproduct costs in order to explore specific margin fluctuations;
- The use of a data reporting system not primarily designed to monitor average gross margins;
- The use of historic seasonality factors which cannot be used definitively to compare average gross margins against the benchmark methodology; and
- The significant variations in the generally small wholesale margins, which limit the application of the wholesale benchmark for single-month comparisons.

A discussion of each of these points is presented in the following chapters.

CHAPTER I

INTRODUCTION

CHAPTER I
INTRODUCTION

More than 16 million homes in the United States use middle distillate as a primary energy source for heating.^{1/} These homes are served by 7,000 to 8,000 independent marketers, both wholesalers and retailers, who receive their product from refiners. Refiners also sell a small portion of their home heating oil directly to residential consumers. Home heating oil is normally resold several times between production at a refinery and delivery to a consumer.

The middle distillate segment of the petroleum industry consists of refiners, wholesalers and retailers. The product does not always flow directly from the refinery to wholesaler, to retailer, to residential consumer. Refiners typically sell a large part of their heating oil production to wholesalers in bulk quantities. They also sell lesser amounts to retailers and consumers. Most wholesalers sell directly to retailers, although a lesser portion of the product is sold directly to residential consumers. Retailers sell to consumers.

^{1/} Middle distillates include heating oil (No. 1 and No. 2) kerosene, range oil, stove oil and diesel fuel (No. 1 and No. 2). This report is concerned primarily with that portion of middle distillates that is eventually sold as No. 2 heating oil to homeowners.

Refiners often sell to one another, as do wholesalers and retailers. (A schematic representation of the structure of the home heating oil industry appears in Exhibit I-1.) As a result of these complex relationships, the reported prices approximate the average of transactions of all types at the stated market level rather than the prices charged by any particular firm for a specific type and volume of sale.

Following the July 1, 1976 exemption of middle distillates, including No. 2 heating oil and No. 2-D diesel fuel, from price and allocation controls^{2/}, the Federal Energy Administration (FEA) instituted a system for monitoring, nationally and regionally, the actual average prices of No. 2 heating oil to ultimate consumers.^{3/} For the 1976-1977 heating season, FEA compared actual national and regional retail prices of No. 2 heating oil to estimates of what these prices would have been had regulatory controls remained in effect. These estimates included a flexibility factor of 2 cents per gallon.

^{2/} 41 FR 41155, September 21, 1976; 42 FR 9415, February 16, 1977.

^{3/} 41 FR 24518, June 16, 1978.

Exhibit I.1
Structure of the Heating Oil Industry

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation.

In July and August 1977, FEA held regional and national hearings to specifically consider what action, if any, should be taken with respect to the middle distillate market. In light of the statements presented at these hearings and written comments received, FEA decided not to reimpose price controls on middle distillates but to continue to monitor middle distillate prices.

On September 30, 1977,^{4/} FEA issued a proposed system to monitor middle distillate prices. Under this system, FEA proposed to survey the prices of No. 2 heating oil and to develop and publish national and regional indices for residential sales of No. 2 heating oil.

Following an analysis of the comments on this proposed system, which disclosed the need to provide a more comprehensive and equitable method of tracking heating oil prices from refiners to residential consumers, FEA revised the original proposal to include development of:

- A refiners' index price for sales to wholesalers and retailers;
- A benchmark gross margin for wholesalers' reflecting marketing costs and reasonable rates of return on investment; and

^{4/} 42 FR 54444, October 6, 1977.

- A benchmark gross margin for retailers' sales to residential consumers.

Subsequently, the Department of Energy (DOE)^{5/} designed a program for monitoring the price and gross margin of No. 2 heating oil at each point in the distribution system -- refining, wholesaling and retailing -- for the 1977-1978 heating season.^{6/} Under this program, DOE's Energy Information Administration (EIA) expanded the number of firms in its survey of sellers of No. 2 heating oil to obtain statistical estimates of residential prices for selected states and DOE regional classifications (see Exhibit I-2). In November 1977, the EIA began publishing monthly information on average prices and gross margins for the refining, wholesaling, and retailing segments of the industry which were computed from sellers' prices and costs of heating oil purchases provided by the firms in the survey.

To help it evaluate the performance of the market and the adequacy of the benchmarks and index as an explanation of market behavior, ERA appointed a Middle Distillate Monitoring Subcommittee of the Fuel Oil Marketing Advisory

^{5/} DOE assumed the functions of FEA effective October 1, 1977.

^{6/} 43 FR 2917, January 20, 1978.

Exhibit I-2

DEPARTMENT OF ENERGY
REGIONAL STRUCTURE

Committee in January 1978. The Subcommittee, which was composed of representatives of industry, consumer organizations, and state energy offices, provided DOE with advice on a number of key issues that affect the middle distillate market. However, the Subcommittee was unable to advise DOE sufficiently on market performance and on the refinement of the index and benchmark methodology. Specifically, because early Subcommittee sessions focused on possible liability, under antitrust law, of some members of the Subcommittee, attention was diverted from the task of advising ERA on the enhancement of the methodologies. Moreover, the Subcommittee was unable to arrive at a consensus on the reasonableness of prices charged and the causes of price increases.

DOE's Office of Fuels Regulation (OFR) performed analyses of the heating oil price data gathered by EIA. OFR's findings on the behavior of prices and margins for home heating oil during the 1977-1978 heating season reflect the market trends that have historically characterized the industry. ^{7/}

^{7/} No widespread shortages were experienced during the 1977-1978 heating season. Therefore, OFR concluded supplies of home heating oil were adequate to meet demand. However, for those interested in the statistical information on supply, summary information is provided in Appendix A.

The data provided to OFR by EIA consisted of the following: For sales of No. 2 heating oil by refiners to intermediate customers (i.e., wholesalers, retailers, and wholesalers/retailers), EIA provided national and regional data on the average price, the range of prices, and the average gross margin (i.e., the difference between the weighted average of selling prices to intermediate customers and the weighted average cost of purchased product and crude oil for each refiner). For sales of No. 2 heating oil by nonrefiners to intermediate customers, EIA provided national and regional data on average prices, the range of prices, and the average gross margin. For residential sales of No. 2 heating oil, EIA published national, regional and state-level^{8/} prices and national and regional average gross margins for non-refiner firms selling to residential users.

Using these data in conjunction with the refiner index and benchmark methodologies to analyze heating oil market behavior, the OFR found that nationally, from June 1977 through March 1978:

- Price increases ranged from 5.2 percent at the retail level to 1.4 percent at the refinery level, with no significant excesses noted in the refiner index;

^{8/} For those states with significant sales of No. 2 heating oil.

- Large market fluctuations precluded consistently meaningful comparisons between benchmarks and average gross margins on a monthly basis; and
- Although the index and benchmarks were, in fact, calculated and compared with average prices and gross margins, both tools were constrained by methodological and data limitations, some of which are inherent in the calculation of averages.

Each of these overall findings is expanded upon in the remainder of this report.^{9/} Specifically, Chapter 2 discusses No. 2 heating oil prices at the various points in the distribution chain. These prices are compared with

^{9/} The Federal Register notice which adopted the 1977-1978 home heating oil monitoring system provided that "A final report will be made on or before June 30, 1978, detailing procedures for the calculations of benchmarks for No. 2 heating oil at the wholesaling and retailing levels and containing benchmarks for each month of the current heating season based upon this procedure." It also provided for a study of the marketing of No. 2 heating oil by wholesalers and retailers during the current and prior heating seasons so that trends within the heating oil industry can be identified and their impact on the goals of the Emergency Petroleum Allocation Act of 1973 (EPAA) can be analyzed. This report is separate and distinct from that study which will be developed by an independent contractor and will include not only the causes of any price increases for No. 2 heating oil but also the nature and intensity of competition in the heating oil market and the economic viability of various sectors of that market.

the refiner index price derived from the methodology ERA used to estimate what refiner prices to wholesalers would have been if controls had been in effect for middle distillates during the 1977-1978 heating season. Chapter 3 presents the average gross margins with the benchmarks developed by OFR to serve as reference points. Chapter 4 summarizes the methodology used in this evaluation, and assesses the sufficiency of the data and analytical tools.

CHAPTER II

1977-1978 HEATING OIL PRICES

CHAPTER II

1977-1978 HEATING OIL PRICES

In examining the price behavior of No. 2 heating oil for the 1977-1978 heating season, OFR found that:

- The average price paid by residential customers increased 5.2 percent between June 1977 and March 1978;
- The average increase in the prices wholesalers charged other wholesalers and retailers was 1.6 percent;
- The average increase in prices that wholesalers paid refiners was 1.4 percent; and
- The refiner index was slightly exceeded twice during the heating season and, on average, refiner prices to wholesalers were well below the guideline established by the index.

Residential Customer Prices

Data from the EIA survey of sellers of No. 2 heating oil indicate that nationwide suppliers increased residential heating oil prices on the average 2.4 cents per gallon (5.2 percent). The average national residential price increased from 46.2 cents per gallon in June 1977 to 48.6 cents per gallon in March 1978 (see Exhibit II-1). The average price increases for Region 1 (New England), Region 2 (New York-New Jersey), and Region 3 (Mid-Atlantic), which account for roughly 80 percent of U.S. residential heating oil sales,^{1/} were 2.4 cents, 2.4 cents, and 2.6 cents per

^{1/} Regions 4, 6, 7, 8, 9 and 10 account for approximately 10 percent, by volume, of the residential home heating oil sales.

Exhibit II.1

Prices to Residential Customers*
(cents per gallon)

DOE Region	1977			1978			Change: June to March	
	Jun	Nov	Dec	Jan	Feb	Mar	Actual	Percent
1	47.0	48.5	48.9	49.4	49.5	49.4	2.4	5.1
2	46.9	48.1	48.6	49.2	49.3	49.3	2.4	5.1
3	45.8	47.0	47.5	48.1	48.4	48.4	2.6	5.7
4	44.9	46.1	46.6	47.5	47.6	47.7	2.8	6.2
5	44.9	45.7	46.1	46.4	46.4	46.5	1.6	3.6
6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	43.0	44.2	44.5	44.5	45.2	44.4	1.4	3.3
8	44.5	45.4	45.7	45.2	45.5	45.0	0.5	1.1
9	42.3	44.9	44.5	44.7	45.6	47.0	4.7	11.1
10	46.4	47.4	47.3	47.4	47.5	47.7	1.3	2.8
U.S. average	46.2	47.6	47.9	48.5	48.6	48.6	2.4	5.2

SOURCE: Energy Information Administration.

*March data are preliminary.

gallon, respectively. These were among the highest price increases observed. The price increase in Region 5 (Upper Mid-West), which accounts for about 10 percent of residential heating oil sales, was 1.6 cents per gallon (about 3.6 percent), and was among the lowest of the price increases.

Wholesale Prices to Wholesalers and Retailers

Prices on sales of heating oil by wholesalers and retailers to other wholesalers and retailers increased nationwide by 0.6 cents per gallon from June 1977 to March 1978 (see Exhibit II-2). This represents a price increase of about 1.6 percent. The highest price increase noted in this category was 1.0 cents per gallon (2.7 percent) in Region 1. In Region 4 the price decreased by 0.9 cent per gallon, or 2.3 percent.

Refiner Prices to Wholesalers

Refiner prices for sales of heating oil to wholesalers increased nationwide by 0.5 cent per gallon from June 1977 to March 1978 (see Exhibit II-3). This is less than a 1.4 percent increase nationwide.

Refiner sales to wholesalers include rack sales to distributors buying at terminals and refineries, deliveries by refineries to wholesalers with some storage capabilities, and bulk sales by pipeline and vessel. The average price increases

Exhibit II.2

Wholesalers' Prices to Resellers and Retailers*
 (cents per gallon)

DOE Region	1977			1978			Change: June to March	
	Jun	Nov	Dec	Jan	Feb	Mar	Actual	Percent
1	36.6	37.5	37.9	37.9	37.7	37.6	1.0	2.7
2	37.0	37.5	37.7	38.1	37.4	37.4	0.4	1.1
3	37.5	38.4	38.4	38.7	38.2	38.4	0.9	2.4
4	39.0	39.0	39.0	37.9	38.7	38.1	(0.9)	(2.3)
5	36.3	36.9	37.5	37.5	36.3	36.3	0.0	0.0
6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
U.S. average	36.4	37.0	37.5	37.8	37.5	37.0	0.6	1.6

SOURCE: Energy Information Administration.

*March data are preliminary.

Exhibit II.3

Refiners' Prices to Wholesalers*
(cents per gallon)

DOE Region	1977			1978			Change: June to March	
	Jun	Nov	Dec	Jan	Feb	Mar	Actual	Percent
1	35.8	36.7	37.1	37.3	36.9	36.9	1.1	3.1
2	35.7	36.6	36.9	37.3	36.9	36.7	1.0	2.8
3	36.6	37.1	37.4	37.6	37.4	37.2	0.6	1.6
4	35.9	35.8	36.3	36.8	36.9	36.0	0.1	0.3
5	36.1	36.9	36.8	36.9	36.7	36.5	0.4	1.1
6	33.4	33.8	33.8	33.7	32.6	32.8	(0.6)	(1.8)
7	35.7	36.3	36.5	36.5	36.1	35.8	0.1	0.3
8	35.3	36.5	36.7	37.1	37.1	36.6	1.3	3.7
9	35.0	35.7	35.8	34.1	35.0	35.0	0.0	0.0
10	35.5	36.2	36.3	36.2	36.0	35.9	0.4	1.1
U.S. average	35.6	36.3	36.6	36.8	36.4	36.1	0.5	1.4

SOURCE: Energy Information Administration.

*March data are preliminary.

in Regions 1, 2, and 3 were 1.1, 1.0, and 0.6 cent per gallon, respectively. The average refiner price increases in other regions were small, ranging from 0.1 cent to 0.4 cent per gallon except for Region 8 (Rocky Mountain), where prices rose 1.3 cents per gallon. In Region 6 (Southwest), prices declined by 0.6 cent per gallon.

To estimate the average price refiners would have charged wholesalers if price controls had been in effect for the period June 1977 to June 1978, a refiner index was developed. The index calculated the increased costs of crude oil, purchased product and nonproduct costs, as well as unrecouped costs from previous months. These average cost increases were added to the weighted average June 1977 price for sales of No. 2 heating oil from refiners to other suppliers.

The actual average refiner price to wholesalers was compared with the refiner index for the period July 1977 through March 1978. Over that period, actual prices exceeded the index twice: by 0.1 cent per gallon in December 1977 and by 0.2 cent per gallon in February 1978.

In all other months, the actual price was equal to or below the refiner index price (see Exhibit II-4).

When the allowable cost increases were compared with cost increases recovered for the period July 1977 through March 1978, refiners had an estimated \$1.68 million of costs left that could have been passed through. Exhibit II-5 presents this calculation.

Exhibit II.4

**National Average Refiner Price to Wholesalers
Compared to Refiner Index**
(cents per gallon).

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation

* March data are preliminary.

Exhibit II.5

**Calculation of Net Under-Recovery by Refiners
For The Period July 1977 Through March 1978
Using the May Base Scenario***

Sales of heating oil to non-ultimate consumers:	2,628.46 million gallons
--	--------------------------

**Increased costs available for pass-through
in March 1978 (cents per gallon):**

Crude oil	.486
Nonproduct	.390
Purchased product	-.042
Available bank**	-.270
Total	.564

2,628.46 million gallons times .54 cents per gallon =
14.82 million dollars in available costs

**Increased cost recovery during March 1978
(cents per gallon):**

Actual price, March 1978	36.1
Actual price, June 1977	35.6
Difference	0.5

2,628.46 million gallons times .5 cents per gallon =
13.14 million dollars in cost recovery

14.82 million dollars in costs available for pass-through less
13.14 million dollars in costs actually recovered, =
1.68 million dollars in under-recovery

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation

* See Chapter IV for explanation.

** Cumulative over-recovered costs through end of February.

CHAPTER III

1977-1978 HEATING OIL GROSS MARGINS

CHAPTER III

1977-1978 HEATING OIL GROSS MARGINS

Understanding the reasons for variations in residential heating oil prices requires isolating prices at all points in the distribution chain. For purposes of OFR's evaluation, these points are the retail level, defined as all sales to residential accounts; the wholesale level, defined as all sales to intermediate customers by wholesalers and retailers; and the refiner level, defined as all sales to intermediate customers by refiners.

Price variations at all levels of the distribution chain are normally the result of changes in purchased product costs or in gross margins. As previously stated, gross margin is the selling price minus the cost of purchased product (or the average cost of crude and purchased product, for refiners), and includes both nonproduct costs and profit.

To evaluate levels of average gross margins, benchmarks were established for comparison purposes. Benchmarks are a useful analytical tool because they indicate general margin trends and identify abnormal regional changes.

Benchmarks are more useful when they are compared with average gross margins on an annual or seasonal basis as opposed to a month to month comparison. (The constraints involved in using benchmarks as an analytical device are discussed in more detail in Chapter IV.)

A review of average gross margin data and a comparison of the benchmarks with these margins allowed OFR to determine certain aspects of market behavior. Specifically, for the period of June 1977 through March 1978, OFR found:

- Retail gross margins

- On a national basis, the average increase in retail gross margins was 1.3 cents per gallon, or 13.3 percent.
- On a regional basis, average retail gross margin increases were not substantially higher than the national average, with the exception of Region 3 where the increase was 1.8 cents per gallon.
- The average gross margins were generally close to or below the benchmarks, with the exception of Region 10.

- Wholesale gross margins

- On a national basis, average wholesale gross margins remained relatively constant, actually decreasing by 0.2 cent per gallon, or 14.3 percent.
- On a regional basis, average wholesale gross margins varied considerably from benchmark calculations.

III-3.

- The average wholesale gross margins did not correspond to benchmarks as consistently as they did at the retail level. Gross margins in Region I exceeded the benchmark in 3 of the 5 heating-season months, while gross margins in Region 3 exceeded the benchmark in every month. The national average exceeded the benchmark twice, in January and February.
- Refiner gross margins
 - On a national basis, average refiner gross margins remained relatively stable.
 - Most regions experienced marginal changes in refiner gross margins ranging from an increase of 0.6 cent per gallon to a decrease of 0.6 cent per gallon.

Retail Gross Margins

Nationally, average retail gross margins increased by 1.3 cents per gallon from June 1977 to March 1978. On a regional basis, increases in average gross margins ranged from 0.5 cent per gallon in Region 7 to 1.8 cents per gallon in Region 3 (see Exhibit III-1). In general, at the retail level, average gross margins increased gradually through the heating season.

The national average gross margin stayed below the benchmark for the June 1977 to March 1978 period (see Exhibit III-2). The actual average margin increased 1.3 cents per gallon, whereas the benchmark increased 1.6 cents a gallon. For the period November through March, both the average gross margin and the benchmark increased 0.9 cent per gallon.

Exhibit III.1

Comparison of Actual Retail Gross Margins to Benchmarks*
(cents per gallon)

1977		1978											
DOE Region	June Base Period Gross Margin	November		December		January		February		March		Margin Change: June to March	
		Margin	B.M.	Margin	B.M.	Margin	B.M.	Margin	B.M.	Margin	B.M.	Actual	Percent
1	10.1	10.8	11.0	10.8	11.3	11.1	12.0	11.5	11.7	11.4	11.7	1.3	12.9
2	10.4	10.9	11.3	11.2	11.6	11.3	12.3	11.6	12.0	11.9	12.0	1.5	14.4
3	9.1	9.8	9.9	10.0	10.2	10.2	10.8	10.7	10.5	10.9	10.5	1.8	19.8
4	8.6	9.2	9.8	9.4	9.9	9.9	10.0	10.3	10.6	10.2	10.4	1.6	18.6
5	8.1	7.7	8.9	8.2	9.4	8.3	9.3	8.9	9.0	8.8	9.5	0.7	8.6
7	7.0	7.2	7.7	7.1	8.1	7.7	8.1	8.5	7.8	7.5	8.0	0.5	7.1
10	10.5	11.1	10.7	11.1	10.8	11.1	10.8	11.3	10.9	11.7	10.9	1.2	11.4
U.S. average	9.8	10.2	10.5	10.4	10.8	10.5	11.3	11.0	11.1	11.1	11.4	1.3	13.3

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation (Benchmarks);
Energy Information Administration (Margins)

NOTE: Data for regions 6, 8, and 9 were insufficient for statistically valid samples
in all months.

*March data are preliminary.

Exhibit III.2

Comparison of Retail (Residential) Margins to Benchmarks*
U.S. Average

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation

* March data are preliminary.

Regionally, average gross margins generally remained below benchmarks except in a few regions. The benchmark was exceeded in Region 3 by only 0.2 cent per gallon in February and 0.4 cent per gallon in March. Average retail gross margins exceeded the benchmark during the entire heating season in Region 10. (This region accounts for less than 3 percent of heating oil residential sales by volume.)

Although the benchmarks were exceeded in Regions 3 and 7 for two months and one month, respectively, the average margins for those regions were far below benchmarks in the preceding or following months. Moreover, where the benchmarks were exceeded, limitations of the benchmark methodology, rather than excessive increases in margins appear to be the cause.

In Region 10 where the benchmarks were exceeded in all heating season months, OFR had a special problem with the treatment of the seasonal factor in the benchmark calculation. A definite seasonal factor for the average gross margin in Region 10 could not be estimated due to the absence of a seasonal pattern over the estimating period, which was January 1974 to March 1977. The OFR, therefore, did not include a seasonal factor in the benchmark for Region 10.

Wholesale Gross Margins

Wholesalers historically have operated on a gross margin of about 1.0 cents to 1.5 cents per gallon. Nationally, average wholesale gross margins remained about the same from June 1977 (1.4 cents per gallon) to March 1978 (1.2 cents per gallon). On a regional basis, changes in average gross margins ranged from a decrease of 0.7 cent per gallon in Region 5 to an increase of 0.3 cent per gallon in Region 3 (see Exhibit III-3).

The national average benchmarks were exceeded in January and February, 1978, but only by 0.1 cent per gallon in both cases. However, average gross margins were above benchmarks on a monthly basis in a number of regions. In Region 1, the benchmark was exceeded from December through February. Once again, the actual margins were only 0.1 cent per gallon over the benchmark in December and January. In February, the benchmark was exceeded by 0.3 cent per gallon. However, the gross margin in Region 1 dropped 0.5 cent per gallon in March, to a level of 0.2 cent per gallon below the benchmark. In Region 3, the benchmark was exceeded by 0.2 to 0.3 cent per gallon in every month. This may be explained by a lower than normal margin in the base period. Specifically, for the June base period, the

Exhibit III.3

Comparison of Actual Wholesaler Gross Margins to Benchmarks*
(cents per gallon)

1977				1978									
DOE Region	June Base Period Gross Margin	November		December		January		February		March		Margin Change: June to March	
		Margin	B.M.	Margin	B.M.	Margin	B.M.	Margin	B.M.	Margin	B.M.	Actual	Percent
1	1.4	1.4	- 1.4	1.5	- 1.4	1.5	- 1.4	1.8	- 1.5	1.3	- 1.5	(0.1)	(7.1)
2	1.7	2.0	- 1.7	1.4	- 1.7	1.8	- 1.8	1.7	- 1.8	1.5	- 1.8	(0.2)	(11.8)
3	1.2	1.5	- 1.2	1.4	- 1.2	1.4	- 1.2	1.4	- 1.2	1.5	- 1.3	0.3	25.0
4	2.5	2.6	- 2.6	2.0	- 2.6	1.1	- 2.6	1.5	- 2.6	1.9	- 2.6	(0.6)	(24.0)
5	2.0	1.7	- 2.0	1.4	- 2.1	1.5	- 2.1	1.2	- 2.1	1.3	- 2.1	(0.7)	(35.0)
U.S. average	1.4	1.3	- 1.4	1.2	- 1.4	1.5	- 1.4	1.6	- 1.5	1.2	- 1.5	(0.2)	(14.3)

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation (Benchmarks);
Energy Information Administration (Margins).

NOTE: Data for regions 6, 7, 8, 9, and 10 were insufficient for statistically valid samples
in all months.

*March data are preliminary.

Region 3 gross margin was 0.2 cent per gallon below the the national average and lower than any other region. In a number of instances where the monthly gross margin exceeded the benchmark in a specific month, the gross margin was below the benchmark in either the preceding or succeeding months (see Exhibit III-4).

Refiner Gross Margins

Nationwide, refiner average gross margins remained relatively stable, showing a slight decline (with the exception of January 1978) from June 1977 to March 1978 (see Exhibit III-5). Regionally, except for Region 6, Region 8, and Region 10, changes in gross margins were less than a cent, ranging from an increase of 0.6 cent per gallon in Region 9, to a decrease of 0.6 cent per gallon in Region 4 and in Region 7. In Region 8, the sharp increase in the average March 1978 gross margin of 2.6 cents per gallon over the June 1977 base was due to a substantial decline in the cost of crude to one refiner who received a one-time reimbursement of entitlement costs. The substantial increase of 2.1 cents per gallon in Region 10 was due to the fact that one refiner's crude oil purchase costs were unusually low in a single month. The decline in the average gross margin in Region 6, from June 1977

Exhibit III.4

Comparison of Wholesale Margins to Benchmarks*
U.S. Average

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation

* March data are preliminary.

Exhibit III.5

Refiners' Gross Margins for Wholesale Sales*
 (cents per gallon)

DOE Region	1977			1978			Change: June to March	
	Jun	Nov	Dec	Jan	Feb	Mar	Actual	Percent
1	7.0	6.9	7.0	7.7	6.8	7.2	0.2	2.9
2	6.6	6.9	6.7	8.0	7.2	7.0	0.4	6.1
3	7.1	7.6	7.3	8.4	7.6	7.5	0.4	5.6
4	6.9	5.9	6.6	7.0	7.2	6.3	(0.6)	(8.7)
5	6.7	7.0	7.0	6.8	6.6	6.4	(0.3)	(4.5)
6	4.4	3.2	3.6	3.8	2.8	2.9	(1.5)	(34.1)
7	5.7	6.1	6.0	6.8	5.7	5.1	(0.6)	(10.5)
8	8.0	8.6	7.0	7.5	7.7	10.6	2.6	32.5
9	7.0	7.2	n/a	n/a	6.9	7.6	0.6	8.6
10	6.5	7.1	7.0	7.2	6.7	8.6	2.1	32.3
U.S.	6.5	6.6	6.5	7.3	6.6	6.4	(0.1)	(1.5)

SOURCE: Energy Information Administration.

*March data are preliminary.

to March 1978, was due to a drop in refiners' prices in the Gulf Coast area and a general increase in crude costs.

The refiner gross margin calculation was included in the monitoring system to identify whether residential price increases were attributable to gross margin expansion at the point of production or at subsequent points in the distribution chain. The refiner gross margin calculation served to identify a source of price increases. However, it was inadequate for evaluating refiner price increases, since gross margin increases could not be specifically allocated cost and profit components. Additionally, because of seasonal factors affecting the prices of products, margins on heating oil tend to increase during the fall and winter months.

The regional disparity in refiner gross margin data may not necessarily reflect actual refiner gross margins in those regions because the calculations are based on national crude and nonproduct costs. DOE does not require refiners to report their costs of crude purchases by the regions in which their refineries are located, because much of the crude oil is processed in regions located apart from the major heating oil consumption areas. Therefore, in a

region where the average heating oil selling prices have increased at a rate greater than the national allocation of crude cost increases to No. 2 heating oil, an unusually high regional margin may appear. Because the regional margin is not calculated by using regional costs, the national gross margin is probably a more appropriate measure of refiners gross margins.

CHAPTER IV

THE WHOLESALE AND RETAIL BENCHMARK | AND THE REFINER INDEX SYSTEMS

CHAPTER IV
THE WHOLESALE AND RETAIL BENCHMARK
AND THE REFINER INDEX SYSTEMS

In Chapters II and III, OFR presented its factual findings with respect to average prices and gross margins, as well as its calculations of the wholesale and retail benchmark margins and the refiner index prices. It is therefore important to define and explain the use and the limitations of the refiner index and the benchmark methodology.

The index and benchmarks serve as useful analytical tools by identifying general price and margin trends. However, the nature of the heating oil market makes it difficult to develop any statistical tool which accurately reflects short-run market behavior. Therefore, the index and benchmarks were useful for an overall trend analysis and were intended to serve only as general guides in evaluating price and margin behavior over the heating season.

Although the index and benchmarks were calculated and compared with average prices and gross margins (see Chapters II and III), both measurement tools were constrained by methodology and data limitations--some of which are inherent in the calculation of averages.

Specifically, the limitations are:

- For wholesale and retail benchmarks:
 - The methodologies for developing benchmarks for wholesalers and retailers do not allow disaggregation of benchmark margins into specific cost components.
 - The data reporting system was primarily designed to measure average prices, and did not collect nonproduct cost information because of intense industry opposition to such collection.
 - Indicators of general inflation do not necessarily accurately measure increases in operating costs of wholesalers and retailers.
 - The historic variation in seasonality factors reduces the predictability of retail margins and limits the value of the retail benchmarks for single-month comparisons.
- For the refiner index:
 - Several methodological constraints (e.g., base month distortion, purchased product cost allocations, inventory cost accumulation timing) combine to limit its month-to-month reference value.
 - The lack of refinery yield data and the lack of complete nonproduct cost data limit the use of the index to conduct monthly comparisons.

Wholesale and Retail Benchmark

OFR originally proposed two approaches in developing average gross margin benchmarks, both of which were based on June 1977

average gross margins, adjusted for seasonal variations and inflation. In the first approach, the individual nonproduct cost elements were disaggregated and individually adjusted according to available cost indices or other appropriate factors. This approach would have permitted disaggregation and individual adjustment according to available cost indices and other appropriate cost-related factors. It would also have yielded a detailed analysis of price increases and would have reflected increases in different types of nonproduct costs.

However, DOE was not able to obtain sufficient data to isolate and develop appropriate weightings for the individual nonproduct cost elements. The lack of necessary data and the resulting inability to determine the effect of nonproduct cost elements their effect on the proposed benchmark methodology were discussed with the Fuel Oil Marketing Advisory Subcommittee, which was not able to provide OFR with agreed upon recommendations.

OFR thus adopted a second approach in which the overall gross margin was adjusted by a general cost index and a seasonal factor at the retail level (see Appendix C).

Under this approach, two key factors were used to calculate the retail and wholesale benchmarks for each month.

The first factor used was the inflation index. For retail gross margins the June 1977 base period margin was inflated by the Consumer Price Index (CPI) for all items excluding food. Since heating oil retailers are generally small, labor intensive businesses, changes in the CPI are generally representative of cost variances at the retail level. On the other hand, the Wholesale Price Index (WPI) for Industrial Commodities was used to inflate wholesale margins. The WPI measures average changes in non-food commodities produced in the primary U.S. market and, thus, relates to the conditions under which wholesalers incur costs. Although general rates of inflation do not correspond directly to the heating oil industry, they were considered to be the most appropriate rates of measure.

The second factor was a seasonal adjustment. Retail gross margins as well as prices of heating oil have historically exhibited seasonal fluctuations. During high-demand winter months, gross margins have increased to recover storage and capital costs incurred during the off-season. To calculate these seasonal fluctuations, OFR used available census regional and national data and the Census Seasonal Adjustment Program. Since census regions do not correspond to DOE

regions, seasonal adjustments for the various DOE regions were approximated.

There are two primary limitations in using the seasonality factor. First, seasonal patterns are highly dependent on the market situation, which is influenced by both weather conditions and industry practices. Seasonal patterns for a given year may not be consistent with average trends of previous years.

Second, the seasonality factor tends to dominate the movement of the benchmark. On a monthly basis, the effect of seasonality is much greater than the effect of inflation on heating oil gross margin trends.

Wholesale and Retail Benchmark Data Limitations

The benchmarks were not designed to evaluate specific, individual wholesale or retail margin changes. Rather, they permit a broader evaluation of aggregate changes. The benchmarks do not permit disaggregation of the average price or gross margin changes that occur to evaluate individual firm prices and margin behavior.

The data collected did not provide operating costs for resellers and retailers which are needed to evaluate increases in gross margins. No current data were

available to permit estimating net margin.^{1/} As a result, in order to calculate the wholesale and retail gross margins, the methodology used current month's purchased product costs.

Because the adopted methodology for calculating the average gross margin reflected only current purchased product costs, gross margins may be somewhat understated during periods of increasing product costs, and somewhat overstated during periods of decreasing product costs (see Exhibit IV-1). The differences in inventory accounting approaches, as well as the mix in inventory use versus purchased product in a particular month, can limit the value of a single month's comparison of actual gross margin against benchmark.

The need for more precise data was even more apparent at the wholesale level. Because wholesale heating oil marketing operations vary considerably in size, from

^{1/} In order to evaluate nonproduct cost increases of a particular firm a complete audit of that firm would be required. The resulting burden of auditing all firms would be heavy. OFR is of the opinion that this burden should only be imposed after large changes in the gross margins have been detected and statistically evaluated.

Exhibit IV.1

Sample Wholesale Operation
Heating Oil Gross Margins
(cents per gallon)

	Purchased Product Cost (current month)	Inventory Cost* (total weighted average)
November 1977		
Selling price	35.59	35.59
Minus cost	(35.03)	(34.33)
Gross margin	0.56	1.26
December 1977		
Selling price	36.01	36.01
Minus cost	(36.67)	(35.69)
Gross margin	(0.66)	0.32
January 1978		
Selling price	36.03	36.03
Minus cost	36.48	36.49
Gross margin	(0.45)	(0.46)
February 1978		
Selling price	36.09	36.09
Minus cost	(35.80)	(36.15)
Gross margin	0.29	(0.06)
March 1978**		
Selling price	35.97	35.97
Minus cost	(36.08)	(35.88)
Gross margin	(0.11)	0.09

SOURCE: Economic Regulatory Administration,
Office of Fuels Regulation.

*Beginning inventory plus purchased product
for the month.

**Preliminary data.

very large volume deepwater terminal operators to retailers who periodically wholesale much smaller volumes of product, gross margins and operating costs can vary considerably. Therefore, when gross margins for large and small wholesalers are combined, an average results which may be representative of neither. For instance average monthly gross margin fluctuations may be distorted by deepwater terminal operators' monthly fluctuations in sales volumes.

The Refiner Index

The purpose of the refiner index was to provide an estimate of the ceiling prices charged to wholesalers/resellers by refiners that would have been allowed had price controls been in effect. This was accomplished by calculating average increases in crude oil costs, purchased product costs, and nonproduct costs and adding them to the weighted average June 1977 price of No. 2 heating oil to wholesalers. The sum of these components was the index price for a given month.

Refiner Index Methodology Limitations

The refiner index methodology was constrained by three primary factors. First, the use of June as the base month for both price and cost increases, as originally proposed

by OFR (43 FR 2917, January 20, 1978) was inappropriate to meet the intent of the refiner index calculation. In short, using the same base month for prices and costs required that refiners absorb a month's increased costs in June 1977. However, refiners had already absorbed one month's costs beginning in 1973 when controls were implemented. OFR found it inappropriate to require refiners to absorb a month's increased costs twice. Therefore, a new index methodology was developed, using a cost base month of May 1977. A detailed explanation of the problem with using June 1977 as the base for increased costs and prices is provided in Appendix B along with the results of two index calculations using May and June base months (Appendix B).

Second, the entire amount of purchased product costs was allocated to non-ultimate consumer sales, even though some purchased product is sold directly to end-users. This deficiency caused the index to be slightly lower throughout the heating season, because the entire amount of purchased product cost decreases was allocated to non-ultimate consumer sales.

Third, inventory cost accumulation began too late in the summer. The heating oil sales season usually ends in March of each year, and in April distillate production normally exceeds demand until November. (See DOE Monthly Energy Review, May 1978, p. 20.) At the same time as refiners build inventories of products, the costs associated with that inventory build-up are being accumulated. However, since the index only began accumulating cost increases in July 1977, refiners lost the opportunity to accumulate three months' "banked" costs (increased costs minus cost recoveries from price increases) for recovery in the next heating season.

Refiner Index Data Limitations

Because of the unavailability of information on production volumes by the refiners of No. 2 heating oil, increased crude oil and nonproduct costs were allocated using volume sold instead of volumes produced, as required by the revised pricing regulations. Since distillate sales are lower than production in summer, these costs are under-allocated during the summer. As a result of distillate sales exceed production in the winter, these costs are overapplied in the winter. (See DOE Monthly Energy Review, May 1978, p. 20.) This distorts the guideline price from month to

month, but over the entire heating season, the impact is reduced by averaging (see Exhibit IV-2). Another problem with the use of sales volumes is that they include sales of gas plant production by integrated firms that have crude oil refineries and gas plants. This results in a lower ratio of heating oil sales to total sales, thus under-allocating both crude oil and nonproduct costs.

A second limitation is the lack of data on refiners' operating costs specifically for sales of heating oil. The EIA collects operating costs for controlled products directly from refiners, but not for decontrolled products. Therefore, the EIA estimates operating costs for heating oil on the basis of the data collected. OFR acknowledged this limitation when the index formula was published. However, the EIA estimates were considered to be close approximations of the actual nonproduct costs for heating oil incurred by refiners, and it was a method with a regulatory basis that was generally consistent with the current pricing regulations.

Exhibit IV.2

Example of Effect of Different Cost Allocations*

Increased crude oil and nonproduct costs are allocated to different types of regulated products in the following way:

Production basis:

$$\frac{\text{Production volume of the regulated product}}{\text{Production volume of all products}} \times \text{cost increases}$$

or

Sales basis:

$$\frac{\text{Sales volume of the regulated product}}{\text{Sales volume of all products}} \times \text{cost increases}$$

Allocators (in barrels):

	June	July	Aug	Sept	Oct	Nov	Dec	Jan
Production basis	.25	.25	.25	.25	.25	.25	.25	.25
Sales basis	.0625	.0625	.0625	.1176	.2105	.3478	.40	.4642
Cost increases	\$100	\$102	\$104	\$106	\$108	\$110	\$112	\$114

Solution:

Allocation times cost increases =

Production basis	25	25.50	26	26.50	27	27.50	28	28.50
Sales basis	6.25	6.38	6.50	12.47	22.73	38.26	44.80	52.92

Total for period:Production basis **\$214.00**Sales basis **\$190.30**

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation.

* Figures are hypothetical, for illustrative purposes only.

APPENDICES

APPENDIX A

MIDDLE DISTILLATE SUPPLY AND DEMAND

During the 1977-1978 heating season, supplies of No. 2 heating oil were adequate to meet demand, and no wide-spread shortages were experienced.^{1/} Middle distillate demand is met by refinery production, imports, and stock drawdowns. For the period of November 1, 1977, to March 31, 1978, there was an average of 49 days of supplies in inventory.

November 1977 inventories of middle distillates represent the highest accumulation of stocks over the past five years. Stocks of middle distillates are accumulated during the non-heating season when refineries normally reduce their heating oil yields. However, they maintain a high level of crude oil runs to meet high motor gasoline demand and consequently produce middle distillate in excess of immediate demand.

1/ Based on DOE data through December 1977 and the latest available data for January through March 1978.

2/ The average days of supply is calculated by dividing the average daily demand into average month-end stocks. This calculation does not include the variables in production and imports that can contribute to meeting demand. Any incremental contribution that these sources of supply make to meeting demand would obviously extend the number of days of supply in inventory.

Stocks generally peak in October and November and decline as they are drawn down during the heating season. During the past heating season stocks remained higher each month than they had for the corresponding period of the previous year, averaging over 25 percent higher than 1976-1977 heating season.

Average daily production of middle distillates during the winter heating season by domestic refiners traditionally begins to decline as demand begins to decline in February and March. Refinery production for this past heating season remained higher than the historical norm for the months of October, November, and December as refiners continued to build up inventories and then remained relatively stable for the last three months of the heating season, reflecting both a higher level of demand and higher volume of supplies in inventory. Average daily production for this year's heating season was 3,131 MB/D which was slightly lower than last heating season's daily production average.

Domestic refinery capacity utilization during the period of maximum middle distillate demand remained generally lower than it has for the past two years averaging an 86 percent utilization of available refinery capacity. Generally, a capacity utilization factor of 90 percent is considered the

maximum sustained production capacity of the domestic refining industry, although individual refineries can operate at higher production rates for short periods of time.

Imports of middle distillates generally averaged 5 percent of total domestic demand during the heating season. For the past heating season imports were 87 percent below the previous year and this reflects the generally high level of stocks and production that was maintained through the 1977-1978 heating season.

Demand for middle distillates averaged 4,217 MB/D during the 1977-1978 heating season which was slightly less than the 4,325 MB/D average demand experienced in the 1976-1977 heating season. The demand for middle distillates typically accelerates during the first three months of the heating season, generally peaking in January and then declining. As a result of the national coal strike, demand for middle distillates, one of the replacement fuels for coal, remained higher than normal during the latter part of this past heating season. The past two winters have been generally colder than normal. Middle distillate demand increased nearly 10 percent in 1976 over 1975 and by about 7 percent in 1977 over 1976. However, demand for the past heating season was about 2.5 percent less than for the prior heating season in spite of the increased demand caused by the coal strike.

APPENDIX B

RATIONALE FOR ALTERNATIVE REFINER INDEX

The decision to develop a second refiner index, with May 1977 as the base month for calculating cost and price increases, was a result of OFR's review of the first refiner index calculation that used June 1977 as the base month. Specifically, OFR found that the purpose of the refiner index -- to determine what the refiners' price of heating oil would have been if controls had remained in effect -- was being frustrated by the use of June 1977 because refiners, in effect, had to absorb one month's worth of cost increases. Under the index, refiners were not allowed to pass through increased June costs in the month of July, the month in which a small price increase had occurred.

Refiners had already absorbed at least one month's cost increases at the beginning of controls. Under the pricing regulations, May 1973 was the base month for both cost and price increase calculations. When the original Cost of Living Council's Phase IV regulations began in August 1973, any costs not reflected in May 15, 1973 prices could not be recovered after August 1973 when price increases could be justified only by cost increases incurred during the preceding month.

Therefore, the use of the original index would require refiners to absorb an additional month's cost increases beyond what they had absorbed at the beginning of price controls. This was not the intention of the refiner index.

It was thus decided to use two parallel indexes -- a May base scenario and a June base scenario -- to indicate the contrast between the results of the index as published (June base scenario), and what was considered an index more closely correlated to the pricing regulations (May base scenario). The following hypothetical example illustrates the two indices.

May base for cost, June base for price
(In cents per gallon)

	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>
Actual Price	15	15	16	16
Index Price			17	17
Actual Cost	10	12	12	13

June base for cost, June base for price
(In cents per gallon)

	<u>May</u>	<u>June</u>	<u>Jul</u>	<u>August</u>
Actual Price	15	15	16	16
Index Price			15	15
Actual Cost	10	12	12	13

With May as a cost base and June as a price base,
July index prices were allowed to reflect June's increased
costs. With June as a cost base as well as a price base,
July index prices had to remain the same.

Exhibit B.1
**Refiners' Indexes and Actual U.S. Average
Prices to Non-ultimate Consumers**
 (cents per gallon)

Month	Indexes		Actual Price	Difference* From May Scenario
	May Scenario	June Scenario		
1977				
June	—	—	35.6	—
July	36.1	35.6	35.8	0.3
August	36.1	35.3	35.6	0.5
September	36.3	35.1	35.5	0.8
October	36.5	35.1	36.0	0.5
November	36.5	34.8	36.3	0.2
December	36.5	35.0	36.6	(0.1)
1978				
January	36.8	34.7	36.8	0.0
February	36.2	33.7	36.4	(0.2)
March	36.2	33.1	36.1	0.1

SOURCE: Energy Information Administration.

*Negative number indicates index was exceeded.
 March data are preliminary.

APPENDIX C

RETAIL AND WHOLESALE BENCHMARK METHODOLOGY

$$B_{rt} = M_r (PI_t)(SF_{rt})$$

where

B_{rt} is the benchmark margin* for month t in Region r

M_r is the gross margin for June 1977 in Region r

PI_t is the price index ratio: month t vs June 1977:

For Retail: CPI (Less Food)

For Wholesale: WPI (Industrial Commodities)

SF_{rt} is the seasonal factor for month t in Region r;

For Retail: See Exhibit C-1

For Wholesale: $SF = 1.0$

r is the DOE Region

t is the month under consideration

* As defined by 43 FR 2917, January 20, 1978.

Exhibit C.1

Retail Seasonality Factors*

DOE Region	1977		1978		
	November	December	January	February	March
1	1.07	1.09	1.15	1.12	1.11
2	1.07	1.09	1.15	1.12	1.11
3	1.07	1.09	1.15	1.12	1.11
4	1.12	1.12	1.13	1.19	1.16
5	1.07	1.13	1.12	1.08	1.12
7	1.07	1.13	1.12	1.08	1.12
10	1.00	1.00	1.00	1.00	1.00
U.S.	1.05	1.07	1.12	1.10	1.11

SOURCE: Economic Regulatory Administration, Office of Fuels Regulation

* Based on gross margin data for January 1974 to March 1977.