

Preface

The *Annual Energy Outlook 2002 (AEO2002)* 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 *AEO2002* reference case. The next section, "Legislation and Regulations," discusses evolving legislative and regulatory issues. "Issues in Focus" discusses electricity and natural gas markets in California, oxygenates in gasoline, energy efficiency trends, and recent EIA analyses of proposed reductions in emissions from electricity generators. It is followed by the analysis of energy market trends.

The analysis in *AEO2002* focuses primarily on a reference case and four other cases that assume higher and lower economic growth and higher and lower world oil prices than in the reference case. Forecast tables for those cases are provided in Appendixes A through C. Alternative cases explore the impacts of varying key assumptions in NEMS—e.g., technology penetration. The major results for the alternative cases are shown in Appendix F.

Appendix G briefly describes NEMS, the *AEO2002* assumptions, and the alternative cases.

The *AEO2002* projections are based on Federal, State, and local laws and regulations in effect on September 1, 2001. Pending legislation and sections of existing legislation requiring funds that have not been appropriated are not reflected in the forecasts. Historical data used for the *AEO2002* projections were the most current available as of July 31, 2001, when most 2000 data but only partial 2001 data were available. Historical data are presented in this report for comparative purposes; documents referenced in the source notes should be consulted for official data values. The projections for 2001 and 2002 incorporate the short-term projections from EIA's October 2001 *Short-Term Energy Outlook*.

The *AEO2002* projections are used by Federal, State, and local governments, trade associations, and other planners and decisionmakers in the public and private sectors. They are published in accordance with Section 205c of the Department of Energy Organization Act of 1977 (Public Law 95–91), which requires the EIA Administrator to prepare annual reports on trends and projections for energy use and supply.

The projections in *AEO2002* are not statements of what will happen but of what might happen, given the assumptions and methodologies used. The projections are business-as-usual trend forecasts, given known technology, technological and demographic trends, and current laws and regulations. Thus, they provide a policy-neutral reference case that can be used to analyze policy initiatives. EIA does not propose, advocate, or speculate on future legislative and regulatory changes. All laws are assumed to remain as currently enacted; however, the impacts of emerging regulatory changes, when defined, are reflected.

Because energy markets are complex, models are simplified representations of energy production and consumption, regulations, and producer and consumer behavior. Projections are highly dependent on the data, methodologies, model structures, and assumptions used in their development.

Behavioral characteristics are indicative of real-world tendencies rather than representations of specific outcomes.

Energy market projections are subject to much uncertainty. Many of the events that shape energy markets are random and cannot be anticipated, including severe weather, political disruptions, strikes, and technological breakthroughs. In addition, future developments in technologies, demographics, and resources cannot be foreseen with any degree of certainty. Many key uncertainties in the *AEO2002* projections are addressed through alternative cases.

EIA has endeavored to make these projections as objective, reliable, and useful as possible; however, they should serve as an adjunct to, not a substitute for, analytical processes in the examination of policy initiatives.

Contents

	Page
Overview	1
Legislation and Regulations	9
Introduction.....	10
Electricity Markets: State Restructuring and the California Energy Crisis.....	11
Appliance Efficiency Standards.....	13
Production Tax Credit for Renewables.....	14
Heavy-Duty Vehicle Emissions and Diesel Fuel Quality Standards.....	14
Relaxed Standard for Reformulated Gasoline in the Midwest.....	15
New Rule on Airborne Benzene.....	16
Low-Emission Vehicle Program.....	16
Proposed Energy Legislation.....	17
Renewal of the Price-Anderson Act.....	21
Analysis of North American Natural Gas Markets.....	21
International Negotiations on Greenhouse Gas Reductions.....	22
Issues in Focus	27
The California Energy Crisis: Implications for Electricity Market Restructuring.....	28
Phasing Out MTBE in Gasoline.....	35
Multiple Emissions Controls in Electricity Markets.....	37
Modeling Energy Efficiency.....	50
Market Trends	55
Trends in Economic Activity.....	56
Economic Growth Cases.....	57
International Oil Markets.....	58
Energy Demand	61
Residential Sector Energy Demand.....	63
Commercial Sector Energy Demand.....	64
Industrial Sector Energy Demand.....	65
Transportation Sector Energy Demand.....	67
Energy Demand in Alternative Technology Cases.....	69
Electricity	72
Electricity Sales.....	72
Electricity Generating Capacity.....	73
Electricity Prices.....	74
Electricity Generation.....	75
Nuclear Power.....	76
Electricity Alternative Cases.....	77
Electricity from Renewable Sources.....	79
Natural Gas	81
Prices and Reserve Additions.....	81
Production and Imports.....	82
Consumption.....	83
Supply and Consumption.....	84
Alternative Cases.....	85
Oil	81
Prices and Reserve Additions.....	86
Production and Consumption.....	87
Alaskan Production and Imports.....	88
Petroleum Imports and Refining.....	89
Refined Petroleum Products.....	90