DOE/EIA-0149(99)

EIA Publications Directory 1999

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Energy Information Administration
National Energy Information Center
U.S. Department of Energy
Washington, DC 20585

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http://www.eia.doe.gov/pub/pdf/other.docs/014999.pdf

Preface

Enacted in 1977, the Department of Energy (DOE) Organization Act established the Energy Information Administration (EIA) as the Department's independent statistical and analytical agency, with a mandate to collect and publish data and prepare analyses on energy production, consumption, prices, resources, and projections of energy supply and demand. This edition of the *EIA Publications Directory* contains titles and abstracts of periodicals and one-time reports produced by EIA from January through December 1999. The body of the *Directory* contains citations and abstracts arranged by broad subject categories; metadata, coal, electricity, end-use consumption, environmental, multi-fuel, natural gas and petroleum, nuclear and uranium, renewable energy and alternative fuels, forecasting, and model documentation. Questions concerning publications in the *Directory* should be directed to the National Energy Information Center (NEIC) at (202) 586-8800. Comments on the *Directory* itself should be directed to Karen Freedman at (202) 586-9254.

How to Use the EIA Publications Directory

Availability. This directory contains abstracts and brief ordering information for individual issues of semiannual, annual, biennial, and triennial periodicals, analysis reports, Service Reports, and model documentation. (Service Reports are prepared by EIA upon special request and may be based on assumptions specified by the requestor.) Most publications are available from the National Technical Information Service (NTIS), U.S. Department of Commerce. Contact NTIS at (703) 605-6000 or 1-800-553-6847 for all specific ordering information.

Periodicals produced more frequently than semiannually -- quarterlies, monthlies, and weeklies -- are listed as single titles. Individual issues are not listed, and no ordering information is given. If the periodical is current, it is available by subscription from the U.S. Government Printing Office (GPO). Contact GPO at (202) 512-1800.

Some recent individual issues are also available from GPO. Most recent issues of current and discontinued periodicals are available from NTIS. For ordering information regarding these periodicals, call NTIS directly. Annual and one-time reports are available from GPO.

Abstracts. Publication abstracts are arranged by subject categories as listed in the table of contents.

Table of Contents

Abstracts

MetaData

Annual Report to Congress 1998

Section 205 of the Department of Energy Organization Act of 1977 established the Energy Information Administration (EIA). One of the mandates in this legislation is that EIA prepare for Congress an annual report summarizing both activities and information collected and published. EIA's major 1998 accomplishments are profiled in the body of this edition of the *Annual Report to Congress*. Appendix A contains abstracts of significant reports issued by EIA in 1998, and a chart of all titles and a list of all feature articles published during the year. Appendix B contains graphs of selected performance measures. Appendix C lists contact information for EIA subject matter specialists. Appendix D lists the major laws, which form the basis of EIA's legislative mandate.

This publication has been discontinued after the 1998 edition was published.

DOE/EIA-0173(98) Annual 88 pp. April 1999

EIA Publications Directory 1998

Enacted in 1977, the Department of Energy Organization Act established the Energy Information Administration (EIA) as the Department's independent statistical and analytical agency, with a mandate to collect and publish data and prepare analyses on energy production, consumption, prices, resources and projections of energy supply and demand. This edition of the *EIA Publications Directory* contains titles and abstracts of periodicals and one-time reports produced by EIA from January through December 1998.

DOE/EIA-0149(98) Annual 39 pp. August 1999

Energy Education Resources: Kindergarten Through 12th Grade

Energy Education Resources: Kindergarten Through 12th Grade is published by the National Energy Information Center (NEIC), a service of the Energy Information Administration (EIA), to provide students, educators, and other information users, a list of generally available free or low-cost energy-related educational materials.

The entries are listed alphabetically by organization title. Each entry includes the address, telephone number, and description of the organization and the energy-related materials available. Most of the entries also include Internet (Web) and electronic mail (E-Mail) addresses. In the back of the book there is a subject index cross-referenced by number to the alphabetical entries.

Some of the organizations represented in this list take policy positions on certain energy issues and express them even in educational materials. Because EIA is the independent statistical and analytical agency within the U.S. Department of Energy (DOE), it does not advocate any policy position of DOE or any other organization. EIA has completed this list solely to aid educators and students in locating materials.

DOE/EIA-0546(99) Annual 110 pp. September 1999

Coal

Quarterly Coal Report

The *Quarterly Coal Report (QCR)* provides comprehensive information about U.S. coal production, distribution, exports, imports, receipts, prices, consumption, distribution, and stocks to a wide audience, including Congress, Federal and State agencies, the coal industry, and the general public. Coke production, consumption, distribution, imports, and export data are also provided. The data presented in the *QCR* are collected and published by the Energy Information Administration (EIA) to fulfill data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275), as amended.

The historical data in this report are collected by the EIA in three quarterly coal surveys (coal consumption at manufacturing plants, coal production, and coal consumption at coke plants), one annual coal production survey, and two monthly surveys of electric utilities. The coal surveys originated in the 1920's, at the Bureau of Mines, U.S. Department of Interior. In 1977, the responsibility for these surveys was transferred to the EIA under the Department of Energy Organization Act (Public Law 95-91). The two electric utility surveys originated at the Federal Power Commission (FPC) – one in 1936 under the Federal Power Act and one in 1972 under FPC Order Number 453. The EIA continued these surveys, reducing the frequency and quantity of information requested and increasing the automation of the associated data processing and report generation functions. Coal export and import data are obtained from the Bureau of the Census, U.S. Department of Commerce, which compiles monthly data from documents filed with the U.S. Customs Service, as required by law.

DOE/EIA-0121 Quarterly

The U.S. Coal Industry in the 1990's: Low Prices and Record Production

This article describes and examines structural and operational changes in the U.S. coal industry in the 1990's. During the decade, U.S. coal production continued an established growth pattern, buttressed by steadily increasing demand for coal for electric power generation. This growth occurred during a time of stiff competition, including closings or acquisitions of a great many mines and increases in the average size and productivity of those that remain. Meanwhile, competing suppliers have cut coal prices while delivering a higher quality product.

During the 1990's, operating mines have continued to cut back the recoverable coal reserves they control, while actual demand for coal and capacity at mines have increased. By the end of 1997, the cushion of coal reserves at producing mines, measured in equivalent years of production, was at its smallest level during the 21 years the Energy Information Administration (EIA) has collected those data.

Using three-year increments for 1991 through 1997, the core tables and graphs in this article summarize coal industry trends of the 1990's. Data for 1986 are included to illustrate relative data levels prior to the 1990's and to enhance common base year data cited in an earlier EIA report. Several tables and graphs include data for additional years, where available, to better illustrate trends.

DOE/EIA-0631 One-time 22 pp. September 1999

U.S. Coal Reserves: 1997 Update

This report, *U.S. Coal Reserves: 1997 Update*, is the fourth in series of "U.S. Coal Reserves" reports. It presents State-level estimates of domestic coal reserves, which may be used in the analysis and forecasting of future coal supply. This report briefly describes the data, methods, and assumptions used to develop such estimates and explains terminology related to recent data programs. In addition, it provides documentation for revisions and adjustments since the previous report to the demonstrated reserve base (DRB) of coal in the United States and for coal quality and reserve allocations. The resulting data are supplied for general use by the public.

The January 1995 database on recoverable coal reserves located *at active mines*, which was included in the previous report, is not part of this update. Reserves at active mines are still reported in EIA's *Coal Industry Annual* series, but not the estimated distribution of rank and sulfur content in those reserves. EIA no longer maintains the coal supply analysis model that used and refined those data to evaluate the areas and magnitude of anticipated investment in new mining capacity.

DOE/EIA-0529(97) One-time 65 pp. February 1999 (WEB ONLY)

Weekly Coal Production

The *Weekly Coal Production* provides national, regional, and State-level data on the production of bituminous coal and lignite and on the production of Pennsylvania anthracite. This data is reported for each of the two most recent weeks and a corresponding week in the previous year. Also shown is current year-to-date production, year-to-date production for a corresponding period in the previous year, production for the most recent 52-week period, and production for a corresponding period in the previous year. Also reported is the number of railroad cars loaded in each time period.

DOE/EIA-0218 Weekly (WEB ONLY)

Electricity

The Changing Structure of the Electric Power Industry 1999: Mergers and Other Corporate Combinations

The electric utility industry, once highly regulated, is becoming more competitive. In the past, retail customers purchased electricity from local utilities. Now, in some States, retail customers can shop around for an alternative electricity supplier with lower prices or better services. The transition to a competitive market for electricity has started but is not complete, nor is it occurring uniformly across the country. As of mid-1999, about 24 States are implementing retail competition, and more States are expected to follow.

Now that the industry is becoming more competitive, electricity suppliers are developing strategies to enhance their ability to compete. More and more the strategy involves a corporate combination such as a merger, joint venture, or business alliance to strengthen a company's position in the industry, or a divestiture of certain assets to refocus a company's business line. Corporate combinations are not new to the electric power industry. Mergers between electric utilities, for example, have been employed many times to improve a company's performance. Over the past few years, however, the size and frequency of mergers among investor-owned electric utilities (IOUs) have increased dramatically.

This report presents data about corporate combinations involving IOUs in the United States, discusses corporate objectives for entering into such combinations, and assesses their cumulative effects on the structure of the industry. From combinations that have taken place over the past few years, three trends have emerged: (1) an increase in the size of IOUs and the concentration of generation capacity within the IOU sector; (2) an expansion of IOUs, which once focused mainly on electricity production and delivery, into the natural gas industry (a trend that has been labeled "convergence" in the trade press and elsewhere); and (3) the move of many vertically integrated IOUs (i.e., utilities that own generation, transmission, and distribution assets) to exit the power generation business to become "wire" companies, enabling them to concentrate solely on operating their transmission and distribution systems.

DOE/EIA-0562(99) Annual 126 pp. December 1999

The Comprehensive Electricity Competition Act: A Comparison of Model Results

The model comparison analysis described in this report was produced by the Energy Information Administration (EIA), applying the National Energy Modeling System (NEMS) to assumptions specified by the U.S. Department of Energy (DOE), Office of Policy, in its May 1999 publication, *Supporting Analysis for the Comprehensive Electricity Act*, or provided subsequently by the Office of Policy. The report was prepared in response to a request from Secretary of Energy Bill Richardson for EIA to "use the NEMS to evaluate the effects of the Administration's restructuring proposal using the parameter settings and assumptions from the POEMS (Policy Office Electricity Modeling System) analysis."

NEMS is an integrated energy-economy modeling system for U.S. energy markets, developed by the EIA as a policy analysis tool to provide an integrated framework for policymakers to understand the implications of proposed policies and alternative assumptions concerning energy markets. NEMS is used by EIA's Office of Integrated Analysis and Forecasting (OIAF) to produce a reference case and a range of alternative projections for the midterm future, which were published most recently in the *Annual Energy Outlook 1999 (AEO99).*

DOE/OIAF/99-04 One-time 88 pp. September 1999

Cost and Quality of Fuels for Electric Utility Plants 1998 Tables

These tables provide comprehensive information concerning the quality, quantity, and cost of fossil fuels used to produce electricity in the United States.

DOE/EIA-0191(98) Annual 136 pp. June 1999 (WEB ONLY)

Electric Power Annual 1998, Volume I

The purpose of this report, *Electric Power Annual 1998, Volume I (EPAVI)* is to provide a comprehensive overview of the electric power industry during the most recent year for which data have been collected, with an emphasis on the major changes that occurred. In response to the changes in 1998, this report has been expanded in scope. It begins with a general review of the year and incorporates new data on nonutility capacity and generation, transmission information, futures prices from the Commodity Futures Trading Commission, and wholesale spot market prices from the Pennsylvania-New Jersey-Maryland Independent System Operator and the California Power Exchange. Electric utility statistics at the Census division and State levels on generation, fuel consumption, stocks, delivered cost of fossil fuels, sales to ultimate customers, average revenue per kilowatthour of electricity sold, and revenues from those retail sales can be found in Appendix A. The *EPAVI* is intended for a wide audience, including Congress, Federal and State agencies, the electric power industry, and the general public.

DOE/EIA-0348(98)/1 Annual 64 pp. May 1999

Electric Power Annual 1998, Volume II

The *Electric Power Annual 1998, Volume II (EPAVII)* presents a summary of electric power industry statistics at national, regional, and State levels. The objective of the publication is to provide industry decisionmakers, government policymakers, analysts, and the general public with historical data that may be used in understanding U.S. electricity markets.

The *EPAVII* presents an overview of the electric power industry in the United States, and a summary of the key statistics for the reporting year. The chapters present information and data in each specific area: electric utility retail sales, revenue, and average revenue per kilowatthour; financial statistics for major electric utilities; wholesale trade among electric utilities; electric utility environmental statistics; electric utility demand-side management activities; and statistics for nonutility power producers. Monetary values in this publication are expressed in nominal terms.

Data published in the *EPAVII* are compiled from seven forms filed annually by electric utilities and one form filed by nonutility power producers. These forms are described in detail in the "Technical Notes."

DOE/EIA-0348(98)/2 Annual 146 pp. December 1999

Electric Power Monthly

The *Electric Power Monthly (EPM)* presents monthly electricity statistics for a wide audience including Congress, Federal and State agencies, the electric utility industry, and the general public. The purpose of this publication is to provide energy decisionmakers with accurate and timely information that may be used in forming various perspectives on electric issues that lie ahead. The Energy Information Administration (EIA) collected the information in this report to fulfill its data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275) as amended.

This publication provides monthly statistics at the State, Census division, and U.S. levels for net generation, fossil fuel consumption and stocks, quantity and quality of fossil fuels, cost of fossil fuels, electricity retail sales, associated revenue, and average revenue per kilowatthour of electricity sold. In addition, data on net generation, fuel consumption, fuel stocks, quantity and cost of fossil fuels are also displayed for the North American Electric Reliability Council (NERC) regions.

The EIA publishes statistics in the *EPM* on net generation by energy source; consumption, stocks, quantity, quality, and cost of fossil fuels; and capability of new generating units by company and plant.

The EPM contains information from seven data sources: Form EIA-759, "Monthly Power Plant Report"; Federal Energy Regulatory Commission (FERC) Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants"; Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions"; Form EIA-900, "Monthly Nonutility Power Report"; Form EIA-861, "Annual Electric Utility Report"; Form EIA-860A, "Annual Electric Generator Report – Utility"; and Form EIA-860B, "Annual Electric Generator Report – Nonutility."

DOE/EIA-0226 Monthly

Electric Sales and Revenue 1998

The *Electric Sales and Revenue 1998* provides information on electricity sales, associated revenue, average revenue per kilowatthour sold, and number of consumers throughout the United States. The data provided are presented at the national, Census division, State, and electric utility levels. The information is based on annual data reported by electric utilities for the calendar year ending December 31, 1998.

In the private sector, users of the *Electric Sales and Revenue* include researchers, analysts, and members of the electric power industry community. Other users include financial and investment institutions, economic development organizations, special interest groups, lobbyists, electric power associations, and the news media.

In the public sector, users include analysts, researchers, statisticians, and other professionals engaged in regulatory, policy, and program activities for Federal, State and local governments, Congress, other legislative bodies, public service commissions, and other special government groups also use information on general trends related to electricity at State and national levels. Data in this report are used in analytical studies to evaluate new legislation and regulatory alternatives and to forecast demand for electric power.

DOE/EIA-0540(98) Annual 270 pp. October 1999

Electric Trade in the United States 1996

The *Electric Trade in the United States 1996* is a publication on electric trade data that provides information on the electric power industry during 1996. The information furnished provided important information on the wholesale structure found within the U.S. electric power industry. The patterns of interutility trade in the report support analyses of wholesale power transactions and provide input for a broader understanding of bulk power market issues that defines the emerging national electric energy policies. The report includes information on a quantity of power purchased, sold, exchanged, and wheeled; the geographical locations of transactions and ownership classes involved; and the revenue and costs. The utilities covered in this publication include all U.S. electric utilities in the 50 States and the District of Columbia. Electric utilities fall into four basic ownership classifications: investor-owned (privately owed), publicly owned, cooperative, and power marketers. Publicly owned utilities may be Federally owned, State-owned, or municipally owned.

DOE/EIA-0531(96) Biennial 318 pp. January 1999

Financial Statistics of Major U.S. Publicly Owned Electric Utilities 1998

The 1998 edition of The *Financial Statistics of Major U.S. Publicly Owned Electric Utilities* publication presents 5 years (1994 through 1998) of summary financial data and current year detailed financial data on the major publicly owned electric utilities. The objective of the publication is to provide Federal and State governments, industry, and the general public with current and historical data that can be used for policymaking and decisionmaking purposes related to publicly owned electric utility issues.

The primary source of publicly owned financial data is the survey Form EIA-412, "Annual Report of Public Electric Utilities." Public electric utilities file this survey on a fiscal year basis, in conformance with their recordkeeping practices. The EIA undertook a review of the survey Form EIA-412 submissions to determine if alternative classifications of publicly owned electric utilities would permit the inclusion of all respondents. The review indicated that financial indicators differ most according to whether or not a publicly owned electric utility generates electricity. Therefore, the front portion of the report provides summary information in generator/nongenerater classification.

DOE/EIA-0437(98) Annual 524 pp. December 1999

Inventory of Electric Utility Power Plants in the United States 1999 – With Data As of January 1, 1999

The historically published *Inventory of Power Plants in the United States* has been renamed *Inventory of Electric Utility Power Plants in the United States*. This is a report of data pertaining to power plants operated by electric utilities. Data pertaining to U.S. nonutility power producer plants in prior issues of this publication will be published in a separate report. The first issue of *Inventory of Nonutility Electric Power Plants in the United States* is forthcoming.

The *Inventory of Electric Utility Power Plants in the United States 1999* provides annual statistics on generating units operated by electric utilities in the United States (the 50 States and the District of Columbia). Statistics presented in this report reflect the status of generating units as of January 1, 1999. This publication also provides a 5-year outlook for generating unit additions and generating unit retirements.

The "Summary" contains aggregate statistics on existing capacity at the national and various regional levels. Also, for existing capacity, aggregate data at the national level are presented by energy source and prime mover; aggregate data on various regional levels are presented by primary energy source. Certain aggregate statistics on capacity of planned generating unit additions and planned generating unit retirements are presented to the extent that they do not disclose individual company data. This chapter also contains detailed generating unit level data about electric generating units that started commercial operation during 1998 and electric generating units that were retired from service during 1998. The chapter, "Electric Generating Units," gives an overview of the generating technologies represented by generating units reported in this publication. It also presents detailed data about these existing electric generating units.

This is a report of electric utility data. Certain data pertaining to ownership may appear for nonutilities that have ownership in generating units operated by electric utilities.

DOE/EIA-0095(99) Annual 366 pp. November 1999

Inventory of Nonutility Electric Power Plants in the United States 1998

The *Inventory of Nonutility Electric Power Plants in the United States 1998* provides annual statistics on generating units operated by nonutilities in the United States (the 50 States and the District of Columbia). Statistics presented in this report reflect the status of generating units as of December 31, 1998. The publication also provides a 5-year outlook for generating unit additions and generating unit changes.

This first time report will be prepared annually by the Electric Power Division; Office of Coal, Nuclear, Electric and Alternate Fuels; Energy Information Administration (EIA); U.S. Department of Energy (DOE). Data summarized in this report are useful to a wide audience including Congress; Federal and State agencies; the electric utility industry; and the general public. Data presented in this report were assembled and published by the EIA to fulfill its data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275) as amended.

The "Summary" contains aggregate statistics on existing capacity at the national and various regional levels. Also, for existing capacity, aggregate data on capacity at the national level are presented by energy source. Certain aggregate statistics on capacity of planned generating unit additions and planned generating unit retirements are presented to the extent that they do not disclose individual company data. The report contains detailed generating unit level data about electric generating units that started commercial operations during 1998 and electric generating units that were retired from service during 1998. Table 8 presents detailed data about existing generating units.

Generally, tables in this publication that contain electric utility capacity data present generator nameplate capacity and net summer capability. Additionally, any discussion of generator capacity by energy source is based on the primary energy source used by the respective generating unit.

Data published in the *Inventory of Nonutility Electric Power Plants in the United States 1998* were compiled from the survey Form EIA-860B, "Annual Electric Generator Report – Nonutility," filed annually with the EIA. The survey is used to collect information from approximately 2,100 nonutilities. A detail description of the survey is included in the Technical Notes.

DOE/EIA-0095(98)/2 Annual 260 pp. December 1999

Inventory of Power Plants in the United States As of January 1, 1998

The *Inventory of Power Plants in the United States As of January 1, 1998* provides annual statistics on generating units operated by electric utilities in the United States (the 50 States and the District of Columbia). Statistics presented in this report reflect the status of generating units as of January 1, 1998. The publication also provides a 10-year outlook for generating unit additions and generating unit changes.

Data summarized in this report are useful to a wide audience including Congress; Federal and State agencies; the electric utility industry; and the general public. Data presented in this report were assembled and published by the Energy Information Administration (EIA) to fulfill its data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275) as amended.

This is a report of electric utility data; in cases where summary data or nonconfidential data or nonutilities are presented, it is specifically noted as nonutility data. Generally, tables in this publication that contain electric utility capacity data present three measures of generator capability – generator nameplate capacity, net summer capability, and net winter capability. However, the EIA uses net summer capability as its statistic for analyzing electric utility capacity. Therefore, all discussion of electric utility generating capacity in this publication refers to net summer capability, unless otherwise stated.

DOE/EIA-0095(98) Annual 436 pp. January 1999

State Electricity Profiles

Section 205(a)(2) of the Department of Energy Organization Act of 1977 (Public Law 95-91) requires the Administrator of the Energy Information Administration (EIA) to carry out a central, comprehensive, and unified energy data and information program that will collect, evaluate, assemble, analyze, and disseminate data and information relevant to energy resources, reserves, and related economic and statistical information.

To assist in meeting these responsibilities in the area of electric power, EIA has prepared this report, *State Electricity Profiles*, which provides a statistical overview of the electric power industry in each of the United States and the District of Columbia. It is intended for a wide audience, including Congress, Federal and State agencies, the electric power industry, and the general public.

The legislation that created EIA vested the organization with an element of statutory independence. EIA does not take positions on policy questions. EIA's responsibility is to provide timely, high-quality information and to perform objective, credible analyses in support of deliberations by both public and private decisionmakers. Accordingly, this report does not purport to represent the policy positions of the U.S. Department of Energy or the Administration.

DOE/EIA-0629 One-time 362 pp. February 1999

End-Use Consumption

A Look at Residential Energy Consumption in 1997

In-depth information about how energy was used in residential housing units that were occupied year-round is provided by the Energy Information Administration (EIA) in this analysis of the 1997 Residential Energy Consumption Survey results. The uses and costs of residential energy (excluding vehicle fuels, primarily gasoline) were analyzed by using households' energy-related characteristics, such as location, type (for example, single-family) size, number of household members and vehicles, and age.

The 1997 Residential Energy Consumption Survey (RECS) was the tenth administration of the survey since 1978. Over the 19 years between the first and last surveys, energy consumption and related household characteristics in U.S. households have changed significantly. Section 2 of this report, "Two Decades of RECS: Changes in Energy Consumption and Related Household Characteristics", describes some of the more notable changes documented by the RECS.

The fuels consumed in U.S. households are usually measured in physical units: electricity in kilowatthours; natural gas in cubic feat; fuel oil, kerosene and liquefied petroleum gas in gallons; and wood in cords. For comparisons across fuels to be made, a common measure is necessary. Hence, the physical units have all been converted to Btu (British thermal units). (For the factors used to convert physical units to Btu, see "Btu Conversion Factors" in the Glossary.)

Although the number of housing units in all four U.S. Census regions increased over the 1978-1997 period, the distribution of those same housing units across the Nation also changed.

DOE/EIA-0632(97) Quadrennial 310 pp. November 1999

Environmental

Emissions of Greenhouse Gases in the United States 1998

The Energy Information Administration (EIA) is required by the Energy Policy Act of 1992 to prepare a report on aggregate U.S. national emissions of greenhouse gases for the period 1987-1990, with annual updates thereafter. This report, *Emissions of Greenhouse Gases in the United States 1998*, is the sixth annual update, covering national emissions over the period 1990-1997, with preliminary estimates of emissions for 1998. The methods used by EIA to estimate national emissions of greenhouse gases are subject to continuing review. As better methods and information become available, EIA revised both current and historical emissions estimates (see "What's New in This Report," page 2). Emissions estimates for carbon dioxide are reported in metric tons of carbon; estimates for other gases are reported in metric tons of gas (see "Units for Measuring Greenhouse Gases," page 3). Total national estimates measured in carbon equivalents are shown in Tables ES2.

Chapter 1 of this report briefly summarizes some background information about global climate changes and the greenhouse effect and discusses important recent developments in global climate change activities. Chapters 2 through 5 cover emissions of carbon dioxide, methane, nitrous oxide, and halocarbons and related gases, respectively. Chapter 6 describes potential sequestration and emissions of greenhouse gases as a result of land use changes.

DOE/EIA-0573(98) Annual 170 pp. October 1999

Voluntary Reporting of Greenhouse Gases 1997

Title XVI, Section 1605(b) of the Energy Policy Act of 1992 (EPACT) directed the Energy Information Administration (EIA) to establish a mechanism for "the voluntary collection and reporting of information on… annual reductions of greenhouse gas emissions and carbon fixation achieved through any measures, including fuel switching, forest management practices, tree planting, use of renewable energy, manufacture or use of vehicles with reduced greenhouse gas emissions, application efficiency, methane recovery, cogeneration, chlorofluorcarbon capture and replacement, and power plant heat rate improvement…."

The legislation further instructed EIA to create forms for the reporting of greenhouse gas emissions and reduction, and to establish a database of the information voluntarily reported under this subsection of EPACT. The reporting Forms EIA-1605 and EIA-1605EZ, "Voluntary Reporting of Greenhouse Gases," were first made available to the public in July 1995, providing a vehicle for voluntary reporting on activities that occurred before and during 1994. This publication summarizes data reported for 1997, the fourth year of data collection for the Voluntary Reporting of Greenhouse Gases Program.

DOE/EIA-0608(97) Annual 134 pp. May 1999

Voluntary Reporting of Greenhouse Gases 1998

Title XVI, Section 1605(b) of the Energy Policy Act of 1992 (EPACT) directed the Energy Information Administration (EIA) to establish a mechanism for "the voluntary collection and reporting of information on… annual reductions of greenhouse gas emissions and carbon fixation achieved through any measures, including fuel switching, forest management practices, tree planting, use of renewable energy, manufacture or use of vehicles with reduced greenhouse gas emissions, application efficiency, methane recovery, cogeneration, chlorofluorcarbon capture and replacement, and power plant heat rate improvement…."

The legislation further instructed EIA to create forms for the reporting of greenhouse gas emissions and reductions, and to establish a database of the information voluntarily reported under this subsection of EPACT. The reporting Forms EIA-1605 and EIA-1605EZ, "Voluntary Report of Greenhouse Gases," were first made available to the public in July 1995, providing a vehicle for voluntary reporting on activities that occurred before and during 1994. This publication summarizes data reported for 1998, the fifth year of data collection for the Voluntary Reporting of Greenhouse Gases Program.

DOE/EIA-0608(98) Annual 108 pp. December 1999

Multi-Fuel

Annual Energy Review 1998

The *Annual Energy Review 1998 (AER)* contains fifty years of history – energy data from 1949 through 1998. Remarkable change occurred in half a century. The U.S. population grew by 82 percent while consumption of energy increased by 194 percent. At the end of the period, the average amount of energy used per person in one year was 62 percent greater than at the beginning.

At mid-century, America was nearly self-sufficient in petroleum; we were a net exporter of natural gas; most of the U.S. coal came from underground mines and was produced at the rate of seven-tenths of a short ton per miner hour; nuclear electric power had not been developed; and almost twice as much electricity was used at industrial sites as in homes.

Near the end of the century, half of the petroleum the U.S. use comes from other countries; 15 percent of the U.S. natural gas consumption is imported; more of U.S. coal comes from surface mines than underground mines and U.S. miners produce coal at a rate of over 6 short tons per miner hour; about a fifth of U.S. electricity is supplied by nuclear electric power; and residences use more electricity than industrial sites.

While the data tables and figures throughout the *Annual Energy Annual 1998* focus on the second half of the twentieth century, Figure 1 (page *xvii*) places that period in the context of the entire history of the Nation. It is difficult to overstate the importance of wood as a source of energy from the country's settlement until well after the Civil War. As the population and the economy grew, coal became a gigantic source of energy, but despite its prominence in the early 1900s, coal was surpassed in the middle of the century by the extraordinary development of petroleum and natural gas. Now, near the end of the century, petroleum and natural gas continue to play a profound role in the energy, economic, and environmental activities of the Nation.

The *Annual Energy Review 1998* data tables serve as a basic reference for fundamental energy data. The graphs are designed to bring out the stories in the data – the peaks, the low points, changes in trends, and relationships among the data. You are invited to study the graphs to examine our energy history and to speculate on the future.

DOE/EIA-0384(98) Annual 398 pp. July 1999

Energy in the Americas

The 1994 Summit of the Americas meeting in Miami led to a plan to promote cooperation among the nations of the Western Hemisphere in pursuing efficient, environmentally sound, and secure energy markets. A series of meetings of energy ministers followed; the latest held in New Orleans in July 1999. In support of this Hemispheric Energy Ministers Conference, the Energy Information Administration developed Energy in the Americas, a compendium of energy and energy-related facts and statistics compiled from dozens of government, non-profit, and private sources.

DOE/EIA-0630 One-time 84 pp. July 1999

Energy in Africa

The U.S. Energy Information Administration has prepared an extensive report, entitled "Energy in Africa," in conjunction with a major summit of African energy ministers which was held in Tucson, Arizona on December 13-15, 1999. The report contains extensive information and data on Africa's economic, environmental, and energy situations, plus a detailed, up-to-date discussion of these topics. In addition, the report discusses trade and cooperation in Africa, and places Africa in a world context. In addition to the color, "hard-copy" report, "Energy in Africa" is also available electronically on the Energy Information Administration's web site at http://www.eia.doe.gov/emeu/cabs/africa.html.

DOE/EIA-0633(99) One-time 96 pp. December 1999

Federal Financial Interventions and Subsidies in Energy Markets 1999: Primary Energy

The analysis in this report was undertaken at the request of the Office of Policy, U.S. Department of Energy. In its request, the Office of Policy asked the Energy Information Administration (EIA) to update the 1992 EIA report on Federal energy subsidies, including any additions or deletions of Federal subsidies based on Administration and Congressional action since the 1992 report was written, and to provide an estimate of the size of each current subsidy. Subsidies to be included are those through which a government or public body provides a financial benefit. The subsidy must be specific; for example, depreciation schedules that can be used in non-energy sectors as well as energy sectors are not included in the definition of a subsidy for this study. This report is to focus on subsidies covering primary energy only; a subsequent report will be requested, covering end-use energy and electricity. The assumptions for the study were noted in a letter provided by the Office of Policy on May 20, 1999. A second letter from the Office of Policy clarified the assumptions further, focusing the analysis of subsidies on goods rather than services.

DOE/EIA-OIAF/99-03 One-time 142 pp. September 1999

International Energy Annual 1997

The *International Energy Annual 1997 (IEA)* presents an overview of key international energy trends for production, consumption, imports, and exports of primary energy commodities in over 220 countries, dependencies, and areas of special sovereignty. Also included are population and gross domestic product data, as well as prices for crude oil and petroleum products in selected countries. Renewable energy reported in the *IEA* includes hydroelectric power and geothermal, solar, and wind electric power. Also included are biomass electric power for Brazil and the United States, and biomass, geothermal, and solar energy produced in the United States and not used for electricity generation.

This report is published to keep the public and other interested parties fully informed of primary energy supplies on a global basis. The data presented have been largely derived from published sources. The data have been converted into units of measurement and thermal values (Appendices E and F) familiar to the American public.

Although the Energy Information Administration (EIA) has mandatory data collection authority for collecting energy information within the United States, it has no authority to require reporting of data from foreign countries. Data for the International Energy Annual must be researched and collected from the most authoritative available sources outside EIA. Because EIA does not have access to the statistical surveys in other countries, it is not able to develop error estimates or revision errors such as might be developed in EIA's domestic surveys.

EIA attempts to identify and collect the best data available for foreign countries. The most authoritative sources are usually the official national statistical report of a country. However, data from official sources are not always available. Therefore, EIA also uses data from reputable secondary sources such as the international organizations – the United Nations, the International Energy Agency, the World Bank, and others. In addition, EIA uses industry reports, academic studies, trade publications, and other sources. Typically these sources are less timely and complete than mandatory survey data for the United States collected by EIA. As a result, it usually takes about two years to prepare complete energy information for all foreign countries.

Many factors beyond EIA's control affect the reliability and integrity of foreign country data. These include a country's level of economic development, commitment to statistical programs, openness with information, and other considerations.

DOE/EIA-0219(97) Annual 264 pp. April 1999

Monthly Energy Review

The *Monthly Energy Review (MER)* presents an overview of the Energy Information Administration's recent monthly energy statistics. The statistics cover the major activities of U.S. production, consumption, trade, stocks, and prices for petroleum, natural gas, coal, electricity, and nuclear energy. Also included are international energy and thermal and metric conversion factors. The *MER* is intended for use by Congress, Federal and State agencies, energy analysts, and the general public.

DOE/EIA-0035 Monthly

Performance Profiles of Major Energy Producers 1997

The information and analyses in *Performance Profiles of Major Energy Producers 1997* is intended to provide a critical review, and promote an understanding, of the possible motivations and apparent consequences of investment decisions made by some of the largest corporations in the energy industry. (For a list of the companies covered in this report, the Financial Reporting System (FRS) companies, see Chapter 1, the box titled "The FRS Companies in 1997.")

The economic performance of these companies, in financial and physical dimensions, continues to serve as a significant factor in evaluating past decisions (from a corporate and a governmental point of view) and guiding future options in the development and supply of energy resources in the U.S. and abroad. Also, this edition of *Performance Profiles of Major Energy Producers* initiates an increased scope of analysis that includes U.S.-based oil and gas producers and petroleum refiners outside the FRS respondent group.

Performance Profiles presents a comprehensive annual financial review and analysis of the domestic and worldwide activities and operations of the major U.S.-based energy-producing companies. Emerging issues in financial performance are also analyzed. The report primarily examines these companies' (the major) operations on a consolidated corporate level, by individual line-of-business, by major functions within each line-of-business, and by various geographic regions. A companion analysis of foreign investment (trends and transactions) in U.S. energy resources, assets, and companies is also included as a separate chapter in the report. The coverage of foreign direct investment developments discussed in this chapter lags the discussion of the FRS companies by one year. This is due to the later release date of much of the foreign direct investment data.

Performance Profiles annually looks at aggregate changes in the U.S. energy industry resulting from major energy company current operations, and from strategic corporate decisions relating to profits, investment, and new business initiatives. Significant organizational decisions of the majors (such as those involving corporate mergers or joint ventures) are highlighted, and new strategic directions (such as concentration on core businesses or competencies, movements into new lines of business, or changes in global investment patterns) are discussed. Changes in the majors' investment and resource development patterns resulting in new or increased opportunities for independent oil and gas producers and independent petroleum refiners in the United States are also explored.

This edition of *Performance Profiles* reviews financial and operating data for the calendar year 1997. Although the focus is on 1997 activities and results, important trends prior to that time and emerging issues relevant to U.S. energy company operations are also discussed.

DOE/EIA-0206(97) Annual 168 pp. January 1999

State Energy Data Report 1996 Consumption Estimates

The *State Energy Data Report 1996 (SEDR)* provides annual time series estimates of State-level energy consumption by major economic sectors. The estimates are developed in the Combined State Energy Data System (CSEDS), which is maintained and operated by the Energy Information Administration (EIA). The goal in maintaining CSEDS is to create historical time series of energy consumption by State that are defined as consistently as possible over time and across sectors. CSEDS exits for two principal reasons: (1) to provide State energy consumption estimates to Members of Congress, Federal and State agencies, and the general public and (2) to provide the historical series necessary for EIA's energy models.

The *State Energy Data Report 1996 (SEDR)* presents estimates of annual energy consumption at the State and national levels, by major economic sector and by principal energy type for 1960, 1965, 1970, 1975, and 1980 through 1996. Included in the report are documentation describing how the estimates were made for each type of energy, the source references for all input data, and a summary of changes from the *State Energy Data Report 1995*, which was published in December 1997.

DOE/EIA-0214(96) Annual 530 pp. February 1999

State Energy Data Report 1997 Consumption Estimates

The *State Energy Data Report 1997 (SEDR)* provides annual time series estimates of State-level energy consumption by major economic sectors. The estimates are developed in the Combined State Energy Data System (CSEDS), which is maintained and operated by the Energy Information Administration (EIA). The goal in maintaining CSEDS is to create historical time series of energy consumption by State that are defined as consistently as possible over time and across sectors. CSEDS exists for two principal reasons: (1) to provide State energy consumption estimates to Members of Congress, Federal and State agencies, and the general public and (2) to provide the historical series necessary for EIA's energy models.

The *State Energy Data Report 1997* presents estimates of annual energy consumption at the State and national levels by major economic sector and by principal energy type for 1960, 1965, 1970, 1975, 1980, and 1985 through 1997. Included in the report are documentation describing how the estimates were made for each type of energy, the source references for all input data, and a summary of changes from the *State Energy Data Report 1996*, which was published in February 1999.

Several renewable energy sources have been added to the database in this update. Estimates of wood energy consumed in the residential, commercial, and industrial sectors from 1960 through 1989 are now included. Direct use of geothermal energy and energy derived from the use of heat pumps in the residential, commercial, and industrial sectors are also added for 1989 forward. Several energy sources previously had been included for 1990 forward – solar energy estimates in the residential (including commercial) sector, industrial use of hydroelectricity, and geothermal, solar and wind energy, and transportation consumption of ethanol – now have 1989 data as well.

The method used to estimate State-level commercial wood consumption for 1990 forward is revised to be consistent with the estimation methodology for the new commercial wood consumption estimates for 1960 through 1989.

DOE/EIA-0214(97) Annual 538 pp. September 1999

Natural Gas and Petroleum

Fuel Oil and Kerosene Sales 1998

The *Fuel Oil and Kerosene Sales 1998* report provides information, illustrations and State-level statistical data on end-use sales of kerosene; No. 1, No. 2, and No. 4 distillate fuel oil; and residual fuel oil. State-level kerosene sales include volumes for residential, commercial, industrial, farm, and all other uses. State-level distillate sales include volumes for residential, commercial, industrial, oil company, railroad, vessel bunkering, military, electric utility, farm, on-highway, off highway construction, and other uses. State-level residual fuel sales include volumes for commercial, industrial, oil company, vessel bunkering, military, electric utility, and other uses.

DOE/EIA-0535(98) Annual 68 pp. August 1999

Historical Natural Gas Annual, 1930 Through 1998

The *Historical Natural Gas Annual* contains historical information on the supply and disposition of natural gas at the national, regional, and State level as well as prices at selected points in the flow of gas from the wellhead to the burner-tip. Data include production, transmission within the United States, imports and exports of natural gas, underground storage activities, and deliveries to consumers. The publication presents historical data at the national level for 1930-1998 and detailed annual historical information by State for 1967-1998.

The *Historical Natural Gas Annual* tables are available as self-extracting executable files in ASCII TXT or CDF file formats. Tables 1-3 present annual historical data at the national level for 1930-1998. The remaining tables contain detailed annual historical information, by State, for 1967-1998.

DOE/EIA-0110(98) Annual 385 pp. November 1999 (WEB ONLY)

International Petroleum Monthly

The *International Petroleum Monthly* (formerly *International Petroleum Statistics Report*) is a monthly publication that provides current international oil data. This report is published for the use of Members of Congress, Federal agencies, State agencies, industry and the general public. Publication of this report is in keeping with the responsibilities given the Energy Information Administration in Public Law 95-91 (Section 205(a)(2)) that states:

"The Administrator shall be responsible for carrying out a central, comprehensive, and unified energy data and informational program which will collect, evaluate, assemble, analyze and disseminate data and information…"

The *International Petroleum Monthly* presents data on international oil production, demand, imports, and stocks. The report has four sections. Section 1 contains time series data on world oil production, and on oil demand and stocks in the Organization for Economic Cooperation and Development (OECD). This section contains annual data beginning in 1990, and monthly data for the most recent two years. Section 2 presents an oil supply/demand balance for the world. This balance is presented in quarterly intervals for the most recent two years and annually for the three years prior to that. Section 3 presents data on oil imports by OECD countries. This section contains annual data for the most recent year, quarterly data for the most recent two quarters, and monthly data for the most recent twelve months. Section 4 presents annual time series data on world oil production and oil stocks, demand, and trade in OECD countries. World oil production and OECD demand data are from 1970; OECD stocks from 1973; and OECD trade from 1988

DOE/EIA-0520 Monthly

Natural Gas 1998: Issues and Trends

Natural Gas 1998: Issues and Trends provides a summary of the latest data and information relating to the U.S. natural gas industry, including prices, production, transmission, consumption, and the financial and environmental aspects of the industry. The report consists of seven chapters and five appendices.

Chapter 1 presents a summary of various data trends and key issues in today's natural gas industry and examines some of the emerging trends. Chapters 2 through 7 focus on specific areas or segments of the industry, highlighting some of the issues associated with the impact of natural gas operations on the environment.

DOE/EIA-0560(98) Biennial 258 pp. May 1999

Natural Gas Annual 1998

The *Natural Gas Annual 1998* provides information on the supply and disposition of natural gas to a wide audience including Congress, Federal and State agencies, industry analysts, consumers, and educational institutions. The 1998 data are presented in a sequence that follows natural gas (including supplemental supplies) from its production to its end use. This is followed by tables summarizing natural gas supply and disposition from 1994 to 1998 for each Census Division and each State. Annual historical data are shown at the national level.

The data in the *Natural Gas Annual 1998* are taken from surveys conducted by the Energy Information Administration (EIA), U.S. Department of Energy (DOE), to fulfill its responsibilities for gathering and reporting energy data. Two EIA surveys provide most of the information presented in this report – the mandatory Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," and the Form EIA-895, "Monthly Quantity and Value of Natural Gas Report." Form EIA-176 was submitted by respondents out of an identified universe of operators of fields, wells, or natural gas processing plants who distribute gas to end users or transport gas to or across a State border; operators of synthetic natural gas plants; natural gas distributors; natural gas pipeline companies; and companies that operate underground natural gas storage facilities. Form EIA-895 was submitted by the appropriate agencies of the 33 natural gas producing States.

Other EIA surveys that provided information for this report are Forms EIA-816. "Monthly Natural Gas Liquids Report," and EIA-641, "Annual Report of the Origin of Natural Gas Liquids Production," for gas processed, plant fuel, and extraction loss data; Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," for data on the city gate prices; Forms EIA-759, "Monthly Power Plant Report," and FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants," for data on the quantity and price of natural gas consumed by electric utilities; and Office of Fossil Energy, "Natural Gas Imports and Exports" for data on the quantity and price of natural gas imports and exports. The EIA report, *U.S. Crude Oil, Natural Gad, and Natural Gas Liquids Reserves, Annual Report*, was the source of the reserves data.

DOE/EIA-0131(98) Annual 258 pp. October 1999

Natural Gas Monthly

The *Natural Gas Monthly (NGM)* highlights activities, events, and analyses of interest to public and private sector organizations associated with the natural gas industry. Volume and price data are presented each month for natural gas production, distribution, consumption, and interstate pipeline activities. Producer-related activities and underground storage data are also reported.

The data in this publication are collected on surveys conducted by the EIA to fulfill its responsibilities for gathering and report energy data. Some of the data collected under the authority of the Federal Energy Regulatory Commission (FERC), an independent commission within the DOE, which has jurisdiction primarily in the regulation of electric utilities and the interstate natural gas industry. Geographic coverage is the 50 States and the District of Columbia.

Explanatory Notes supplement the information found in tables of the report. A description of the data collection surveys that support the *NGM* is provided in the Data Sources section. A glossary of the terms used in this report is also provided to assist readers in understanding the data presented in this publication.

All natural gas volumes are reported at a pressure base of 14.73 pounds per square inch absolute (psia) and at 60 degrees Fahrenheit. Cubic feet are converted to cubic meters by applying a factor of 0.02831685.

DOE/EIA-0130 Monthly

Oil and Gas Field Code Master List Updates 1998

The *Oil and Gas Field Code Master List Updates 1998* is an addendum to the 1997 edition of the EIA publication *Oil and Gas Field Code Master List*, an annual listing of all identified oil and gas fields in the United States. These updates represent the addition of new fields to the list and changes to the records of previously listed fields, including deletions. The current publication is based on field information collected through October 1998.

This *Updates* publication and the complete *Master List* of more than 47,000 oil and gas fields are printed in alternate years. However, the complete version, this year titled *Oil and Gas Field Code Master List 1998*, has been prepared and is available electronically on the quarterly EIA Energy InfoDisc CD-ROM and at the EIA World-Wide Web site http://www.eia.doe.gov.

The purpose of this publication is to provide standardized names and codes for identifying domestic fields. Use of these field names and codes fosters consistency of field identification by government and industry. As a result of their widespread adoption they have in effect become a national standard. The use of field names and codes listed in *Oil and Gas Field Code Master List* is required on survey forms and other reports regarding field-specific data collected by EIA. The surveys currently using these field names and/or field codes are Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves", and Form EIA-191, "Monthly Underground Gas Storage Report".

DOE/EIA-0370U(98) Annual 57 pp. January 1999

Petroleum: An Energy Profile 1999

Petroleum has become so interwoven in the daily lives of Americans over the past century that it now comprises an industry which accounts for about 40 percent of all energy consumed in the United States. Americans use petroleum, directly or indirectly, in many applications including transportation fuel, light, heat, and for use in the manufacture of consumer products. Daily per capita consumption of petroleum products in the United States averages nearly 3 gallons – more than one-fourth of the petroleum consumed worldwide.

Although petroleum provides many useful products, the most notable are motor gasoline and heating fuel. Petroleum's many uses in the transportation sector include fuel for automobiles, trucks, agricultural and industrial machinery, trains, ships, and aircraft. Petroleum is used to heat homes, offices, and factories and is used to grow, process, package, distribute, refrigerate, and cook food. Petroleum is also the source of synthetic fabric for cloths as well as detergents and dry cleaning solvent to clean them. Moreover, petroleum provides a chemical base for cosmetics and pharmaceutical products as well as for many plastic products from toys to building materials.

This report, *Petroleum: An Energy Profile 1999*, is intended as a general reference about petroleum; its origins, production, refining, marketing, and use. Presented is an overview of refined petroleum products and their use, crude oil reserves and production, refining, technology and U.S. refining capacity, the development and operation of petroleum markets, and foreign trade. The report is an update of the 1991 edition. The Energy Information Administration (EIA) statistics provided in this report were the most current data available at the time of publication. However, the user can update this report with the most current information by visiting the EIA Web site at http://www.eia.doe.gov. See the end of each chapter for the names of specific publications that are pertinent to each chapter. In addition to the many data publications cited in this report, EIA publishes many in-depth analyses of various aspects of the petroleum industry. For a current list of these reports, see the EIA Web site mentioned above. Then select first "Petroleum" and then select "Analysis" or "Feature Articles."

DOE/EIA-0545(99) One-time 84 pp. July 1999

Petroleum Marketing Annual 1998

The *Petroleum Marketing Annual 1998 (PMA)* provides information and statistical data on a variety of crude oils and refined petroleum products. The publication presents statistics on crude oil costs and refined petroleum products sales for use by industry, government, private sector analysts, educational institutions, and consumers. Data on crude oil include the domestic first purchase price, the f.o.b. and landed cost of imported crude oil, and the refiners' acquisition cost of crude oil. Refined petroleum product sales data include motor gasoline, distillates, residuals, aviation fuels, kerosene, and propane.

The data within the *Petroleum Marketing Annual* are compiled from six Energy Information Administration (EIA) survey forms. The crude oil statistics are calculated from data collected on the following three survey forms: Form EIA-182, "Domestic Crude Oil First Purchase Report"; Form EIA-856, "Monthly Foreign Crude Oil Acquisition Report"; and Form EIA-14, "Refiners' Monthly Cost Report."

The statistics on petroleum product sales prices and volumes are derived from Form EIA-782A, Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report" and Form EIA-782B, "Resellers'/Retailers' Monthly Petroleum Product Sales Report."

The data presented in Tables 48 to 50 are derived from aggregations of data from Form EIA-782C, "Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption."

DOE/EIA-0487(98) Annual 403 pp. October 1999 (WEB ONLY)

Petroleum Marketing Monthly

The *Petroleum Marketing Monthly (PMM)* provides information and statistical data on a variety of crude oils and refined petroleum products. The publication presents statistics on crude oil costs and refined petroleum products sales for use by industry, government, private sector analysts, educational institutions, and consumers. Data on crude oil include the domestic first purchase price, the f.o.b. and landed cost of imported crude oil, and the refiners' acquisition cost of crude oil. Refined petroleum product sales data include motor gasoline, distillates, residuals, aviation fuels, kerosene, and propane.

The data within the *Petroleum Marketing Monthly* are compiled from six Energy Information Administration (EIA) survey forms. The crude oil statistics are calculated from data collected on the following three survey forms: Form EIA-182, "Domestic Crude Oil First Purchase Report"; Form EI-856, "Monthly Foreign Crude Oil Acquisition Report"; and Form EIA-14, "Refiners' Monthly Cost Report."

The statistics on petroleum product sales prices and volumes are derived from Form EI-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report" and Form EIA-782B, "Resellers'/Retailers' Monthly Petroleum Product Sales Report."

The data presented in Tables 48 to 50 are derived from aggregations of data from Form EI-782C, "Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption."

DOE/EIA-0380 Monthly

Petroleum Supply Annual 1998, Volume 1

The *Petroleum Supply Annual 1998, Volume 1 (PSAV1)* contains information on the supply and disposition of crude oil and petroleum products. The publication reflects data that were collected from the petroleum industry during 1998 through annual and monthly surveys. The *PSA* is divided into two volumes. This first volume contains three sections: Summary Statistics, Detailed Statistics, and Refinery Capacity, each with final annual data. The summary statistics section contains a summary of the data presented each month in the *Petroleum Supply Monthly (PSM)*. The tables in Volumes 1 and 2 are similarly numbered to facilitate comparison between them.

The Summary Statistics section contains a summary of the data presented each month in the *PSM* and in Volume 2 of the *PSA*. Graphs and tables are provided which show 14 years of data depicting the balance between supply, disposition and ending stocks for various commodities including crude oil, motor gasoline, distillate fuel oil, residual fuel oil, jet fuel, propane/propylene, and liquefied petroleum gases.

The Detailed Statistics section contains tables that provide 1998 detailed statistics on supply and disposition, refinery operations, imports and exports, stocks, and transportation of crude oil and petroleum products. In most cases, the statistics are presented for several geographic areas -- the United States (50 States and the District of Columbia), five Petroleum Administration for Defense (PAD) Districts, and 12 Refining Districts. At the U.S. and PAD District level, the total volume and the daily rate of activities are presented.

The Refinery Statistics section contains tables compiled from the survey Form EIA-820, "Biennial Refinery Report." Of particular note are listings of refineries and associated crude oil distillation and downstream capacities by State, as of January 1, 1999, as well as summaries of corporate refinery capacities and refinery storage capacities. In addition, refinery receipts of crude oil by method of transportation for 1998 are provided. Also included are fuels consumed by refineries, and lists of shutdown, sales, reactivations, and mergers during 1998.

Three Appendices are provided to assist in understanding and interpreting the data presented in this publication. Industry terminology and product definitions are listed alphabetically in the Glossary.

DOE/EIA-0340(98)/1 Annual 182 pp. June 1999

Petroleum Supply Annual 1998, Volume 2

The *Petroleum Supply Annual 1998, Volume 2 (PSAV2)* contains information on the supply and disposition of crude oil and petroleum products. The publication reflects data that were collected from the petroleum industry during 1998 through annual and monthly surveys. The *PSA* is divided into tow volumes. This first volume contains three sections: Summary Statistics, Detailed Statistics, and Refinery Statistics; each with final annual data. The second volume contains final statistics for each month of 1998, and replaces data previously published in the *Petroleum Supply Monthly (PSM)*. The tables in Volumes 1 and 2 are similarly numbered to facilitate comparison between them. Explanatory Notes, located at the end of this publication, present information describing data collection, sources, estimation methodology, data quality control procedures, modifications to reporting requirements and interpretation of tables. Industry terminology and product definitions are listed alphabetically in the Glossary.

DOE/EIA-0340(98)/2 Annual 606 pp. June 1999

Petroleum Supply Monthly

The *Petroleum Supply Monthly (PSM)* is one of a family of four petroleum supply publications produced by the Petroleum Division within the Energy Information Administration (EIA) reflecting different levels of data timeliness and completeness. The other publications are the *Weekly Petroleum Status Report (WPSR)*, the *Winter Fuels Report*, and the *Petroleum Supply Annual (PSA)*.

Data presented in the *PSM* describe the supply and disposition of petroleum products in the United States and major U.S. geographic areas. The data series describe production, imports and exports, inter-Petroleum Administration for Defense (PAD) District movements, and inventories by the primary suppliers of petroleum products in the United States (50 States and the District of Columbia). The reporting universe includes those petroleum sectors in primary supply. Included are: petroleum refiners, motor gasoline blenders, operators of natural gas processing plants and fractionators, inter-PAD transporters, importers, and major inventory holders of petroleum products and crude oil. When aggregated, the data reported by these sectors approximately represents the consumption of petroleum products in the United States.

Data presented in the *PSM* are divided into two sections: Summary Statistics and Detailed Statistics.

The tables and figures in the Summary Statistics section of the *PSM* present a time series of selected petroleum data on a U.S. level. Most time series include preliminary estimates for one month based on the Weekly Petroleum Supply Reporting System; statistics based on the most recent data from the Monthly Petroleum Supply Reporting System (MPSRS); and statistics published in prior issues of the *PSM* and *PSA*.

The Detailed Statistics tables of the *PSM* present statistics for the most current month available as well as year-to-date. In most cases, the statistics are presented for several geographic areas – the United States (50 States and the District of Columbia), five PAD Districts, and 12 Refining Districts. At the U.S. and PAD District level, the total volume and the daily rate of activities are presented. The statistics are developed from monthly survey forms submitted by respondents to the EIA and from data provided from other sources.

Four Appendices are provided to assist in understanding and interpreting the data presented in this publication. Industry terminology and product definitions are listed alphabetically in the Glossary. Final statistics for the data series published in the *PSM*, as well as additional data from the biennial refinery and oxygenate capacity surveys are published in the *PSA*. The *PSA* is published approximately five months after the end of the report year.

DOE/EIA-0109 Monthly

Price Changes in the Gasoline Market

This report, *Price Changes in the Gasoline Market*, concentrates on regional gasoline prices in the Midwest from October 1992 through June 1998, and reaches the following conclusions:

- Wholesale and retail gasoline price changes in the Midwest during this period are basically symmetric with respect to changes in crude oil prices.

- Retail gasoline prices in the Midwest often rise faster that they fall in response to wholesale gasoline price changes, so they report detected pattern asymmetry. However, after all lagged price adjustments have been completed, wholesale price changes will almost completely pass through to the retail level, so there is little evidence of amount asymmetry.

- The adjustment times between different levels of the gasoline market make it possible for the detection of pattern asymmetry to be only a statistical artifact. The report shows how, because of time lags in the gasoline distribution system, retail prices may continue to rise even after wholesale prices have begun falling, giving the appearance of pattern price asymmetry. However, when allowance is made for the lagged adjustment times, the perceived pattern asymmetry largely disappears.

- The conclusions of this report depend importantly on various characteristics of the data used, including frequency and location specificity. Thus, conclusions about price asymmetry at the city or state level would necessitate a collection of data and an examination of numerous local gasoline markets.

DOE/EIA-0626 One-time 60 pp. February 1999

U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1998 Annual Report

The *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1998 Annual Report* is the 22nd prepared by the Energy Information Administration (EIA) to fulfill its responsibility to gather and report annual proved reserves estimates. The EIA annual reserves report series is the only source of comprehensive domestic proved reserves estimates. This publication is used by the Congress, Federal and State agencies, industry, and other interested parties to obtain accurate estimates of the Nation's proved reserves of crude oil, natural gas, and natural gas liquids. These data are essential to the development, implementation, and evaluation of energy policy and legislation.

This report presents estimates of proved reserves of crude oil, natural gas, and natural gas liquids as of December 31, 1998, as well as production volumes for the United States and selected States and State subdivisions for the year 1998. Estimates are presented for the following four categories of natural gas: total gas (wet after lease separation), nonassociated gas and associated-dissolved gas (which are the two major types of wet natural gas), and total dry gas (wet gas adjusted for the removal of liquids at natural gas processing plants). In addition, reserve estimates for two types of natural gas liquids, lease condensate and natural gas plant liquids, are presented. The estimates are based upon data obtained from two annual EIA surveys: Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves" and Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production." Also included is information on indicated additional crude oil reserves and crude oil, natural gas, and lease condensate reserves in nonproducing reservoirs. A discussion of notable oil and gas exploration and development activities during 1998 is provided.

The appendices contain data by operator production size class for crude oil and natural gas reserves and production; the top 100 U.S. fields ranked within an oil or gas proved reserves group for 1998; report Table 1 converted to metric units; historical State data; a summary of survey operations; a discussion of statistical considerations; methods used to develop the estimates proved in this report; maps of selected State subdivisions; and examples of the survey forms. A glossary of the terms used in this report and in survey Forms EIA-23 and EIA-64A is provided to assist readers in move fully understanding the data.

DOE/EIA-0216(98) Annual 168 pp. December 1999

Weekly Petroleum Status Report

The *Weekly Petroleum Status Report (WPSR)* provides timely information on supply and selected prices of crude oil and principal petroleum products in the context of historical data and forecasts. It serves the industry, the press, planners, policymakers, consumers, analysts, and State and local governments with a ready, reliable source of current information. The supply data contained in this report are based primarily on company submissions for the week ending 7:00 a.m. the preceding Friday. Weekly price data are collected as of 8:00 a.m. every Monday. The daily spot and futures prices are provided by Reuters, Inc. Data are released electronically after 9:00 a.m. each Wednesday, and hard copies of the publication are available for distribution on Friday. For some weeks which include holidays, publication of the *WPSR* is delayed by one day.

DOE/EIA-0208 Weekly

Nuclear and Uranium

Uranium Industry Annual 1998

The *Uranium Industry Annual 1998 (UIA 1998)* provides current statistical data on the U.S. uranium industry's activities relating to uranium raw materials and uranium marketing. The *UIA 1998* is prepared for use by the Congress, Federal and State agencies, the uranium and nuclear electric utility industries, and the public. It contains data for the period 1989 through 2008 as collected on the Form EIA-858, "Uranium Industry Annual Survey."

DOE/EIA-0478(98) Annual 92 pp. April 1999

Renewable Energy and Alternative Fuels

Renewable Energy Annual 1998 With Data for 1997

This report, *Renewable Energy Annual 1998 With Data for 1997*, is the fourth annual report published by the Energy Information Administration (EIA) which presents information on renewable energy consumption, capacity, and electricity generation data; U.S. solar thermal and photovoltaic collector manufacturing activities; and U.S. geothermal heat pump manufacturing activities. It updates and provides more detail on renewable energy information than what's published in the Energy Information Administration's (EIA) *Annual Energy Review 1997*.

The renewable energy resources included in the report are: biomass (wood, wood waste, municipal solid waste, ethanol, and biodiesel); geothermal; wind; solar (solar thermal and photovoltaic); and hydropower. However, hydropower is also regarded as a "conventional" energy source because it has furnished a significant amount of electricity for more than a century. Therefore, the contribution of hydropower to total renewable energy consumption is discussed, although hydropower as an individual energy source is not addressed. Since EIA collects data only on terrestial (land-based) systems, satellite and military applications are not included in this report.

The first chapter provides an overview of renewable energy use and capability from 1993 through 1997. It discusses renewable energy consumption, and electric capacity and generation data. Chapter 2 presents current (through 1997) information on the United States solar energy industry. EIA collected this information on the Form EIA-63A, "Annual Survey of Solar Collector Manufacturers," and the Form EIA-63B, "Annual Survey of Photovoltaic Module/Cell Manufacturers," covering the 1997 calendar year. Chapter 3 presents, for the first time, information on the United States geothermal heat pump industry. This information was collected on the Form EIA-902, "Annual Geothermal Heat Pump Manufacturers Survey," and covers the calendar years, 1994-1997.

DOE/EIA-0603(98) Annual 92 pp. January 1999

Renewable Energy 1998: Issues and Trends

Renewable Energy 1998: Issues and Trends is the first in an expected series of biannual analysis reports on topical renewable energy issues. The precursor of this report is the *Renewable Energy Annual* series of reports that has now been split into an annual data report (see *Renewable Energy Annual 1998 With Data for 1997*, DOE/EIA-0603(98), December 1998) and this report. The next "Issues and Trends" report is scheduled for publication at the end of 2000. This report presents five papers, each of which has been recently published electronically as a feature article. Two of the papers cover material that applies generally to renewable energy. Three of the papers analyze issues specific to a particular renewable resource or technology.

DOE/EIA-0628(98) Biennial 98 pp. March 1999

Forecasting

Analysis of The Climate Change Technology Initiative

In February 1999, the Administration sent its fiscal year 2000 budget request to the U.S. Congress. It includes more than $4 billion in programs related to climate change. Nearly $1.8 billion of the funding is proposed for tax incentives, research and development, and other spending for the Climate Change Technology Initiative (CCTI). CCTI includes tax credits to serve as incentives for energy efficiency improvements and renewable technologies for buildings, light-duty vehicles, industry, and electricity generation. Other funding covers research, development, and deployment for energy-efficient and renewable technologies, more efficient generating technologies, and carbon sequestration research.

The analysis in this report was undertaken at the request of the Committee on Science of the U.S. House of Representatives. In its request, the Committee asked the Energy Information Administration (EIA) to analyze "the impact of specific policies on the reduction of carbon emissions and their impact on U.S. energy use and prices … in the 2008-2012 time frame," analyze the impact of the President's Climate Change Technology Initiative, as defined for the 2000 budget, on reducing carbon emissions from the levels forecast in the *Annual Energy Outlook 1999* reference case."

The projections and quantitative analysis in this report were conducted primarily using the National Energy Modeling System (NEMS), an energy-economy model of U.S. energy markets designed, developed, and maintained by EIA, which is used each year to provide the projections in the *Annual Energy Outlook*. Chapter 1 of this report provides background discussion of CCTI and the methodology of the analysis. Chapters 2, 3, and 4, respectively, analyze the impacts of the tax credit; research, development, and deployment programs; and funding for accelerated appliance standards proposed in CCTI.

DOE/EIA-OIAF/99-01 One-time 104 pp. April 1999

Analysis of the Impacts of an Early Start for Compliance with the Kyoto Protocol

The analysis in this report was undertaken at the request of the Committee on Science of the U.S. House of Representatives, subsequent to the report *Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity*, published by the Energy Information Administration (EIA) in October 1998. In its request, the Committee asked EIA to "evaluate an earlier start date than 2005, which was the first year that the price signal was passed to consumers in you study of the Kyoto Protocol," as noted in the letter in Appendix B.

In its 1998 study, EIA analyzed the impacts of the Kyoto Protocol, assuming that a price was imposed on the consumption of fossil fuels relative to their carbon content in order to reduce projected carbon emissions in the United States to the level specified in the Kyoto Protocol for the period 2008 through 2012. The carbon price was phased in beginning in 2005, in order to allow energy markets time for adjustment before 2008. The present study assumes that the United States reaches the same level of carbon emissions in the period 2008 through 2012, in order to analyze whether a longer, more gradual adjustment would be beneficial. The projections in this report were produced using the National Energy Modeling System (NEMS), an energy-economy model of U.S. energy markets designed, developed, and maintained by EIA, which is used each year to provide the projections in EIA's *Annual Energy Outlook.* The detailed energy market results are provided in Appendix A.

DOE/EIA-OIAF/99-02 One-time 90 pp. July 1999

Annual Energy Outlook 2000

The *Annual Energy Outlook 2000 (AEO2000)* presents midterm forecasts of energy supply, demand, and prices through 2020 prepared by the Energy Information Administration (EIA). The projections are based on results from EIA's National Energy Modeling System (NEMS).

The report begins with an "Overview" summarizing the *AEO2000* reference case. The next section, "Legislation and Regulations," describes the assumptions made with regard to laws that affect energy markets and discusses evolving legislative and regulatory issues. "Issues in Focus" discusses current energy issues – appliance standards, gasoline and diesel fuel standards, natural gas industry expansion, competitive electricity pricing, renewable portfolio standards, and carbon emissions. It is followed by the analysis of energy market trends.

DOE/EIA-0383(2000) Annual 258 pp. December 1999

International Energy Outlook 1999

The *International Energy Outlook 1999 (IEO99)* presents an assessment by the Energy Information Administration (EIA) of the outlook for international energy markets through 2020. The report is an extension of the EIA's *Annual Energy Outlook 1999 (AEO99)*, which was prepared using the National Energy Modeling System (NEMS). U.S. projections appearing in *IEO99* are consistent with those published in *AEO99*. *IEO99* is provided as a statistical service to energy managers and analysts, both in government and in the private sector. The projections are used by international agencies, Federal and State government, trade associations, and other planners and decisionmakers. They are published pursuant to the Department of Energy Organization Act of 1977 (Public Law 95-91), Section 205(c). The *IEO99* projections are based on U.S. and foreign government policies in effect on October 1, 1998.

The report begins with a review of world trends in energy demand. The historical time frame begins with data from 1970 and extends to 1996, providing readers with a 26-year historical view of energy periods. The *IEO99* projections cover a 24-year period.

The next part of the report is organized by energy source. Regional consumption projections for oil, natural gas, coal nuclear power, and renewable energy (hydroelectricity, geothermal, wind, solar, and other renewables) are presented in the five fuel chapter, along with a review of the current status of each fuel on a worldwide basis. The third part of the report looks at energy consumption in the end-use sectors, beginning with a chapter on energy use for electricity generation. New to this year's *Outlook* are chapters on energy use in the transportation sector and on environmental issues related to energy consumption.

DOE/EIA-0484(99) Annual 248 pp. March 1999

Issues in Midterm Analysis and Forecasting 1999

Issues in Midterm Analysis and Forecasting 1999 (Issues) presents a series of eight papers, which cover topics in analysis and modeling that underlie the *Annual Energy Outlook 1999 (AEO99)*, as well as other significant issues in midterm energy markets. *AEO99*, DOE/EIA-0383(99), published in December 1998, presents national forecasts of energy production, demand, imports, and prices through the year 2020 for five cases – a reference case and four additional cases that assume higher and lower economic growth and higher and lower world oil prices than in the reference case. The forecasts were generated using Energy Information Administration's (EIA) National Energy Modeling System (NEMS).

The papers included in the *Issues* describe underlying analyses for the projections in *AEO99* and the forthcoming *Annual Energy Outlook 2000* and other analytical products of EIA's Office of Integrated Analysis and Forecasting. Their purpose is to provide public access to analytical work done in preparation for the midterm projections and other unpublished analyses. Specific topics were chosen for their relevance to current energy issues or to highlight modeling activities in NEMS.

DOE/EIA-0607(99) Annual 112 pp. August 1999

Short-Term Energy Outlook Quarterly Projections

The *Short-Term Energy Outlook Quarterly Projections (STEO)* presents quarterly forecasts of energy supply, demand, stock, and prices for each quarter. The forecasts are produced by using the Short-Term Integrated Forecasting System, which uses two principal driving variables; a macroeconomic forecast and world oil price assumptions. The three projections for petroleum supply and demand are based on low, middle, and high economic growth scenarios that incorporate high, middle and low crude oil price trajectories. The tables and discussion refer primarily to the middle or base case scenario and to the domestic situation. Other cases, which examine the sensitivity of total petroleum, demand to varying assumptions about prices, weather and economic activity are presented. The petroleum outlook includes data projections of domestic crude oil production, motor gasoline, distillate fuel oil, residual fuel oil, and other products and inventories. Also included are natural gas, coal and electric power projections. Additionally, the international petroleum situation is discussed.

DOE/EIA-0202 Quarterly

Model Documentation

Integrating Module of the National Energy Modeling System,
EIA Model Documentation 2000

The National Energy Modeling System (NEMS) is a computer-based, energy-economy modeling system of U.S. energy markets for the midterm period. NEMS projects the production, imports, conversion, consumption, and prices of energy, subject to a variety of assumptions. The assumptions encompass macroeconomic and financial indicators, world energy markets, resource availability and costs, behavioral and technological choice criteria, technology characteristics, and demographics. NEMS produces a general equilibrium solution for energy supply and demand in the U.S. energy markets on an annual basis through 2020.

Baseline forecasts from NEMS is published in the *Annual Energy Outlook*. Analyses are also prepared in response to requests by the U.S. Congress, the DOE Office of Policy, and others. NEMS was first used for forecasts presented in the *Annual Energy Outlook 1994*.

Publication of this document is supported by Public Law 93-275, Federal Energy Administration Act of 1974, Section 57(B)(1) (as amended by Public Law 94-385, Energy Conservation and Production Act), which states in part

> …that adequate documentation for all statistical and forecast reports prepared…is made available to the public at the time of publication of such report.

In particular, this report is designed to meet EIA's model documentation standards established in accordance with these laws.

For documentation purposes, the individual components of NEMS are considered distinct models and documented individually. While the NEMS integrating module is a distinct component of NEMS, the integrating modules is not by itself, a model. Rather, it is a component of the overall NEMS model and implements specific aspects of the overall modeling methodology that are not documented elsewhere. The documentation is organized accordingly.

DOE/EIA-M057(2000) Annual 94 pp. December 1999

Coal Market Module of the National Energy Modeling System,
EIA Model Documentation 1999

This report documents the objectives and the conceptual and methodological approach used in the development of the National Energy Modeling System's (NEMS) Coal Market Module (CMM) used to develop the *Annual Energy Outlook 1999 (AEO99).* This report catalogues and describes the assumptions, methodology, estimation techniques, and source code of CMM's two submodules. These are the Coal Production Submodule (CPS) and the Coal Distribution Submodule (CDS).

This document has three purposes. It is a reference document providing a description of CMM for model analysts and the public. It meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its statistical and forecast reports (Public Law 93-275, Federal Energy Administration Act of 1974, Section 57(B)(1), as amended by Public Law 94-385). Finally, it facilitates the continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements as future goals to improve the quality of the module.

DOE/EIA-M060(99) Annual 160 pp. January 1999

Coal Market Module of the National Energy Modeling System,
EIA Model Documentation 2000

This report documents the objectives and the conceptual and methodological approach used in the development of the National Energy Modeling System's (NEMS) Coal Market Module (CMM) used to develop the *Annual Energy Outlook 2000 (AEO2000).* This report catalogues and describes the assumptions, methodology, estimation techniques, and source code of the CMM's two sub-modules. These are the Coal Production Sub-module (CPS) and the Coal Distribution Sub-module (CDS).

This document has three purposes. It is a reference document providing a description of the CMM for the model analysts and the public. It meets the legal requirements of the Energy Information Administration (EIA) to provide adequate documentation in support of its statistical and forecast report (Public Law 93-275, Federal Energy Administration Act of 1974, Section (B)(1), as amended by Public Law 94-385). Finally, it facilitates continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements as future goals to improve the quality of the module.

The CMM provides annual forecasts of prices, production, and consumption of coal for the NEMS. In general, the CDS integrates the supply inputs from the CPS to satisfy demands for coal from exogenous demand models. The international component of the CDS forecasts annual world coal trade flows from major supply to major demand regions and provides annual forecasts of U.S. coal exports for input to NEMS. Specifically, the CDS receives minemouth prices produced by the CPS, demand and other exogenous inputs from other NEMS conponents, and provides delivered coal prices and quantities to the NEMS economic sectors and regions.

DOE/EIA-M060(2000) Annual 164 pp. December 1999

Natural Gas Transmission and Distribution Model of the National Energy Modeling System, Volume I, EIA Model Documentation 1999

This report documents the archived version of the Natural Gas Transmission and Distribution Model (NGTDM) that was used to produce the natural gas forecasts used in support of the *Annual Energy Outlook 1999,* (DOE/EIA-0383(99)). The purpose of this report is to provide a reference document for model analysts, users, and the public that defines the objectives of the model, describes its basic approach, and provides detail on the methodology employed. Previously this report represented Volume I of a two-volume set. Volume II reported on model performance, detailing convergence criteria and properties, results of sensitivity testing, comparison of model outputs with the literature and/or model results, and major unresolved issues, for the version of the NGTDM used for the *Annual Energy Outlook 1995,* (DOE/EIA-0383(95)). There are no plans for producing another version of Volume II in the foreseeable future. The model documentation is updated annually to reflect significant model methodology and software changes that take place as the model develops. The next version of the documentation is planned for release in the first quarter of 2000.

DOE/EIA-M062/1(99) Annual 164 pp. February 1999

Documentation of the Oil and Gas Supply Module (OGSM),
EIA Model Documentation, Volume 1, 1999

The purpose of this report is to define the objectives of the Oil and Gas Supply Model (OGSM), to describe the model's basic approach, and to provide detail on how the model works. This report is intended as a reference document for model analysts, users, and the public. It is prepared in accordance with the Energy Information Administration's (EIA's) legal obligation to provide adequate documentation in support of its statistical and forecast reports (Public Law 93-275, Section 57(B)(2)).

DOE/EIA-M063/1(99) Annual 202 pp. March 1999

Documentation of the Oil and Gas Supply Module (OGSM),
EIA Model Documentation, Volume 2 -- Appendices, 1999

The purpose of this report is to define the objectives of the Oil and Gas Supply Model (OGSM), to describe the model's basic approach, and to provide detail on how the model works. This report is intended as a reference document for model analysts, users, and the public. It is prepared in accordance with the Energy Information Administration's (EIA's) legal obligation to provide adequate documentation in support of its statistical and forecast reports (Public Law 93-275, Section 57(B)(2)).

DOE/EIA-M063/2(99) Annual 144 pp. March 1999

Industrial Sector Demand Module of the National Energy Modeling System, EIA Model Documentation Report 1999

This report documents the objectives, analytical approach, and development of the National Energy Modeling System (NEMS) Industrial Demand Model. The report catalogues and describes model assumptions, computational methodology, parameter estimation techniques, and model source code.

This document serves three purposes. First, it is a reference document providing a detailed description of the NEMS Industrial Model for model analysts, users, and the public. Second, this report meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its models (Public Law 94-385, Section 57 (B)(2)). Third, it facilitates continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements as future projects.

DOE/EIA-M064(99) Annual 94 pp. January 1999

Macroeconomic Activity Module (MAM): Kernel Regression Documentation of the National Energy Modeling System, EIA Model Documentation 1999

The Macroeconomic Activity Module (MAM) serves two functions within the National Energy Modeling System (NEMS). First, it provides consistent sets of baseline macroeconomic variables (GDP and components, aggregate prices, interest rates, industrial output, housing starts, commercial floor space, new car sales, etc.) which are used by the supply, demand and conversion modules in reaching an energy market equilibrium. Second, it is designed to provide a feedback mechanism that alters the baseline variables during the course of an integrated NEMS run.

For the reasons enumerated in the Component Design Report, the MAM is not a structural model. Instead, the consistent sets of baseline variables are generated by running the full slate of DRI models (macroeconomic, input-output, employment, and regional). The macroeconomic variables required by NEMS are extracted and uploaded to the RISC platform. In order to provide the feedback mechanism within NEMS, numerous simulations of the DRI models are completed on a personal computer, and the solutions saved. A simplified representation of the relationship between the important inputs (provided by the NEMS) and the required output (provided back to NEMS) is then constructed.

DOE/EIA-M065(99) Annual 70 pp. January 1999

Commercial Sector Demand Module of the National Energy Modeling System – Part 1 – Report, EIA Model Documentation 2000

This report documents the objectives, analytical approach and development of the National Energy Modeling System (NEMS) Commercial Sector Demand Module. The report catalogues and describes the model assumption, computational methodology, parameter estimation techniques, model source code, and forecast results generated through the synthesis and scenario development based on these components.

This document serves three purposes. First, it is a reference document providing a detailed description for model analysts, users, and the public. Second, this report meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its models (Public Law 93-275, Section (B)(1)). Third, it facilitates continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements as future projects.

The NEMS Commercial Sector Demand Module is a simulation tool based upon economic and engineering relationships that models commercial sector energy demands at the nine Census division level of detail for eleven distinct categories of commercial buildings. Commercial equipment selections are performed for the major fuels of electricity, natural gas, and distillate fuel, for the major services of space heating, space cooling, water heating, ventilation, cooking, refrigeration, and lighting. The market segment level of detail is modeled using a constrained life cycle cost minimization algorithm that considers commercial sector consumer behavior and time preference premiums. The algorithm also models demand for the minor fuels of residual oil, liquefied petroleum gas, steam coal, motor gasoline, and kerosene, the renewable fuel sources of wood, municipal solid waste, and solar energy, and the minor services of office equipment (with a separate breakout of personal computers) and “other” in less detail than the major fuels and services. Commercial decisions regarding the use of distributed generation and cogeneration technologies are performed using an endogenous positive cash-flow algorithm. Numerous specialized considerations are incorporated, including the effects of changing building shell efficiencies, and consumption to provide district services.

DOE/EIA-M066(2000)/Part 1 Annual 90 pp. December 1999

Commercial Sector Demand Module of the National Energy Modeling System – Part 2 – Appendices, EIA Model Documentation 2000

This Appendix describes the input data, parameter estimates, variables and data calibrations that currently reside on EIA's computing platform for the execution of the National Energy Modeling Syestem (NEMS) Commercial Module. These data provide a detailed representation of commercial sector energy consumption and technology descriptions that support the module. Appendix A also discusses the primary module outputs.

Table A-1 references the input data, parameter estimates, variables, and module outputs documented in this report. For each item, Table A-1 lists an equation reference to Appendix B of this report, a subroutine reference, the item definition and dimensions, a subroutine reference, the item classification, and units. Note that all variables classified as "Calculated Variable" can also be considered to fall into the "Output" classification, as they are located in common blocks accessible to other NEMS modules and external programs. The references for item pertaining to the Distributed Generation and Cogeneration Submodule are found at the end of Table A-1. Following Table A-1 are profiles of the data items. Each profile describes the data sources, analytical methodologies, and parameter estimates corresponding to the table.

The remainder of Appendix A contains supporting discussion including data selection and calibration procedures, required transformations, levels of disaggregation, and model input files.

DOE/EIA-M066(2000)/Part 2 Annual 170 pp. December 1999

Residential Sector Demand Module of the National Energy Modeling System, EIA Model Documentation 1999

This report documents the objectives, analytical approach, and development of the National Energy Modeling System (NEMS) Residential Sector Demand Module. The report catalogues and describes the model assumptions, computational methodology, parameter estimation techniques, and FORTRAN source code.

This document serves three purposes. First, it is a reference document that provides a detailed description for energy analysts, other users, and the public. Second, this report meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its statistical and forecast reports according to Public Law 93-275, Section 57(B)(1). Third, it facilitates continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements.

DOE/EIA-M067(99) Annual 224 pp. January 1999

Residential Sector Demand Module of the National Energy Modeling System, EIA Model Documentation 2000

This report documents the objectives, analytical approach, and development of the National Energy Modeling System (NEMS) Residential Sector Demand Module. The report catalogues and describes the model assumptions, computational methodology, parameter estimation techniques, and FORTRAN source code.

This documents serves three purposes. First, it is a reference document that provides a detailed description of energy analysts, other users, and the public. Second, this report meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its statistical and forecast reports according to Public Law 93-275, Section 57(B)(1). Third, it facilitates continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements.

The NEMS Residential Sector Demand Module is currently used for mid-term forecasting purposes and energy policy analysis over the forecast horizon of 1997 through 2020. The model generates forecasts of energy demand, which is used interchangeably with the concept of energy consumption in this document, for the residential sector by service, fuel, and Census Division. The policy impacts that result from the introduction of new technologies, market incentives, and regulatory changes can be estimated using the module, by the user who defines alternative input and parameter assumptions.

The Residential Sector Demand Module uses inputs from the NEMS system to generate outputs needed in the NEMS integration process. The inputs required by the Residential Sector Demand Module from the NEMS system include energy prices and macroeconomic indicators. These inputs are used by the module to generate energy consumption by fuel type and Census Division in the residential sector. The NEMS system uses these forecasts to compute equilibrium energy prices and quantities.

DOE/EIA-M067(2000) Annual 188 pp. December 1999

Electricity Market Module of the National Energy Modeling System, EIA Model Documentation 1999

The National Energy Modeling System (NEMS) was developed to provide mid-term 20 to 25 years) forecasts and analyses of energy-related activities. The NEMS Electricity Market Module (EMM) provides a major link in the NEMS framework. In each model year, the EMM receives electricity demand from the NEMS demand modules, fuel prices from the NEMS fuel supply modules, expectations from the NEMS system module, and macroeconomic parameters from the NEMS macroeconomic module and then estimates the actions taken by electric utilities and nonutilities to meet demand in the most economical manner. The EMM then outputs electricity prices to the demand modules, fuel consumption to the fuel supply modules, emissions to the system module, and capital requirements to the macroeconomic module. The model is iterated until a solution is reached for that model year.

The EMM represents the capacity planning, generation, transmission, and pricing of electricity, subject to delivered prices for coal, petroleum products, and natural gas; the cost of centralized generation facilities; macroeconomic variables for costs of capital and domestic investment; and electricity trade are represented in the fuel dispatching and capacity planning submodules. Nonutility generation from cogenerators and other facilities whose primary business is not electricity generation is represented in the demand and fuel supply modules. All other nonutility generation is represented in the EMM. The generation of electricity is accounted for in 13 supply regions.

DOE/EIA-M068(99) Annual 220 pp. March 1999

**Renewable Fuels Module of the National Energy Modeling System,
EIA Model Documentation 1999**

This report documents the objectives, analytical approach, and design of the National Energy Modeling System (NEMS) Renewable Fuels Module (RFM) as it relates to the production of the *Annual Energy Outlook 1998 (AEO99)* forecasts. This report catalogues and describes modeling assumptions, computational methodologies, data inputs, and parameter estimation techniques. A number of offline analyses used in lieu of RFM modeling components are also described.

This documentation report serves three purposes. First, it is a reference document for model analysts, model users, and the public interested in the construction and application of the RFM. Second, it meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its models (Public Law 93-275, Federal Energy Administration Act of 1974, Section 57(B)(1)). Finally, such documentation facilitates continuity in EIA model development by providing information sufficient to perform model enhancements and data updates as EIA's ongoing mission to provide an analytical and forecasting information system.

DOE/EIA-M069(99) Annual 166 pp. January 1999

**Transportation Sector Model of the National Energy Modeling System,
EIA Model Documentation (Volume 1) 1999**

This report documents the objectives, analytical approach and development of the National Energy Modeling System (NEMS) Transportation Model (TRAN). The report catalogues and describes the model assumptions, computational methodology, parameter estimation techniques, model source code, and forecast results generated by the model.

This documentation report serves three purposes. First, it is a reference document providing a detailed description of TRAN for model analysts, users, and the public. Second, this report meets the legal requirements of the Energy Information Administration (EIA) to provide adequate documentation in support of its statistical and forecast report (Public Law 93-275, Section 57(B)(1)). Third, it permits continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements.

DOE/EIA-M070/1(99) Annual 194 pp. February 1999

**Transportation Sector Model of the National Energy Modeling System,
EIA Model Documentation (Volume 2 – Appendices,
Part A – Appendices A-E) 1999**

This documentation report contains supplement information to Volume 1 of the Transportation Sector Model Documentation Report. This report describes the input data and parameters, model abstract, data quality and estimation, as well as attachments to the model.

DOE/EIA-M070/2A(99) Annual 156 pp. February 1999

**Transportation Sector Model of the National Energy Modeling System,
EIA Model Documentation (Volume 2 – Appendices,
Part B – Appendix F) 1999**

The attachments contained within this appendix provide additional details about the model development and estimation process which do not easily lend themselves to incorporation in the main body of the model documentation report. The information provided in these attachments is not integral to the understanding of the model's operation, but provides the reader with the opportunity to gain a deeper understanding of some of the model's underlying assumptions. There will be a slight degree of replication of materials found elsewhere in the documentation, made avoidable by the dictates of internal consistency. Each attachment is associated with a specific component of the transportation model; the presentation follows the same sequence of modules employed in Volume 1.

DOE/EIA-M070/2B(99) Annual 205 pp. February 1999

International Energy Module of the National Energy Modeling System – (World Oil Market Petroleum Products Supply and Oxygenates Supply Components), EIA Model Documentation 1999

The understanding of world oil market issues, especially the forecasting of mid to long term world oil prices, has always been a primary EIA focus. To enhance the capabilities of the National Energy Modeling System (NEMS) to address international issues and their interaction with U.S. markets, the International Energy Module (IEM) was incorporated into the system. Components of the NEMS IEM accomplish the following:

- Calculate the average world oil price and provide supply curves for five grades of crude oil for import to the United States.

- Calculate the change in the world oil price in response to shifts in U.S. import demand.

- Provide crude oil and petroleum product supply curves with a representation of foreign supply levels and associated costs for U.S. petroleum imports. Calculated shifts in import supply cures as world oil market conditions vary.

- Provide supply cures for U.S. imports of oxygenates (Methyl tertiary butyl ether [MTBE] and methanol).

These separate components of the IEM have been developed to carry out these functions. The World Oil Market (WOM) component forecasts international crude oil market conditions, including demand, price and supply availability, and the effects of U.S. petroleum market on the world market. The Petroleum Product Supply (PPS) component generates supply curves for petroleum products imports into the United States. These supply curves reflect conditions in the international market, including refinery capacity, transportation costs, and the effects of U.S. demand on world markets. Finally, the Oxygenates Supply (OS) component produces supply curves for U.S. imports of MTBE and methanol.

DOE/EIA-M071(99) Annual 72 pp. February 1999

**Transportation Sector Model of the World Energy Projection System –
EIA Model Documentation 1999**

This report documents the objectives, analytical approach, and development of the World Energy Projection System (WEPS) Transportation Energy Model. The report catalogues and describes model assumptions, computational methodology, and parameter estimation approach.

This documentation report serves three purposes. First, it is a reference document providing detailed descriptions of the WEPS Transportation Energy Model for energy analysts, model users, and the public. Second, this report meets the legal requirement of the Energy Information Administration (EIA) to provide adequate documentation in support of its models (Public Law 94-3895, Section 57(B)(2)). Third, it facilitates continuity in model development by providing documentation from which energy analysts can undertake model enhancements, data updates, and parameter refinements as future projects.

DOE/EIA-M072(99) Annual 38 pp. June 1999

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