State Energy Price System: 1983 Update Overview and Documentation

**K. L. Imhoff
J. M. Fang
L. G. McWethy**

December 1985

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EXECUTIVE SUMMARY

This report documents the update of the State Energy Price System (STEPS) for the 1970-1983 period. The STEPS data base, developed by the Pacific Northwest Laboratory (PNL) under contract to the Office of Energy Markets and End Use, Energy Information Administration, contains national and state-level energy price data for ten fuels and five end-use sectors. STEPS is intended to provide energy price information for Federal, state, and local government and private sector applications. The primary objective of this study is to document the update of the price series to include data for 1983. Concurrent with the 1983 update, PNL also began verifying the reproducibility of individual prices in the data base for the 1970-1982 period. While the reproducibility check work is completed for six of the ten fuels and is integrated in the documentation for those fuels, the findings from this task are not discussed in detail in this report.

The 1983 update and the partially completed task to verify and revise STEPS prices for 1970-1982 are aimed at improving both the accuracy of reported prices, and the documentation describing computational procedures. These improvements should enhance the useability of the STEPS data base in all of its applications. The six fuel price series in STEPS that have been both verified (1970-1982) and updated (1983) are electricity, natural gas, coking coal, steam coal, distillate fuel, and diesel fuel. For motor gasoline, kerosene/jet fuel, residual fuel, and liquefied petroleum gas, the 1983 update is complete, and verification of prices for 1970-1982 is scheduled for completion in early 1986. The differences between the STEPS prices for electricity, steam coal, and distillate fuel contained in this report and prices contained in previous STEPS reports are more pronounced. The natural gas, coking coal, and diesel fuel prices have remained similar to prices previously reported for those fuels. Because they have not yet been verified, the 1970-1982 prices for motor gasoline, kerosene/jet fuel, residual fuel, and LPG are identical to those published in the 1982 STEPS Update.

One of the major problems with previous STEPS update documentation was the "piggy-backing" of the update reports on the original report documenting the original development of the data base. The original report contained documentation for 1970-1980, while each of the update reports contained information only about changes for 1981 or 1982. In addition, much of the original documentation was incomplete, particularly in regard to the imputation of prices for missing states. This report marks the transition to documentation that describes STEPS procedures for the entire time period covered by the price series (1970-1983 for this update). Other significant improvements in documentation have also accompanied the 1983 update; for example, all variables and computer files are coded using an established naming convention that is similar to the naming convention used by the EIA in other state-level energy data bases. Equations have been rewritten to more accurately reflect the data as reported by the source documents, and the computational procedures are more completely described. Some problems encountered in the previous versions of the STEPS documentation are not within the scope of this study; in particular, the uncertainty as to whether or not taxes are included in many of the price series is a problem that should be addressed in future revisions of STEPS.

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1.0 INTRODUCTION

The mission of the Energy Information Administration (EIA) is to carry out "a central, comprehensive, and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information."^(a) To fulfill this mission, the Division of Economics and Statistics, Office of Energy Markets and End Use has the responsibility to maintain and improve existing energy data series and to conduct sector surveys of energy consumption. One data series being maintained and updated by the Division of Economics and Statistics is the series of state-level energy prices by end-use sectors known as the State Energy Price System (STEPS).

The Pacific Northwest Laboratory (PNL) began assisting EIA with the development and evaluation of the STEPS data base in August 1980. The initial data base construction was conducted on a fuel-by-fuel basis, where potential data sources for each price series were reviewed and screened. Imputation strategies were developed for cases where price data were not directly available from a published data source. The resulting state-level prices and the corresponding documentation of this first effort were published as State Energy Price System (Volume I--Overview and Technical Documentation and Volume II--Data Base Development).^(b) PNL later published State Energy Price System: 1981 Update (Fang, Imhoff, and Hood 1983) and State Energy Price System: 1982 Update (Imhoff and Fang 1984). These latter reports contained the 1981 and 1982 updated versions of the STEPS price series and a description of the changes in computational procedures needed to incorporate 1981 and 1982 prices into the data base.

Currently, the STEPS data base is a key input to the EIA's State Energy Price and Expenditure Report (SEPER), which combines energy prices with energy consumption data from State Energy Data System (SEDS) to compute national and

(a)The Department of Energy Organization Act, Public Law 95-91, Section 205, a(2).

(b)Fang, et al (1982); also published as Pacific Northwest Laboratory (1982).

state-level energy expenditures. The continuing use of STEPS in Federal and state policy analyses, as well as its growing use by the private sector, called for improvements to the computation and reporting of the price series. In addition, changes in available energy price data sources suggested that a review of data sources and computational procedures would be advisable to ensure that the STEPS price series are reasonable, consistent, and well-documented.

In response to this need, PNL began two tasks: 1) updating the STEPS price series to 1983; and 2) verifying the reproducibility of previously calculated prices for 1970-1982. This report documents the 1983 update for all ten fuels covered by STEPS. The need for the second task, the reproducibility check of prices for 1970-1982, became apparent when users were not able to recreate some prices in the data base. The purpose of this task was to verify the input data and computational procedures used to generate the STEPS price series. The results of the verification of prices for 1970-1982 for the six completed fuels are reflected in the revised documentation and final prices contained in this report. For the remaining four fuels (motor gasoline, kerosene/jet fuel, residual fuel, and liquefied petroleum gas), only documentation for the 1983 update is included in this report. Until the verification task is completed for these fuels, documentation for the 1970-1982 period can be found in the documents State Energy Price System (Volume I) and State Energy Price System: 1982 Update.

1.1 OBJECTIVE AND SCOPE

The primary objective of this study is to improve and update the existing STEPS data base to include energy prices for 1983 using reasonable, consistent, and well-documented published data sources. This objective includes promoting consistency within the STEPS data base and between STEPS and other energy prices published by EIA. As part of this effort, PNL was asked to investigate the incorporation of petroleum price data from the EIA's Petroleum Marketing Monthly into STEPS for 1983 and future years. The desired end result of this effort continues to be a state-level energy price series by fuel type and by end-use sector.

The energy types included in STEPS are four nonpetroleum fuels or energy forms (electricity, natural gas, coking coal, and steam coal), and six petroleum products: distillate fuel, motor gasoline, diesel fuel, kerosene/jet fuel, residual fuel, and liquefied petroleum gas (LPG). The end-use sectors covered by the data base are the residential, commercial, industrial, transportation, and electric utility sectors. Price series are developed only for the sectors with reported use of the specific fuel in question (generally as reported in SEDS); see Table 1.1 for the sector coverage offered by STEPS. All 50 states, the District of Columbia, and the United States as a whole are covered. Generally, if no or very little consumption is reported by SEDS for a state, no STEPS energy prices are developed. Both Btu and physical unit prices are developed for all fuels.

TABLE 1.1. STEPS End-Use Sector Coverage by Fuel, 1970-1983

<u>Fuel/Energy Type</u>	<u>End-Use Sector</u>				
	<u>Resi- dential</u>	<u>Commer- cial</u>	<u>Indus- trial</u>	<u>Transpor- tation</u>	<u>Electric Utility</u>
Nonpetroleum Fuels					
Electricity	*	*	*	*	-
Natural Gas	*	*	*	-	*
Coking Coal	-	-	*	-	-
Steam Coal	*	-	*	-	*
Petroleum Fuels					
Distillate Fuel	*	*	*	-	*
Motor Gasoline	-	-	-	*	-
Diesel Fuel	-	-	-	*	-
Kerosene/Jet Fuel	*	-	*	*	*
Residual Fuel	-	*	*	*	*
LPG	*	-	*	-	-

Key: "*" = contained in STEPS; "-" = not contained in STEPS.

Source: Pacific Northwest Laboratory

1.2 REPORT STRUCTURE

The remainder of this report contains the findings, methodology, and final documentation for the 1983 STEPS update work. Chapter 2.0 contains the findings and recommendations associated with the completed update work. Chapter 3.0 discusses the general approach used for developing the original STEPS data base, for verifying the reproducibility of the data base, and for updating the data base for 1983. Chapters 4.0, 5.0, 6.0, 7.0, 8.0, and 10.0 contain the complete STEPS documentation (1970-1983) for electricity, natural gas, coking coal, steam coal, distillate fuel, and diesel fuel, respectively. Chapters 9.0, 11.0, 12.0, and 13.0 contain documentation for the 1983 update for motor gasoline, kerosene/jet fuel, residual fuel, and LPG, respectively. Since the reproducibility work for these latter four fuels is currently underway, documentation for 1970-1982 for these fuels can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update.

Following the references section, Appendix A contains the key to the variable naming convention used in STEPS equations and computer files. Appendix B contains the final calculated STEPS prices in physical units, while Appendix C contains the final calculated STEPS prices in dollars per million Btu.

2.0 FINDINGS AND RECOMMENDATIONS

This chapter contains a summary of the findings and recommendations associated with the 1983 update of the STEPS data base. Some of the major findings from the development of the original STEPS price series are also discussed. Since the STEPS data base itself is the primary "finding," Section 2.1 gives a general description of the data base. Section 2.2 discusses general findings and Section 2.3 discusses specific findings by fuel. Section 2.4 contains recommendations formulated for future improvements to the STEPS data base.

2.1 GENERAL DESCRIPTION OF THE STEPS DATA BASE

The State Energy Price System contains time series price data for energy and fuels by end-use sector for states and the United States as a whole. Prices per million Btu and physical unit prices are developed for each of the following ten fuels: electricity, natural gas, coking coal, steam coal, distillate fuel, motor gasoline, diesel fuel, kerosene/jet fuel, residual fuel, and liquefied petroleum gas (LPG). The end-use sectors covered are residential, commercial, industrial, transportation, and electric utility. The individual price series, cross-classified by fuel and end-use sector, are shown in Table 1.1 of Chapter 1.0. Note that the 1983 updated version of STEPS no longer contains transportation sector prices for natural gas. The 1983 version of the STEPS data base contains prices covering the period 1970-1983. Previous versions of STEPS contained prices from 1960 through 1982 for electricity and natural gas.

The STEPS data base is compiled from various data sources, including those published by the EIA and other Federal agencies, as well as those published by private groups. To the extent possible, price data are taken directly from source documents. In many cases, however, prices are calculated using revenue (cost) and sales (volume) data. If a data source does not cover all the states for which consumption of a fuel is reported by SEDS, missing state prices are developed using an imputation strategy. Data sources are

briefly summarized below; detailed information about data sources and computational procedures by fuel can be found in Chapters 4.0 through 13.0.

2.1.1 Sources of Data

The various published data sources used to compile the STEPS data base originate with the Energy Information Administration, other Federal agencies, and other non-Federal groups. Table 2.1 shows the distribution of price data sources by end-use sector and fuel. The bulk of the data used by STEPS are published by the EIA and other Federal agencies. A brief discussion of each type of data source is presented below.

EIA Sources. Since the EIA is the primary Federal agency charged with the collection and publication of objective and validated energy data, and since consistency with other published EIA prices is an important criteria in the development of STEPS, many EIA series are used in STEPS. Data from the EIA's Natural Gas Annual and Cost and Quality of Fuels for Electric Utility Plants provided the data for the natural gas price series. Cost and Quality of Fuels also provided electric utility sector data for 1973-1983 for steam coal, distillate fuel, kerosene/jet fuel (1973-1982), and residual fuel. Coking coal prices are taken exclusively from Coke and Coal Chemicals and Quarterly Coal Report. Data from forms EIA-3 and EIA-9A are used for the steam coal and distillate fuel series, respectively. Several of the petroleum series have 1983 prices based on EIA's Petroleum Marketing Monthly. Other EIA sources used include Annual Energy Review, Monthly Energy Review, State Energy Data System (SEDS), Monthly Petroleum Product Price Report, Monthly Petroleum Supply Annual, Retail Sales and Inventories of Fuel Oil, and Deliveries of Fuel Oil and Kerosene.

It should be noted that predecessor documents to the EIA publications, such as the Bureau of Mines Natural Gas Production and Consumption: Annual (predecessor to Natural Gas Annual), are treated as an EIA data source. The electricity and LPG price series are the only STEPS series that do not use any EIA publications for basic price data; the electricity series uses EIA data only to adjust state-level prices taken from Edison Electric Institute's Statistical Year Book of the Electric Utility Industry.

TABLE 2.1. Sources of STEPS Price Data by Fuel and End-Use Sector

<u>Energy/Fuel</u>	<u>End-Use Sector</u>				
	<u>Residential</u>	<u>Commercial</u>	<u>Industrial</u>	<u>Transportation</u>	<u>Electric Utility</u>
Electricity	<u>Statistical Year Book Annual Energy Review</u>	<u>Statistical Year Book Annual Energy Review</u>	<u>Statistical Year Book Annual Energy Review</u>	<u>Statistical Year Book</u>	---
Natural Gas	<u>Natural Gas Annual</u>	<u>Natural Gas Annual</u>	<u>Natural Gas Annual</u>	---	<u>Natural Gas Annual Cost and Quality of Fuels</u>
Coking Coal	---	---	<u>Coke and Coal Chemicals Quarterly Coal Report</u>	---	---
Steam Coal	<u>Gas Househeating Survey Statistical Year Book</u>	---	<u>Annual Survey/Census Of Manufactures EIA-3</u>	---	<u>Statistical Year Book Cost and Quality of Fuels</u>
Distillate Fuel	<u>Monthly Energy Review Platt's Oil Price Handbook</u>	<u>Energy Prices: 1960-73 Platt's Oil Price Handbook</u>	<u>Annual Survey/Census Of Manufactures Platt's Oil Price Handbook</u>	---	<u>Statistical Year Book Cost and Quality of Fuels</u>
Motor Gasoline (1983 only)	---	---	---	<u>Petroleum Marketing Monthly Consumer Prices: Energy</u>	---
Diesel Fuel	---	---	---	<u>Agricultural Prices</u>	---
Kerosene/Jet Fuel (1983 only)	<u>Agricultural Prices Producer Prices and Price Indexes</u>	---	<u>Producer Prices and Price Indexes STEPS Industrial Distillate Prices</u>	<u>Petroleum Marketing Monthly</u>	---
Residual Fuel (1983 only)	---	<u>STEPS Electric Utility Residual Prices Monthly Energy Review</u>	<u>Annual Survey/Census of Manufactures Platt's Oil Price Handbook</u>	<u>Monthly Energy Review STEPS Commercial Residual Prices</u>	<u>Cost and Quality of Fuels</u>
LPG (1983 only)	<u>Gas Househeating Survey</u>	---	<u>Agricultural Prices Annual Survey/Census of Manufactures</u>	---	---

Sources: Pacific Northwest Laboratory

Other Federal Sources. Several non-EIA Federal data sources are used in the construction of STEPS. Data from the Bureau of the Census are taken from Annual Survey of Manufactures, Census of Manufactures, and Statistical Abstract. The Bureau of Labor Statistics' Consumer Prices: Energy and Producer Prices and Price Indexes are used for the motor gasoline and kerosene/jet fuel price series, respectively. The diesel, kerosene residential, and LPG industrial price series are based on price data from Agricultural Prices, published by the Crop Reporting Board, U.S. Department of Agriculture. The state-level diesel and gasoline monthly consumption volumes published by the Federal Highway Administration in Highway Statistics are also used.

Non-Federal Sources. Four non-EIA, non-Federal publications representing industry or quasi-industry sources are used to construct the electricity, steam coal, distillate, motor gasoline, residual fuel, and LPG price series. Edison Electric Institute's Statistical Year Book of the Electric Utility Industry is used for all sectors in the electricity price series, and for the electric utility sector in the steam coal, distillate and residual fuel price series. Platt's Oil Price Handbook and Oilmanac, published by McGraw-Hill, provides wholesale distillate and residual fuel prices which are used to estimate retail prices. Platt's also is a source for motor gasoline retail prices. The third and fourth non-Federal data sources are the American Gas Association's Gas Househeating Survey and Gas Facts. The former publication is used for residential sector steam coal and LPG prices, while the latter is the source for natural gas conversion factors for 1970-1979.

2.1.2 Hierarchy of Price Imputation

The use of diverse data sources in the construction of the STEPS data base resulted in gaps and discrepancies which have to be filled through imputation procedures. Several different imputation strategies are used throughout the data base, depending on what data are available. These procedures include mapping, linking, and price assignments. The data points derived from some procedures are "imputed data" or "synthetic data." The documentation of computational procedures for each fuel indicate which prices have been imputed and describe the imputation strategy used. The different

procedures used can be generally ordered as follows in terms of their "imputedness:"

No Imputation. Except for combining some of the originally reported categories to be consistent with the end-use sector definitions established for STEPS, no imputation is made in the data base development process. However, more than one data source may be used.

Mapping. Two or more data series with similar or comparable definitions and coverage are mapped or spliced together using regression analysis.

Linking. Data points outside the period covered by original source data are generated by assumed relationship or regression equations, linking the available data to an ongoing series.

Price Assignments. The price data for a fuel in a specific state or region are assigned to a neighboring state or region, with or without a constraint, or prices of one fuel are assigned to another fuel.

Table 2.2 provides a summary of the STEPS price series in terms of this hierarchy of imputation. This table is intended to provide an overview of the types of imputation techniques used to develop each data series. The electricity, natural gas, coking coal, motor gasoline (1983 only), and diesel fuel price series have very little imputation. The steam coal and distillate fuel price series have moderate amounts of imputation, while the kerosene/jet fuel, residual fuel, and LPG price series (all 1983 only) are almost entirely imputed. Details about the imputation strategies used for each fuel can be found in Chapters 4.0 through 13.0.

2.2 GENERAL FINDINGS

As a result of the 1983 update of the data base, several observations can be made about the differences in data sources and computational procedures between the prices for 1970-1982 published in the 1982 STEPS Update and the 1983 prices published in this report. Virtually all of the 1983 fuel price series differ from the 1982 versions in the following ways: 1) more complete documentation; 2) additional verification of input data and computational procedures; 3) change in the calculation of Btu prices (or physical unit prices, in some cases); and 4) increased use of computer programming. Highlights of

TABLE 2.2. Hierarchy of Imputation in the STEPS Data Base

<u>Energy/Fuel</u>	<u>End-Use Sector</u>	<u>No Imputation</u>	<u>Mapping</u>	<u>Linking</u>	<u>Price Assignment</u>
Electricity	Residential	A/D			
	Commercial	A/D			
	Industrial	A/D			
	Transportation	A/D			
Natural Gas	Residential	B/D			C/E
	Commercial	B/D			C/E
	Industrial	B/D			C/E
	Electric Utility	B/D			C/F
Coking Coal	Industrial	B/D			C/D
Steam Coal	Residential	B/E	A/F		C/E
	Industrial	B/E	A/F		C/E
	Electric Utility	B/D		C/F	C/F
Distillate Fuel	Residential	C/F		B/D	B/D
	Commercial	C/F		A/E	
	Industrial	B/E		A/F	C/E
	Electric Utility	A/E	A/F	C/E	
Motor Gasoline (1983 only)	Transportation	A/D			
Diesel Fuel	Transportation	A/E			C/F
Kerosene/ Jet Fuel (1983 only)	Residential			A/D	
	Industrial			A/D	
	Transportation				A/D
Residual Fuel (1983 only)	Commercial			A/D	
	Industrial			A/D	
	Transportation			A/D	
	Electric Utility	A/D			
LPG (1983 only)	Residential	B/D		C/D	
	Industrial			A/D	

KEY: A = all states; B = most states; C = some states;
D = all years; E = most years; F = some years.

Source: Pacific Northwest Laboratory

the findings for specific fuels will be described after the following discussion on these general findings.

2.2.1 Documentation

The documentation contained in Chapters 4.0 through 13.0 represents a significant improvement over previous versions of STEPS documentation. In the latter, many discrepancies and omissions of pertinent information made it very difficult to reproduce individual prices in the data base. Procedures for imputing missing states were often vague or were missing altogether. The documentation reported by fuel in Chapters 4.0 through 13.0 is much more detailed and uses a consistent naming convention for labelling variables and computer files. Considerable effort has been made to include all the details about the type of data (units, and price, fuel, and end-use sector definitions) and computational procedures in this documentation. Whether or not taxes are included in the final STEPS prices is explicitly stated.

Another problem with earlier documentation was the "piggy-backing" of update documentation with the original documentation, State Energy Price System (Volume I). The update documentation referred readers back to the original documentation, noting any changes in data sources or procedures necessary to develop prices for 1981 or 1982. This dispersion of documentation decreased the useability of the data base. This report and future STEPS documentation will include in one volume all information about data sources and computational procedures for all years covered by the data base.

2.2.2 Computational Procedures

The review and verification of the input data and computational procedures used in the 1983 update are the same as the practice adopted for the reproducibility check work. Input data are thoroughly reviewed and corrected as needed. Computer programs are documented and run with trial data to verify that they are correctly performing the desired calculations. Many input and procedural errors have been found through the reproducibility effort, so increased emphasis has been placed on one-over-one review of all development

work. In addition, computer checks have been made of non-price data by checking monthly and U.S. totals where appropriate.

Several users of the STEPS data base complained that the Btu prices reported in the published documentation could not be reproduced exactly using the physical unit prices and the conversion factors as stated in documentation. This problem was the result of rounding error generated by the number of decimal places carried by the computer. To resolve the discrepancy due to rounding error, physical unit prices (Btu prices) are first calculated to several decimal places. These prices are then rounded to three places after the decimal and Btu prices (physical unit prices) are calculated from the conversion factor and the rounded physical unit prices. All the revised and updated fuel prices, except electric utility price series based on data from the EIA's Cost and Quality of Fuels, are calculated using this procedure.

2.2.3 Implementation of Computational Procedures

The final general difference between earlier versions of STEPS and the current version is the increased use of computer programming in all stages of the computational procedures. This improvement offers accuracy and consistency in price calculations and a good method for tracking the actual computer development of the data base. The transition from hand calculations to computer calculations is made easier for some fuels (such as motor gasoline) by the availability of new data sources for 1983 (such as EIA's Petroleum Marketing Monthly). The documentation contained in Chapters 4.0 through 13.0 describes the development of STEPS in a clear and concise manner so that data base users can reproduce individual prices. However, in the actual construction of the data base there are more efficient ways of performing these calculations, particularly in terms of the order of calculation. While the computer programs do strongly resemble the written documentation, there are some differences that are effectively recorded with the use of established programs. Another benefit of established programming is the simplification of the update process.

2.3 SPECIFIC FINDINGS BY FUEL

In addition to the general findings described above, there are several important findings specific to each fuel series in the STEPS data base. These findings are presented below.

2.3.1 Electricity

The STEPS electricity price series cover the residential, commercial, industrial, and transportation sectors. Both the reproducibility check and update work are complete for this fuel, so the documentation contained in Chapter 4.0 covers the entire period 1970-1983. The procedures for calculating 1983 electricity prices remain basically the same as for previous years, as amended by the reproducibility work. One difference is the change in temporal coverage from 1960-1983 to 1970-1983 requested by EIA.

One change in the 1983 and future update procedures is the substitution of final Statistical Year Book data for the preliminary data previously used. In 1980, Edison Electric Institute (EEI) started publishing preliminary data in each edition of Statistical Year Book, then updating that information in the following year. No effort was made in previous STEPS updates to revise the electricity prices once the revised EEI data were available. It is intended that the substitution of final prices for preliminary prices will continue as the former become available. The EIA requested that conversion factors be taken from the State Energy Data Report (SEDR) instead of from Annual Energy Review; this change had no affect as the factors reported in the two documents are identical.

Another change from the reproducibility effort that affects the 1983 electricity update is the added step to reconcile state-level prices from Statistical Year Book with U.S. prices from Annual Energy Review. Previously, U.S. prices were calculated directly from Statistical Year Book data in the same way as state prices. In the revised procedure, the U.S. prices are taken directly from AER and the ratios of AER prices to the U.S. prices published in Statistical Year Book are used as adjustment factors. Virtually all the

electricity prices now reported in STEPS are affected by this procedural change which brings the STEPS U.S. electricity prices into agreement with the U.S. electricity prices published in other EIA publications. This change also serves as a check on the prices collected by EEI, a non-Federal government source.

2.3.2 Natural Gas

The 1983 STEPS natural gas price series cover the residential, commercial, industrial, and electric utility sectors. The 1982 STEPS Update for this series also included prices for the transportation sector, but since the pipeline prices previously used for this sector really represent intermediate transactions, they have been dropped from the data base. As for electricity, the EIA also requested that the natural gas price series cover the period 1970-1983 instead of the period 1960-1983. Both the reproducibility check and the 1983 update are complete for the natural gas price series. Since the data sources and procedures vary significantly between the residential, commercial, and industrial sectors, and the electric utility sector, the discussion of findings is separated below. Detailed documentation for natural gas for 1970-1983 can be found in Chapter 5.0.

Residential, Commercial, and Industrial Sectors. For the residential and commercial sectors, data sources and computational procedures for 1983 are the same as those for 1970-1982. For the industrial sector, the use of lease and plant fuel data is discontinued for all years, including 1983. These data had been added to the Natural Gas Annual industrial sector data to construct the STEPS industrial sector price series. This change means that all of the reported prices for the natural gas industrial sector series differ from those reported in the 1982 version of STEPS. A few states continue to have outlying prices that appear to be the result of errors in the source documents: Oklahoma (1979, commercial); Utah (1980-1982, commercial); and Wyoming (1974, industrial).

Electric Utility Sector. The data source for natural gas electric utility sector prices continues to be the EIA's Cost and Quality of Fuels in 1983. However, instead of using data from a computer tape, EIA has requested that

data be taken from published hard copies of the data source. For this fuel series as a whole, reported prices are very similar to previous versions of STEPS, with a few exceptions for states that are missing prices for years where prices were reported before. Alaska (1980-1981) and West Virginia (1973-1974) continue to have prices that stand out from general trends.

2.3.3 Coking Coal

The STEPS coking coal price series cover the industrial sector only. Both the reproducibility check and the 1983 update are complete for this fuel. There are no differences in data sources or procedures from 1982, and reported physical unit coking coal prices for 1970-1982 are virtually identical in the 1982 and 1983 versions of STEPS. A few prices are modified due to corrections in data input errors, and all the Btu prices are modified by the EIA request to use conversion factors from SEDR. Since the physical unit prices did not extend beyond three places after the decimal point in the source documents, there never was a rounding error problem for this price series. Chapter 6.0 contains the detailed STEPS documentation for coking coal.

2.3.4 Steam Coal

The STEPS steam coal price series cover three end-use sectors: electric utility, residential, and industrial. Both the reproducibility check and the 1983 update are complete for this fuel. Since the data sources and procedures vary significantly between the electric utility, residential, and industrial sectors, the discussion of findings is separated below. The detailed STEPS documentation for steam coal can be found in Chapter 7.0.

Electric Utility Sector. The data source for steam coal electric utility sector Btu and physical unit prices continues to be Cost and Quality of Fuels in 1983. There is a change from Cost and Quality computer tape data to published hard copy data, made at the request of EIA. For this fuel series as a whole, the prices for 1970-1972 reported in this document are identical to the 1982 update report while prices for 1973-1983 differ somewhat from the 1982 report in both the physical unit and Btu series. One reason for the differences is the change from computer tape to published hard copy data sources

which took place during the reproducibility check; another possible contributing factor could be an error in the calculation of previously reported prices. Inadequacies in the 1970-1982 documentation do not allow verification of the procedures previously used.

Residential Sector. There is no change in basic computational procedures for this sector but there is a change in data sources for the data year 1983. The regression equation used to impute residential steam coal prices for 1979-1983 was revised during the reproducibility check. The 1979-1982 prices reported in the 1982 STEPS Update were estimated using two separate equations: one for states with bituminous coal use and one for states that do not use bituminous coal. The equation for the former group of states was estimated with Cost and Quality bituminous spot prices, while the equation for states without bituminous use was estimated with all coal spot prices. Since EIA has decided to use only published hard copy Cost and Quality data in STEPS, the distinction between types of spot coal prices can no longer be maintained. To solve this problem, separate regression runs were made with all coal spot prices and with all coal spot and contract prices. Since the best results were obtained with the spot prices alone, the equation using spot prices is used to calculate 1979-1983 prices for all states. In addition to the change in input data for the regression equation, EIA also requested a change in data sources for conversion factors from Monthly Energy Review to SEDR. As a result, the entire physical unit price series is affected.

Industrial Sector. The final steam coal industrial prices calculated included in this update report are calculated similarly to those for 1982. The imputation of data for states missing EIA-3 data follows the procedure established during the reproducibility check for 1980-1982. Missing states prices are imputed using averages of only published prices from adjacent states instead of using the old procedure of averaging published and unpublished data from adjacent states. Btu prices are affected by the change, made at the request of the EIA, to SEDR as the conversion factor data source.

2.3.5 Distillate Fuel

STEPS distillate fuel prices are developed for the residential, commercial, industrial, and electric utility sectors. Both the reproducibility check and the 1983 update are complete for this fuel. Detailed information about the data sources and computational procedures used to construct these price series for the period 1970-1983 is given in Chapter 8.0. Since the data sources and computational procedures vary significantly between the sectors, the findings are discussed separately for each sector below.

Residential Sector. For the 24 states that had state-level residential sector heating oil prices reported for 1978-1982, no changes in data source or procedures took place for the 1983 update. Annual average prices for these states are taken from EIA's Monthly Energy Review, following procedures developed for 1978-1982 in the reproducibility check. For the other 27 states, however, the 1983 data source is EIA's Petroleum Marketing Monthly (PMM), an EIA report that began publication with 1983 data. While the procedures for estimating state-level prices for these states from the published monthly regional data are basically unchanged, the regional definitions themselves do change from Federal Regions to PAD Districts. Prices for the U.S. are still taken from Annual Energy Review. The distillate residential sector (and commercial and industrial sector) prices are not changed by EIA's request to take conversion factors from SEDR.

Commercial Sector. The distillate commercial prices for 1983 are calculated similarly to those for the residential sector using data from PMM, except that monthly state-level prices are available for the 24 states instead of annual average prices. These monthly prices are weighted into annual averages using monthly heating degree data from the National Oceanic and Atmospheric Administration (NOAA). This change in data source offers significant improvements to the quality of distillate commercial prices over the markup-based estimation procedures used for 1970-1982.

Industrial Sector. The distillate industrial sector prices for 1983 are also computed from PMM data, using procedures similar to those for the

residential and commercial sectors. The monthly state-level prices for 24 states are combined into annual prices with simple averaging techniques. The PMM data fill the gap left by the lack of Annual Survey of Manufactures (ASM) data after 1981. Since there are no sources of distillate industrial sector prices for 1982, the preliminary prices estimated during the 1982 Update are replaced with prices estimated based on the relationship between ASM data and the completed STEPS distillate electric utility prices for 1978-1981. The procedures for 1982 and 1983 are different than those for previous years.

Electric Utility Sector. The data source for distillate electric utility sector Btu and physical unit prices continues to be Cost and Quality of Fuels in 1983. There is, however, a change from computer tape sources to published hard copy sources, as for the natural gas and steam coal electric utility price series. This change is made at the request of the EIA, and affects all distillate electric utility sector prices for 1973-1983.

2.3.6 Motor Gasoline

The STEPS motor gasoline price series cover the transportation sector only. Only the 1983 update is complete for this fuel; the reproducibility check work is scheduled for completion in early 1986. Chapter 9.0 only contains documentation for the development of the 1983 prices. Information about the development of the 1970-1982 prices can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update.

The 1983 motor gasoline price series in the STEPS data base are based on monthly state-level prices taken from the EIA's publication Petroleum Marketing Monthly. Composite "all types" prices for finished gasoline are available for all states except Alaska, Hawaii, and the District of Columbia. Prices for these three states are taken from Consumer Prices: Energy as in previous years. Monthly gasoline consumption volumes from Highway Statistics continue to be used to calculate annual prices. With sharp decline in the availability of monthly, state-level gasoline prices from Platt's Oil Price Handbook and Oilmanac, the PMM provides the best available data for use in constructing the STEPS series. When the reproducibility work is completed, the impacts of the change in procedures between 1982 and 1983 can be evaluated.

2.3.7 Diesel Fuel

Like motor gasoline, the diesel prices series cover only the transportation sector. Both the reproducibility check and the 1983 update are complete for the STEPS diesel price series. Other than the general differences mentioned in Section 2.2, there are no differences in data sources or computational procedures for the calculation of 1983 prices. The change to SEDR as the source of diesel conversion factors, made at the request of the EIA, does not affect the final reported prices. Detailed diesel documentation for 1970-1983 can be found in Chapter 10.0.

2.3.8 Kerosene and Jet Fuel

The STEPS kerosene/jet fuel price series cover the residential, industrial, transportation, and electric utility sectors. For 1983, however, no electric utility sector data are available, so no prices are developed for this year. Only the 1983 update is complete for this fuel; the reproducibility work is scheduled for completion in early 1986. Chapter 11.0 contains documentation only for the development of 1983 prices. Information about the development of the 1970-1982 prices can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update.

Residential and Industrial Sectors. Other than the general changes mentioned in Section 2.2, kerosene prices for the residential and industrial sectors are calculated using the same data sources and procedures as 1982. The Bureau of Labor Statistics' Producer Prices and Price Indexes is the basis for the series, with sector adjustments from Agricultural Prices in the residential sector and the STEPS distillate industrial price series for the industrial sector. EIA's request to use the conversion factors found in SEDR does not affect either the residential sector or industrial sector final kerosene prices.

Transportation Sector. Transportation sector jet fuel prices for 1983 are computed from Petroleum Marketing Monthly data for PAD Districts. The 1983 jet fuel prices are different from those developed for previous years in

several respects. First, PMM provides retail price data, while Producer Prices provides wholesale data. Since no retail jet fuel data were previously available to adjust the wholesale data, STEPS jet fuel prices for 1970-1982 are wholesale. The PMM data are also reported for PAD Districts instead of the Census Divisions reported by Producer Prices. The procedure of assigning regional prices directly to states is continued for 1983, so the 1983 price series are based on slightly more aggregated prices (seven PAD Districts as opposed to nine Census Divisions). When the reproducibility check is completed, the impacts of these differences on the continuity of the series can be evaluated.

2.3.9 Residual Fuel

The STEPS residual fuel price series cover the commercial, industrial, transportation, and electric utility sectors. Only the 1983 update has been completed for residual fuel; the reproducibility check is scheduled for completion in early 1986. Chapter 12.0 contains documentation only for the development of 1983 prices. Information about the development of residual prices for 1970-1982 can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update. Due the significant differences in data sources and computational procedures among sectors, the discussion of findings is separated below.

Electric Utility Sector. Like the electric utility sector price series for natural gas, steam coal, and distillate fuel, the residual fuel series for 1983 is based on the EIA's Cost and Quality of Fuels published hard copy data. No imputation is needed for any states in 1983.

Industrial Sector. The 1983 update of the STEPS residual price series consists of two steps: 1) finalizing prices for 1982, and 2) generating prices for 1983. Prior to 1982, industrial residual prices are computed from Annual Survey of Manufactures (ASM) and Census of Manufactures (CM) data. Since ASM/CM ceased publication of state-level residual data after 1981, prices for 1982 and 1983 are imputed based on the relationship between Platt's prices for No. 6 fuel oil and ASM/CM-based residual STEPS prices for 1978-1981. The residual conversion factors are taken from SEDR, at the request of the EIA.

Commercial and Transportation Sectors. Other than the general changes mentioned in Section 2.2, the data sources and procedures for calculating 1983 residual fuel commercial and transportation sector prices are basically the same as for 1982. The one exception to this is the substitution of the price for residual fuel oil with sulfur content greater than one percent, for the Bunker C price in the transportation sector; this change is necessary because Bunker C prices are no longer available for EIA sources. Both of these sectors use the conversion factors from SEDR.

2.3.10 Liquefied Petroleum Gas

The STEPS liquefied petroleum gas (LPG) price series cover the residential and industrial sectors. Only the 1983 update is complete for this fuel; the reproducibility check for LPG is scheduled for completion in early 1986. Chapter 13.0 contains the detailed documentation for this fuel for 1983 only. The documentation for the 1970-1982 prices can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update.

The 1983 LPG prices for the residential sector are calculated using the same data sources and procedures as for previous years. With the suspension of publication of ASM/CM after 1981, the procedures for the industrial sector LPG price series for 1983 had to be changed from those of previous years. The 1983 LPG industrial prices are calculated based on the relationship between ASM/CM prices and Agricultural Prices data for 1978-1981. The procedures involved are similar to those used for the residual fuel industrial sector price series. It is anticipated that this same procedure will be used during the reproducibility check to estimate prices for 1982.

2.4 RECOMMENDATIONS

The 1983 update of the STEPS and the reproducibility check completed for six fuels have resulted in significant improvements to the 1982 version of STEPS. To extend this improvement for the remaining four fuels, it is recommended that the reproducibility work currently underway for motor gasoline, kerosene/jet fuel, residual fuel, and LPG be completed and included in the

1984 STEPS Update report. The continuation of STEPS updates in accordance with the standards for accuracy and consistency established during the reproducibility check will give users more confidence in the state energy price data base for many applications.

One major issue that surfaced during the 1983 update and the reproducibility check is the question of whether or not taxes are included in the reported prices. Many of the original data sources do not explicitly state whether or not taxes are included in their data, and many of the data collection forms issued by either Federal or non-Federal agencies do not include instructions on how taxes should be treated. It is relatively important to be able to identify the tax status of prices, particularly in data series such as the distillate residential series, that are pieced together from several different data sources. Users of STEPS need to be advised about any potential differences in the nature of prices reported in the data base. Resolution of this question may involve interviews with the agencies or groups responsible for the different publications. Once the tax status has been ascertained, it may make sense to revise fuel price series that have inconsistent tax reporting.

Another general recommendation is to continue to utilize computer programming as much as possible in the data base. For some fuel price series, hand calculations are still used in the development process. The accuracy and efficiency of the update process will be enhanced by the further use of computer programming.

The following two recommendations are fuel-specific. First, the natural gas price series has several reported prices that do not follow the apparent trends. Since input data or procedural errors do not explain these odd prices, it appears likely that there may be errors in the value or quantity data published in the source documents. It is recommended that an effort be made to double check the source values with the originating agency. Second, consideration should be given to either discontinuing prices or developing another imputation strategy for the steam coal residential sector. As the update years get further away from 1978 (the last year of coal data from a published source), the less accurate estimates of actual prices are likely to

be. With the 1984 update, the years of estimated prices will nearly equal the years used as the basis for the series.

3.0 METHODOLOGICAL OVERVIEW

This chapter presents an overview of the approach and methodology adopted for the development of STEPS. This discussion includes an explanation of the original criteria for the data base; definitions of prices, fuels, and sectors; and the methodology itself. The methodology and approach discussed reflect any changes made to the original methodology during the reproducibility check, and are directly related to the prices reported in the 1983 STEPS data base.

3.1 CRITERIA FOR DATA BASE DEVELOPMENT

When PNL first began work on the development of a state-level energy price data base in 1980, the EIA outlined several criteria that were to be met by the final data base. For the most part these criteria have remained constant through the various updates, but a few changes have been made as STEPS has progressed through the various update and reproducibility check tasks. The basic criteria upon which the 1983 update price series are based, are as follows:

1. The energy price series to be developed are electricity, natural gas, coking coal, steam coal, distillate fuel, motor gasoline, diesel fuel, kerosene/jet fuel, residual fuel, and LPG.
2. The applicable end-use sectors are residential, commercial, industrial, transportation, and electric utility.
3. The state is the smallest unit of disaggregation for each energy price series. Each price series must be able to stand independently from similar data and be reaggregated.
4. The time period to be covered is 1970 through 1983.
5. The price series developed should be consistent with prices published in other EIA documents.
6. Where possible, the variables included in the prices (i.e. taxes, transportation costs, etc.) should be identified.
7. The definitions used for fuels and sectors should be the same as those found in State Energy Data Report.

8. It should be noted if any price series segments share data elements across state boundaries.
9. EIA data sources should be carefully considered in the evaluation of alternative data sources. If an EIA series is considered to be inadequate, a discussion of the inadequacy should be provided.
10. Complete documentation must be provided for implementation of the state energy price series and for subsequent annual updates.

3.2 DEFINITIONS

With the variety of original data sources used in the development of STEPS, there are some differences in the definitions of price, fuel, and end-use sector. Inconsistencies of definitions generally follow changes in data sources; however, over time definitions may change within a particular data source. While it would be ideal to have uniform definitions of price, fuel, and end-use sector in STEPS, it should be noted that this data base is not the result of a primary data collection effort. To improve the useability of the data base despite some inconsistencies, an effort has been made to document the definitions used by the various original data sources. This information is included in detail in the discussion of individual fuel computational procedures (Chapters 4.0 through 13.0), and is summarized below.

3.2.1 Price Definitions

Price is a basic economic concept. Generally, price represents the amount of money that is transferred to effect a transaction of a unit of product or service. There are many dimensions of a transaction that may affect the price, including: the quality of the product or service, terms of payment, the timing and location of the transaction, the inclusion or exclusion of transportation and distribution costs, quantity discounts, and the nature of customer classes. Examples of how each of these dimensions affects energy prices are shown below:

Quality of a Product. Coal and residual fuel prices vary with sulfur content; electricity and natural gas prices may be lower if service is interruptible.

Terms of Payment. Prices may vary depending on whether a transaction is a cash sale, charge sale, or installment sale. The spot price for a fuel is likely to be different from the long-term contract price.

Time and Location. The price of gasoline during the summer travel months may be different from the price in winter. The price of natural gas in Texas may be different from the price of natural gas in Washington. Prices may change hourly, daily, weekly, monthly, quarterly, seasonally, or yearly.

Transportation/Distribution Costs. The delivered price of crude oil may be different from the FOB price; the city-gate price of natural gas is different from the delivered price to households.

Quantity Discounts. The volume of a transaction may affect the unit price in the form of a discount for large volumes. This price difference may actually reflect some of the reduced cost of effecting the transaction.

Customer Classes. The prices to residential, commercial, industrial, and electric utilities differ, partly because of differences in transaction and transportation costs. Similarly, wholesale prices differ from retail prices.

The types of prices found in the STEPS data base include average price, wholesale price, retail price, spot price, contract price, and delivered price. Average price may refer to "average" revenue per unit of product, a population-weighted average price, or the average of price quotes over a period such as a day, a week, a month, or a year. Retail prices are prices paid by consumers of a product who intend to use the product for final consumption or production purposes, not for resale to others. Wholesale prices are charged to buyers who purchase the product for the purpose of reselling at a profit. The spot price is the price quoted for "on the spot" transactions, as opposed to the long-term contract price which is intended to be in effect for a long period of time (usually with some mechanism for changing the price quotes if necessary). Delivered prices include the cost of delivering the product from the seller's location to that of the purchaser. The cost of delivery may include transportation, insurance, and customs taxes.

The major objective of the work to develop the State Energy Price System is to develop an energy price data base that can be used by the EIA in its regional energy analysis activities, in developing state energy expenditures

accounts, and in general monitoring and information activities. With these intended uses, the prices sought for the STEPS data base are the average retail price per unit of fuel. In general, average prices should be quantity-weighted if quantity data are available; in some cases, however, proportional and other linear relationships are used in the imputation of prices, so that quantity-weighting cannot be done. The use of imputation strategies to estimate missing prices sometimes makes an exact definition of the resulting price difficult to state, particularly if two different sources with different definitions of price are involved. With several of the data sources, including EIA, other Federal, and non-Federal sources, it is not clear whether or not taxes are included in the reported prices. The inclusion or exclusion of taxes, or the uncertainty as to inclusion or exclusion, is explicitly stated in the fuel-by-fuel documentation given in Chapters 4.0 through 13.0.

3.2.2 Fuel Definitions

Ten major fuels are covered by STEPS: electricity, natural gas, coking coal, steam coal, distillate fuel, motor gasoline, diesel fuel, kerosene/jet fuel, residual fuel, and LPG. Prices for other fuels for which consumption data are available in SEDS (such as lubricant, road oils, asphalt, wood, etc.) are beyond the scope of STEPS development. The definitions of the covered fuels used in STEPS are consistent with those included in the EIA's Annual Energy Review.^(a) Because of data source limitations, however, there are some discrepancies. While the fuel definitions used by each data source are documented in Chapters 4.0 through 13.0, the following definitions are used for general purposes:

Electricity. Electricity sales to ultimate consumers.

Natural Gas. A mixture of hydrocarbons and small quantities of various non-hydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs.

Coking Coal. Bituminous coal from which constituents have been driven off by heat so that the fixed carbon and the ash are fused together.

(a)Energy Information Administration, U.S. Department of Energy. Annual Energy Review 1983. DOE/EIA-0384(83), pp. 229-237, Washington, D. C.

Steam Coal. Includes all ranks of coal--anthracite, bituminous coal (including subbituminous coal), and lignite.

Anthracite. A hard, black, lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. It is often referred to as hard coal.

Bituminous. A coal that is high in carbonaceous matter having a volatility greater than anthracite and calorific value greater than lignite. Often referred to in the United States as soft coal.

Lignite. A brownish-black coal of low rank with high inherent moisture and volatile matter. It is also referred to as brown coal.

Subbituminous. A dull, black coal of rank intermediate between lignite and bituminous coal.

Distillate Fuel. A general classification for one of the petroleum fractions produced in conventional distillation operations. Included are products known as No. 1 and No. 2 heating oils, diesel fuels, and No. 4 fuel oil.

Motor Gasoline. A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that have been blended to form a fuel suitable for use in spark-ignition engines. Included are finished leaded gasoline, finished unleaded gasoline, and gasohol.

Diesel Fuel. A type of distillate fuel oil.

Kerosene. A petroleum middle distillate having burning properties suitable for use as an illuminant when burned in wick lamps. Included are No. 1-K and No. 2-K and grades of kerosene called range oil having properties similar to No. 1 fuel oil.

Jet Fuel. Includes both naphtha-type and kerosene-type jet fuel meeting standards for use in aircraft turbine engines.

Residual Fuel. The topped crude of refinery operations that includes No. 5 and No. 6 fuel oils, Navy Special fuel oil, and Bunker C fuel oil.

Liquefied Petroleum Gas (LPG). Included are propane, propylene, butane, butylene, ethane-propane mixtures, propane-butane mixtures, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate raw natural gas plant liquids. Ethane and ethylene are excluded.

3.2.3 End-Use Sector Definitions

The classification of end-use sectors used in STEPS is in accordance with SEDS and the EIA's Annual Energy Review. There are five end-use sectors covered by STEPS: residential, commercial, industrial, transportation, and electric utility. The residential sector consists of households occupying single family homes, multiple family dwellings, and mobile homes. The commercial sector includes retail and wholesale establishments, office buildings, warehouses, educational facilities, hospitals and health care buildings, commercial lodging, recreational, other assembly buildings, and utilities except electric utilities. The industrial sector includes manufacturing, agriculture, construction, and mining. The transportation sector covers common carrier air, ground, and water transportation for passengers and freight. Common practice also includes gasoline and diesel use by private automobiles in the transportation sector. The electric utility sector covers power plants which consume primary energy sources such as coal, oil, natural gas, and nuclear fuels to generate electricity.

The STEPS data base sector definitions resemble the above EIA definitions as closely as the source data publications allow. There are several difficulties in assigning actual data to sectors, partly due to the differences between the EIA sector definitions and the definitions used by the original data source. For the electricity and natural gas STEPS price series, the division between the industrial and commercial sectors is sometimes blurred. Collection of data on electricity kilowatt-hour sales and revenues is generally based on the specific rate schedules in use by individual utilities. Historical data on sales of electricity to both businesses and industries are generally grouped into two categories: "small power and light," requiring less than 1000 kilowatts of service, and "large power and light," requiring more than 1000 kilowatts of service. Generally, the assumption is made that the former category approximates the commercial sector, while the latter approximates the industrial sector. However, there may be small manufacturing establishments which are included in the industrial sector but which are also included in the "small power and light" category. Similarly, there may be large commercial businesses which are included in "large power and light."

3.3 GENERAL METHODOLOGY

The fuel price series contained in the 1983 STEPS are developed from the original STEPS data base for 1970-1980, the 1981 and 1982 updates, and the reproducibility check work (for electricity, natural gas, coking coal, steam coal, distillate fuel, and diesel fuel). While this data base has evolved through the updating and reproducibility check tasks, the basic methodology used in its construction has remained relatively unchanged. The discussion of methodology in this section does not reflect all the iterations of the data base, but rather focuses on the procedures actually used to generate the prices found in this report.

The development of the STEPS data base has been carried out in a fuel-by-fuel fashion, where each fuel has its own documentation, programs, and data file library. The construction of each fuel series can be broken into several major steps: 1) data source review; 2) analysis of imputation options; 3) initial documentation; 4) calculation and verification of prices; and 6) final documentation. Each of these steps is discussed below.

3.3.1 Data Source Review

The first step in the development of STEPS fuel price series is to review the available, published data sources from which prices or other relevant data may be taken. To screen potential data sources, a set of review criteria are established in accordance with requirements of the STEPS (see Section 3.1), the intended uses of the final data base, and the data accessibility and quality requirements of EIA. The set of review criteria established and used for all fuels for the 1983 update are as follows:

1. The source must provide data that is the result of primary data collection. It is at the level of actual data collection and aggregation that the reliability of the data can be assessed. This criterion eliminates data that are a compilation or re-presentation of data from secondary sources.
2. The data must be published and be available from 1970, and must be collected on a consistent basis at fixed time intervals of one year or less. Since the EIA must, by law, make public any data which it

uses, (a) the STEPS cannot contain proprietary data. Consistency in the method and timing of data collection is desired because the EIA data base development must be on a continuing basis. Collection intervals of one year or less are necessary to allow for calculation of annual prices. This criterion rules out the use of data which do not form a comprehensive and consistent series, such as the data collected by individual state agencies.

3. The data must be reported at the company, utility, city, or state level. This criterion is designed to identify data sources that contain state-level price estimates or data sources from which state-level price estimates can be generated. Sources whose price data have a lowest aggregation level greater than the state level, are, therefore, generally excluded from possible use in the data development process.
4. The data must cover the entire United States. This criterion is included in the review both to minimize the number of states for which prices have to be imputed, and to exclude data sources in which the accuracy of the data varies considerably across states. It is recognized, however, that some gaps in coverage of Alaska, Hawaii, and the District of Columbia may be unavoidable.
5. The data must be reported by end-use sector. This criterion screens out those data bases that aggregate all end-use consumption and those that categorize consumption by source or type of supply, rather than by demand sector. As noted, the five end-use sectors considered in this study are the residential, commercial, industrial, transportation, and electric utility sectors; however, not all five sectors are required for each of the fuels considered.
6. Data collection and aggregation procedures must be documented by the source organization. In order to evaluate the accuracy of the data and its suitability for EIA purposes, factors such as sample design, product definitions, and price imputation methods must be known. This criterion rules out possible use of data bases whose source organization refuses to reveal the methodology used.
7. The data for a calendar year must be available before the end of the following calendar year. This is required because the price series data are needed to prepare the EIA's Annual Energy Review and other documents that must be produced in a timely manner.
8. The data must permit calculation of a volume-weighted cost per million Btu. This is required by the EIA. With this measure of energy price, the price data can be multiplied by consumption volume data to yield an estimate of total fuel expenditures. A price per million Btu consumed also ensures consistent measurement of end-use consumption across physical units that may vary in Btu content.

(a) Department of Energy Organization Act, P. L. 95-91, Section 205, g.

In order to evaluate potential data sources against these criteria, telephone and personal interviews are conducted with the publishing organization for candidate series. An initial screening of the available data series is then conducted to eliminate those data sources with gross deficiencies. A detailed comparison and review of the remaining data sources is then conducted, where the performance of each data source with regard to the review criteria is evaluated. This comparative analysis determined whether a single data source or a combination of data sources is needed to construct state-level prices for a particular fuel and end-use sector.

3.3.2 Analysis of Imputation Options

The analysis of imputation options, the next step in the development of the STEPS data base, is contingent upon the findings during the data base review. For some fuel/sector price series, no prices need to be imputed. For other series, a great deal of imputation may be required. Prices are generally considered to be "missing" if consumption data for a state are reported by SEDS. Almost all of the ten fuels have some prices generated using imputation methods.

The choice of imputation strategies is made by PNL and EIA after the following three elements have been identified: 1) the sectoral, geographical, and time coverage of the usable data sources; 2) alternative logic and data requirements for different imputation strategies; and 3) the costs and benefits associated with the different proposed strategies. A variety of imputation strategies are used throughout STEPS including adjacent state averages or price assignments, average ratios, trend analysis, simple regression analysis, and multiple regression analysis and pooling techniques.

3.3.3 Initial Documentation

After data sources and imputation strategies have been selected and approved by EIA, the initial documentation for each fuel is prepared. This documentation is used as the basis for the preparation of input data, the naming of data files, and computer programming. All data sources are specifically mentioned, and all computational procedures are described both

in prose and by mathematical equations. As data entry to the computer and computer programming are done, any needed changes to this documentation are noted. The feedback that occurs during the next step in the process, calculation and verification, is an important part of finalizing the documentation.

3.3.4 Calculation and Verification of Prices

The amount of work involved in the calculation and verification of the final STEPS prices varies considerably from fuel to fuel. In the simplest case, data are transferred from the original source documents to the EIA computer, simple calculations are performed to generate physical unit prices, and Btu prices are generated using a conversion factor. In most cases, however, the many complexities associated with combining data from different sources and imputing missing prices make the calculation step more involved. Data verification takes place throughout the data input and computational process. At least two iterations are performed in the verification of input data, and test cases are run to verify computer programming. Once the final STEPS prices have been completed, the series is checked again to look for prices that do not fit apparent trends. Any outlying prices are rechecked to ensure that no data input or computational errors are involved.

3.3.5 Final Documentation

The preparation of the final documentation is the last step in the construction of the STEPS price series. The initial documentation is revised to incorporate any improvements identified during the calculation and verification of prices. Other comments designed to improve the clarity or accuracy of the procedures actually used in the data base development process are also included. In addition to the final documentation report, all computer data files and program files are finalized and saved.

3.4 DATA AND METHODOLOGICAL ISSUES

Several data and methodological issues arise in the development of the kind of data base documented in this report. The issues of potential uses of state-level energy price data, and the need for imputation and the nature of the imputed data are discussed below.

3.4.1 Uses of State-Level Energy Price Data

There are primarily four major uses of the energy price series developed as STEPS: policy analysis, information and comparison, market assessment and program evaluation, and short-term analysis and forecasting. These four uses are necessarily interrelated and are somewhat overlapping. As explained below, the main differences among the four uses are a matter of emphasis.

Policy Analysis. State-level energy price data are used for making decisions in both the public and private sectors. With the rapid increase in fuel prices since the 1973-1974 oil embargo, industries and businesses are incorporating energy prices into their location and investment decisions. Consumers are becoming accustomed to basing their purchases of durable goods on energy efficiency and prices. Federal, state, and local governments are also basing their research, development, and other decisions on energy price information.

Information and Comparison. Energy price data provide information for understanding past trends and monitoring current developments in the relative prices of different fuels, as well as between fuels and other commodities, services, and factor inputs. These data are components of general price indicators such as the Consumer Price Index and the Producer Price Index. From the prices of the same energy source or fuel for different states, comparisons can be made in the cost of energy and fuels among states. Energy price data are also useful in constructing state-level energy expenditure accounts. This type of information can be used in comparing impacts of changing energy prices on households, businesses, and industries in the states and regions of the United States.

Market Assessment and Program Evaluation. The assessment of market potential for new sources of energy supply, as well as for new conservation and renewable resource technologies, requires information on current and expected future prices of competing energy sources. Similarly, the benefit/cost analysis of proposed programs to encourage energy conservation and utilization of renewable resources requires projections of future energy prices. Development of current and historical price data bases is a necessary first step in projecting future prices of competing fuels.

Short-Term Analysis and Forecasting. Energy price data are essential in the analysis, modelling, and forecasting of energy use, production, and energy market performance. Data are needed to establish the relationship between production, costs, prices, and consumption, such as in the estimation of price elasticities and cross elasticities. They are essential in the application of historical observations or forecasting of future developments.

3.4.2 Imputation and the Nature of Imputed Data

One important constraint on the development of the STEPS data base is the requirement that existing data sources be used; no primary data collection is included as part of this project. This means that the quality of the resulting data base is limited by the quality of existing data sources. In addition, where more than one data base met the data source review criteria, Federal data sources are to be used over non-Federal sources.

Given the constraints of available data sources and the EIA requirements, many prices have to be imputed either because the original data source did not distinguish between end-use sectors, or because data for certain years or states are missing. For the purpose of this report, the term "imputed" is used to refer to any of the following:

1. Utilization of two or more data sources to derive a single sector-specific price series for a fuel. This often involves splicing of the data series involved using simple ratios or empirically estimated regression equations.

2. Extrapolation of a single data source to cover an earlier or later period than that for which the source data are collected, or when interpolation is required to fill in some of the missing data points within the data period covered by source data.
3. Assignment of a price series for one fuel to represent a closely related fuel, or when a fuel- and sector-specific price series from a state or region is used to represent the same price series for other states or regions.

The hierarchy of imputation for the 1983 STEPS is given in Section 2.1.2 of the previous chapter. Because the STEPS data base is constructed from a wide range of data sources collected for different purposes, and because of the necessity to impute some data points, it is not possible to give a degree of confidence, in the statistical sense, for the data included in the data base. The discussion of the hierarchy of "imputedness" is intended to give users of STEPS an indication of the relative accuracy of specific data points. Detailed documentation about the imputation for each fuel can be found in the respective Chapter 4.0 through 13.0.

4.0 ELECTRICITY

The STEPS electricity price series are developed for the residential, commercial, industrial, and transportation sectors. Prices given are retail prices for sales of electricity to ultimate users. It is unclear whether or not these prices include taxes. For all four sectors, physical unit prices are calculated from source data, then prices per million Btu are computed using a conversion factor. Since the computational procedures are similar for all four sectors covered by electricity prices, the following discussion is not broken down by sectors.

4.1 DATA SOURCES

- 1970-1983 Edison Electric Institute. Statistical Year Book of the Electric Utility Industry. Table titled, "Revenues: Total Electric Utility Industry," and "Energy Sales: Total Electric Utility Industry."
- 1970-1983 Energy Information Administration, U.S. Department of Energy. Annual Energy Review 1984. Table 82, "Average Price of Electricity Sold by the Electric Utility Industry to End-Use Sector, 1960-1984."

4.2 CONVERSION FACTOR

- 1970-1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 670.
- 3412 Btu per kilowatt-hour

4.3 COMPUTATIONAL PROCEDURES

1. Physical unit prices for states and the U.S. are calculated for all four sectors as average revenue per unit of sales for all the electric utilities reporting in a state. The calculation of physical unit prices is done with the revenues and sales data from Statistical Year Book for each year in the series. For the years 1980 and on, prices are based on preliminary revenues and sales data in the update year and are replaced with revised data in the following year. For example, the 1983 STEPS update involves calculating preliminary 1983 prices and replacing the 1982 preliminary prices developed in the 1982 update with prices based on the revised 1982 sales and revenues available in the 1983 edition of Statistical

Year Book. The only exception to this rule is the revenues data for Arkansas for 1981; preliminary data are used in this case because of an apparent error in the revised data.

Residential Sector: 1970-1983

$$ESRCNZZ = (ESRCCZZ / ESRVZZ) / 1000 \quad (4.1)$$

where:

ESRCNZZ = residential sector electricity price for State ZZ or the U.S. (\$/kWh)

ESRCCZZ = residential revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESRVZZ = residential energy sales for State ZZ or the U.S. from Statistical Year Book (million kWh)

Commercial Sector: 1970-1983

$$ESCCNZZ = [(ESCCCZZ + ESSTCZZ + ESOPCZZ + ESIDCZZ) / (ESCCVZZ + ESSTVZZ + ESOPVZZ + ESIDVZZ)] / 1000 \quad (4.2)$$

where:

ESCCNZZ = commercial sector electricity price for State ZZ or the U.S. (\$/kWh)

ESCCCZZ = commercial revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESSTCZZ = street and highway lighting revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESOPCZZ = other public authorities revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESIDCZZ = interdepartmental revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESCCVZZ = commercial energy sales for State ZZ or the U.S. from Statistical Year Book (million kWh)

ESSTVZZ = street and highway lighting energy sales for State ZZ or the U.S. from Statistical Year Book (million kWh)

ESOPVZZ = other public authorities energy sales for State ZZ or the U.S. from Statistical Year Book (million kWh)

ESIDVZZ = interdepartmental revenues for State ZZ or the U.S. from Statistical Year Book (million kWh)

Industrial Sector: 1970-1983

$$ESICNZZ = (ESICCZZ / ESICVZZ) / 1000 \quad (4.3)$$

where:

ESICNZZ = industrial sector electricity price for State ZZ or the U.S. (\$/kWh)

ESICCZZ = industrial revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESICVZZ = industrial energy sales for State ZZ or the U.S. from Statistical Year Book (million kWh)

Transportation Sector: 1970-1983

$$ESACUZZ = (ESRRCZZ / ESRRVZZ) / 1000 \quad (4.4)$$

where:

ESACUZZ = STEPS final transportation sector electricity price for State ZZ or the U.S. (\$/kWh)

ESRRCZZ = railroads and railways revenues for State ZZ or the U.S. from Statistical Year Book (\$1000)

ESRRVZZ = railroads and railways energy sales for State ZZ or the U.S. from Statistical Year Book (million kWh)

2. There are no revenues and/or energy sales data for some states in the transportation sector. If energy sales or revenues or both are reported by Statistical Year Book as zero (0) for a state, then no STEPS transportation sector price is reported for that state. States without reported prices during the 1970-1983 period are given in Table 4.1.
3. Maryland prices are assigned for missing District of Columbia prices. There are no other missing prices for the residential, commercial, and industrial sectors.
4. In order to reconcile the STEPS electricity series (based on Statistical Year Book data) with the EIA electricity prices published in Annual Energy Review (AER), yearly adjustment factors are calculated for the residential, commercial, and industrial sectors from U.S. prices from the Statistical Year Book and AER. Since no transportation sector prices are published in AER, no adjustments are made to that sector.

$$ESRCSUS = ESRCUUS / ESRCNUS \quad (4.5)$$

$$ESCCSUS = ESCCUUS / ESCCNUS \quad (4.6)$$

$$ESICSUS = ESICUUS / ESICNUS \quad (4.7)$$

TABLE 4.1. States Without Reported STEPS Transportation Sector
Electricity Prices, 1970-1983

<u>State</u>	<u>Year(s)</u>
AK	1970-1971
AL	1970-1983
AZ	1970-1980
CO	1970-1983
CT	1970-1982
DE	1970-1983
FL	1970-1983
GA	1970-1978
HI	1970-1983
IA	1970-1983
ID	1970-1983
KS	1970-1983
KY	1970-1983
LA	1971, 1974-1983
ME	1970-1983
MI	1970-1983
MN	1970-1983
MS	1970-1983
MT	1975-1983
NC	1970-1983
ND	1970-1983
NH	1970-1983
NM	1970-1983
NV	1970-1983
OK	1970-1983
OR	1970-1983
RI	1970-1983
SC	1970-1983
SD	1970-1983
TN	1970-1983
TX	1970-1983
UT	1970-1983
VA	1970-1977
VT	1970-1983
WI	1970-1983
WV	1970-1983
WY	1970-1983

Source: Pacific Northwest Laboratory

where:

ESRCSUS = residential sector adjustment factor for reconciling
Statistical Year Book and AER electricity data (ratio)

ESRCUUS = residential sector U.S. electricity price from
AER (\$/kWh)

ESRCNUS = residential sector U.S. electricity price from
Equation 4.1 (\$/kWh)

ESCCSUS = commercial sector adjustment factor for reconciling
Statistical Year Book and AER electricity data (ratio)

ESCCUUS = commercial sector U.S. electricity price from
AER (\$/kWh)

ESCCNUS = commercial sector U.S. electricity price from
Equation 4.2 (\$/kWh)

ESICSUS = industrial sector adjustment factor for reconciling
Statistical Year Book and AER electricity data (ratio)

ESICUUS = industrial sector U.S. electricity price from
AER (\$/kWh)

ESICNUS = industrial sector electricity price from Equation 4.3
(\$/kWh)

5. To calculate final STEPS physical unit prices for the residential, commercial, and industrial sectors, the state and U.S. prices calculated from the Statistical Year Book sales and revenues data are multiplied by the appropriate yearly sector adjustment factors:

$$\text{ESRCUZZ} = \text{ESRCNZZ} * \text{ESRCSUS} \quad (4.8)$$

$$\text{ESCCUZZ} = \text{ESCCNZZ} * \text{ESCCSUS} \quad (4.9)$$

$$\text{ESICUZZ} = \text{ESICNZZ} * \text{ESICSUS} \quad (4.10)$$

where:

ESRCUZZ = STEPS final residential sector electricity price for
State ZZ or the U.S. (\$/kWh)

ESCCUZZ = STEPS final commercial sector electricity price for
State ZZ or the U.S. (\$/kWh)

ESICUZZ = STEPS final industrial sector electricity price for
State ZZ or the U.S. (\$/kWh)

6. Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor as illustrated in the following equations:

$$\text{ESRCDZZ} = \text{ESRCUZZ} / (3412 / 1,000,000) \quad (4.11)$$

$$\text{ESCCDZZ} = \text{ESCCUZZ} / (3412 / 1,000,000) \quad (4.12)$$

$$\text{ESICDZZ} = \text{ESICUZZ} / (3412 / 1,000,000) \quad (4.13)$$

$$\text{ESACDZZ} = \text{ESACUZZ} / (3412 / 1,000,000) \quad (4.14)$$

where:

ESRCDZZ = STEPS final residential sector electricity price for
State ZZ or the U.S. (\$/MMBtu)

ESCCDZZ = STEPS final commercial sector electricity price for
State ZZ or the U.S. (\$/MMBtu)

ESICDZZ = STEPS final industrial sector electricity price for
State ZZ or the U.S. (\$/MMBtu)

ESACDZZ = STEPS final transportation sector electricity price for
State ZZ or the U.S. (\$/MMBtu)

5.0 NATURAL GAS

The STEPS natural gas price series are developed for four end-use sectors: residential, commercial, industrial, and electric utility. No prices are reported for the transportation sector because natural gas used for transportation is almost solely consumed in natural gas pipeline operations. As such, it is an intermediate transaction (process fuel). Prices reported in STEPS are retail prices for sales of natural gas to ultimate users. It is not clear whether or not any taxes are included in these prices. For all four sectors, physical unit prices for states and the U.S. are calculated directly from the data sources, then Btu prices are computed using a conversion factor.

Since there is a major difference in computational procedures for the electric utility sector price series, the documentation is divided into two parts. The procedures for the residential, commercial, and industrial sectors are explained together, followed by the procedures for the electric utility sector.

5.1 RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL SECTORS

5.1.1 Data Sources

1980-1983	Energy Information Administration, U.S. Department of Energy. <u>Natural Gas Annual</u> . Table 11 (1980); and Table 14 (1981-1983).
1970-1979	Bureau of Mines, U.S. Department of the Interior. <u>Natural Gas Production and Consumption</u> . Table 6 (1970, 1979); and Table 7 (1971-1978).

5.1.2 Conversion Factors

1969-1979	American Gas Association. <u>Gas Facts</u> . Table titled, "Gas Utility Industry Sales, by State and Class of Service." Values used are given in Table 5.1. Conversion factors for 1970 and 1971, which are not available, are imputed as the average of the 1969 and 1972 factors; factors for Hawaii for 1970 and 1971 are assumed to be equal to the 1972 factor.

TABLE 5.1. Btu Conversion Factors for Natural Gas, by State,
1970-1983

<u>Year</u>	<u>AK</u>	<u>AL</u>	<u>AR</u>	<u>AZ</u>	<u>CA</u>	<u>CO</u>	<u>CT</u>
1970	1005	1032	1002	1068	1062	981	1016
1971	1005	1032	1002	1068	1062	981	1016
1972	1005	1031	1004	1059	1054	974	1016
1973	1010	1029	999	1056	1053	962	1015
1974	1005	1028	999	1065	1056	967	1012
1975	1005	1029	997	1052	1057	913	1005
1976	1005	1030	997	1052	1053	914	1008
1977	1005	1031	1021	1056	1052	900	1010
1978	1000.0	1032.5	1000.9	1064.7	1053.2	875.9	1013.0
1979	1000.0	1028.4	1017.0	1045.4	1049.7	892.4	1011.7
1980	1003	1034	1001	1049	1046	993	1022
1981	1004	1036	1001	1053	1048	994	1025
1982	1000	1052	1002	1054	1049	1000	1027
1983	1002	1038	1023	1045	1043	1006	1029

<u>Year</u>	<u>DC</u>	<u>DE</u>	<u>FL</u>	<u>GA</u>	<u>HI</u>	<u>IA</u>	<u>ID</u>
1970	1019	1031	1045	1037	962	1015	1042
1971	1019	1031	1045	1037	962	1015	1042
1972	1016	1020	1041	1031	962	1009	1061
1973	1013	1020	1043	1030	935	1012	1058
1974	1012	1020	1043	1028	921	1011	1042
1975	1012	1020	1043	1027	947	1008	1055
1976	1012	1025	1041	1027	911	1008	1057
1977	1016	1030	1045	1027	949	1004	1060
1978	1016.0	1030.9	1047.0	1027.9	958.0	1002.2	1053.4
1979	1016.0	1031.1	1037.3	1039.0	950.0	1002.3	1047.1
1980	1003	1035	1041	1032	963	1003	1053
1981	1014	1035	1059	1027	959	1003	1070
1982	1017	1033	1044	1030	989	1008	1072
1983	1010	1018	1048	1026	1023	1014	1047

TABLE 5.1 (CONT). Btu Conversion Factors for Natural Gas, by State,
1970-1983

<u>Year</u>	<u>IL</u>	<u>IN</u>	<u>KS</u>	<u>KY</u>	<u>LA</u>	<u>MA</u>	<u>MD</u>
1970	1029	1004	993	1020	1021	1012	1023
1971	1029	1004	993	1020	1021	1012	1023
1972	1025	1006	998	1017	1029	1012	1022
1973	1023	998	988	1019	1031	1011	1020
1974	1023	997	986	1015	1030	1009	1020
1975	1026	990	984	1008	1037	1004	1013
1976	1025	990	981	1011	1038	1006	1014
1977	1028	990	981	1011	1038	1007	1016
1978	1018.3	989.1	978.1	1009.9	1044.7	1009.1	1030.1
1979	1024.4	990.4	977.8	1009.9	1036.9	1009.1	1044.8
1980	1022	989	987	1009	1038	1016	1020
1981	1020	993	987	1014	1037	1016	1014
1982	1022	1016	999	1014	1047	1024	1018
1983	1041	1006	999	1020	1042	1025	1021

<u>Year</u>	<u>ME</u>	<u>MI</u>	<u>MN</u>	<u>MO</u>	<u>MS</u>	<u>MT</u>	<u>NC</u>
1970	1021	1015	1006	1014	1025	1016	1025
1971	1021	1015	1006	1014	1025	1016	1025
1972	1012	1015	1002	1007	1025	1032	1024
1973	1011	1010	999	995	1024	1032	1027
1974	1011	1007	1001	1005	1025	1022	1025
1975	1024	1012	1001	1006	1023	1021	1018
1976	1024	1008	998	1003	1023	1014	1018
1977	1024	1006	997	1002	1025	1009	1019
1978	1024.0	1005.5	996.7	1003.8	1021.2	1000.5	1020.8
1979	1000.0	1005.3	995.3	979.5	1024.3	990.1	1021.9
1980	1024	1011	997	1014	1028	1012	1012
1981	1025	1017	995	1015	1025	1011	1012
1982	1025	1022	1005	1018	1028	1011	1033
1983	1026	1024	1023	1027	1027	1008	1033

TABLE 5.1 (CONT). Btu Conversion Factors for Natural Gas, by State,
1970-1983

<u>Year</u>	<u>ND</u>	<u>NE</u>	<u>NH</u>	<u>NJ</u>	<u>NM</u>	<u>NV</u>	<u>NY</u>
1970	1020	1003	1010	1032	1091	1070	1021
1971	1020	1003	1010	1032	1091	1070	1021
1972	1031	1008	1010	1026	1083	1082	1021
1973	1024	1005	1008	1027	1067	1067	1030
1974	1002	1002	1007	1026	1062	1067	1023
1975	1001	994	1010	1031	1064	1067	1015
1976	1000	994	1010	1034	1057	1066	1014
1977	1000	998	1000	1034	1057	1049	1011
1978	1000.0	997.8	1007.3	1035.0	1055.0	1027.9	1011.9
1979	1000.0	993.8	1040.0	1035.9	1056.4	1013.1	1015.5
1980	1052	978	1020	1033	1043	1061	1025
1981	1042	978	1022	1034	1047	1076	1020
1982	1026	981	1020	1031	1045	1070	1023
1983	1045	982	1021	1031	1033	1066	1027

<u>Year</u>	<u>OH</u>	<u>OK</u>	<u>OR</u>	<u>PA</u>	<u>RI</u>	<u>SC</u>	<u>SD</u>
1970	1027	1028	1050	1033	1032	1032	1005
1971	1027	1028	1050	1033	1032	1032	1005
1972	1023	1032	1045	1033	1021	1028	1004
1973	1025	1023	1059	1036	1016	1026	1002
1974	1026	1032	1044	1024	1013	1025	999
1975	1023	1015	1039	1025	1014	1024	1000
1976	1025	1014	1036	1025	1013	1023	999
1977	1024	1027	1042	1021	1013	1022	1000
1978	1023.0	1023.9	1045.1	1021.5	1012.9	1032.0	999.2
1979	1024.9	1023.5	1044.8	1020.6	1011.3	1018.1	995.6
1980	1016	1023	1046	1022	1021	1033	998
1981	1023	1035	1044	1022	1022	1023	1002
1982	1029	1023	1044	1028	1036	1030	999
1983	1034	1042	1041	1029	1035	1027	1011

TABLE 5.1 (CONT). Btu Conversion Factors for Natural Gas, by State,
1970-1983

Year	<u>IN</u>	<u>TX</u>	<u>UT</u>	<u>VA</u>	<u>VT</u>	<u>WA</u>	<u>WI</u>
1970	1031	1033	932	1029	1020	1059	1022
1971	1031	1033	932	1029	1020	1059	1022
1972	1022	1027	938	1026	1006	1055	1019
1973	1022	1027	945	1025	1006	1051	1015
1974	1020	1027	952	1022	1008	1047	1015
1975	1031	1026	950	1019	1008	1042	1020
1976	1029	1025	948	1019	1008	1041	1017
1977	1031	1027	950	1023	1008	1045	1015
1978	1028.0	1028.1	956.2	1020.8	1010.5	1047.6	1012.3
1979	1032.6	1032.5	959.8	1021.4	1010.1	1046.9	1012.9
1980	1016	1033	1086	1016	990	1052	1008
1981	1016	1032	1073	1024	993	1050	1009
1982	1024	1032	939	1027	993	1053	1012
1983	1023	1029	1075	1030	992	1043	1009

Year	<u>WV</u>	<u>WY</u>	<u>US</u>
1970	1034	992	1029
1971	1034	992	1029
1972	1029	1023	1027
1973	1030	1017	1021
1974	1023	996	1024
1975	1037	934	1021
1976	1043	950	1020
1977	1042	937	1021
1978	1031.4	913.7	1019.0
1979	1023.7	929.2	1020.8
1980	1032	1060	1026
1981	1040	1059	1027
1982	1047	1002	1028
1983	1038	1059	1031

Source: Pacific Northwest Laboratory

1980-1983 Energy Information Administration, U.S. Department of Energy.
 Natural Gas Annual. Table 11 (1980), and Table 14 (1981-1983).
 Values used are given in Table 5.1.

5.1.3 Computational Procedures

1. All natural gas physical unit prices for the residential, commercial, and industrial sectors are calculated from value and quantity of sales data from Natural Gas Annual or its predecessor report Natural Gas Production and Consumption (NGA).^(a) State and U.S. prices are calculated directly from the data sources as average revenue per unit of sales by natural gas utilities. Prices for each of the three sectors are computed as discussed below.

Residential Sector: 1970-1983.

$$\text{NGRCUZZ} = \text{NGRCCZZ} / \text{NGRCVZZ} \quad (5.1)$$

where:

NGRCCZZ = residential value of gas reported for State ZZ
 or the U.S. from NGA (\$1000)

NGRCVZZ = residential quantity of gas sold reported for State ZZ
 or the U.S. from NGA (million cu ft)

Commercial Sector: 1970-1981.

$$\text{NGCCUZZ} = (\text{NGCCCZZ} + \text{NGOCCZZ}) / (\text{NGCCVZZ} + \text{NGOCVZZ}) \quad (5.2)$$

where:

NGCCUZZ = STEPS final commercial sector natural gas price for
 State ZZ or the U.S. (\$/1000 cu ft)

NGCCCZZ = commercial value of gas for State ZZ or the U.S. from
 NGA (\$1000)

NGCCVZZ = commercial volume of gas sold for State ZZ or the U.S.
 from NGA (million cu ft)

NGOCCZZ = other consumers value of gas reported for State ZZ
 or the U.S. from NGA (\$1000)

NGOCVZZ = other consumers volume of gas sold reported for
 State ZZ or the U.S. from NGA (million cu ft)

(a)Both of these EIA publications will be abbreviated NGA, since the data contained in each is similar.

Commercial Sector: 1982-1983.

$$NGCCUZZ = NGCCCZZ / NGCCVZZ \quad (5.3)$$

where:

NGCCUZZ = STEPS final commercial sector natural gas price for State ZZ or the U.S. (\$/1000 cu ft)

NGCCCZZ = commercial value of gas reported for State ZZ or the U.S. from NGA (\$1000)

NGCCVZZ = commercial volume of gas sold reported for State ZZ or the U.S. from NGA (million cu ft)

Industrial Sector: 1970-1983.

$$NGICUZZ = NGICCZZ / NGICVZZ \quad (5.4)$$

where:

NGICUZZ = STEPS final industrial sector natural gas price for State ZZ or the U.S. (\$/1000 cu ft)

NGICCZZ = industrial value of gas reported for State ZZ or the U.S. from NGA (\$1000)

NGICVZZ = industrial volume of gas sold reported for State ZZ or the U.S. from NGA (million cu ft)

2. For 1970-1979, both the value and quantity of sales data from NGA are reported as composites for Maryland/District of Columbia and Maine/New Hampshire/Vermont. In each case, the combined prices are assigned equally and identically to each of the states in the composite. Hawaii has no reported natural gas use for 1970-1979 in the residential and commercial sectors and for 1970-1983 in the industrial sector, so no STEPS prices are reported for these years.
3. Btu prices for states and the U.S. for all years are calculated using the completed physical unit price series and the state-level conversion factors:

$$NGRCDZZ = (NGRCUZZ / NGNCKZZ) * 1000 \quad (5.5)$$

$$NGCCDZZ = (NGCCUZZ / NGNCKZZ) * 1000 \quad (5.6)$$

$$NGICDZZ = (NGICUZZ / NGNCKZZ) * 1000 \quad (5.7)$$

where:

NGRCDZZ = STEPS final residential sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGCCDZZ = STEPS final commercial sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGICDZZ = STEPS final industrial sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGNCKZZ = conversion factor for natural gas for State ZZ or the U.S. from Table 5.1 (Btu/cu ft)

5.2 ELECTRIC UTILITY SECTOR

5.2.1 Data Sources

1980-1983	Energy Information Administration, U.S. Department of Energy. <u>Natural Gas Annual</u> . Table 11 (1980); and Table 14 (1981-1983).
1970-1979	Bureau of Mines, U.S. Department of the Interior. <u>Natural Gas Production and Consumption</u> . Table 6 (1970, 1979); and Table 7 (1971-1978).
1973-1983	Energy Information Administration, U.S. Department of Energy. <u>Cost and Quality of Fuels for Electric Utility Plants</u> . Tables numbered as shown in Table 5.2.

5.2.2 Conversion Factors

1970-1972	American Gas Association. <u>Gas Facts</u> . Table titled, "Gas Utility Industry Sales, by State and Class of Service." Values used are listed in Table 5.1. Conversion factors for 1970 and 1971, which are not available, are imputed as the average of the 1969 and 1972 factors.
1973-1983	No conversion factors are required; Btu and physical unit prices are calculated directly from data sources.

TABLE 5.2. Tables from Cost and Quality of Fuels Used to Calculate Electric Utility Sector Natural Gas Prices

<u>Year</u>	<u>C&Q Table(s)</u> <u>Containing</u> <u>Price Data</u>	<u>C&Q Table(s)</u> <u>Containing</u> <u>Volume Data</u>
1973	10	9
1974	10	9
1975	10, 16	9, 15
1976	10, 16	9, 15
1977	10, 16	9, 15
1978	10, 16	9, 15
1979	10, 16	9, 15
1980	48	--
1981	48	--
1982	48	--
1983	53	--

Source: Pacific Northwest Laboratory

5.2.3 Computational Procedures: 1970-1972

1. State and U.S. prices for 1970-1972 are taken from Natural Gas Production and Consumption and are calculated similarly to prices for the residential, commercial, industrial, and transportation sectors. Prices, as average revenues of per unit of sales, are computed from value and quantity of sales data from the source reports.

$$\text{NGEUZZ} = \text{NGEUCZZ} / \text{NGEUVZZ} \quad (5.8)$$

where:

NGEUZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/1000 cu ft)

NGEUCZZ = electric utilities value reported for State ZZ or the U.S. from NGA (\$1000)

NGEUVZZ = electric utilities volume reported for State ZZ or the U.S. from NGA (million cu ft)

2. The Hawaii, Idaho, and Washington value and consumption data are both equal to zero (0) throughout the period 1970-1972, so no STEPS prices are developed for these three states. A combined price is reported for Maine, New Hampshire, and Vermont for 1971 and 1972; each of these states is assigned the combined price equally and identically. The combined Maryland/District of Columbia prices are assigned equally and identically to these two states.
3. Btu prices for states and the U.S. are calculated from the completed physical unit price series using the state-level conversion factors.

$$\text{NGEUDZZ} = (\text{NGEUZZ} / \text{NGNCKZZ}) * 1000 \quad (5.9)$$

where:

NGEUDZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGNCKZZ = conversion factor for natural gas for State ZZ or the U.S. from Table 5.1 (Btu/cu ft)

5.2.4 Computational Procedures: 1973-1974, 1983

1. Btu and physical unit prices for states and the U.S. are reported by Cost and Quality of Fuels (C&Q) for gas consumed at steam-electric plants only. Prices are taken directly from Cost and Quality for the physical unit price series, while prices per million Btu are converted from cents to dollars.

$$\text{NGEUZZ} = \text{NGSEZZ} \quad (5.10)$$

$$\text{NGEUDZZ} = \text{NGSEFZZ} / 100 \quad (5.11)$$

where:

NGEUZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/1000 cu ft)

NGSEZZ = natural gas price for State ZZ or the U.S. from C&Q (\$/1000 cu ft)

NGEUDZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGSEFZZ = natural gas price for State ZZ or the U.S. from C&Q (c/MMBtu)

2. Alaska is the only state missing Cost and Quality price data for which prices are imputed. The imputation of Alaska prices for all the years 1973-1983 is discussed later. States with no prices reported by STEPS for 1973, 1974, and 1983 are listed in Table 5.3.

TABLE 5.3. States With No Electric Utility Sector Prices Reported by STEPS, 1973-1983

<u>State</u>	<u>Years With No Reported Prices</u>
CT	1973-1983
DC	1973-1983
HI	1973-1983
ID	1973-1974, 1983
MD	1973-1974, 1983
ME	1973-1983
NC	1983
ND	1973-1974, 1976-1983
NH	1973-1974, 1977-1978, 1980, 1982-1983
OR	1983
PA	1973
RI	1976-1978, 1980
SC	1977
SD	1983
TN	1974-1983
VT	1983
WA	1973-1978, 1983
WY	1973, 1975

Source: Pacific Northwest Laboratory

5.2.5 Computational Procedures: 1975-1979

1. Btu and physical unit prices for states and the U.S. are reported separately by Cost and Quality for gas consumed at steam-electric plants and gas consumed at combustion turbine and internal combustion units. Weighted-average Btu and physical unit prices are calculated using the two Cost and Quality prices and the respective gas deliveries for steam-electric and combustion use.

$$\text{NGEUZZ} = [(\text{NGSEZZ} * \text{NGSEVZZ}) + (\text{NGCTNZ} * \text{NGCTVZZ})] / (\text{NGSEVZZ} + \text{NGCTVZZ}) \quad (5.12)$$

$$\text{NGEUDZZ} = [(\text{NGSEFZZ} / 100) * \text{NGSEVZZ}] + [(\text{NGCTFZZ} / 100) * \text{NGCTVZZ}] / (\text{NGSEVZZ} + \text{NGCTVZZ}) \quad (5.13)$$

where:

NGEUZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/1000 cu ft)

NGSEZZ = steam-electric gas price for State ZZ or the U.S. from C&Q (\$/1000 cu ft)

NGSEVZZ = deliveries of gas to steam-electric plants as reported for State ZZ or the U.S. from C&Q (million cu ft)

NGCTNZ = combustion turbine gas price for State ZZ or the U.S. from C&Q (\$/1000 cu ft)

NGCTVZZ = deliveries of gas to combustion turbine units as reported for State ZZ or the U.S. from C&Q (million cu ft)

NGEUDZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGSEFZZ = steam-electric gas price for State ZZ or the U.S. from C&Q (c/MMBtu)

NGCTFZZ = combustion turbine gas price for State ZZ or the U.S. from C&Q (c/MMBtu)

2. The imputation of Alaska prices is discussed below. No other state prices are imputed for the 1975-1979 period. Table 5.3 lists the states with no reported STEPS prices for the 1975-1979 period.

5.2.6 Computational Procedures: 1980-1982

1. Btu and physical unit prices for states and the U.S. for 1980-1982 are taken from Cost and Quality for all reporting plants. Physical unit prices are taken directly from the data source, while Btu prices are converted from cents to dollars per million Btu.

$$\text{NGEUZZ} = \text{NGEUNZZ} \quad (5.14)$$

$$\text{NGEUDZZ} = \text{NGEUFZZ} / 100 \quad (5.15)$$

where:

NGEUZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/1000 cu ft)

NGEUNZZ = all reporting plants gas price for State ZZ or the U.S. from C&Q (\$/1000 cu ft)

NGEUDZZ = STEPS final electric utility sector natural gas price for State ZZ or the U.S. (\$/MMBtu)

NGEUFZZ = all reporting plants gas price for State ZZ or the U.S. from C&Q (c/MMBtu)

2. The imputation of Alaska prices is described below. No other missing state prices are imputed for the 1980-1982 period. States with no reported prices for these years are listed in Table 5.3.

5.2.7 Imputation of Alaska Prices: 1973-1983

1. Since Cost and Quality does not cover Alaska prices and since SEDS does report natural gas usage in the electric utility sector, Alaska prices are imputed from other data sources. NGA does have quantity and value data from which physical unit prices are calculated:

$$\text{NGEUUAK} = \text{NGEUCAK} / \text{NGEUVAK} \quad (5.16)$$

where:

NGEUUAK = STEPS final electric utility sector natural gas price for Alaska (\$/1000 cu ft)

NGEUCAK = electric utility value of gas for Alaska from NGA (\$1000)

NGEUVAK = electric utility quantity of gas consumed in Alaska from NGA (million cu ft)

2. Btu prices are calculated using the Alaska physical unit prices and the Btu conversion factors for Alaska:

$$\text{NGEUDAK} = (\text{NGEUUAK} / \text{NGNCKAK}) * 1000 \quad (5.17)$$

where:

NGEUDAK = STEPS final electric utility sector natural gas price for Alaska (\$/MMBtu)

NGNCKAK = conversion factor for Alaska from Table 5.1

6.0 COKING COAL

The coking coal price series in STEPS cover only the industrial sector. Prices are those paid at coke plants for coal received, and probably include any taxes paid (although this is not clear from the data collection form). Physical unit prices for states and the U.S. are taken directly from the data sources, then Btu prices are computed using a conversion factor.

6.1 DATA SOURCES

1970-1980	Energy Information Administration, U.S. Department of Energy. <u>Coke and Coal Chemicals</u> . Tables numbered as shown in Table 6.1.
1981-1983	Energy Information Administration, U.S. Department of Energy. <u>Quarterly Coal Report</u> . Table A3.

TABLE 6.1. Numbers of Coke and Coal Chemicals Tables
Used for Price Data, 1970-1980

<u>Year(s)</u>	<u>Table Number</u>
1970	8
1971	16
1972-1973	19
1974-1976	22
1977	19
1978	15
1979-1980	7

Source: Pacific Northwest Laboratory

6.2 CONVERSION FACTOR

1970-1983 Energy Information Administration, U.S. Department of Energy.
State Energy Data Report. Table titled, "Conversion Factors
in the State Energy Data System." Average bituminous coal and
lignite consumption in coke plants.

26.8 Million Btu per short ton

6.3 COMPUTATIONAL PROCEDURES: 1970-1983

1. Individual state and U.S. physical unit prices are assigned to their respective states. Group prices are assigned equally and identically to each state within the group. Table 6.2 shows these price assignments by state.

$$CCICUZZ = CCICNZZ \quad (6.1)$$

where:

CCICUZZ = STEPS final industrial sector coking coal price
for State ZZ or the U.S. (\$/ton)

CCICNZZ = price of coal coke reported for State ZZ or the U.S.
in Coke and Coal Chemicals or Quarterly Coal Report
(\$/ton)

2. Btu prices are calculated for states and the U.S. using the completed physical unit price series and the conversion factor:

$$CCICDZZ = CCICUZZ / 26.8 \quad (6.2)$$

where:

CCICDZZ = STEPS final industrial sector coking coal price
for State ZZ or the U.S. (\$/MMBtu)

TABLE 6.2. Coking Coal Price Assignments, 1970-1983

State	Year(s)	Price Assigned
AL	1970-1983	Alabama
CA	1970-1982	California, Colorado, Utah
CO	1970-1982	California, Colorado, Utah
IL	1970-1983	Illinois
IN	1970-1983	Indiana
KY	1970-1983	Kentucky, Missouri, Tennessee, Texas
MD	1970-1971	Maryland, New Jersey, New York
	1972-1982	Maryland, New York
MI	1970-1978	Michigan
	1979	Michigan, Minnesota, Wisconsin
	1980-1983	Michigan, Wisconsin
MN	1970-1978	Minnesota, Wisconsin
	1979	Michigan, Minnesota, Wisconsin
MO	1970-1983	Kentucky, Missouri, Tennessee, Texas
NJ	1970-1971	Maryland, New Jersey, New York
NY	1970-1971	Maryland, New Jersey, New York
	1972-1982	Maryland, New York
OH	1970-1983	Ohio
PA	1970-1983	Pennsylvania
TN	1970-1983	Kentucky, Missouri, Tennessee, Texas
TX	1970-1983	Kentucky, Missouri, Tennessee, Texas
UT	1970-1982	California, Colorado, Utah
VA	1978-1982	Virginia, West Virginia
WI	1970-1978	Minnesota, Wisconsin
	1979	Michigan, Minnesota, Wisconsin
	1980-1983	Michigan, Wisconsin
WV	1970-1977	West Virginia
	1978-1982	Virginia, West Virginia
US	1970-1983	United States

Source: Pacific Northwest Laboratory

7.0 STEAM COAL

STEPS steam coal price series are developed for the residential, industrial, and electric utility sectors. While some commercial and transportation sector coal use is reported in the State Energy Data Report, no commercial or transportation price data are available. The industrial sector steam coal prices reported in STEPS can be used as estimates of prices for these two sectors. The types of prices and computational procedures for the steam coal price series are discussed separately below.

7.1 ELECTRIC UTILITY SECTOR

For all years, Btu and physical unit retail prices for states and the U.S. are taken directly from the data sources. For 1970-1972, prices are the average for coal burned under boilers or by internal combustion engines for the electric utility industry. For 1973-1983, prices are the average cost per ton of coal purchased by electric utility plants within each state. It is not clear whether or not taxes are included in any of the steam coal electric utility prices.

7.1.1 Data Sources

1970-1983	Edison Electric Institute. <u>Statistical Year Book of the Electric Utility Industry</u> . Table titled, "Analysis of Fuel for Electric Generation: Total Electric Utility Industry."
1973-1983	Energy Information Administration, U.S. Department of Energy. <u>Cost and Quality of Fuels for Electric Utility Plants</u> . Table 3 (1973-1979), Table 51 (1980-1982) and Table 50 (1983). Average of all coal spot and contract prices.

7.1.2 Conversion Factors

1970-1983	Both 8tu and physical unit prices are taken directly from the data sources, so no explicit conversion factors are used.

7.1.3 Computational Procedures: 1970-1972

Physical unit and Btu prices for steam coal in the electric utility sector are taken from the Edison Electric Institute's Statistical Year Book. Btu prices are converted from cents to dollars per million Btu, and a few states are assigned combined prices. The 1971 electric utility prices for Alaska are imputed using an average ratio technique.

1. Btu and physical unit prices for states and the U.S. are taken from the Statistical Year Book. Physical unit prices in dollars per ton are used directly from the data source, while prices per million Btu are converted from cents to dollars.

$$BCEUZZ = CLEUNZZ \quad (7.1)$$

$$BCEUDZZ = CLEUFZZ / 100 \quad (7.2)$$

where:

BCEUZZ = STEPS final electric utility sector steam coal price for State ZZ or the U.S. (\$/ton)

CLEUNZZ = cost of coal burned in the electric utility sector for State ZZ or the U.S. from Statistical Year Book (\$/ton)

BCEUDZZ = STEPS final electric utility sector steam coal price for State ZZ or the U.S. (\$/MMBtu)

CLEUFZZ = cost of coal burned in the electric utility sector for State ZZ or the U.S. from Statistical Year Book (c/MMBtu)

2. Delaware, the District of Columbia, and Maryland are each assigned the combined price for those three states.
3. The California price reported in Statistical Year Book in 1970, and the Oregon and Rhode Island prices reported for 1970-1972 are not used; no prices are reported in STEPS for these states, due to a lack of coal consumption as reported in SEDS.
4. The steam coal electric utility sector Alaska price for 1971 is imputed as discussed in Section 7.1.5.

7.1.4 Computational Procedures: 1973-1983

Steam coal electric utility prices (both physical unit and Btu) are taken from the EIA's Cost and Quality of Fuels for Electric Utility Plants (C&Q). All available physical unit prices and Btu prices are used. Physical unit prices are used directly, while Btu prices are converted from cents to dollars per million Btu. Except for the imputation of Alaska prices that is discussed below, there is no imputation of prices for states without C&Q data.

1. Btu and physical unit prices for states and the U.S. are taken from Cost and Quality for 1973-1983. Physical unit prices are used as reported in the data sources, while Btu prices are converted from cents to dollars per million Btu:

$$BCEUZZ = BCSENZZ \quad (7.3)$$

$$BCEUDZZ = BCSEFZZ / 100 \quad (7.4)$$

where:

BCEUZZ = STEPS final electric utility sector steam coal price for State ZZ or the U.S. (\$/ton)

BCSEZZ = steam-electric steam coal price for State ZZ or the U.S. from C&Q (\$/ton)

BCEUDZZ = STEPS final electric utility sector steam coal price for State ZZ or the U.S. (\$/MMBtu)

BCSEFZZ = steam-electric steam coal price for State ZZ or the U.S. from C&Q (c/MMBtu)

2. Hawaii, which is not covered by Cost and Quality, does not have prices reported by STEPS for any years in the 1973-1983 period. No prices are reported for the following states: Louisiana (1980); Oregon (1979); Rhode Island (1974); and Vermont (1977-1978).

7.1.5 Computational Procedures: Imputation of Alaska Prices

Since Cost and Quality data do not cover Alaska, Btu and physical unit prices for Alaska are taken from other sources or imputed for 1973-1983 and for 1971.

1. For the years 1974, 1976, 1977, and 1979-1983, prices are taken directly from Statistical Year Book and entered into the data base; this involves converting prices per million Btu from cents to dollars as shown in Equation 7.6:

$$BCEUAK = CLEUNAK \quad (7.5)$$

$$BCEUDAK = CLEUFAK / 100 \quad (7.6)$$

where:

BCEUAK = STEPS final electric utility sector steam coal price for Alaska (\$/ton)

CLEUNAK = electric utility cost of coal for Alaska from Statistical Year Book (\$/ton)

BCEUDAK = STEPS final electric utility sector steam coal price for Alaska (\$/MMBtu)

CLEUFAK = electric utility cost of coal for Alaska from Statistical Year Book (c/MMBtu)

2. Alaska prices for 1971, 1973, 1975, and 1978 are imputed from Statistical Year Book prices for the U.S. and the average ratio of Alaska to U.S. prices for the years when Alaska prices are available. The 1971 and 1973 imputed prices (both physical unit and Btu) are based on the average ratio for 1970 and 1972, while the 1975 and 1978 imputed prices are based on the average ratio for 1974, 1976, 1977, and 1979. The Btu price calculations are shown as Equations 7.7 and 7.8; the actual calculations are done by hand as shown in Table 7.1.

TABLE 7.1. Imputation of Steam Coal Electric Utility Alaska
Btu Prices for 1971, 1973, 1975, and 1978

1971, 1973

Year	c/MMBtu	
	EEI Alaska Price	EEI U.S. Price
1970	67.7	31.2
1971	CLEUFAK ₇₁	36.3
1972	67.5	38.4
1973	CLEUFAK ₇₃	41.9

Using Equation 7.7:

$$BCEUDAK_{71} = \frac{1}{2} \left(\frac{67.7}{31.2} + \frac{67.5}{38.4} \right) * 36.3 = 71.287$$

$$BCEUDAK_{73} = \frac{1}{2} \left(\frac{67.7}{31.2} + \frac{67.5}{38.4} \right) * 41.9 = 82.285$$

1975, 1978

Year	c/MMBtu	
	EEI Alaska Price	EEI U.S. Price
1974	81.6	67.8
1975	CLEUFAK ₇₅	86.4
1976	97.7	88.7
1977	108.0	97.5
1978	CLEUFAK ₇₈	116.1
1979	131.0	126.7

Using Equation 7.8:

$$BCEUDAK_{75} = \frac{1}{4} \left(\frac{81.6}{67.8} + \frac{97.7}{88.7} + \frac{108.0}{97.5} + \frac{131.0}{126.7} \right) * 86.4 = 96.047$$

$$BCEUDAK_{78} = \frac{1}{4} \left(\frac{81.6}{67.8} + \frac{97.7}{88.7} + \frac{108.0}{97.5} + \frac{131.0}{126.7} \right) * 116.1 = 129.064$$

Source: Pacific Northwest Laboratory

$$BCEUDAK_t = 1/2 \sum_{i=1}^2 ((CLEUFAK_i / CLEUFUS_i) * CLEUFUS_t) \quad (7.7)$$

$$BCEUDAK_r = 1/4 \sum_{j=1}^4 ((CLEUFAK_j / CLEUFUS_j) * CLEUFUS_r) \quad (7.8)$$

where:

BCEUDAK = STEPS final electric utility sector steam coal price for Alaska (c/MMBtu)

CLEUFAK = electric utility cost of coal for Alaska from Statistical Year Book (c/MMBtu)

CLEUFUS = electric utility cost of coal for the U.S. from Statistical Year Book (c/MMBtu)

t = 1971 or 1973

i = 1970, 1972

r = 1975 or 1978

j = 1974, 1976, 1977, 1979

3. The physical unit price imputation calculations are done for the same years as the Btu calculations, using Equations 7.7 and 7.8 but substituting the Statistical Year Book physical unit prices (dollars per ton) for the Btu price data inputs. The hand calculation of these Alaska prices is shown in Table 7.2.

7.2 RESIDENTIAL SECTOR

Residential sector steam coal prices are the average delivered prices for coal purchased by residential customers. It is not clear whether or not these prices include any taxes. For all the years 1970-1983, Btu prices are calculated first, then physical unit prices are calculated using the completed Btu price series and the conversion factors.

7.2.1 Data Sources

1971-1978	American Gas Association. <u>Gas Househeating Survey</u> . Table titled, "Competitive Fuel Prices."
1970-1978	Edison Electric Institute. <u>Statistical Year Book of the Electric Utility Industry</u> . Table 43S.
1974-1983	Energy Information Administration, U.S. Department of Energy. <u>Cost and Quality of Fuels for Electric Plants</u> . Average spot coal prices. Table 2 (1974-1979); Table 44 (1980-1982); and Table 49 (1983).
1970-1983	Energy Information Administration, U.S. Department of Energy. <u>State Energy Data System</u> . Residential sector coal consumption.

TABLE 7.2. Imputation of Steam Coal Electric Utility Alaska
Physical Unit Prices for 1971, 1973, 1975, and 1978

1971, 1973

Year	\$ / ton	
	EEI Alaska Price	EEI U.S. Price
1970	11.57	7.08
1971	CLEUNAK ₇₁	8.18
1972	11.74	8.69
1973	CLEUNAK ₇₃	9.32

Using Equation 7.7:

$$BCEUAK_{71} = \frac{1}{2} \left(\frac{11.57}{7.08} + \frac{11.74}{8.69} \right) * 8.18 = 12.213$$

$$BCEUAK_{73} = \frac{1}{2} \left(\frac{11.57}{7.08} + \frac{11.74}{8.69} \right) * 9.32 = 13.915$$

1975, 1978

Year	\$ / ton	
	EEI Alaska Price	EEI U.S. Price
1974	14.20	14.81
1975	CLEUNAK ₇₅	18.71
1976	16.94	19.29
1977	18.83	20.97
1978	CLEUNAK ₇₈	24.70
1979	22.77	27.13

Using Equation 7.8:

$$BCEUAK_{75} = \frac{1}{4} \left(\frac{14.20}{14.81} + \frac{16.94}{19.29} + \frac{18.83}{20.97} + \frac{22.77}{27.13} \right) * 18.71 = 16.727$$

$$BCEUAK_{78} = \frac{1}{4} \left(\frac{14.20}{14.81} + \frac{16.94}{19.29} + \frac{18.83}{20.97} + \frac{22.77}{27.13} \right) * 24.70 = 22.082$$

Source: Pacific Northwest Laboratory

7.2.2 Conversion Factors

1970-1983 Energy Information Administration, U.S. Department of Energy. Annual Energy Review 1984. Table titled, "Thermal Conversion Factors: Coal and Coal Coke, 1949-1984." Bituminous coal and lignite consumption in the residential/commercial sector. Values used are shown in Table 7.3.

7.2.3 Computational Procedures: Btu State Prices, 1971-1978

For 1971-1978, Btu steam coal prices are calculated first, based on data from Gas Househeating Survey (GHS). Since GHS reports data in physical units for 1971 and 1972, this means that these prices must be converted to prices per million Btu. Simple averages of adjacent state prices are used to impute missing prices throughout the 1971-1978 period. The GHS prices are the average delivered prices to residential consumers as reported by competitive natural gas distributors; it is not clear whether or not the prices include any taxes.

1. Because they have no residential coal consumption reported in SEDS, the following states are not covered by STEPS prices for the entire period (even though a few have some prices reported by GHS): Alaska, Arkansas, Arizona, California, Florida, Hawaii, Louisiana, Mississippi, New Mexico, Oklahoma, Oregon, and Texas.

TABLE 7.3. Steam Coal Residential Sector Conversion Factors
(Million Btu per Short Ton)

<u>Year</u>	<u>Conversion Factor</u>
1970	23.111
1971	22.927
1972	22.861
1973	22.887
1974	22.523
1975	22.258
1976	22.819
1977	22.594
1978	22.078
1979	21.884
1980	22.488
1981	22.191
1982	22.373
1983	22.934

Source: Annual Energy Review 1984.

2. For 1971 and 1972, GHS reports physical unit rather than the Btu prices published from 1973 to 1978. For either type of data, the price for a state is equal to the simple average of the city/utility price observations for that state. Equation 7.9 shows the calculation for 1971 and 1972, and Equation 7.10 shows the calculation for 1973-1978. Both of these equations are hand calculated.

$$BCRCUZZ = 1/N \sum_{i=1}^N BCRCNKK_i \quad (7.9)$$

$$BCRCDZZ = 1/N \sum_{i=1}^N BCRCFKK_i \quad (7.10)$$

where:

BCRCUZZ = STEPS final residential coal price for State ZZ (\$/ton)

BCRCNKK = coal price observed in State ZZ and reported by GHS (\$/ton)

BCRCDZZ = STEPS final residential sector steam coal price for State ZZ (\$/MMBtu)

BCRCFKK = coal price observed in State ZZ and reported by GHS (\$/MMBtu)

N = number of city/utility observations in State ZZ

i = index for a city/utility observation

3. Maryland prices are substituted for missing District of Columbia and Delaware prices.
4. A simple average of price observations in Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont is assigned equally and identically to each of these states.
5. To impute other missing prices in the 1971-1978 period, simple averages of adjacent state prices are used as shown in Table 7.4. Only adjacent state prices from GHS and the assigned prices for the District of Columbia, Delaware, and the New England states are used in the imputations (that is, no imputed data are used to impute data for another state).
6. At this point, STEPS Btu prices have been calculated for all states for 1973-1978, and physical unit prices have been calculated for 1971 and 1972. The next step is to convert the prices for 1971-1972 into Btu prices using the conversion factors from Table 7.3:

$$BCRCDZZ = BCRCUZZ / BCRCKUS \quad (7.11)$$

where:

BCRCKUS = coal conversion factor of 22.927 in 1971 and 22.861 in 1972 (MMBtu/ton)

TABLE 7.4. Imputation of Missing State Prices: Steam Coal
Residential Sector, 1971-1978

<u>Missing State</u>	<u>Year(s)</u>	<u>Adjacent States Used in Imputation</u>
AL	1971	TN
GA	1971	NC, TN
	1972	AL, NC, TN
ID	1977	MT, UT, WY
KS	1971, 1972	CO, MO
MN	1971	IA, ND, WI
	1972	IA, WI
MT	1971	ID, ND, WY
	1972, 1973	ID, WY
ND	1972	IA, WI
	1973	MN, SD
	1974	MN, MT, SD
NE	1971, 1972	CO, IA, MO, WY
	1975	CO, IA, KS, MO, SD, WY
NJ	1971, 1972, 1974, 1977, 1978	DE, NY, PA
NV	1971, 1972, 1975	ID, UT
	1973	ID, OR, UT
SC	1971, 1972	NC
SD	1971	IA, ND, WY
	1972	IA, WY
UT	1974, 1978	CO, ID, NV, WY
WA	1971, 1972, 1974	ID
	1977	MT, UT, WY
WV	1971, 1972	KY, MD, OH, PA, VA

Source: Pacific Northwest Laboratory

7.2.4 Computational Procedures: Btu State Prices, 1979-1983

1. Residential steam coal Btu prices for 1979 and subsequent years are computed using an equation estimated by regressing the residential steam coal prices generated for 1974-1978 (from GHS) and average spot coal Btu prices from Cost and Quality of Fuels. The resulting equation is as follows (the estimated coefficients for the state dummy variables are shown in Table 7.5). Note that the Cost and Quality prices in cents per million Btu must be changed to dollars per million Btu before they are used to estimate the 1979-1983 prices. Since the tax status of the GHS data used to estimate this equation is uncertain, it is unclear whether or not taxes are included in the imputed 1979-1983 prices.

$$\text{BCRCDZZ} = 0.2703 + 1.7568 (\text{BCEUFZZ} / 100) + c_{ZZ} * \text{DUMZZ} \quad (7.12)$$

(3.736) (23.295)

$$R\text{-square} = 0.7691$$

where:

BCRCDZZ = STEPS final residential steam coal price for State ZZ (\$/MMBtu)

BCEUFZZ = spot coal price for State ZZ from C&Q (c/MMBtu)

DUMZZ = dummy variable for State ZZ; Alabama is the reference state

2. States with very little or no reported coal use in SEDS from 1979-1983 (therefore no dummy variable in Equation 7.12) are: Alaska, Arkansas, Arizona, California, Florida, Hawaii, Louisiana, Mississippi, New Mexico, Oklahoma, Oregon, and Texas.
3. Several states are missing Cost and Quality coal spot prices, both in the 1974-1978 data used to estimate Equation 7.12 and in the 1979-1983 data that is used to calculate STEPS prices. For these missing data, Cost and Quality prices are substituted from other states as described in Table 7.6.

7.2.5 Computational Procedures: Btu State Prices, 1970

1. Since state-level coal price data for 1970 are not available from either Gas Househeating Survey or Cost and Quality of Fuels, the 1970 residential sector coal prices are calculated using the equation below. Equation 7.13 was estimated using the 1971-1978 data from the Statistical Year Book for the 39 states with some reported coal use from 1971-1983 and regression analysis. The estimated coefficients for the state dummy variable are given in Table 7.7. It is unclear whether or not taxes are included in the imputed prices for 1970.

TABLE 7.5. Estimated Values of Dummy Variable Coefficients:
Residential Sector Steam Coal (Equation 7.12)

<u>State ZZ</u>	<u>c_{ZZ}</u>	<u>t-ratio</u>	<u>State ZZ</u>	<u>c_{ZZ}</u>	<u>t-ratio</u>
AL	0.1980	0.317	NC	-0.1026	-0.164
CO	0.4243	0.681	ND	-1.1706	-1.872
CT	0.7768	1.243	NE	0.9537	1.529
DC	0.2396	0.384	NH	0.7768	1.243
DE	0.4059	0.650	NJ	-0.4248	-0.678
GA	0.0886	0.142	NV	2.1343	3.426
IA	0.5547	0.888	NY	0.5006	0.802
ID	-0.4406	-0.705	OH	0.3935	0.631
IL	-0.3056	-0.489	PA	0.2795	0.448
IN	0.2553	0.410	RI	0.7768	1.243
KS	-0.3309	-0.531	SC	0.3242	0.519
KY	-0.0623	-0.100	SD	0.3474	0.556
MA	0.7768	1.243	TN	-0.6601	-1.058
MD	0.2397	0.384	UT	0.9133	1.466
ME	0.7768	1.243	VA	0.5838	0.932
MI	0.5760	0.922	VT	1.2950	2.077
MN	1.1888	1.904	WA	1.2643	2.030
MO	-0.9019	-1.442	WI	1.0461	1.676
MT	-1.6506	-2.640	WV	-0.8479	-1.360
			WY	-0.1207	-0.194

Source: Pacific Northwest Laboratory

**TABLE 7.6. Assignment of Prices for States Missing Cost and Quality
Average Spot Coal Prices, 1974-1983**

<u>Missing State</u>	<u>Year(s)</u>	<u>State Price Assigned</u>
CO	1979, 1981	KS
CT	1975	NY
	1976-1979	NH
	1980-1983	MA
DC	1976-1983	MD
ID	1974, 1979-1982	NV
	1975-1977	SD
	1978	ND
	1983	CO
MA	1975	VT
	1976-1979	NH
ME	1974-1975, 1981, 1983	VT
	1976-1980, 1982	NH
MT	1974-1975, 1978	ND
	1976-1977	SD
	1979-1982	NV
ND	1976-1977	SD
	1979-1983	MN
NH	1974-1975, 1981, 1983	VT
NV	1975-1978, 1983	CO
RI	1974	CT
	1975	VT
	1976-1979	NH
	1980-1983	MA
SD	1978	ND
	1979-1983	MN
UT	1975-1978, 1980, 1983	CO
	1979	NV
VT	1976, 1980	NH
WA	1974-1978, 1983	CO
	1979-1982	NV
WY	1974-1976, 1978, 1982-1983	CO

Source: Pacific Northwest Laboratory

TABLE 7.7. Estimated Values of Dummy Variable Coefficients:
Steam Coal Residential Sector (Equation 7.13)

<u>State ZZ</u>	<u>d_{ZZ}</u>	<u>t-ratio</u>	<u>State ZZ</u>	<u>d_{ZZ}</u>	<u>t-ratio</u>
AL	(a)	--	ND	0.6783	6.1401
CO	0.1046	0.9554	NE	0.0752	0.6917
CT	0.0943	0.8628	NH	0.2367	2.1765
DC	-0.0305	-0.2802	NJ	-0.0511	-0.4675
DE	0.0434	0.3990	NV	0.3682	3.3576
GA	-0.0537	-0.4944	NY	0.1661	1.5259
IA	0.3036	2.7943	OH	0.1844	1.6972
ID	0.3933	3.5444	PA	0.1047	0.9636
IL	0.1418	1.3049	RI	0.1157	1.0597
IN	0.3328	3.0547	SC	0.0412	0.3786
KS	-0.0080	-0.0730	SD	0.5579	5.1165
KY	0.1943	1.7829	TN	-0.0128	-0.1177
MA	0.1309	1.2000	UT	0.0084	0.0770
MD	-0.0305	-0.2802	VA	0.2295	2.1090
ME	0.2367	2.1765	VT	0.0879	0.8046
MI	0.3453	3.1780	WA	0.2418	2.2001
MN	0.4517	4.1478	WI	0.4197	3.8632
MO	0.0757	0.6936	WV	-0.1880	-1.7306
MT	0.1863	1.6788	WY	0.2149	1.9043
NC	0.0295	0.2714			

(a) Alabama is the reference state.
Source: Pacific Northwest Laboratory

$$\ln \text{BCRCDZZ} = 0.7205 + 0.6878 \ln (\text{CLEUFZZ} / 100) + (d_{ZZ} * \text{DUMZZ}) \quad (7.13)$$

(9.2966) (23.864)

$$R\text{-square} = 0.7771$$

where:

BCRCDZZ = STEPS final residential sector steam coal price for State ZZ (\$/MMBtu)

CLEUFZZ = coal price for State ZZ from Statistical Year Book (c/MMBtu)

DUMZZ = dummy variable for State ZZ; Alabama is the reference state

2. The same 12 states have no reported STEPS steam coal prices in 1970 as in the other years.
3. For estimating Equation 7.13, states missing Statistical Year Book data are assigned prices as follows: Maine is assigned the New Hampshire price (1970-1978); Rhode Island is assigned the Connecticut price (1973, 1975-1978); Massachusetts is assigned the Connecticut price (1976-1978); Idaho is assigned the Montana price (1970-1978); and Washington is assigned the Oregon price (1970-1972). Delaware, the District of Columbia, and Maryland are all assigned the combined Statistical Year Book price for those states.

7.2.6 Computational Procedures: Btu U.S. Prices, 1970-1983

Btu prices for the U.S. are calculated from the state-level Btu prices, using the following equation and steam coal residential sector consumption data from SEDS:

$$\text{BCRCDUS} = \left(\sum_{ZZ=1}^{51} (\text{BCRCDZZ} * \text{BCRCPZZ}) \right) / \sum_{ZZ=1}^{51} \text{BCRCPZZ} \quad (7.14)$$

where:

BCRCDUS = STEPS final residential sector steam coal price for the U.S. (\$/MMBtu)

BCRCPZZ = volume of residential coal consumed as reported for State ZZ from SEDS (1000 short tons)

7.2.7 Computational Procedures: Physical Unit Prices, 1970-1983

Btu prices for 1970-1983 are converted to physical unit prices using the completed Btu price series for states and the U.S. and the coal conversion factors from Table 7.3.

$$\text{BCRCUZZ} = \text{BCRCDZZ} * \text{BCRCCKUS} \quad (7.15)$$

where:

BCRCUZZ = STEPS final residential sector steam coal price for State ZZ or the U.S. (\$/ton)

BCRCBUS = coal conversion factor from Table 7.3 (MMBtu/ton)

7.3. INDUSTRIAL SECTOR

The industrial sector steam coal prices in the STEPS data base are developed using different data sources and computational procedures, depending on the years involved. For 1970-1979, prices reported in STEPS are the average cost of coal sold to manufacturing firms. For 1980-1983, prices are average price of coal receipts at manufacturing plants. It is not clear whether or not any of the prices for 1970-1983 include any taxes. Physical unit prices are calculated first, then Btu prices are computed using the conversion factors.

7.3.1 Data Sources

1971, 1974-1979	Bureau of the Census, U.S. Department of Commerce. <u>Annual Survey of Manufactures</u> , and <u>Census of Manufactures</u> . Table 4 (1971) and Table 3 (1974-1979).
1980-1983	Energy Information Administration, U.S. Department of Energy. "Quarterly Coal Consumption Report: Manufacturing Plants," (EIA-3). Only published data are used.
1970,1972, 1973	STEPS steam coal electric utility physical unit price series.

7.3.2 Conversion Factors

1970-1983	Energy Information Administration, U.S. Department of Energy. <u>Annual Energy Review 1984</u> . Table titled, "Thermal Conversion Factors: Coal and Coal Coke, 1949-1984." Bituminous coal and lignite consumption in the Other/Industrial Sector. Values used are given in Table 7.8.
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7.3.3 Computational Procedures: Physical Unit Prices, 1970-1979

For 1970-1979, physical unit industrial steam coal prices are based either directly on manufacturing cost and quantity data from the Annual Survey of Manufactures (ASM) and Census of Manufactures (CM), or on imputation strategies that depend indirectly on the ASM/CM data. These prices represent the average cost of steam coal per ton to manufacturing firms; it is not clear whether or not these prices include any taxes.

TABLE 7.8. Steam Coal Industrial Sector Conversion Factors
(Million Btu per Short Ton)

<u>Year</u>	<u>Conversion Factor</u>
1970	22.973
1971	22.653
1972	22.539
1973	22.585
1974	22.420
1975	22.439
1976	22.528
1977	22.290
1978	22.175
1979	22.436
1980	22.690
1981	22.572
1982	22.694
1983	22.679

Source: Annual Energy Review 1984.

1. For 1971 and 1974-1979, available cost and quantity of bituminous coal, lignite, and anthracite from ASM or CM are used to calculate prices as average cost per unit of sales for covered states and the U.S. (states with undisclosed data are not considered covered).

$$BCICUZZ = (BCMFCZZ / BCMFVZZ) * 1000 \quad (7.16)$$

where:

BCICUZZ = STEPS final industrial sector steam coal price for State ZZ or the U.S. (\$/ton)

BCMFCZZ = manufacturing cost of coal for State ZZ or the U.S. from ASM/CM (\$million)

BCMFVZZ = manufacturing quantity of coal sold for State ZZ or the U.S. from ASM/CM (1000 short tons)

2. For states with industrial steam coal use and for which ASM and CM data are not available in 1971 and 1974-1979, adjacent state averages of available ASM/CM data are used to impute prices. The assigned adjacent states are given in Table 7.9.

$$BCICUZZ_m = 1/N \sum_{a=1}^N BCICUZZ_a \quad (7.17)$$

TABLE 7.9. Imputation of Missing ASM/CM Steam Coal Industrial Sector Data for 1971, and 1974-1979

Missing State	Year(s)	Adjacent States Used in Imputation
AR	1974-1975	MO, TN
	1979	MO, TN, TX
AZ	1971	CA, NV, UT
	1974-1978	CA, UT
CO	1974-1978	KS, NE, UT
	1979	UT
CT	1974-1978	MA, NY
	1979	NY
DC	1971, 1974-1979	MD, VA
DE	1971, 1974-1979	MD, NJ, PA
FL	1979	AL, GA
ID	1974	OR, UT
	1975-1978	UT
	1979	UT, WA
KS	1979	MO
LA	1978	AR
	1979	TX
MA	1979	NY
ME	1975-1978	MA
	1979	NY
MS	1971, 1974-1975, 1979	AL, TN
	1976-1978	AL, AR, TN
MT	1974-1978	MN, NE, UT
	1979	MN, UT
ND	1974-1979	MN
NE	1979	IA, MO
NM	1971	CO, OK, TX, UT
	1974, 1976-1978	KS, UT
	1979	UT
NV	1974	CA, OR, UT
	1975-1979	CA, UT
OK	1974-1975	KS, MO
	1976-1978	AR, KS, MO
	1979	MO, TX
OR	1975-1978	CA
	1979	CA, WA
SD	1975-1978	IA, MN, NE
	1979	IA, MN
TX	1974-1975	KS
	1976-1978	AR, KS
WA	1974	CA, OR
	1975-1978	CA
WY	1974-1978	NE, UT
	1979	UT

Source: Pacific Northwest Laboratory

where:

BCICUZZ = STEPS final industrial sector steam coal price for State ZZ (\$/ton)

m = state with missing data for 1971, 1974-1977

a = index for adjacent state with data

N = number of states adjacent to missing State ZZ

3. State and U.S. steam coal industrial sector prices for 1970, 1972, and 1973 (years for which no ASM/CM prices are available) are imputed using the following equation. This equation was estimated using regression techniques where values for the independent variable are STEPS steam coal electric utility sector physical unit prices and values for the dependent variable are the steam coal industrial physical unit prices (from ASM or imputed as described above) for 1971, and 1974-1977. A few states are assigned utility sector data because no utility prices are available; these assignments are given in Table 7.10. Because they have no reported industrial coal use for 1970, 1972, and 1973, the following states do not have prices imputed with Equation 7.18: Florida, Hawaii, Louisiana, New Hampshire, Rhode Island, and Vermont. Alaska prices are imputed as described later. The estimated coefficients for dummy variable are listed in Table 7.11.

$$\begin{aligned} \text{BCICUZZ} = & 12.2473 + 0.7330 \text{ BCEUZZ} - 7.8391 \text{ TIME} \\ & (5.5309) \quad (10.0754) \quad (-8.1059) \\ & + e_{ZZ} * \text{DUMZZ} \end{aligned} \quad (7.18)$$

R-square = 0.8734

where:

BCICUZZ = STEPS final industrial sector steam coal price for State ZZ or the U.S. (\$/ton)

BCEUZZ = STEPS electric utility steam coal price for State ZZ (\$/ton)

DUMZZ = dummy variable for State ZZ; Ohio is the reference state

TIME = time dummy variable; equals 1.0 for 1970-1973 and 0.0 for 1974-1977

4. The following states do not have reported STEPS steam coal industrial prices for years in the 1970-1979 time period: Arkansas (1970-1972); Florida (1970-1974); Hawaii (1970-1979); Louisiana (1970-1976); New Hampshire (1970-1979); New Mexico (1975); Oklahoma (1970); Rhode Island (1970-1979); South Dakota (1970-1974); and Vermont (1970-1979).
5. Steam coal industrial sector prices are imputed for the state of Alaska based on the assumption that the ratio of the state price to the U.S. price for the industrial sector is the same as the ratio found in the electric utility sector for each respective year from 1970-1979:

$$\text{BCICUAK} = (\text{BCEUAK} / \text{BCEUUS}) * \text{BCICUUS} \quad (7.19)$$

where:

TABLE 7.10. Steam Coal Electric Utility Sector Price Assignments Used to Estimate and Implement Equation 7.20, 1970-1977

<u>Missing State</u>	<u>Missing Year(s)</u>	<u>State Price Assignment</u>
AR	1973-1977	MO
CA	1970-1977	NV
CT	1975-1977	NY
DC	1976-1977	MD
ID	1970-1977	MT
MA	1976-1977	NH
ME	1970-1977	NH
OK	1973-1975	KS
OR	1973-1977	WA
TX	1970	NM
WA	1970-1972	OR

Source: Pacific Northwest Laboratory

TABLE 7.11. Estimated Values of Dummy Variable Coefficients:
Steam Coal Industrial Sector (Equation 7.18)

<u>State ZZ</u>	<u>e_{ZZ}</u>	<u>t-ratio</u>	<u>State ZZ</u>	<u>e_{ZZ}</u>	<u>t-ratio</u>
AL	-2.3399	-0.9976	NC	1.0588	0.4453
AR	5.2366	2.0551	ND	3.3254	1.2945
AZ	5.4667	2.1719	NE	-7.2280	-3.0791
CA	5.1889	2.1282	NJ	-7.0239	-2.7423
CO	0.1566	0.0643	NM	5.8262	2.1771
CT	6.9254	2.8939	NV	2.7732	1.1374
DC	-8.7746	-3.5061	NY	-1.3483	-0.5644
DE	-4.8691	-2.0439	OH	(a)	--
GA	0.7788	0.3316	OK	2.6432	1.1076
IA	-0.2156	-0.0916	OR	3.1060	1.1942
ID	3.9712	1.5586	PA	-2.0366	-0.8681
IL	1.2728	0.5394	SC	0.3771	0.1572
IN	3.2796	1.3753	SD	5.1595	1.7898
KS	0.1760	0.0736	TN	-0.0244	-0.0104
KY	2.4424	1.0288	TX	7.0541	2.7629
MA	10.8275	4.4004	UT	-1.6081	-0.6737
MD	-9.8336	-4.0756	VA	-1.3264	-0.5510
ME	11.9965	4.9388	WA	4.4751	1.8322
MI	1.6057	0.6834	WI	4.3602	1.8583
MN	-0.8192	-0.3400	WV	-0.3571	-0.1523
MO	2.3030	0.9615	WY	1.0650	0.7707
MS	-0.9100	-0.3881	US	1.6574	0.7055
MT	3.7178	1.4592			

(a) Ohio is the reference state.

Source: Pacific Northwest Laboratory

BCICUAK = STEPS final industrial sector steam coal price for
 Alaska (\$/ton)
 BCEUUAK = STEPS final electric utility sector steam coal price for
 Alaska (\$/ton)
 BCEUUUS = STEPS final electric utility sector steam coal price for
 the U.S. (\$/ton)
 BCICUUS = STEPS final industrial sector steam coal price for
 the U.S. (\$/ton)

7.3.4 Computational Procedures: Physical Unit Prices, 1980-1983

For 1980-1983, physical unit steam coal prices for states and the U.S. are taken from EIA-3 data. Published prices as average cost per ton are used directly when available, while missing prices are imputed using simple averages or price assignments from adjacent states. It is not clear whether or not these prices include taxes.

1. State and U.S. physical unit prices where available are taken directly from the EIA-3 data.

$$BCICUZZ = BCMFNZZ \quad (7.20)$$

where:

BCICUZZ = STEPS final industrial sector steam coal price for
 State ZZ or the U.S. (\$/ton)
 BCMFNZZ = average price of coal at manufacturing plants for
 State ZZ or the U.S. from EIA-3 (\$/ton)

2. Missing state data are imputed using simple averages of the published data for adjacent states. In some cases, a single adjacent state price is available for the imputation. The adjacent states used for imputations are given in Table 7.12.

$$BCICUZZ = 1/N \sum_{a=1}^N BCMFNZZ_a \quad (7.21)$$

where:

BCICUZZ = STEPS final industrial sector steam coal price for
 State ZZ (\$/ton)
 a = index for adjacent states
 N = number of states adjacent to State ZZ with published data

3. No steam coal industrial prices are reported by STEPS for 1980-1983 for the following states: Alaska, Connecticut, the District of Columbia, Hawaii, New Hampshire, Rhode Island, and Vermont.

TABLE 7.12. Industrial Sector Steam Coal Imputations for 1980-1983

<u>Missing State</u>	<u>Year(s)</u>	<u>Adjacent States Used in Imputations</u>
AZ	1980	CA, UT
	1981	CA, CO, UT
CO	1980	KS, UT
DE	1980-1983	MD
FL	1980	AL, GA
LA	1980-1983	AR, TX
MA	1980-1983	NY
ME	1980-1983	NY
MS	1980-1983	AL, AR, TN
MT	1983	ID, WY
ND	1980-1982	MN, MT
	1983	MN
NE	1980	IA, KS, MO
	1982-1983	CO, IA, KS, MO, WY
NJ	1980-1983	NY, PA
NM	1980	TX, UT
	1981	CO, OK, TX
	1982-1983	AZ, CO, OK, TX
NV	1980-1981	CA, ID, UT
	1983	AZ, CA, ID, UT
OK	1980	AR, KS, MO, TX
OR	1980, 1981, 1983	CA, ID, WA
	1982	CA, ID, NV, WA
SD	1980	IA, MN, MT
	1981	IA, MN, MT, NE
	1982	IA, MN, MT, WY
	1983	IA, MN, WY
WV	1980	KY, MD, OH, PA, VA
WY	1980	ID, MT, UT
	1981	CO, ID, MT, NE, UT

Source: Pacific Northwest Laboratory

7.3.5 Computational Procedures: Btu Prices, 1970-1983

Btu prices for states and the U.S. for all the years 1970-1983 are computed using the completed physical unit price series and the conversion factors given in Table 7.8:

$$BCICDZZ = BCICUZZ / BCICKUS \quad (7.22)$$

where:

BCICDZZ = STEPS final industrial sector steam coal price for
State ZZ or the U.S. (\$/MMBtu)

BCICKUS = industrial sector coal conversion factor from Table 7.8
(MMBtu/ton)

8.0 DISTILLATE FUEL OIL

The STEPS distillate price series cover the residential, commercial, industrial, and electric utility sectors with physical unit prices in dollars per gallon and prices per million Btu. Distillate transportation sector use is covered by the STEPS price series for motor gasoline and diesel. Since the types of prices and the computational procedures vary significantly for each sector, the sectors are described separately below.

8.1 RESIDENTIAL SECTOR

The STEPS distillate residential price series is developed from a variety of data sources, depending on the years involved. In all cases, physical unit prices for states and the U.S. are developed first, then 8tu prices are calculated using the completed physical unit price series and the conversion factor. The prices contained in this series are the retail prices paid by consumers for residential heating oil. Except for 1983, it is not clear whether or not these prices include any taxes; in 1983 taxes are excluded.

8.1.1 Data Sources

1970-1983	McGraw-Hill, Inc. <u>Platt's Oil Price Handbook and Oilmanac</u> . Refinery and terminal prices for No. 2 fuel oil.
1975-1983	Energy Information Administration, U.S. Department of Energy. <u>Monthly Energy Review</u> . Table titled, "Residential Heating Oil Prices by Region," (1975-1982); and "Sales Prices of No. 2 Distillate to Residences for Selected States," (1983).
1983	Energy Information Administration, U.S. Department of Energy. <u>Petroleum Marketing Monthly</u> . Table titled, "Sales Prices of No. 2 Fuel Oil, by PAD District and Selected States."
1975-1983	National Oceanic and Atmospheric Administration, U. S. Department of Commerce. <u>State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population (1980 Census)</u> . Historical Climatology Series 5-1, table titled, "1951-80 State Pop. Wgt'd Heating Degree Days."
1970-1983	Energy Information Administration, U.S. Department of Energy. <u>Annual Energy Review 1984</u> . Table 58.
1970-1983	Energy Information Administration, U.S. Department of Energy. <u>State Energy Data System</u> . Computer tape. Residential sector distillate consumption.

8.1.2 Conversion Factor

1970-1983 Energy Information Administration, U.S. Department of Energy.
 State Energy Data Report. Appendix C, p. 667.

5.825 Million Btu per Barrel

8.1.3 Computational Procedures: Physical Unit State Prices, 1975-1977

For the years 1975-1977, no state-level data are available. Regional data from the Monthly Energy Review (MER) are available at the Census Division level, except for Federal Region prices for November and December of 1977. These price data are collected on Form EIA-9 (formerly Form FEA-P112-M-1). The Census Division prices from MER are allocated to states based on their relationship to comparable Census Division prices estimated from state-level prices from Platt's Oil Price Handbook and Oilmanac (Platt's) and state-level residential distillate consumption volumes from SEDS. Adjustment factors are calculated at the regional level and applied to Platt's price data assigned to states. This procedure is described step-by-step below.

1. Monthly regional price data for 1975 and 1976 are reported in MER only for Census Divisions. In 1977, however, monthly price data are reported for Census Divisions for January through October and for Federal Regions for November and December. The Federal Region prices for November and December are assigned to their respective states and reaggregated into Census Divisions in order to create a consistent set of monthly Census Division prices for 1977. Annual residential sector distillate consumption volumes from SEDS are used to do the reaggregation:

$$DFRCMZZ_m = DFRCMY_m \quad (8.1)$$

$$DFRCMX_m = \frac{\sum_{ZZ=1}^{N_{XX}} (DFRCMZZ_m * DFRCPZZ)}{\sum_{ZZ=1}^{N_{XX}} DFRCPZZ} \quad (8.2)$$

where:

DFRCMZZ = residential sector monthly distillate price for State ZZ
(c/gal)

DFRCMY = residential sector monthly distillate price for Federal
Region YY from MER (c/gal)

DFRCMX = residential sector distillate price in Census Division XX
(c/gal)

DFRCPZZ = residential sector distillate consumption for State ZZ
from SEDS (1000 bbls)

N_{XX} = number of States ZZ in Census Division XX

m = index for November or December 1977

2. The Census Division monthly price data from MER for 1975, 1976, and the first 10 months of 1977 are used with the estimated Census Division price data for November and December 1977 (DFRCMXX above) to estimate state-level prices for STEPS.

- a. Missing monthly prices in the East South Central Division for June and November 1975, and the Mountain Division for March and July 1975 are imputed using an average of the prices for the month preceding and the month following the missing month. Missing November and December West South Central Division prices in 1977 are imputed with the assignment of the October price to both months. No monthly price data are available for the West South Central Region in 1975; part (f) below discusses how the calculations are handled for this region.
- b. The monthly state-level heating degree day normal data are averaged for the states within each Census Division to estimate regional monthly heating degree days. Alaska, the District of Columbia, and Hawaii are assigned the monthly heating degree days from Minnesota, Maryland, and Florida, respectively.

$$HDXX_m = 1/N_{XX} \sum_{ZZ=1}^{N_{XX}} HDZZ_m \quad (8.3)$$

where:

HDXX = average heating degree day normal for Census Division XX
(base 65 degrees F)

HDZZ = average heating degree day normal for State ZZ
(base 65 degrees F)

m = index for months

N_{XX} = number of States ZZ in Census Division XX

- c. Average annual distillate prices for Census Divisions are calculated using the monthly Census Division price data from MER and the heating degree day normals estimated for Census Divisions:

$$DFRCNXX = \left(\sum_{m=1}^{12} (DFRCMXX_m * HDXX_m) / \sum_{m=1}^{12} HDXX_m \right) / 100 \quad (8.4)$$

where:

DFRCNXX = residential sector distillate price for Census
Region XX (\$/gal)

DFRCMXX = residential sector distillate price for Census Division
XX from MER (1975, 1976, and January - October 1977)
or the imputed prices (DFRCMXX_m) calculated above for
November and December 1977 (c/gal)

- d. City-level No. 2 fuel oil refinery and terminal prices from Platt's for 1975-1977 are assigned to states as shown in Table 8.1. The assigned Platt's prices for states are volume-weighted into Census Divisions using residential sector consumption volumes from SEDS:

$$DFNRNXX = \left(\sum_{ZZ=1}^{N_{XX}} [(DFNCNZZ_{XX} / 100) * DFRCPPZ_{XX}] \right) / \sum_{ZZ=1}^{N_{XX}} DFRCPPZ_{XX} \quad (8.5)$$

where:

DFNRNXX = estimated distillate price based on Platt's for Census Division XX (\$/gal)

DFNCNZZ = No. 2 fuel oil price assigned to State ZZ from Platt's (c/gal)

DFRCPPZ = residential sector distillate consumption for State ZZ from SEDS (1000 bbls)

N_{XX} = number of States ZZ in Census Division XX

- e. An adjustment factor relating the MER Census Division prices with the Census Division prices estimated from Platt's is calculated as follows:

$$DFRCAXX = DFRCNXX / DFNRNXX \quad (8.6)$$

where:

DFRCAXX = residential sector adjustment factor equal to the ratio of MER to Platt's distillate prices for Census Division XX (ratio)

- f. Since there are no 1975 MER price data for the West South Central Region from which to calculate an adjustment factor, the adjustment factor for this region for 1975 is assumed to be equal to the average of the West South Central adjustment factors (DFRCAWS) for 1976 and 1977, or 1.1313.
- g. The STEPS residential sector distillate state prices for all 51 states are calculated using the regional adjustment factors for each year and the state-level assigned Platt's prices:

$$DFRCUZZ = DFRCAXX * (DFNCNZZ_{XX} / 100) \quad (8.7)$$

where:

DFRCUZZ = STEPS final residential sector distillate price for State ZZ (\$/gal)

**TABLE 8.1. Platt's Prices for No. 2 Fuel, Assigned to States:
1970-1983**

<u>State</u>	<u>Assigned City Prices</u>
AK	Los Angeles/San Francisco, CA, 1970-1976; Portland, OR, 1977-1978; Seattle, WA, 1979-1980; Seattle-Tacoma/Spokane, WA, 1981-1983
AL	Birmingham/Mobile/Montgomery, 1970-1974; Mobile/Birmingham, 1975-1977; Birmingham, 1978-1983
AR	Arkansas, 1970-1983
AZ	Los Angeles/San Francisco, CA, 1970-1978; Phoenix, 1979-1983
CA	Los Angeles/San Francisco, 1970-1983
CO	Minneapolis-St. Paul, MN, 1970-1976; Denver, 1977-1983
CT	New Haven, 1970-1983
DC	Baltimore, MD, 1970-1983
DE	Baltimore, MD, 1970-1983
FL	Jacksonville/Miami/Tampa/Pensacola/Panama City/Port Everglades, 1970-1972; Miami/Tampa/Pensacola, 1973; Miami/Tampa, 1974-1975, 1981-1983; Miami, 1976-1980
GA	Atlanta/Savannah/Albany/Athens/Bainbridge/Columbus/Macon, 1970-1973; Atlanta/Savannah, 1974-1983
HI	Los Angeles/San Francisco, CA, 1970-1983
IA	Chicago, IL, 1970-1981; Des Moines, 1982-1983
ID	Los Angeles/San Francisco, CA, 1970-1976; Portland, OR, 1977-1982; Boise, 1983
IL	Chicago, 1970-1983
IN	Chicago, 1970-1983
KS	Los Angeles/San Francisco, CA, 1970-1973; St. Louis, MO, 1974-1983
KY	Baton Rouge/New Orleans, LA, 1970; New Orleans, LA, 1971-1983
LA	Baton Rouge/New Orleans, 1970; New Orleans, 1971-1983
MA	Boston, 1970-1983
MD	Baltimore, 1970-1983
ME	Portland, 1970-1983
MI	Detroit, 1970-1983
MN	Minneapolis-St. Paul, 1970-1983
MO	Baton Rouge/New Orleans, LA, 1970; New Orleans, LA, 1971-1973; St. Louis, 1974-1983
MS	Greenville/Meridian, 1970-1973; New Orleans, LA, 1974-1983
MT	Minneapolis-St. Paul, MN, 1970-1976; Billings, 1977-1983
NC	Greensboro/Wilmington/Charlotte/Salisbury/Selma, 1970-1973; Greensboro/Wilmington/Charlotte, 1974-1975; Greensboro/Wilmington, 1976-1983
ND	Minneapolis-St. Paul, MN, 1970-1983
NE	Baton Rouge/New Orleans, LA, 1970; New Orleans, 1971-1973; St. Louis, MO, 1974-1983
NH	Portland, ME, 1970-1983
NJ	New York/Albany/Buffalo, NY, 1970-1975; New York/Albany, NY, 1976-1982; North Jersey, 1983
NM	New Mexico-West Texas, 1970-1972; Los Angeles/San Francisco, CA, 1973-1976; Albuquerque, 1977-1980, 1983; Albuquerque/Farmington, 1981-1982
NV	Los Angeles/San Francisco, CA, 1970-1983

TABLE 8.1 (CONT). Platt's Prices for No. 2 Fuel Oil Assigned to States: 1970-1983

<u>State</u>	<u>Assigned City Prices</u>
NY	New York/Albany/Buffalo, 1970-1975; New York/Albany, 1976-1983
OH	Toledo/Cleveland/Zanesville/Columbus/Dayton, 1970-1972; Detroit, MI, 1973-1982; Columbus, 1983
OK	Oklahoma (Group 3), 1970-1983
OR	Los Angeles/San Francisco, CA, 1970-1976; Portland, 1977-1983
PA	Philadelphia, 1970-1978; Philadelphia/Pittsburgh, 1979-1983
RI	Providence, 1970-1975; New Haven, CT, 1976-1983
SC	Charleston/Spartanburg/Belton, 1970-1975; Charleston/Spartanburg, 1976-1983
SD	Minneapolis-St. Paul, MN, 1970-1983
TN	Chattanooga, 1970-1973; New Orleans, LA, 1974-1983
TX	New Mexico-West Texas, 1970-1972; New Orleans, LA, 1973-1978; Houston, 1979-1980; Dallas-Ft. Worth/Houston, 1981; Amarillo/ Corpus Christi/Dallas-Ft. Worth/Houston, 1982-1983
UT	Minneapolis-St. Paul, 1970-1976; Salt Lake City, 1977-1983
VA	Norfolk/Roanoke, 1970-1973; Norfolk, 1974-1983
VT	Portland, ME, 1970-1983
WA	Los Angeles/San Francisco, CA, 1970-1976; Seattle, 1977, 1979-1980, Portland, OR, 1978; Seattle-Tacoma/Spokane, 1981-1983
WI	Chicago, IL, 1970-1983
WV	Norfolk/Roanoke, VA, 1970-1973; Norfolk, VA, 1974-1983
WY	Minneapolis-St. Paul, MN, 1970-1976; Cheyenne, 1977-1982; Casper, 1983

Source: Pacific Northwest Laboratory

8.1.4 Computational Procedures: Physical Unit State Prices, 1978-1982

For 1978-1982, annual physical unit distillate prices for states are either taken directly from Monthly Energy Review or are calculated from monthly Federal Region price data, also from Monthly Energy Review. These data are collected on Form EIA-9A (formerly Form EIA-9 and Form FEA-P112-M-1). The Platt's price data and SEDS consumption data for 1978-1982 are used to compute state prices when only regional data are available. These calculations are described step-by-step below.

1. Annual state physical unit prices are available from MER for the following 24 states: Alaska, Connecticut, District of Columbia, Delaware, Idaho, Illinois, Indiana, Massachusetts, Maryland, Maine, Pennsylvania, Rhode Island, Virginia, Vermont, Washington, Wisconsin, and West Virginia. The 24 covered states compose all of Federal Regions 1, 2, 3, 5, and 10. Prices for these states exclude taxes and are converted to dollars per gallon for reporting in STEPS.

$$\text{DFRCUZZ} = \text{DFRCNZZ} / 100 \quad (8.8)$$

where:

DFRCUZZ = STEPS final residential sector distillate price for State ZZ (\$/gal)

DFRCNZZ = residential sector distillate price for State ZZ from MER (c/gal)

2. Of the remaining 27 states, the 22 in Federal Regions 4, 7, 8, and 9 have annual prices imputed from the monthly Federal Region prices published in MER. No regional prices are available for Federal Region 6 for the 1978-1982 period, and some monthly prices are missing in Regions 7, 8, and 9 in 1980, 1981, and 1982.
 - a. Missing monthly prices for Federal Regions are imputed with assigned prices as follows: the Region 9 November 1980 price is assigned for December 1980; an average of the Region 7 July and October 1982 prices is assigned to August and September 1982; an average of Region 8 June and September 1982 prices is assigned to July and August 1982; and an average of Region 3 August and October 1982 prices is assigned for the missing September 1982 price. Imputation of missing Region 6 prices for 1978-1982 and missing Region 9 prices for 1981-1982 is discussed later.
 - b. Monthly state-level heating degree day normal data are averaged for all the states within each of the ten Federal Regions to estimate average Federal Region heating degree days. Alaska, the District of Columbia, and Hawaii are assigned the monthly heating degree days from Minnesota, Maryland, and Florida, respectively.

$$\text{HDYY}_m = 1/N_{YY} \sum_{ZZ=1}^{N_{YY}} \text{HDZZ}_m \quad (8.9)$$

where:

HDYY = average heating degree day monthly normal for Federal Region YY (base 65 degrees F)

HDZZ = average heating degree day monthly normal for State ZZ (base 65 degrees F)

m = index for months

N_{YY} = number of States ZZ in Federal Region YY

- c. Average annual physical unit distillate prices for the residential sector are calculated for Federal Regions 4, 7, 8, and 9 (except for Region 9 in 1981 and 1982) using the regional heating degree day normals and the monthly regional prices from MER:

$$DFRCNYY = \left(\sum_{m=1}^{12} [(DFRCMY_m / 100) * HDYY_m] \right) / \sum_{m=1}^{12} HDYY_m \quad (8.10)$$

where:

DFRCNYY = annual residential sector distillate price in Federal Region YY (\$/gal)

DFRCMY = monthly residential sector distillate price for Federal Region YY from MER (c/gal)

m = index for months

- d. In 1981, only March and May prices are available for Federal Region 9. To estimate the average annual price for this Region, the relationship between the U.S. annual heating oil price (from MER) and the U.S. March and May prices is expressed as a ratio and used with the Region 9 March and May prices to estimate the 1981 annual Region 9 price:

$$DFRCS09_m = DFRCNUS / DFRCMUS_m \quad (8.11)$$

$$DFRCN09 = \left(1/2 \sum_{m=1}^2 [(DFRCS09_m * DFRCM09_m)] \right) / 100 \quad (8.12)$$

where:

DFRCS09 = ratio of the annual 1981 distillate U.S. price to the U.S. price (ratio)

DFRCNUS = annual U.S. distillate price for 1981 from MER (c/gal)

DFRCMUS = monthly U.S. distillate price for 1981 from MER (c/gal)

DFRCN09 = estimated annual Federal Region 9 distillate price for 1981 (\$/gal)

DFRCM09 = Region 9 monthly distillate price in 1981 from MER (c/gal)

m = index for March or May

- e. City-level prices from Platt's are assigned to states as shown in Table 8.1. The assigned state-level Platt's prices for states are volume-weighted into Federal Regions using residential sector consumption volume data from SEDS:

$$DFNRNYY = \frac{\left(\sum_{ZZ=1}^{N_{YY}} [(DFNCNZZ_{YY} / 100) * DFRCPZZ_{YY}] \right)}{\sum_{ZZ=1}^{N_{YY}} DFRCPZZ_{YY}} \quad (8.13)$$

where:

DFNRNYY = estimated distillate price for Federal Region YY based on Platt's and SEDS data (\$/gal)

DFNCNZZ = No. 2 fuel oil price assigned to State ZZ from Platt's (c/gal)

DFRCPZZ = residential sector distillate consumption volume for State ZZ from SEDS (1000 bbls)

- f. An adjustment factor relating the regional MER prices with the regional Platt's-based prices is calculated for Federal Regions 4, 7, 8, and 9 (except for 1982) as follows:

$$DFRCAYY = DFRCNYY / DFNRNYY \quad (8.14)$$

where:

DFRCAYY = residential sector distillate adjustment factor equal to the ratio of MER to Platt's data for Federal Region YY (ratio)

- g. Since there are no monthly regional distillate prices from Monthly Energy Review for Federal Region 6 for 1978-1982 and Federal Region 9 for 1982, the adjustment factors for these regions are based on the adjustment factors for previous time periods. The Region 6 adjustment factor (DFRCA06) for each of the years in the 1978-1982 period is equal to 1.1313, which is the average of the adjustment factor for the West South Central Census Division for 1976 and 1977 (calculation of this factor is described in the procedures for 1975-1977 above). The Region 9 adjustment factor for 1982 is equal to 1.1995, which is the average adjustment factor for Region 9 from 1978 to 1981.

- h. The STEPS residential sector distillate state prices for the 27 states in Federal Regions 4, 6, 7, 8, and 9 are calculated using the regional adjustment factors for each year and the state-level assigned Platt's prices:

$$\text{DFRCUZZ} = \text{DFRCAYY} * (\text{DFNCNZY} / 100) \quad (8.15)$$

where:

DFRCUZZ = STEPS final residential sector distillate price for State ZZ (\$/gal)

8.1.5 Computational Procedures: Physical Unit State Prices, 1983

For 1983, physical unit distillate prices in cents per gallon (excluding taxes) are available for 24 states and 7 PAD Districts from MER and Petroleum Marketing Monthly (PMM), EIA publications that take their distillate prices from Form EIA-782. Platt's Oil Price Handbook and Oilmanac price data assigned to states and state-level SEDS data are used to impute state prices from the PAD District prices for the 27 states that do not have prices in MER. This procedure is described step-by-step below.

1. Annual state physical unit prices from Monthly Energy Review are available for the same 24 states covered for 1978-1982. Prices for these states are taken from MER and converted to dollars per gallon:

$$\text{DFRCUZZ} = \text{DFRCNZZ} / 100 \quad (8.16)$$

where:

DFRCUZZ = STEPS final residential sector distillate price for State ZZ (\$/gal)

DFRCNZZ = residential sector distillate price for State ZZ from MER (c/gal)

2. The remaining 27 states have annual prices imputed from monthly PAD District prices in PMM for seven districts: Ia, Ib, Ic, II, III, IV, and V.
 - a. PAD Districts Ic and IV are missing January prices and PAD District III is missing prices for January, February, March, and April. PAD Districts Ia and Ib have no states needing imputation of annual prices because these two districts are completely covered in the 24 states for which state-level data are available (see above). The respective February prices are assigned for the missing January prices in Districts Ic and IV, while the District III May price is assigned for each of the missing months January, February, March, and April.

- b. Monthly state-level heating degree day normal data are averaged for all states within each of the 7 PAD Districts to estimate PAD District heating degree days. Alaska, the District of Columbia, and Hawaii are assigned the heating degree day normals from Minnesota, Maryland, and Florida, respectively.

$$HDWW_m = 1/N_{WW} \sum_{ZZ=1}^{N_{WW}} HDZZ_m \quad (8.17)$$

where:

HDWW = average heating degree day monthly normal for
PAD District WW (base 65 degrees F)

HDZZ = average heating degree day monthly normal for State ZZ
(base 65 degrees F)

m = index for months

N_{WW} = number of States ZZ in PAD District WW

- c. Average annual physical unit distillate prices for the residential sector are calculated for PAD Districts Ic, II, III, IV, and V using the monthly PAD District price data and the PAD District estimated monthly heating degree day normals:

$$DFRCNWW = \left(\sum_{m=1}^{12} [(DFRCMWW_m / 100) * HDWW_m] \right) / \sum_{m=1}^{12} HDWW_m \quad (8.18)$$

where:

DFRCNWW = annual residential sector distillate price for PAD
District WW (\$/gal)

DFRCMWW = monthly residential sector distillate price for
PAD District WW from PMM (c/gal)

m = index for months

- d. City-level No. 2 fuel oil refinery and terminal prices from Platt's Oil Price Handbook and Oilmanac are assigned to States as shown in Table 8.1. The assigned state-level Platt's prices are volume-weighted into PAD District prices using state-level residential sector consumption volume data from SEDS:

$$DFNRNWW = \left(\sum_{ZZ=1}^{N_{WW}} [(DFNCNZZ_{WW} / 100) * DFRCPZZ_{WW}] \right) / \sum_{ZZ=1}^{N_{WW}} DFRCPZZ_{WW} \quad (8.19)$$

where:

DFNRNWW = estimated distillate price based on Platt's for
PAD District WW (\$/gal)

DFNCNZZ = distillate price assigned to State ZZ from Platt's
(c/gal)

DFRCPZZ = residential sector distillate consumption volume for
State ZZ from SEDS (1000 bbls)

- e. An adjustment factor relating the PMM PAD District prices to the Platt's-based PAD District prices is calculated for PAD Districts Ic, II, III, IV, and V:

$$\text{DFRCAWW} = \text{DFRCNWW} / \text{DFNRNWW} \quad (8.20)$$

where:

DFRCAWW = residential sector adjustment factor equal to the
ratio of PMM to Platt's distillate prices for PAD
District WW (ratio)

- f. Annual physical unit distillate prices for the 27 states not explicitly covered by PMM state-level data are calculated using the assigned Platt's prices for each state and the PAD District-level adjustment factors:

$$\text{DFRCUZZ} = \text{DFRCAWW} * (\text{DFNCNZZ}_{\text{WW}} / 100) \quad (8.21)$$

where:

DFRCUZZ = STEPS final residential sector distillate price for
State ZZ (\$/gal)

8.1.6 Computational Procedures: Physical Unit State Prices, 1970-1974

There are no regional or state-level distillate price data directly available for the 1970-1974 period. To estimate state prices, regional average prices are first derived from the relationship between U.S. prices and Federal Region prices for 1975 to 1980. State prices are then estimated from the regional prices using a methodology similar to that described above for 1978-1982.

1. The first step in the estimation of residential distillate prices for the 1970-1974 time period, is to develop an equation that uses U.S. prices to estimate prices for Federal Regions. Regression techniques are used for this purpose. U.S. prices for 1975-1980 are taken from the Annual Energy Review and used as the independent variable for estimating the equation; annual Federal Region prices are used as the dependent variable. Federal Region prices for 1978-1980 are calculated above (DFRCNYY), but MER prices for 1975-1977 are for Census Divisions. To convert these annual Census Division prices into Federal Region prices, the estimated STEPS state prices for 1975-1977 (DFRCUZZ) are aggregated using SEDS volumes into Federal Regions:

$$DFRCNYY = \left(\sum_{ZZ=1}^{N_{YY}} (DFRCUZZ_{YY} * DFRCPPZ_{YY}) \right) / \sum_{ZZ=1}^{N_{YY}} DFRCPPZ_{YY} \quad (8.22)$$

where:

DFRCNYY = estimated residential sector distillate price for Federal Region YY (\$/gal)

DFRCUZZ = STEPS residential sector distillate price for State ZZ (\$/gal)

DFRCPPZ = residential sector distillate consumption for State ZZ from SEDS (1000 bbls)

2. Regression techniques are applied to the pooled Federal Region price data (dependent variable) and the U.S. prices from AER (independent variable) for 1975-1980 and the following equation is estimated. U.S. prices for 1970-1974 are input to this equation to estimate annual Federal Region prices for 1970-1974. The estimated coefficients on the dummy variable are give in Table 8.2.

$$DFRCNYY = 0.0270 + 0.9733 (DFRCUUS / 100) + c_{YY} * DUMYY \quad (8.23)$$

(2.6191) (82.435)

R-square = 0.9929

where:

DFRCNYY = estimated residential sector distillate price for Federal Region YY (\$/gal)

DFRCUUS = residential sector distillate price for the U.S. from AER (c/gal)

TABLE 8.2. Estimated Values for the Federal Region Dummy Variables: Distillate Residential Sector, 1970-1974 (Equation 8.23)

<u>Federal Region</u>	<u>c_{YY}</u>	<u>t Ratio</u>
2	-0.0085	-0.7685
3	-0.0175	-1.5839
4	-0.0276	-2.4911
5	-0.0340	-3.0743
6	-0.0735	-6.6346
7	-0.0400	-3.6124
8	-0.0297	-2.6850
9	-0.0314	-2.8381
10	-0.0123	-1.1149

Source: Pacific Northwest Laboratory

3. City-level prices from Platt's for 1970-1974 are assigned to states as shown in Table 8.1. The assigned state-level Platt's prices are volume-weighted into Federal Regions using residential sector distillate consumption volumes from SEDS:

$$DFNRNYY = \left(\sum_{ZZ=1}^{N_{YY}} (DFNCNZZ_{YY} / 100) * DFRCPZZ_{YY} \right) / \sum_{ZZ=1}^{N_{YY}} DFRCPZZ_{YY} \quad (8.24)$$

where:

DFNRNYY = estimated distillate price based on Platt's for Federal Region YY (\$/gal)

DFNCNZZ = No. 2 fuel oil price assigned to State ZZ from Platt's (c/gal)

DFRCPZZ = residential sector distillate consumption for State ZZ from SEDS (1000 bbls)

4. An adjustment factor relating the regional MER Federal Region prices with the Platt's-based Federal Region prices is calculated as follows:

$$DFRCAYY = DFRCNYY / DFNRNYY \quad (8.25)$$

where:

DFRCAYY = residential sector distillate adjustment factor equal to the ratio of MER to Platt's distillate prices for Federal Region YY

5. The STEPS residential sector distillate prices for all 51 states are calculated using the regional adjustment factors for each year and the state-level assigned Platt's prices:

$$DFRCUZZ = DFRCAYY * (DFNCNZZ_{YY} / 100) \quad (8.26)$$

where:

DFRCUZZ = STEPS final residential sector distillate price for State ZZ (\$/gal)

8.1.7 Computational Procedures: Physical Unit U.S. Prices, 1970-1983

Residential sector distillate physical unit prices for the U.S. are taken from the Annual Energy Review for 1970-1983.

$$DFRCUUS = DFRCNUS / 100 \quad (8.27)$$

where:

DFRCUUS = STEPS final residential sector distillate price for the U.S. (\$/gal)

DFRCNUS = residential sector U.S. distillate price from AER (c/gal)

8.1.8 Computational Procedures: Btu Prices, 1970-1983

Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor:

$$\text{DFRCDZZ} = (\text{DFRCUZZ} * 42) / 5.825 \quad (8.28)$$

where:

DFRCDZZ = STEPS final residential sector distillate price for
State ZZ or the U.S. (\$/MMBtu)

8.2 COMMERCIAL SECTOR

The data sources and computational procedures for the STEPS commercial sector distillate price series are basically split between 1970-1982 and 1983. For 1970-1982, commercial distillate prices are based on markups calculated from Energy Prices: 1960-73 and refinery and terminal (wholesale) prices from Platt's. It is not clear whether or not these prices include any taxes. For 1983, retail prices paid by commercial/institutional establishments (excluding taxes) are taken from PMM. Throughout the 1970-1983 period, physical unit prices are calculated from the data sources and Btu prices are computed using the physical unit price series and the conversion factor.

8.2.1 Data Sources

1970-1972	Foster Associates, Inc. 1974. <u>Energy Prices 1960-73</u> . Tables 4-c and 5-b.
1970-1983	McGraw-Hill, Inc. <u>Platt's Oil Price Handbook and Oilmanac</u> . Refinery and terminal prices for No. 2 fuel oil.
1983	Energy Information Administration, U.S. Department of Energy. <u>Petroleum Marketing Monthly</u> . Table titled, "Sales Prices of No. 2 Fuel Oil, by PAD District and Selected States."
1983	National Oceanic and Atmospheric Administration, U.S. Department of Commerce. <u>State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population (1980 Census)</u> . Historical Climatology Series 5-1, table titled, "1951-80 State Population Wgt'd Heating Degree Days."
1970-1983	Energy Information Administration, U.S. Department of Energy. <u>State Energy Data System</u> . Computer tape. Commercial sector distillate consumption.

8.2.2 Conversion Factor

1970-1983 Energy Information Administration, U.S. Department of Energy.
 State Energy Data Report. Appendix C, p. 667.

5.825 Million Btu per Barrel

8.2.3 Computational Procedures: Physical Unit State Prices, 1970-1982

Commercial sector distillate physical unit prices for 1970-1982 are calculated using Platt's prices assigned to states and commercial sector markups estimated from Energy Prices: 1960-73.

1. The first step is to compute the markups. Energy Prices contains single price estimates for small commercial users and two price estimates for large commercial users for 10 cities: Boston, MA; Albany, NY; New York, NY; Charlotte, NC; Washington, DC; Chicago, IL; Detroit MI; Minneapolis/St. Paul, MN; St. Louis, MO; and Seattle, WA. Before Equation 8.29 is executed, a simple average of the two large commercial prices is calculated for each city except for Albany and New York. In this case, all four large commercial prices will be averaged together, since cities are assigned to their respective states in Equation 8.29.

$$DFCCNZ = 1/2 (DFSCNZ + DFLCNZ) \quad (8.29)$$

where:

DFCCNZ = average commercial sector distillate price calculated for State ZZ from Energy Prices (c/gal)

DFSCNZ = No. 2 fuel oil price paid by small commercial users for State ZZ from Energy Prices (c/gal)

DFLCNZ = average of the No. 2 fuel oil prices paid by large commercial users for State ZZ from Energy Prices (c/gal)

2. For the 9 states covered by the Energy Prices data, the markup of the reported Energy Prices prices over the assigned Platt's prices (see Table 8.1) and the markup of the STEPS residential prices calculated above for 1970-1972 over the Platt's prices are calculated. The nine states involved are: District of Columbia, Illinois, Massachusetts, Michigan, Minnesota, Missouri, North Carolina, New York, and Washington.

$$DFCCTZ = (DFCCNZ / DFNCNZ) - 1 \quad (8.30)$$

$$DFRCTZ = [DFRCUZ / (DFNCNZ / 100)] - 1 \quad (8.31)$$

where:

DFCCTZZ = commercial sector retail markup for State ZZ (ratio)
DFNCNZZ = No. 2 fuel oil price assigned to State ZZ from Platt's
(c/gal)
DFRCTZZ = residential sector retail markup for State ZZ (ratio)
DFRCUZZ = final STEPS residential sector distillate price for
State ZZ (\$/gal)

3. At this point, residential and commercial sector retail markups have been computed for 9 states for each of the years 1970-1972. The next step is to calculate the average retail markup for the three year period for each sector. A simple average of the markup ratios is calculated:

$$DFCCRZZ = 1/3 \sum_{t=70}^{72} DFCCTZZ \quad (8.32)$$

$$DFRCRZZ = 1/3 \sum_{t=70}^{72} DFRCTZZ \quad (8.33)$$

where:

DFCCRZZ = average commercial sector retail markup for 1970-1972
for State ZZ (ratio)
DFRCRZZ = average residential sector retail markup for 1970-1972
for State ZZ (ratio)

4. The average commercial and residential sector retail markups for the nine available states (District of Columbia, Illinois, Massachusetts, Michigan, Minnesota, Missouri, North Carolina, New York, and Washington) are assigned to the other 42 states as shown in Table 8.3.
5. To translate the average commercial and residential markups for 1970-1972 into the estimated commercial sector retail markups to be used in STEPS for 1970-1982, the relationship between these two markups is used with the residential markups calculated for all 51 states for each year. The calculation of the residential markups is the same procedure used in Equation 8.31:

$$DFRCTZZ = [DFRCUZZ / (DFNCNZZ / 100)] - 1 \quad (8.34)$$

$$DFCCAZZ = (DFCCRZZ / DFRCRZZ) * DFRCTZZ \quad (8.35)$$

where:

DFRCTZZ = residential sector retail markup for State ZZ (ratio)
DFCCAZZ = commercial sector markup adjustment factor for
State ZZ (ratio)

TABLE 8.3. Assignment of Energy Prices Commercial Sector
Distillate Markups to States, 1970-1982

<u>State</u>	<u>Assigned City Markup</u>
AK	Seattle, WA
AL	Charlotte, NC
AR	St. Louis, MO
AZ	Seattle, WA
CA	Seattle, WA
CO	Minneapolis/St. Paul, MN
CT	Boston, MA
DC	Washington, DC
DE	Washington, DC
FL	Charlotte, NC
GA	Charlotte, NC
HI	Seattle, WA
IA	St. Louis, MO
ID	Seattle, WA
IL	Chicago, IL
IN	Chicago, IL
KS	St. Louis, MO
KY	Chicago, IL
LA	St. Louis, MO
MA	Boston, MA
MD	Washington, DC
ME	Boston, MA
MI	Detroit, MI
MN	Minneapolis/St. Paul, MN
MO	St. Louis, MO
MS	Charlotte, NC
MT	Minneapolis/St. Paul, MN
NC	Charlotte, NC
ND	Minneapolis/St. Paul, MN
NE	St. Louis, MO
NH	Boston, MA
NJ	Albany and New York, NY
NM	Seattle, WA
NV	Seattle, WA
NY	Albany and New York, NY
OH	Detroit, MI
OK	St. Louis, MO
OR	Seattle, WA
PA	Albany and New York, NY
RI	Boston, MA
SC	Charlotte, NC
SD	Minneapolis/St. Paul, MN
TN	Chicago, IL
TX	St. Louis, MO

TABLE 8.3 (CONT). Assignment of Energy Prices Commercial Sector
Distillate Markups to States, 1970-1982

<u>State</u>	<u>Assigned City Markup</u>
UT	Minneapolis/St. Paul, MN
VA	Washington, DC
VT	Boston, MA
WA	Seattle, WA
WI	Chicago, IL
WV	Washington, DC
WY	Minneapolis/St. Paul, MN

Source: Pacific Northwest Laboratory

6. The commercial sector adjustment factors for each state for each of the years 1970-1982 are used with the corresponding Platt's prices for 1970-1982 to calculate the final STEPS commercial sector physical unit prices:

$$DFCCUZZ = (1 + DFCCAZZ) * (DFNCNZZ / 100) \quad (8.36)$$

where:

DFCCUZZ = STEPS final commercial sector distillate price for
State ZZ (\$/gal)

8.2.4 Computational Procedures: Physical Unit State Prices, 1983

For 1983, physical commercial sector distillate prices in cents per gallon (excluding taxes) are available for 24 states and 7 PAD Districts from Petroleum Marketing Monthly (PMM) under the heading "Sales to End-Users: Commercial/Institutional Consumers." Platt's distillate price data assigned to states and state-level SEDS data are used to impute state prices from the PAD District prices for the 27 states that do not have prices in PMM. This procedure is described step-by-step below.

1. Monthly state physical unit prices from PMM are available for the following 24 states: Alaska, Connecticut, District of Columbia, Delaware, Idaho, Illinois, Indiana, Massachusetts, Maryland, Maine, Michigan, Minnesota, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Virginia, Vermont, Washington, Wisconsin, and West Virginia.
 - a. Several states are missing some monthly PMM commercial price data. The missing monthly prices are assigned prices or averages of prices for adjacent months as shown in Table 8.4.

TABLE 8.4. Imputation of Missing Monthly PMM Commercial/Institutional Distillate Prices, 1983

State	Missing Month	Assigned Monthly Price (or Average)
AK	January	February
DC	January	February
DE	January, February	March
ID	January	February
	May	April/June
	July	June/August
ME	January	February
MI	January, February	March
MN	January	February
NH	January	February
NJ	January	February
OH	January	February
OR	January	February
RI	January	February
VA	February	January/March
WI	January	February
WV	January, February	March

Source: Pacific Northwest Laboratory

- b. Annual physical unit prices are calculated for the 24 states from the monthly prices and state-level heating degree day monthly normals. Alaska, the District of Columbia, and Hawaii are assigned the monthly heating degree day normals for Minnesota, Maryland, and Florida, respectively.

$$DFCCUZZ = \left(\sum_{m=1}^{12} [(DFCIMZZ_m / 100) * HDZZ_m] \right) / \sum_{m=1}^{12} HDZZ_m \quad (8.37)$$

where:

DFCCUZZ = STEPS final commercial sector distillate price for State ZZ (\$/gal)

DFCIMZZ = commercial/institutional sector distillate price for State ZZ from PMM (c/gal)

HDZZ = monthly heating degree day normal for State ZZ (base 65 degrees F)

m = index for months

2. Physical unit state prices for the remaining 27 states are imputed from monthly PAD District prices from PMM for seven districts: Ia, Ib, Ic, II, III, IV, and V.

- a. PAD District IV is missing prices for January and July; the average price for June and August is assigned to July and the February price is assigned for January. Because the 24 states covered directly by PMM data completely encompass PAD Districts Ia and Ib, the missing January prices for these two regions do not have to be imputed.
- b. Average annual physical unit distillate prices for the commercial sector are calculated for PAD Districts Ic, II, III, IV, and V using the monthly PAD District price data from PMM and the PAD District estimated monthly heating degree day normals:

$$DFCCNWW = \left(\sum_{m=1}^{12} [(DFCIMWW_m / 100) * HDWW_m] \right) / \sum_{m=1}^{12} HDWW_m \quad (8.38)$$

where:

DFCCNWW = annual commercial sector distillate price for PAD District WW (\$/gal)

DFCIMWW = monthly commercial/institutional sector distillate price for PAD District WW from PMM (c/gal)

HDWW = average heating degree day monthly normal for PAD District WW from Equation 8.17 (base 65 degrees F)

m = index for months

- c. City-level distillate refinery and terminal prices from Platt's are assigned to states as shown in Table 8.1. The assigned state-level Platt's prices are volume-weighted into PAD District prices using state-level commercial sector consumption volume data from SEDS:

$$DFNCNWW = \left(\sum_{ZZ=1}^{N_{WW}} [(DFNCZZ_{WW} / 100) * DFCCPZZ_{WW}] \right) / \sum_{ZZ=1}^{N_{WW}} DFCCPZZ_{WW} \quad (8.39)$$

where:

DFNCNWW = estimated commercial sector distillate price based on Platt's for PAD District WW (\$/gal)

DFNCZZ = No. 2 fuel oil price assigned to State ZZ from Platt's (c/gal)

DFCCPZZ = commercial sector distillate consumption volume for State ZZ from SEDS (1000 bbls)

N_{WW} = number of States ZZ in PAD District WW

- d. An adjustment factor relating the PMM PAD District prices to the Platt's-based PAD District prices is calculated for PAD Districts Ic, II, III, IV, and V:

$$DFCCAWW = DFCCNWW / DFNCNWW \quad (8.40)$$

where:

DFCCAWW = commercial sector adjustment factor equal to the ratio of PMM to Platt's distillate prices for PAD District WW

- e. Annual physical unit distillate prices for the 27 states not explicitly covered by PMM state-level data are calculated using the assigned Platt's prices for each state and the PAD District-level adjustment factors:

$$DFCCUZZ = DFCCAWW * (DFNCNZZ_{WW} / 100) \quad (8.41)$$

where:

DFCCUZZ = STEPS final commercial sector distillate price for State ZZ (\$/gal)

8.2.5 Computational Procedures: Physical Unit U.S. Prices, 1970-1983

Commercial sector physical unit prices for the U.S. are calculated from the completed state-level physical unit prices and commercial sector distillate consumption data from SEDS:

$$DFCCUUS = \left(\sum_{ZZ=1}^{51} (DFCCUZZ * DFCCPZZ) \right) / \sum_{ZZ=1}^{51} DFCCPZZ \quad (8.42)$$

where:

DFCCUUS = STEPS final commercial sector distillate price for the U.S. (\$/gal)

DFCCPZZ = commercial sector distillate consumption for State ZZ from SEDS (1000 bbls)

8.2.6 Computational Procedures: Btu Prices, 1970-1983

Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor:

$$DFCCDZZ = (DFCCUZZ * 42) / 5.825 \quad (8.43)$$

where:

DFCCDZZ = STEPS final commercial sector distillate price for State ZZ or the U.S. (\$/MMBtu)

8.3 ELECTRIC UTILITY SECTOR

The STEPS electric utility price series for distillate contain prices equal to the average delivered cost of receipts at electric utilities. For 1973-1983, these prices are taken from Cost and Quality of Fuels for Electric Utility Plants, and for 1970-1972 prices from Statistical Year Book of the Electric Utility Industry are used with regression analysis. It is not clear whether or not these prices include any taxes. Both physical unit and Btu prices are developed directly from the data sources.

8.3.1 Data Sources

1970-1983	Edison Electric Institute. <u>Statistical Yearbook of the Electric Utility Industry</u> . Table titled, "Analysis of Fuel for Electric Generation -- Total Electric Utility Industry."
1973-1983	Energy Information Administration, U.S. Department of Energy. <u>Cost and Quality of Fuels for Electric Utility Plants</u> . Table 6 (1973 and 1974); Tables 5, 6, 12, 13 (1975-1979); Table 45 (1980-1982); Table 51 (1983).
1970-1973	Energy Information Administration, U.S. Department of Energy. <u>State Energy Data System</u> . Computer tape. Electric utility sector distillate consumption.

8.3.2 Conversion Factors

Both Btu and physical unit prices are calculated directly from data sources, so no explicit conversion factors are needed for any years for the electric utility sector.

8.3.3 Computational Procedures: 1973-1983

Physical unit and Btu prices for the years 1973-1982 are based directly on the physical unit and Btu prices reported in Cost and Quality of Fuels (C&Q). For 1973, 1974 and 1980-1983, both physical unit and Btu prices are taken directly from the data source and converted to STEPS units. For 1975-1979, weighted average physical unit and Btu prices are calculated from prices and consumption volumes reported separately for steam-electric plants and for combustion turbine and internal combustion units. Except for 1973, U.S. prices are also taken from Cost and Quality and changed to the appropriate units for STEPS. Because 1973 was the first year Cost and Quality was published, there are many states with missing data for this year. The imputation of these missing prices follows the same procedure as prices for 1970-1972 and is discussed below. The calculation of 1973 U.S. prices also follows the 1970-1972 procedure. No prices are imputed for 1974-1983, except for Hawaii (1974-1982), or for Alaska for 1970-1973; states with no distillate electric utility sector prices in STEPS are summarized by year in Table 8.5.

TABLE 8.5. States with No Distillate Electric Utility Sector
Prices Reported by STEPS, 1970-1983

<u>State</u>	<u>Years with No Reported Prices</u>
AK	1970-1983
CA	1983
ID	1970-1974, 1976, 1980-1983
ME	1974
MT	1974-1975, 1977, 1983
NH	1974
NJ	1974
RI	1976-1983
SD	1974
VT	1974, 1978, 1983
WA	1970-1971, 1974-1977

Source: Pacific Northwest Laboratory

1973-1974, 1983.

Btu prices in cents per million Btu and physical unit prices in dollars per barrel are taken directly from Cost and Quality and converted to dollars per million Btu and dollars per gallon, respectively. For 1974 and 1983, the calculations include the U.S., while for 1973 they do not.

$$DFEUZZ = DFSENZZ / 42 \quad (8.44)$$

$$DFEUDZZ = DFSEFZZ / 100 \quad (8.45)$$

where:

DFEUZZ = STEPS final electric utility sector distillate price for State ZZ or (1974, 1983) the U.S. (\$/gal)

DFSENZZ = physical price of fuel oil No. 2 delivered to steam electric plants from C&Q (\$/bbl)

DFEUDZZ = STEPS final electric utility sector distillate price for State ZZ or (1974, 1983) the U.S. (\$/MMBtu)

DFSEFZZ = Btu price of fuel oil No. 2 delivered to steam electric plants from C&Q (c/million Btu)

1975-1979.

Btu prices in cents per million Btu and physical unit prices in dollars per barrel are taken from Cost and Quality with their corresponding delivered quantities, weighted into overall prices, and converted to the appropriate STEPS units. These calculations apply equally to states and the U.S.

$$\text{DFEUZZ} = [(\text{DFSENZZ} / 42) * \text{DFSEVZZ}] + [(\text{DFCTNZZ} / 42) * \text{DFCTVZZ}] \\ / (\text{DFSEVZZ} + \text{DFCTVZZ}) \quad (8.46)$$

$$\text{DFEUDZZ} = [(\text{DFSEFZZ} / 100) * \text{DFSEVZZ}] + [(\text{DFCTFZZ} / 100) * \text{DFCTVZZ}] \\ / (\text{DFSEVZZ} + \text{DFCTVZZ}) \quad (8.47)$$

where:

DFSEVZZ = quantity of fuel oil No. 2 delivered to steam-electric plants in State ZZ or the U.S. from C&Q (1000 bbls)
 DFCTNZZ = price of fuel oil No. 2 delivered to combustion turbine and internal combustion plants in State ZZ or the U.S. from C&Q (\$/bbl)
 DFCTVZZ = quantity of fuel oil No. 2 delivered to combustion turbine and internal combustion plants in State ZZ or the U.S. from C&Q (1000 bbls)
 DFCTFZZ = price of No. 2 fuel oil delivered to combustion turbine and internal combustion plants in State ZZ or the U.S. from C&Q (c/MMBtu)

1980-1982.

For the 1980-1982 period, Btu and physical unit prices are reported in Cost and Quality for all reporting plants. These prices are changed to dollars per million Btu and to dollars per gallon for use in the STEPS series.

$$\text{DFEUZZ} = \text{DFEUNZZ} / 42 \quad (8.48)$$

$$\text{DFEUDZZ} = \text{DFEUFZZ} / 100 \quad (8.49)$$

where:

DFEUNZZ = price of No. 2 fuel oil delivered to all reporting plants in State ZZ or the U.S. from C&Q (\$/bbl)
 DFEUFZZ = price of No. 2 fuel oil delivered to all reporting plants in State ZZ or the U.S. from C&Q (c/MMBtu)

Imputation of Hawaii Prices: 1974-1982.

Since Cost and Quality does not cover the State of Hawaii (which does have distillate fuel usage in the electric utility sector reported in SEDS), prices for this state are imputed. The ratio of the reported Cost and Quality U.S. price and the Statistical Year Book U.S. price is multiplied by the Statistical Year Book Hawaii price for each year to estimate the Hawaii price reported in STEPS. Separate equations are used for physical unit and Btu prices.

$$\text{DFEUUHI} = [\text{DFEUUUS} / (\text{OLEUNUS} / 42)] * (\text{OLEUNHI} / 42) \quad (8.50)$$

$$\text{DFEUDHI} = [\text{DFEUDUS} / (\text{OLEUFUS} / 100)] * (\text{OLEUFHI} / 100) \quad (8.51)$$

where:

DFEUHI = STEPS final electric utility sector distillate price for Hawaii (\$/gal)

DFEUUS = STEPS final electric utility sector distillate price for the U.S. from C&O (\$/gal)

OLEUNUS = price for oil for the U.S. from Statistical Year Book (\$/bbl)

OLEUNHI = price for oil for Hawaii from Statistical Year Book (\$/bbl)

DFEUDHI = STEPS final electric utility sector distillate price for Hawaii (\$/MMBtu)

DFEUDUS = STEPS final electric utility sector distillate price for the U.S. (\$/MMBtu)

OLEUFUS = price for oil for the U.S. from Statistical Year Book (c/MMBtu)

OLEUFHI = price for oil for Hawaii from Statistical Year Book (c/MMBtu)

8.3.4 Computational Procedures: 1970-1973

Both Btu and physical unit prices for 1970-1972 and for states missing Cost and Quality data for 1973 (Connecticut, District of Columbia, Delaware, Maryland, Maine, Montana, New Hampshire, New Jersey, South Dakota, Tennessee, Vermont, Washington, West Virginia, and Wyoming) are estimated using data from Statistical Year Book of the Electric Utility Industry. U.S. prices are then computed using the completed state-level price series and electric utility distillate consumption data from SEDS.

1. Regression techniques are used to estimate the equations for estimating utility sector distillate prices for the 1970-1973 period. Separate equations are estimated for the calculation of Btu and physical unit prices, with each equation treating Alabama as a reference state. The regression equation uses Statistical Year Book state-level prices for 1974-1980 as the independent variable and the state-level STEPS prices calculated above for 1974-1980 as the dependent variable. Substituting physical unit and Btu prices for 1970-1973 from Statistical Yearbook into the following two equations yields the utility sector state-level distillate prices reported in STEPS. The coefficients for the state dummy variables are given in Tables 8.6 and 8.7.

$$\ln DFEUZZ = 0.2197 + 1.0613 \ln (OLEUNZZ / 42) + (c_{ZZ} * DUMZZ) \quad (8.52)$$

(3.4125) (38.9131)

$$R\text{-square} = 0.8520$$

$$\ln DFEUDZZ = 0.0983 + 1.0689 \ln (OLEUFZZ / 100) + (d_{ZZ} * DUMZZ) \quad (8.53)$$

(1.4867) (36.8191)

$$R\text{-square} = 0.8381$$

TABLE 8.6. Estimated Values for State Dummy Coefficients: Distillate
Electric Utility Sector Physical Unit Prices (Equation 8.52)

State	<u>C_{ZZ}</u>	<u>t Ratio</u>	State	<u>C_{ZZ}</u>	<u>t Ratio</u>
AL	(a)	(a)	MT	0.1347	1.4089
AR	-0.0424	-0.5199	NC	-0.0439	-0.5377
AZ	0.0158	0.1940	ND	0.1748	2.1408
CA	-0.1666	-2.0409	NE	0.1083	1.3264
CO	-0.0200	-0.2456	NH	0.1235	1.4552
CT	-0.0573	-0.7028	NJ	-0.0609	-0.7172
DC	-0.0290	-0.3352	NM	-0.0080	-0.0985
DE	-0.0067	-0.0822	NV	0.1272	1.5597
FL	0.0645	0.7911	NY	-0.0072	-0.0882
GA	0.0486	0.5961	OH	-0.1257	-1.5404
HI	0.0046	0.0557	OK	0.0610	0.7481
IA	-0.0345	-0.4231	OR	-0.0859	-1.0524
ID	0.1642	1.7146	PA	-0.0435	-0.5338
IL	-0.0876	-1.0739	RI	-0.0803	-0.6556
IN	-0.0857	-1.0508	SC	0.3343	4.0797
KS	0.1723	2.1070	SD	0.1257	1.4814
KY	0.0863	1.0582	TN	0.0206	0.2527
LA	0.0018	0.0225	TX	0.1174	1.4369
MA	0.0752	0.9222	UT	0.2026	2.4817
MD	0.0072	0.0884	VA	0.0748	0.9166
ME	0.1984	2.3375	VT	-0.0411	-0.4592
MI	-0.0151	-0.1857	WA	-0.0229	-0.2170
MN	0.0501	0.6138	WI	-0.0674	-0.8270
MO	0.0468	0.5735	WV	-0.1202	-1.4714
MS	0.1204	1.4744	WY	0.1733	2.1255

Source: Pacific Northwest Laboratory

TABLE 8.7. Estimated Values for State Dummy Coefficients: Distillate Electric Utility Sector Btu Prices (Equation 8.53)

State	<u>d_{ZZ}</u>	<u>t Ratio</u>	State	<u>d_{ZZ}</u>	<u>t Ratio</u>
AL	(a)	(a)	MT	-0.0298	-0.2973
AR	0.0217	0.2532	NC	-0.0318	-0.3716
AZ	0.0569	0.6657	ND	0.1780	2.0774
CA	-0.1080	-1.2623	NE	0.1558	1.8169
CO	0.0169	0.1973	NH	0.1918	2.1534
CT	-0.0058	-0.0684	NJ	-0.0233	-0.2619
DC	0.0272	0.3182	NM	0.0265	0.3098
DE	0.0454	0.5306	NV	0.1724	2.0137
FL	0.1331	1.5540	NY	0.0477	0.5574
GA	0.0982	1.1475	OH	-0.1065	-1.2446
HI	0.0615	0.7158	OK	0.0652	0.7613
IA	-0.0504	-0.5891	OR	-0.0901	-1.0522
ID	0.1333	1.3277	PA	-0.0036	-0.0423
IL	-0.0478	-0.5590	RI	-0.0302	-0.2352
IN	-0.0898	-1.0500	SC	0.3970	4.6083
KS	0.2354	2.7405	SD	0.2556	2.8694
KY	0.1131	1.3224	TN	0.0207	0.2416
LA	0.0573	0.6696	TX	0.1487	1.7334
MA	0.1384	1.6170	UT	0.2332	2.7209
MD	0.0619	0.7239	VA	0.1283	1.4983
ME	0.2574	2.8896	VT	-0.0561	-0.5975
MI	0.0207	0.2420	WA	0.0245	0.2207
MN	0.1102	1.2869	WI	-0.0707	-0.8262
MO	0.0627	0.7335	WV	-0.1471	-1.7164
MS	0.1881	2.1916	WY	0.1666	1.9475

Source: Pacific Northwest Laboratory

where:

OLEUNZZ = price of oil purchased for electric generation in State ZZ from Statistical Year Book (\$/bbl)

OLEUFZZ = price of oil purchased for electric generation in State ZZ from Statistical Year Book (c/MMBtu)

2. U.S. prices are computed for both the Btu and physical unit price series using the respective state-level prices and distillate electric utility sector consumption data from SEDS for weights:

$$DFEUUUS = \left(\sum_{ZZ=1}^{51} (DFEUZZ * DFEUPZZ) \right) / \sum_{ZZ=1}^{51} DFEUPZZ \quad (8.54)$$

$$DFEUDUS = \left(\sum_{ZZ=1}^{51} (DFEUDZZ * DFEUPZZ) \right) / \sum_{ZZ=1}^{51} DFEUPZZ \quad (8.55)$$

where:

DFEUUUS = STEPS final electric utility sector distillate price for the U.S. (\$/gal)

DFEUDUS = STEPS final electric utility sector distillate price for the U.S. (\$/MMBtu)

DFEUPZZ = electric utility sector distillate consumption for State ZZ from SEDS (1000 bbls)

8.4 INDUSTRIAL SECTOR

The STEPS industrial sector distillate price series are developed using several different data sources and computational procedures, depending on the years involved. For 1970-1982, prices reported in STEPS are the average cost of distillate to manufacturing firms; it is not clear whether or not these prices contain any taxes. For 1983, sales prices of No. 2 fuel oil to industrial consumers (excluding taxes) are taken from Petroleum Marketing Monthly. Regardless of data source, physical unit prices for states and the U.S. are calculated first, then Btu prices are computed using the physical unit prices and the conversion factor.

8.4.1 Data Sources

1971, 1977 1981	Bureau of the Census, U.S. Department of Commerce. <u>Census of Manufactures</u> . Table 4 (1971), and Table 3 (1977 and 1981).
1974-1976, 1978-1980	Bureau of the Census, U.S. Department of Commerce. <u>Annual Survey of Manufactures</u> . Table 3.
1970-1983	McGraw-Hill, Inc. <u>Platt's Oil Price Handbook and Oilmanac</u> . Refinery and terminal prices for No. 2 fuel oil.

- 1983 Energy Information Administration, U.S. Department of Energy. Petroleum Marketing Monthly. Table titled, "Sales Prices of No. 2 Fuel Oil, by PAD District and Selected States."
- 1970-1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape. Industrial sector distillate consumption.

8.4.2 Conversion Factor

- 1970-1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 667.
- 5.825 Million Btu per Barrel

8.4.3 Computational Procedures: Physical Unit State Prices, 1970-1981

For the years 1970-1981, industrial sector distillate prices are either calculated directly from cost and quantity data from Annual Survey of Manufactures (ASM) or Census of Manufactures (CM), or are imputed using the relationship of ASM/CM data to No. 2 fuel oil price data from Platt's.

1. For 1971 and 1974-1981, industrial sector physical unit prices are calculated as average cost per unit of sales from cost and quantity data from ASM or CM. It is not clear whether or not these prices include any taxes.

$$DFICUZZ = (DFMFCZZ / DFMFVZZ) * 1000 / 42 \quad (8.56)$$

where:

DFICUZZ = STEPS final industrial sector distillate price for State ZZ (\$/gal)

DFMFCZZ = cost of distillate purchased for State ZZ from ASM/CM (\$million)

DFMFVZZ = quantity of distillate purchased for State ZZ from ASM/CM (1000 bbls)

2. Six states are missing some ASM cost and quantity data for the 1974-1981 period. Cost and quantity data for these states are estimated as the simple average of the cost and quantity data for their adjacent states. The states, the years for which data are imputed, and the adjacent states used to make the estimation are all shown in Table 8.8. There are no missing prices for 1971. The estimated cost and quantity data are used in Equation 8.56 to estimate final STEPS prices.

$$DFMFCZZ_b = 1/N \sum_{a=1}^N DFMFCZZ_a \quad (8.57)$$

TABLE 8.8. Adjacent State Assignments for the Imputation of
Missing Data: Distillate Industrial Sector, 1974-1981

<u>Missing State</u>	<u>Years</u>	<u>Adjacent States Assigned</u>
Hawaii	1979-1981	California
North Dakota	1979-1981	Minnesota, Montana, South Dakota
New Mexico	1974-1979	Arizona, Colorado, Texas
Nevada	1974-1981	Arizona, California, Idaho, Oregon, Utah
Oklahoma	1974-1978	Arkansas, Colorado, Kansas, Missouri, Texas
Wyoming	1974-1981	Colorado, Idaho, Montana, Nebraska, South Dakota, Utah

Source: Pacific Northwest Laboratory

$$DFMFVZZ_b = 1/N \sum_{a=1}^N DFMFVZZ_a \quad (8.58)$$

where:

b = index for State ZZ with missing data for 1971, 1974-1981

a = index for State ZZ with data and adjacent to the State ZZ with missing data

N = number of states adjacent to State ZZ with missing data

3. Since ASM and CM data are not available for 1970, 1972, or 1973, prices for these years must be estimated. Physical unit prices are based on the ratio of 1971 CM prices to the 1971 assigned Platt's prices (see Table 8.1). The resulting ratios for each state are used with the Platt's assigned prices for 1970, 1972, and 1973 to estimate STEPS prices.
 - a. The first step in the estimation of industrial sector distillate STEPS prices is to calculate state-level ratios between STEPS prices calculated from the 1971 CM cost and quantity data and the 1971 assigned Platt's prices. There are no missing states in either of these two sets of prices.

$$DFICSZZ = DFICUZZ / (DFNCNZ / 100) \quad (8.59)$$

where:

DFICSZZ = ratio of the STEPS 1971 price to the assigned Platt's 1971 price for State ZZ

DFNCNZ = No. 2 fuel oil price assigned to State ZZ from Platt's (c/gal)

- b. State-level physical unit prices for 1970, 1972, and 1973 are estimated using the 1971 ratio and the assigned state-level Platt's prices for each respective year:

$$DFICUZZ = DFICSZZ * (DFNCNZZ / 100) \quad (8.60)$$

where:

DFICUZZ = STEPS final industrial sector distillate price for State ZZ (\$/gal)

8.4.4 Computational Procedures: Physical Unit State Prices, 1982

In 1984, the Bureau of the Census announced that detailed fuel cost and quantity information would no longer be published in the Annual Survey of Manufactures and probably not in the Census of Manufactures. In addition, Petroleum Marketing Monthly, the source for 1983 industrial sector distillate price data, does not contain 1982 prices. Because of this lack of price data, the 1982 STEPS industrial sector distillate prices are imputed based on the relationship of industrial sector prices to electric utility sector prices for 1978-1981. The 1983 prices are not used in the imputation because they exclude taxes, while the 1978-1981 prices may include taxes.

1. The states of Alaska (1978-1982), Idaho (1980-1982), Rhode Island (1978-1982), and Vermont (1978) are missing electric utility data for 1978-1982 period. To calculate the average ratios in Equation 8.61, Idaho is assigned Montana electric utility prices, Rhode Island is assigned Connecticut prices, Alaska is assigned Washington prices, and Vermont is assigned the Maine price.
2. The average 1978-1981 ratios of industrial to electric utility sector distillate prices are calculated for each state:

$$DFICRZZ = 1/4 \sum_{t=78}^{81} (DFICUZZ_t / DMEUZZ_t) \quad (8.61)$$

where:

DFICRZZ = average ratio of STEPS industrial sector distillate prices to STEPS electric utility sector distillate prices for State ZZ (ratio)

DFICUZZ = STEPS final industrial sector distillate price for State ZZ (\$/gal)

DMEUZZ = STEPS final electric utility sector distillate price for State ZZ with imputations for missing states (\$/gal)

t = index for years (1978-1981)

3. Prices for 1982 are computed using the average ratios and STEPS electric utility data for 1982. The imputed prices for Alaska, Idaho, and Rhode Island for 1982 are described in (1) above.

$$DFICUZZ = DFICRZZ * DFEUZZ \quad (8.62)$$

where:

DFICUZZ = STEPS final industrial sector distillate price for State ZZ in 1982

8.4.5 Computational Procedures: Physical Unit State Prices, 1983

For 1983, physical unit industrial sector distillate prices in cents per gallon (excluding taxes) are available for 24 states and 7 PAD Districts from Petroleum Marketing Monthly (PMM) under the heading "Sales to End-Users: Industrial Consumers." Platt's distillate price data assigned to states and state-level SEDS consumption data are used to impute state prices from the PAD District prices for the 27 states that do not have prices in PMM. This procedure is described step-by-step below.

1. Monthly state physical unit prices from PMM are available for the following 24 states: Alaska, Connecticut, District of Columbia, Delaware, Idaho, Illinois, Indiana, Massachusetts, Maryland, Maine, Michigan, Minnesota, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Virginia, Vermont, Washington, Wisconsin, and West Virginia.
 - a. Several of these states are missing some monthly PMM industrial price data. The missing monthly prices are assigned prices or averages of prices for adjacent months as shown in Table 8.9.
 - b. Annual physical unit prices are calculated for the 24 states covered directly by PMM as simple averages of the monthly prices:

$$DFICUZZ = 1/12 \sum_{m=1}^{12} (DFICMZZ_m / 100) \quad (8.63)$$

where:

DFICUZZ = STEPS final industrial sector distillate price for State ZZ (\$/gal)

DFICMZZ = monthly industrial sector distillate price for State ZZ from PMM (c/gal)

m = index for months

TABLE 8.9. Imputation of Missing PMM Monthly Prices:
Distillate Industrial Sector, 1983

<u>State</u>	<u>Missing Month</u>	<u>Assigned Month (or Average)</u>
AK	January-March	April
DC	January-October	MD January-October
DE	January	February
	December	November
ID	January-October, December	[Calculated as for other PAD IV States]
IL	January	February
MD	January, February	March
ME	January	February
	March, April	February/May Average
MI	January	February
NH	January, February	March
	June, July	May/August Average
NJ	January	February
NY	January	February
DH	January	February
OR	January	February
	August-November	WA August-November
RI	January	February
VA	January	February
VT	January, February	March
WA	January	February
WI	January	February
WV	January, February	March

Source: Pacific Northwest Laboratory

2. Physical unit state prices for the remaining 27 states are imputed from monthly PAD District prices from PMM for seven districts: Ia, Ib, Ic, II, III, IV, and V.
 - a. PAD Districts Ic and IV are both assigned the average of their respective January and March prices for their missing February prices. Although some monthly prices are missing for Districts Ia and Ib, these are completely covered state-level data, so no imputation is needed.
 - b. Average annual physical unit distillate prices for the industrial sector are calculated for PAD Districts Ic, II, III, IV, and V using simple averages of the monthly PAD District price data from PMM:

$$DFICNWW = 1/12 \sum_{m=1}^{12} (DFICMWW_m / 100) \quad (8.64)$$

where:

DFICNWW = annual industrial sector distillate price for PAD District WW (\$/gal)

DFICMWW = monthly industrial sector distillate price for PAD District WW from PMM (c/gal)

m = index for months

- c. City-level distillate refinery and terminal prices from Platt's are assigned to states as shown in Table 8.1. The assigned state-level Platt's prices are volume-weighted into PAD District prices using state-level industrial sector consumption volume data from SEDS:

$$DFNINWW = \frac{\sum_{ZZ=1}^{N_{WW}} [(DFNCNZZ_{WW} / 100) * DFICPZZ_{WW}]}{\sum_{ZZ=1}^{N_{WW}} DFICPZZ_{WW}} \quad (8.65)$$

where:

DFNINWW = estimated industrial sector distillate price based on Platt's for PAD District WW (\$/gal)

DFNCNZZ = distillate price assigned to State ZZ from Platt's (c/gal)

DFICPZZ = industrial sector distillate consumption volume for State ZZ from SEDS (1000 bbls)

N_{WW} = number of States ZZ in PAD District WW

- d. An adjustment factor relating the PMM PAD District prices to the Platt's-based PAD District prices is calculated for PAD Districts Ic, II, III, IV, and V:

$$DFICAWW = DFICNWW / DFNINWW \quad (8.66)$$

where:

DFICAWW = industrial sector adjustment factor equal to the ratio of PMM to Platt's distillate prices for PAD District WW

- e. Annual physical unit prices for the 27 states not explicitly covered by PMM state-level data are calculated using the assigned Platt's prices for each state and the PAD District-level adjustment factors:

$$DFICUZZ = DFICAWW * (DFNCNZZ_{WW} / 100) \quad (8.67)$$

where:

DFICUZZ = STEPS final industrial sector distillate price for State ZZ (\$/gal)

8.4.6 Computational Procedures: Physical Unit U.S. Prices, 1970-1983

Physical unit prices for the U.S. are computed using the completed state physical unit prices and the distillate industrial consumption data from SEDS:

$$DFICUUS = \left(\sum_{ZZ=1}^{51} (DFICUZZ * DFICPZZ) \right) / \sum_{ZZ=1}^{51} DFICPZZ \quad (8.68)$$

where:

DFICUUS = STEPS final industrial sector distillate price for the U.S. (\$/gal)

DFICPZZ = industrial sector distillate consumption for State ZZ from SEDS (1000 bbls)

8.4.7 Computational Procedures: Btu Prices, 1970-1983

Btu prices for states and the U.S. are calculated using the completed STEPS physical unit price series and the conversion factor:

$$DFICDZZ = (DFICUZZ * 42) / 5.825 \quad (8.69)$$

where:

DFICDZZ = STEPS final industrial sector distillate price for State ZZ or the U.S. (\$/MMBtu)

9.0 MOTOR GASOLINE

The STEPS motor gasoline price series cover the transportation sector with prices in dollars per gallon and dollars per million Btu. The prices in this series are retail prices (usually service station prices) including taxes. Physical unit prices are calculated from the data sources, while Btu prices are computed using the completed physical unit price series and the conversion factor. The development of the STEPS motor gasoline price series is described below only for the year 1983; this is the only year for which data sources and calculations have been verified. For information about the development of the STEPS motor gasoline price series for 1970-1982, the reader should see State Energy Price System (Volume I) and State Energy Price System: 1982 Update.

9.1 DATA SOURCES

- 1983 Energy Information Administration, U.S. Department of Energy. Petroleum Marketing Monthly. Table titled, "Refiner and Gas Plant Operator Sales Prices of Finished Motor Gasoline, by Type of Seller and PAD District and State."
- 1983 Federal Highway Administration, U.S. Department of Transportation. Highway Statistics. Tables MF-26 (monthly consumption volumes) and MF-121T (taxes).
- 1983 Bureau of Labor Statistics, U.S. Department of Labor. Consumer Prices: Energy. Computer printouts of gasoline prices (obtained directly from BLS).
- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape. Transportation sector motor gasoline consumption data.

9.2 CONVERSION FACTOR

- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 667.

5.253 Million Btu per Barrel

9.3 COMPUTATIONAL PROCEDURES

Motor gasoline physical unit prices are based on monthly state-level price data available from Petroleum Marketing Monthly (PMM) or from Consumer Prices: Energy (CPI). Where necessary, state taxes are added to the monthly prices. Monthly gasoline consumption volumes from Highway Statistics are then used to combine monthly prices into annual prices for each state. The U.S. physical unit price is calculated using the completed physical unit state prices and annual state-level consumption volumes from SEDS. Btu prices are calculated using the completed physical unit price series and the conversion factor.

1. Monthly state-level gasoline prices are available for all states except Alaska, the District of Columbia, and Hawaii from PMM. The average sales price (excluding taxes) of finished motor gasoline to end-users through company outlets is used, based on the assumption that these prices approximate retail gasoline prices. Finished motor gasoline in this case includes leaded, unleaded, and gasohol.
 - a. A few states are missing monthly prices for specific months. Price assignments for missing months are given in Table 9.1.

TABLE 9.1. Assignments for Missing Monthly Gasoline Price Data from Petroleum Marketing Monthly, 1983

<u>Missing State</u>	<u>Missing Month(s)</u>	<u>Price Assigned</u>
AR	February	AR January
MD	January	DE January
	February	DE February
	September	DE September
	October	DE October
	November	DE November
	December	DE December
ME	January, February	ME March
MT	January, February	MT March
NM	April	NM May
SD	February	SD January
VT	January, February, March, April	VT May
WY	January, February	WY March

Source: Pacific Northwest Laboratory

- b. Because the PMM prices exclude taxes, taxes must be added to the reported prices. Monthly state-level tax information is taken from Highway Statistics and is added to the PMM prices as follows:

$$MGACGZZ_m = (MG[MON]ZZ_m + MGTAXZZ_m) / 100 \quad (9.1)$$

where:

MGACGZZ = monthly motor gasoline price, including taxes, for State ZZ (\$/gal)

MG[MON]ZZ = monthly motor gasoline price, excluding taxes, for State ZZ from PMM (c/gal)

MGTAXZZ = monthly tax on motor gasoline for State ZZ from Highway Statistics (c/gal)

m = index for months

2. Monthly motor gasoline prices for Alaska, the District of Columbia, and Hawaii are taken directly from CPI, since these prices already include taxes.

$$MGACGZZ_m = MGACMZZ_m \quad (9.2)$$

where:

MGACGZZ = monthly motor gasoline price, including taxes, for State ZZ (\$/gal)

MGACMZZ = monthly motor gasoline price, including taxes, for State ZZ from CPI (\$/gal)

m = index for months

3. Annual physical unit prices for all 51 states are calculated from the monthly gasoline prices calculated above and monthly gasoline consumption volumes for states from Highway Statistics:

$$MGACUZZ = \left(\sum_{m=1}^{12} (MGACGZZ_m * MGHWZZ_m) \right) / \sum_{m=1}^{12} MGHWZZ_m \quad (9.3)$$

where:

MGACUZZ = STEPS final transportation sector motor gasoline price for State ZZ (\$/gal)

MGHWZZ = highway use gasoline consumption volume for State ZZ from Highway Statistics (1000 gal)

m = index for months

4. The physical unit U.S. price is computed using the completed physical unit state prices and annual state-level motor gasoline consumption data for the transportation sector from SEDS:

$$MGACUUS = \left(\sum_{ZZ=1}^{51} (MGACUZZ * MGACPZZ) \right) / \sum_{ZZ=1}^{51} MGACPZZ \quad (9.4)$$

where:

MGACUUS = STEPS final transportation sector motor gasoline price
for the U.S. (\$/gal)

MGACPZZ = transportation sector motor gasoline consumption for
State ZZ from SEDS (1000 bbls)

5. Btu prices for states and the U.S. are computed using the completed STEPS physical unit price series and the conversion factor:

$$MGACDZZ = (MGACUZZ * 42) / 5.253 \quad (9.5)$$

where:

MGACDZZ = STEPS final transportation sector motor gasoline price
for State ZZ or the U.S. (\$/MMBtu)

10.0 DIESEL FUEL

The STEPS diesel price series cover the transportation sector only. The prices reported are the retail prices paid by farmers in both dollars per gallon and dollars per million Btu. No information about whether or not these prices include taxes is available from the data sources. For all the years in the 1970-1983 period, physical unit prices are calculated from the data sources, while Btu prices are computed using the completed physical unit price series and the conversion factor.

10.1 DATA SOURCES

- 1970-1983 Crop Reporting Board, U.S. Department of Agriculture.
Agricultural Prices. Table generally titled, "Motor Supplies:
Average Price Paid by Farmers for Motor Fuel," for 1970-1979,
and "Diesel Fuel: Average Price Paid by States," for 1980-1983.
- 1970-1983 Federal Highway Administration, U.S. Department of
Transportation. Highway Statistics. Table MF-25 for 1970-1983;
this table is not included in the 1976 volume, but is publicly
available directly from the Federal Highway Administration.

10.2 CONVERSION FACTOR

- 1970-1983 Energy Information Administration, U.S. Department of Energy.
State Energy Data Report. Appendix C, distillate fuel oil.
- 5.825 Million Btu per Barrel

10.3 COMPUTATIONAL PROCEDURES

Physical unit prices for states and the U.S. are calculated using consumption volume data from Highway Statistics to weight the monthly or quarterly Agricultural Prices prices into annual diesel prices for STEPS. Btu prices are then calculated using the completed physical unit price series and the conversion factor.

10.3.1 Physical Unit Prices: 1970-1976

1. Quarterly prices from Agricultural Prices and monthly special fuels volume data from Highway Statistics are collected for states and the U.S.
 - a. Prices for 1970-1972 are reported in cents per gallon and must be converted to dollars per gallon. Prices for 1973-1976 are already reported in dollars per gallon.
 - b. For 1971-1973, state-level prices are not available for Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont. Each of these states is assigned the New England price for these three years.
 - c. The third quarter Delaware price is assigned to the missing fourth quarter Delaware price in 1972.
 - d. The combined Maryland/Delaware prices reported in 1973 are assigned equally and identically to each of these two states.
 - e. For 1970-1976, no prices are available for Alaska and the District of Columbia. No prices are developed for Alaska, while Maryland (or Maryland/Delaware) prices are assigned to the District of Columbia.
2. The monthly special fuels volumes for each of the years 1970-1976 are converted into quarterly volumes by summing the months for each respective quarter. Since no Alaska prices are developed, the monthly consumption volumes for this state are set equal to zero for all the years 1970-1976.

$$DLHWXZZ_q = \sum_{m=1}^3 DLHWYZZ_{q,m} \quad (10.1)$$

where:

DLHWXZZ = quarterly volume of special fuels used in State ZZ or the U.S. (1000 gal)

DLHWYZZ = monthly volume of special fuels used in State ZZ or the U.S. from Highway Statistics (1000 gal)

q = index for quarters

m = index for months

3. The volume-weighted annual diesel physical unit prices for states and the U.S. are calculated using the quarterly weights and quarterly prices. The equation for 1970-1972 is as follows:

$$DLACUZZ = \left(\sum_{q=1}^4 [(DLAQZZ_q * DLHWXZZ_q) / 100] \right) / \sum_{q=1}^4 DLHWXZZ_q \quad (10.2)$$

where:

DLACUZZ = STEPS final transportation sector diesel price for State ZZ or the U.S. (\$/gal)

DLAQZZ = quarterly diesel price for State ZZ or the U.S. from Agricultural Prices (c/gal)

4. The volume-weighted annual diesel prices for 1973-1976 are calculated as follows:

$$DLACUZZ = \left(\sum_{q=1}^4 (DLAQZZ_q * DLHWXZZ_q) \right) / \sum_{q=1}^4 DLHWXZZ_q \quad (10.3)$$

where:

DLACUZZ = STEPS final transportation sector diesel price for State ZZ or the U.S. (\$/gal)

DLAQZZ = quarterly diesel price for State ZZ or the U.S. from Agricultural Prices (\$/gal)

10.3.2 Physical Unit Prices: 1977-1983

1. Monthly prices from Agricultural Prices and monthly special fuels consumption volume data from Highway Statistics are collected for states and the U.S. No prices are developed for Alaska for any of the years 1977-1983, and Maryland prices are assigned to the District of Columbia. Monthly consumption volumes for Alaska are set equal to zero for all the years 1977-1983 because no prices are developed for these years.
2. The volume-weighted annual diesel physical unit prices for states and the U.S. are calculated using the monthly Agricultural Prices price data and the monthly Highway Statistics volume data:

$$DLACUZZ = \left(\sum_{m=1}^{12} (DLAGMZZ_m * DLHWYZZ_m) \right) / \sum_{m=1}^{12} DLHWYZZ_m \quad (10.4)$$

where:

DLACUZZ = STEPS final transportation sector diesel price for State ZZ or the U.S. (\$/gal)

DLAGMZZ = monthly diesel price for State ZZ or the U.S. from Agricultural Prices (\$/gal)

DLHWYZZ = consumption volume of special fuels for State ZZ or the U.S. from Highway Statistics (1000 gal)

m = index for months

10.3.3 Btu Prices: 1970-1983

Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor:

$$DLACDZZ = (DLACUZZ * 42) / 5.825 \quad (10.5)$$

where:

DLACDZZ = STEPS final transportation sector diesel price for
State ZZ or the U.S. (\$/MMBtu)

11.0 KEROSENE AND JET FUEL

The STEPS kerosene and jet fuel price series cover the residential, industrial, transportation, and electric utility sectors, with prices in dollars per gallon and dollars per million Btu. The residential and industrial sector series are based on prices for kerosene only, the transportation sector is based on prices for jet fuel, and the electric utility sector is based on prices for both kerosene and jet fuel. Since types of prices and computational procedures vary significantly from sector to sector, the development of 1983 prices for each sector is discussed separately below; note, however, that there are no electric utility sector prices developed for 1983, due to a lack of data. Descriptions of data sources and computational procedures for 1970-1982 can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update. The kerosene and jet fuel prices reported in Appendices B and C are from previous versions of STEPS and have not been checked for reproducibility.

11.1 RESIDENTIAL SECTOR

11.1.1 Data Sources

1975-1976	Crop Reporting Board, U.S. Department of Agriculture. <u>Agricultural Prices</u> . Table titled, "Household Supplies: Average Price Paid by Farmers for Lawn Mowers and Petroleum Products."
1975-1976, 1983	Bureau of Labor Statistics, U.S. Department of Labor. <u>Producer Prices and Price Indexes: Annual Supplement</u> . Commodity code 0572.
1978-1981	Energy Information Administration, U.S. Department of Energy. <u>Retail Sales and Inventories of Fuel Oil</u> . Table 2.
1983	Energy Information Administration, U.S. Department of Energy. <u>State Energy Data System</u> . Computer tape. Residential sector kerosene consumption data.

11.1.2 Conversion Factor

1983 Energy Information Administration, U.S. Department of Energy.
 State Energy Data Report. Appendix C, p. 667.

5.670 Million Btu per Barrel

11.1.3 Computational Procedures

The STEPS residential sector kerosene price series for 1983 is based on kerosene base prices and indexes from Producer Prices and Indexes (PPI) and an adjustment factor that accounts for the relationship between PPI and Agricultural Prices prices for quarters where the two series overlap (third quarter of 1975 to fourth quarter of 1976). These prices are approximately the retail prices paid by farmers for kerosene and it is not clear whether or not they include taxes. The Agricultural Prices data is used to estimate residential kerosene prices because it is available at the state-level (while PPI data is available only at the Census Division level) and because it includes some residential end use. Once state-level physical unit kerosene prices are developed, physical unit prices for the U.S. are calculated using the state prices and state residential kerosene consumption data from SEDS. Btu prices for states and the U.S. are calculated from the completed physical unit price series and the conversion factor.

1. The first step in the calculation of prices for 1983 is to compute the adjustment factor relating PPI and Agricultural Prices data. Both of these two data sources report prices beginning with the third quarter of 1975 (1975.3) and ending with the fourth quarter of 1976 (1976.4). The adjustment factor will be the average of these six quarters.
 - a. Quarterly physical unit kerosene prices are available directly from Agricultural Prices for 1975.3 through 1976.4. Maryland prices are assigned for the missing District of Columbia prices; no prices are imputed for missing Alaska prices.
 - b. Since the PPI prices and indexes for 1975.3 through 1976.4 are available only on a monthly basis, quarterly prices must be calculated. This is done using the July 1975 base prices and the respective monthly indexes for those months contained in the 1975.3 to 1976.4 period (July 1975 through December 1976). The PPI prices are calculated for the nine Census Divisions as follows:

$$KSNCMXX_m = (KSNCIXX_m / 100) * KSNCJXX \quad (11.1)$$

where:

KSNCMXX = kerosene monthly price for Census Division XX (\$/gal)

KSNCIXX = kerosene monthly price index for Census Division XX
 from PPI

KSNCJXX = kerosene July 1975 base price for Census Division XX
 from PPI (\$/gal)

m = index for months

- c. The Census Division monthly prices calculated in Equation 11.1 are assigned equally and identically to each state within its respective Census Division:

$$KSNMZZ_{XX,m} = KSNMXX_m \quad (11.2)$$

where:

$KSNMZZ$ = kerosene monthly price for State ZZ in Census Division XX (\$/gal)

m = index for months

- d. In order to combine the monthly PPI-based state-level prices into weighted average annual state prices, monthly quantity weights are calculated from data available in Retail Sales and Inventories of Fuel Oil. The "other distillate oil" volumes reported for November 1978 through March of 1981 are simply averaged by month using whatever consumption data are available for each month for each PAD District. The variation in data availability results in some months with averages based on three data points while others are based on one or two data points. The Retail Sales data and the resulting monthly averages are shown in Table 11.1. Each month's share of average annual sales (result is a fraction) is calculated by PAD District from the average monthly sales figures shown in Table 11.1. These shares, which are the monthly weights used, are then assigned to each and every state within each respective PAD District.

$$KSNCSZZ_{WW,m} = KSNVWW_m / \sum_{m=1}^{12} KSNVWW_m \quad (11.3)$$

where:

$KSNCSZZ$ = share of average kerosene sales in State ZZ of PAD District WW

$KSNVWW$ = average monthly retail sales of other distillate fuel oil for PAD District WW from Table 11.1 (1000 bbls)

m = index for months

- e. Volume-weighted quarterly PPI-based prices for states are calculated using the monthly volume weights developed in Equation 11.3:

$$KSNQZZ_q = \left(\sum_{m=1}^3 (KSNMZZ_{q,m} * KSNCSZZ_{q,m}) \right) / \sum_{m=1}^3 KSNCSZZ_{q,m} \quad (11.4)$$

where:

$KSNQZZ$ = kerosene quarterly price for State ZZ (\$/gal)

m = index for months

TABLE 11.1 Other Distillate Sales by PAD Districts and
Monthly Average Sales (1000 barrels)

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<u>PAO 1a</u>												
1978											453	610
1979	792	789	522	350	183	119	77	120	156	227	335	470
1980	631	651	465	228	141	105	55	61	116	208	382	646
1981	774	481	389									
Avg	732	640	459	289	162	112	66	91	136	218	390	575
<u>PAD 1b</u>												
1978											924	1429
1979	2092	1898	1444	897	445	460	399	356	422	728	937	1220
1980	1556	1508	1179	751	466	276	231	275	309	633	845	1334
1981	1763	1320	1145									
Avg	1804	1575	1256	824	456	368	315	316	366	681	902	1328
<u>PAD 1c</u>												
1978											307	587
1979	930	839	361	139	84	98	127	114	157	253	284	520
1980	664	668	351	105	50	37	34	68	97	239	294	558
1981	753	417	213									
Avg	782	641	308	122	67	68	81	91	127	246	295	555
<u>PAD 2</u>												
1978												
1979					163	135	90	101	142	268	369	475
1980	561	518	372	198	103	85	54	70	129	244	281	442
1981	516	405	273									
Avg	539	462	323	198	133	110	72	86	136	256	325	459

TABLE 11.1 (contd.)

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<u>PAD 3</u>												
1978												
1979	1	1	1	0	0	1	0.05	1	0	0.5	0.5	1
1980	1	1	1	0	0	0	0	0.5	0.5	0.5	0.5	1
1981	1	1	1									
Avg	1	1	1	0	0	0.5	0.25	0.75	0.25	0.5	0.5	1
<u>PAD 4</u>												
1978												
1979			4	2	2	2	1	1	2	3	4	5
1980	6	6	2	2	1	1	2	2	2	4	5	8
1981	7	6	5									
Avg	6.5	6	3.7	2	1.5	1.5	1.5	1.5	2	3.5	4.5	6.5
<u>PAD 5</u>												
1978												
1979						22	19	77	31	37	65	81
1980	89	69	51	31	21	15	18	21	27	45	46	79
1981	68	55	41									
Avg	79	62	46	31	21	19	19	49	29	41	56	80

- f. The adjustment factor relating PPI and Agricultural Prices data is calculated as follows:

$$KSRCZZ = 1/6 \sum_{q=1}^6 (KSAGQZZ_q / KSNCQZZ_q) \quad (11.5)$$

where:

KSRCZZ = adjustment factor comparing quarterly prices for PPI and Agricultural Prices for State ZZ (ratio)

KSAGQZZ = kerosene quarterly prices for State ZZ from Agricultural Prices (\$/gal)

q = index for quarters

2. The next step in the calculation of residential kerosene prices for 1983 is to calculate monthly state-level prices from PPI kerosene Census Division data for 1983.

- a. Monthly Census Division PPI prices are computed using the July 1975 base prices and the monthly price indexes for 1983:

$$KSNCMXX_m = (KSNCIXX_m / 100) * KSNCJXX \quad (11.6)$$

where:

KSNCMXX = kerosene monthly price for Census Division XX (\$/gal)

KSNCIXX = kerosene monthly price index for Census Division XX from PPI

KSNCJXX = kerosene July 1975 base price for Census Division XX from PPI (\$/gal)

m = index for months

- b. The Census Division monthly prices are assigned equally and identically to each state within the respective Census Division:

$$KSNCMZZ_{XX,m} = KSNCMXX_m \quad (11.7)$$

where:

KSNCMZZ = kerosene monthly price for State ZZ in Census Division XX (\$/gal)

m = index for months

3. The next step is the calculation of annual physical unit state prices.

- a. Annual PPI-based physical unit prices for states are computed from the monthly PPI prices (KSNCMZZ) and the monthly volume weights from Equation 11.3 (KSNCZZ):

$$KSRCNZZ = \left(\sum_{m=1}^{12} (KSNCMZ_m * KSNCZZ_m) \right) / \sum_{m=1}^{12} KSNCZZ_m \quad (11.8)$$

where:

KSRCNZZ = kerosene annual price for State ZZ (\$/gal)

KSNCZZ = share of average kerosene sales in State ZZ from Equation 11.3 (fraction)

m = index for months

- b. Final STEPS physical unit residential sector kerosene prices for states are calculated using the adjustment factor (KSRCZZ) and the annual PPI-based state prices:

$$KSRCUZZ = KSRCZZ * KSNCNZZ \quad (11.9)$$

where:

KSRCUZZ = STEPS final residential sector kerosene price for State ZZ (\$/gal)

KSRCZZ = adjustment factor (ratio) relating PPI and Agricultural Prices data from Equation 11.5

4. Physical unit prices for the U.S. are calculated using the final state-level physical unit state prices and residential sector kerosene consumption data from SEDS:

$$KSRCUUS = \left(\sum_{ZZ=1}^{51} (KSRCUZZ * KSRCPZZ) \right) / \sum_{ZZ=1}^{51} KSRCPZZ \quad (11.10)$$

where:

KSRCUUS = STEPS final residential sector kerosene price for the U.S. (\$/gal)

KSRCPZZ = residential sector kerosene consumption for State ZZ from SEDS (1000 bbls)

5. Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor:

$$KSRCDZZ = (KSRCUZZ * 42) / 5.670 \quad (11.11)$$

where:

KSRCDZZ = STEPS final residential sector kerosene price for State ZZ or the U.S. (\$/MMBtu)

11.2 INDUSTRIAL SECTOR

11.2.1 Data Sources

- 1983 Bureau of Labor Statistics, U.S. Department of Labor. Producer Prices and Price Indexes: Annual Supplement. Commodity codes 0572 and 0573.
- 1983 STEPS industrial sector distillate price series.
- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape. Industrial sector kerosene consumption data.

11.2.2 Conversion Factor

- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 667.
- 5.670 Million Btu per Barrel

11.2.3 Computational Procedures

Industrial sector STEPS kerosene prices for 1983 are estimated from PPI base prices and indexes for kerosene and No. 2 distillate oil, and from the STEPS industrial sector distillate price series. It is not clear whether or not these retail prices include taxes. The ratio of PPI kerosene prices to PPI distillate prices is used as an adjustment factor with the STEPS distillate prices to estimate kerosene prices. Physical unit prices for the U.S. are computed using the physical unit state prices and consumption volumes from SEDS. Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor.

1. Annual wholesale prices are calculated from PPI annual indexes for kerosene and No. 2 distillate fuel oil and their respective July 1975 base prices for Census Divisions:

$$KSICNXX = (KSNCIXX / 100) * KSNCJXX \quad (11.12)$$

$$DFICNXX = (DFNCIXX / 100) * DFNCJXX \quad (11.13)$$

where:

KSICNXX = kerosene annual price for Census Division XX (\$/gal)

KSNCIXX = kerosene annual price index for Census Division XX
from PPI

KSNCJXX = kerosene July 1975 base price for Census Division XX
from PPI (\$/gal)

DFICNXX = fuel oil No. 2 annual price for Census Division XX
(\$/gal)

DFNCIXX = fuel oil No. 2 annual price index for Census Division XX
from PPI

DFNCJXX = fuel oil No. 2 July 1975 base price for Census Division XX
from PPI (\$/gal)

2. Census Division prices for both kerosene and fuel oil No. 2 are assigned equally and identically to each state within its respective Census Division:

$$KSICNZZ_{XX} = KSICNXX \quad (11.14)$$

$$DFICNZZ_{XX} = DFICNXX \quad (11.15)$$

where:

KSICNZZ = kerosene annual price for State ZZ in Census Division XX
(\$/gal)

DFICNZZ = fuel oil No. 2 annual price for State ZZ in Census
Division XX (\$/gal)

3. The industrial sector physical unit STEPS kerosene prices for states are computed using the STEPS distillate industrial physical unit price series and the ratio of PPI kerosene prices to PPI fuel oil No. 2 prices:

$$KSICUZZ = (KSICNZZ / DFICNZZ) * DFICUZZ \quad (11.16)$$

where:

KSICUZZ = STEPS final industrial sector kerosene price for
State ZZ (\$/gal)

DFICUZZ = STEPS final industrial sector distillate price for
State ZZ (\$/gal)

4. Physical unit U.S. kerosene prices are calculated using the completed kerosene state physical unit prices and SEDS industrial sector kerosene consumption volumes:

$$KSICUUS = \left(\sum_{ZZ=1}^{51} (KSICUZZ * KSICPZZ) \right) / \sum_{ZZ=1}^{51} KSICPZZ \quad (11.17)$$

where:

KSICUUS = STEPS final industrial sector kerosene price for the U.S. (\$/gal)

KSICPZZ = industrial sector kerosene consumption for State ZZ from SEDS (1000 bbls)

5. Btu prices for states and the U.S. are computed using the completed physical unit price series and the conversion factor:

$$KSICDZZ = (KSICUZZ * 42) / 5.670 \quad (11.18)$$

where:

KSICDZZ = STEPS final industrial sector kerosene price for State ZZ or the U.S. (\$/MMBtu)

11.3 TRANSPORTATION SECTOR

11.3.1 Data Sources

1983 Energy Information Administration, U.S. Department of Energy. Petroleum Marketing Monthly. Table 11 (January-October) and Table 14 (November-December).

1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape. Transportation sector jet fuel consumption data.

11.3.2 Conversion Factor

1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 667.

5.670 Million Btu per Barrel

11.3.3 Computational Procedures

The jet fuel transportation sector STEPS series contains PAD District retail prices, excluding taxes, assigned to states. The monthly state-level PAD District prices from Petroleum Marketing Monthly (PMM) are combined into annual prices, which are then assigned to states according to their PAD Districts. Physical unit U.S. prices are calculated from the assigned state prices and jet fuel consumption volumes from SEDS. Btu prices for states and the U.S. are calculated from the completed STEPS physical unit price series and the conversion factor.

1. Monthly jet fuel prices in cents per gallon excluding taxes, are available from PMM for seven (7) PAD Districts. The monthly prices for each of the PAD Districts (Ia, Ib, Ic, II, III, IV, and V) are assigned equally and identically to each state within a District. The missing January and February prices for PAD District Ia are assumed to be equal to the March price for that District.

$$JFACMZZ_m = JFACMWW_m / 100 \quad (11.19)$$

where:

JFACMZZ = monthly transportation sector jet fuel price for State ZZ (\$/gal)

JFACMWW = monthly transportation sector jet fuel price for PAD District WW from PMM (c/gal)

m = index for months

2. Annual jet fuel physical unit prices are computed as the simple average of the state-level prices assigned in Equation 11.19:

$$JFACUZZ = 1/12 \sum_{m=1}^{12} JFACMZZ_m \quad (11.20)$$

where:

JFACUZZ = STEPS final transportation sector jet fuel price for State ZZ (\$/gal)

m = index for months

3. Physical unit U.S. jet fuel prices are calculated using the completed state prices and jet fuel consumption volumes from SEDS:

$$JFACUUS = \left(\sum_{ZZ=1}^{51} (JFACUZZ * JFACPZZ) \right) / \sum_{ZZ=1}^{51} JFACPZZ \quad (11.21)$$

where:

JFACUUS = STEPS final transportation sector jet fuel price for the U.S. (\$/gal)

JFACPZZ = transportation sector jet fuel consumption volume from SEDS (1000 bbls)

4. Btu prices for states and the U.S. are calculated from the completed physical unit price series and the conversion factor:

$$JFACDZZ = (JFACUZZ * 42) / 5.670 \quad (11.22)$$

where:

JFACDZZ = STEPS final transportation sector jet fuel price for State ZZ or the U.S. (\$/MMBtu)

12.0 RESIDUAL FUEL

The STEPS residual fuel price series are developed for the electric utility, industrial, commercial, and transportation sectors. Physical unit prices in dollars per barrel and Btu prices in dollars per million Btu are calculated for all four sectors. Since the types of prices and computational procedures vary significantly by sector, the construction of the price series is discussed separately for each sector. Although STEPS covers the entire period from 1970 to 1983, only the development of prices for 1983 is discussed below. Descriptions of data sources and computational procedures for residual fuel prices for 1970-1982 can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update. The 1970-1982 residual fuel prices reported in Appendices B and C of this report have not yet been verified for reproducibility.

12.1 ELECTRIC UTILITY

The STEPS electric utility sector price series for residual fuel contain prices equal to the average delivered cost of receipts at electric utility plants. It is not clear whether or not these prices include any taxes. For 1983, both physical unit and Btu prices are developed directly from the data sources.

12.1.1 Data Source

1983 Energy Information Administration, U.S. Department of Energy. Cost and Quality of Fuels for Electric Utility Plants. Table 51.

12.1.2 Conversion Factors

1983 Since both Btu and physical unit prices are taken directly from the data source, no explicit conversion factors are used.

12.1.3 Computational Procedures

Both physical unit and Btu electric utility sector residual fuel price series are taken from the data source Cost and Quality of Fuels for Electric Utility Plants (C&Q) for 1983. These prices are calculated as the average cost per unit of purchase by electric utilities; it is not clear whether or not taxes are included. The prices for No. 6 fuel oil for states and the U.S. are taken directly from Cost and Quality, while the Btu prices are converted to dollars per million Btu. No imputation is done for states not covered by Cost and Quality.

1. Physical unit prices for No. 6 fuel oil are taken directly from the data source for states and the U.S.:

$$RFEUZZ = RFSENZ \quad (12.1)$$

where:

RFEUZZ = STEPS final electric utility sector residual fuel price for State ZZ or the U.S. (\$/bbl)

RFSENZ = No. 6 fuel oil price paid by steam-electric plants for State ZZ or the U.S. from C&Q (\$/bbl)

2. Btu prices for states and the U.S. are equal to the Btu prices reported in Cost and Quality, converted from cents to dollars per million Btu:

$$RFEUDZZ = RFSEFZZ / 100 \quad (12.2)$$

where:

RFEUDZZ = STEPS final electric utility sector residual fuel price for State ZZ or the U.S. (\$/MMBtu)

RFSEFZZ = No. 6 fuel oil price paid by steam-electric plants for State ZZ or the U.S. from C&Q (c/MMBtu)

3. The following 22 states do not have physical unit and Btu prices reported by STEPS for 1983: Alaska, Alabama, District of Columbia, Iowa, Idaho, Indiana, Kentucky, Montana, North Carolina, Nebraska, Nevada, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Utah, Vermont, Washington, Wisconsin, West Virginia, and Wyoming.

12.2 INDUSTRIAL SECTOR

The STEPS industrial sector residual fuel price series contain average cost of residual fuel to manufacturing firms. It is not clear whether or not any of these prices include taxes. Physical unit prices are calculated first, then Btu prices are computed using the physical unit prices and the conversion factor. The 1983 update procedures for the residual fuel industrial sector price series include two steps: 1) finalizing prices for 1982, and 2) generating prices for 1983.

12.2.1 Data Sources

- 1978-1980 Bureau of the Census, U.S. Department of Commerce. Annual Survey of Manufactures. Table 3.
- 1981 Bureau of the Census, U.S. Department of Commerce. Census of Manufactures. Table 3.
- 1978-1983 McGraw-Hill, Inc. Platt's Oil Price Handbook and Oilmanac. Refinery and terminal prices for No. 6 fuel oil.
- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape. Industrial sector residual fuel consumption volumes.

12.2.2 Conversion Factor

- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 668.

6.287 Million Btu per Barrel

12.2.3 Computational Procedures

Prior to 1982, the STEPS industrial sector residual fuel price series are based on cost and volume data from the Annual Survey of Manufactures (ASM) and the Census of Manufactures (CM). Since ASM/CM ceased publication of state-level residual fuel data after 1981, prices for 1982 and 1983 in the STEPS series are imputed based on the relationship between Platt's prices and industrial ASM/CM-based prices for the period 1978-1981. These prices are the average cost of residual fuel purchased at manufacturing establishments; it is not clear whether or not taxes are included. Physical unit prices for states are calculated, then U.S. physical unit prices are computed using SEDS industrial residual fuel consumption volumes as weights. Btu prices for both states and the U.S. are computed using the completed physical unit price series and the conversion factor.

1. The first step in the estimation of residual fuel industrial prices for 1982 and 1983 is to calculate prices for 1978-1981 from the ASM/CM cost and quantity data for residual fuel.

$$RFMFNZZ = (RFMFCZZ / RFMFVZZ) * 1000 \quad (12.3)$$

where:

RFMFNZZ = manufacturing sector residual fuel price for State ZZ (\$/bbl)

RFMFCZZ = cost of residual fuel to manufacturing plants for State ZZ from ASM/CM (\$million)

RFMFVZZ = quantity of residual fuel sold to manufacturing plants for State ZZ from ASM/CM (1000 bbls)

2. A few states are missing ASM/CM data for some of the years from 1978-1981; cost and quantity data for these states are imputed using adjacent state averages given in Table 12.1. Equation 12.4 illustrates the estimation of missing cost data; the calculation of missing quantity data is identical with the substitution of RFMFVZZ for RFMFCZZ. Note that Alaska is the only state for which missing data are not imputed. This is explained later. Once the cost and quantity data are estimated for missing states, Equation 12.3 is used to calculate prices.

$$RFMFNZZ_e = \frac{1}{N} \sum_{a=1}^N RFMFNZZ_a \quad (12.4)$$

where:

RFMFNZZ = manufacturing sector price for State ZZ (\$/barrel)

e = index for missing state

a = index for assigned adjacent states with ASM/CM data

N = number of adjacent states assigned to a missing state

3. Residual fuel industrial prices for 1982 and 1983 are based on the average relationship between the ASM/CM-based prices generated for 1978-1981 in Equations 12.3 and 12.4, and assigned Platt's No. 6 fuel oil prices for 1978-1981 (see Table 12.2). These average ratios are calculated at the state-level for all states except Alaska.

TABLE 12.1. Assignment of Adjacent States to be Used in the Imputation of Missing Residual Fuel Industrial Sector Prices, 1978-1981

<u>Missing State</u>	<u>Missing Year(s)</u>	<u>Adjacent States Used in the Imputation</u>
AK	1980-1981	No Imputation
DC	1979-1981	MD, VA
MT	1978-1979	ID, ND, SD, WY
ND	1980	MN, MT, SD
NM	1978-1981	AZ, CO, TX
NV	1978	AZ, CA, ID, OR, UT
OK	1978, 1980	AR, CO, KS, MO, TX
SD	1981	IA, MN, MT, ND, NE
WY	1978-1979	CO, ID, NE, UT
	1980-1981	CO, ID, MT, NE, UT

Source: Pacific Northwest Laboratory

TABLE 12.2. No. 6 Fuel Oil Price Assignments from Platt's: 1978-1983

State	Year(s)	City Price Assignment
AK	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
AL	1978-1983	Savannah, GA
AR	1978-1983	Arkansas
AZ	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
CA	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
CO*	1978-1983	Minneapolis/St. Paul, MN
CT	1978-1983	New Haven
DC	1978-1983	Baltimore, MD
DE	1978-1983	Baltimore, MD
FL	1978-1983	Jacksonville/Miami
GA	1978-1983	Savannah
HI	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
IA*	1978-1983	Chicago, IL
ID	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
IL*	1978-1983	Chicago
IN*	1978-1983	Chicago, IL
KS	1978-1983	New Orleans, LA
KY	1978-1983	New Orleans, LA
LA	1978-1983	New Orleans
MA	1978-1983	Boston (three price average)
MD	1978-1983	Baltimore
ME	1978-1983	Portland
MI*	1978-1983	Detroit
MN*	1978-1983	Minneapolis/St. Paul
MO*	1978-1983	St. Louis
MS	1978-1983	New Orleans, LA
MT*	1978-1983	Minneapolis/St. Paul, MN
NC	1978-1983	Wilmington
ND*	1978-1983	Minneapolis/St. Paul, MN
NE	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
NH	1978-1983	Portland, ME
NJ	1978-1983	New York/Albany, NY
NM	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
NV	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
NY	1978-1983	New York/Albany
DH*	1978-1983	Detroit, MI
OK	1978-1983	New Orleans, LA
OR	1978-1980	Los Angeles, CA
	1981-1983	Los Angeles/San Francisco, CA
PA	1978-1983	Philadelphia
RI	1978-1983	New Haven, CT

TABLE 12.2 (CONT). No. 6 Fuel Oil Price Assignments from Platt's: 1978-1983

State	Year(s)	City Price Assignment
SC	1978-1983	Charleston
SD*	1978-1983	Minneapolis/St. Paul, MN
TN	1978-1983	New Orleans, LA
TX	1978-1983	New Orleans, LA
UT*	1978-1983	Minneapolis/St. Paul, MN
VA	1978-1983	Norfolk
VT	1978-1983	Portland, ME
WA	1978-1979	Los Angeles, CA
	1980-1983	Seattle/Tacoma
WI*	1978-1983	Chicago, IL
WV	1978-1983	Norfolk, VA
WY*	1978-1983	Minneapolis/St. Paul, MN

* Raw data from Platt's must be converted from c/gallon to \$/barrel.

Source: Pacific Northwest Laboratory

$$RFICRZZ = \frac{1}{4} \sum_{t=78}^{81} (RFMFNZZ / RFNCNZZ) \quad (12.5)$$

where:

RFICRZZ = average ratio of ASM/CM-based residual fuel prices to Platt's No. 6 fuel oil prices for State ZZ (ratio)

RFNCNZZ = No. 6 fuel oil price assigned to State ZZ from Platt's (\$/bbl)

t = index for years

- Physical unit residual fuel industrial prices for 1982 and 1983 are calculated using the assigned Platt's prices for 1982 and 1983 (see Table 12.2) and the state-level average ratios calculated above. Since there is no reported SEDS consumption for the State of Alaska, Alaska prices are not developed for either 1982 or 1983. All other states have prices reported STEPS prices.

$$RFICUZZ = RFICRZZ * RFNCNZZ \quad (12.6)$$

where:

RFICUZZ = STEPS final industrial sector residual fuel price for State ZZ (\$/bbl)

RFNCNZZ = assigned residual fuel price for 1982 or 1983 for State ZZ from Platt's (\$/bbl)

5. Physical unit U.S. prices for 1982 and 1983 are calculated using the completed physical unit state prices and industrial residual fuel consumption volumes from SEDS.

$$RFICUUS = \left(\sum_{ZZ=1}^{51} (RFICUZZ * RFICPZZ) \right) / \sum_{ZZ=1}^{51} RFICPZZ \quad (12.7)$$

where:

RFICUUS = STEPS final industrial sector residual fuel price for the U.S. (\$/bbl)

RFICPZZ = industrial sector residual fuel consumption for State ZZ from SEDS (1000 bbls)

6. Btu prices for states and the U.S. for both 1982 and 1983 are computed using the completed physical unit price series and the conversion factor:

$$RFICDZZ = RFICUZZ / 6.287 \quad (12.8)$$

where:

RFICDZZ = STEPS final industrial sector residual fuel price for State ZZ or the U.S. (\$/MM8tu)

12.3 COMMERCIAL SECTOR

Commercial sector residual fuel prices for 1983 are imputed for all states from national-level residual fuel prices and the state-level electric utility sector residual fuel prices calculated for STEPS. State-level prices are calculated from U.S. prices that include taxes. Physical unit prices are calculated first, then Btu prices are computed using the physical unit prices and the conversion factor.

12.3.1 Data Sources

1983	STEPS 1983 electric utility residual fuel price series.
1983	Bureau of the Census, U.S. Department of Commerce. <u>Statistical Abstract of the United States 1984</u> . Table 472, "General sales and gross receipts (percent)."
1983	Energy Information Administration, U.S. Department of Energy. <u>Monthly Energy Review</u> . Table titled, "Refiner and Gas Plant Operator Sales Prices of Residual Fuel Oil." Average Sales to End Users.
1983	Energy Information Administration, U.S. Department of Energy. <u>State Energy Data System</u> . Computer tape. Commercial sector residual fuel consumption volume data.

12.3.2 Conversion Factor

1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 668.

6.287 Million Btu per Barrel

12.3.3 Computational Procedures

The 1983 commercial sector residual fuel physical unit price series are estimated from the completed electric utility sector residual price series for 1983 and the tax-adjusted U.S. residual fuel price for 1983.

1. The first step in the estimation of the commercial residual fuel physical unit state prices is to convert the state-level excise tax rates reported in Statistical Abstract into a volume-weighted average U.S. sales tax rate. This calculation uses the 1983 commercial residual fuel consumption volume data from SEDS:

$$RFNCXUS = \left(\sum_{ZZ=1}^{51} (RFNCXZZ * RFCCPZZ) \right) / \sum_{ZZ=1}^{51} RFCCPZZ \quad (12.9)$$

where:

RFNCXUS = estimated average tax rate on residual fuel for the U.S. (percent)

RFNCXZZ = reported excise tax rate on general sales and gross receipts for State ZZ from Statistical Abstract (percent)

RFCCPZZ = commercial sector residual fuel consumption volume reported for State ZZ from SEDS (1000 bbls)

2. The tax-adjusted U.S. residual fuel oil price is computed using the average U.S. tax rate estimated in Equation 12.9 and the annual average U.S. residual fuel price to end users from Monthly Energy Review (MER):

$$RFCCNUS = (RFNCNUS / 100) * [1 + (RFNCXUS / 100)] * 42 \quad (12.10)$$

where:

RFCCNUS = tax-adjusted U.S. residual fuel price for the commercial sector (\$/bbl)

RFNCNUS = refiner and gas operator sales price of residual fuel to end users from MER (c/gal)

3. Commercial sector physical unit residual fuel prices for states are computed using the 1983 STEPS electric utility sector residual fuel price series. To do this calculation, the relationship between the state-level and U.S. prices in the commercial sector is assumed to be the same as the relationship between state and U.S. prices in the electric utility sector. Some states are missing electric utility prices for 1983; these are imputed using the adjacent state average described in Table 12.3.

TABLE 12.3. Adjacent State Assignments for Imputing Missing Prices:
Residual Fuel Electric Utility Sector, 1983

<u>Missing State</u>	<u>Adjacent State Assignments</u>
AL	FL, GA, MS
DC	MD, VA
IA	IL, MN, MO
ID	CA, CO
IN	IL, MI, OH
KY	IL, MO, OH, VA
MT	CO, ND
NC	GA, VA
NE	CO, KS, MO
NV	AZ, CA
OR	CA
SC	GA
SD	MN, ND
TN	AR, GA, MO, MS, VA
UT	AZ, CO
VT	ME, NH, NY
WA	CA
WI	IL, MI, MN
WV	MD, OH, PA, VA
WY	CO, ND

Source: Pacific Northwest Laboratory

$$RFCCUZZ = RFEUZZ * (RFCCNUS / RFEUUUS) \quad (12.11)$$

where:

RFCCUZZ = STEPS final commercial sector residual fuel price for State ZZ (\$/bbl)

RFEUZZ = STEPS final electric utility sector residual fuel price for State ZZ (\$/bbl)

RFEUUUS = STEPS final electric utility sector residual fuel price for the U.S. (\$/bbl)

4. Physical unit U.S. residual fuel prices for the commercial sector are computed using the completed state-level physical unit prices and commercial sector consumption volume data from SEDS:

$$RFCCUUS = \left(\sum_{ZZ=1}^{51} (RFCCUZZ * RFCCPZZ) \right) / \sum_{ZZ=1}^{51} RFCCPZZ \quad (12.12)$$

where:

RFCCUUS = STEPS final commercial sector residual fuel price for the U.S. (\$/bbl)

RFCCPZZ = commercial sector consumption volume for State ZZ from SEDS (1000 bbls)

5. Btu prices for both states and the U.S. are calculated from the completed physical unit price series and the conversion factor:

$$RFCCDZZ = RFCCUZZ / 6.287 \quad (12.13)$$

where:

RFCCDZZ = STEPS final commercial sector residual fuel price for State ZZ or the U.S. (\$/MMBtu)

12.4 TRANSPORTATION SECTOR

Transportation sector residual fuel prices in the STEPS data base are developed using different procedures, depending on the primary transportation end-uses for each state. Prices for all years are imputed from the residual fuel commercial sector price series developed above. Physical unit prices are calculated first, then Btu prices are computed using the physical unit prices and the conversion factor.

12.4.1 Data Sources

- 1983 Energy Information Administration, U.S. Department of Energy. Monthly Energy Review. Refiner and gas plant operator sales price of residual fuel oil with sulfur content greater than one percent; sales to end users excluding tax, 1983 average U.S. price.

- 1983 Energy Information Administration, U.S. Department of Energy. Petroleum Supply Annual. Volume I, Table 5.
- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape; transportation sector residual fuel consumption data.
- 1983 STEPS commercial sector residual price series.

12.4.2 Conversion Factor

- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data Report. Appendix C, p. 668.

6.287 Million Btu per Barrel

12.4.3 Computational Procedures

The primary uses of residual fuel in the transportation sector include vessel bunkering and railroads. Transportation sector residual fuel prices for states in the STEPS series are based on the proportion of these two uses of fuel for each state. Once physical unit state prices have been calculated, U.S. physical unit prices are computed using the completed state physical unit prices and transportation sector residual fuel consumption volumes from SEDS. The tax status of these prices appears to be mixed, with some states having prices that include taxes, while others have prices that exclude taxes.

1. In 1983, 26 states consumed residual fuel only for vessel bunkering (see Table 12.4). For these states, the physical STEPS prices are calculated from the U.S. residual fuel oil (sulfur content greater than one percent) price (excluding taxes) and corresponding commercial sector U.S. and state prices. The generated prices are based on the assumption that the state Bunker C prices have the same ratio to the commercial sector state prices that the Bunker C U.S. price (approximated with the residual/sulfur greater than one percent price) has to the commercial sector U.S. price.

$$RFACUZZ = RFCCUZZ * [(RFBKNUS / 100 * 42) / RFCCUUS] \quad (12.14)$$

where:

RFACUZZ = STEPS final transportation sector residual fuel price for State ZZ (\$/bbl)

RFBKNUS = average U.S. vessel bunkering residual fuel price from MER; equal to 61.6 c/gal in 1983 (c/gal)

RFCCUZZ = STEPS final transportation sector residual fuel price for State ZZ (\$/bbl)

RFCCUUS = STEPS final transportation sector residual fuel price for the U.S. (\$/bbl)

TABLE 12.4. Transportation Sector End-Uses for Residual Fuel,
by State, 1983

<u>Vessel Bunkering Only</u>	<u>Vessel Bunkering and Railroad Use</u>	<u>No Use</u>
Alabama	Illinois	Alaska
California	Michigan	Arkansas
Connecticut	Minnesota	Arizona
Delaware	Tennessee	Colorado
Florida	Wisconsin	District of Columbia
Georgia		Iowa
Hawaii		Idaho
Indiana		Kansas
Louisiana		Kentucky
Massachusetts		Montana
Maryland		North Dakota
Maine		Nebraska
Missouri		New Mexico
North Carolina		Nevada
New Hampshire		Oklahoma
New Jersey		South Dakota
New York		Utah
Ohio		Vermont
Oregon		West Virginia
Pennsylvania		Wyoming
Rhode Island		
South Carolina		
Texas		
Virginia		
Washington		

Source: Petroleum Supply Annual, 1983.

2. In years prior to 1983, states with residual fuel consumption only in railroads are assigned their respective commercial sector prices. No states have use limited to railroads in 1983.
3. Five states in 1983 have roughly equal amounts of vessel bunkering and railroad residual fuel use. Prices for these states are calculated as the weighted average vessel bunkering prices (from Equation 12.14) and railroad prices (assigned commercial sector prices). The weights used for this calculation are taken from Petroleum Supply Annual.

- a. First, the vessel bunkering price for each of the five states (IL, MI, MN, TN, and WI) is calculated similarly to Equation 12.14:

$$RFBKNZZ = RFCCUZZ * [(RFBKNUS / 100 * 42) / RFCCUUS] \quad (12.15)$$

where:

RFBKNZZ = vessel bunkering residual fuel price for State ZZ (\$/bbl)

- b. Next, the railroad price for each of the five states is calculated by simply assigning the corresponding commercial sector price:

$$RFRRNZZ = RFCCUZZ \quad (12.16)$$

where:

RFRRNZZ = railroad residual fuel price for State ZZ (\$/bbl)

- c. The STEPS physical unit state prices are calculated as the weighted average of the vessel bunkering and railroad prices calculated above and the vessel bunkering and railroad consumption reported in Petroleum Supply Annual:

$$RFACUZZ = [(RFRRNZZ * RFRRVZZ) + (RFBKNZZ * RFBKVZZ)] / (RFRRVZZ + RFBKVZZ) \quad (12.17)$$

where:

RFACUZZ = STEPS final transportation sector residual fuel price for State ZZ (\$/bbl)

RFRRVZZ = railroad consumption of residual fuel from for State ZZ from Petroleum Supply Annual (1000 bbls)

RFBKVZZ = vessel bunkering consumption of residual fuel from for State ZZ from Petroleum Supply Annual (1000 bbls)

4. No prices for 1983 are developed for the 20 states with no vessel bunkering or railroad use reported in Petroleum Supply Annual (see Table 12.3).

5. The 1983 physical unit U.S. residual fuel price for the transportation sector is calculated from the completed state physical unit price series and transportation sector residual fuel consumption volumes from SEDS:

$$RFACUUS = \left(\sum_{ZZ=1}^{51} (RFACUZZ * RFACPZZ) \right) / \sum_{ZZ=1}^{51} RFACPZZ \quad (12.18)$$

where:

RFACUUS = STEPS final transportation sector residual fuel price for the U.S. (\$/bbl)

RFACPZZ = transportation sector residual fuel consumption volume for State ZZ from SEDS (1000 bbls)

6. Btu prices for both states and the U.S. are computed from the completed physical unit price series and the conversion factor:

$$RFACDZZ = RFACUZZ / 6.287 \quad (12.19)$$

where:

RFACDZZ = STEPS final transportation sector residual fuel price for State ZZ or the U.S. (\$/MMBtu)

13.0 LIQUEFIED PETROLEUM GAS

Liquefied petroleum gas (LPG) STEPS price series are developed for the residential and the industrial sectors, with prices in dollars per gallon and in dollars per million Btu. The development of the STEPS liquefied petroleum gas price series is described below only for the year 1983; this is the only year for which data sources and calculations have been verified for reproducibility. Information about the construction of the LPG price series for 1970-1982, can be found in State Energy Price System (Volume I) and State Energy Price System: 1982 Update. Since the data sources and computational procedures are different for the residential and industrial sectors, they are described separately below.

13.1 RESIDENTIAL SECTOR

13.1.1 Data Sources

- 1983 American Gas Association. 1984. Gas Househeating Survey: 1983. Appendix 2, "Competitive Fuel Prices."
- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Computer tape. Residential sector LPG consumption.

13.1.2 Conversion Factor

- 1983 Energy Information Administration, U.S. Department of Energy. Monthly Energy Review. Table titled, "Approximate Heat Content of Fuels, 1979-1985."

3.614 Million Btu per Barrel

13.1.3 Computational Procedures

Residential sector LPG Btu prices for STEPS are based on the city-level LPG prices reported in Gas Househeating Survey (GHS). Btu prices for Alaska and Hawaii are imputed and U. S. prices are calculated using the completed state Btu prices and residential sector consumption volumes from SEDS. Physical unit LPG prices are calculated using the completed Btu price series and the conversion factor. These prices are the average delivered prices for propane purchased by residential consumers; it is not clear whether or not taxes are included.

1. City-level prices from GHS are assigned to their respective states. The STEPS price for a state is equal to the simple average of the city price observations for that state. This equation is executed with hand calculations.

$$\text{LGRCDDZZ} = 1/N \sum_{i=1}^N \text{LGRCFZZ}_i \quad (13.1)$$

where:

LGRCDDZZ = STEPS final residential sector LPG price for State ZZ (\$/MMBtu)

LGRCFZZ = residential sector propane price for State ZZ from GHS (\$/MMBtu)

i = index for city observations

N = number of city observations for State ZZ

2. Alaska and Hawaii are the only states that do not have prices reported in GHS. Missing prices for these two states are imputed by computing the average ratio of state to U.S. prices for years when Alaska or Hawaii data are available, and applying the average ratio to the 1983 U.S. prices to estimate the 1983 prices.

- a. To calculate the average ratios (one for Alaska and one for Hawaii), state prices are compared to U.S. prices for the following years: 1972 and 1980 (Alaska); and 1971, 1977, 1978, and 1979 (Hawaii). The U.S. price for this calculation is a simple average of available state prices for each year (including states with prices imputed from adjacent state averages).

$$\text{LGRCDZZ} = 1/N \sum_{t=1}^N (\text{LGRCFZZ}_t / \text{LGRCFUS}_t) \quad (13.2)$$

where:

LGRCDZZ = average ratio of Alaska (Hawaii) GHS residential sector LPG prices to U.S. prices (ratio)

LGRCFZZ = residential sector LPG price for Alaska (Hawaii) from GHS (\$/MMBtu)

LGRCFUS = residential sector LPG price for the U.S., equal to the simple average of state prices other than Alaska and Hawaii from GHS (\$/MMBtu)

t = index for years where Alaska (Hawaii) data are available

N = number of years for which Alaska (Hawaii) data are available

- b. The average ratio for each state is used with the simple average U. S. price for 1983 to impute the 1983 Alaska and Hawaii prices. Equation 13.3 shows the calculation for Alaska while Equation 13.4 shows the calculation for Hawaii.

$$\text{LGRCDAK} = \text{LGRCAK} * \text{LGRCFUS} \quad (13.3)$$

$$\text{LGRCDHI} = \text{LGRCHHI} * \text{LGRCFUS} \quad (13.4)$$

where:

LGRCDAK = STEPS final residential sector LPG price for Alaska (\$/MMBtu)

LGRCFUS = simple average of available GHS state prices for 1983 (\$/MMBtu)

LGRCDHI = STEPS final residential sector LPG price for Hawaii (\$/MMBtu)

3. Final STEPS Btu prices for the U.S. are calculated using the completed Btu state prices and residential sector LPG consumption volumes from SEDS to calculate a weighted average national price:

$$\text{LGRCDUS} = \left(\sum_{ZZ=1}^{51} (\text{LGRCDZZ} * \text{LGRCPZZ}) \right) / \sum_{ZZ=1}^{51} \text{LGRCPZZ} \quad (13.5)$$

where:

LGRCDUS = STEPS final residential sector LPG price for the U.S. (\$/MMBtu)

LGRCPZZ = residential sector LPG consumption volume for State ZZ from SEDS (1000 bbls)

4. Physical unit LPG prices for states and the U.S. are calculated using the completed Btu price series and the conversion factor:

$$\text{LGRCUZZ} = (\text{LGRCDZZ} * 3.614) / 42 \quad (13.6)$$

where:

LGRCUZZ = STEPS final residential sector LPG price for State ZZ or the U.S. (\$/gal)

13.2 INDUSTRIAL SECTOR

13.2.1 Data Sources

- 1978-1981, 1983 Crop Reporting Board, U.S. Department of Agriculture. Agricultural Prices. Table titled, "Household Supplies: Average Price Paid by Farmers" (1978-1979); "L.P. Gas: Average Price Paid by States" (1980); and "L.P. Gas: Average Price Paid by Months by States" (1981, 1983).
- 1978-1980 Bureau of the Census, U.S. Department of Commerce. Annual Survey of Manufactures. Table 3, state-level quantity and cost of liquefied petroleum gases.
- 1981 Bureau of the Census, U.S. Department of Commerce. Census of Manufactures. Table 3, state-level quantity and cost of liquefied petroleum gases.
- 1983 Energy Information Administration, U.S. Department of Energy. State Energy Data System. Industrial sector LPG consumption volumes.

13.2.2 Conversion Factor

- 1983 Energy Information Administration, U.S. Department of Energy. Monthly Energy Review. Table titled, "Approximate Heat Content of Fuels, 1979-1985."

3.614 Million Btu per Barrel

13.2.3 Computational Procedures

The STEPS industrial sector 1983 physical unit price series for LPG is based on 1983 state-level LPG prices from Agricultural Prices and the average ratio of prices from Annual Survey of Manufactures (ASM) or Census of Manufactures (CM) and Agricultural Prices for 1978-1981. Physical unit prices for the U.S. are computed using the state-level prices and industrial sector LPG consumption volumes from SEDS. Btu prices for states and the U.S. are calculated from the completed physical unit price series and the conversion factor. It is not clear whether or not these retail prices include any taxes.

1. Monthly LPG prices for states and the U.S. from Agricultural Prices are first converted into annual state-level prices for the years 1978-1981 and 1983. For all five years, Alaska, the District of Columbia, Hawaii and West Virginia are the only missing states. No prices are imputed for the District of Columbia, Alaska and Hawaii prices are imputed as described later, and West Virginia is assigned the Tennessee prices for 1978-1981. This calculation is done using simple averaging:

TABLE 13.1. Price Assignments for States Missing ASM/CM Prices, 1978-1981

<u>Missing State</u>	<u>Year(s)</u>	<u>Assigned State</u>
AK	1978	--
AR	1978	LA
LA	1980	AR
NM	1979-1981	AZ
WY	1978-1981	CO

Source: Pacific Northwest Laboratory

$$LGAGNZZ = 1/12 \sum_{m=1}^{12} LGAGMZZ_m \quad (13.7)$$

where:

LGAGNZZ = annual LPG price based on Agricultural Prices for State ZZ (\$/gal)

LGAGMZZ = monthly LPG price for State ZZ from Agricultural Prices (\$/gal)

m = index for months

2. The cost and quantity of LPG data from ASM/CM for 1978-1981 are used to calculate state-level industrial sector LPG prices for use in the average ratio calculation (Equation 13.9). Since the quantity data are expressed in pounds rather than gallons, the price per pound must be adjusted to price per gallon with the conversion factor of 4.5 pounds per gallon. This calculation is done for all states (including Alaska and Hawaii), with imputations for missing years as shown in Table 13.1. No prices are imputed for the District of Columbia throughout the period.

$$LGMFNZZ = (LGMFCZZ / LGMFVZZ) * 4.5 \quad (13.8)$$

where:

LGMFNZZ = annual LPG price based on ASM/CM for State ZZ (\$/gal)

LGMFCZZ = cost of LPG purchased for heat and power for State ZZ from ASM/CM (\$million)

LGMFVZZ = quantity of LPG purchased for heat and power in State ZZ from ASM/CM (million pounds)

3. The average ratio of ASM/CM prices to Agricultural Prices LPG prices for 1978-1981 is calculated for all states except Alaska and Hawaii as follows:

$$LGICRZZ = 1/4 \sum_{t=78}^{81} (LGMFNZZ / LGAGNZZ) \quad (13.9)$$

where:

LGICRZZ = average ratio of ASM/CM prices to Agricultural Prices prices for State ZZ (ratio)

t = index for years

4. Industrial sector LPG physical unit prices for 1983, for all states except Alaska and Hawaii, are calculated using the estimated annual Agricultural Prices data for 1983 and the state-level average ratios:

$$LGICUZZ = LGAGNZZ * LGICRZZ \quad (13.10)$$

where:

LGICUZZ = STEPS final industrial sector LPG price for State ZZ (\$/gal)

LGAGNZZ = estimated annual LPG price for 1983 for State ZZ from Agricultural Prices (\$/gal)

5. Alaska and Hawaii prices are imputed by estimating the relationship between ASM/CM prices for these states (1979-1981 for Alaska and 1978-1981 for Hawaii) and the U.S. price reported by Agricultural Prices. The average ratio for the available years for each of these two states is calculated and used with the Agricultural Prices U.S. price for 1983 to impute 1983 prices:

Alaska

$$LGICRAK = 1/3 \sum_{t=79}^{81} (LGMFNAK_t / LGAGNUS_t) \quad (13.11)$$

$$LGICUAK = LGAGNUS_{83} * LGICRAK \quad (13.12)$$

where:

LGICRAK = average ratio of the ASM/CM LPG price for Alaska to the reported price for the U.S. from Agricultural Prices (ratio)

LGMFNAK = LPG annual price for Alaska from ASM/CM (\$/gal)

LGAGNUS = LPG price for the U.S. from Agricultural Prices (\$/gal)

LGICUAK = STEPS final industrial sector LPG price for Alaska (\$/gal)

Hawaii

$$LGICRHI = 1/4 \sum_{t=78}^{81} (LGMFNHI_t / LGAGNUS_t) \quad (13.13)$$

$$LGICUHI = LGAGNUS_{83} * LGICRHI \quad (13.14)$$

where:

LGICRHI = average ratio of the ASM/CM LPG price for Hawaii to the reported price for the U.S. from Agricultural Prices (ratio)

LGMFNHI = LPG annual price for Hawaii from ASM/CM (\$/gal)

LGAGNUS = LPG price for the U.S. from Agricultural Prices (\$/gal)

LGICUHI = STEPS final industrial sector LPG price for Hawaii (\$/gal)

6. The physical unit U.S. price for STEPS is calculated using the completed physical unit state prices and industrial LPG consumption volumes from SEDS:

$$LGICUUS = \left(\sum_{ZZ=1}^{51} (LGICUZZ * LGICPZZ) \right) / \sum_{ZZ=1}^{51} LGICPZZ \quad (13.15)$$

where:

LGICUUS = STEPS final industrial sector LPG price for the U.S. (\$/gal)

LGICPZZ = industrial sector LPG consumption volume for State ZZ from SEDS (1000 bbls)

7. Btu prices for states and the U.S. are calculated using the completed physical unit price series and the conversion factor:

$$LGICDZZ = (LGICUZZ * 42) / 3.614 \quad (13.16)$$

where:

LGICDZZ = STEPS final industrial sector LPG price for State ZZ or the U.S. (\$/MMBtu)

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APPENDIX A

STEPS Variable Naming Convention

STEPS VARIABLE NAMING CONVENTION

Characters 1 & 2 = Fuel Type

BC = steam coal	LG = liquefied petroleum gas
CC = metallurgical coal	MG = motor gasoline
CL = coal	ML = leaded motor gasoline
DF = distillate fuel	MU = unleaded motor gasoline
DL = diesel	NG = natural gas
ES = electricity	OL = oil
JF = jet fuel	RF = residual fuel
KS = kerosene	

NOTE: Substitutions for the second character are made in two cases: 1) all data files have "D" for the second character (e.g. BD would be a steam coal data file); and 2) files with modifications described in the documentation have "M" for the second character (e.g. RMEU would be a modified version of a residual electric utility file). In addition, the motor gasoline price series has some files with "C" as the second character to denote an intermediate calculated file that does not appear in the written documentation.

Characters 3 & 4 = Sector or End Use

AC = transportation	LC = large commercial
AG = agriculture	MF = manufacturing
BK = vessel bunkering	NC = no sector/end use specified
CB = carbon black	NR = nonsector-based residential (Platt's)
CC = commercial	OC = other consumption
CT = combustion turbine	OI = other industrial
EC = electric utility	OP = other public authorities
contract purchase	PP = pipeline
EP = electric utility spot	RC = residential
purchase	RF = refinery fuel
EU = electric utility	RR = railroad and railway
FU = field use	SC = small commercial
HW = highway use	SE = steam electric
IC = industrial	ST = street and highway lighting
ID = interdepartmental	

NOTE: The motor gasoline price series has third and fourth character codes that do not conform to this convention. These codes are used only to describe hand-calculations; they are not used in file names that are stored in the computer data library. The code "CH" is used to designate files that are hand-calculated from CPI data; the code "PH" is used to designate files that are hand-calculated from Platt's data.

Character 5 = Type of Data

A = adjustment factor	N = annual physical price
B = Btu quantity (SEDS)	P = physical quantity (SEDS)
C = cost (revenues)	Q = quarterly physical price
D = STEPS Btu price	R = average share or ratio
F = annual Btu price	S = share or ratio
G = monthly physical composite price (motor gasoline)	T = markup
I = price index	U = STEPS physical price
J = base price (for use with price index)	V = annual physical quantity (sales, consumption)
K = Btu conversion factor	X = quarterly physical quantity
M = monthly physical price	Y = monthly physical quantity

Characters 6 & 7 = Geographic Coverage

AK = Alaska	ND = North Dakota
AL = Alabama	NE = Nebraska
AR = Arkansas	NH = New Hampshire
AZ = Arizona	NJ = New Jersey
CA = California	NM = New Mexico
CO = Colorado	NV = Nevada
CT = Connecticut	NY = New York
DC = District of Columbia	OH = Ohio
DE = Delaware	OK = Oklahoma
FL = Florida	OR = Oregon
GA = Georgia	PA = Pennsylvania
HI = Hawaii	QQ = Census Region
IA = Iowa	RI = Rhode Island
ID = Idaho	SC = South Carolina
IL = Illinois	SD = South Dakota
IN = Indiana	TN = Tennessee
KK = city	TX = Texas
KS = Kansas	US = United States
KY = Kentucky	UT = Utah
LA = Louisiana	VA = Virginia
MA = Massachusetts	VT = Vermont
MD = Maryland	WA = Washington
ME = Maine	WI = Wisconsin
MI = Michigan	WV = West Virginia
MN = Minnesota	WW = PAD District
MO = Missouri	WY = Wyoming
MS = Mississippi	XX = Census Division
MT = Montana	YY = Federal Region
NC = North Carolina	ZZ = State (and U.S.)

Source: Pacific Northwest Laboratory

APPENDIX B

Final STEPS Physical Unit Prices

TABLE B.1. Electricity Prices: Residential Sector (\$/kWh)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.032	0.016	0.023	0.024	0.022	0.027	0.025	0.024	0.026
1971	0.032	0.017	0.024	0.024	0.023	0.027	0.027	0.026	0.028
1972	0.035	0.018	0.024	0.025	0.025	0.027	0.029	0.028	0.032
1973	0.033	0.020	0.024	0.027	0.026	0.028	0.032	0.029	0.033
1974	0.034	0.023	0.029	0.032	0.034	0.030	0.044	0.039	0.045
1975	0.035	0.028	0.032	0.040	0.036	0.034	0.050	0.043	0.048
1976	0.037	0.030	0.037	0.042	0.038	0.035	0.048	0.044	0.049
1977	0.042	0.036	0.041	0.048	0.042	0.037	0.049	0.046	0.056
1978	0.045	0.037	0.042	0.051	0.045	0.039	0.050	0.051	0.057
1979	0.046	0.042	0.044	0.057	0.045	0.043	0.058	0.052	0.062
1980	0.055	0.049	0.053	0.063	0.059	0.051	0.069	0.059	0.074
1981	0.060	0.055	0.056	0.069	0.065	0.059	0.086	0.066	0.085
1982	0.072	0.063	0.065	0.077	0.077	0.067	0.095	0.064	0.097
1983	0.085	0.066	0.072	0.078	0.071	0.067	0.096	0.066	0.096

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.021	0.018	0.028	0.027	0.016	0.027	0.022	0.025	0.020
1971	0.021	0.019	0.030	0.027	0.017	0.028	0.023	0.025	0.018
1972	0.022	0.020	0.030	0.028	0.017	0.030	0.024	0.025	0.019
1973	0.024	0.021	0.033	0.029	0.017	0.031	0.025	0.025	0.021
1974	0.031	0.025	0.038	0.032	0.017	0.036	0.027	0.027	0.024
1975	0.037	0.031	0.050	0.036	0.018	0.039	0.029	0.032	0.027
1976	0.040	0.032	0.052	0.039	0.020	0.042	0.033	0.034	0.028
1977	0.041	0.037	0.056	0.043	0.021	0.044	0.037	0.040	0.031
1978	0.044	0.041	0.063	0.044	0.022	0.049	0.041	0.043	0.034
1979	0.048	0.043	0.068	0.049	0.025	0.053	0.044	0.046	0.037
1980	0.057	0.047	0.081	0.055	0.029	0.061	0.047	0.054	0.044
1981	0.072	0.051	0.121	0.063	0.031	0.070	0.052	0.060	0.051
1982	0.075	0.061	0.132	0.068	0.034	0.079	0.061	0.069	0.055
1983	0.077	0.062	0.119	0.071	0.034	0.089	0.065	0.076	0.059

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.023	0.029	0.024	0.028	0.024	0.025	0.027	0.017	0.023
1971	0.023	0.031	0.026	0.028	0.025	0.026	0.027	0.019	0.022
1972	0.023	0.033	0.028	0.029	0.026	0.027	0.028	0.021	0.023
1973	0.024	0.034	0.029	0.030	0.027	0.027	0.028	0.020	0.024
1974	0.027	0.048	0.039	0.034	0.032	0.030	0.031	0.025	0.024
1975	0.027	0.052	0.043	0.040	0.039	0.034	0.034	0.028	0.024
1976	0.029	0.054	0.044	0.038	0.042	0.036	0.038	0.034	0.024
1977	0.031	0.056	0.046	0.042	0.045	0.040	0.040	0.037	0.025
1978	0.033	0.057	0.051	0.043	0.049	0.042	0.044	0.039	0.028
1979	0.037	0.062	0.052	0.050	0.052	0.043	0.047	0.043	0.029
1980	0.047	0.076	0.059	0.063	0.057	0.055	0.052	0.049	0.031
1981	0.058	0.092	0.066	0.072	0.064	0.059	0.056	0.059	0.036
1982	0.063	0.090	0.073	0.074	0.066	0.063	0.061	0.062	0.038
1983	0.066	0.091	0.072	0.073	0.070	0.066	0.064	0.062	0.044

TABLE B.1 (CONT). Electricity Prices: Residential Sector (\$/kWh)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.019	0.027	0.021	0.028	0.027	0.028	0.015	0.030	0.024
1971	0.020	0.027	0.022	0.028	0.031	0.028	0.015	0.032	0.025
1972	0.021	0.027	0.024	0.028	0.032	0.029	0.016	0.034	0.025
1973	0.022	0.028	0.023	0.030	0.035	0.029	0.017	0.037	0.026
1974	0.027	0.029	0.025	0.040	0.048	0.032	0.021	0.051	0.032
1975	0.032	0.031	0.026	0.049	0.054	0.036	0.026	0.056	0.037
1976	0.036	0.033	0.032	0.049	0.057	0.038	0.031	0.058	0.039
1977	0.038	0.036	0.035	0.052	0.063	0.043	0.035	0.063	0.043
1978	0.041	0.038	0.037	0.058	0.064	0.050	0.036	0.065	0.047
1979	0.043	0.039	0.039	0.061	0.069	0.058	0.038	0.072	0.051
1980	0.048	0.045	0.045	0.072	0.082	0.065	0.049	0.079	0.056
1981	0.054	0.052	0.051	0.091	0.095	0.072	0.049	0.098	0.063
1982	0.063	0.056	0.049	0.089	0.105	0.081	0.059	0.105	0.071
1983	0.066	0.061	0.061	0.094	0.105	0.078	0.063	0.109	0.077

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.025	0.013	0.025	0.029	0.019	0.027	0.011	0.022	0.023
1971	0.026	0.013	0.026	0.029	0.021	0.027	0.013	0.022	0.024
1972	0.025	0.013	0.029	0.033	0.022	0.027	0.013	0.022	0.024
1973	0.025	0.014	0.031	0.035	0.023	0.027	0.014	0.023	0.024
1974	0.026	0.016	0.039	0.050	0.028	0.029	0.017	0.026	0.025
1975	0.028	0.018	0.044	0.053	0.033	0.031	0.023	0.030	0.030
1976	0.032	0.020	0.045	0.052	0.036	0.034	0.025	0.034	0.034
1977	0.036	0.024	0.048	0.058	0.039	0.035	0.025	0.038	0.037
1978	0.039	0.026	0.050	0.059	0.041	0.038	0.029	0.041	0.044
1979	0.041	0.026	0.053	0.067	0.043	0.040	0.033	0.045	0.049
1980	0.046	0.032	0.060	0.077	0.047	0.050	0.036	0.051	0.058
1981	0.054	0.036	0.067	0.095	0.054	0.056	0.044	0.062	0.063
1982	0.061	0.036	0.077	0.092	0.060	0.061	0.049	0.072	0.067
1983	0.066	0.041	0.076	0.095	0.064	0.066	0.050	0.076	0.072

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.021	0.023	0.011	0.023	0.022	0.026	0.022
1971	0.021	0.023	0.011	0.024	0.023	0.026	0.023
1972	0.022	0.026	0.011	0.025	0.024	0.026	0.024
1973	0.024	0.028	0.011	0.027	0.025	0.025	0.025
1974	0.031	0.034	0.012	0.030	0.030	0.026	0.031
1975	0.038	0.039	0.013	0.034	0.036	0.026	0.035
1976	0.038	0.043	0.014	0.037	0.039	0.026	0.037
1977	0.043	0.044	0.015	0.040	0.037	0.027	0.041
1978	0.045	0.047	0.015	0.042	0.039	0.030	0.043
1979	0.051	0.048	0.016	0.046	0.040	0.031	0.046
1980	0.061	0.054	0.019	0.051	0.043	0.040	0.054
1981	0.062	0.062	0.023	0.058	0.050	0.044	0.062
1982	0.067	0.067	0.028	0.067	0.057	0.046	0.069
1983	0.070	0.068	0.035	0.070	0.058	0.053	0.072

TABLE B.2. Electricity Prices: Commercial Sector (\$/kWh)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.033	0.019	0.021	0.019	0.017	0.021	0.025	0.024	0.023
1971	0.033	0.020	0.022	0.020	0.018	0.021	0.026	0.026	0.024
1972	0.036	0.020	0.022	0.021	0.019	0.021	0.028	0.027	0.028
1973	0.034	0.023	0.023	0.023	0.021	0.021	0.030	0.028	0.029
1974	0.034	0.026	0.027	0.027	0.028	0.024	0.043	0.040	0.041
1975	0.037	0.031	0.030	0.035	0.030	0.027	0.047	0.043	0.044
1976	0.037	0.033	0.035	0.038	0.033	0.030	0.047	0.046	0.046
1977	0.042	0.042	0.039	0.043	0.042	0.032	0.048	0.052	0.056
1978	0.044	0.042	0.040	0.047	0.045	0.035	0.049	0.056	0.058
1979	0.046	0.048	0.042	0.053	0.045	0.040	0.057	0.057	0.062
1980	0.062	0.056	0.051	0.057	0.062	0.050	0.068	0.063	0.072
1981	0.067	0.061	0.048	0.062	0.066	0.056	0.084	0.071	0.077
1982	0.075	0.068	0.056	0.071	0.074	0.062	0.090	0.074	0.078
1983	0.080	0.070	0.062	0.072	0.073	0.060	0.090	0.076	0.083

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.021	0.020	0.034	0.026	0.014	0.023	0.023	0.021	0.019
1971	0.022	0.021	0.036	0.027	0.015	0.024	0.023	0.021	0.017
1972	0.023	0.022	0.036	0.028	0.015	0.025	0.024	0.021	0.017
1973	0.025	0.024	0.039	0.029	0.015	0.026	0.025	0.022	0.015
1974	0.033	0.029	0.044	0.031	0.015	0.031	0.027	0.024	0.016
1975	0.039	0.037	0.057	0.036	0.017	0.036	0.029	0.028	0.018
1976	0.041	0.039	0.059	0.040	0.019	0.039	0.032	0.032	0.019
1977	0.044	0.041	0.064	0.043	0.021	0.041	0.036	0.038	0.022
1978	0.046	0.045	0.071	0.045	0.021	0.046	0.041	0.041	0.026
1979	0.051	0.048	0.076	0.050	0.023	0.049	0.044	0.044	0.028
1980	0.060	0.050	0.091	0.055	0.029	0.058	0.046	0.051	0.036
1981	0.073	0.055	0.130	0.063	0.030	0.066	0.049	0.057	0.041
1982	0.069	0.062	0.135	0.067	0.037	0.074	0.054	0.062	0.051
1983	0.068	0.062	0.122	0.071	0.038	0.077	0.056	0.068	0.049

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.017	0.028	0.024	0.027	0.024	0.027	0.024	0.019	0.020
1971	0.018	0.030	0.026	0.027	0.025	0.027	0.025	0.020	0.020
1972	0.018	0.030	0.027	0.029	0.026	0.028	0.025	0.022	0.020
1973	0.019	0.031	0.028	0.029	0.028	0.028	0.026	0.022	0.021
1974	0.023	0.046	0.040	0.033	0.033	0.032	0.029	0.028	0.022
1975	0.024	0.050	0.043	0.040	0.039	0.036	0.033	0.030	0.022
1976	0.027	0.052	0.046	0.039	0.044	0.038	0.037	0.036	0.022
1977	0.029	0.056	0.052	0.043	0.047	0.040	0.037	0.039	0.021
1978	0.031	0.057	0.056	0.045	0.051	0.041	0.041	0.041	0.027
1979	0.035	0.062	0.057	0.053	0.054	0.043	0.046	0.047	0.027
1980	0.042	0.076	0.063	0.066	0.061	0.045	0.049	0.053	0.029
1981	0.050	0.091	0.071	0.075	0.067	0.051	0.050	0.066	0.034
1982	0.052	0.087	0.076	0.077	0.071	0.054	0.057	0.067	0.034
1983	0.055	0.087	0.075	0.071	0.073	0.058	0.060	0.066	0.040

TABLE B.2 (CONT). Electricity Prices: Commercial Sector (\$/kWh)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.016	0.023	0.017	0.030	0.026	0.020	0.016	0.027	0.022
1971	0.017	0.023	0.017	0.031	0.030	0.020	0.017	0.031	0.023
1972	0.018	0.023	0.018	0.032	0.031	0.021	0.018	0.033	0.023
1973	0.019	0.023	0.019	0.033	0.033	0.021	0.018	0.036	0.024
1974	0.025	0.025	0.020	0.044	0.047	0.024	0.022	0.052	0.030
1975	0.029	0.027	0.024	0.053	0.052	0.027	0.028	0.057	0.035
1976	0.032	0.029	0.028	0.055	0.054	0.030	0.032	0.060	0.036
1977	0.034	0.032	0.031	0.058	0.059	0.034	0.036	0.065	0.042
1978	0.037	0.034	0.033	0.065	0.061	0.040	0.039	0.063	0.046
1979	0.039	0.036	0.036	0.069	0.065	0.047	0.040	0.068	0.049
1980	0.042	0.042	0.044	0.084	0.077	0.055	0.053	0.080	0.054
1981	0.048	0.049	0.048	0.098	0.088	0.063	0.059	0.101	0.061
1982	0.055	0.051	0.049	0.091	0.095	0.071	0.063	0.106	0.068
1983	0.057	0.057	0.057	0.092	0.093	0.070	0.065	0.113	0.071

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.019	0.013	0.023	0.024	0.017	0.026	0.017	0.018	0.018
1971	0.019	0.014	0.026	0.025	0.018	0.026	0.019	0.018	0.019
1972	0.020	0.014	0.027	0.028	0.018	0.025	0.019	0.018	0.019
1973	0.019	0.015	0.028	0.029	0.019	0.026	0.020	0.019	0.020
1974	0.021	0.016	0.036	0.044	0.025	0.028	0.023	0.022	0.021
1975	0.023	0.018	0.041	0.048	0.029	0.030	0.029	0.026	0.025
1976	0.028	0.019	0.043	0.047	0.031	0.034	0.031	0.030	0.027
1977	0.032	0.020	0.046	0.052	0.034	0.035	0.033	0.035	0.031
1978	0.035	0.022	0.050	0.053	0.036	0.037	0.038	0.038	0.036
1979	0.036	0.024	0.052	0.060	0.039	0.039	0.043	0.042	0.041
1980	0.041	0.031	0.057	0.070	0.042	0.045	0.046	0.049	0.046
1981	0.045	0.036	0.065	0.087	0.049	0.052	0.053	0.059	0.052
1982	0.050	0.040	0.074	0.082	0.054	0.052	0.064	0.067	0.057
1983	0.054	0.045	0.074	0.086	0.056	0.056	0.055	0.070	0.063

YEAR	VA	VT	WA	WI	WV	WY	WS
1970	0.017	0.023	0.011	0.025	0.020	0.018	0.021
1971	0.017	0.024	0.011	0.026	0.022	0.019	0.022
1972	0.018	0.026	0.012	0.027	0.023	0.019	0.023
1973	0.019	0.028	0.012	0.029	0.023	0.018	0.024
1974	0.025	0.035	0.013	0.031	0.028	0.018	0.030
1975	0.033	0.039	0.014	0.035	0.034	0.019	0.035
1976	0.033	0.042	0.014	0.037	0.038	0.019	0.037
1977	0.040	0.043	0.016	0.041	0.038	0.021	0.041
1978	0.041	0.046	0.016	0.043	0.040	0.024	0.044
1979	0.046	0.046	0.017	0.046	0.039	0.025	0.047
1980	0.054	0.054	0.020	0.053	0.043	0.039	0.053
1981	0.055	0.067	0.024	0.059	0.049	0.043	0.063
1982	0.059	0.072	0.029	0.066	0.055	0.043	0.069
1983	0.061	0.074	0.031	0.069	0.055	0.048	0.070

TABLE B.3. Electricity Prices: Industrial Sector (\$/kWh)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.018	0.008	0.010	0.012	0.010	0.012	0.015	0.013	0.011
1971	0.019	0.009	0.010	0.012	0.010	0.012	0.016	0.014	0.013
1972	0.020	0.009	0.011	0.013	0.011	0.013	0.019	0.015	0.016
1973	0.021	0.010	0.012	0.015	0.013	0.014	0.020	0.016	0.018
1974	0.022	0.013	0.017	0.019	0.020	0.016	0.031	0.025	0.028
1975	0.023	0.018	0.018	0.024	0.023	0.019	0.036	0.029	0.032
1976	0.035	0.020	0.023	0.026	0.026	0.021	0.035	0.027	0.031
1977	0.035	0.023	0.025	0.030	0.032	0.022	0.037	0.029	0.034
1978	0.035	0.026	0.026	0.031	0.037	0.024	0.037	0.035	0.036
1979	0.035	0.030	0.027	0.034	0.038	0.027	0.044	0.034	0.040
1980	0.035	0.035	0.031	0.039	0.055	0.032	0.057	0.040	0.052
1981	0.044	0.041	0.038	0.042	0.062	0.037	0.070	0.044	0.056
1982	0.070	0.047	0.040	0.052	0.073	0.044	0.075	0.059	0.061
1983	0.089	0.050	0.041	0.053	0.068	0.042	0.075	0.061	0.052

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.012	0.010	0.016	0.013	0.006	0.012	0.012	0.012	0.007
1971	0.012	0.011	0.017	0.014	0.006	0.013	0.012	0.012	0.008
1972	0.014	0.012	0.017	0.014	0.007	0.014	0.013	0.012	0.009
1973	0.015	0.013	0.019	0.015	0.007	0.014	0.014	0.013	0.009
1974	0.021	0.018	0.023	0.017	0.008	0.018	0.016	0.015	0.011
1975	0.026	0.025	0.034	0.022	0.009	0.022	0.019	0.019	0.016
1976	0.029	0.025	0.034	0.024	0.011	0.024	0.021	0.022	0.016
1977	0.029	0.027	0.039	0.027	0.012	0.026	0.026	0.027	0.018
1978	0.031	0.031	0.045	0.029	0.013	0.031	0.031	0.029	0.023
1979	0.035	0.032	0.049	0.032	0.015	0.033	0.032	0.031	0.026
1980	0.046	0.036	0.064	0.036	0.019	0.040	0.038	0.037	0.030
1981	0.058	0.039	0.104	0.040	0.021	0.046	0.041	0.042	0.036
1982	0.057	0.047	0.109	0.044	0.023	0.053	0.040	0.049	0.041
1983	0.056	0.045	0.095	0.046	0.025	0.055	0.050	0.053	0.042

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.009	0.017	0.013	0.012	0.013	0.014	0.014	0.010	0.005
1971	0.009	0.018	0.014	0.012	0.014	0.015	0.014	0.011	0.005
1972	0.009	0.020	0.015	0.013	0.014	0.016	0.015	0.012	0.005
1973	0.010	0.021	0.016	0.014	0.015	0.016	0.016	0.013	0.006
1974	0.014	0.034	0.025	0.020	0.021	0.019	0.019	0.018	0.005
1975	0.014	0.038	0.029	0.022	0.027	0.023	0.022	0.022	0.007
1976	0.014	0.040	0.027	0.021	0.029	0.025	0.025	0.025	0.007
1977	0.017	0.044	0.029	0.023	0.031	0.030	0.027	0.028	0.007
1978	0.019	0.043	0.035	0.024	0.035	0.032	0.031	0.030	0.008
1979	0.023	0.048	0.034	0.031	0.038	0.033	0.032	0.034	0.009
1980	0.031	0.062	0.040	0.045	0.045	0.038	0.038	0.039	0.010
1981	0.039	0.075	0.044	0.051	0.051	0.042	0.040	0.048	0.014
1982	0.045	0.071	0.049	0.049	0.057	0.049	0.045	0.052	0.022
1983	0.047	0.073	0.047	0.047	0.055	0.047	0.046	0.051	0.025

TABLE B.3 (CONT). Electricity Prices: Industrial Sector (\$/kWh)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.009	0.020	0.012	0.014	0.013	0.012	0.007	0.012	0.010
1971	0.010	0.021	0.012	0.014	0.016	0.012	0.008	0.013	0.011
1972	0.011	0.022	0.013	0.015	0.017	0.012	0.008	0.014	0.011
1973	0.012	0.022	0.014	0.016	0.019	0.013	0.010	0.015	0.011
1974	0.017	0.024	0.014	0.026	0.031	0.016	0.015	0.023	0.016
1975	0.022	0.027	0.017	0.032	0.034	0.019	0.014	0.027	0.019
1976	0.023	0.029	0.020	0.032	0.035	0.022	0.021	0.027	0.019
1977	0.025	0.031	0.021	0.034	0.041	0.027	0.024	0.031	0.022
1978	0.027	0.032	0.022	0.039	0.042	0.034	0.026	0.032	0.026
1979	0.028	0.032	0.024	0.043	0.045	0.042	0.031	0.036	0.028
1980	0.032	0.034	0.030	0.054	0.058	0.041	0.040	0.041	0.030
1981	0.035	0.041	0.033	0.074	0.068	0.052	0.040	0.053	0.037
1982	0.041	0.050	0.038	0.069	0.076	0.060	0.047	0.056	0.045
1983	0.042	0.052	0.040	0.071	0.074	0.060	0.049	0.054	0.045

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.011	0.004	0.012	0.017	0.008	0.016	0.007	0.009	0.013
1971	0.011	0.005	0.014	0.018	0.009	0.017	0.008	0.009	0.013
1972	0.011	0.005	0.015	0.020	0.009	0.017	0.008	0.009	0.014
1973	0.011	0.005	0.016	0.021	0.010	0.017	0.009	0.010	0.014
1974	0.012	0.005	0.023	0.036	0.015	0.019	0.011	0.013	0.015
1975	0.015	0.007	0.027	0.039	0.020	0.021	0.017	0.016	0.018
1976	0.019	0.009	0.027	0.038	0.021	0.023	0.018	0.020	0.021
1977	0.023	0.010	0.031	0.043	0.023	0.024	0.020	0.023	0.023
1978	0.025	0.011	0.033	0.044	0.025	0.027	0.025	0.025	0.026
1979	0.026	0.013	0.036	0.050	0.027	0.028	0.030	0.029	0.030
1980	0.032	0.016	0.044	0.063	0.029	0.033	0.033	0.034	0.035
1981	0.037	0.020	0.049	0.079	0.034	0.037	0.040	0.042	0.039
1982	0.042	0.030	0.058	0.077	0.039	0.044	0.046	0.051	0.045
1983	0.044	0.034	0.056	0.079	0.040	0.043	0.047	0.053	0.046

YEAR	VA	VT	WA	WI	WV	WY	WS
1970	0.011	0.016	0.003	0.015	0.009	0.011	0.010
1971	0.011	0.016	0.003	0.015	0.010	0.011	0.011
1972	0.012	0.018	0.003	0.016	0.011	0.011	0.012
1973	0.013	0.019	0.004	0.017	0.012	0.011	0.013
1974	0.020	0.025	0.004	0.019	0.017	0.012	0.017
1975	0.025	0.026	0.005	0.023	0.022	0.012	0.021
1976	0.024	0.028	0.005	0.025	0.023	0.013	0.022
1977	0.029	0.028	0.005	0.026	0.023	0.014	0.025
1978	0.031	0.030	0.005	0.028	0.026	0.017	0.028
1979	0.034	0.031	0.005	0.030	0.026	0.017	0.031
1980	0.042	0.039	0.008	0.035	0.029	0.018	0.037
1981	0.042	0.048	0.011	0.039	0.033	0.025	0.043
1982	0.047	0.054	0.019	0.045	0.040	0.032	0.050
1983	0.047	0.058	0.022	0.047	0.040	0.035	0.050

TABLE B.4. Electricity Prices: Transportation Sector (\$/kWh)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	0.0	0.012	0.0	0.010	0.0	0.0	0.013	0.0
1971	0.0	0.0	0.012	0.0	0.010	0.0	0.0	0.015	0.0
1972	0.041	0.0	0.013	0.0	0.010	0.0	0.0	0.016	0.0
1973	0.071	0.0	0.015	0.0	0.011	0.0	0.0	0.017	0.0
1974	0.075	0.0	0.022	0.0	0.013	0.0	0.0	0.026	0.0
1975	0.032	0.0	0.025	0.0	0.015	0.0	0.0	0.028	0.0
1976	0.031	0.0	0.027	0.0	0.017	0.0	0.0	0.026	0.0
1977	0.031	0.0	0.019	0.0	0.028	0.0	0.0	0.025	0.0
1978	0.030	0.0	0.014	0.0	0.031	0.0	0.0	0.036	0.0
1979	0.034	0.0	0.028	0.0	0.025	0.0	0.0	0.038	0.0
1980	0.036	0.0	0.029	0.0	0.039	0.0	0.0	0.043	0.0
1981	0.026	0.0	0.029	0.075	0.045	0.0	0.0	0.050	0.0
1982	0.030	0.0	0.019	0.050	0.063	0.0	0.0	0.063	0.0
1983	0.041	0.0	0.020	0.047	0.070	0.0	0.067	0.065	0.0

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.0	0.0	0.0	0.0	0.0	0.014	0.018	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.015	0.020	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.016	0.019	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.017	0.021	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.020	0.026	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.021	0.032	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.023	0.038	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.025	0.046	0.0	0.0
1978	0.0	0.0	0.0	0.0	0.0	0.028	0.053	0.0	0.0
1979	0.0	0.032	0.0	0.0	0.0	0.032	0.058	0.0	0.0
1980	0.0	0.034	0.0	0.0	0.0	0.040	0.063	0.0	0.0
1981	0.0	0.041	0.0	0.0	0.0	0.047	0.076	0.0	0.0
1982	0.0	0.044	0.0	0.0	0.0	0.055	0.090	0.0	0.0
1983	0.0	0.042	0.0	0.0	0.0	0.060	0.096	0.0	0.0

YEAR	LA	MA	ME	NE	MI	MN	MO	MS	MT
1970	0.013	0.019	0.013	0.0	0.0	0.0	0.009	0.0	0.005
1971	0.0	0.028	0.015	0.0	0.0	0.0	0.010	0.0	0.005
1972	0.014	0.030	0.016	0.0	0.0	0.0	0.011	0.0	0.005
1973	0.012	0.025	0.017	0.0	0.0	0.0	0.012	0.0	0.005
1974	0.0	0.044	0.026	0.0	0.0	0.0	0.014	0.0	0.005
1975	0.0	0.050	0.028	0.0	0.0	0.0	0.019	0.0	0.0
1976	0.0	0.062	0.026	0.0	0.0	0.0	0.024	0.0	0.0
1977	0.0	0.064	0.025	0.0	0.0	0.0	0.026	0.0	0.0
1978	0.0	0.072	0.036	0.0	0.0	0.0	0.031	0.0	0.0
1979	0.0	0.063	0.037	0.0	0.0	0.0	0.032	0.0	0.0
1980	0.0	0.074	0.043	0.0	0.0	0.0	0.036	0.0	0.0
1981	0.0	0.083	0.050	0.0	0.0	0.0	0.041	0.0	0.0
1982	0.0	0.081	0.054	0.0	0.0	0.0	0.042	0.0	0.0
1983	0.0	0.062	0.052	0.0	0.0	0.0	0.041	0.0	0.0

TABLE B.4 (CONT). Electricity Prices: Transportation Sector (\$/kWh)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.0	0.0	0.011	0.0	0.016	0.0	0.0	0.016	0.014
1971	0.0	0.0	0.011	0.0	0.020	0.0	0.0	0.019	0.015
1972	0.0	0.0	0.013	0.0	0.019	0.0	0.0	0.021	0.016
1973	0.0	0.0	0.011	0.0	0.021	0.0	0.0	0.025	0.017
1974	0.0	0.0	0.011	0.0	0.029	0.0	0.0	0.042	0.024
1975	0.0	0.0	0.014	0.0	0.038	0.0	0.0	0.047	0.026
1976	0.0	0.0	0.015	0.0	0.032	0.0	0.0	0.047	0.029
1977	0.0	0.0	0.016	0.0	0.036	0.0	0.0	0.039	0.038
1978	0.0	0.0	0.016	0.0	0.034	0.0	0.0	0.046	0.041
1979	0.0	0.0	0.016	0.0	0.041	0.0	0.0	0.052	0.045
1980	0.0	0.0	0.026	0.0	0.051	0.0	0.0	0.051	0.046
1981	0.0	0.0	0.029	0.0	0.068	0.0	0.0	0.059	0.059
1982	0.0	0.0	0.028	0.0	0.059	0.0	0.0	0.074	0.071
1983	0.0	0.0	0.029	0.0	0.065	0.0	0.0	0.099	0.076

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.0	0.0	0.012	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.015	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.017	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.018	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.026	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.029	0.0	0.0	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.029	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.032	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.032	0.0	0.0	0.0	0.0	0.0	0.0
1979	0.0	0.0	0.035	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.052	0.0	0.0	0.0	0.0	0.0	0.0
1981	0.0	0.0	0.063	0.0	0.0	0.0	0.0	0.0	0.0
1982	0.0	0.0	0.068	0.0	0.0	0.0	0.0	0.0	0.0
1983	0.0	0.0	0.049	0.0	0.0	0.0	0.0	0.0	0.0

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.0	0.0	0.007	0.0	0.0	0.0	0.015
1971	0.0	0.0	0.007	0.0	0.0	0.0	0.017
1972	0.0	0.0	0.008	0.0	0.0	0.0	0.019
1973	0.0	0.0	0.009	0.0	0.0	0.0	0.022
1974	0.0	0.0	0.010	0.0	0.0	0.0	0.034
1975	0.0	0.0	0.011	0.0	0.0	0.0	0.037
1976	0.0	0.0	0.011	0.0	0.0	0.0	0.038
1977	0.0	0.0	0.014	0.0	0.0	0.0	0.035
1978	0.050	0.0	0.013	0.0	0.0	0.0	0.039
1979	0.051	0.0	0.013	0.0	0.0	0.0	0.043
1980	0.050	0.0	0.015	0.0	0.0	0.0	0.049
1981	0.060	0.0	0.017	0.0	0.0	0.0	0.060
1982	0.061	0.0	0.019	0.0	0.0	0.0	0.068
1983	0.062	0.0	0.021	0.0	0.0	0.0	0.079

TABLE B.5. Natural Gas Prices: Residential Sector (\$/1000 cu ft)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	1.519	1.130	0.754	1.199	0.985	0.719	1.912	1.455	1.585
1971	1.531	1.186	0.787	1.226	1.034	0.746	2.069	1.511	1.627
1972	1.553	1.266	0.827	1.244	1.079	0.782	2.394	1.649	1.710
1973	1.574	1.368	0.872	1.368	1.161	0.825	2.247	1.681	1.853
1974	1.580	1.550	1.060	1.500	1.380	1.000	2.790	1.707	2.110
1975	1.627	1.568	1.116	1.534	1.574	1.157	3.293	2.332	2.426
1976	1.653	1.989	1.227	2.117	1.771	1.268	3.411	2.574	2.609
1977	1.710	2.309	1.980	2.612	1.887	1.625	4.340	3.181	3.249
1978	1.760	2.706	1.960	3.070	1.985	1.938	4.473	3.400	4.060
1979	1.708	3.651	1.569	3.504	2.469	2.476	4.746	3.764	4.025
1980	1.737	4.046	2.474	4.052	3.517	3.239	5.850	4.574	4.300
1981	1.954	4.774	3.042	4.632	3.735	4.175	6.851	5.499	5.532
1982	1.797	5.589	3.830	5.925	4.439	4.899	8.515	6.645	6.047
1983	2.336	6.224	4.408	6.659	5.413	5.516	9.705	3.103	6.593

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	2.514	1.048	0.0	0.966	1.391	1.046	1.310	0.885	0.828
1971	2.537	1.133	0.0	1.027	1.494	1.072	1.080	0.717	0.880
1972	2.658	1.257	0.0	1.106	1.507	1.135	1.138	0.736	0.925
1973	2.702	1.303	0.0	1.170	1.521	1.213	1.195	0.747	0.989
1974	2.850	1.400	0.0	1.220	1.800	1.350	1.280	0.900	1.100
1975	2.739	1.497	0.0	1.427	2.181	1.613	1.455	1.029	1.227
1976	2.813	1.695	0.0	1.612	2.241	1.898	1.695	1.482	1.320
1977	3.529	1.966	0.0	1.935	2.857	2.213	2.022	1.734	1.788
1978	3.540	2.330	0.0	2.252	3.407	2.503	2.168	1.770	1.937
1979	3.700	2.877	0.0	2.684	3.725	3.006	2.646	1.952	2.353
1980	4.802	3.679	12.997	3.192	4.978	3.612	3.155	2.367	3.029
1981	5.307	4.342	15.572	3.895	5.570	4.046	3.607	3.029	3.488
1982	6.598	5.334	15.708	4.693	6.922	4.733	4.389	4.061	4.469
1983	6.857	6.109	16.469	5.523	7.383	5.467	5.492	4.681	5.308

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.774	1.919	1.455	1.986	1.015	1.096	0.964	0.884	0.908
1971	0.711	2.119	1.511	2.053	1.063	1.183	1.016	0.944	0.935
1972	0.915	2.290	1.649	2.140	1.098	1.231	1.097	1.082	0.966
1973	0.973	2.401	1.681	2.174	1.182	1.304	1.161	1.089	1.086
1974	1.120	2.710	1.707	2.377	1.370	1.410	1.270	1.230	1.120
1975	1.368	3.152	2.332	2.648	1.621	1.569	1.495	1.408	1.296
1976	1.571	3.642	2.574	2.680	1.899	1.738	1.699	1.712	1.364
1977	1.973	3.950	3.181	3.623	2.221	2.132	2.184	2.107	1.616
1978	2.470	4.167	3.400	3.572	2.308	2.406	2.289	2.398	1.894
1979	2.709	4.554	3.764	4.103	2.644	2.862	2.756	2.801	2.213
1980	3.403	5.421	4.467	6.350	3.191	3.228	3.286	3.478	3.053
1981	4.149	6.372	5.065	7.449	3.845	4.090	4.021	3.990	3.754
1982	5.325	7.542	6.129	8.638	4.790	4.962	5.202	4.931	4.460
1983	6.120	8.327	7.432	9.835	5.846	5.906	6.123	5.887	4.627

TABLE B.5 (CONT). Natural Gas Prices: Residential Sector (\$/1000 cu ft)

YEAR	NC	ND	NE	NH	NJ	NM	NO	NY	OH
1970	1.300	1.024	0.851	1.986	1.868	0.928	1.507	1.398	0.900
1971	1.338	1.099	0.922	2.053	1.946	0.954	1.512	1.497	0.984
1972	1.407	1.132	0.991	2.140	2.018	0.973	1.524	1.616	1.054
1973	1.505	1.144	1.041	2.174	2.089	1.003	1.538	1.741	1.110
1974	1.690	1.190	1.140	2.377	2.250	1.240	1.720	2.000	1.240
1975	2.024	1.509	1.281	2.648	2.692	1.330	1.950	2.536	1.504
1976	2.133	1.790	1.366	2.680	3.140	1.363	2.043	2.870	1.773
1977	2.812	2.106	1.796	3.623	3.423	2.115	2.782	3.281	2.212
1978	2.999	2.328	1.968	3.572	3.533	2.496	2.800	3.676	2.426
1979	3.516	2.878	2.304	4.103	4.300	2.732	2.832	4.124	2.808
1980	4.110	3.851	2.729	4.663	5.065	3.323	4.068	4.956	3.546
1981	5.172	4.277	3.451	5.676	5.873	3.864	4.839	5.500	3.966
1982	5.731	4.612	4.157	6.852	7.032	4.948	5.564	6.517	4.965
1983	6.657	5.570	4.957	7.476	7.435	5.500	6.816	7.874	6.087

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.841	1.511	1.237	1.832	1.353	1.040	0.912	0.921	0.850
1971	0.874	1.600	1.280	1.932	1.470	1.102	0.976	0.993	0.873
1972	0.898	1.678	1.356	2.053	1.615	1.132	1.024	1.014	0.901
1973	0.919	1.764	1.481	2.373	1.652	1.194	1.077	1.039	0.987
1974	1.050	2.000	1.660	2.550	1.970	1.290	1.170	1.170	1.070
1975	1.218	2.196	1.924	3.085	2.130	1.397	1.291	1.523	1.218
1976	1.497	2.682	2.138	3.340	2.291	1.501	1.611	1.987	1.379
1977	1.783	3.432	2.506	4.228	2.874	1.828	2.094	2.392	1.637
1978	1.930	3.827	2.633	4.180	3.004	2.100	2.140	2.731	1.929
1979	2.198	4.122	3.192	3.668	3.501	2.613	2.365	3.214	2.222
1980	2.461	5.609	3.909	5.692	4.192	3.132	2.991	3.407	2.741
1981	2.945	6.063	4.509	6.606	4.902	3.912	3.466	4.197	3.227
1982	3.534	6.922	5.424	7.960	5.515	4.711	4.320	5.212	3.410
1983	4.335	7.239	6.443	8.660	6.380	5.591	5.261	5.558	4.266

YEAR	VA	VT	WA	WI	WV	WY	US
1970	1.490	1.986	1.403	1.247	0.891	0.682	1.090
1971	1.522	2.053	1.434	1.264	0.938	0.707	1.149
1972	1.598	2.140	1.467	1.338	0.964	0.740	1.214
1973	1.679	2.174	1.552	1.429	0.974	0.765	1.287
1974	1.870	2.377	1.770	1.500	1.100	0.850	1.431
1975	2.244	2.648	2.274	1.746	1.453	1.017	1.708
1976	2.536	2.680	2.695	2.110	1.668	1.184	1.978
1977	3.028	3.623	3.124	2.495	2.547	1.588	2.349
1978	3.269	3.572	3.482	2.683	2.610	1.911	2.363
1979	3.720	4.103	3.946	3.063	2.925	2.513	2.975
1980	4.266	6.231	5.313	3.840	3.595	2.820	3.682
1981	4.659	6.999	6.022	4.771	4.241	3.511	4.290
1982	6.030	7.245	6.870	5.643	5.208	4.539	5.177
1983	7.031	6.788	6.876	6.487	6.003	5.131	6.064

TABLE B.6. Natural Gas Prices: Commercial Sector (\$/1000 cu ft)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.685	0.602	0.526	0.632	0.728	0.570	1.472	1.112	1.245
1971	0.732	0.656	0.547	0.685	0.758	0.593	1.552	1.147	1.271
1972	0.818	0.732	0.568	0.723	0.813	0.644	1.620	1.223	1.355
1973	0.776	0.737	0.617	0.766	0.851	0.683	1.822	1.259	1.386
1974	0.874	0.875	0.756	0.830	0.992	0.828	2.228	1.430	1.630
1975	0.974	1.074	0.891	1.159	1.289	0.990	2.635	1.987	1.901
1976	1.038	1.596	1.018	1.427	1.588	1.089	3.221	2.156	1.976
1977	1.345	1.827	1.613	1.757	2.073	1.403	3.563	2.723	2.947
1978	1.325	2.092	1.625	2.202	2.245	1.725	3.768	2.963	3.851
1979	1.031	2.778	2.259	2.644	2.733	2.290	3.946	3.170	3.743
1980	1.058	3.383	2.276	3.135	3.982	3.015	4.770	4.220	4.045
1981	1.405	4.072	2.816	3.535	4.378	3.837	5.600	5.124	5.179
1982	1.592	4.824	3.628	4.898	5.318	4.566	6.962	6.276	5.586
1983	1.940	5.418	4.174	5.552	6.332	5.043	7.454	7.439	6.078

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.927	0.740	0.0	0.688	1.014	0.749	0.832	0.454	0.667
1971	1.063	0.850	0.0	0.734	1.010	0.779	0.881	0.471	0.706
1972	1.204	0.887	0.0	0.833	1.030	0.843	0.926	0.510	0.751
1973	1.292	0.935	0.0	0.899	1.070	0.889	0.985	0.533	0.804
1974	1.643	1.015	0.0	0.939	1.212	1.016	1.056	0.598	0.909
1975	1.699	1.096	0.0	1.063	1.548	1.313	1.245	0.671	1.061
1976	1.720	1.382	0.0	1.295	2.060	1.640	1.497	1.098	1.148
1977	2.010	1.754	0.0	1.647	2.420	1.982	1.839	1.194	1.655
1978	2.032	2.075	0.0	1.984	3.075	2.268	2.009	1.171	1.831
1979	2.735	2.524	0.0	2.388	3.456	2.807	2.459	1.607	2.205
1980	3.433	3.218	12.227	2.846	4.592	3.339	2.954	1.897	2.920
1981	3.752	3.980	14.742	3.506	5.002	3.742	3.384	2.406	3.391
1982	4.675	4.743	14.213	4.313	6.123	4.439	4.173	3.239	4.394
1983	5.044	5.417	14.704	5.043	6.230	4.966	5.171	4.556	5.158

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.379	1.417	1.112	1.436	0.839	0.695	0.627	0.582	0.618
1971	0.410	1.596	1.147	1.495	0.869	0.759	0.651	0.625	0.654
1972	0.462	1.713	1.223	1.634	0.903	0.834	0.754	0.677	0.663
1973	0.511	1.811	1.259	1.704	0.960	0.850	0.780	0.723	0.775
1974	0.601	2.145	1.430	1.884	1.130	0.979	0.896	0.753	0.897
1975	0.798	2.647	1.987	2.116	1.483	1.162	1.154	0.943	1.095
1976	1.099	3.077	2.156	2.652	1.822	1.410	1.354	1.290	1.185
1977	1.396	3.429	2.723	3.231	2.117	1.724	1.643	1.765	1.599
1978	1.442	3.537	2.963	3.267	2.228	2.023	2.002	2.025	1.658
1979	2.280	3.839	3.170	3.608	2.578	2.587	2.556	2.457	1.995
1980	2.694	4.723	3.957	5.124	3.188	2.879	2.928	3.068	3.144
1981	3.693	5.725	4.483	6.128	3.826	3.638	3.592	3.572	4.103
1982	4.927	6.415	5.554	7.324	4.658	4.551	4.766	4.532	4.874
1983	5.715	7.422	6.710	8.897	5.633	5.269	5.608	5.473	5.064

TABLE B.6 (CONT). Natural Gas Prices: Commercial Sector (\$/1000 cu ft)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.962	0.693	0.528	1.436	1.418	0.476	0.756	1.190	0.763
1971	0.983	0.765	0.587	1.495	1.456	0.500	0.773	1.265	0.821
1972	1.069	0.807	0.583	1.634	1.489	0.526	0.800	1.302	0.875
1973	1.137	0.873	0.758	1.704	1.553	0.524	0.872	1.370	0.925
1974	1.276	1.000	0.812	1.884	1.862	0.716	1.358	1.590	1.077
1975	1.745	1.106	0.994	2.118	2.328	0.797	1.548	2.002	1.344
1976	2.040	1.353	1.154	2.652	2.768	1.071	1.773	2.349	1.622
1977	3.046	1.671	1.394	3.231	3.098	1.676	2.196	2.855	2.070
1978	2.792	1.938	1.537	3.267	3.374	2.001	2.405	3.052	2.240
1979	3.092	2.472	2.004	3.608	3.994	2.304	2.796	3.499	2.601
1980	3.711	3.432	2.286	4.128	4.596	2.927	3.875	4.267	3.315
1981	4.719	3.654	2.961	5.106	5.482	3.388	4.579	4.735	3.711
1982	5.240	4.096	3.492	6.068	6.360	4.435	5.544	5.483	4.646
1983	6.009	5.060	4.216	6.730	6.690	4.805	6.034	6.475	5.713

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.522	1.278	0.965	1.474	0.889	0.636	0.713	0.454	0.591
1971	0.534	1.312	1.006	1.619	0.985	0.669	0.766	0.496	0.636
1972	0.565	1.432	1.086	1.822	1.008	0.693	0.859	0.524	0.709
1973	0.640	1.452	1.152	1.885	1.017	0.766	0.910	0.555	0.795
1974	0.751	1.710	1.279	2.131	1.129	1.135	0.978	0.709	0.930
1975	0.935	1.863	1.709	2.746	1.253	0.993	1.127	1.050	1.519
1976	1.166	2.373	1.721	3.387	1.482	1.132	1.431	1.422	1.527
1977	1.525	3.077	2.307	3.461	2.115	1.444	2.074	1.797	1.730
1978	1.685	3.387	2.399	3.260	2.457	1.725	2.040	2.196	1.668
1979	3.418	3.718	2.951	3.089	2.784	2.230	2.469	2.645	2.333
1980	2.300	5.110	3.569	5.105	3.210	2.720	3.000	2.993	5.594
1981	2.857	5.430	4.217	5.825	3.962	3.412	3.539	3.681	5.353
1982	3.454	6.294	5.043	6.861	4.811	4.092	4.426	4.486	3.431
1983	4.127	6.488	6.075	7.103	5.534	4.876	5.153	5.046	4.318

YEAR	VA	VT	WA	WI	WV	WY	JS
1970	0.962	1.436	1.105	0.834	0.706	0.436	0.769
1971	0.996	1.495	1.128	0.952	0.734	0.477	0.821
1972	1.103	1.634	1.162	0.998	0.746	0.498	0.878
1973	1.128	1.704	1.246	1.108	0.762	0.529	0.944
1974	1.304	1.884	1.331	1.123	0.892	0.592	1.072
1975	1.717	2.118	1.819	1.312	1.220	0.673	1.350
1976	1.895	2.652	2.230	1.712	1.503	0.782	1.641
1977	2.427	3.231	2.674	2.097	2.253	1.198	2.037
1978	2.642	3.267	2.849	2.348	2.153	1.655	2.234
1979	3.134	3.608	3.463	2.690	2.690	2.374	2.725
1980	3.767	6.151	4.834	3.461	3.340	2.653	3.393
1981	4.183	6.851	5.346	4.377	3.952	3.271	4.002
1982	5.373	7.061	6.212	4.941	4.944	4.627	4.822
1983	6.236	6.513	6.076	5.313	5.725	5.369	5.592

TABLE B.7. Natural Gas Prices: Industrial Sector (\$/1000 cu ft)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.428	0.335	0.285	0.437	0.405	0.278	1.044	0.664	0.586
1971	0.435	0.391	0.308	0.467	0.438	0.302	1.157	0.719	0.630
1972	0.684	0.424	0.346	0.476	0.471	0.331	1.173	0.750	0.756
1973	0.725	0.476	0.395	0.491	0.533	0.375	1.259	0.775	0.813
1974	0.750	0.580	0.400	0.580	0.690	0.480	1.730	1.181	1.010
1975	0.811	0.746	0.672	0.757	1.111	0.645	2.247	1.372	1.392
1976	0.868	1.102	0.913	0.919	1.464	0.795	2.674	1.621	1.461
1977	1.011	1.328	1.217	1.305	1.949	1.097	2.971	2.197	2.472
1978	0.960	1.652	1.155	1.623	2.149	1.322	3.083	2.629	2.510
1979	1.048	2.334	1.222	2.150	2.731	1.844	3.293	2.193	2.007
1980	0.388	2.545	2.223	2.685	3.801	2.632	4.171	2.456	2.804
1981	0.359	3.153	2.762	3.172	4.054	3.401	5.094	3.009	3.663
1982	0.581	4.239	3.244	4.038	4.879	3.983	6.023	0.0	4.579
1983	0.067	4.503	3.629	4.139	5.490	4.283	5.928	0.0	4.285

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.390	0.413	0.0	0.367	0.446	0.502	0.474	0.273	0.485
1971	0.442	0.517	0.0	0.393	0.489	0.561	0.511	0.266	0.539
1972	0.499	0.535	0.0	0.464	0.536	0.637	0.557	0.333	0.546
1973	0.581	0.612	0.0	0.518	0.589	0.682	0.590	0.360	0.574
1974	0.750	0.700	0.0	0.600	0.710	0.810	0.700	0.400	0.660
1975	1.026	0.843	0.0	0.779	1.171	1.223	0.902	0.540	0.753
1976	1.057	1.105	0.0	1.009	1.545	1.464	1.080	0.812	1.079
1977	1.146	1.412	0.0	1.351	1.885	1.852	1.476	0.993	1.413
1978	1.187	1.757	0.0	1.659	2.242	2.124	1.688	1.151	1.594
1979	2.165	2.238	0.0	1.950	2.534	2.625	2.169	1.634	1.979
1980	2.790	2.842	0.0	2.516	3.767	3.171	2.504	2.331	2.681
1981	3.271	3.603	0.0	3.104	3.993	3.612	3.041	3.022	3.184
1982	4.066	4.172	0.0	3.742	4.802	4.262	3.755	2.939	4.116
1983	4.103	4.516	0.0	4.103	5.120	4.832	4.364	3.394	4.566

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.241	1.040	0.684	0.853	0.535	0.418	0.403	0.300	0.339
1971	0.272	1.070	0.719	0.935	0.565	0.447	0.434	0.330	0.358
1972	0.326	1.234	0.750	1.011	0.632	0.485	0.444	0.342	0.382
1973	0.378	1.298	0.775	1.107	0.694	0.544	0.461	0.435	0.426
1974	0.630	1.710	1.181	1.198	0.910	0.640	0.580	0.570	0.580
1975	0.761	2.292	1.372	1.457	1.254	0.836	0.802	0.721	0.949
1976	0.944	2.500	1.521	2.267	1.548	1.129	0.996	1.048	0.997
1977	1.183	2.596	2.197	2.691	1.841	1.123	1.450	1.457	1.558
1978	0.960	3.008	2.629	2.776	1.939	1.236	1.461	1.519	1.642
1979	0.921	3.234	2.193	3.262	2.310	1.453	1.945	2.271	1.749
1980	1.283	4.154	3.251	4.290	2.927	2.499	2.856	2.754	3.143
1981	1.877	5.090	3.974	5.216	3.545	3.183	3.320	3.316	4.258
1982	3.158	5.673	5.041	6.633	4.315	4.097	4.414	4.122	5.488
1983	3.132	5.674	6.017	7.659	5.127	4.465	5.009	4.299	3.990

TABLE B.7 (CONT). Natural Gas Prices: Industrial Sector (\$/1000 cu ft)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.512	0.393	0.320	0.853	0.696	0.266	0.562	0.695	0.580
1971	0.535	0.443	0.366	0.925	0.739	0.323	0.574	0.771	0.617
1972	0.597	0.485	0.488	1.011	0.811	0.337	0.715	0.856	0.630
1973	0.682	0.543	0.440	1.107	0.870	0.381	0.793	0.909	0.673
1974	0.870	0.640	0.540	1.198	1.110	0.550	0.880	1.110	0.810
1975	1.363	1.002	0.685	1.457	1.899	0.621	1.134	1.494	1.111
1976	1.684	1.333	0.848	2.267	2.178	0.697	1.427	1.575	1.394
1977	2.368	1.711	1.024	2.691	2.419	1.477	1.966	1.919	1.899
1978	1.961	1.961	1.112	2.776	3.389	1.722	1.780	2.271	2.010
1979	2.676	2.505	1.252	3.262	3.187	2.115	2.321	2.734	2.358
1980	3.360	2.719	2.169	3.931	3.748	2.576	2.980	3.504	3.056
1981	4.416	4.098	2.781	4.621	4.722	2.991	3.605	3.966	3.429
1982	4.642	4.319	3.547	5.584	5.241	3.614	4.414	4.970	4.516
1983	5.171	4.765	3.724	5.994	5.446	3.893	4.816	5.682	5.150

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.253	0.484	0.586	0.866	0.463	0.326	0.390	0.210	0.296
1971	0.271	0.513	0.651	0.958	0.494	0.351	0.446	0.247	0.304
1972	0.293	0.545	0.721	1.148	0.548	0.382	0.496	0.260	0.364
1973	0.362	0.699	0.761	1.337	0.648	0.407	0.497	0.313	0.394
1974	0.490	0.890	0.940	1.730	0.720	0.720	0.610	0.530	0.460
1975	0.717	0.961	1.097	2.129	1.028	0.602	0.751	0.947	0.693
1976	0.891	1.768	1.354	2.291	1.294	0.726	1.174	1.311	0.965
1977	1.326	2.110	1.917	2.947	1.597	0.964	1.495	1.269	1.178
1978	1.486	2.516	2.020	2.800	1.849	1.598	1.614	1.908	1.430
1979	1.796	2.902	2.502	2.669	2.468	2.037	2.105	1.896	1.735
1980	2.110	4.399	3.066	4.542	2.990	2.344	2.578	2.306	2.269
1981	2.553	4.622	3.699	5.324	3.839	3.024	3.154	2.906	2.581
1982	2.963	5.584	4.499	6.183	4.374	3.897	3.960	3.406	2.453
1983	3.351	5.343	5.070	6.169	4.856	4.456	4.310	3.450	3.145

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.507	0.853	0.401	0.552	0.458	0.249	0.371
1971	0.568	0.935	0.441	0.577	0.520	0.272	0.409
1972	0.595	1.011	0.472	0.636	0.558	0.301	0.451
1973	0.658	1.107	0.531	0.679	0.634	0.314	0.501
1974	0.930	1.198	0.810	0.770	0.750	0.370	0.674
1975	1.100	1.457	1.344	1.053	1.013	0.518	0.964
1976	1.455	2.267	1.742	1.398	1.296	0.694	1.240
1977	1.932	2.691	2.123	1.781	2.021	0.943	1.499
1978	2.144	2.776	2.514	2.035	1.875	1.280	1.704
1979	2.325	3.262	2.929	2.428	2.459	1.907	1.991
1980	3.035	4.883	4.302	3.144	2.998	2.466	2.563
1981	3.587	5.613	4.625	3.770	3.519	3.074	3.136
1982	4.386	5.464	5.363	4.417	4.384	3.421	3.878
1983	5.036	5.015	5.257	4.688	5.078	3.677	4.184

TABLE B.8. Natural Gas Prices: Electric Utility Sector (\$/1000 cu ft)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.375	0.273	0.255	0.368	0.346	0.234	0.347	0.329	0.379
1971	0.427	0.322	0.283	0.418	0.364	0.263	0.391	0.353	0.477
1972	0.433	0.352	0.307	0.419	0.400	0.308	0.433	0.348	0.484
1973	0.466	0.370	0.350	0.440	0.450	0.290	0.0	0.0	0.700
1974	0.500	0.890	0.410	0.570	0.630	0.400	0.0	0.0	1.010
1975	0.514	1.110	0.620	0.783	1.110	0.586	0.0	0.0	1.100
1976	0.661	1.900	0.800	0.877	1.650	0.748	0.0	0.0	1.210
1977	0.761	2.070	1.020	1.150	2.220	1.031	0.0	0.0	2.030
1978	0.830	2.350	1.160	1.420	2.311	1.285	0.0	0.0	1.950
1979	0.865	2.560	1.760	2.196	2.582	1.850	0.0	0.0	2.900
1980	0.480	2.960	2.210	2.550	3.710	2.590	0.0	0.0	0.620
1981	0.550	3.290	2.750	2.790	4.210	3.170	0.0	0.0	4.340
1982	0.710	3.380	3.090	3.830	5.290	3.480	0.0	0.0	4.220
1983	1.050	3.450	3.320	4.300	5.320	4.170	0.0	0.0	4.320

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.365	0.294	0.0	0.276	0.0	0.360	0.349	0.295	0.292
1971	0.399	0.322	0.0	0.319	0.0	0.390	0.387	0.322	0.334
1972	0.403	0.353	0.0	0.360	0.0	0.436	0.426	0.377	0.365
1973	0.460	0.480	0.0	0.420	0.0	0.610	0.470	0.290	0.340
1974	0.600	0.600	0.0	0.500	0.0	0.790	0.560	0.350	0.420
1975	0.729	0.731	0.0	0.682	1.450	1.158	0.819	0.479	0.693
1976	0.838	1.012	0.0	0.929	1.600	1.407	1.087	0.702	0.847
1977	0.892	1.330	0.0	1.309	2.040	1.843	1.347	0.991	1.108
1978	1.052	1.740	0.0	1.691	2.230	2.807	1.660	1.182	1.073
1979	1.292	2.830	0.0	2.016	2.920	2.743	2.192	1.380	1.717
1980	1.550	2.650	0.0	2.430	3.900	3.260	2.520	1.710	2.210
1981	1.870	3.530	0.0	2.990	4.580	4.230	3.000	2.110	2.640
1982	2.220	4.180	0.0	3.640	5.740	4.700	3.560	2.380	3.470
1983	2.560	4.280	0.0	3.850	0.0	5.440	4.250	2.810	3.880

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.218	0.338	0.329	0.0	0.423	0.259	0.264	0.274	0.278
1971	0.241	0.436	0.353	0.459	0.474	0.295	0.306	0.306	0.330
1972	0.274	0.452	0.368	0.449	0.486	0.397	0.368	0.321	0.343
1973	0.320	0.540	0.0	0.0	0.440	0.430	0.320	0.420	0.340
1974	0.440	1.440	0.0	0.0	0.730	0.470	0.430	0.580	0.340
1975	0.676	1.330	1.040	0.0	1.076	0.630	0.572	0.858	0.430
1976	0.831	1.530	1.530	0.0	1.227	0.802	0.752	1.294	0.490
1977	0.962	1.880	2.080	0.0	1.326	1.080	1.089	1.377	0.790
1978	1.172	1.870	1.360	0.0	1.594	1.350	1.109	1.425	0.820
1979	1.540	2.692	1.890	0.0	1.655	1.711	1.486	1.752	2.280
1980	2.090	3.400	2.560	0.0	2.020	1.970	2.170	2.150	4.060
1981	2.820	3.940	2.810	0.0	2.150	2.580	2.620	2.650	4.230
1982	3.230	4.220	4.210	0.0	2.540	3.350	3.720	3.240	2.010
1983	3.300	4.100	0.0	0.0	4.930	3.840	4.140	3.420	0.960

TABLE B.8 (CONT). Natural Gas Prices: Electric Utility Sector
(\$/1000 cu ft)

YEAR	NC	ND	NE	NH	NJ	NM	NY	OH
1970	0.381	0.385	0.268	0.0	0.401	0.323	0.413	0.385
1971	0.480	0.400	0.312	0.459	0.474	0.365	0.453	0.496
1972	0.502	0.402	0.370	0.449	0.489	0.369	0.471	0.382
1973	0.520	0.0	0.410	0.0	0.550	0.350	0.540	0.540
1974	0.950	0.0	0.480	0.0	0.730	0.500	0.760	0.670
1975	1.445	0.700	0.620	1.010	0.974	0.720	1.166	0.901
1976	3.490	0.0	0.791	1.800	1.479	0.984	1.520	1.100
1977	4.260	0.0	0.940	0.0	1.837	1.484	1.840	1.449
1978	3.110	0.0	1.060	0.0	2.032	1.709	1.680	1.538
1979	3.040	0.0	1.382	2.950	2.659	2.140	2.430	2.352
1980	3.260	0.0	1.730	0.0	3.120	2.540	2.700	2.760
1981	4.630	0.0	2.260	3.530	4.140	2.910	3.380	3.600
1982	4.620	0.0	2.960	0.0	4.440	3.290	4.180	4.020
1983	0.0	0.0	3.090	0.0	4.200	3.560	4.830	5.230

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.198	0.384	0.428	0.398	0.379	0.334	0.255	0.251	0.286
1971	0.214	0.435	0.497	0.502	0.445	0.355	0.275	0.286	0.303
1972	0.249	0.451	0.499	0.514	0.487	0.362	0.328	0.288	0.324
1973	0.280	0.570	0.0	0.590	0.540	0.400	0.330	0.280	0.300
1974	0.410	0.770	1.590	0.920	0.780	0.470	0.0	0.450	0.350
1975	0.629	1.310	1.470	1.200	0.735	0.640	0.0	0.773	0.580
1976	1.050	1.700	1.640	0.0	1.042	0.850	0.0	1.035	0.890
1977	1.359	2.022	2.070	0.0	0.0	1.190	0.0	1.250	1.030
1978	1.480	2.381	2.530	0.0	1.820	1.430	0.0	1.422	1.250
1979	1.619	3.429	3.010	2.580	2.331	1.870	0.0	1.645	1.550
1980	1.820	4.280	3.670	0.0	2.480	1.940	0.0	1.910	1.910
1981	2.010	4.600	4.080	3.340	3.370	2.240	0.0	2.530	2.130
1982	2.170	5.320	4.130	4.040	4.050	3.570	0.0	3.240	2.290
1983	2.520	0.0	5.100	3.900	4.400	0.0	0.0	3.250	2.950

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.298	0.0	0.0	0.428	0.328	0.229	0.292
1971	0.371	0.459	0.0	0.448	0.345	0.288	0.323
1972	0.417	0.449	0.0	0.449	0.383	0.301	0.340
1973	0.410	0.440	0.0	0.470	0.160	0.0	0.350
1974	0.570	0.510	0.0	0.570	0.150	0.920	0.490
1975	1.086	1.170	0.0	0.839	0.460	0.0	0.769
1976	1.248	1.760	0.0	1.207	0.680	1.930	1.959
1977	1.921	2.010	0.0	1.775	1.970	1.700	1.334
1978	2.200	2.220	0.0	1.982	1.750	2.100	1.479
1979	2.463	2.630	2.720	2.279	2.770	2.710	1.807
1980	3.190	4.500	3.540	2.960	2.990	3.900	2.280
1981	3.890	4.820	3.940	3.680	4.480	3.920	2.910
1982	4.260	5.000	5.910	4.230	4.150	4.370	3.520
1983	4.390	0.0	0.0	4.240	4.550	4.970	3.580

TABLE B.9. Coking Coal Prices: Industrial Sector (\$/ton)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	11,380	0.0	0.0	11,610	11,610	0.0	0.0	0.0
1971	0.0	12,460	0.0	0.0	12,500	12,500	0.0	0.0	0.0
1972	0.0	14,160	0.0	0.0	13,820	13,820	0.0	0.0	0.0
1973	0.0	17,240	0.0	0.0	16,260	16,260	0.0	0.0	0.0
1974	0.0	33,940	0.0	0.0	34,650	34,650	0.0	0.0	0.0
1975	0.0	40,270	0.0	0.0	37,110	37,110	0.0	0.0	0.0
1976	0.0	40,050	0.0	0.0	40,550	40,550	0.0	0.0	0.0
1977	0.0	55,230	0.0	0.0	42,380	42,380	0.0	0.0	0.0
1978	0.0	48,690	0.0	0.0	45,670	45,670	0.0	0.0	0.0
1979	0.0	48,280	0.0	0.0	46,630	46,630	0.0	0.0	0.0
1980	0.0	52,560	0.0	0.0	52,880	52,880	0.0	0.0	0.0
1981	0.0	55,370	0.0	0.0	60,510	60,510	0.0	0.0	0.0
1982	0.0	58,440	0.0	0.0	55,600	55,600	0.0	0.0	0.0
1983	0.0	54,480	0.0	0.0	0.0	0.0	0.0	0.0	0.0

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	NY
1970	0.0	0.0	0.0	0.0	0.0	11,160	11,340	0.0	10,220
1971	0.0	0.0	0.0	0.0	0.0	13,410	14,670	0.0	11,730
1972	0.0	0.0	0.0	0.0	0.0	14,940	15,730	0.0	15,280
1973	0.0	0.0	0.0	0.0	0.0	16,140	18,390	0.0	17,710
1974	0.0	0.0	0.0	0.0	0.0	32,830	37,030	0.0	32,830
1975	0.0	0.0	0.0	0.0	0.0	39,800	47,250	0.0	42,870
1976	0.0	0.0	0.0	0.0	0.0	38,480	40,640	0.0	44,670
1977	0.0	0.0	0.0	0.0	0.0	42,290	45,180	0.0	47,040
1978	0.0	0.0	0.0	0.0	0.0	49,710	54,150	0.0	50,620
1979	0.0	0.0	0.0	0.0	0.0	48,960	50,250	0.0	47,020
1980	0.0	0.0	0.0	0.0	0.0	51,750	57,050	0.0	48,520
1981	0.0	0.0	0.0	0.0	0.0	56,100	67,060	0.0	54,510
1982	0.0	0.0	0.0	0.0	0.0	59,790	69,430	0.0	54,770
1983	0.0	0.0	0.0	0.0	0.0	56,630	65,550	0.0	42,250

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.0	0.0	15,630	0.0	14,680	14,150	10,220	0.0	0.0
1971	0.0	0.0	18,940	0.0	17,710	18,990	11,730	0.0	0.0
1972	0.0	0.0	20,520	0.0	19,380	18,160	15,280	0.0	0.0
1973	0.0	0.0	22,590	0.0	21,300	21,290	17,710	0.0	0.0
1974	0.0	0.0	42,700	0.0	44,290	38,680	32,830	0.0	0.0
1975	0.0	0.0	57,270	0.0	55,430	48,370	42,670	0.0	0.0
1976	0.0	0.0	56,650	0.0	53,460	48,700	44,670	0.0	0.0
1977	0.0	0.0	57,210	0.0	53,760	48,410	47,040	0.0	0.0
1978	0.0	0.0	62,670	0.0	58,220	65,290	50,620	0.0	0.0
1979	0.0	0.0	62,200	0.0	59,020	59,020	47,020	0.0	0.0
1980	0.0	0.0	63,900	0.0	60,740	0.0	48,520	0.0	0.0
1981	0.0	0.0	68,480	0.0	64,700	0.0	54,510	0.0	0.0
1982	0.0	0.0	73,150	0.0	66,210	0.0	54,770	0.0	0.0
1983	0.0	0.0	0.0	0.0	58,770	0.0	42,250	0.0	0.0

TABLE B.9 (CONT). Coking Coal Prices: Industrial Sector (\$/ton)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.0	0.0	0.0	0.0	15,630	0.0	0.0	15,630	11,350
1971	0.0	0.0	0.0	0.0	18,940	0.0	0.0	18,940	13,520
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20,520	15,490
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22,590	17,560
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42,700	34,890
1975	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57,270	42,120
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56,650	40,900
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57,210	41,100
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62,670	47,170
1979	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62,200	47,300
1980	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63,900	53,540
1981	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68,480	63,060
1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75,150	65,250
1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58,520

YEAR	OK	OR	PA	RI	SC	SD	TH	TX	UT
1970	0.0	0.0	11,760	0.0	0.0	0.0	10,220	10,220	11,610
1971	0.0	0.0	12,370	0.0	0.0	0.0	11,730	11,730	12,500
1972	0.0	0.0	14,880	0.0	0.0	0.0	15,280	15,280	13,820
1973	0.0	0.0	17,950	0.0	0.0	0.0	17,710	17,710	16,260
1974	0.0	0.0	36,440	0.0	0.0	0.0	32,830	32,830	34,650
1975	0.0	0.0	40,690	0.0	0.0	0.0	42,870	42,870	37,110
1976	0.0	0.0	43,450	0.0	0.0	0.0	44,670	44,670	40,550
1977	0.0	0.0	43,430	0.0	0.0	0.0	47,040	47,040	42,380
1978	0.0	0.0	52,960	0.0	0.0	0.0	50,620	50,620	45,670
1979	0.0	0.0	50,370	0.0	0.0	0.0	47,020	47,020	46,630
1980	0.0	0.0	58,930	0.0	0.0	0.0	48,520	48,520	52,880
1981	0.0	0.0	63,590	0.0	0.0	0.0	54,510	54,510	60,510
1982	0.0	0.0	67,670	0.0	0.0	0.0	54,770	54,770	55,600
1983	0.0	0.0	57,580	0.0	0.0	0.0	42,250	42,250	0.0

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.0	0.0	0.0	14,150	10,760	0.0	12,210
1971	0.0	0.0	0.0	18,990	12,520	0.0	14,000
1972	0.0	0.0	0.0	18,160	13,500	0.0	15,740
1973	0.0	0.0	0.0	21,290	15,100	0.0	18,320
1974	0.0	0.0	0.0	38,680	30,450	0.0	36,490
1975	0.0	0.0	0.0	48,370	40,590	0.0	44,210
1976	0.0	0.0	0.0	48,700	43,930	0.0	44,160
1977	0.0	0.0	0.0	48,410	45,250	0.0	46,240
1978	46,460	0.0	0.0	65,290	46,460	0.0	52,050
1979	47,690	0.0	0.0	59,020	47,690	0.0	50,690
1980	49,760	0.0	0.0	60,740	49,760	0.0	56,330
1981	52,460	0.0	0.0	64,700	52,460	0.0	62,860
1982	54,890	0.0	0.0	66,210	54,890	0.0	64,970
1983	0.0	0.0	0.0	58,770	0.0	0.0	59,300

TABLE B.10. Steam Coal Prices: Residential Sector (\$/ton)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	18.766	0.0	0.0	0.0	20.892	29.998	24.151	26.000
1971	0.0	22.377	0.0	0.0	0.0	18.319	37.325	30.011	30.011
1972	0.0	23.844	0.0	0.0	0.0	21.466	37.675	35.000	35.000
1973	0.0	26.801	0.0	0.0	0.0	33.919	41.929	31.790	35.452
1974	0.0	41.938	0.0	0.0	0.0	24.190	49.213	51.127	51.127
1975	0.0	40.599	0.0	0.0	0.0	35.101	58.360	38.907	60.696
1976	0.0	43.356	0.0	0.0	0.0	32.084	50.265	39.888	39.888
1977	0.0	45.414	0.0	0.0	0.0	36.376	70.538	60.326	60.326
1978	0.0	64.137	0.0	0.0	0.0	37.753	81.335	62.922	65.351
1979	0.0	60.378	0.0	0.0	0.0	64.908	79.614	63.682	66.046
1980	0.0	66.789	0.0	0.0	0.0	57.030	100.431	71.444	75.919
1981	0.0	82.240	0.0	0.0	0.0	75.960	119.831	83.394	92.270
1982	0.0	73.876	0.0	0.0	0.0	71.034	122.089	85.465	94.369
1983	0.0	81.576	0.0	0.0	0.0	66.646	115.037	77.288	85.452

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.0	23.134	0.0	29.443	22.787	23.689	25.399	20.962	19.968
1971	0.0	22.560	0.0	24.853	22.996	30.906	23.615	20.474	19.006
1972	0.0	25.810	0.0	29.994	25.010	31.502	26.385	22.129	21.992
1973	0.0	22.178	0.0	26.526	18.264	25.542	26.846	26.961	25.885
1974	0.0	29.956	0.0	39.911	31.239	38.244	51.510	25.676	42.366
1975	0.0	71.893	0.0	82.043	39.552	46.875	56.001	30.026	42.580
1976	0.0	34.685	0.0	50.995	43.698	50.521	57.527	30.349	48.878
1977	0.0	51.514	0.0	51.153	30.796	51.695	55.378	40.330	54.384
1978	0.0	64.357	0.0	71.312	55.195	52.435	56.674	41.948	54.820
1979	0.0	63.223	0.0	71.561	50.289	50.049	50.486	48.386	47.795
1980	0.0	70.140	0.0	74.525	57.479	48.304	54.691	48.417	51.700
1981	0.0	79.777	0.0	77.913	63.311	54.079	61.025	59.206	58.296
1982	0.0	83.295	0.0	85.868	69.535	61.973	62.577	49.198	57.879
1983	0.0	76.875	0.0	84.145	46.831	58.665	62.977	68.022	55.294

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.0	24.243	24.151	29.859	32.979	35.753	19.606	0.0	18.535
1971	0.0	37.325	30.011	37.325	33.840	23.844	22.652	0.0	23.225
1972	0.0	37.675	35.000	37.675	39.001	21.695	22.792	0.0	19.203
1973	0.0	41.929	31.790	41.929	31.882	25.885	17.622	0.0	20.255
1974	0.0	49.213	51.127	49.213	61.871	72.749	31.600	0.0	23.964
1975	0.0	58.360	38.907	58.360	68.221	67.753	38.284	0.0	23.683
1976	0.0	60.265	39.888	60.265	65.194	68.046	37.241	0.0	47.258
1977	0.0	70.538	60.326	70.538	75.690	68.008	45.188	0.0	26.661
1978	0.0	81.335	62.922	81.335	73.917	85.663	44.973	0.0	28.481
1979	0.0	79.614	63.682	79.614	76.616	91.300	41.120	0.0	23.810
1980	0.0	100.431	71.444	87.793	83.183	97.216	38.342	0.0	30.269
1981	0.0	119.831	83.394	107.981	91.338	78.423	38.046	0.0	36.460
1982	0.0	122.089	85.465	99.001	94.906	115.020	37.117	0.0	42.464
1983	0.0	115.037	77.288	93.020	91.323	103.937	48.093	0.0	15.480

TABLE B.10 (CONT). Steam Coal Prices: Residential Sector (\$/ton)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	26.370	35.984	24.983	29.859	26.023	0.0	30.345	33.118	24.382
1971	22.744	30.011	20.634	37.325	32.648	0.0	20.497	42.873	23.202
1972	28.759	33.034	21.924	37.675	31.777	0.0	21.489	33.491	27.845
1973	30.966	32.088	26.526	41.929	31.538	0.0	17.966	34.102	26.366
1974	56.375	58.492	34.235	49.213	49.346	0.0	34.235	45.969	57.817
1975	45.807	68.733	47.966	58.360	46.519	0.0	34.589	61.766	58.316
1976	49.563	83.061	50.727	60.265	78.041	0.0	64.167	63.962	59.489
1977	62.811	36.828	57.954	70.538	60.778	0.0	75.238	68.573	64.393
1978	58.352	39.078	75.507	81.335	62.061	0.0	75.507	66.124	60.229
1979	53.463	39.654	80.532	79.614	64.120	0.0	106.641	67.534	61.231
1980	60.628	44.144	80.934	87.793	71.354	0.0	115.386	73.198	68.926
1981	73.741	26.052	83.305	107.981	79.288	0.0	120.453	81.508	74.695
1982	64.949	62.242	95.309	99.001	79.290	0.0	127.146	86.472	73.382
1983	63.344	49.813	97.080	93.020	69.582	0.0	105.863	84.328	70.751

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.0	0.0	23.781	22.718	27.826	40.467	17.056	0.0	17.495
1971	0.0	0.0	25.059	37.325	22.744	21.276	22.377	0.0	17.998
1972	0.0	0.0	26.862	37.675	28.759	21.695	24.327	0.0	17.992
1973	0.0	0.0	24.810	41.929	26.526	38.267	23.574	0.0	16.524
1974	0.0	0.0	50.925	49.213	44.933	78.740	41.758	0.0	27.726
1975	0.0	0.0	57.270	58.360	54.977	80.351	38.840	0.0	29.603
1976	0.0	0.0	51.868	60.265	66.129	80.209	39.665	0.0	34.685
1977	0.0	0.0	53.412	70.538	67.669	67.850	44.849	0.0	38.636
1978	0.0	0.0	54.687	81.335	67.117	72.592	41.661	0.0	48.550
1979	0.0	0.0	55.673	79.614	65.915	72.874	33.067	0.0	79.920
1980	0.0	0.0	60.608	100.431	71.714	78.281	44.414	0.0	68.026
1981	0.0	0.0	71.233	119.831	86.212	59.738	52.837	0.0	96.331
1982	0.0	0.0	71.526	122.089	82.512	96.204	39.153	0.0	85.174
1983	0.0	0.0	62.608	115.037	84.099	84.626	36.786	0.0	77.861

YEAR	VA	VT	WA	WI	WV	WY	US
1970	30.876	31.662	21.386	37.625	15.207	15.230	26.023
1971	30.011	37.325	25.996	38.586	25.449	16.691	27.765
1972	36.509	37.675	25.010	36.075	29.651	13.397	28.305
1973	35.406	41.929	26.343	38.450	21.537	21.102	27.121
1974	59.506	49.213	31.239	64.709	32.951	21.262	49.798
1975	60.764	58.360	25.374	68.978	27.066	21.991	55.022
1976	70.921	60.265	43.356	65.856	27.740	32.220	54.606
1977	77.271	70.538	30.796	71.261	40.895	27.113	56.146
1978	82.660	81.335	56.299	79.680	33.559	25.721	56.674
1979	80.971	102.373	87.602	80.489	31.185	16.238	58.102
1980	86.691	99.442	95.321	98.153	35.756	19.475	63.214
1981	97.396	119.499	101.147	92.093	47.422	27.251	71.566
1982	94.660	117.749	107.681	91.953	49.690	58.841	74.502
1983	84.649	104.923	85.911	95.864	37.726	54.147	67.288

TABLE B.11. Steam Coal Prices: Industrial Sector (\$/ton)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	18,393	6,488	0.0	12,726	15,329	8,648	19,081	2,685	6,591
1971	16,005	9,193	0.0	11,226	12,658	8,702	18,868	11,135	10,689
1972	16,800	8,519	0.0	14,727	14,486	9,249	21,618	5,500	9,405
1973	19,567	9,193	14,952	14,661	14,178	9,146	25,922	7,787	10,014
1974	20,861	19,143	21,072	20,747	24,209	16,197	33,391	24,791	21,659
1975	27,860	24,502	26,101	19,302	21,168	17,308	47,349	29,737	28,272
1976	25,859	28,367	31,553	23,611	25,616	22,150	38,097	26,604	24,233
1977	27,281	30,689	28,302	26,054	28,298	22,759	40,938	27,779	31,943
1978	27,652	35,014	36,668	27,886	31,108	26,429	39,147	31,704	28,736
1979	30,298	37,483	33,894	32,633	36,008	28,634	37,906	32,283	30,597
1980	0.0	41,840	40,430	32,090	40,300	26,160	0.0	0.0	29,260
1981	0.0	47,860	44,550	32,687	45,800	25,100	0.0	0.0	33,740
1982	0.0	48,820	45,640	43,440	51,010	30,350	0.0	0.0	33,460
1983	0.0	46,490	46,850	44,410	52,030	29,470	0.0	0.0	32,950

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.0	11,799	0.0	9,089	10,578	10,270	11,690	9,517	10,266
1971	0.0	10,913	0.0	9,805	10,369	9,617	9,570	10,381	8,945
1972	0.0	12,927	0.0	10,086	10,857	11,501	12,724	10,287	11,344
1973	0.0	12,876	0.0	11,303	10,908	11,992	13,039	9,385	11,747
1974	0.0	28,959	0.0	17,509	16,122	18,542	21,403	19,893	18,367
1975	12,516	30,711	0.0	26,296	17,437	25,909	29,696	18,919	29,848
1976	28,121	28,737	0.0	27,196	21,607	28,044	25,373	24,967	27,454
1977	32,324	31,393	0.0	27,678	23,810	30,472	28,094	22,275	28,496
1978	36,605	36,010	0.0	30,089	24,664	34,348	31,917	27,289	33,815
1979	37,065	36,647	0.0	31,769	33,537	35,315	32,370	32,966	35,519
1980	40,435	39,030	0.0	34,270	30,000	38,140	35,060	28,440	42,220
1981	47,180	42,800	0.0	38,180	32,880	41,090	37,810	32,890	44,700
1982	49,750	44,560	0.0	40,360	34,880	43,180	33,260	36,710	46,190
1983	48,430	42,060	0.0	37,300	37,180	40,640	31,780	37,500	42,700

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.0	21,649	1,626	23,654	12,318	8,625	10,713	8,028	10,325
1971	0.0	14,970	9,629	20,000	13,000	12,777	9,405	9,633	13,569
1972	0.0	24,875	4,441	25,956	13,989	9,167	11,410	9,890	10,604
1973	0.0	30,314	4,558	26,278	14,363	8,757	12,018	10,506	10,655
1974	0.0	41,237	18,476	36,437	23,922	13,583	17,606	21,840	14,094
1975	0.0	62,500	25,039	62,500	34,176	16,420	25,110	25,796	16,475
1976	0.0	43,796	22,911	43,796	32,081	20,959	26,774	27,945	20,814
1977	30,303	49,080	25,300	49,080	32,519	23,975	27,610	28,559	23,025
1978	36,668	43,011	26,937	43,011	37,251	20,099	30,704	34,243	24,032
1979	36,412	37,906	26,030	37,906	40,816	22,158	32,966	34,893	25,096
1980	27,490	41,090	29,250	41,090	43,730	30,170	34,680	38,600	38,890
1981	34,180	46,060	32,740	46,060	51,140	34,390	37,020	43,413	36,660
1982	37,190	49,710	33,460	49,710	54,430	36,030	37,650	45,023	35,570
1983	36,825	48,730	32,950	48,730	49,730	38,550	35,650	43,833	31,065

TABLE B.11 (CONT). Steam Coal Prices: Industrial Sector (\$/ton)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	12,658	10,277	3,345	0.0	5,550	12,104	12,913	11,460	9,173
1971	14,030	8,547	8,392	0.0	12,366	11,309	12,085	13,215	9,705
1972	13,237	10,409	4,415	0.0	9,303	12,257	12,971	12,296	10,661
1973	14,109	9,324	4,899	0.0	10,051	12,279	11,763	12,215	11,489
1974	30,588	13,583	11,413	0.0	25,575	18,589	18,317	25,545	22,466
1975	35,957	16,420	15,567	0.0	30,457	0.0	19,302	32,198	29,719
1976	30,786	20,959	19,677	0.0	22,788	23,287	23,611	32,399	28,094
1977	33,822	23,975	22,191	0.0	45,455	23,042	26,054	32,795	29,790
1978	39,236	20,099	27,333	0.0	31,250	25,976	27,386	35,263	31,787
1979	39,554	22,158	32,368	0.0	34,483	28,634	32,321	37,906	34,975
1980	41,660	34,530	32,463	0.0	36,690	19,215	31,393	41,090	31,360
1981	45,280	35,525	36,700	0.0	41,985	27,317	35,280	46,060	35,490
1982	49,400	35,800	33,734	0.0	45,710	34,995	48,560	49,710	36,250
1983	44,250	38,550	32,974	0.0	43,885	34,743	41,793	48,730	35,240

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.0	7,514	7,723	0.0	11,815	0.0	8,195	10,331	7,000
1971	15,873	9,317	10,073	0.0	13,110	0.0	10,073	11,723	8,936
1972	10,584	7,514	9,621	0.0	13,185	0.0	10,211	13,676	8,004
1973	7,051	12,132	7,173	0.0	14,014	0.0	10,622	12,774	8,884
1974	18,749	14,957	20,926	0.0	33,615	0.0	24,537	19,893	17,286
1975	22,014	21,168	29,321	0.0	36,036	19,428	27,091	18,919	17,437
1976	27,765	25,616	27,000	0.0	31,998	22,677	23,914	28,260	21,607
1977	26,062	28,298	27,044	0.0	32,659	24,615	26,634	25,289	23,010
1978	31,553	31,108	28,921	0.0	38,314	25,840	31,046	31,978	24,664
1979	34,689	37,224	31,279	0.0	39,270	26,964	32,305	36,412	28,634
1980	29,525	39,680	32,290	0.0	41,550	34,443	33,530	14,550	23,880
1981	33,040	44,353	37,910	0.0	45,750	36,483	37,830	23,810	27,160
1982	37,450	47,513	41,710	0.0	48,730	33,890	40,610	28,740	33,390
1983	38,290	45,470	39,040	0.0	46,040	33,600	38,160	26,800	33,550

YEAR	VA	VT	WA	WI	WV	WY	US
1970	10,089	0.0	12,673	15,233	8,317	8,066	11,255
1971	12,640	0.0	12,945	12,456	8,791	4,484	10,720
1972	11,042	0.0	11,757	16,641	10,135	8,440	12,435
1973	11,467	0.0	13,501	17,022	10,370	8,807	12,670
1974	31,105	0.0	19,583	24,106	21,627	14,349	22,666
1975	34,434	0.0	21,168	33,159	31,345	16,502	29,364
1976	30,297	0.0	25,616	32,559	27,962	20,742	28,057
1977	32,228	0.0	28,298	34,281	29,876	23,000	29,513
1978	37,371	0.0	31,108	36,597	31,488	25,999	32,702
1979	38,537	0.0	38,440	40,755	32,710	28,634	34,795
1980	40,150	0.0	48,740	33,440	35,056	30,923	35,140
1981	46,150	0.0	54,380	47,640	36,690	31,700	39,480
1982	47,360	0.0	55,630	50,290	38,790	23,600	41,010
1983	42,710	0.0	47,200	49,010	37,580	24,950	39,320

TABLE B.12. Steam Coal Prices: Electric Utility Sector (\$/ton)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	11,570	6,030	0.0	3,890	0.0	5,570	10,570	9,620	9,620
1971	12,213	7,920	0.0	4,760	0.0	6,040	12,830	12,810	12,610
1972	11,740	8,800	0.0	6,620	0.0	6,390	14,030	13,460	13,460
1973	13,915	9,720	0.0	6,530	0.0	6,250	19,910	16,580	14,290
1974	14,200	17,140	0.0	3,690	0.0	7,420	26,420	42,230	26,770
1975	16,727	21,240	0.0	4,340	0.0	9,550	0.0	38,310	26,290
1976	16,940	23,240	0.0	4,730	0.0	9,660	0.0	0.0	25,430
1977	18,830	26,220	0.0	10,030	0.0	12,260	0.0	0.0	26,400
1978	20,082	31,490	16,380	10,370	0.0	13,270	0.0	0.0	31,880
1979	22,770	35,390	19,110	16,670	0.0	15,180	0.0	0.0	33,460
1980	30,630	38,550	22,720	20,730	0.0	17,110	0.0	0.0	40,860
1981	30,630	45,260	26,250	22,000	0.0	19,390	0.0	0.0	50,710
1982	20,300	48,830	29,740	24,930	0.0	21,370	0.0	0.0	54,000
1983	27,260	48,440	30,020	25,810	0.0	21,590	0.0	0.0	50,560

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	6,980	9,020	0.0	6,680	0.0	6,260	5,460	6,730	4,660
1971	7,720	10,130	0.0	7,780	0.0	7,100	6,160	7,450	5,550
1972	9,610	10,560	0.0	8,040	0.0	7,940	6,670	7,780	6,130
1973	11,720	10,490	0.0	9,700	0.0	8,610	7,300	6,550	6,660
1974	16,920	18,670	0.0	13,080	0.0	11,220	9,380	7,260	11,760
1975	23,390	22,150	0.0	17,220	0.0	15,280	12,570	13,400	13,800
1976	25,520	23,190	0.0	18,050	0.0	17,380	14,520	15,130	14,990
1977	29,380	26,020	0.0	20,490	0.0	21,080	17,360	14,270	18,700
1978	34,630	29,700	0.0	23,350	0.0	25,750	23,680	16,400	24,390
1979	38,430	32,780	0.0	23,090	0.0	29,880	25,220	18,530	25,590
1980	42,640	35,710	0.0	25,850	0.0	33,290	27,360	19,680	29,970
1981	47,850	40,870	0.0	27,250	0.0	38,630	31,920	21,470	33,630
1982	51,720	44,640	0.0	28,660	0.0	41,370	34,920	23,800	35,380
1983	53,170	45,800	0.0	29,530	0.0	42,370	34,300	24,910	35,200

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.0	8,750	9,620	0.0	8,600	6,870	5,460	6,180	3,000
1971	0.0	9,690	12,810	0.0	10,110	7,250	6,140	6,920	3,210
1972	0.0	13,150	13,460	0.0	10,880	7,610	6,410	8,720	3,380
1973	0.0	20,570	13,620	0.0	11,390	7,050	7,240	9,560	3,450
1974	0.0	31,860	27,900	0.0	19,510	8,760	9,070	13,910	4,230
1975	0.0	31,880	31,680	0.0	21,840	11,180	11,590	19,010	4,760
1976	0.0	0.0	28,180	0.0	24,020	12,220	13,540	23,660	4,940
1977	0.0	0.0	29,240	0.0	25,840	12,990	16,400	24,870	4,810
1978	0.0	0.0	33,030	0.0	29,720	14,080	21,600	34,060	3,480
1979	0.0	62,780	35,360	0.0	34,550	17,840	22,720	39,080	6,140
1980	0.0	52,060	38,090	0.0	37,570	18,310	25,320	44,090	7,540
1981	34,400	64,230	44,350	0.0	41,000	19,930	28,520	55,020	8,770
1982	37,980	65,550	47,660	0.0	46,340	22,780	30,630	58,730	9,790
1983	38,890	59,900	44,240	0.0	44,200	24,440	31,970	60,450	12,630

TABLE B.12 (CONT). Steam Coal Prices: Electric Utility Sector (\$/ton)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	9.810	3.470	8.410	9.890	11.140	2.550	7.320	11.460	6.500
1971	10.700	3.520	9.190	11.820	13.410	2.730	7.360	12.850	7.710
1972	10.600	3.650	9.570	13.030	16.260	2.760	6.670	12.600	8.530
1973	11.790	2.170	10.530	13.470	17.280	2.790	6.250	12.490	9.660
1974	25.550	2.360	12.810	21.710	32.980	3.430	6.320	24.870	19.170
1975	25.550	3.520	18.280	32.240	40.330	4.040	7.690	28.510	20.870
1976	26.560	3.840	19.430	33.740	37.910	4.630	11.020	27.630	20.780
1977	29.630	5.120	22.390	34.770	36.840	5.270	12.090	28.430	22.020
1978	33.280	5.260	22.870	38.410	40.820	7.590	17.340	31.100	27.170
1979	35.470	6.250	21.410	40.940	43.620	8.510	23.390	33.430	29.520
1980	36.460	7.360	23.360	42.860	47.200	9.680	23.170	36.260	30.820
1981	42.280	9.020	20.610	46.230	54.220	12.780	24.240	41.720	37.340
1982	46.090	10.730	20.370	50.940	56.490	14.350	25.960	45.410	39.820
1983	47.020	10.890	21.390	52.500	52.100	15.230	28.330	44.590	40.650

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	9.710	0.0	7.300	0.0	9.590	5.800	5.200	0.0	5.730
1971	4.910	0.0	8.630	0.0	11.960	6.920	7.180	3.000	6.930
1972	4.820	0.0	9.890	0.0	11.460	7.270	7.950	3.020	7.100
1973	0.0	0.0	10.590	0.0	12.590	6.220	8.510	1.790	8.300
1974	0.0	0.0	18.420	0.0	31.360	7.710	10.670	2.370	9.440
1975	0.0	0.0	22.460	0.0	27.470	6.090	19.080	2.970	11.250
1976	16.180	0.0	23.410	0.0	25.270	6.700	20.510	4.500	14.840
1977	18.070	0.0	24.140	0.0	29.630	6.990	22.880	8.190	17.180
1978	18.190	0.0	27.900	0.0	33.450	7.570	26.990	9.610	19.810
1979	20.020	0.0	28.930	0.0	36.000	8.300	31.250	14.130	24.060
1980	21.460	23.150	32.100	0.0	38.690	9.610	36.210	17.900	26.060
1981	24.870	26.290	37.450	0.0	44.320	11.900	40.290	21.820	28.990
1982	28.080	28.500	39.680	0.0	47.250	14.530	41.220	23.920	32.580
1983	29.730	0.0	37.550	0.0	49.110	14.520	40.510	24.990	30.970

YEAR	VA	VT	WA	WI	WV	WY	US
1970	9.560	12.250	0.0	8.820	5.820	2.310	7.080
1971	11.140	15.390	0.0	9.800	7.330	2.440	8.180
1972	10.860	16.180	0.0	10.740	8.300	2.820	8.690
1973	11.440	19.220	6.300	11.260	8.620	3.320	9.010
1974	28.670	38.770	5.990	15.920	19.590	3.930	15.430
1975	27.380	52.750	9.160	18.360	20.240	4.100	17.630
1976	27.840	0.0	12.190	19.070	21.550	5.050	18.380
1977	33.120	0.0	11.720	20.560	24.040	6.110	20.370
1978	36.640	0.0	12.490	23.900	28.030	6.630	23.750
1979	41.540	45.950	13.550	26.450	30.490	8.210	26.150
1980	42.850	0.0	15.580	29.090	34.130	9.990	28.760
1981	47.850	54.560	17.960	30.600	39.100	12.000	32.310
1982	48.160	53.940	22.500	34.490	41.900	13.680	34.900
1983	43.030	0.0	26.230	34.220	42.120	16.090	34.990

TABLE B.13. Distillate Fuel Prices: Residential Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.194	0.172	0.130	0.176	0.176	0.177	0.235	0.196	0.196
1971	0.205	0.189	0.140	0.186	0.186	0.188	0.216	0.200	0.200
1972	0.206	0.191	0.142	0.187	0.187	0.189	0.217	0.201	0.201
1973	0.237	0.210	0.183	0.218	0.218	0.219	0.246	0.234	0.234
1974	0.365	0.313	0.316	0.346	0.346	0.348	0.400	0.358	0.358
1975	0.388	0.351	0.332	0.391	0.388	0.394	0.394	0.376	0.376
1976	0.431	0.387	0.353	0.420	0.431	0.408	0.421	0.403	0.403
1977	0.463	0.455	0.403	0.435	0.446	0.451	0.471	0.460	0.460
1978	0.532	0.478	0.411	0.472	0.453	0.455	0.501	0.507	0.478
1979	0.682	0.634	0.634	0.613	0.621	0.642	0.720	0.742	0.682
1980	0.978	0.948	0.907	1.009	0.959	0.965	0.980	1.026	0.954
1981	1.180	1.186	1.118	1.103	1.096	1.153	1.217	1.274	1.173
1982	1.174	1.132	1.055	1.124	1.088	1.102	1.183	1.245	1.113
1983	1.088	0.934	0.927	1.056	1.010	0.930	1.091	1.170	1.060

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.174	0.172	0.176	0.169	0.194	0.167	0.167	0.165	0.165
1971	0.192	0.189	0.186	0.177	0.205	0.179	0.179	0.179	0.181
1972	0.193	0.191	0.197	0.178	0.206	0.180	0.180	0.180	0.182
1973	0.213	0.225	0.218	0.220	0.237	0.231	0.231	0.196	0.218
1974	0.344	0.341	0.346	0.338	0.365	0.358	0.358	0.337	0.334
1975	0.363	0.362	0.388	0.356	0.391	0.356	0.356	0.363	0.345
1976	0.403	0.401	0.431	0.383	0.420	0.390	0.390	0.397	0.384
1977	0.447	0.455	0.446	0.443	0.452	0.446	0.446	0.447	0.448
1978	0.482	0.484	0.453	0.458	0.436	0.465	0.485	0.458	0.467
1979	0.632	0.640	0.621	0.615	0.621	0.688	0.727	0.682	0.641
1980	0.960	0.960	0.959	0.942	0.916	0.958	0.996	0.951	0.955
1981	1.205	1.195	1.096	1.118	1.104	1.149	1.185	1.126	1.185
1982	1.162	1.158	1.088	1.096	1.104	1.109	1.143	1.088	1.125
1983	1.104	1.062	1.010	1.029	1.018	1.004	1.007	1.016	0.999

YEAR	LA	MA	MD	ME	MI	MN	MO	NE	NT
1970	0.134	0.207	0.196	0.209	0.171	0.175	0.165	0.172	0.177
1971	0.147	0.218	0.200	0.219	0.181	0.180	0.179	0.197	0.188
1972	0.148	0.219	0.201	0.220	0.182	0.180	0.180	0.199	0.189
1973	0.172	0.251	0.234	0.248	0.196	0.224	0.196	0.218	0.219
1974	0.294	0.370	0.358	0.377	0.327	0.349	0.337	0.334	0.348
1975	0.310	0.395	0.376	0.398	0.349	0.354	0.363	0.345	0.394
1976	0.353	0.421	0.403	0.424	0.385	0.389	0.397	0.384	0.408
1977	0.392	0.473	0.460	0.475	0.446	0.444	0.447	0.443	0.452
1978	0.411	0.488	0.492	0.486	0.479	0.478	0.458	0.467	0.461
1979	0.640	0.709	0.701	0.688	0.709	0.724	0.682	0.641	0.647
1980	0.922	0.978	0.979	0.963	0.978	0.999	0.951	0.955	0.960
1981	1.143	1.213	1.214	1.204	1.183	1.184	1.126	1.185	1.147
1982	1.055	1.176	1.171	1.155	1.139	1.151	1.088	1.125	1.167
1983	0.924	1.091	1.103	1.028	1.064	1.031	1.016	0.924	0.989

TABLE B.13 (CONT). Distillate Fuel Prices: Residential Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.181	0.177	0.165	0.209	0.199	0.136	0.176	0.199	0.195
1971	0.191	0.188	0.179	0.219	0.209	0.147	0.186	0.209	0.211
1972	0.191	0.189	0.180	0.220	0.210	0.148	0.187	0.210	0.212
1973	0.221	0.219	0.196	0.248	0.240	0.178	0.218	0.240	0.196
1974	0.352	0.348	0.337	0.377	0.369	0.339	0.346	0.369	0.327
1975	0.376	0.354	0.363	0.398	0.389	0.391	0.391	0.389	0.349
1976	0.407	0.389	0.397	0.424	0.411	0.420	0.420	0.411	0.385
1977	0.455	0.444	0.447	0.475	0.467	0.449	0.435	0.467	0.446
1978	0.487	0.468	0.458	0.503	0.496	0.412	0.453	0.501	0.474
1979	0.643	0.669	0.602	0.725	0.710	0.631	0.621	0.712	0.686
1980	0.964	0.960	0.951	1.004	0.979	0.942	0.959	0.982	0.919
1981	1.198	1.151	1.126	1.237	1.215	1.119	1.096	1.232	1.132
1982	1.163	1.119	1.085	1.174	1.174	1.076	1.086	1.205	1.102
1983	1.070	1.030	1.016	1.041	1.079	0.936	1.010	1.121	1.012

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.124	0.196	0.187	0.207	0.180	0.177	0.171	0.136	0.177
1971	0.126	0.205	0.200	0.218	0.190	0.188	0.189	0.147	0.188
1972	0.126	0.206	0.201	0.219	0.190	0.189	0.191	0.148	0.189
1973	0.156	0.237	0.232	0.246	0.229	0.219	0.215	0.172	0.219
1974	0.303	0.365	0.363	0.375	0.352	0.340	0.334	0.294	0.348
1975	0.308	0.388	0.390	0.395	0.373	0.354	0.345	0.311	0.394
1976	0.345	0.431	0.407	0.421	0.406	0.389	0.384	0.353	0.408
1977	0.389	0.463	0.461	0.471	0.456	0.444	0.443	0.392	0.451
1978	0.404	0.458	0.488	0.507	0.488	0.468	0.467	0.411	0.458
1979	0.642	0.680	0.698	0.728	0.643	0.669	0.641	0.666	0.625
1980	0.915	0.973	0.964	1.011	0.964	0.960	0.955	0.903	0.955
1981	1.110	1.114	1.181	1.238	1.202	1.151	1.185	1.114	1.139
1982	1.046	1.116	1.137	1.201	1.160	1.119	1.125	1.044	1.143
1983	0.996	1.036	1.058	1.105	1.066	1.030	0.999	0.920	0.960

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.190	0.209	0.194	0.167	0.190	0.177	0.185
1971	0.203	0.219	0.205	0.179	0.203	0.188	0.196
1972	0.204	0.220	0.206	0.180	0.204	0.189	0.197
1973	0.227	0.248	0.237	0.231	0.227	0.219	0.228
1974	0.352	0.377	0.365	0.358	0.352	0.348	0.360
1975	0.373	0.398	0.388	0.356	0.373	0.394	0.377
1976	0.403	0.424	0.431	0.390	0.403	0.408	0.406
1977	0.459	0.475	0.463	0.446	0.459	0.451	0.460
1978	0.491	0.508	0.486	0.447	0.462	0.453	0.490
1979	0.704	0.725	0.697	0.673	0.651	0.644	0.704
1980	0.985	1.015	1.008	0.915	0.922	0.962	0.974
1981	1.205	1.254	1.165	1.091	1.150	1.145	1.194
1982	1.177	1.201	1.176	1.078	1.093	1.129	1.160
1983	1.087	1.129	1.090	1.012	1.010	0.961	1.078

TABLE B.14. Distillate Fuel Prices: Commercial Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.168	0.134	0.119	0.155	0.155	0.146	0.152	0.155	0.155
1971	0.177	0.146	0.128	0.163	0.163	0.152	0.160	0.158	0.158
1972	0.178	0.146	0.129	0.164	0.164	0.152	0.160	0.158	0.158
1973	0.210	0.161	0.168	0.196	0.196	0.184	0.192	0.183	0.183
1974	0.343	0.263	0.296	0.329	0.329	0.315	0.340	0.310	0.310
1975	0.361	0.308	0.318	0.363	0.361	0.345	0.338	0.332	0.332
1976	0.403	0.341	0.336	0.395	0.403	0.365	0.363	0.357	0.357
1977	0.433	0.397	0.387	0.409	0.417	0.404	0.411	0.413	0.413
1978	0.482	0.414	0.393	0.440	0.422	0.413	0.432	0.443	0.429
1979	0.646	0.589	0.606	0.601	0.608	0.604	0.637	0.646	0.617
1980	0.936	0.863	0.867	0.964	0.916	0.900	0.883	0.908	0.874
1981	1.119	1.080	1.069	1.054	1.047	1.085	1.115	1.149	1.100
1982	1.112	1.015	1.009	1.073	1.038	1.019	1.081	1.102	1.036
1983	1.037	0.840	0.833	1.007	0.963	0.879	0.974	0.995	0.940

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.136	0.134	0.155	0.146	0.168	0.144	0.144	0.143	0.142
1971	0.148	0.146	0.163	0.152	0.177	0.153	0.153	0.154	0.154
1972	0.148	0.146	0.164	0.153	0.178	0.153	0.153	0.155	0.155
1973	0.163	0.172	0.196	0.194	0.210	0.200	0.200	0.173	0.185
1974	0.289	0.286	0.329	0.318	0.343	0.330	0.330	0.317	0.300
1975	0.313	0.312	0.361	0.332	0.363	0.332	0.332	0.339	0.318
1976	0.350	0.348	0.403	0.357	0.395	0.360	0.360	0.370	0.355
1977	0.394	0.401	0.417	0.414	0.425	0.415	0.415	0.418	0.407
1978	0.417	0.419	0.422	0.426	0.412	0.429	0.441	0.426	0.427
1979	0.587	0.594	0.608	0.601	0.604	0.645	0.669	0.666	0.612
1980	0.874	0.875	0.916	0.892	0.889	0.900	0.924	0.901	0.900
1981	1.097	1.088	1.047	1.074	1.059	1.091	1.113	1.081	1.117
1982	1.041	1.038	1.038	1.042	1.056	1.045	1.065	1.035	1.050
1983	0.945	0.909	0.963	0.934	0.912	0.895	0.879	0.923	0.907

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.123	0.153	0.155	0.174	0.146	0.145	0.143	0.134	0.146
1971	0.134	0.162	0.158	0.182	0.153	0.148	0.154	0.152	0.152
1972	0.135	0.162	0.153	0.183	0.153	0.147	0.155	0.153	0.152
1973	0.158	0.196	0.183	0.213	0.168	0.187	0.173	0.167	0.184
1974	0.276	0.315	0.310	0.341	0.300	0.316	0.317	0.280	0.315
1975	0.297	0.339	0.332	0.361	0.323	0.324	0.339	0.302	0.345
1976	0.336	0.363	0.357	0.386	0.354	0.355	0.370	0.338	0.365
1977	0.376	0.413	0.413	0.436	0.413	0.407	0.418	0.387	0.406
1978	0.393	0.428	0.436	0.449	0.436	0.430	0.426	0.404	0.418
1979	0.612	0.632	0.626	0.641	0.661	0.658	0.666	0.595	0.609
1980	0.882	0.881	0.886	0.907	0.905	0.915	0.901	0.870	0.895
1981	1.093	1.113	1.120	1.145	1.113	1.100	1.081	1.079	1.079
1982	1.009	1.077	1.066	1.098	1.066	1.052	1.035	1.009	1.079
1983	0.831	0.991	0.926	0.970	0.925	0.943	0.923	0.831	0.916

TABLE B.14 (CONT). Distillate Fuel Prices: Commercial Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.141	0.146	0.143	0.154	0.159	0.128	0.155	0.159	0.166
1971	0.147	0.152	0.154	0.163	0.167	0.138	0.163	0.167	0.178
1972	0.147	0.152	0.155	0.163	0.168	0.138	0.164	0.168	0.178
1973	0.169	0.184	0.173	0.193	0.196	0.167	0.196	0.196	0.188
1974	0.296	0.315	0.317	0.321	0.325	0.324	0.329	0.325	0.300
1975	0.324	0.324	0.329	0.341	0.344	0.363	0.363	0.344	0.323
1976	0.353	0.355	0.370	0.366	0.366	0.395	0.395	0.366	0.354
1977	0.401	0.407	0.411	0.414	0.424	0.422	0.409	0.424	0.413
1978	0.421	0.425	0.426	0.436	0.444	0.399	0.422	0.447	0.433
1979	0.597	0.630	0.666	0.631	0.643	0.611	0.608	0.644	0.648
1980	0.878	0.895	0.901	0.893	0.897	0.912	0.916	0.898	0.871
1981	1.091	1.083	1.081	1.127	1.128	1.083	1.047	1.137	1.083
1982	1.042	1.035	1.035	1.076	1.087	1.042	1.038	1.103	1.045
1983	0.916	0.935	0.923	0.945	0.899	0.842	0.963	0.994	0.883

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.114	0.170	0.151	0.153	0.140	0.146	0.147	0.125	0.146
1971	0.115	0.177	0.161	0.162	0.146	0.152	0.161	0.134	0.152
1972	0.115	0.178	0.161	0.162	0.146	0.152	0.162	0.135	0.152
1973	0.143	0.210	0.185	0.192	0.175	0.184	0.183	0.158	0.184
1974	0.284	0.343	0.318	0.319	0.295	0.315	0.300	0.276	0.315
1975	0.295	0.361	0.344	0.339	0.322	0.324	0.316	0.297	0.345
1976	0.329	0.403	0.362	0.363	0.352	0.355	0.355	0.336	0.365
1977	0.373	0.433	0.418	0.411	0.402	0.407	0.407	0.376	0.404
1978	0.386	0.428	0.438	0.435	0.423	0.425	0.427	0.393	0.416
1979	0.614	0.647	0.634	0.640	0.597	0.630	0.612	0.637	0.588
1980	0.875	0.931	0.907	0.896	0.878	0.895	0.900	0.863	0.890
1981	1.061	1.066	1.112	1.124	1.094	1.083	1.117	1.065	1.072
1982	1.000	1.065	1.062	1.088	1.040	1.035	1.050	0.998	1.057
1983	0.904	0.959	0.955	1.050	0.912	0.935	0.907	0.827	0.907

YEAR	VA	VT	WA	WI	WV	WY	WY
1970	0.150	0.154	0.168	0.144	0.150	0.146	0.153
1971	0.160	0.163	0.177	0.153	0.160	0.152	0.161
1972	0.160	0.163	0.178	0.153	0.160	0.152	0.161
1973	0.177	0.193	0.210	0.200	0.177	0.184	0.190
1974	0.305	0.321	0.343	0.320	0.305	0.315	0.318
1975	0.329	0.341	0.361	0.322	0.329	0.345	0.337
1976	0.357	0.366	0.403	0.360	0.357	0.365	0.363
1977	0.412	0.414	0.433	0.415	0.412	0.404	0.414
1978	0.434	0.438	0.448	0.418	0.421	0.411	0.432
1979	0.633	0.631	0.657	0.636	0.607	0.606	0.633
1980	0.896	0.898	0.958	0.874	0.866	0.897	0.895
1981	1.111	1.134	1.108	1.055	1.085	1.077	1.105
1982	1.067	1.087	1.113	1.026	1.027	1.044	1.066
1983	0.922	1.076	0.947	0.946	0.855	0.908	0.938

TABLE B.15. Distillate Fuel Prices: Industrial Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.092	0.094	0.093	0.099	0.094	0.115	0.101	0.169	0.108
1971	0.094	0.103	0.099	0.102	0.097	0.114	0.107	0.171	0.109
1972	0.096	0.103	0.099	0.103	0.098	0.113	0.107	0.170	0.109
1973	0.127	0.113	0.131	0.138	0.131	0.149	0.137	0.196	0.125
1974	0.338	0.239	0.252	0.221	0.272	0.250	0.310	0.322	0.274
1975	0.371	0.283	0.290	0.303	0.307	0.272	0.334	0.346	0.309
1976	0.393	0.309	0.284	0.330	0.340	0.301	0.349	0.364	0.327
1977	0.443	0.370	0.360	0.344	0.360	0.306	0.385	0.449	0.375
1978	0.487	0.397	0.368	0.362	0.369	0.330	0.400	0.441	0.394
1979	0.691	0.506	0.491	0.461	0.528	0.391	0.556	0.515	0.545
1980	0.869	0.733	0.675	0.714	0.762	0.739	0.798	1.058	0.791
1981	0.968	0.906	0.808	0.862	0.890	0.805	0.961	0.864	0.947
1982	1.120	0.890	0.989	0.852	0.870	0.824	1.073	1.047	0.985
1983	0.987	0.834	0.827	0.881	0.843	0.863	0.933	0.886	0.851

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.078	0.080	0.102	0.104	0.106	0.105	0.103	0.089	0.101
1971	0.084	0.086	0.105	0.108	0.109	0.109	0.106	0.095	0.109
1972	0.084	0.086	0.106	0.108	0.110	0.109	0.106	0.095	0.109
1973	0.092	0.101	0.142	0.146	0.147	0.147	0.144	0.113	0.129
1974	0.279	0.225	0.301	0.284	0.317	0.299	0.302	0.239	0.286
1975	0.305	0.285	0.308	0.299	0.333	0.323	0.311	0.295	0.320
1976	0.324	0.304	0.289	0.329	0.355	0.342	0.316	0.317	0.325
1977	0.374	0.372	0.372	0.358	0.361	0.385	0.368	0.356	0.380
1978	0.406	0.410	0.370	0.386	0.405	0.407	0.384	0.387	0.406
1979	0.530	0.504	0.528	0.528	0.595	0.533	0.518	0.479	0.501
1980	0.797	0.754	0.762	0.732	0.835	0.745	0.772	0.692	0.754
1981	0.951	0.873	0.890	0.813	1.024	0.884	0.893	0.862	0.879
1982	0.960	0.927	1.195	0.808	0.817	0.951	0.904	0.900	0.908
1983	0.898	0.865	0.843	0.882	0.949	0.894	0.868	0.871	0.857

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.071	0.103	0.112	0.087	0.095	0.115	0.106	0.102	0.121
1971	0.076	0.109	0.114	0.092	0.097	0.114	0.114	0.115	0.120
1972	0.076	0.109	0.113	0.092	0.097	0.113	0.114	0.115	0.119
1973	0.090	0.141	0.130	0.117	0.110	0.149	0.136	0.125	0.157
1974	0.207	0.310	0.298	0.267	0.285	0.290	0.291	0.240	0.296
1975	0.251	0.327	0.325	0.319	0.315	0.331	0.313	0.235	0.339
1976	0.287	0.344	0.348	0.354	0.320	0.343	0.336	0.288	0.314
1977	0.302	0.383	0.383	0.402	0.379	0.382	0.371	0.377	0.343
1978	0.280	0.404	0.408	0.428	0.408	0.411	0.394	0.402	0.374
1979	0.467	0.561	0.538	0.617	0.521	0.556	0.498	0.574	0.614
1980	0.678	0.776	0.777	0.824	0.772	0.785	0.808	0.770	0.720
1981	0.899	0.922	0.945	0.892	0.895	0.891	0.970	0.850	0.977
1982	0.907	0.940	0.939	0.979	0.925	1.014	0.936	0.946	0.817
1983	0.824	0.901	0.891	0.947	0.903	0.861	0.871	0.824	0.920

TABLE B.15 (CONT). Distillate Fuel Prices: Industrial Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.098	0.109	0.102	0.095	0.105	0.131	0.133	0.097	0.107
1971	0.101	0.109	0.109	0.101	0.112	0.138	0.137	0.104	0.112
1972	0.100	0.108	0.109	0.101	0.112	0.138	0.139	0.103	0.112
1973	0.115	0.142	0.130	0.128	0.136	0.171	0.185	0.126	0.109
1974	0.275	0.304	0.257	0.304	0.301	0.250	0.273	0.302	0.308
1975	0.304	0.378	0.311	0.318	0.327	0.286	0.310	0.328	0.320
1976	0.333	0.415	0.332	0.324	0.333	0.331	0.340	0.337	0.341
1977	0.378	0.381	0.351	0.376	0.382	0.358	0.362	0.387	0.382
1978	0.397	0.414	0.382	0.402	0.397	0.375	0.374	0.408	0.400
1979	0.517	0.563	0.464	0.401	0.544	0.533	0.517	0.544	0.537
1980	0.762	0.771	0.685	0.795	0.759	0.891	0.767	0.743	0.756
1981	0.904	0.906	0.888	0.878	0.915	1.103	0.888	0.912	0.916
1982	0.938	0.955	0.794	0.852	0.922	0.949	0.924	0.955	1.007
1983	0.871	0.883	0.871	0.932	0.843	0.835	0.843	0.910	0.866

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.075	0.112	0.098	0.099	0.080	0.101	0.100	0.092	0.092
1971	0.075	0.114	0.104	0.105	0.082	0.100	0.108	0.097	0.091
1972	0.074	0.115	0.103	0.105	0.082	0.099	0.108	0.097	0.090
1973	0.094	0.153	0.118	0.133	0.098	0.131	0.121	0.115	0.119
1974	0.262	0.281	0.301	0.298	0.286	0.323	0.277	0.261	0.272
1975	0.296	0.317	0.330	0.324	0.294	0.357	0.293	0.279	0.302
1976	0.317	0.341	0.335	0.309	0.322	0.376	0.313	0.343	0.338
1977	0.365	0.383	0.367	0.391	0.375	0.391	0.381	0.369	0.357
1978	0.383	0.389	0.396	0.415	0.403	0.438	0.400	0.394	0.360
1979	0.593	0.518	0.530	0.576	0.506	0.604	0.506	0.587	0.505
1980	0.788	0.780	0.786	0.783	0.640	0.784	0.763	0.844	0.762
1981	0.666	0.875	0.917	1.006	0.928	0.913	0.918	0.941	0.863
1982	0.844	0.894	0.953	1.073	0.882	0.886	1.057	0.875	0.850
1983	0.854	0.812	0.873	0.991	0.868	0.883	0.857	0.821	0.912

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.083	0.117	0.101	0.106	0.098	0.111	0.100
1971	0.088	0.124	0.104	0.109	0.104	0.110	0.104
1972	0.088	0.124	0.105	0.109	0.104	0.109	0.104
1973	0.096	0.157	0.140	0.148	0.114	0.143	0.127
1974	0.259	0.308	0.226	0.295	0.276	0.281	0.280
1975	0.303	0.331	0.264	0.310	0.315	0.311	0.309
1976	0.316	0.371	0.314	0.337	0.333	0.333	0.330
1977	0.370	0.403	0.360	0.381	0.398	0.348	0.371
1978	0.391	0.417	0.407	0.399	0.418	0.376	0.390
1979	0.498	0.613	0.581	0.590	0.538	0.487	0.534
1980	0.739	0.810	0.840	0.718	0.853	0.739	0.763
1981	0.926	0.905	0.933	0.956	0.940	0.894	0.904
1982	0.910	0.960	1.120	1.016	0.943	0.795	0.919
1983	0.854	0.921	0.859	0.849	0.848	0.913	0.861

TABLE B.16. Distillate Fuel Prices: Electric Utility Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	0.111	0.065	0.100	0.051	0.066	0.052	0.064	0.066
1971	0.0	0.125	0.094	0.090	0.082	0.098	0.076	0.096	0.098
1972	0.0	0.128	0.104	0.139	0.106	0.098	0.091	0.092	0.094
1973	0.0	0.123	0.149	0.142	0.150	0.218	0.124	0.114	0.116
1974	0.0	0.282	0.280	0.293	0.258	0.320	0.316	0.262	0.288
1975	0.0	0.298	0.307	0.313	0.329	0.352	0.316	0.289	0.302
1976	0.0	0.324	0.343	0.338	0.364	0.328	0.336	0.311	0.330
1977	0.0	0.369	0.362	0.372	0.373	0.369	0.333	0.361	0.344
1978	0.0	0.381	0.363	0.384	0.389	0.390	0.293	0.373	0.341
1979	0.0	0.568	0.407	0.612	0.492	0.616	0.541	0.508	0.536
1980	0.0	0.872	0.620	0.905	0.745	0.890	0.836	0.819	0.860
1981	0.0	1.070	0.889	1.023	0.989	1.007	1.041	1.004	1.031
1982	0.0	0.983	0.938	1.024	0.882	0.802	1.005	0.976	0.981
1983	0.0	0.865	0.917	0.871	0.0	0.843	0.862	0.808	0.842

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.051	0.056	0.064	0.106	0.0	0.092	0.107	0.089	0.143
1971	0.067	0.098	0.075	0.119	0.0	0.096	0.112	0.116	0.134
1972	0.080	0.091	0.085	0.123	0.0	0.101	0.113	0.112	0.134
1973	0.129	0.104	0.108	0.159	0.0	0.135	0.140	0.186	0.116
1974	0.255	0.288	0.142	0.234	0.0	0.259	0.241	0.290	0.305
1975	0.304	0.312	0.241	0.289	0.297	0.298	0.293	0.288	0.310
1976	0.323	0.337	0.266	0.323	0.0	0.333	0.277	0.308	0.336
1977	0.358	0.379	0.318	0.369	0.396	0.385	0.325	0.359	0.387
1978	0.369	0.387	0.386	0.372	0.445	0.392	0.364	0.363	0.396
1979	0.667	0.533	0.499	0.506	0.451	0.541	0.534	0.482	0.618
1980	0.790	0.858	0.726	0.838	0.0	0.863	0.830	0.785	0.905
1981	0.986	1.073	1.225	1.020	0.0	1.080	1.049	0.976	1.115
1982	0.993	1.003	1.260	0.861	0.0	1.027	0.950	0.941	1.050
1983	0.872	0.850	0.972	0.854	0.0	0.875	0.832	0.834	0.870

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.083	0.059	0.067	0.059	0.091	0.090	0.098	0.086	0.061
1971	0.089	0.105	0.099	0.067	0.107	0.137	0.117	0.127	0.028
1972	0.114	0.110	0.095	0.065	0.112	0.127	0.101	0.123	0.098
1973	0.200	0.155	0.118	0.068	0.131	0.181	0.180	0.145	0.208
1974	0.445	0.283	0.269	0.0	0.268	0.304	0.309	0.290	0.0
1975	0.275	0.295	0.298	0.347	0.279	0.316	0.311	0.289	0.0
1976	0.296	0.335	0.318	0.357	0.323	0.314	0.319	0.309	0.340
1977	0.340	0.374	0.368	0.390	0.364	0.366	0.369	0.353	0.0
1978	0.352	0.389	0.381	0.415	0.383	0.368	0.367	0.350	0.400
1979	0.405	0.583	0.560	0.639	0.552	0.470	0.561	0.526	0.479
1980	0.638	0.830	0.820	0.573	0.836	0.810	0.827	0.751	0.661
1981	0.880	1.036	1.000	1.099	1.026	1.103	0.999	0.981	0.771
1982	0.900	0.983	0.966	1.044	0.972	0.995	0.959	0.915	0.715
1983	0.855	0.872	0.814	0.893	0.837	0.870	0.839	0.843	0.0

TABLE B.16 (CONT). Distillate Fuel Prices: Electric Utility Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.113	0.169	0.089	0.056	0.063	0.040	0.102	0.061	0.102
1971	0.123	0.165	0.106	0.057	0.101	0.076	0.126	0.079	0.109
1972	0.094	0.179	0.131	0.067	0.103	0.107	0.137	0.093	0.112
1973	0.120	0.130	0.150	0.109	0.129	0.249	0.195	0.123	0.157
1974	0.319	0.285	0.202	0.0	0.0	0.290	0.309	0.307	0.295
1975	0.308	0.295	0.261	0.304	0.288	0.258	0.343	0.290	0.323
1976	0.339	0.345	0.313	0.326	0.315	0.331	0.318	0.318	0.338
1977	0.378	0.382	0.359	0.369	0.368	0.355	0.352	0.366	0.382
1978	0.387	0.400	0.383	0.389	0.385	0.387	0.358	0.367	0.400
1979	0.525	0.552	0.605	0.580	0.573	0.576	0.679	0.551	0.513
1980	0.804	0.849	0.855	0.817	0.808	0.883	0.302	0.775	0.791
1981	1.017	1.045	0.997	1.028	0.997	1.028	0.906	0.985	0.994
1982	0.975	0.997	0.919	0.959	0.961	0.955	0.988	0.959	1.026
1983	0.826	0.796	0.810	0.843	0.870	0.839	0.846	0.893	0.927

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.080	0.122	0.068	0.059	0.096	0.119	0.0	0.089	0.048
1971	0.074	0.126	0.107	0.092	0.146	0.142	0.140	0.096	0.049
1972	0.094	0.112	0.108	0.092	0.156	0.141	0.122	0.126	0.050
1973	0.179	0.167	0.160	0.181	0.167	0.146	0.168	0.169	0.020
1974	0.230	0.307	0.318	0.300	0.319	0.0	0.366	0.260	0.313
1975	0.267	0.316	0.312	0.284	0.334	0.320	0.304	0.282	0.323
1976	0.296	0.303	0.327	0.0	0.333	0.360	0.324	0.337	0.337
1977	0.372	0.365	0.307	0.0	0.380	0.409	0.369	0.352	0.364
1978	0.360	0.347	0.389	0.0	0.391	0.411	0.368	0.355	0.352
1979	0.694	0.779	0.536	0.0	0.520	0.577	0.499	0.693	0.662
1980	0.752	0.894	0.809	0.0	0.801	0.886	0.388	0.533	0.873
1981	0.978	0.918	1.006	0.0	1.021	1.078	1.140	0.602	1.027
1982	0.926	0.990	0.980	0.0	0.951	0.922	1.123	0.686	0.972
1983	0.800	0.832	0.856	0.0	0.836	0.785	0.900	0.717	0.856

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.050	0.127	0.0	0.096	0.129	0.106	0.074
1971	0.064	0.136	0.0	0.126	0.118	0.086	0.095
1972	0.075	0.144	0.072	0.113	0.131	0.148	0.100
1973	0.121	0.157	0.132	0.178	0.175	0.158	0.133
1974	0.291	0.0	0.0	0.284	0.316	0.328	0.301
1975	0.305	0.303	0.0	0.318	0.324	0.341	0.301
1976	0.334	0.319	0.0	0.319	0.351	0.350	0.325
1977	0.385	0.385	0.0	0.366	0.392	0.459	0.369
1978	0.385	0.0	0.464	0.367	0.405	0.479	0.377
1979	0.557	0.704	0.492	0.485	0.585	0.636	0.556
1980	0.819	0.855	0.839	0.772	0.883	0.972	0.793
1981	0.985	0.994	0.890	0.901	1.046	1.062	0.990
1982	0.970	1.029	1.097	0.946	0.988	1.008	0.956
1983	0.812	0.0	0.940	0.821	0.869	0.874	0.844

TABLE B.17. Motor Gasoline Prices: Transportation Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.399	0.352	0.343	0.350	0.350	0.340	0.370	0.358	0.358
1971	0.407	0.356	0.356	0.359	0.355	0.367	0.378	0.367	0.365
1972	0.402	0.369	0.347	0.354	0.349	0.351	0.376	0.377	0.372
1973	0.434	0.386	0.370	0.383	0.386	0.389	0.410	0.390	0.388
1974	0.597	0.518	0.512	0.515	0.539	0.525	0.546	0.562	0.513
1975	0.647	0.533	0.575	0.578	0.605	0.584	0.576	0.607	0.567
1976	0.670	0.588	0.604	0.605	0.631	0.613	0.600	0.633	0.573
1977	0.711	0.641	0.645	0.637	0.667	0.642	0.639	0.673	0.601
1978	0.744	0.659	0.663	0.676	0.678	0.632	0.663	0.682	0.617
1979	0.974	0.866	0.857	0.865	0.930	0.857	0.896	0.878	0.873
1980	1.276	1.210	1.206	1.194	1.271	1.171	1.244	1.247	1.224
1981	1.448	1.388	1.341	1.327	1.398	1.305	1.401	1.403	1.405
1982	1.419	1.319	1.292	1.290	1.339	1.248	1.292	1.325	1.252
1983	1.309	1.059	1.004	1.027	1.046	1.055	1.113	1.308	1.100

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	NY
1970	0.351	0.350	0.412	0.354	0.351	0.381	0.372	0.330	0.367
1971	0.347	0.363	0.420	0.363	0.350	0.376	0.376	0.332	0.375
1972	0.360	0.361	0.416	0.373	0.352	0.364	0.356	0.322	0.373
1973	0.381	0.386	0.448	0.390	0.400	0.406	0.393	0.379	0.408
1974	0.509	0.549	0.597	0.513	0.537	0.560	0.559	0.524	0.553
1975	0.549	0.592	0.681	0.575	0.601	0.591	0.595	0.563	0.587
1976	0.571	0.606	0.709	0.604	0.623	0.608	0.609	0.589	0.603
1977	0.588	0.644	0.740	0.648	0.656	0.646	0.646	0.621	0.640
1978	0.648	0.659	0.777	0.678	0.687	0.666	0.674	0.639	0.651
1979	0.875	0.882	0.974	0.806	0.892	0.909	0.900	0.850	0.868
1980	1.214	1.239	1.352	1.224	1.205	1.227	1.235	1.160	1.191
1981	1.358	1.385	1.560	1.362	1.373	1.361	1.360	1.265	1.329
1982	1.315	1.304	1.536	1.322	1.337	1.280	1.301	1.257	1.285
1983	1.067	1.037	1.466	1.122	1.106	1.072	1.073	1.057	1.050

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.358	0.350	0.357	0.378	0.339	0.372	0.341	0.355	0.362
1971	0.356	0.366	0.361	0.391	0.345	0.371	0.362	0.375	0.360
1972	0.341	0.359	0.377	0.381	0.342	0.371	0.358	0.375	0.353
1973	0.365	0.391	0.392	0.402	0.396	0.391	0.372	0.385	0.396
1974	0.500	0.548	0.565	0.544	0.569	0.541	0.541	0.522	0.538
1975	0.562	0.592	0.608	0.571	0.591	0.579	0.569	0.542	0.597
1976	0.604	0.602	0.620	0.588	0.601	0.595	0.582	0.572	0.609
1977	0.630	0.645	0.654	0.629	0.642	0.632	0.618	0.624	0.656
1978	0.665	0.644	0.666	0.652	0.668	0.633	0.626	0.647	0.693
1979	0.875	0.874	0.878	0.882	0.912	0.876	0.866	0.901	0.876
1980	1.219	1.212	1.242	1.222	1.263	1.195	1.166	1.266	1.075
1981	1.364	1.354	1.376	1.356	1.396	1.347	1.361	1.407	1.308
1982	1.282	1.261	1.310	1.259	1.320	1.311	1.227	1.372	1.296
1983	1.055	1.085	1.104	1.108	1.102	1.119	1.024	1.037	1.065

TABLE B.17 (CONT). Motor Gasoline Prices: Transportation Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.353	0.354	0.378	0.365	0.374	0.368	0.383	0.365	0.367
1971	0.373	0.371	0.375	0.383	0.381	0.370	0.378	0.377	0.379
1972	0.373	0.325	0.375	0.376	0.363	0.364	0.390	0.394	0.379
1973	0.393	0.392	0.401	0.401	0.386	0.383	0.418	0.420	0.386
1974	0.522	0.528	0.534	0.547	0.569	0.530	0.548	0.564	0.536
1975	0.569	0.587	0.596	0.567	0.599	0.591	0.593	0.601	0.591
1976	0.605	0.625	0.632	0.595	0.611	0.595	0.592	0.613	0.593
1977	0.620	0.665	0.662	0.631	0.646	0.637	0.640	0.647	0.625
1978	0.640	0.690	0.688	0.655	0.644	0.664	0.681	0.668	0.643
1979	0.854	0.894	0.902	0.892	0.895	0.844	0.917	0.918	0.863
1980	1.214	1.209	1.222	1.243	1.243	1.176	1.236	1.267	1.182
1981	1.365	1.337	1.372	1.379	1.356	1.344	1.402	1.388	1.336
1982	1.311	1.367	1.331	1.319	1.269	1.321	1.386	1.307	1.289
1983	1.077	1.149	1.131	1.115	1.049	1.077	1.075	1.071	1.106

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.353	0.354	0.365	0.362	0.344	0.372	0.356	0.333	0.344
1971	0.351	0.358	0.372	0.369	0.357	0.360	0.356	0.342	0.350
1972	0.348	0.353	0.367	0.361	0.366	0.327	0.355	0.338	0.355
1973	0.375	0.384	0.379	0.383	0.384	0.387	0.375	0.349	0.374
1974	0.505	0.520	0.550	0.527	0.531	0.525	0.508	0.497	0.504
1975	0.565	0.555	0.590	0.562	0.544	0.587	0.573	0.545	0.565
1976	0.595	0.573	0.602	0.586	0.580	0.611	0.597	0.565	0.586
1977	0.638	0.616	0.640	0.622	0.613	0.640	0.641	0.600	0.610
1978	0.668	0.661	0.639	0.638	0.627	0.668	0.669	0.610	0.638
1979	0.859	0.903	0.876	0.890	0.865	0.885	0.876	0.816	0.883
1980	1.205	1.220	1.215	1.239	1.218	1.208	1.213	1.151	1.206
1981	1.341	1.351	1.257	1.376	1.355	1.336	1.357	1.294	1.348
1982	1.275	1.312	1.257	1.267	1.328	1.327	1.292	1.227	1.347
1983	1.022	1.018	1.074	1.109	1.084	1.121	1.056	1.017	1.051

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.356	0.387	0.365	0.332	0.357	0.366	0.356
1971	0.358	0.401	0.367	0.346	0.378	0.371	0.363
1972	0.367	0.401	0.360	0.336	0.384	0.346	0.361
1973	0.395	0.417	0.393	0.384	0.392	0.394	0.388
1974	0.551	0.559	0.537	0.538	0.515	0.537	0.540
1975	0.596	0.586	0.577	0.568	0.577	0.597	0.581
1976	0.627	0.601	0.601	0.583	0.591	0.617	0.601
1977	0.667	0.620	0.646	0.619	0.632	0.660	0.637
1978	0.674	0.642	0.675	0.623	0.641	0.691	0.655
1979	0.869	0.904	0.897	0.858	0.891	0.895	0.882
1980	1.235	1.255	1.231	1.179	1.253	1.093	1.220
1981	1.384	1.392	1.374	1.319	1.394	1.338	1.358
1982	1.317	1.316	1.305	1.294	1.302	1.338	1.296
1983	1.082	1.155	1.063	1.105	1.145	1.071	1.067

TABLE B.18. Diesel Fuel Prices: Transportation Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	0.184	0.160	0.174	0.197	0.167	0.193	0.183	0.173
1971	0.0	0.187	0.169	0.181	0.216	0.172	0.207	0.193	0.186
1972	0.0	0.197	0.171	0.184	0.206	0.171	0.208	0.195	0.191
1973	0.0	0.243	0.199	0.205	0.247	0.204	0.250	0.244	0.247
1974	0.0	0.378	0.326	0.352	0.406	0.339	0.377	0.385	0.386
1975	0.0	0.405	0.351	0.380	0.447	0.346	0.402	0.390	0.390
1976	0.0	0.428	0.374	0.394	0.460	0.374	0.430	0.417	0.417
1977	0.0	0.443	0.429	0.457	0.458	0.428	0.501	0.490	0.490
1978	0.0	0.457	0.438	0.472	0.458	0.446	0.526	0.515	0.515
1979	0.0	0.660	0.656	0.665	0.683	0.669	0.738	0.750	0.761
1980	0.0	0.969	0.929	1.018	0.980	0.988	1.027	1.068	1.071
1981	0.0	1.187	1.123	1.173	1.129	1.140	1.250	1.182	1.183
1982	0.0	1.124	1.068	1.112	1.105	1.075	1.208	1.100	1.101
1983	0.0	0.977	0.948	0.990	0.989	0.947	1.124	1.034	1.035

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.200	0.183	0.199	0.177	0.182	0.193	0.170	0.164	0.201
1971	0.209	0.208	0.202	0.178	0.189	0.198	0.171	0.164	0.194
1972	0.216	0.209	0.203	0.182	0.194	0.201	0.178	0.170	0.196
1973	0.256	0.243	0.222	0.214	0.225	0.249	0.224	0.216	0.222
1974	0.358	0.371	0.326	0.348	0.358	0.373	0.368	0.357	0.370
1975	0.401	0.419	0.365	0.367	0.372	0.393	0.373	0.375	0.386
1976	0.440	0.434	0.395	0.399	0.399	0.416	0.390	0.388	0.415
1977	0.490	0.488	0.434	0.459	0.435	0.479	0.466	0.435	0.469
1978	0.522	0.500	0.474	0.468	0.449	0.502	0.468	0.456	0.467
1979	0.769	0.722	0.664	0.700	0.674	0.748	0.697	0.696	0.666
1980	1.070	1.038	1.025	0.966	0.964	1.033	0.995	0.978	0.951
1981	1.271	1.213	1.201	1.148	1.131	1.222	1.197	1.135	1.144
1982	1.146	1.098	1.180	1.105	1.103	1.181	1.151	1.095	1.089
1983	1.041	0.978	1.213	0.985	0.975	1.065	1.034	0.966	0.980

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.150	0.187	0.183	0.192	0.176	0.172	0.171	0.280	0.172
1971	0.162	0.206	0.193	0.207	0.181	0.177	0.176	0.244	0.178
1972	0.164	0.208	0.195	0.208	0.179	0.173	0.176	0.215	0.178
1973	0.197	0.250	0.248	0.250	0.229	0.224	0.215	0.245	0.213
1974	0.333	0.378	0.385	0.379	0.369	0.354	0.350	0.367	0.358
1975	0.352	0.403	0.390	0.402	0.384	0.370	0.377	0.381	0.368
1976	0.371	0.430	0.417	0.430	0.401	0.399	0.400	0.448	0.387
1977	0.415	0.501	0.491	0.502	0.468	0.461	0.436	0.525	0.436
1978	0.429	0.526	0.515	0.526	0.493	0.463	0.459	0.535	0.456
1979	0.656	0.741	0.752	0.735	0.718	0.704	0.696	0.754	0.671
1980	0.949	1.026	1.067	1.028	0.997	0.993	0.967	1.064	0.992
1981	1.193	1.256	1.183	1.255	1.199	1.156	1.149	1.292	1.159
1982	1.055	1.213	1.099	1.210	1.157	1.126	1.104	1.227	1.128
1983	0.923	1.125	1.034	1.115	1.052	0.997	0.995	1.043	0.993

TABLE B.18 (CONT). Diesel Fuel Prices: Transportation Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.180	0.184	0.159	0.182	0.218	0.160	0.208	0.200	0.175
1971	0.185	0.183	0.160	0.207	0.243	0.161	0.221	0.202	0.194
1972	0.190	0.184	0.160	0.208	0.278	0.167	0.221	0.196	0.191
1973	0.244	0.222	0.211	0.250	0.297	0.205	0.252	0.243	0.224
1974	0.408	0.354	0.340	0.379	0.411	0.346	0.400	0.375	0.362
1975	0.433	0.370	0.347	0.403	0.445	0.363	0.417	0.394	0.383
1976	0.460	0.405	0.387	0.430	0.440	0.387	0.425	0.420	0.410
1977	0.516	0.453	0.438	0.502	0.476	0.431	0.456	0.481	0.466
1978	0.536	0.471	0.453	0.526	0.506	0.456	0.480	0.509	0.490
1979	0.728	0.706	0.686	0.746	0.712	0.669	0.690	0.726	0.712
1980	1.017	1.003	0.979	1.023	1.018	0.967	1.021	1.034	0.964
1981	1.232	1.189	1.163	1.249	1.215	1.191	1.210	1.310	1.183
1982	1.189	1.143	1.093	1.209	1.150	1.106	1.160	1.242	1.148
1983	1.087	1.010	0.965	1.132	1.062	1.007	1.052	1.141	1.034

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.155	0.186	0.187	0.188	0.183	0.183	0.178	0.146	0.183
1971	0.156	0.197	0.190	0.206	0.214	0.182	0.183	0.160	0.194
1972	0.157	0.193	0.196	0.209	0.216	0.187	0.190	0.160	0.193
1973	0.206	0.220	0.228	0.256	0.261	0.229	0.236	0.194	0.233
1974	0.343	0.344	0.364	0.378	0.405	0.360	0.375	0.324	0.391
1975	0.362	0.373	0.366	0.403	0.418	0.377	0.419	0.346	0.412
1976	0.389	0.395	0.409	0.430	0.445	0.406	0.425	0.371	0.395
1977	0.450	0.427	0.473	0.501	0.493	0.469	0.456	0.413	0.445
1978	0.468	0.442	0.494	0.526	0.520	0.488	0.482	0.426	0.463
1979	0.730	0.657	0.720	0.740	0.694	0.700	0.696	0.664	0.691
1980	1.013	0.965	0.978	1.028	1.058	0.987	1.005	0.983	0.974
1981	1.194	1.101	1.201	1.238	1.252	1.168	1.176	1.155	1.131
1982	1.131	1.084	1.168	1.208	1.172	1.115	1.093	1.091	1.097
1983	1.005	0.960	1.055	1.125	1.067	0.984	0.956	0.946	1.005

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.173	0.198	0.183	0.184	0.238	0.181	0.181
1971	0.183	0.207	0.192	0.186	0.265	0.184	0.190
1972	0.184	0.208	0.199	0.185	0.288	0.181	0.189
1973	0.220	0.251	0.223	0.224	0.346	0.209	0.221
1974	0.358	0.378	0.347	0.341	0.506	0.355	0.366
1975	0.378	0.403	0.368	0.363	0.551	0.375	0.391
1976	0.403	0.430	0.401	0.390	0.507	0.401	0.413
1977	0.462	0.502	0.433	0.449	0.559	0.436	0.450
1978	0.487	0.526	0.442	0.475	0.600	0.466	0.462
1979	0.690	0.745	0.650	0.714	0.826	0.693	0.686
1980	1.009	1.027	0.932	1.010	1.160	1.025	0.988
1981	1.225	1.251	1.125	1.172	1.412	1.165	1.160
1982	1.176	1.210	1.118	1.130	1.365	1.117	1.114
1983	1.066	1.120	0.996	1.019	1.227	0.999	1.002

TABLE B.19. Kerosene Prices: Residential Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	0.219	0.189	0.391	0.347	0.204	0.229	0.203	0.181
1971	0.0	0.225	0.191	0.363	0.371	0.208	0.225	0.248	0.194
1972	0.0	0.228	0.200	0.330	0.409	0.210	0.228	0.227	0.205
1973	0.0	0.262	0.257	0.346	0.479	0.246	0.262	0.257	0.257
1974	0.0	0.399	0.371	0.535	0.721	0.387	0.407	0.397	0.396
1975	0.0	0.447	0.376	0.628	0.685	0.399	0.457	0.454	0.454
1976	0.0	0.480	0.391	0.619	0.701	0.431	0.452	0.443	0.443
1977	0.0	0.521	0.463	0.704	0.773	0.483	0.506	0.520	0.520
1978	0.0	0.576	0.487	0.749	0.814	0.514	0.541	0.552	0.552
1979	0.0	0.943	0.659	0.853	1.163	0.571	0.719	0.746	0.746
1980	0.0	0.811	1.044	1.576	1.756	1.077	1.100	1.154	1.154
1981	0.0	1.507	1.270	1.927	2.065	1.320	1.422	1.458	1.458
1982	0.0	1.458	1.251	1.934	2.099	1.326	1.456	1.426	1.426
1983	0.0	1.316	1.116	1.793	1.904	1.237	1.264	1.266	1.266

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.220	0.199	0.396	0.212	0.337	0.222	0.215	0.190	0.204
1971	0.216	0.207	0.427	0.219	0.326	0.227	0.205	0.193	0.215
1972	0.216	0.222	0.468	0.219	0.417	0.225	0.187	0.199	0.217
1973	0.248	0.254	0.487	0.251	0.434	0.259	0.238	0.235	0.255
1974	0.400	0.401	0.619	0.375	0.536	0.396	0.382	0.365	0.399
1975	0.442	0.452	0.700	0.403	0.550	0.429	0.420	0.384	0.422
1976	0.480	0.459	0.760	0.440	0.588	0.452	0.439	0.407	0.446
1977	0.546	0.537	0.849	0.503	0.645	0.526	0.516	0.477	0.485
1978	0.584	0.574	0.894	0.535	0.667	0.551	0.541	0.507	0.536
1979	0.791	0.779	1.277	0.737	0.763	0.786	0.772	0.699	0.836
1980	1.203	1.184	1.928	1.093	1.439	1.175	1.154	1.036	0.825
1981	1.515	1.491	2.267	1.337	1.764	1.443	1.417	1.268	1.405
1982	1.502	1.478	2.304	1.298	1.772	1.402	1.377	1.231	1.355
1983	1.349	1.328	2.090	1.217	1.652	1.288	1.265	1.154	1.229

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.216	0.219	0.203	0.216	0.211	0.205	0.193	0.278	0.232
1971	0.228	0.225	0.246	0.225	0.208	0.208	0.211	0.288	0.241
1972	0.237	0.228	0.227	0.228	0.212	0.212	0.213	0.295	0.244
1973	0.274	0.262	0.257	0.262	0.256	0.242	0.247	0.306	0.291
1974	0.437	0.407	0.397	0.407	0.405	0.374	0.375	0.427	0.416
1975	0.461	0.427	0.454	0.427	0.421	0.393	0.389	0.513	0.427
1976	0.511	0.452	0.443	0.452	0.436	0.426	0.425	0.553	0.439
1977	0.597	0.506	0.520	0.506	0.509	0.498	0.494	0.598	0.501
1978	0.627	0.541	0.552	0.541	0.533	0.530	0.525	0.661	0.533
1979	0.900	0.719	0.746	0.719	0.761	0.730	0.723	1.083	0.592
1980	1.345	1.100	1.154	1.100	1.138	1.082	1.073	0.932	1.117
1981	1.636	1.422	1.456	1.422	1.397	1.325	1.313	1.730	1.369
1982	1.611	1.456	1.426	1.456	1.357	1.286	1.275	1.674	1.375
1983	1.441	1.264	1.266	1.264	1.246	1.206	1.195	1.511	1.282

TABLE B.19 (CONT). Kerosene Prices: Residential Sector (\$/gal)

YEAR	NC	ND	NE	NH	NI	NM	NV	NY	OH
1970	0.189	0.223	0.187	0.213	0.232	0.201	0.451	0.211	0.192
1971	0.196	0.220	0.188	0.225	0.239	0.201	0.465	0.224	0.201
1972	0.200	0.220	0.189	0.228	0.244	0.206	0.443	0.223	0.200
1973	0.238	0.259	0.234	0.262	0.293	0.241	0.480	0.273	0.236
1974	0.368	0.361	0.356	0.407	0.445	0.388	0.623	0.410	0.378
1975	0.399	0.363	0.370	0.427	0.474	0.411	0.647	0.442	0.391
1976	0.432	0.403	0.410	0.452	0.510	0.430	0.644	0.463	0.420
1977	0.487	0.459	0.469	0.506	0.569	0.482	0.733	0.521	0.487
1978	0.521	0.488	0.498	0.541	0.604	0.512	0.779	0.552	0.510
1979	0.706	0.672	0.687	0.719	0.820	0.588	0.886	0.750	0.729
1980	1.074	0.997	1.018	1.100	1.252	1.075	1.640	1.146	1.089
1981	1.353	1.220	1.247	1.422	1.601	1.324	2.005	1.465	1.337
1982	1.341	1.185	1.210	1.456	1.601	1.327	2.013	1.463	1.300
1983	1.204	1.110	1.134	1.264	1.429	1.229	1.866	1.308	1.196

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.191	0.377	0.211	0.230	0.213	0.211	0.219	0.175	0.354
1971	0.195	0.403	0.219	0.225	0.216	0.212	0.218	0.188	0.405
1972	0.191	0.440	0.214	0.228	0.218	0.218	0.226	0.190	0.429
1973	0.226	0.454	0.246	0.262	0.256	0.243	0.256	0.216	0.482
1974	0.375	0.506	0.390	0.407	0.403	0.375	0.427	0.364	0.621
1975	0.388	0.515	0.421	0.427	0.426	0.392	0.457	0.408	0.696
1976	0.417	0.522	0.440	0.452	0.447	0.424	0.468	0.424	0.644
1977	0.477	0.581	0.494	0.506	0.506	0.487	0.517	0.501	0.743
1978	0.504	0.612	0.524	0.541	0.541	0.517	0.572	0.526	0.791
1979	0.708	0.874	0.712	0.719	0.734	0.713	0.892	0.756	0.879
1980	1.074	1.320	1.007	1.100	1.116	1.057	0.900	1.130	1.657
1981	1.311	1.551	1.389	1.422	1.405	1.294	1.500	1.374	2.032
1982	1.293	1.577	1.390	1.456	1.393	1.256	1.446	1.353	2.041
1983	1.156	1.430	1.240	1.264	1.251	1.178	1.311	1.210	1.903

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.194	0.220	0.333	0.196	0.221	0.230	0.207
1971	0.203	0.225	0.357	0.205	0.229	0.231	0.215
1972	0.204	0.228	0.375	0.214	0.232	0.266	0.215
1973	0.241	0.262	0.403	0.249	0.280	0.285	0.253
1974	0.372	0.407	0.468	0.379	0.399	0.416	0.394
1975	0.404	0.427	0.488	0.400	0.428	0.428	0.423
1976	0.430	0.452	0.543	0.419	0.463	0.439	0.448
1977	0.487	0.506	0.580	0.490	0.519	0.491	0.509
1978	0.521	0.541	0.611	0.513	0.555	0.523	0.544
1979	0.707	0.719	0.873	0.732	0.753	0.581	0.726
1980	1.073	1.100	1.318	1.095	1.145	1.095	1.377
1981	1.354	1.422	1.550	1.344	1.442	1.343	1.422
1982	1.342	1.456	1.575	1.307	1.429	1.348	1.400
1983	1.205	1.264	1.429	1.200	1.284	1.257	1.259

TABLE B.20. Kerosene Prices: Industrial Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	0.219	0.189	0.391	0.348	0.204	0.229	0.203	0.181
1971	0.0	0.225	0.191	0.363	0.371	0.208	0.225	0.248	0.194
1972	0.0	0.228	0.200	0.330	0.409	0.210	0.228	0.227	0.205
1973	0.0	0.262	0.227	0.346	0.479	0.246	0.262	0.257	0.257
1974	0.0	0.399	0.371	0.535	0.721	0.387	0.407	0.397	0.396
1975	0.0	0.447	0.378	0.628	0.685	0.399	0.427	0.454	0.454
1976	0.0	0.480	0.391	0.619	0.701	0.431	0.452	0.443	0.443
1977	0.0	0.520	0.463	0.705	0.773	0.484	0.507	0.521	0.521
1978	0.0	0.576	0.406	0.749	0.814	0.515	0.542	0.553	0.553
1979	0.0	0.943	0.698	1.006	1.163	0.681	0.721	0.747	0.747
1980	0.0	1.245	1.043	1.578	1.756	1.079	1.102	1.156	1.156
1981	0.0	1.528	1.181	1.927	2.064	1.324	1.426	1.447	1.447
1982	1.317	0.967	0.997	0.949	1.055	0.873	1.191	1.199	1.055
1983	1.060	0.898	0.939	0.966	0.905	0.968	1.039	0.958	0.920

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.220	0.200	0.396	0.212	0.337	0.222	0.215	0.190	0.234
1971	0.216	0.207	0.427	0.219	0.326	0.227	0.205	0.193	0.215
1972	0.216	0.222	0.468	0.219	0.417	0.225	0.187	0.199	0.217
1973	0.248	0.254	0.487	0.251	0.434	0.259	0.238	0.235	0.256
1974	0.400	0.401	0.619	0.375	0.536	0.396	0.382	0.365	0.369
1975	0.442	0.452	0.700	0.403	0.551	0.429	0.420	0.384	0.422
1976	0.480	0.459	0.760	0.440	0.588	0.452	0.439	0.407	0.446
1977	0.547	0.538	0.849	0.504	0.646	0.527	0.517	0.478	0.466
1978	0.585	0.576	0.894	0.536	0.688	0.552	0.542	0.508	0.538
1979	0.793	0.781	1.277	0.738	0.909	0.788	0.774	0.700	0.839
1980	1.206	1.187	1.728	1.095	1.441	1.178	1.157	1.038	1.166
1981	1.526	1.502	2.267	1.421	1.769	1.446	1.420	1.348	1.430
1982	1.061	1.052	1.357	0.972	1.101	0.957	0.933	0.915	1.007
1983	0.971	0.936	0.905	0.920	1.040	0.978	0.949	0.909	0.922

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.216	0.219	0.203	0.216	0.211	0.205	0.193	0.278	0.232
1971	0.228	0.225	0.246	0.225	0.208	0.208	0.211	0.288	0.241
1972	0.237	0.228	0.227	0.228	0.212	0.212	0.213	0.295	0.245
1973	0.274	0.262	0.257	0.262	0.257	0.242	0.247	0.306	0.291
1974	0.437	0.407	0.397	0.407	0.405	0.374	0.375	0.427	0.416
1975	0.461	0.427	0.454	0.427	0.421	0.393	0.389	0.513	0.427
1976	0.511	0.452	0.443	0.452	0.436	0.426	0.425	0.553	0.439
1977	0.596	0.507	0.521	0.507	0.510	0.499	0.495	0.598	0.501
1978	0.626	0.542	0.553	0.542	0.534	0.531	0.526	0.661	0.534
1979	0.899	0.721	0.747	0.721	0.763	0.731	0.725	1.083	0.706
1980	1.344	1.102	1.156	1.102	1.140	1.084	1.075	1.429	1.118
1981	1.522	1.426	1.447	1.426	1.400	1.408	1.396	1.755	1.372
1982	0.828	1.187	1.090	1.196	0.964	1.019	0.988	0.945	1.072
1983	0.936	1.004	0.964	1.055	0.987	0.898	0.909	0.887	1.008

TABLE B.20 (CONT). Kerosene Prices: Industrial Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.189	0.223	0.187	0.213	0.232	0.201	0.451	0.211	0.192
1971	0.196	0.220	0.188	0.225	0.239	0.201	0.468	0.225	0.201
1972	0.200	0.220	0.189	0.228	0.245	0.206	0.443	0.223	0.200
1973	0.239	0.259	0.234	0.262	0.293	0.241	0.486	0.273	0.236
1974	0.369	0.361	0.356	0.407	0.445	0.388	0.623	0.410	0.378
1975	0.399	0.363	0.370	0.427	0.474	0.411	0.647	0.442	0.391
1976	0.432	0.403	0.410	0.452	0.510	0.430	0.644	0.463	0.420
1977	0.488	0.460	0.470	0.507	0.571	0.482	0.754	0.522	0.488
1978	0.522	0.489	0.499	0.542	0.605	0.513	0.780	0.554	0.512
1979	0.708	0.673	0.686	0.721	0.822	0.684	1.047	0.752	0.736
1980	1.077	0.999	1.020	1.102	1.254	1.076	1.642	1.148	1.092
1981	1.362	1.297	1.325	1.426	1.604	1.320	2.006	1.468	1.340
1982	1.028	1.163	0.924	1.118	1.111	1.227	1.113	1.164	0.995
1983	0.942	0.921	0.909	1.028	0.927	0.915	0.924	0.977	0.947

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.191	0.377	0.212	0.230	0.213	0.211	0.219	0.175	0.354
1971	0.195	0.403	0.219	0.225	0.216	0.213	0.216	0.188	0.405
1972	0.191	0.440	0.214	0.228	0.218	0.218	0.226	0.190	0.429
1973	0.226	0.454	0.246	0.262	0.256	0.243	0.256	0.216	0.432
1974	0.376	0.506	0.390	0.407	0.403	0.375	0.427	0.364	0.621
1975	0.388	0.516	0.421	0.427	0.426	0.393	0.457	0.408	0.696
1976	0.417	0.522	0.440	0.452	0.447	0.424	0.468	0.424	0.644
1977	0.479	0.581	0.495	0.507	0.507	0.488	0.519	0.501	0.744
1978	0.506	0.612	0.525	0.542	0.542	0.518	0.574	0.526	0.792
1979	0.710	0.874	0.713	0.721	0.736	0.714	0.895	0.755	1.047
1980	1.077	1.319	1.089	1.102	1.119	1.059	1.244	1.129	1.659
1981	1.227	1.551	1.392	1.426	1.415	1.375	1.526	1.278	2.036
1982	0.955	1.096	1.097	1.198	1.008	1.083	0.992	1.003	1.015
1983	0.970	0.872	0.957	1.104	0.939	0.921	0.952	0.932	1.000

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.195	0.220	0.333	0.198	0.221	0.230	0.209
1971	0.203	0.225	0.357	0.205	0.229	0.231	0.216
1972	0.204	0.228	0.375	0.214	0.232	0.266	0.218
1973	0.241	0.262	0.403	0.249	0.260	0.285	0.254
1974	0.372	0.407	0.468	0.379	0.399	0.416	0.400
1975	0.404	0.427	0.488	0.400	0.428	0.428	0.429
1976	0.430	0.452	0.544	0.419	0.463	0.439	0.454
1977	0.489	0.507	0.580	0.491	0.521	0.492	0.521
1978	0.522	0.542	0.611	0.514	0.557	0.523	0.557
1979	0.709	0.721	0.872	0.734	0.755	0.692	0.751
1980	1.078	1.102	1.318	1.097	1.148	1.097	1.127
1981	1.363	1.426	1.549	1.347	1.452	1.346	1.450
1982	1.016	1.225	1.108	0.960	1.085	1.283	0.994
1983	0.924	1.026	0.922	0.928	0.917	1.001	0.941

TABLE B.21. Jet Fuel Prices: Transportation Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.104	0.092	0.110	0.108	0.104	0.108	0.106	0.108	0.108
1971	0.109	0.096	0.116	0.113	0.109	0.113	0.111	0.113	0.113
1972	0.108	0.096	0.115	0.113	0.108	0.113	0.111	0.113	0.113
1973	0.129	0.114	0.137	0.134	0.129	0.134	0.131	0.134	0.134
1974	0.222	0.196	0.236	0.231	0.222	0.231	0.226	0.231	0.231
1975	0.289	0.256	0.308	0.301	0.289	0.301	0.295	0.301	0.301
1976	0.329	0.276	0.325	0.331	0.329	0.331	0.322	0.320	0.320
1977	0.370	0.321	0.379	0.384	0.370	0.384	0.371	0.378	0.378
1978	0.404	0.362	0.437	0.413	0.404	0.413	0.418	0.419	0.419
1979	0.536	0.490	0.605	0.578	0.536	0.578	0.560	0.585	0.585
1980	0.878	0.804	0.971	0.932	0.878	0.932	0.916	0.957	0.957
1981	1.020	1.008	1.056	1.035	1.020	1.035	1.053	1.028	1.028
1982	0.996	1.002	0.957	0.996	0.996	0.996	1.013	0.969	0.969
1983	0.903	0.851	0.851	0.903	0.903	0.899	0.929	0.869	0.869

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.108	0.108	0.104	0.109	0.108	0.105	0.105	0.109	0.092
1971	0.113	0.113	0.109	0.114	0.113	0.110	0.110	0.114	0.096
1972	0.113	0.113	0.108	0.114	0.113	0.109	0.109	0.114	0.096
1973	0.134	0.134	0.129	0.135	0.134	0.130	0.130	0.135	0.114
1974	0.231	0.231	0.222	0.233	0.231	0.224	0.224	0.233	0.196
1975	0.301	0.301	0.289	0.304	0.301	0.292	0.292	0.304	0.256
1976	0.320	0.320	0.329	0.332	0.331	0.330	0.330	0.332	0.276
1977	0.378	0.378	0.370	0.389	0.384	0.373	0.373	0.389	0.321
1978	0.419	0.419	0.404	0.420	0.413	0.402	0.402	0.420	0.362
1979	0.585	0.585	0.556	0.583	0.578	0.549	0.549	0.583	0.490
1980	0.957	0.957	0.878	0.933	0.932	0.893	0.893	0.933	0.804
1981	1.028	1.028	1.030	1.036	1.035	1.019	1.019	1.036	1.008
1982	0.969	0.969	0.996	0.971	0.996	0.975	0.975	0.971	1.002
1983	0.863	0.863	0.903	0.882	0.899	0.882	0.882	0.882	0.882

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.110	0.106	0.108	0.106	0.105	0.109	0.109	0.092	0.108
1971	0.116	0.111	0.113	0.111	0.110	0.114	0.114	0.096	0.113
1972	0.115	0.111	0.113	0.111	0.109	0.114	0.114	0.096	0.113
1973	0.137	0.131	0.134	0.131	0.130	0.135	0.135	0.114	0.134
1974	0.236	0.226	0.231	0.226	0.224	0.233	0.233	0.196	0.231
1975	0.308	0.295	0.301	0.295	0.292	0.304	0.304	0.256	0.301
1976	0.325	0.322	0.320	0.322	0.330	0.332	0.332	0.276	0.331
1977	0.379	0.371	0.378	0.371	0.373	0.389	0.389	0.321	0.384
1978	0.437	0.418	0.419	0.418	0.402	0.420	0.420	0.362	0.413
1979	0.605	0.560	0.585	0.560	0.549	0.583	0.583	0.490	0.578
1980	0.971	0.916	0.957	0.916	0.893	0.933	0.933	0.804	0.932
1981	1.026	1.053	1.036	1.053	1.019	1.036	1.036	1.008	1.035
1982	0.957	1.013	0.969	1.013	0.975	0.971	0.971	1.002	0.996
1983	0.851	0.929	0.869	0.929	0.882	0.882	0.882	0.851	0.899

TABLE B.21 (CONT). Jet Fuel Prices: Transportation Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.108	0.109	0.109	0.106	0.103	0.108	0.108	0.103	0.105
1971	0.113	0.114	0.114	0.111	0.108	0.113	0.113	0.108	0.110
1972	0.113	0.114	0.114	0.111	0.108	0.113	0.113	0.108	0.109
1973	0.134	0.135	0.135	0.131	0.128	0.134	0.134	0.128	0.130
1974	0.231	0.233	0.233	0.226	0.221	0.231	0.231	0.221	0.224
1975	0.301	0.304	0.304	0.295	0.288	0.301	0.301	0.288	0.292
1976	0.320	0.332	0.332	0.322	0.312	0.331	0.331	0.312	0.330
1977	0.378	0.389	0.389	0.371	0.359	0.384	0.384	0.359	0.373
1978	0.419	0.420	0.420	0.418	0.408	0.413	0.413	0.408	0.402
1979	0.585	0.583	0.583	0.560	0.551	0.578	0.578	0.551	0.549
1980	0.957	0.933	0.933	0.916	0.897	0.932	0.932	0.897	0.893
1981	1.028	1.036	1.036	1.053	1.011	1.035	1.035	1.011	1.019
1982	0.969	0.971	0.971	1.013	0.947	0.996	0.996	0.947	0.975
1983	0.863	0.882	0.882	0.929	0.869	0.851	0.903	0.869	0.882

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.110	0.104	0.103	0.106	0.108	0.109	0.092	0.110	0.108
1971	0.116	0.109	0.108	0.111	0.113	0.114	0.096	0.116	0.113
1972	0.115	0.108	0.108	0.111	0.113	0.114	0.096	0.115	0.113
1973	0.137	0.129	0.128	0.131	0.134	0.135	0.114	0.137	0.134
1974	0.236	0.222	0.221	0.226	0.231	0.233	0.196	0.236	0.231
1975	0.308	0.289	0.288	0.295	0.301	0.304	0.256	0.308	0.301
1976	0.325	0.329	0.312	0.322	0.320	0.332	0.276	0.325	0.331
1977	0.379	0.370	0.359	0.371	0.378	0.389	0.321	0.379	0.384
1978	0.437	0.404	0.408	0.418	0.419	0.420	0.362	0.437	0.413
1979	0.605	0.536	0.551	0.560	0.585	0.583	0.490	0.605	0.578
1980	0.971	0.878	0.897	0.916	0.957	0.933	0.804	0.971	0.932
1981	1.026	1.020	1.011	1.053	1.028	1.036	1.005	1.026	1.035
1982	0.957	0.996	0.947	1.013	0.969	0.971	1.002	0.957	0.996
1983	0.882	0.903	0.869	0.929	0.863	0.882	0.882	0.851	0.899

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.108	0.106	0.104	0.105	0.108	0.108	0.105
1971	0.113	0.111	0.109	0.110	0.113	0.113	0.110
1972	0.113	0.111	0.108	0.109	0.113	0.113	0.110
1973	0.134	0.131	0.129	0.130	0.134	0.134	0.131
1974	0.231	0.226	0.222	0.224	0.231	0.231	0.225
1975	0.301	0.295	0.289	0.292	0.301	0.301	0.294
1976	0.320	0.322	0.329	0.330	0.320	0.331	0.323
1977	0.378	0.371	0.370	0.373	0.378	0.384	0.371
1978	0.419	0.418	0.404	0.402	0.419	0.413	0.411
1979	0.585	0.560	0.556	0.549	0.585	0.578	0.560
1980	0.957	0.916	0.878	0.893	0.957	0.932	0.913
1981	1.028	1.053	1.020	1.019	1.028	1.035	1.024
1982	0.969	1.013	0.996	0.975	0.969	0.996	0.976
1983	0.863	0.929	0.903	0.882	0.863	0.899	0.879

TABLE B.22. Residual Fuel Prices: Commercial Sector (\$/bbl)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	2.866	3.344	2.366	2.563	2.841	2.415	2.783	4.202	3.247
1971	3.743	4.223	3.722	3.753	3.671	3.334	3.894	5.481	4.234
1972	4.064	4.489	3.957	3.836	3.952	3.590	4.318	5.927	4.525
1973	4.888	5.278	4.712	4.707	4.718	4.398	5.357	7.089	5.406
1974	9.715	11.105	9.796	8.487	10.604	10.011	13.007	14.715	12.107
1975	11.892	11.197	10.481	12.005	10.645	9.193	13.631	16.501	11.995
1976	12.182	11.019	10.565	12.182	10.130	11.474	13.223	15.966	11.545
1977	12.242	12.757	11.747	12.706	12.149	11.881	14.993	15.993	13.994
1978	12.104	12.498	11.680	13.618	11.327	12.407	14.860	20.321	13.204
1979	16.850	16.719	16.057	16.322	15.809	18.345	23.890	29.549	20.305
1980	30.403	22.308	21.535	28.904	23.100	27.937	33.244	50.066	30.614
1981	37.375	31.879	30.675	32.332	30.295	24.869	40.227	54.085	34.412
1982	31.779	27.133	26.419	30.459	28.305	24.686	32.459	41.663	29.610
1983	0.0	25.992	23.422	32.082	37.392	28.218	28.247	28.123	27.732

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	2.112	2.289	3.350	3.358	2.455	3.585	2.769	2.718	2.513
1971	3.211	3.283	4.366	4.346	3.518	4.540	3.804	3.712	3.855
1972	3.365	3.587	4.630	4.674	3.929	5.012	4.106	3.943	4.030
1973	4.224	4.474	5.505	5.572	4.929	5.983	5.018	4.783	5.058
1974	9.254	11.300	10.962	11.289	13.549	13.621	11.749	9.725	10.819
1975	11.259	10.870	12.322	12.312	12.895	13.723	11.944	11.821	13.580
1976	10.928	11.080	12.667	13.456	10.595	13.203	11.434	11.747	13.163
1977	12.901	13.406	13.468	13.695	13.633	14.766	13.272	12.963	15.076
1978	11.811	12.124	13.941	13.992	15.264	14.658	14.123	11.993	14.870
1979	17.819	16.976	20.492	17.840	17.500	20.553	19.334	16.045	19.967
1980	25.127	25.125	27.948	21.046	27.476	27.640	25.067	29.295	26.159
1981	30.227	31.999	35.486	31.994	36.278	34.826	31.291	36.540	37.254
1982	26.564	20.107	33.205	25.735	33.457	29.461	26.772	28.066	32.144
1983	26.811	27.603	34.410	29.347	32.805	38.859	32.025	28.644	30.313

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	3.612	3.062	2.952	2.275	3.043	2.852	2.911	2.638	3.062
1971	4.305	4.356	3.998	3.364	4.172	3.927	4.080	3.507	3.242
1972	4.696	4.479	4.398	3.665	4.367	4.096	4.184	3.831	4.479
1973	5.445	5.443	5.360	4.611	5.271	4.948	5.055	4.651	5.443
1974	11.719	12.803	12.762	11.749	11.075	10.717	10.277	10.850	12.434
1975	11.054	13.212	13.375	11.668	12.721	11.177	11.698	11.351	13.206
1976	11.212	12.657	12.627	11.414	11.757	11.070	11.606	10.494	12.774
1977	12.829	14.468	14.818	13.994	14.107	13.200	13.901	12.499	14.630
1978	11.064	13.729	13.830	13.113	13.679	13.356	13.295	11.629	13.664
1979	17.707	21.306	23.613	19.848	16.362	18.181	17.517	16.160	19.623
1980	26.918	30.257	31.931	28.042	23.596	21.699	22.602	20.601	23.971
1981	32.120	38.399	37.206	36.384	31.320	26.521	31.605	31.190	29.684
1982	28.774	33.543	31.683	31.211	27.841	24.982	26.327	27.008	27.402
1983	21.302	26.355	28.267	29.020	29.080	22.887	26.295	23.561	26.137

TABLE B.22 (CONT). Residual Fuel Prices: Commercial Sector (\$/bbl)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	2.605	6.050	2.653	2.862	3.288	3.062	3.062	3.039	3.110
1971	3.722	6.729	4.162	3.978	4.377	4.103	5.113	4.182	4.244
1972	4.004	6.851	3.910	4.153	4.779	4.479	4.479	4.453	4.590
1973	4.956	7.418	4.768	5.036	5.790	5.443	5.443	5.415	5.594
1974	11.453	10.522	7.352	10.931	13.253	12.434	12.434	11.872	12.874
1975	12.353	12.445	11.197	11.913	13.795	13.206	13.206	12.925	13.928
1976	12.313	11.586	12.263	11.343	13.466	12.774	12.774	12.718	12.586
1977	14.344	12.417	14.736	13.932	15.385	14.630	14.630	14.622	14.952
1978	13.426	12.760	12.891	13.144	14.779	13.864	13.864	14.436	15.011
1979	18.814	17.715	15.936	19.442	23.459	23.564	17.500	19.699	19.242
1980	27.202	26.176	22.878	28.880	34.304	35.977	27.379	27.622	24.184
1981	34.458	30.988	31.800	35.915	40.341	44.227	36.514	37.628	33.862
1982	29.721	24.377	30.690	31.091	34.656	37.721	33.980	31.994	30.067
1983	27.782	24.056	27.719	26.286	29.436	0.0	34.737	28.109	28.138

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	3.062	2.530	3.285	2.641	2.066	3.999	2.147	1.877	3.714
1971	3.743	3.467	4.274	3.804	3.262	5.011	3.160	3.037	4.285
1972	4.479	3.774	4.701	4.154	3.430	5.193	3.553	3.117	4.779
1973	5.443	4.626	5.665	5.179	4.372	6.013	4.519	3.967	5.517
1974	12.434	10.246	13.314	12.363	10.154	11.013	11.320	8.416	12.363
1975	13.206	11.882	13.294	13.181	11.678	12.966	12.169	9.725	11.453
1976	12.774	11.212	12.546	12.971	11.636	12.051	12.142	11.495	11.131
1977	14.630	12.469	14.653	14.694	13.901	13.860	13.272	12.407	13.221
1978	13.864	12.225	14.244	14.941	12.770	13.588	13.255	12.376	9.691
1979	16.926	16.061	20.969	21.484	17.211	15.863	17.632	16.917	16.511
1980	37.775	24.799	29.753	31.018	25.797	24.377	24.561	26.948	27.124
1981	48.384	33.695	38.668	38.661	32.093	27.548	33.572	30.843	25.621
1982	36.149	29.351	32.646	30.780	27.942	25.744	29.165	27.531	25.461
1983	0.0	37.392	28.346	27.167	27.603	23.472	25.768	20.143	30.150

YEAR	VA	VT	WA	WI	WV	WY	US
1970	1.749	3.062	2.616	3.222	3.289	3.062	3.138
1971	2.894	4.141	3.467	4.346	4.111	4.103	4.176
1972	3.162	4.474	3.775	4.577	4.569	4.479	4.443
1973	4.123	5.434	4.572	5.500	5.444	5.443	5.446
1974	10.614	12.782	9.827	11.228	13.069	12.434	12.129
1975	11.627	12.394	11.453	13.253	12.353	13.206	12.761
1976	11.474	12.485	10.746	12.506	11.242	12.774	12.445
1977	13.561	14.756	11.685	14.365	13.303	14.630	14.359
1978	12.841	14.254	11.761	13.992	13.285	13.364	13.965
1979	18.420	20.025	16.212	17.640	15.368	19.623	19.498
1980	26.160	29.319	24.577	24.187	24.308	29.254	27.911
1981	32.471	38.854	32.431	32.177	33.367	34.633	34.460
1982	27.968	32.922	30.066	26.958	28.166	28.803	30.632
1983	27.960	27.805	37.392	30.275	28.183	26.137	26.885

TABLE B.23. Residual Fuel Prices: Industrial Sector (\$/bbl)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	2.803	3.270	2.902	2.506	2.779	2.362	2.722	4.109	3.175
1971	3.660	4.130	3.640	3.670	3.590	3.260	3.810	5.360	4.140
1972	3.975	4.390	3.870	3.751	3.864	3.511	4.222	5.796	4.425
1973	4.780	5.162	4.608	4.603	4.614	4.301	5.239	6.932	5.280
1974	9.500	10.860	9.580	8.300	10.370	9.790	12.720	14.390	11.840
1975	11.620	10.950	10.250	11.740	10.410	8.990	13.330	16.136	11.730
1976	12.050	10.900	10.450	12.050	10.020	11.350	13.080	15.793	11.420
1977	11.880	12.380	11.400	12.330	11.790	11.530	14.550	15.520	13.580
1978	11.990	12.380	11.570	13.490	11.220	12.290	14.720	20.100	13.080
1979	15.136	15.018	14.423	14.662	14.201	16.479	21.460	26.544	18.240
1980	26.151	19.168	18.524	24.862	19.869	24.030	28.594	43.064	26.333
1981	34.090	25.372	29.126	24.242	25.252	26.675	36.074	49.332	32.326
1982	30.425	25.977	25.294	29.162	27.099	23.634	31.077	39.889	28.349
1983	0.0	24.207	24.649	30.081	26.864	26.812	29.380	30.543	27.425

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	2.066	2.238	3.276	3.284	2.400	3.506	2.708	2.658	2.457
1971	3.140	3.210	4.270	4.250	3.440	4.440	3.720	3.630	3.770
1972	3.291	3.508	4.528	4.571	3.842	4.902	4.015	3.856	3.941
1973	4.131	4.375	5.384	5.449	4.821	5.851	4.907	4.678	4.946
1974	9.050	11.050	10.720	11.020	13.250	13.320	11.490	9.510	10.580
1975	11.010	10.630	12.050	12.040	12.610	13.420	11.680	11.560	13.280
1976	10.810	10.960	12.530	13.310	10.480	13.060	11.310	11.620	13.020
1977	12.520	13.010	13.070	13.290	13.230	14.330	12.880	12.580	14.630
1978	11.700	12.010	13.810	13.860	15.120	14.520	13.790	11.880	14.730
1979	16.006	15.249	18.408	16.026	15.720	18.462	17.367	14.412	17.936
1980	21.613	21.611	24.339	18.102	23.634	23.775	21.561	25.198	22.501
1981	28.840	29.567	28.484	20.314	27.455	28.809	27.971	25.381	29.442
1982	25.433	26.910	31.791	24.639	32.032	28.206	25.631	26.871	30.775
1983	24.306	25.747	32.650	23.141	32.099	28.061	26.523	24.454	30.761

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	3.532	2.995	2.887	2.225	2.975	2.789	2.846	2.580	2.995
1971	4.210	4.260	3.910	3.290	4.080	3.840	3.990	3.430	3.170
1972	4.592	4.380	4.301	3.584	4.270	4.006	4.091	3.747	4.380
1973	5.325	5.323	5.261	4.509	5.154	4.839	4.943	4.548	5.323
1974	11.460	12.520	12.400	11.490	10.830	10.480	10.250	10.610	12.160
1975	10.810	12.920	13.080	11.410	12.440	10.930	11.440	11.100	12.914
1976	11.090	12.520	12.490	11.290	11.630	10.950	11.400	10.380	12.636
1977	12.450	14.040	14.380	13.580	13.690	12.810	13.490	12.130	14.198
1978	10.960	13.600	13.700	12.990	13.550	13.230	13.170	11.520	13.733
1979	15.906	19.139	26.672	17.829	14.698	16.331	15.735	14.516	17.627
1980	23.154	26.025	27.465	24.120	20.296	18.664	19.441	17.720	20.619
1981	28.824	31.181	33.049	31.434	25.712	26.980	23.607	27.115	26.316
1982	27.549	32.115	30.334	29.882	26.655	23.918	27.120	25.858	26.205
1983	27.651	28.705	23.752	28.528	25.243	25.600	25.888	25.264	22.719

TABLE B.23 (CONT). Residual Fuel Prices: Industrial Sector (\$/bbl)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	2,548	5,916	2,599	2,799	3,215	2,995	2,995	2,972	3,041
1971	3,640	6,580	4,070	3,890	4,280	4,012	5,000	4,090	4,150
1972	3,916	6,699	3,824	4,062	4,673	4,380	4,380	4,355	4,489
1973	4,847	7,255	4,663	4,925	5,662	5,323	5,323	5,296	5,471
1974	11,200	10,290	7,190	10,690	12,960	12,160	12,160	11,610	12,590
1975	12,080	12,170	10,950	11,650	13,490	12,914	12,914	12,640	13,620
1976	12,180	11,460	12,130	11,220	13,320	12,636	12,636	12,580	12,450
1977	13,920	12,050	14,360	13,520	14,930	14,198	14,198	14,190	14,510
1978	13,300	12,640	12,770	13,020	14,640	13,733	13,733	14,300	14,870
1979	16,900	15,913	14,315	17,464	21,073	21,167	15,720	17,695	17,284
1980	23,398	22,515	19,678	24,841	29,507	30,945	23,550	23,759	20,801
1981	30,261	23,945	35,688	32,069	30,697	40,340	30,303	30,337	29,717
1982	28,455	23,338	29,383	29,767	33,180	36,114	32,533	30,631	28,786
1983	27,480	24,833	26,074	28,749	30,724	30,059	30,755	27,653	27,806

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	2,995	2,474	3,213	2,583	2,020	3,910	2,100	1,836	3,632
1971	3,660	3,390	4,180	3,720	3,190	4,900	3,090	2,970	4,190
1972	4,380	3,690	4,598	4,062	3,362	5,078	3,480	3,048	4,674
1973	5,323	4,523	5,540	5,064	4,276	5,880	4,419	3,879	5,395
1974	12,160	10,020	13,320	12,090	9,930	10,770	11,070	8,230	12,090
1975	12,914	11,620	13,000	12,890	11,420	12,680	11,900	9,510	11,200
1976	12,636	11,090	12,410	12,830	11,510	11,920	12,010	11,370	11,010
1977	14,198	12,100	14,220	14,260	13,490	13,450	12,680	12,040	12,830
1978	13,733	12,110	14,110	14,800	12,650	13,460	13,130	12,260	9,600
1979	15,204	14,427	18,836	19,298	15,460	14,250	15,839	16,993	14,832
1980	32,492	21,331	25,572	26,680	22,189	20,968	21,126	23,179	23,331
1981	27,264	24,285	31,300	31,219	30,120	25,126	27,092	25,052	30,033
1982	34,609	28,101	31,256	29,469	26,752	24,648	27,923	26,358	24,376
1983	30,589	27,834	27,980	27,213	26,462	25,053	27,898	23,034	25,465

YEAR	VA	VT	WA	WI	WV	WY	US
1970	1,710	2,994	2,558	3,151	3,217	2,995	2,824
1971	2,830	4,050	3,390	4,250	4,020	4,012	3,824
1972	3,092	4,375	3,691	4,476	4,468	4,380	4,122
1973	4,032	5,314	4,471	5,379	5,324	5,323	5,006
1974	10,380	12,500	9,510	10,980	12,780	12,160	11,433
1975	11,370	12,120	11,200	12,960	12,080	12,914	11,955
1976	11,350	12,350	10,630	12,370	11,120	12,636	11,304
1977	13,160	14,320	11,340	13,940	12,910	14,198	13,371
1978	12,720	14,120	11,650	13,860	13,160	13,733	13,129
1979	16,547	17,988	14,563	15,846	13,805	17,627	17,422
1980	22,501	25,219	21,140	20,805	20,908	25,162	23,385
1981	29,820	31,164	25,439	26,237	29,438	31,589	28,429
1982	26,777	31,520	28,786	25,810	26,966	27,576	28,377
1983	26,828	29,519	26,144	25,259	25,473	26,027	27,557

TABLE B.24. Residual Fuel Prices: Transportation Sector (\$/bbl)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	2.321	2.708	0.0	0.0	2.301	2.415	2.254	0.0	2.629
1971	3.031	3.420	0.0	0.0	2.973	3.334	3.155	0.0	3.428
1972	3.291	3.635	0.0	0.0	3.200	3.590	3.496	0.0	3.664
1973	3.958	4.274	0.0	0.0	3.820	4.398	4.338	0.0	4.372
1974	7.866	8.992	0.0	0.0	8.587	10.011	10.533	0.0	9.804
1975	9.613	9.059	0.0	0.0	8.612	9.193	11.028	0.0	9.704
1976	10.194	9.221	0.0	0.0	8.477	11.474	11.065	0.0	9.661
1977	9.972	10.392	0.0	0.0	9.897	11.881	12.214	0.0	11.399
1978	9.392	9.698	0.0	0.0	8.789	12.407	11.531	0.0	10.246
1979	13.949	13.840	0.0	0.0	13.087	18.345	19.776	0.0	16.809
1980	23.452	17.208	0.0	0.0	17.819	27.937	25.643	0.0	23.615
1981	29.739	25.366	0.0	0.0	24.106	24.869	32.008	0.0	27.381
1982	0.0	22.525	0.0	0.0	23.498	0.0	26.947	0.0	24.582
1983	0.0	0.0	0.0	0.0	37.912	0.0	28.640	0.0	28.118

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	1.710	1.853	2.712	3.358	0.0	3.183	2.242	2.718	0.0
1971	2.600	2.658	3.536	4.346	0.0	4.031	3.080	3.712	0.0
1972	2.725	2.905	3.749	4.674	0.0	4.450	3.325	3.943	0.0
1973	3.420	3.623	4.458	5.572	0.0	5.312	4.064	4.783	0.0
1974	7.494	9.150	8.876	11.269	0.0	12.093	9.514	9.725	0.0
1975	9.108	8.794	9.969	12.312	0.0	12.178	9.663	11.821	0.0
1976	9.145	9.272	10.600	13.456	0.0	11.933	9.568	11.747	0.0
1977	10.510	10.921	10.971	13.695	0.0	13.152	10.812	12.963	0.0
1978	9.165	9.408	10.018	13.992	0.0	12.722	10.959	11.993	0.0
1979	14.751	14.053	16.984	17.840	0.0	20.553	16.005	16.045	0.0
1980	19.382	19.381	21.559	21.046	0.0	27.640	19.336	29.295	0.0
1981	24.051	25.461	28.236	31.994	0.0	34.826	24.898	36.540	0.0
1982	22.053	23.334	27.566	0.0	0.0	28.147	22.225	0.0	0.0
1983	27.184	27.987	34.809	0.0	0.0	39.129	0.0	0.0	0.0

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	2.925	2.480	2.390	1.842	2.464	2.309	2.911	2.136	0.0
1971	3.486	3.527	3.238	2.724	3.378	3.180	4.080	2.840	0.0
1972	3.802	3.627	3.561	2.967	3.536	3.317	4.184	3.102	0.0
1973	4.409	4.407	4.357	3.734	4.268	4.007	5.055	3.766	0.0
1974	9.489	10.367	10.334	9.514	8.968	8.678	10.277	8.785	0.0
1975	8.943	10.689	10.821	9.439	10.291	9.042	11.898	9.183	0.0
1976	9.382	10.592	10.566	9.551	9.839	9.263	11.606	8.781	0.0
1977	10.451	11.785	12.071	11.399	11.492	10.753	13.901	10.182	0.0
1978	8.585	10.653	10.732	10.176	10.614	10.364	13.295	9.624	0.0
1979	14.658	17.637	19.051	16.430	13.545	15.050	17.517	13.377	0.0
1980	20.764	23.339	24.631	21.631	18.202	16.738	22.602	15.891	0.0
1981	25.558	30.554	28.604	28.950	24.921	21.102	31.605	24.818	0.0
1982	23.887	27.847	26.303	25.910	23.996	21.031	23.516	22.421	0.0
1983	21.598	26.722	28.680	29.424	29.329	23.131	26.661	23.889	0.0

TABLE B.24 (CONT). Residual Fuel Prices: Transportation Sector (\$/bbl)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	2.110	0.0	2.658	0.0	2.662	0.0	0.0	2.461	2.518
1971	3.014	0.0	4.162	0.0	3.544	0.0	0.0	3.367	3.436
1972	3.242	0.0	3.910	0.0	3.869	0.0	0.0	3.606	3.717
1973	4.013	0.0	4.768	0.0	4.689	0.0	0.0	4.385	4.530
1974	9.274	0.0	7.352	0.0	10.731	0.0	0.0	9.613	10.425
1975	9.994	0.0	11.197	0.0	11.160	0.0	0.0	10.457	11.268
1976	10.304	0.0	12.263	0.0	11.268	0.0	0.0	10.642	10.532
1977	11.685	0.0	14.736	0.0	12.533	0.0	0.0	11.911	12.180
1978	10.418	0.0	12.891	0.0	11.468	0.0	0.0	11.202	11.648
1979	15.575	0.0	15.936	0.0	19.420	0.0	0.0	16.307	15.929
1980	20.983	0.0	22.378	0.0	26.462	0.0	0.0	21.307	18.655
1981	27.418	0.0	31.800	0.0	32.099	0.0	0.0	29.941	26.944
1982	24.673	0.0	0.0	25.811	28.770	0.0	0.0	26.560	24.961
1983	0.0	0.0	0.0	26.852	29.845	0.0	0.0	28.500	28.529

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.0	2.049	2.660	2.139	1.673	0.0	0.0	1.520	0.0
1971	0.0	2.807	3.461	3.080	2.641	0.0	0.0	2.459	0.0
1972	0.0	3.056	3.607	3.363	2.784	0.0	0.0	2.524	0.0
1973	0.0	3.746	4.587	4.193	3.540	0.0	0.0	3.212	0.0
1974	0.0	8.297	10.781	10.011	8.222	0.0	0.0	6.815	0.0
1975	0.0	9.613	10.755	10.664	9.448	0.0	0.0	7.868	0.0
1976	0.0	9.382	10.499	10.854	9.737	0.0	0.0	9.619	0.0
1977	0.0	10.157	11.937	11.970	11.324	0.0	0.0	10.107	0.0
1978	0.0	9.486	11.053	11.593	9.909	0.0	0.0	9.604	0.0
1979	0.0	13.296	17.358	17.785	14.247	0.0	0.0	15.660	0.0
1980	0.0	19.129	22.931	23.926	19.899	0.0	0.0	20.787	0.0
1981	0.0	26.811	30.768	30.922	25.536	0.0	0.0	24.542	0.0
1982	0.0	24.366	27.102	25.553	23.197	0.0	29.165	22.855	0.0
1983	0.0	0.0	28.740	27.545	0.0	0.0	0.0	20.423	0.0

YEAR	VA	VT	WA	WI	WV	WY	US
1970	1.416	0.0	2.118	2.609	0.0	3.062	2.252
1971	2.343	0.0	2.807	3.519	0.0	4.103	3.075
1972	2.560	0.0	3.056	3.706	0.0	4.479	3.304
1973	3.339	0.0	3.702	4.454	0.0	5.443	4.010
1974	8.595	0.0	7.957	9.092	0.0	12.434	8.372
1975	9.406	0.0	9.266	10.722	0.0	13.206	9.132
1976	9.602	0.0	8.993	10.465	0.0	12.774	9.560
1977	11.047	0.0	9.519	11.702	0.0	14.630	10.580
1978	9.964	0.0	9.126	10.857	0.0	13.864	9.497
1979	15.249	0.0	13.421	14.603	0.0	19.623	14.931
1980	20.179	0.0	18.958	18.658	0.0	29.254	19.990
1981	25.837	0.0	25.805	25.603	0.0	34.633	25.843
1982	23.218	0.0	24.960	23.039	0.0	28.803	24.152
1983	28.349	0.0	0.0	0.0	0.0	0.0	26.542

TABLE B.25. Residual Fuel Prices: Electric Utility Sector (\$/bbl)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.0	0.0	2.640	4.033	2.479	2.330	2.340	2.062	2.850
1971	0.0	0.0	3.734	3.671	3.881	3.390	3.330	4.134	4.116
1972	0.0	0.0	4.116	5.476	4.893	3.382	3.945	3.975	3.958
1973	0.0	0.0	4.520	6.369	5.774	5.243	5.178	4.704	5.036
1974	0.0	0.0	10.365	11.173	12.320	11.387	12.486	12.266	12.570
1975	0.0	0.0	11.660	13.030	15.289	12.054	12.305	12.389	12.152
1976	0.0	0.0	12.062	13.952	14.339	10.170	11.862	11.899	11.686
1977	0.0	0.0	12.560	14.211	14.526	11.941	13.741	13.828	13.497
1978	0.0	0.0	12.076	13.845	15.856	11.161	13.077	13.018	12.731
1979	0.0	0.0	15.769	18.020	19.316	15.311	20.505	20.271	20.273
1980	0.0	0.0	21.021	27.506	30.941	27.493	28.974	27.982	26.789
1981	0.0	0.0	22.474	31.664	40.795	27.451	34.499	30.895	32.302
1982	0.0	0.0	25.150	32.319	42.046	0.0	29.694	0.0	29.459
1983	0.0	0.0	23.640	32.380	37.740	28.480	28.510	0.0	27.990

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	2.054	1.954	2.523	3.393	0.0	3.719	0.0	3.238	0.0
1971	2.634	3.317	2.941	3.767	0.0	3.878	0.0	4.124	0.0
1972	3.140	3.087	3.301	3.900	0.0	4.054	0.0	4.017	0.0
1973	4.217	3.510	4.010	5.043	0.0	4.248	0.0	5.085	0.0
1974	11.153	9.801	4.713	0.0	0.0	7.788	0.0	9.878	0.0
1975	11.526	10.829	9.399	0.0	0.0	8.391	0.0	10.122	0.0
1976	11.281	10.925	9.872	0.0	0.0	12.755	0.0	10.231	0.0
1977	13.206	12.727	11.680	0.0	0.0	15.230	0.0	12.486	0.0
1978	12.300	12.085	13.858	0.0	0.0	15.673	0.0	11.379	0.0
1979	18.059	17.279	16.136	0.0	0.0	23.722	0.0	13.266	0.0
1980	23.406	21.734	23.508	0.0	0.0	34.764	0.0	27.853	0.0
1981	29.816	26.607	41.021	0.0	0.0	46.040	0.0	28.730	0.0
1982	27.195	23.482	41.425	0.0	0.0	44.856	0.0	23.457	0.0
1983	27.060	27.860	34.730	0.0	0.0	39.220	0.0	28.910	0.0

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	3.071	2.299	2.681	2.135	3.955	3.593	3.550	3.018	2.298
1971	3.264	3.931	3.872	2.412	4.599	5.307	4.185	4.327	3.111
1972	4.127	4.093	3.724	2.338	4.802	4.953	3.645	4.191	3.578
1973	4.607	4.446	4.482	2.429	4.897	5.563	4.849	5.605	6.215
1974	10.232	11.942	11.380	10.088	10.819	11.558	11.151	10.208	7.187
1975	10.775	11.823	11.404	11.066	12.319	12.328	11.079	10.706	0.0
1976	10.814	11.144	11.124	10.959	13.535	11.062	10.893	10.731	0.0
1977	11.730	13.059	13.197	12.785	16.350	12.926	12.582	11.175	13.400
1978	11.266	11.787	12.274	12.828	16.256	12.915	12.815	11.032	0.0
1979	16.772	17.427	18.705	17.841	19.367	16.160	15.421	13.722	0.0
1980	22.433	24.053	26.266	27.364	25.057	28.119	21.929	19.089	0.0
1981	27.514	29.669	31.466	33.205	34.558	33.907	28.266	24.087	0.0
1982	24.793	26.422	28.726	30.303	30.517	29.438	27.241	24.251	0.0
1983	21.500	26.600	28.550	29.290	29.350	23.100	26.540	23.780	0.0

TABLE B.25 (CONT). Residual Fuel Prices: Electric Utility Sector (\$/bbl)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	4.228	0.0	3.119	2.093	2.797	1.599	3.645	2.582	4.299
1971	4.555	0.0	3.662	2.134	4.316	2.910	4.682	3.265	4.552
1972	3.565	0.0	4.474	2.481	4.397	4.022	5.067	3.772	4.665
1973	3.746	0.0	4.097	3.635	5.342	4.879	7.172	4.866	5.420
1974	10.996	0.0	10.428	11.899	12.864	9.871	12.113	12.093	14.227
1975	10.993	0.0	10.937	11.353	12.710	10.431	12.418	11.882	13.905
1976	0.0	0.0	10.990	10.804	12.292	11.138	12.537	11.735	12.075
1977	0.0	0.0	11.320	12.843	14.173	12.325	13.190	13.487	15.042
1978	11.869	0.0	10.857	11.978	13.495	13.223	12.437	12.554	15.380
1979	0.0	0.0	14.284	16.799	20.686	19.182	16.460	18.357	18.628
1980	0.0	0.0	20.324	23.761	29.446	26.038	22.274	26.081	22.569
1981	0.0	0.0	34.490	29.207	34.436	35.809	29.110	31.744	31.424
1982	0.0	0.0	0.0	25.960	31.950	34.679	26.410	29.224	33.020
1983	0.0	24.280	0.0	26.530	29.710	25.470	0.0	28.370	28.400

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	2.991	0.0	2.876	2.696	2.832	4.079	0.0	3.298	1.692
1971	2.795	0.0	4.385	4.080	4.176	4.793	0.0	3.515	1.713
1972	3.462	0.0	4.405	4.091	4.447	4.773	0.0	4.541	1.744
1973	4.430	0.0	5.262	4.340	3.819	5.062	0.0	5.273	3.940
1974	10.171	0.0	12.202	11.861	7.057	10.543	0.0	9.513	9.853
1975	9.204	0.0	12.588	11.302	7.126	13.889	0.0	11.578	9.598
1976	9.464	0.0	12.152	11.328	8.830	10.724	0.0	10.965	9.484
1977	12.196	0.0	14.046	12.802	10.828	11.636	0.0	11.938	13.164
1978	0.0	0.0	13.498	12.553	11.866	12.782	0.0	11.648	10.592
1979	13.898	0.0	20.021	19.793	16.305	14.067	0.0	14.430	16.110
1980	0.0	0.0	27.956	24.968	21.534	19.459	0.0	23.229	23.268
1981	24.713	0.0	33.625	30.085	27.304	36.144	0.0	27.577	25.712
1982	0.0	0.0	31.235	23.917	26.053	0.0	0.0	28.484	0.0
1983	0.0	0.0	28.610	27.420	0.0	0.0	0.0	20.330	0.0

YEAR	VA	VT	WA	WI	WV	WY	US
1970	1.953	0.0	0.0	3.649	0.0	0.0	2.505
1971	2.472	0.0	0.0	4.665	0.0	0.0	3.511
1972	2.857	0.0	2.148	4.220	0.0	0.0	3.874
1973	3.417	0.0	4.486	4.965	0.0	0.0	4.805
1974	10.286	0.0	4.477	9.590	0.0	0.0	11.559
1975	11.567	0.0	0.0	10.366	0.0	0.0	12.305
1976	11.099	0.0	0.0	10.685	0.0	0.0	12.030
1977	13.324	0.0	0.0	12.720	0.0	0.0	13.573
1978	12.402	0.0	0.0	12.076	16.258	0.0	13.114
1979	18.533	0.0	16.611	15.539	0.0	0.0	18.516
1980	24.709	0.0	22.811	27.202	0.0	0.0	26.539
1981	31.597	0.0	0.0	34.167	0.0	0.0	33.251
1982	28.921	0.0	0.0	0.0	0.0	0.0	30.290
1983	28.220	0.0	0.0	0.0	0.0	0.0	28.720

TABLE B.26. LPG Prices: Residential Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.291	0.216	0.181	0.174	0.214	0.164	0.258	0.216	0.216
1971	0.286	0.200	0.175	0.226	0.234	0.159	0.233	0.250	0.203
1972	0.300	0.200	0.180	0.254	0.250	0.166	0.254	0.223	0.220
1973	0.504	0.371	0.298	0.321	0.340	0.306	0.322	0.336	0.302
1974	0.519	0.365	0.280	0.388	0.400	0.255	0.301	0.336	0.345
1975	0.559	0.393	0.320	0.505	0.405	0.303	0.456	0.418	0.431
1976	0.610	0.380	0.400	0.514	0.421	0.350	0.486	0.431	0.444
1977	0.683	0.435	0.418	0.655	0.498	0.371	0.570	0.431	0.420
1978	0.663	0.457	0.343	0.504	0.461	0.400	0.584	0.510	0.600
1979	0.914	0.550	0.625	0.623	0.617	0.554	0.660	0.776	0.560
1980	1.120	0.710	0.803	0.775	0.747	0.671	0.844	0.913	0.781
1981	1.832	0.735	0.657	0.690	0.690	0.703	0.846	0.990	0.823
1982	1.166	0.782	0.759	1.027	0.867	0.801	1.064	1.003	0.824
1983	1.204	0.797	0.769	1.010	0.947	0.728	0.906	1.165	0.977

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.221	0.224	0.296	0.171	0.213	0.186	0.193	0.144	0.219
1971	0.270	0.216	0.400	0.159	0.250	0.177	0.184	0.134	0.205
1972	0.291	0.209	0.305	0.175	0.262	0.188	0.195	0.142	0.220
1973	0.410	0.336	0.513	0.313	0.532	0.311	0.349	0.278	0.362
1974	0.497	0.352	0.528	0.317	0.285	0.338	0.301	0.280	0.375
1975	0.575	0.401	0.569	0.323	0.380	0.339	0.357	0.300	0.379
1976	0.553	0.425	0.621	0.362	0.392	0.381	0.380	0.320	0.429
1977	0.644	0.435	0.650	0.411	0.479	0.438	0.424	0.378	0.463
1978	0.638	0.436	0.662	0.410	0.490	0.410	0.427	0.355	0.475
1979	0.712	0.485	0.878	0.570	0.614	0.583	0.581	0.600	0.539
1980	0.947	0.700	1.128	0.628	0.719	0.648	0.675	0.626	0.761
1981	1.047	0.757	1.166	0.593	0.977	0.677	0.727	0.628	0.789
1982	1.136	0.757	1.255	0.625	0.805	0.675	0.768	0.651	0.808
1983	1.108	0.783	1.296	0.659	0.850	0.712	0.775	0.606	0.832

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.179	0.274	0.216	0.237	0.211	0.185	0.179	0.203	0.202
1971	0.195	0.272	0.237	0.195	0.183	0.175	0.173	0.193	0.215
1972	0.232	0.280	0.225	0.350	0.196	0.186	0.178	0.200	0.210
1973	0.359	0.407	0.360	0.376	0.342	0.336	0.304	0.340	0.340
1974	0.500	0.423	0.313	0.464	0.341	0.318	0.271	0.350	0.379
1975	0.400	0.448	0.420	0.436	0.391	0.385	0.297	0.373	0.353
1976	0.550	0.475	0.440	0.443	0.395	0.425	0.344	0.401	0.392
1977	0.431	0.499	0.412	0.518	0.460	0.430	0.386	0.438	0.399
1978	0.415	0.529	0.496	0.555	0.413	0.436	0.367	0.400	0.429
1979	0.545	0.764	0.623	0.830	0.670	0.546	0.596	0.560	0.531
1980	0.782	0.824	0.999	0.920	0.740	0.672	0.647	0.765	0.660
1981	0.735	0.902	0.795	1.000	0.755	0.675	0.645	0.725	0.756
1982	0.828	0.933	0.750	1.042	0.811	0.797	0.712	0.853	0.768
1983	0.811	0.985	0.808	1.052	0.814	0.750	0.669	0.808	0.717

TABLE B.26 (CONT). LPG Prices: Residential Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NV	NY	OH
1970	0.216	0.191	0.157	0.247	0.227	0.156	0.201	0.247	0.195
1971	0.195	0.183	0.153	0.231	0.266	0.142	0.327	0.179	0.192
1972	0.214	0.185	0.163	0.238	0.275	0.150	0.307	0.243	0.186
1973	0.334	0.326	0.283	0.390	0.427	0.293	0.373	0.340	0.328
1974	0.538	0.324	0.303	0.430	0.485	0.312	0.400	0.396	0.376
1975	0.377	0.320	0.325	0.428	0.450	0.379	0.434	0.408	0.412
1976	0.437	0.376	0.381	0.405	0.408	0.388	0.427	0.447	0.408
1977	0.475	0.429	0.419	0.509	0.534	0.417	0.536	0.524	0.475
1978	0.487	0.420	0.352	0.507	0.620	0.459	0.505	0.526	0.446
1979	0.642	0.570	0.565	0.720	0.695	0.479	0.658	0.665	0.564
1980	0.703	0.685	0.625	0.845	0.900	0.659	0.850	0.755	0.702
1981	0.795	0.691	0.646	0.914	1.050	0.750	0.931	0.903	0.779
1982	0.846	0.686	0.665	0.925	0.995	0.428	0.962	0.887	0.808
1983	0.868	0.681	0.642	0.956	1.010	0.761	1.052	0.908	0.826

YEAR	OK	OR	PA	RI	SC	SD	TN	TX	UT
1970	0.151	0.214	0.221	0.237	0.232	0.180	0.211	0.153	0.206
1971	0.148	0.239	0.213	0.253	0.210	0.170	0.190	0.156	0.165
1972	0.143	0.243	0.264	0.207	0.227	0.172	0.208	0.154	0.249
1973	0.253	0.336	0.317	0.340	0.333	0.302	0.352	0.316	0.446
1974	0.293	0.386	0.374	0.340	0.366	0.289	0.319	0.294	0.323
1975	0.285	0.480	0.403	0.500	0.390	0.311	0.350	0.319	0.453
1976	0.374	0.405	0.483	0.515	0.483	0.327	0.376	0.360	0.376
1977	0.386	0.540	0.518	0.505	0.475	0.402	0.451	0.424	0.455
1978	0.400	0.485	0.497	0.485	0.468	0.371	0.426	0.393	0.457
1979	0.510	0.680	0.682	0.700	0.650	0.559	0.586	0.529	0.617
1980	0.668	0.824	0.824	0.785	0.684	0.628	0.701	0.677	0.795
1981	0.677	0.835	0.895	0.920	0.831	0.642	0.830	0.748	0.710
1982	0.736	0.834	0.899	0.834	0.830	0.640	0.856	0.811	0.773
1983	0.780	0.892	0.976	0.940	0.862	0.666	0.776	0.763	0.805

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.215	0.258	0.214	0.197	0.213	0.190	0.190
1971	0.213	0.235	0.301	0.177	0.215	0.173	0.187
1972	0.213	0.228	0.271	0.199	0.233	0.181	0.196
1973	0.347	0.330	0.417	0.334	0.374	0.261	0.329
1974	0.351	0.540	0.370	0.333	0.357	0.303	0.339
1975	0.404	0.430	0.522	0.378	0.453	0.383	0.365
1976	0.422	0.450	0.380	0.392	0.427	0.386	0.399
1977	0.461	0.547	0.540	0.452	0.437	0.401	0.447
1978	0.435	0.500	0.565	0.412	0.510	0.389	0.434
1979	0.601	0.716	0.690	0.626	0.614	0.535	0.596
1980	0.739	0.850	0.744	0.704	0.819	0.664	0.714
1981	0.803	0.930	0.970	0.739	0.945	0.687	0.762
1982	0.843	0.834	0.924	0.775	0.843	0.662	0.904
1983	0.923	1.080	0.886	0.772	0.866	0.662	0.814

TABLE B.27. LPG Prices: Industrial Sector (\$/gal)

YEAR	AK	AL	AR	AZ	CA	CO	CT	DC	DE
1970	0.119	0.146	0.112	0.096	0.130	0.113	0.132	0.128	0.130
1971	0.123	0.154	0.120	0.102	0.139	0.117	0.127	0.132	0.132
1972	0.123	0.154	0.122	0.102	0.143	0.121	0.129	0.133	0.134
1973	0.131	0.162	0.129	0.116	0.154	0.138	0.127	0.142	0.144
1974	0.225	0.276	0.244	0.205	0.234	0.251	0.212	0.248	0.251
1975	0.243	0.280	0.236	0.229	0.260	0.242	0.263	0.298	0.325
1976	0.268	0.304	0.255	0.266	0.282	0.268	0.299	0.321	0.339
1977	0.303	0.354	0.280	0.305	0.339	0.313	0.318	0.337	0.341
1978	0.316	0.330	0.299	0.400	0.362	0.336	0.337	0.423	0.432
1979	0.346	0.385	0.333	0.321	0.366	0.349	0.363	0.342	0.342
1980	0.346	0.462	0.485	0.500	0.456	0.419	0.464	0.498	0.413
1981	0.474	0.536	0.527	0.595	0.529	0.556	0.565	0.512	0.539
1982	0.485	0.538	0.564	0.610	0.603	0.543	0.595	0.564	0.549
1983	0.520	0.593	0.612	0.673	0.625	0.584	0.634	0.60	0.585

YEAR	FL	GA	HI	IA	ID	IL	IN	KS	KY
1970	0.117	0.153	0.117	0.109	0.138	0.098	0.128	0.079	0.135
1971	0.117	0.159	0.122	0.117	0.144	0.104	0.136	0.085	0.144
1972	0.120	0.163	0.122	0.115	0.148	0.104	0.136	0.082	0.148
1973	0.130	0.171	0.130	0.127	0.152	0.113	0.142	0.092	0.155
1974	0.222	0.277	0.223	0.230	0.226	0.197	0.251	0.185	0.244
1975	0.228	0.269	0.240	0.226	0.285	0.197	0.259	0.178	0.266
1976	0.250	0.302	0.265	0.246	0.281	0.217	0.272	0.203	0.295
1977	0.256	0.347	0.300	0.298	0.332	0.261	0.332	0.244	0.321
1978	0.292	0.353	0.295	0.316	0.360	0.272	0.346	0.244	0.337
1979	0.427	0.373	0.360	0.314	0.343	0.310	0.345	0.272	0.360
1980	0.478	0.461	0.333	0.427	0.500	0.431	0.446	0.313	0.457
1981	0.530	0.532	0.250	0.482	0.608	0.467	0.464	0.445	0.773
1982	0.571	0.559	0.438	0.480	0.611	0.468	0.525	0.467	0.621
1983	0.607	0.616	0.426	0.542	0.659	0.526	0.572	0.462	0.604

YEAR	LA	MA	MD	ME	MI	MN	MO	MS	MT
1970	0.104	0.149	0.113	0.124	0.129	0.112	0.112	0.126	0.125
1971	0.104	0.135	0.117	0.132	0.129	0.120	0.126	0.131	0.130
1972	0.104	0.136	0.117	0.133	0.133	0.120	0.116	0.135	0.129
1973	0.114	0.135	0.125	0.131	0.140	0.123	0.124	0.146	0.142
1974	0.214	0.225	0.219	0.220	0.225	0.232	0.232	0.247	0.220
1975	0.236	0.270	0.243	0.291	0.228	0.239	0.217	0.247	0.228
1976	0.257	0.330	0.271	0.322	0.258	0.265	0.244	0.269	0.258
1977	0.282	0.338	0.296	0.330	0.308	0.296	0.292	0.314	0.282
1978	0.316	0.340	0.347	0.335	0.289	0.326	0.317	0.317	0.250
1979	0.346	0.405	0.331	0.392	0.350	0.314	0.332	0.337	0.360
1980	0.503	0.483	0.448	0.530	0.451	0.426	0.474	0.430	0.511
1981	0.433	0.508	0.512	0.556	0.494	0.477	0.554	0.549	0.595
1982	0.550	0.604	0.516	0.624	0.517	0.514	0.334	0.552	0.539
1983	0.573	0.643	0.553	0.664	0.564	0.570	0.585	0.600	0.570

TABLE B.27 (CONT). LPG Prices: Industrial Sector (\$/gal)

YEAR	NC	ND	NE	NH	NJ	NM	NY	OH
1970	0.126	0.113	0.099	0.133	0.143	0.109	0.095	0.135
1971	0.126	0.120	0.107	0.136	0.143	0.116	0.100	0.132
1972	0.126	0.120	0.104	0.139	0.139	0.117	0.088	0.129
1973	0.137	0.124	0.116	0.135	0.147	0.132	0.110	0.135
1974	0.217	0.214	0.216	0.226	0.309	0.243	0.173	0.228
1975	0.235	0.225	0.220	0.252	0.332	0.247	0.197	0.283
1976	0.235	0.254	0.240	0.349	0.358	0.278	0.206	0.289
1977	0.285	0.271	0.280	0.338	0.332	0.320	0.271	0.349
1978	0.320	0.217	0.293	0.409	0.337	0.325	0.250	0.344
1979	0.311	0.367	0.293	0.329	0.351	0.376	0.346	0.378
1980	0.459	0.458	0.454	0.418	0.451	0.527	0.437	0.506
1981	0.557	0.493	0.454	0.576	0.510	0.552	0.630	0.525
1982	0.540	0.483	0.466	0.603	0.621	0.612	0.554	0.627
1983	0.567	0.505	0.517	0.642	0.663	0.653	0.605	0.650

YEAR	OK	OR	PA	RI	SC	SD	TN	TX
1970	0.103	0.118	0.132	0.107	0.137	0.115	0.115	0.088
1971	0.113	0.125	0.132	0.114	0.144	0.118	0.125	0.094
1972	0.109	0.128	0.132	0.116	0.148	0.120	0.123	0.097
1973	0.122	0.135	0.139	0.113	0.155	0.126	0.131	0.110
1974	0.243	0.202	0.285	0.189	0.246	0.224	0.223	0.209
1975	0.230	0.256	0.263	0.231	0.260	0.228	0.213	0.209
1976	0.257	0.279	0.299	0.272	0.281	0.244	0.246	0.220
1977	0.324	0.330	0.322	0.284	0.290	0.301	0.291	0.256
1978	0.346	0.351	0.336	0.302	0.316	0.294	0.303	0.216
1979	0.355	0.379	0.371	0.321	0.329	0.357	0.346	0.373
1980	0.500	0.472	0.469	0.462	0.371	0.381	0.434	0.456
1981	0.545	0.541	0.525	0.538	0.495	0.375	0.507	0.514
1982	0.577	0.511	0.593	0.554	0.541	0.445	0.540	0.521
1983	0.623	0.525	0.474	0.590	0.565	0.488	0.582	0.565

YEAR	VA	VT	WA	WI	WV	WY	US
1970	0.134	0.120	0.121	0.131	0.128	0.117	0.100
1971	0.140	0.116	0.137	0.139	0.133	0.125	0.105
1972	0.141	0.117	0.131	0.139	0.133	0.120	0.106
1973	0.150	0.116	0.135	0.147	0.145	0.132	0.118
1974	0.243	0.194	0.203	0.254	0.232	0.207	0.218
1975	0.269	0.251	0.238	0.250	0.239	0.233	0.225
1976	0.276	0.289	0.259	0.254	0.272	0.267	0.242
1977	0.325	0.290	0.312	0.331	0.317	0.298	0.279
1978	0.313	0.316	0.287	0.344	0.323	0.308	0.270
1979	0.372	0.321	0.383	0.366	0.370	0.348	0.357
1980	0.402	0.489	0.490	0.466	0.507	0.499	0.459
1981	0.506	0.563	0.535	0.492	0.543	0.501	0.500
1982	0.545	0.575	0.548	0.562	0.581	0.540	0.535
1983	0.568	0.612	0.652	0.619	0.633	0.531	0.574

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