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Remarks  
Please acknowledge receipt directly to DOE on behalf of DCI.

  
 Executive Secretary  
 1 August 1984  
 Date

CTA  
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Department of Energy  
Washington, D.C. 20585

Executive Registry  
84-2300/1

III DDE-04133/1-84  
ER89-48894/1  
DDE 84-7268/1

Honorable William J. Casey  
Director, Central Intelligence  
Agency  
Washington, D.C. 20250

Dear Mr. Casey:

Enclosed are two copies of "Energy Activity and Its Impact Upon the Economy," the economic appendix to the National Energy Policy Plan (NEPP). As you know, the NEPP reiterates the Administration's determination to approach energy as one aspect of our overall economic policy.

Consistent with past practice, this report uses macroeconomic simulation models to project economic effects, including household expenditure effects, of alternative NEPP energy price paths. A unique feature of this report is the emphasis on microeconomic aspects of energy activity, including fuel substitution behavior. In addition, a section has been developed to characterize how energy activity is linked to economic activity within most large-scale macroeconomic models. The major deficiencies associated with the energy-economy linkages as presently modeled also are discussed.

I hope you will find the report useful and informative, and I would welcome any comments or questions you may have.

Sincerely,

*Jan W. Mares*  
Jan W. Mares  
Assistant Secretary  
Policy, Safety, and Environment

Enclosures



L-275



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# ENERGY ACTIVITY AND ITS IMPACT UPON THE ECONOMY

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A Technical Report in Support of  
the National Energy Policy Plan

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June 1984

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U.S. Department of Energy  
Office of Policy, Planning, and Analysis

DDI- 04133-84/1

17 JUL 1984

MM. ER 84-2300  
DDI 7268/1-84  
ER 83-4889/1

MEMORANDUM FOR: Director of Central Intelligence

VIA: Deputy Director of Central Intelligence  
Executive Director

FROM: Robert M. Gates  
Deputy Director for Intelligence

SUBJECT: Proposed DCI Response to Energy Secretary Hodel (U)

1. Action: Your signature on the attached reply to Secretary of Energy Donald Hodel's letter to you of 3 July requesting the Agency's proposals for strategies, programs, and initiatives that might be considered during preparation of the next National Energy Policy Plan. (U)

2. Background: The National Energy Policy Plan, submitted by President Reagan to Congress as required by law, is one of the Department of Energy's basic policy documents. It notes the principal goal of U.S. national energy policy is to foster an adequate supply of energy at reasonable costs. A dual strategy of minimizing federal control and involvement while promoting a balanced and mixed energy resource system has been adopted to achieve this goal. Federal programs in international energy security and cooperation, including emergency preparedness, international cooperation, and energy trade and transportation development, are critical to the strategy of promoting a balanced and mixed energy resource system. (U)

Robert M. Gates

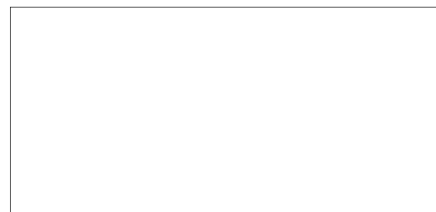
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L-275

SUBJECT: Proposed DCI Response to Energy Secretary Hodel (U)

DDI/OGI/SR [redacted] (17 July 1984)

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Central Intelligence Agency

Washington, D. C. 20505

DDI-04133-84

20 JUL 1984

The Honorable Donald P. Hodel  
The Secretary of Energy  
Washington, D.C. 20585

Dear Don:

Thank you for your letter of 3 July requesting our proposals for strategies, programs, and initiatives that might be considered during the preparation of the next National Energy Policy Plan. As you know, the Agency does not analyze U.S. energy needs or programs or make specific policy recommendations. On the international scene, however, there are some areas where we believe U.S. strategies and initiatives might contribute toward meeting the overall goal of ensuring adequate supplies of energy at reasonable cost. (C)

In our view, a program of primary reliance on the marketplace should continue as the main strategy for Federal energy plans. Market forces, however, will require some form of international or coordinated cooperation from time to time during emergencies. Some progress has already been made on this front within the International Energy Agency with the recent announcement of a coordinated stock program. Further efforts need to be made to ensure that foreign countries pursue programs aimed at increasing oil stockpiles for use during a supply disruption. The IEA and member governments can also serve a useful purpose as honest brokers of information during a crisis, keeping the market abreast of details as they become known during periods of heightened uncertainty when rumors often dictate market reaction. (C)

On the issue of energy security, I believe it is important that we keep abreast of developments in the European gas market. I continue to be concerned by the Europeans' pessimistic views of their future gas needs, an outlook that is already causing some lack of momentum on developing alternative gas supplies for the 1990s. At the same time, the Soviets continue to seek new gas markets, recently reaching agreement with Turkey on a sale, and making overtures to Belgium, Greece, and Sweden. I believe we need to make a continued effort in the IEA and bilaterally to ensure that the Europeans do not allow themselves to become even more dependent on Soviet gas for lack of developing alternative supplies in a timely fashion. (C)

Yours,

/s/ William J. Casey

William J. Casey  
Director of Central Intelligence

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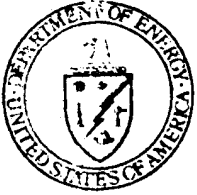
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SUSPENSE      18 July  
Date

Remarks: Please prepare response for DCI's signature.

  
 Executive Secretary  
 10 July 84  
 Date



THE SECRETARY OF ENERGY  
WASHINGTON, D.C. 20585

July 3, 1984

Executive Registry
84-2300

AH. DDI 726811-84  
ER 83-4889+1

Honorable William J. Casey  
Director of Central Intelligence  
Central Intelligence Agency  
Washington, DC 20505

Dear Mr. Casey:

The Department of Energy Reorganization Act requires that the President prepare a biennial National Energy Policy Plan (NEPP). As you know, in October 1983, President Reagan submitted the fourth NEPP to the Congress. A copy is enclosed for your review. That policy plan -- with a goal of ensuring an adequate supply of energy at reasonable cost -- has provided a framework of and focus for the full range of federal energy programs under this Administration.

The strategies we have pursued under NEPP IV have been to minimize government intervention in the marketplace and to promote a balanced and mixed energy resource system. As a result, domestic energy production has been increased, imports of insecure supplies of oil have been reduced, energy prices have moderated, and a more reliable, less vulnerable energy system has emerged.

We are now embarking on preparation of the President's fifth National Energy Policy Plan, to be submitted to the Congress in 1985. This letter is to request your input to that plan.

You are invited to submit your proposals for strategies, programs, and initiatives that we might consider during preparation of the next National Energy Policy Plan. Your guidance will be critical to continuing the progress we've made in charting the proper energy course for America.

May we have your input by September 1, 1984.

Sincerely,

DONALD PAUL HODEL

Enclosure



L-275





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# THE NATIONAL ENERGY POLICY PLAN

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October 1983

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A Report to the Congress  
Required by Title VIII of the  
Department of Energy Organization Act  
(Public Law 95-91)

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U.S. Department of Energy  
Washington, D.C. 20585

DDI- ~~7442~~/83/1

AH. ER 83-4889, +/1

14 OCT 1983

MEMORANDUM FOR: Director of Central Intelligence  
Deputy Director of Central Intelligence

VIA : Deputy Director for Intelligence S

FROM : [Redacted]  
Director of Global Issues

25X1

SUBJECT : Proposed DCI Response to Energy Secretary Hodel (U)

1. Action Requested. Your signature on the attached reply to Secretary of Energy Donald Hodel's letter to you of 6 October 1983 forwarding the 1983 National Energy Policy Plan and welcoming your comments and questions. We have also indicated what we are doing on the Secretary's 16 September request for help in finding someone to serve as the Department's Senior Intelligence Officer. (U)

2. Background. The National Energy Policy Plan, submitted by President Reagan to Congress as required by law, is one of the Department of Energy's basic policy documents. It notes the principal goal of U.S. national energy policy is to foster an adequate supply of energy at reasonable costs. A dual strategy of minimizing federal control and involvement while promoting a balanced and mixed energy resource system has been adopted to achieve this goal. Federal programs in international energy security and cooperation, including emergency preparedness, international cooperation, and energy trade and transportation development, are critical to the strategy of promoting a balanced and mixed energy resource system. (U)

3. As for the Senior Intelligence Officer issue, we have been in contact with Earl Gjelde, Special Assistant to the Secretary; for all practical purposes Gjelde also serves as the Deputy Secretary. We are trying to find out how they intend to organize their intelligence effort so that we can match it with the right person. We have gone this route before with DOE and want to avoid another round of wheel spinning--Gjelde agrees. (C)

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L-275

SUBJECT: Proposed DCI Response to Energy Secretary Hodel

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OGI/SRD/EV  (14 Oct 83)

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C O N F I D E N T I A L

Central Intelligence Agency



Washington, D.C. 20505

83-4889/1

24 OCT 1983

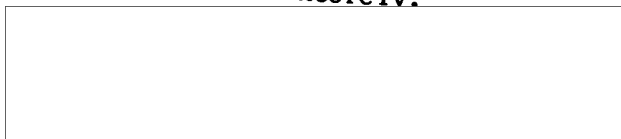
The Honorable Donald P. Hodel  
The Secretary of Energy  
Washington, D.C. 20585

Dear Don:

Thank you for your letter of 6 October forwarding a copy of the 1983 National Energy Policy Plan (NEPP). On the complex matter of world oil price projections, Agency energy analysts concur in the NEPP's assessment that, barring major changes in crude oil availability, real world oil prices will tend to fall in the next couple of years and should not begin to rise again until well into the second half of the decade. As you know, however, we remain deeply concerned about recent developments in the Persian Gulf and the risks posed to oil supplies.

Concerning our recent discussion on the intelligence needs of the Department, members of my staff are in contact with Earl Gjelde to determine the best kind of support the Agency can provide. As I understand it, discussions are centering on how the Department would like to organize the intelligence effort and the kind of person best suited to serve as Senior Intelligence Officer.

Sincerely,



William J. Casey  
Director of Central Intelligence

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C O N F I D E N T I A L



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Remarks:

Please prepare short acknowledgment for DCI's signature.

*JAX*  
 Executive Secretary  
 7 October 1983  
 Date



THE SECRETARY OF ENERGY  
WASHINGTON, D.C. 20585  
October 6, 1983

*(Handwritten mark)*

Executive Register  
83-4889

Honorable William J. Casey  
Director, Central Intelligence Agency  
Washington, D.C. 20250

Dear Mr. Casey:

Enclosed is a copy of the 1983 National Energy Policy Plan (NEPP), submitted by President Reagan to the Congress as required by Section 801 of the Department of Energy Organization Act (Public Law 95-91).

The Plan reiterates the Administration's determination to approach energy as one aspect of our overall economic policy. The goal of national energy policy is to foster an adequate supply of energy at reasonable costs. We have adopted two strategies for pursuing that goal: 1) to minimize federal control and intervention in energy markets while maintaining public health and safety and environmental quality and 2) to promote a balanced and mixed energy resource system.

Since the President assumed office, we have made substantial progress in all areas of energy, resulting in lower prices to American consumers and more efficient production of the Nation's domestic resources. In addition, our energy security has been enhanced through Administration actions in filling of the Strategic Petroleum Reserve and as a result of our market-based energy policy which has fostered a significant decrease in oil imports.

The NEPP also discusses the continuing need for action in the areas of natural gas decontrol and nuclear licensing reform and the importance we attach to continued progress in areas such as energy conservation, energy research and development, and international energy issues.

I hope you will find the NEPP useful and informative, and I would welcome any comments or questions you may have.

Sincerely,

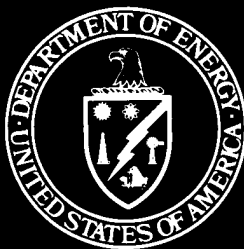
*(Handwritten signature: Don Hodel)*

DONALD PAUL HODEL

Enclosure



L-275



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# THE NATIONAL ENERGY POLICY PLAN

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October 1983

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A Report to the Congress  
Required by Title VIII of the  
Department of Energy Organization Act  
(Public Law 95-91)

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U.S. Department of Energy

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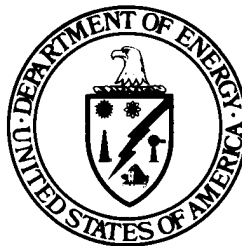
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# THE NATIONAL ENERGY POLICY PLAN

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October 1983

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A Report to the Congress  
Required by Title VIII of the  
Department of Energy Organization Act  
(Public Law 95-91)

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U.S. Department of Energy  
Washington, D.C. 20585

## **PREFACE**

**This National Energy Policy Plan is submitted to the Congress as required by section 801 of the Department of Energy Organization Act (Public Law 95-91). The technical reports that are referred to in this document will be issued by the Department of Energy after submission of this National Energy Policy Plan.**

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## NATIONAL ENERGY POLICY: A SUMMARY

The U.S. energy situation today is significantly better than it was in 1981 when the third National Energy Policy Plan was published. Since then,

- Total energy efficiency has increased.
- Domestic energy resources are being developed more effectively.
- Oil prices have declined.
- U.S. dependence on foreign energy sources has diminished.
- The Nation's vulnerability to energy supply disruptions has been reduced markedly, especially through additions to our strategic petroleum reserves and through lower levels of oil imports.

These conditions have resulted from a combination of complex factors, but a principal element in the improved U.S. energy situation has been the implementation of a national energy policy that was first described in the 1981 National Energy Policy Plan. This policy includes a *goal*, *strategies* for pursuing that goal, and federal *programs* and actions determined by those strategies. It approaches energy as one part of an overall economic policy based on less federal regulation, lower taxes, reduced federal expenditures, and maximum reliance on the private sector to make decisions about the production and consumption of commodities, including energy.

### THE NATIONAL ENERGY POLICY GOAL

*... an adequate supply of energy at reasonable costs ...*

The goal of national energy policy is to foster an adequate supply of energy at reasonable costs—a goal on which nearly everyone can agree. However, because judgments about what constitutes “adequate” or “reasonable” vary over time and with circumstances, energy policy realistically cannot attempt to define these terms precisely. Instead, our policy recognizes that “adequate supply” requires a flexible energy system that avoids undue dependence on any single source of supply, foreign or domestic, and thereby contributes to our national security. The concept of “adequate supply” further implies freedom of choice about the mix and measure of energy needed to meet our industrial, commercial, and personal requirements. At the same time, an adequate supply of energy for the United States is not independent of the energy supply circumstances of our

allies abroad. The international dimensions of energy security and emergency preparedness are fundamental aspects of the definition of adequate supply for ourselves. Finally, “reasonable costs” suggests economic efficiency and prices that permit residential users to use energy for heating and cooking without being required to alter their lifestyles; and it suggests that commercial and industrial users will be able to consume energy without reducing their competitiveness in domestic and international markets.

### STRATEGIES OF NATIONAL ENERGY POLICY

*... minimize federal control and involvement ...*

*... promote a balanced and mixed energy resource system ...*

The strategies adopted by the Administration for achieving our energy policy goal reflect the lessons of history about what has worked to produce the Nation's growth and prosperity. These strategies are:

- To minimize federal control and involvement in energy markets while maintaining public health and safety and environmental quality.
- To promote a balanced and mixed energy resource system.

These strategies will provide economic efficiency. They offer the best possible assurance that individuals and businesses throughout the Nation will have abundant and affordable energy available when, where, and in the forms it is needed.

Economic efficiency is at the heart of the Nation's prosperity. It allows our resources to be allocated according to their optimum value. It ensures maximum possible freedom and opportunity, and it minimizes production and delivery costs. By so doing, it sustains and advances the Nation's social, political, and economic achievements, resulting in a system that is vastly superior to any alternative.

*... minimize federal control ...*

The record to date of energy markets and the economy, as described in Chapter II of this Plan, demonstrates clearly that economic efficiency does not result from federal intervention and control. Over time, government intervention in the market does not work, primarily because it cannot deal adequately

with all the various factors in a system as complex as the Nation's energy system. Further, government intervention creates rigidities that prevent or discourage market forces from adjusting to change and uncertainty and leave no room for technological or economic breakthroughs.

The factors that determine energy supply and demand are changing constantly. As a result, some uncertainty is and will remain an important and unavoidable element in our energy situation. Our national energy policy assumes that no federal actions can eliminate this uncertainty over any extended period of time. In fact, the more the government intervenes in energy markets, the less flexible the system becomes and the less able it is to adjust efficiently—if at all—to changing circumstances. By minimizing federal intervention and thus encouraging flexibility, current policy does not straitjacket the economy to a single approach or to one set of assumptions about our energy future. Instead, it permits individuals and businesses to apply and to react to their respective views of the future and to reap the benefits, as well as bear the risks, of their decisions.

The strategy to promote economic efficiency and to minimize federal intervention does not assume, however, that all forms of government activities should be eliminated. In setting forth our national energy policy, we recognize that protecting the environment, maintaining health and safety standards, and improving energy security are appropriate government responsibilities. Limited control and intervention may be required to reflect nonmonetary costs to society as a whole of energy production and use.

Government actions to control energy prices or to allocate energy supplies in an attempt to protect consumers are certain to fail and are bound to create inequities. If a successful energy policy achieves its goal of fostering an adequate supply of energy at reasonable costs, but does not respond adequately to the income limitations of the poor, society may decide, as ours has, to provide assistance. However, attempts to provide this assistance by restricting prices or allocating energy resources will distort our national energy system while offering inadequate assistance to some and unintended windfalls to others. Therefore, national energy policy reflects our belief that those in need should be assisted directly, *not* as a part of *energy* policy, but rather as part of our national income maintenance policies and programs.

*... a balanced and mixed energy resource system ...*

Implicit in the goal of an adequate supply of energy at reasonable costs is the strategy of a balanced and mixed energy resource system—a system in which a number of energy resources, including fossil fuels, solar and other renewables, nuclear energy, and conservation combine to meet the Nation's energy requirements. Balance in this context does not imply equality. It means an economically efficient, flexible energy system in which the mix of energy supplies is appropriate to support economic growth and adequate to permit producers and consumers to choose freely among a range of energy options. Balance and diversity avoid undue dependence on any single energy source. Because of our desire for balance and diversity, national energy policy encourages research and

development of new and alternative energy technologies that may help ensure adequate supplies long into the future. This encouragement is provided by direct spending, by the deregulation of the prices of competitive fuels, and by a modified tax structure that encourages investment risk-taking and technology innovation, as well as by other means.

## FEDERAL PROGRAMS AND ACTIONS IN ENERGY

Since 1981, federal programs and actions based on the strategies described above have led to substantial progress and a reinvigorated national energy system. The following are some of those programs and actions:

- Price and allocation controls on crude oil and petroleum products have been removed, resulting in increased production of our domestic resources and lower gasoline prices to consumers.
- Federal energy regulations governing other forms of energy have been reviewed, and substantial numbers have been rescinded, withdrawn, or modified, thus eliminating needless and counterproductive federal intervention and its associated costs.
- Congress and the Administration, working cooperatively, obtained passage of the landmark Nuclear Waste Policy Act of 1982, which for the first time provides for a comprehensive national system for safe, permanent disposal of commercial nuclear waste.
- The Department of the Interior has revised substantially the procedures for leasing federal lands and the Outer Continental Shelf to ensure that the Nation's abundant energy resources are made available for exploration and development in accordance with strict environmental rules.
- The amount of oil in the U.S. Strategic Petroleum Reserve has tripled.
- Presidential policy statements have been issued to provide specific guidance for federal action in the areas of nuclear non-proliferation, nuclear energy, and coal exports.
- Federal energy research and development programs have been adjusted to emphasize basic and applied research and development that cannot be carried out by private industry. We have sought to eliminate from federal programs those large-scale demonstration and commercialization activities that are more appropriately designed and carried out by the private sector. As a result, total federal energy expenditures for research and development have been reduced, while federal funding for basic science research has been increased.
- Energy-related environmental regulations have been reviewed to strengthen enforcement standards and to improve public safety. The Clean Water Act requirements and regulations regarding the lead content in gasoline are cases in point.
- U.S. energy consumption has declined and domestic energy production has increased to the point where net

oil imports in 1982 fell to 4.3 million barrels per day, or about 13 percent of U.S. energy consumption, compared to the peak level of 8.6 million barrels per day (about 24 percent of energy consumption) in 1977 and 5.4 million barrels per day (about 15 percent of energy consumption) in 1981. These volumes include crude oil imported for the Strategic Petroleum Reserve.

As this National Energy Policy Plan is published, we have emerged from a recession; economic recovery clearly is under way. It is essential that the actions we take on energy and related public issues continue to support these economic improvements. Programs and actions to minimize federal intervention in energy markets and to encourage balance and diversity in our energy resource system will contribute significantly to economic efficiency, continued recovery, and future economic growth. In this connection, three areas of energy programs and actions are particularly important.

### Conservation

The first is energy conservation, which ought to be viewed by policymakers, producers, and consumers as a significantly important energy *resource*. That is, energy conservation should be seen as a set of actions that individuals and businesses can take that are cost-effective alternatives to new supply development. Energy conservation actions are often cheaper and easier to undertake, and they often make good business sense. Since the energy price shocks of the 1970s, energy use per dollar of gross national product has declined steadily; and important energy-efficiency improvements have occurred in a host of areas, from automobiles to homes and office buildings and manufacturing processes. These accomplishments, coupled with the stability of energy prices in general and the lowering of world oil prices within the past year, should not obscure the fact that further gains can still be made. Conservation is, and will remain, an important component of the available energy resource mix.

### Research and Development

The second area to which increased attention will be paid is basic and applied research and development. Federally sponsored research and development serves two critical purposes. First, it advances the frontiers of our scientific and technical knowledge and provides the fundamental building blocks for technological innovation. Simply stated, we do it because we are better off as human beings and as a Nation for having increased our understanding of nature and matter. Second, federal energy research and development programs support the development of new and alternative energy resources by providing scientific and engineering knowledge for further development outside the federal sector. Federal research and development programs in areas such as solar energy, conservation technologies, enhanced recovery techniques, magnetic fusion, breeder technology, and synthetic fuels are useful precursors to commercialization of the new fuels and technologies needed to foster a balanced and mixed energy resource system over the long term. Once basic and applied research and development have been accomplished, the pace at which new or alternative technologies are commercialized and marketed will be determined not by the federal government, but by

entrepreneurs and consumers. The federal government will continue to emphasize the importance of *technology transfer* efforts to ensure that the results of publicly supported research and development are available widely and promptly to the marketplace.

### Energy Security

The third critical area of energy programs and actions is that of energy security and international cooperation. U.S. participation in a world market for energy resources, particularly petroleum, demands that a high priority be placed on domestic energy policies and programs in the areas of national and international energy security. Federal programs that focus directly on our preparedness for an energy emergency include the development and continued expansion of the Strategic Petroleum Reserve (SPR), maintenance of the Naval Petroleum Reserve (NPR), emergency response planning, and frequent tests of our ability to respond to a wide range of possible energy emergencies. Domestic energy security is enhanced by a range of other federal energy programs, including oil price deregulation; regulatory reform efforts in natural gas pricing and nuclear licensing; leasing programs for federal lands and the Outer Continental Shelf; enhanced energy trade; and expanded research and development, including cooperative international research efforts.

The United States and its allies continue to work together to develop effective techniques for improving international energy security. Special emphasis is being placed on diversifying the sources of foreign oil supply and avoiding undue dependence on unreliable sources of energy. Thus, energy trade is likely to be an increasingly important aspect of international energy activity, and the United States ought to seek to increase its role as a reliable, cost-competitive energy trade partner. In addition, the United States must remain receptive to new technologies and ideas while continuing to exert its influence to ensure that nuclear non-proliferation, the security of natural gas supplies to Europe, and other issues vital to our national interest are satisfactorily resolved.

Two current legislative initiatives are particularly important to maintaining an energy system that will continue to provide an adequate supply of energy at reasonable costs.

### Natural Gas

The first, to which the Administration attaches high energy legislative priority, is the removal of controls on natural gas wellhead prices. Earlier this year, the Administration proposed the Natural Gas Consumer Regulatory Reform Amendments of 1983. This proposal was based on the major principles of (i) ensuring consumer protection for natural gas users, (ii) deregulating natural gas prices at the wellhead by a date certain to capture the benefits of competition in the marketplace, and (iii) adjusting contract provisions entered into in a regulatory environment. Since then, committee action has taken place in both Houses of Congress leading to bills that differ in various ways from the Administration's proposal. The Administration is committed to continued cooperation with Congress to achieve passage of this critically important legislation.

## **Nuclear Regulation**

The second legislative initiative, which exemplifies the principle of protecting public health and safety through appropriate federal regulation, is the Administration's proposed legislation to reform the nuclear licensing and regulatory process. The proposed reforms will modernize the nuclear regulatory process to reflect the current state of nuclear technology development. Of equal importance, nuclear regulatory reform will enhance public participation in decisionmaking processes, improve nuclear safety, and increase efficiency by reducing wasteful costs and delays attributable to the current regulatory process. As a result, the Administration's proposal will help ensure that decisions about the future use of nuclear energy are consistent with protecting public health and safety, are the result of deliberate choices by local decisionmakers, and are

not made by default because of the existing unpredictable and inefficient nuclear regulatory and licensing process.

These and other federal programs and actions in energy are discussed in greater detail in Chapter III of this Plan. Considered as a whole, they manifest our determination to move from an interventionist to a market-based energy policy and a continuation of policy directions set forth in the 1981 National Energy Policy Plan. In the relatively brief, two-year period since that Plan was issued, it is evident that national energy policy has benefited our national economy and consumers by providing stability in energy markets and by relying on the entrepreneurial, competitive, and innovative characteristics of the U.S. economy. Our goal of ensuring an adequate supply of energy at reasonable costs recognizes that energy is intrinsically interwoven in the economic, industrial, social, and political systems of the United States and the world.

## II

## ENERGY MARKETS AND THE ECONOMY: THE RECORD TO DATE

A brief review of the history of energy markets helps establish a perspective for the national energy policy described in this Plan. The strategies that have been adopted by the Administration for pursuing the goal of its national energy policy recognize the importance of the relationship between energy and our overall economy.

Energy plays a dual role in our national economy. Adequate supplies of energy are required to meet the physical requirements for fuel and electricity that allow us to maintain and to increase productivity, communications, mobility, and comfort. Energy prices, on the other hand, affect business and household energy expenditures as well as the overall performance of the economy. Changes in energy prices can affect production costs, wage levels, and, indirectly, interest rates, inflation, and investment decisions. When energy price changes are gradual or anticipated, adjustments by other sectors of the economy occur almost as a matter of course; when they are sudden or unanticipated, their effects may be severely disruptive in the short term. These disruptive effects can be exacerbated by inappropriate government policy responses such as the government controls on oil markets that were in place during the supply disruptions in 1973-74 and 1979.

Recollections of the "energy crises" of the 1970s may obscure the fact that, although energy is a vital part of an industrial society, it plays a relatively small direct role in total U.S. commercial and economic activity. In 1982, for example, less than 10 percent of U.S. consumer income was spent for gasoline and household fuels. Similarly, energy industries accounted for just over 15 percent of total U.S. industrial investment in new structures and equipment. Energy is a slightly larger component of international trade activity, accounting for 18 percent of total U.S. imports in 1982—compared to 24 percent of total imports in 1977, when oil imports reached 8.6 million barrels per day.

The history of energy in the United States is a record of various fuels and technologies replacing others in response to changes in energy demand, supply, and prices. Such transitions accompanied the Nation's changing technology base, ongoing economic development, and improvements in the quality of life. They occurred without federal controls on energy activity except for the federal government's regulation of interstate commerce, water development, monopoly powers, and feder-

ally owned lands; and while regional impacts varied, transitions in energy markets did not disrupt our national economy.

Before the 1950s, federal involvement in energy consisted largely of hydropower development and taxation policies intended to stimulate domestic oil production. In the mid-1950s, however, federal intervention in energy markets became much more extensive, first with the Supreme Court's 1954 *Phillips Petroleum Co. v. Wisconsin* decision, which extended regulation of interstate commerce in natural gas to pricing at the wellhead; and later with a 1959 Executive Order limiting volumes of imported oil—a response to the fact that demand for cheaper imported oil was increasing because domestic oil was more expensive to produce. Natural gas price controls and the oil import quota system continued throughout the 1960s, establishing conditions that would foster difficulties in the oil and natural gas markets during the 1970s. Meanwhile, however, the country continued to experience generally falling energy prices, high economic growth, and increasing demand for gas and oil.

As the economy expanded, U.S. demand for oil grew; and the volume of imported oil continued to increase despite the oil import quota system. Relatively cheap imported supplies displaced the development of costlier domestic resources. Domestic drilling had begun to decline in the 1950s, and U.S. additions to reserves dwindled from 2 billion barrels per year in the mid-1950s to less than 600 million barrels in 1973. U.S. oil production peaked in 1970; natural gas production peaked in 1973. Oil imports also displaced coal production because utilities and industrial users were turning to oil to meet sulfur emission controls imposed by federal environmental regulations. In the utility sector alone, demand for oil more than tripled between 1967 and 1973. Overall, demand for oil increasingly exceeded domestic production. As a result, oil import quotas became unworkable.

Shortly after the oil import quota system was rescinded in May 1973, the first of two oil supply disruptions occurred. During 1973, 17 percent of U.S. energy supplies—and, more important, 35 percent of crude oil and petroleum products—were imported. The oil embargo that began in October 1973 jolted international and domestic markets. The price of oil from members of the Organization of Petroleum Exporting Countries (OPEC) quadrupled by January 1974. In response



to widespread concerns over high prices and inadequate supplies, the Congress and the Administration froze into place existing federal price controls on domestic crude oil and petroleum products in a failed attempt to insulate consumers and the economy from the hardships of price increases. Also established were allocation controls intended to distribute supplies in accordance with perceived requirements.<sup>1</sup>

Oil price and allocation controls had several effects that proved detrimental to the U.S. economy. In the short run, they created the gasoline lines that frustrated the U.S. public. Over the longer term, they reduced incentives to develop U.S. energy resources by holding domestic crude oil prices below world prices. As a result, total domestic energy production generally stagnated from 1972 through 1978. At the same time, federal policy, which kept prices from rising, employed regulations to limit demand.

Maintaining artificially low oil prices during a period of rapid economic growth led to increased demand for oil. This demand, in turn, could only be met by ever-increasing levels of imports, and these imports, ironically, were subsidized by the federal government by averaging their costs with price-controlled domestic supplies. By 1977, net oil imports increased to almost 8.6 million barrels per day, or 46 percent of total U.S. oil consumption—nearly double net oil imports in 1972. Under free-market conditions, the increased world oil prices would have made domestic petroleum resources more competitive and would have stimulated increased exploration and production. For comparison's sake, in 1982, a year after federal price and allocation controls were eliminated, net oil imports were 4.3 million barrels per day—28 percent of total U.S. oil consumption.

The federal government's efforts, begun in 1975, to increase energy supplies by subsidizing development and commercialization of alternative energy technologies led to rapidly increased government expenditures. The situation was a classic example of how government attempts to control one part of the market inevitably create problems in other parts of the market. On the one hand, government controls were holding down the price of conventional fuels, thus ensuring that more expensive alternative energy technologies could not be competitive in the marketplace. On the other hand, rapidly increasing government expenditures to subsidize the demonstration and commercialization of new technologies were intended to accelerate the market penetration of these alternative energy sources.

In early 1979, when the second oil supply disruption occurred following the Iranian revolution, the hazards of government intervention in the market were illustrated graphically again. Despite the fact that neither the 1979 Iranian cutoff nor the 1973 embargo reduced oil imports to the United States by more than 10 percent, regional shortages and long gasoline lines occurred after both events. Federal price and allocation regulations created far greater dislocations than the actual supply losses warranted. The national energy policy initiative that could have been most effective in reducing the effect of the

<sup>1</sup>Phase IV of the Cost of Living Council's wage and price controls, with a two-tier price control system for crude oil, was in effect at the time of the October 1973 embargo. The Emergency Petroleum Allocation Act, enacted November 7, 1973, continued Phase IV crude oil price controls and initiated mandatory petroleum allocations and price regulations for most petroleum products.

1979 disruption—that is, the elimination of the price and allocation controls that subsidized higher imports and misdirected gasoline supplies, thereby making gasoline lines inevitable—was not considered to be a viable option. Nor was the Strategic Petroleum Reserve an option: at the beginning of 1979, it contained only 67 million barrels of oil, about a 10-day supply of crude oil imports at the demand level of the time. Moreover, the equipment to remove the oil was not operational.

The detrimental effects of federal controls also were felt in natural gas markets. The Supreme Court's 1954 *Phillips* decision effectively had created two markets: a price-controlled interstate system and an intrastate market that was not subject to federal price controls. Because intrastate markets could pay higher prices, much of the Nation's newly found natural gas reserves were dedicated to intrastate sales. The distorting effects of interstate controls became apparent by the mid-1970s, when distributors in the interstate market were unable to purchase sufficient gas at controlled prices to meet consumer demand. Because regulatory practices prevented prices from rising quickly enough to balance supply and demand, some users were denied access to gas supplies. Curtailments peaked in the severe winter of 1976–77 at close to 2 trillion cubic feet of gas, and to some it seemed as if the Nation were running out of natural gas. In fact, gas supplies were not running out. Once again, federal price controls had reduced incentives to bring an energy resource into the market. The Natural Gas Policy Act of 1978 made some progress in removing these disincentives by eliminating distinctions between interstate and intrastate markets and by providing production incentives through a complex system that allowed higher prices for gas developed from higher cost resources. But wellhead price controls remained and again have led to a different set of market distortions: increasing gas prices during a period of surplus supplies, disincentives to produce lower cost resources, and severe price disparities among various regions of the country that exceed those expected because of differences in transportation costs.

National energy strategies have been revised significantly in the past two and one-half years. An interventionist approach has been abandoned and replaced with increased reliance on the free market to do what no government agency can do—namely, to promote economic efficiency through innovation, fuel substitution, and development of new technologies.

The flexibility of the market to respond to changed circumstances and their accompanying price signals is illustrated clearly by recent trends in world oil prices. The dramatic oil price increases of the mid- and late-1970s stimulated conservation measures and contributed to the decline in oil demand—a decline further compounded by international recession. At prevailing prices, oil supplies, which were considered "tight" as recently as 1979, actually exceeded demand by mid-1981. The resulting surplus and the elimination of oil market controls combined to help push down the price of oil.

Downward price pressures were first apparent in the spot market. Later, they were confirmed by pricing actions taken by members of the Organization of Petroleum Exporting Countries. During 1982, these actions consisted primarily of statements relating to production quotas for member countries

along with informal discounting from official prices. Then, in response to declining world demand—by February 1983 world demand for OPEC oil had fallen to less than 15 million barrels per day, compared to 31 million barrels per day in 1979—OPEC reduced its posted marker crude oil price in March 1983 by 15 percent, from \$34 per barrel to \$29 per barrel.

The effects of market incentives on U.S. energy production and consumption also have been dramatic. Following the sharp world oil price increases in 1979–80 and the removal of government price and allocation controls on crude oil in 1981, total domestic oil production rose, including the first increase in production from the lower-48 states since 1970. In 1981, drilling and exploration for oil climbed to record levels. The production response from older oil fields was particularly significant, with additions to reserves from older fields more than double the reserve additions from new field discoveries in the 1980–81 period. More recently, lower demand coupled with tax changes and lower prices has caused a decline in the number of rotary rigs drilling exploratory wells, although the number of oil well completions and the total footage of wells drilled in 1982 still exceeded pre-1981 years.

Higher oil prices after 1979 also affected U.S. demand for oil and stimulated increased efficiency in energy use, fuel switching, and other conservation measures. The economy has proven to be capable of significant improvements in energy efficiency—greater than were foreseen prior to 1979. The rate

of energy use per dollar of gross national product fell by 10 percent between 1979 and 1982. U.S. demand for oil declined further as general economic conditions turned downward during 1980–82. By the end of 1982, diminished U.S. oil demand resulted in the lowest level of oil imports since 1972. As economic recovery continues, U.S. demand for energy is expected to increase and thus provide renewed stimulus to domestic energy production, including oil, coal, renewables, and other resources. Some increased demand for oil imports also is expected to accompany economic recovery; however, because of efficiency improvements and fuel switching, imports are not expected to return to their peak levels.

Since 1981, removal of government oil price controls, reduced economic activity, and consumer response to market-determined oil prices have been the major factors determining the Nation's energy situation. The ability of the market to respond to changing economic conditions has been enhanced significantly by a national energy policy that limits the federal role to the functions of establishing the boundaries of national security and public health and safety within which the market operates and of complementing private initiatives through basic research and development and economic management of publicly owned resources.<sup>2</sup>

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<sup>2</sup>Additional information is contained in the technical report *Energy Activity and Its Impact Upon the Economy*.

# III

## FEDERAL PROGRAMS AND ACTIONS IN ENERGY

The federal programs and actions described in this chapter of the National Energy Policy Plan are based on the energy strategies adopted by the Administration: to minimize federal control and involvement while maintaining public health and safety and environmental quality; and to promote a balanced and diverse energy resource system that is responsive to both domestic and international market forces and that will protect our national security interests. These strategies and the federal activities to implement them improve economic efficiency. At the same time, they enhance national energy security and allow maximum opportunity for the expression of regional differences in energy resources and requirements.

### MINIMIZING FEDERAL CONTROL WHILE MAINTAINING PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY

Implementation of a market-based energy policy since 1981 has required significant changes in the federal role in energy. Nowhere are these changes more evident than in the area of federal regulation. Three principal concerns guide federal energy regulation activities: the need to remove price controls where competitive market conditions exist; the need to continue and, as appropriate, to improve protection of the environment and public health and safety; and the need to maintain and ensure a regulatory framework that addresses these concerns in a manner that promotes market efficiency.

#### Oil and Natural Gas Decontrol

During every year of the past three decades, oil and natural gas have accounted for at least 60 percent—and in some years more than three-fourths—of the primary energy consumed in the United States. As indicated in Chapter II, the oil and gas markets have provided an important laboratory for observing the effects of government intervention and demonstrating the benefits of free-market pricing.

Price and allocation controls on crude oil, which had begun to be phased out in June 1979, were completely removed by Executive Order in January 1981. Thereafter, domestic drilling and oil production increased, arresting a 10-year decline in production in the lower-48 states. The removal of price controls raised incentives to search more intensively for new oil fields and encouraged greater investment in processes to

increase recovery from older fields, avoiding the high initial costs of exploration and development. Indeed, during 1981, additions to domestic oil reserves from these less costly extensions to old reservoirs yielded more than twice the volume of additions to reserves from exploration and development of new fields. These results indicate that decontrol of crude oil prices enables maximum production of the lowest cost domestic oil.

By allowing market forces to determine oil prices, national energy policy has produced direct benefits to U.S. consumers. Retail gasoline prices, which rose briefly after decontrol as a result of the December 1980 OPEC price increase, declined from a peak national average of \$1.39 per gallon in March 1981 to about \$1.27 per gallon in July 1983. Even with the addition of a 5-cent-per-gallon increase in the federal excise tax that went into effect on April 1, 1983, and despite some general inflation over the two-year period, nominal retail gasoline prices in July 1983 remained lower than they were during January 1981, the last month of price controls. In real terms, these prices were more than 15 percent below January 1981 levels.

While lower gasoline prices did not result solely from decontrol of oil prices, they do reflect the benefits that a combination of market forces have produced for the consuming public. These include increased domestic production, increased efficiency and competition in distribution, lower demand for oil here and abroad, and declining world oil prices since 1981.

Similar benefits have not yet been achieved in the case of natural gas, which remains the only primary energy source subject to government price controls. Implementation of a market-based system for natural gas is essential to achieving national energy policy objectives as they apply to natural gas, and it is critical to continued economic recovery and growth.

Natural gas accounts for 26 percent of total U.S. energy use, amounting to 17.7 trillion cubic feet in 1982. Ninety-five percent of the gas used in the United States is domestically produced; imported gas makes up the remaining 5 percent. As with other fuels, supply and demand for natural gas have changed over time. Federal price controls, however, have prevented the market from responding to these changes and, instead, have allowed gas prices to move only in an upward direction despite growing surpluses and declining demand. They have encouraged contract provisions that bind producers and pipeline companies to what, in an unregulated market,

would be irrational economic behavior. These circumstances have encouraged premature abandonment of older wells that could produce more supplies of less expensive gas and have skewed the gas market to economically inefficient production of higher cost supplies, thereby depriving consumers of lower prices.

The Administration's proposal to correct distortions caused by current federal regulation of the gas market is based on three fundamental principles: consumer protection against unreasonable price increases resulting from the status quo or from new legislation; gas deregulation of natural gas prices at the wellhead to capture the benefits of competition in the marketplace; and adjustments of contracts entered into in a regulatory environment that has contributed to the present situation in which gas prices escalate even though supplies are abundant. Within this framework, decontrol of all natural gas prices at the wellhead by a date certain is critically important to achieving a decrease in natural gas prices after legislation is enacted and to maintaining gas prices at a level that is lower than what would result from continued government controls. As indicated in Chapter I, the Administration will continue to work closely with Congress to obtain passage of natural gas decontrol.

The energy policy strategy to minimize federal control involves more than removing price controls. As indicated in previous sections of this Plan, a market-based national energy policy does not presume that the federal government should refrain absolutely from intervening in energy markets. Where markets do not readily reflect full costs and benefits to society, federal regulation may be required, as in the case of ensuring environmental, health, and safety objectives.

## **Environmental Regulation**

Almost all energy production and consumption activities use or affect environmental resources—air, land, and water. The benefits from increased use of environmental resources in the production and use of energy should be balanced with environmental costs in terms of opportunities to use these resources in some other fashion. In practice, however, debate and uncertainty usually accompany the calculation of costs and benefits, and definitive answers seldom emerge. Decision-makers are faced with the challenge of balancing the goals of energy policy within the broader context of economic policy, while giving adequate consideration to environmental concerns.

Federal efforts to ensure that the Nation's energy system remains environmentally sound fall into two categories: analyzing the probable environmental consequences of energy technologies through research and development programs, and promoting cost-effective regulations. Both efforts advance environmental interests by ensuring that energy prices reflect environmental costs and benefits to society.

Several important regulatory policy initiatives have been taken in the past two and one-half years to promote an environmentally acceptable system of energy production and use. A single standard for lead content in gasoline has been applied to all producers. Although this initiative resulted in increased production costs for some refiners and blenders, the adverse

health implications of airborne lead emissions justified its adoption. In the case of Clean Water Act requirements, initiatives have been taken to strengthen the enforcement of existing standards, to streamline the permit issuance process, and to increase the authorities and responsibilities of the states. These efforts are aimed at developing more effective regulatory strategies to maintain and to enhance water quality. Finally, initiatives aimed at allowing market forces to operate freely can promote environmental protection. Such is the case with the Administration's proposal to deregulate natural gas. This policy initiative will serve both consumer and environmental interests by allowing increased use of a plentiful domestic energy source that is generally considered to be the most environmentally preferred of all fossil fuels.

In the area of acid rain—perhaps the Nation's most controversial energy-related environmental issue—national energy policy has supported accelerated research to determine how acidic compounds are formed in the atmosphere and the relationship between air emissions and acid deposition effects. The National Academy of Sciences and the White House Office of Science and Technology Policy recently released their findings on the acid rain phenomenon, and an interagency group that includes the Environmental Protection Agency and the Department of Energy is reviewing these and other research findings and alternative options for mitigating the adverse effects of acid rain. The national energy policy objective concerning acid rain continues to be one of achieving a scientific understanding of the atmospheric physics and chemistry and related characteristics of the acid rain phenomenon and of avoiding premature or excessive regulatory initiatives that might increase consumer prices significantly without providing corresponding benefits in controlling acid rain.

Energy and environmental objectives may appear to conflict more frequently than they converge, but they are not mutually exclusive. The question is not one of "either/or"; rather, it is a matter of determining how we can achieve both. Overall, public health has improved significantly as industrial society has advanced. In many cases, such as production of unleaded gasoline or flue gas cleanup, added energy consumption is required to achieve environmental protection. In addition, many current initiatives to promote a balanced and mixed energy system, such as the emphasis on conservation and renewable energy as well as the proposed deregulation of natural gas prices, can result in positive environmental effects. National energy policy is committed to achieving both objectives: adequate supply of energy at reasonable costs and an environmentally acceptable mix of energy supplies.

## **Nuclear Energy Regulation**

Nuclear energy is of continuing importance to the Nation's economic growth and, along with coal, is economically more attractive over the long term for baseload electricity generation than either oil or gas. Nuclear power plants have been providing about one-eighth of the Nation's electricity supply for more than five years and are now operating in 26 states. Nuclear power fills more than half the total electricity requirements in some states; and by 1990, when most plants now under construction will be operating, nuclear-generated power is expected

to account for about 20 percent of our total national electricity supply. Beyond its importance in terms of domestic supply, nuclear-based electricity will be an increasing source of future worldwide energy supply because many of our allies have fewer cost-competitive energy options than the United States. All these factors make it imperative that the United States maintain nuclear power as a viable energy option and an area of U.S. technical leadership.

Decisions about whether to build and use nuclear power will remain matters of local determination. Unfortunately, segments of the public—consumers, public officials, industry, and even some regulators—no longer seem certain that current federal regulation of nuclear energy is capable of ensuring nuclear safety, despite the nuclear industry's enviable safety record.

If nuclear power is to remain a viable energy option for the future, the nuclear regulatory process must continue to ensure public health and safety and must become more predictable, timely, and efficient. Several actions taken since publication of the 1981 National Energy Policy Plan are intended to stabilize the nuclear regulatory process, improve nuclear safety, and enhance public participation in nuclear power decision-making.

In October 1981, the President issued his nuclear energy policy statement, which included as one of its principal objectives the development of a program for storing and disposing of commercial high-level radioactive waste. Safe, efficient management and permanent disposal of nuclear wastes is essential to the continued use of existing or future nuclear power plants as part of a diverse, balanced mix of energy supplies. Congress recognized this need by enacting the Nuclear Waste Policy Act of 1982, a landmark legislative achievement that provides the Nation's first comprehensive nuclear waste management program. The Act establishes rigorous schedules and processes for siting, constructing, and licensing geologic repositories for permanent waste disposal; provides for a utility-paid fee system under which the costs of waste disposal will be borne by the owners and generators of nuclear waste; prescribes that the Department of Energy submit a proposal for the construction of one or more monitored retrievable storage facilities by 1985; and requires that states be allowed to participate extensively in the processes concerning selection of waste repository sites. The Act's major objectives are to construct a permanent nuclear waste repository by 1998; to assist utilities in developing and licensing additional at-reactor storage capacity; and to provide necessary emergency federal interim storage.

The Department of Energy is implementing the Nuclear Waste Policy Act with high administrative priority. Nine potentially acceptable repository sites have been identified in Louisiana, Mississippi, Nevada, Texas, Utah, and Washington for possible selection as the Nation's first repository site. Literature surveys of geologic formations in several other states are being conducted to determine if these states contain potentially acceptable sites for a second repository. Governors and legislatures in the several states have been notified, and public hearings have been conducted in the six states with candidate sites for the first repository.

As required by the Act, the Department of Energy has begun collecting fees from utilities that use nuclear power to generate electricity. The fees will total approximately half a billion dollars per year by fiscal year 1987. In addition, about \$2 billion in fees will be collected from owners of inventories of spent fuel or high-level radioactive waste. The Department also has submitted a report to Congress on research and development that would be required for monitored retrievable storage facilities. By mid-1985, DOE will submit a proposal, supporting plans, and environmental assessments for the construction of one or more of these facilities. In addition, the Nuclear Regulatory Commission (NRC) has published a proposed rule establishing procedures and criteria for determining eligibility of utilities for federal interim storage of spent fuel, and has issued a rule addressing the administrative procedures and technical criteria for disposal of high-level wastes in geologic repositories.

Another objective of the President's nuclear energy policy statement is to streamline federal nuclear regulatory and licensing processes. Accordingly, the Administration has proposed the Nuclear Licensing and Regulatory Reform Act of 1983. This bill would provide five major improvements in the nuclear regulatory and licensing process: approval by NRC of suitable sites prior to filing of construction permit applications; approval by NRC of optional standardized designs for entire plants or major subsystems; a disciplined process for requiring equipment modifications on new and existing plants; an optional combined construction and operating license; and improvements in the public hearing process. Each of these provisions offers significant benefits independently of the others. Their combined effect will provide a more rational and integrated approach to nuclear licensing, resulting in improved safety, reduced costs, and, it is hoped, renewed public confidence in the reliability of nuclear-generated electricity.

Ultimately, the question of public confidence in nuclear safety is not simply a matter of federal responsibility. National energy policy, which leaves to states and localities the role of determining whether or not to build and use nuclear power, also assigns to them primary responsibility for developing contingency plans tailored to local conditions that are available for use in the event of emergencies. Federal regulations require that such plans be developed with adequate provisions for addressing the safety needs of those potentially affected in the unlikely event of emergencies at nuclear power plants. The federal government will continue to work cooperatively with states and localities in the development of such plans, and it will do so recognizing that the task of maintaining and renewing public confidence in government regulation and control of nuclear-generated electricity is shared by officials at all levels of government and must be accomplished as a matter of providing for our general welfare.

### **Federal Leasing**

The domestic energy resources of the United States are sufficiently abundant to ensure a secure, diverse mix of energy supplies under any reasonable projection of our energy future well beyond the year 2000. Timely, economic development of these resources to ensure future supply certainly will be deter-

mined in part by how well federal programs in leasing of public lands and the Outer Continental Shelf (OCS) support private sector initiatives and capital investment in exploration and development activities.

The federal government owns one-third of the Nation's onshore land and all the Outer Continental Shelf seaward of state ownership. In the lower-48 states, these federal lands and OCS areas contain a little less than half of the Nation's prospective crude oil and natural gas resources, about one-third of its coal resources, and almost three-fourths of its oil shale and tar sands resources. The federal government, because of its resource ownership, has a direct influence on future energy resource development through its onshore and OCS leasing policies.

To encourage private exploration and development of the Nation's energy resources to meet future U.S. energy needs, the federal government must allow a broad range of opportunities for investment in these resources, including making federal offshore and onshore resources available for leasing. In particular, the Outer Continental Shelf (for oil and gas) and the federal lands in the West (for coal) provide an important source of new reserves to replace domestic reserves produced to meet demand.

Long-term prospects and uncertainties, rather than short-term considerations, should determine leasing policy. There is a very long lag time between leasing and production of oil, gas, and coal. Resources leased this year will not enter production for at least 5 to 10 years, and they will not complete production for 15 to 40 years or, in some cases, longer. Production from federal lands today depends heavily on resources leased in the 1960s. Similarly, the value of leasing these resources is determined by the prices in effect when they are produced and current estimates of those prices, rather than simply by today's prices. Thus, companies will bid today for leases on the basis of their expectations of what prices will be in the future. If they expect prices to rebound and demand to be strong, they will bid higher and buy more leases; if they expect prices to remain low, they will bid less and lease only the best prospects and deposits.

Although future world oil prices are uncertain, we know that reserves of potentially competing energy supplies will help restrain future oil price increases. The federal government impedes this process at the risk of our national economic well-being if it restricts opportunities for companies to invest in exploration and development of our energy resources.

One of the major purposes of offering expanded areas for lease is to maximize energy investment opportunities for the efficient production of energy for consumers; it is not, as some suggest, merely to balance the federal budget. More federal revenue is obtained from royalties and taxes (plus expanded economic activity) on actual production than from up-front payments for the right—which may never be exercised—to explore for and to develop resources on federal lands. Far more important than federal revenues is the benefit to the economy as a whole of timely and efficient energy production. To maximize federal bonus payment revenues, some would have the federal government behave like a monopolist, restricting supplies to keep prices up. In the long run, the Nation is

better served by lower prices to consumers than by artificially inflating the average price of a tract in the pursuit of higher short-run federal revenues.

The U.S. Outer Continental Shelf continues to offer some of the most economically and environmentally attractive prospects for developing domestic energy resources. In fact, the record to date indicates that offshore oil production results in far fewer oil spills than transporting oil by tanker. To ensure that these offshore resources are made available for development, the Outer Continental Shelf leasing process has been streamlined. A vigorous but deliberate schedule is being implemented to make available major prospective producing regions. Also, this leasing process has been restructured to allow individual companies to decide on which specific tracts to bid, rather than to continue relying on the federal government to determine which limited prospects are most likely to be productive.

Onshore oil and gas development may be less prolific per well than offshore drilling, but it involves many more leases and individuals. The Administration has made major strides in reducing the previously lengthy backlog of unprocessed non-competitive lease applications, allowing more timely exploration and development. An increase in the filing fee has helped reduce this backlog and place the opportunities for oil and gas development in the hands of those who can best and most efficiently exploit those opportunities. In addition, increased filing fees have increased federal revenues. Major onshore oil and gas resources in Alaska have been made available for lease for the first time.

Coal leasing essentially was halted during the 1970s. Eighty-three percent of all current federal coal leases were issued in the 1960s or earlier; only 9 percent of current leases were issued in the 1970s, when a moratorium was in effect through much of the decade. Despite the many unforeseen changes in the energy market during the 1970s, federal coal leasing policy late in the 1970s embraced the notion that production requirements could be predicted by government and that, as a result, the federal government could and should tailor its leasing precisely to such predictions. The current Administration, understanding that circumstances change and that the private sector needs an extensive and diverse array of opportunities for development, has redesigned and revitalized the coal leasing program, again making federal coal available to energy markets, and ensuring that an adequate supply of coal reserves will be available for development when it is needed.

The regulatory and federal leasing accomplishments and initiatives of the past two years are principal elements of the national energy strategy to minimize federal control while maintaining public health and safety and environmental quality. They provide for economic efficiency, and they support implementation of the national energy policy strategy to promote a balanced and diverse energy resource system.

## **PROMOTING A BALANCED AND DIVERSE ENERGY RESOURCE SYSTEM**

Achieving a balanced and diverse energy resource system involves both public and private initiatives. The federal role in

putting this energy strategy maintains our national energy security and creates a technological and economic climate that encourages private innovation and investment. In this connection, federal programs and actions involve the full range of energy resources and a variety of national and international activities.

## Energy Resources

### Conservation

National energy policy regards conservation essentially as increased energy efficiency and views it as an energy resource—to be approached with the same market-oriented public policy strategy as are other energy resources. Conservation investment options by businesses and consumers frequently are competitive with new energy supply or fuel-switching investments.

Investment in energy conservation often makes good business sense. It need not be viewed as an altruistic activity or as a sacrifice. As our experience with conservation practices has expanded, our understanding of the technical characteristics and the economic returns of alternative conservation techniques also has expanded. The provision of technical and economic information is a particularly effective role for the federal government in terms of expanding the use of cost-effective conservation measures. On the other hand, the Administration does not support an emphasis on federal funding of large-scale conservation projects or the imposition of federal regulations upon consumers and businesses to conserve energy according to federal mandate.

Since publication of the 1981 National Energy Policy Plan, the Administration has implemented this approach by emphasizing market pricing of energy, redirecting federal conservation programs to emphasize basic research and development in materials and combustion processes, and modifying or eliminating federal regulations that attempted to mandate specific levels of conservation, regardless of cost or consumer preference. In addition, and consistent with the view that energy policy is part of overall economic policy, tax reductions provided by the President's Economic Recovery Program benefit conservation as well as other economic activities by freeing private capital for investment and research and development activities that will improve energy efficiency.

During the past decade, U.S. consumers have demonstrated the energy resource potential of conservation by using energy more efficiently in response to market conditions. Some federal energy conservation programs, including those that help provide increased information about the energy efficiency of equipment and appliances as well as about research and development programs, have contributed to the increased efficiency of energy use by U.S. consumers. Residential and commercial buildings in the United States today consume 20 percent less energy per square foot than they did 10 years ago. Energy consumption per capita has declined by 13 percent since 1973. Energy input per unit of industrial output has declined by 23 percent since 1973; between 1979 and 1981 alone, it fell by 10 percent. Fuel use per vehicle declined by 20 percent over the last decade. Similar energy-efficiency gains have been achieved in nearly every aspect of energy use. As a result, the overall rate of energy consumption per dollar of gross national product has

fallen by 19 percent since 1973, declining by 10 percent in the relatively brief period from 1979 to 1982. While early increases in automobile fuel efficiency were facilitated by fuel efficiency standards enacted in 1975, fuel efficiency and other energy conservation advances during more recent years occurred primarily as a result of consumer response to market forces, and not as a result of federal intervention in the marketplace.

Conservation has shown itself to be a unique, economic, and highly flexible energy resource applicable to all energy technologies and fuel types. It is not limited by geography or indigenous natural resources, and it may offer significant environmental advantages. No other energy resource can be tailored to individual needs or employed in increments as effectively as conservation, and each additional increment results in immediate energy savings, thus promptly reducing costs and offering return on capital investment. In short, conservation actions in response to changing market incentives have a degree of flexibility unequaled by any other energy resource option, and they will continue to be an important component of our energy resource choices made by consumers and businesses.

Energy conservation occurs in response to various forces at work in the marketplace. The most influential factor is the price of energy. Other important elements include changing economic conditions, new trends in technology, changing consumer preferences, and legislative and regulatory factors that directly and indirectly relate to energy use. These forces have produced both long-term, fundamental trends that can be expected to continue and short-term trends that may be temporary or may reverse themselves as conditions change.

Some of the more fundamental improvements in energy efficiency are a result of technological improvements, which have been spurred by the fact that energy is a significant cost of doing business. As new and more efficient equipment makes up a larger share of energy-using capital stock, the effects of these trends in conservation will become increasingly evident. In many cases, energy-efficiency improvements depend on changes to capital stock (machines, automobiles, appliances, and buildings)—changes that require time. In addition, the energy content of products and services consumed within the economy is expected to continue to change in ways that will tend to reduce the average content of energy contained within products and services. Advances in energy efficiency observed during the last 5 to 10 years give an indication of conservation's continuing potential, and they suggest that many conservation measures begun in response to the events of the 1970s are only now beginning systematically to affect national patterns of energy production and consumption.

Recent technological advances and current market conditions offer a wide range of conservation opportunities; national energy policy encourages private initiatives to take advantage of these opportunities. The Administration has supported existing tax credits for residential conservation investments to encourage private sector implementation of additional energy-efficiency improvements. On the other hand, the Department of Energy has not promulgated substantive mandatory appliance efficiency standards because, after full rulemakings, it was

determined that substantive appliance efficiency standards for eight consumer appliances were not economically justified, and for seven of the eight appliances such standards would not save a significant amount of energy. A more cost-effective approach to improved energy efficiency in appliances is accomplished by providing accurate information to consumers, and the Administration therefore supports continuation of the appliance labeling program. Conservation initiatives by states and the private sector also are encouraged through a variety of loan and grant programs administered by several federal agencies. For example, the Low Income Homeowner Energy Assistance Program (administered by the Department of Health and Human Services), while primarily designed to pay heating bills, allows up to 15 percent of the funds allotted to each state to be used as a block grant for weatherizing homes. Similarly, the Department of Housing and Urban Development's community development block grant program allows states to use some of their funds for weatherization programs. Private sector initiatives are provided through the Small Business Administration's loans to firms providing conservation or weatherization materials and services and the Department of Agriculture's loan/grant program for weatherizing rural homes and buildings.

National energy policy also seeks to foster a technical and economic environment that will ensure continued development of conservation's energy resource potential. The President's Economic Recovery Program provides broad-based benefits toward this end. In addition, federally funded research and development programs and related technology transfer activities specifically promote full development of conservation as a critical element in a balanced and diverse energy resource system.

### **Energy Research and Development**

To a large extent, research and development activity can be described in terms of the path of technology development and the stages through which new technologies pass until they reach the market as competitive energy investment options. Stated simply, the technology development path consists of five stages. *Basic research* involves the development of scientific knowledge, including a fundamental understanding of the physical and chemical properties of new or unconventional fuel sources or energy systems. *Applied research* includes the broad engineering and physical science aspects of specific energy technologies. *Proof-of-concept* is where enough is learned to establish the technical viability and basic engineering feasibility of a concept and to forecast its expected economic and environmental performance standards, permitting industry to make decisions concerning whether the concept merits further development. *Process development* involves increasingly larger scale systems where the objective is to reduce technical risks and to improve process operability, reliability, economics, and environmental impacts. *Commercialization* enables a new energy technology to gain acceptance in the marketplace.

In the two years since publication of the last National Energy Policy Plan, federal energy research and development funding has been redirected to emphasize basic and applied research and development and to move away from the

demonstration and commercialization efforts that dominated previous energy research and development policy. This change in federal research and development emphasis is consistent with the Administration's views concerning the federal role in research and development and reflects our confidence in the private sector's ability to make the best-informed decisions about the production and use of specific fuels, technologies, and energy-efficiency improvements. It also reflects the Administration's determination to recognize budget constraints and to use federal resources to their maximum advantage.

The federal role in energy research and development is concentrated in areas where the incentives for and availability of private investment are severely limited or nonexistent. In these areas, competitive rates of return on investment cannot be realized by private firms, either because they are difficult to predict or highly risky, or because they would require an exceptionally long time to be realized. The success of federal research and development programs in providing options for private investment and commercial development depends on effective *technology transfer*. The federal government does not have responsibility for the adoption of new energy technologies by the private sector and often is not a customer for such technologies. Its contribution to the development of future energy resources lies in the prompt and effective transfer of results from federally funded generic research and development activities to private entrepreneurs, innovators, businesses, and industry and in facilitating transfers of technology within the private sector. Traditionally, such transfer is accomplished through a variety of mechanisms, ranging from publications and symposia to advisory boards and peer reviews, and to federal laboratory access and patent policy. Recognizing the critical importance of effective technology transfer to the success of national energy policy, the Administration will intensify its emphasis on effective management of the process through which it is accomplished.

A balanced national research and development program that includes public and private funding and effective technology transfer enhances the Nation's ability to develop new technologies and to improve the efficiency and acceptability of existing technologies. The scope of federal research and development programs designed to accomplish these objectives is far too broad to describe in this Plan beyond the brief summary that follows.<sup>2</sup>

**Conservation.** Current and future market conditions offer a wide range of incentives for conservation initiatives by the private sector. Federally funded research and development, therefore, is selectively targeted to particular areas of energy efficiency that are not likely to be undertaken by the private sector alone. Examples include programs to develop alternatives to liquid fuels in automotive applications, advanced industrial and heat recovery processes, and improvements in the energy performance of buildings. In addition, federal research and development addresses scientific processes that cut across a variety of end-use applications, including combus-

<sup>2</sup>More detailed information about Department of Energy research and development activity is contained in the *Secretary's Annual Report to Congress*. (U.S., Department of Energy, *Secretary's Annual Report to Congress*, Government Printing Office, Washington, 1983. [DOE/S-0010(83)])



tion and fluid mechanics, electrochemistry, and materials and thermal sciences. As circumstances change and our understanding of certain energy-efficient technologies advances, the priorities and mix of research and development programs will be reviewed to ensure that federal efforts continue to provide a flexible, evolutionary process that supports private sector investment and application of energy-efficiency improvements.

**Renewable Resources.** Technologies that convert renewable resources into usable forms of energy—such as active and passive solar heating and cooling; photovoltaics; wind, biomass, and ocean thermal conversion; and geothermal energy systems—offer a vast potential source of energy supply. Many utilities are finding renewable energy to be a viable option for satisfying a portion of their needs for expanded electricity generating capacity. The Geysers geothermal field in northern California has been tapped by several utilities, including the Sacramento Municipal Utility District and Pacific Gas and Electric Company. A total of 902 megawatts-electric (MWe) of capacity were on line in 1981, with an additional 1,988 MWe projected to be available by the year 2000. Southern California Edison has in place or on contract more than 1,200 MWe of renewable energy generating capacity and plans to have a total of 2,150 MWe by 1990.

For many renewable technologies, however, advances still must be made before economically viable systems will be available to produce energy in major direct thermal applications and bulk electricity supply or to meet requirements for liquid and gaseous fuels.

Federal research and development programs in renewable energy are aimed at improving system efficiencies, reducing material costs, and improving system operating life. In solar heat technologies and photovoltaics, federal research seeks to develop less costly and more efficient materials. Biomass research is directed toward improving pyrolysis, liquefaction, and gasification processes. Wind energy research aims to validate analytic and modeling techniques and to test existing and advanced systems. Research in geothermal energy is designed to reduce the technical risks associated with exploiting the geothermal resource base.

The overall objective of these programs is to contribute scientific and engineering knowledge to the renewable energy technology base so that industry can develop systems for transforming renewable resources into energy forms suitable for widespread application.

**Magnetic Fusion.** One of the clearest examples of basic research in the federal research and development portfolio is the magnetic fusion program. In a fusion reaction, nuclei of the isotopes of hydrogen (deuterium and tritium) fuse under conditions of extreme pressure and temperature. The reaction creates helium and releases enormous amounts of energy in a way similar to the reactions that take place in the sun. Fusion energy has vast potential and could become a principal energy source in the very long term—well into the next century. Before it will have any practical application, however, numerous technical and basic scientific uncertainties that are being addressed by federal research must be overcome. Despite the very long-term potential of fusion energy, near-term benefits also are obtained from the U.S. fusion energy program in areas

as diverse as superconducting magnets, high-power accelerators, advanced material development, and advanced computer techniques.

**Fossil Fuels.** Continued long-term production of our domestic fossil resources will depend on the interplay between advances in extraction technologies, the difficulties of developing increasingly marginal known deposits, and discovery of presently unknown reserves. In the case of oil and gas, long-term production from conventional sources is likely to decline, certainly within the next century. In the case of coal, the known U.S. resource base—the world's largest known reserves—will be adequate for several centuries at current and projected rates of demand. Actual long-term development will depend importantly on the ability of private and public sector research groups to develop acceptable environmental protection technologies; adequate technologies for efficient use of coal, both directly and by conversion; and on the availability of adequate economical coal transportation facilities.

Federal research and development efforts in areas such as advanced coal cleaning, coal conversion, and enhanced oil recovery are intended to ensure economic development and use of domestic fossil resources over the long term. As fossil fuel prices rise because of resource exhaustion, which will probably happen sooner with oil and gas than with coal, other energy sources will become comparatively more economic.

**Nuclear Energy.** Nuclear energy has been a major element of the federal energy research and development program since the 1950s. The decision to develop commercial nuclear power was and continues to be based on our need to provide safe and economic alternatives to our finite fossil energy resources; and, hence, to help ensure reliable sources of the energy needed for long-term economic development and national security. Nuclear research and development is a lengthy and capital-intensive process that requires resources and capabilities normally outside the realm of the private sector. In addition, federal responsibility in the area of nuclear health and safety assurance is unique and essential. Thus, the federal government's role in nuclear power development is fundamental.

The original U.S. nuclear program strategy called for a two-stage approach: (i) to develop and commercialize light water reactors that economically could use the high-grade uranium resources initially available; and (ii) to develop breeder reactors that would use uranium much more effectively as those resources declined. The first part of that strategy is essentially complete, although the government continues to play a unique role in certain areas, such as improving the safety and reliability of nuclear power plants.

The second part of that strategy is well under way—the development of the liquid metal fast breeder reactor. The immediate goal of the Department of Energy's program is to develop the technology to a level that will enable industry to make appropriate commercial decisions with acceptable risks. Utilizing a systematic program of research, test facility construction and operation, and cooperative efforts with private industry, the federal government is pursuing a program to develop and demonstrate a breeder technology that private industry can commercialize as electric power demand and competitive market forces dictate. Furthermore, if the United

States is to maintain a position of leadership and influence in nuclear trade and non-proliferation matters—a position critical to our national security—it must continue to advance its scientific and technical competence in all areas of nuclear energy technology, but particularly in the area of the fast breeder reactor and its fuel cycle.

To this end, the Administration is requesting that Congress provide for partial federal funding to complete the Clinch River Breeder Reactor (CRBR). Although the CRBR is an exception to our general approach to energy research and development, its completion is the most cost-effective way of advancing breeder reactor technology—an objective of the President's 1981 nuclear energy policy statement.

The unique aspects of nuclear energy suggest that a substantial portion of federal energy research and development efforts will continue to be devoted to nuclear research and development. They do not, however, diminish the importance that national energy policy assigns to ensuring a balanced, diverse, and economically efficient energy system. Nor do they preclude continuing review of nuclear research and development budgets for the purpose of identifying appropriate alternative approaches. The recent efforts by Congress and the Administration to obtain additional private sector investment in the Clinch River Breeder Reactor plant serve as an example of the pursuit of such alternatives.

**Synthetic Fuels.** By some criteria, federal support for synthetic fuels development also may seem to be an anomaly of current energy policy. It should be noted, however, that the federal synthetic fuels program was established at a time when most projections of future energy trends suggested shortages and large price increases for oil and petroleum products by the end of the century. While world conditions have changed and current energy projections accordingly do not point to such shortages or to such large price increases, it is likely that over the longer term the lowest cost energy supply, as well as our national economic and security interests, will dictate the substitution of synthetic liquids and gas for present supplies of oil and natural gas. The same changes that have led to revised energy projections have resulted in currently diminished incentives for private investment in synthetic fuels. In these circumstances, some continued federal support for synthetic fuels development is warranted. In this connection, the Department of Energy is conducting research and development programs related to synthetic fuels, and the Synthetic Fuels Corporation is implementing a strategy of support for the most promising synthetic fuel technologies using a number of economic incentives.

### Electricity

Electricity is an important intermediate activity on the spectrum between energy producer and energy consumer. Electric power generation consumes about 33 percent of the primary energy used in the United States. Current DOE estimates indicate that electricity demand growth is likely to increase at an annual rate of 3 percent over the period 1982 to 2000. This is equivalent to the projected rate of GNP growth and would continue a trend over the past 10 years of matching average growth rates for electricity demand and real GNP. Since other

end-use fuel demand is projected to increase at less than the rate of GNP growth, the electricity share of final energy consumption is projected to increase during the remainder of this century.

Between 1973 and 1982, demand for electricity increased about 25 percent more than growth in the gross national product. Electricity prices per kilowatt-hour on a national average increased significantly less than those for other energy forms and, in real terms, were no higher in 1980 than in 1960, although real prices increased roughly 60 percent from their low point in 1970 to their highest level in 1982. But these national statistics mask substantial variations among different sections of the country, among various sectors of the economy, and between systems using different fuels to generate electricity. No other energy commodity shows as much regional price variation as does electricity.

The availability of an adequate supply of electricity at reasonable costs to meet current and future needs has come to be viewed as a "right" by many consumers. Although sufficient electricity supplies should be available throughout the 1980s, the long-term outlook for continued availability of reliable supplies is not certain.

Current estimates of future energy supplies do not project electricity shortages in this decade. According to one set of load-growth projections, however, significant additional generating capacity will be required to meet future demands, to replace obsolete facilities during the 1990s, to displace high-cost fuels (that is, oil and natural gas), and to provide for effective reserve margins.<sup>3</sup> Should these projections prove correct, 438 gigawatts of additional generating capacity would be needed by the year 2000. This translates into the need to build the equivalent of 438 large (1,000 megawatt) electric generating plants. Approximately 25 percent of this additional capacity is currently planned or under construction. The electric power industry would have to spend more than a trillion dollars in new capital investment between 1983 and the year 2000 to provide this additional generation capacity. Such an investment would not represent a larger fraction of gross domestic private investment than the industry has previously required. It would be a sizable capital undertaking for the industry—an undertaking made difficult by the fast-changing economic and energy conditions of the past decade.

Cost increases (especially fuel costs, which have increased from 15 percent to 35 percent of total production costs over the past decade) and rate regulatory practices, which resulted in underrecovery of investment and substantial increases in the ratio of noncash earnings (that is, future or accrued, as opposed to currently available earnings) to cash earnings, have combined to create serious disincentives for new investment in electric power facilities. Noncash earnings result from construction expenditures that are not permitted by regulation to be included in a utility's rate base for collection as current receipts and thus are not available to the utility as current earnings. As such, they are an important negative financial

<sup>3</sup>U.S. Department of Energy, *The Future of Electric Power in America: Economic Supply for Economic Growth*, Report of the Electricity Policy Project (Washington, D.C.: Government Printing Office, 1983). [DOE/PE-0045]

factor affecting investor ratings of a utility's financial risk and credit worthiness. Although some financial indexes for the electric utility industry have shown recent improvement, the industry continues to face significant financial disincentives to new capital investment.

The utility industry also faces an uncertain future supply and demand situation. More than 200 delays or cancellations of new coal-fired and nuclear power plants were announced during 1980 and 1981. About half these plants would have displaced projected higher cost fuels and therefore would have reduced future electricity prices for consumers based on mid-range NEPP-1983 price projections for oil and natural gas. Delays and cancellations of new generating facilities may be justified in terms of both market conditions and current financial disincentives that face utility companies as a result of rate regulation; however, the long-term economic and social costs to the Nation resulting from these regulatory disincentives to efficient investment will continue to be a significant issue for national energy policy.

The electric power industry has had to face radical changes over the past decade. The ability of the industry and its regulators at all levels of government to adapt to these changes will ultimately determine the sufficiency and efficiency of electric supplies in the long term. The federal role is important but limited. In areas where the federal government has responsibility (for example, nuclear licensing and wholesale rate setting), the policy should be to regulate in a manner that protects public interests and allows market mechanisms to operate in electric power supply and consumption. In areas where state or local governments have primary responsibility (for example, retail rate regulation), the federal government will offer its full cooperation, including information sharing, wherever possible, while continuing to defer to the authority of state or local governments.

Using this established division of responsibilities between federal, state, and local governments, the full cooperation of the various government entities will be required to enable the electric power industry to maintain its tradition of reliable service at reasonable costs.

### **Energy Security and International Cooperation**

Federal programs in the area of energy security are critical to our national and international security interests. U.S. energy security interests are enhanced by a range of federal energy programs, including many of those already mentioned, such as oil and natural gas price decontrol, leasing of federal lands and the Outer Continental Shelf, and research and development, including cooperative research and development efforts in the international community. Federal programs related directly to energy security include development of the U.S. Strategic Petroleum Reserve (SPR), management of naval petroleum reserves (NPR), energy emergency preparedness actions, nuclear non-proliferation agreements, energy trade, and related activities to secure energy supplies needed for our economic welfare and defense readiness.

#### **Emergency Preparedness**

The most effective actions taken by the United States to enhance energy security over the last two and one-half years

have been the removal of price and allocation controls on oil and the rapid filling of the Strategic Petroleum Reserve. Since the end of 1980, the amount of oil stored in the SPR has tripled, to more than 350 million barrels in September 1983. The Administration remains committed to construction and fill of SPR capacity to a level of 750 million barrels.

Together with private petroleum stockpiles (about 1.1 billion barrels in August 1983), the SPR can be a cost-effective form of insurance against the potentially severe effects of oil supply disruptions. Current market conditions—namely, lower U.S. import levels and very large amounts of spare world oil production capacity (estimated to be more than 10 million barrels per day in the second quarter of 1983)—reduce the potential effects of oil supply disruptions in the near term. The Administration, therefore, has moved to fill the SPR at a rate consistent with these conditions. As world oil market conditions change, the Administration will review SPR fill rates to ensure that the insurance provided by SPR is maintained in a manner that is cost effective.

In the event of a supply disruption, the United States will fulfill its international obligations and rely on unrestricted energy markets to distribute supplies domestically, including supplies drawn down from the SPR. Markets are far superior to any alternative way of allocating oil during supply disruptions. They permit prompt, decentralized, flexible responses to the uncertainties that accompany disruptions and thus avoid the rigidities of government controls that necessarily are based on historical patterns of consumption. We know from experience that government allocation schemes do not work. The U.S. experience with oil price and allocation controls during past disruptions included long gasoline lines and misallocations of supplies. This contrasts sharply with the experience of industrialized countries such as Japan, West Germany, and the United Kingdom that relied on market allocation and did not encounter such difficulties. The decentralized decisionmaking that characterizes market allocation permits supplies to flow to where demand is greatest and allows much more diversity of response—conservation, fuel switching, and domestic production. It also reduces the likelihood that the federal government, which at the outset consistently has overestimated the severity of past disruptions, will cause widespread damage by decisions that later prove to be wrong or misdirected.

In addition to further development of the Strategic Petroleum Reserve and reliance on the market to distribute oil supplies, the Administration will continue to strengthen the Nation's energy emergency preparedness efforts as part of our commitment to maintain and improve its defense and national security positions.

The Administration will seek legislation to ensure the availability and effectiveness of the Executive Manpower Reserves in domestic and international energy emergencies; to extend the International Energy Agency (IEA) antitrust defense to June 30, 1985, consistent with authorities contained in the Energy Policy and Conservation Act of 1975; and to correct shortfalls in existing emergency preparedness legislation, such as current provisions that require clarifications or that contain inconsistencies. In addition, the Administration and Congress are committed to improving federal-state coordination during an emergency period.

Comprehensive energy emergency preparedness can be furthered also by appropriate administrative action on a timely basis. The comprehensive energy emergency response procedures contemplated by the Energy Emergency Preparedness Act of 1982 are being improved. As part of this effort, several tests of emergency systems have been conducted, including the recent SPR drawdown exercise, and more are planned. In addition, an analysis of administrative actions is under way, designed to support the existing SPR drawdown plan and associated legal authorities.

### **International Cooperation**

No less important than the actions it takes domestically are the international efforts of the United States that support international energy security objectives. As the world's largest producer and consumer of energy resources, the United States is a leader in international energy policy by virtue of the example it sets in its choice of domestic policies and the role it plays in promoting cooperative approaches to the mutual energy concerns of the free world.

Consistent with U.S. national interests and international relations, the national energy policy goal of fostering adequate supplies of energy at reasonable costs applies, as well, to our international energy policymaking. Similarly, the U.S. approach is to rely on market forces at home and abroad and thereby demonstrate to others in our international energy relations that this strategy is in our mutual long-term interests. Implicit in this approach is achievement of energy stability and security in a manner that respects the sovereignty of other nations and reflects the need to accommodate and resolve broader mutual security issues.

Although the primary threat to the collective energy security of the United States, Western Europe, and Japan remains our continued vulnerability to oil supply disruptions, there have been a number of changes in the world energy situation since the oil supply disruptions of the 1970s that have strengthened significantly free-world energy security. For instance, the United States and its allies have diversified their sources of foreign oil supply. During the first six months of 1983, U.S. oil imports from Mexico and Canada were more than double our total oil imports from the Persian Gulf. Organization for Economic Cooperation and Development (OECD) countries, excluding the United States, also have diversified their sources of foreign oil supply, and since 1979 have decreased total dependence on OPEC oil from 40 percent to about 28 percent of their energy demand.

Since the 1970s, we also have witnessed energy-efficiency improvements and fuel switching in the international community parallel to those that have taken place in the United States. For example, since 1973 the rate of energy consumption per dollar of gross national product is estimated to have declined by 15 percent in OECD Europe and by a little less than 10 percent in Japan. During the same period, oil's share of total energy consumption is estimated to have declined by more than 10 percent in OECD Europe and by almost 15 percent in Japan. Despite this progress in energy efficiency and fuel switching, dependence on imported oil remains high in many countries; and, therefore, further reduction in vulnera-

bility and strengthening of emergency response measures continue to be primary international energy policy concerns.

Recent events have demonstrated the need for greater vigilance, for improved international cooperation, and for a more flexible approach to international energy policy to prepare better for new problems and new vulnerabilities. The overriding concern of our allies to reduce their dependence on imported oil has led to growing reliance on natural gas from the Soviet Union, a new source of vulnerability and concern to our collective energy security and to fundamental U.S. national security interests. Accordingly, a principal concern of this Administration's international energy policy involves national security interests and the importance of cooperative efforts to find secure and economic alternatives to increased Western reliance on insecure and prospectively uneconomic Soviet supplies.

Through the International Energy Agency, the Organization for Economic Cooperation and Development, and economic summits, the United States has participated in reassessing collective energy requirements and establishing a framework for international energy security. Within this framework, the United States will address natural gas security issues bilaterally and under the auspices of IEA/OECD; will maintain its strong commitment to the International Energy Program and the IEA oil emergency system; and will continue its support of IEA programs to remove market impediments, accelerate the development of new technologies, increase energy efficiency, and strengthen emergency preparedness. U.S. international energy policy also will continue to promote safe, reliable nuclear power and nuclear non-proliferation goals through the Nuclear Energy Agency and the International Atomic Energy Agency.

A major national security issue is the need to strengthen the international nuclear non-proliferation regime, while continuing to promote the peaceful uses of nuclear energy and maintaining the role of the United States as a reliable trading partner and stable supplier of nuclear material, equipment, and services. In accordance with the Nuclear Non-Proliferation Act of 1978, new and amended agreements for nuclear cooperation are being negotiated to clarify and strengthen the non-proliferation conditions under which the United States exports nuclear materials and equipment. In addition, the United States is continuing to work with other supplier nations to gain acceptance of strengthened uniform safeguards—an effort that will improve the international non-proliferation regime and place U.S. suppliers on a more equal basis with foreign suppliers.

### **Energy Trade and Transportation**

Actions by the United States in international energy matters affect not only energy security, but our economic progress as well. Continued economic recovery in the world's industrialized nations and the growth of developing countries, unless offset by gains in energy efficiency, inevitably will lead to long-term growth in total energy demand. Energy demand growth, coupled with the fact that the world's energy resources and technological capabilities are not distributed evenly, will lead to the increasing importance of energy trade and related energy transportation issues in national and international energy

policy concerns. As in other areas of energy policy, the U.S. goal is to foster adequate supplies of energy at reasonable costs by supporting a free-market environment that encourages economic efficiency. Since 1981, the United States has sent several official delegations to allied countries to promote expanded energy trade.

The vast reserves of domestic coal offer significant export potential. In 1982, the United States exported 106 million short tons of coal, slightly less than the 1981 high of 113 million short tons. Coal export levels in 1983 have fallen sharply in response to lower oil prices, lagging recovery from the recent recession, and increased competition from other coal exporting nations. The market will continue to determine the level of U.S. coal exports in competition with lower cost supplies from areas such as Poland, Australia, and South Africa. The competitiveness of U.S. coal in foreign markets will depend on the transportation costs incurred in moving the coal from mine mouth to the port of export and from there to foreign destinations. In a move to enhance the confidence of coal importing nations in the security of U.S. coal supplies, the Administration has continued to stress that coal destined for export will not be diverted to satisfy domestic demand except in the event of a national emergency.

Modernization of the Nation's port system can enhance America's competitiveness in the world trading community and reduce the cost of transporting coal and other commodities to overseas markets. Accordingly, the Administration has budgeted for and supports proposed financing arrangements that would allow expansion of port facilities consistent with port and user needs. User fees along with streamlined authorization and approval procedures would ensure that decisions to expand port facilities reflect market conditions.

Inland transportation costs will have a major impact on the competitiveness of U.S. export coal. Coal slurry pipelines, for example, may offer the potential to reduce inland coal transportation costs by increasing competition and encouraging expanded use of coal in both domestic and international markets. However, the construction of slurry pipelines involves questions of eminent domain and rights-of-way that are reserved to state and local authorities. National energy policy recognizes the role of state and local interests in balancing energy needs and property rights. At the same time, the development of an economical coal slurry pipeline industry would promote competition in inland coal transportation and would be in the national interest. In this connection, legislation may be worthy of consideration that would permit the exercise of federal eminent domain for slurry pipelines in a manner that protects state water rights and preserves the rights of individual property owners and states in eminent domain actions. Such legislation would not guarantee that coal slurry pipelines, in fact, would be built. If enacted, however, it would remove a barrier to market efficiency and the operation of competitive forces to transport coal for domestic consumption and international trade.

A second energy trade issue involves the export of domestic oil, particularly from Alaska. Current law permits exports of petroleum products, but prohibits exports of crude oil. U.S. petroleum product exports have tripled since 1977. Product

exports to the Pacific Rim countries have grown from 36,000 barrels per day in 1977 to 138,000 barrels per day in 1982, the majority going to Japan.

There are a number of important reasons for considering alternatives to the existing ban on the export of Alaskan crude oil. In 1982, the majority of oil imported by the Pacific Rim countries was from potentially insecure sources, with Japan depending on the Middle East for approximately 70 percent of its oil consumption and Korea importing from the Middle East approximately 79 percent of the oil it consumes. Substitution of Alaskan oil for some of the oil now obtained from insecure sources would strengthen the energy security of Pacific Rim nations, a stated goal of the International Energy Agency and, in turn, would enhance free-world energy security, including that of the United States. In addition, depending on specific provisions that might be adopted in connection with relaxing export restrictions, significant potential economic benefits could accrue to the United States. In particular, some portion of the Alaskan oil that currently is creating excess supplies on the west coast or is being shipped to U.S. Gulf Coast refineries—a distance of approximately 6,800 miles—could be shipped more cheaply over the 3,300 miles to Japan. This could have several beneficial effects. In particular, less expensive supplies for Gulf Coast refineries could be obtained from such sources as Mexico and Venezuela. Further, such trade would provide new opportunities for expanding Alaskan and west coast production.

The Administration recognizes that important considerations exist on both sides of the Alaskan export question (not the least being the health of the U.S. maritime industry); the Administration intends to work cooperatively with Congress to identify possible alternative approaches. The goals would be to provide economic benefits to the United States and to maintain its energy security while at the same time ensuring the energy security of the Pacific Rim countries and the free world in general.

Finally, the area of nuclear energy trade remains a principal concern of U.S. energy and foreign policies. As indicated previously, the United States remains committed to nuclear non-proliferation goals and provisions of the Nuclear Non-Proliferation Act of 1978. Within this framework, the United States has sought to reassure Western Europe and Japan that we are supportive of nuclear programs and that we recognize the vital role that nuclear energy plays in their energy systems. At the same time, the Administration has sought to expedite the processes for granting export approvals and licenses. Most important, the United States has emphasized to its nuclear trade partners that the strict control of sensitive materials and technologies must be ensured to preclude nuclear proliferation to unstable or sensitive areas of the world.<sup>4</sup>

Continued implementation of market-based domestic and international energy policies will promote increased efficiency and development of alternative resources and technologies. As a result, the United States and its allies will be better prepared to respond to emergencies should they occur. The United States

<sup>4</sup>Additional information on nuclear non-proliferation is contained in the *Secretary's Annual Report to Congress*. See footnote 2, page 14.

will continue its efforts to remove barriers to its domestic energy markets and to support the momentum for similar efforts within the international community.

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Energy as a major concern of national debate and policymaking is a relatively recent phenomenon, roughly dating to the oil embargo of 1973-74. Before then, relatively abundant supplies and declining energy prices made national energy policymaking and concerns about the federal role in energy

largely unnecessary. In less than a decade, the national posture on energy has evolved from "crisis" perceptions and attempts through federal intervention to shield our economy from the realities of change to renewed confidence in the ability of consumers and businesses responding to market forces to ensure adequate supplies at reasonable costs. National energy policy will continue to reflect confidence in American consumers and in businesses and the determination of this Administration to continue implementing the energy strategies that have resulted in significant energy accomplishments since 1980.

## IV

### 1983 NEPP ENERGY PROJECTIONS

This chapter briefly summarizes information contained in the technical report *Energy Projections to the Year 2010*.

Energy price increases of the past decade, which have stimulated conservation and the continuing process of innovation and technology improvement, make it very likely that increased market efficiency and production will continue to meet our national goal of adequate energy supplies at reasonable costs. The specifics of future energy prices and production are very uncertain and not subject to precise definition. The projections discussed in this chapter do not necessarily represent Administration policy or the beliefs of the President or the Secretary of Energy. They are, instead, presented in compliance with congressional mandate as one of a number of sets of projections that can be derived from mathematical modeling processes.

Like other private and government energy projections, the energy projections presented with this 1983 National Energy Policy Plan are inherently uncertain. Because projections cannot fully represent a number of important qualitative factors that influence energy markets—such as political events, consumer behavior, or policy changes—these NEPP projections involve a considerable amount of analytical judgment. As most energy analysts will acknowledge, projections cannot and should not be a substitute for common sense. Thus, the energy outlook presented here should be interpreted as simply a point of departure for understanding future energy developments.

- Although the outlook for future world oil prices<sup>1</sup> is highly uncertain, most analysts now agree that world oil prices probably will fall in real terms until the mid-1980s, barring a significant oil supply disruption. From 1985 to 1990, prices are projected to increase moderately in real terms. Beyond 1990, the outlook becomes increasingly uncertain.
- The oil price increases of 1973–74 and 1979–80 set into motion powerful energy conservation forces that are likely to continue, especially in terms of oil use. Energy conservation has become as important as various sources of energy supply in determining the future evolution of the U.S. and world energy situations. Therefore, more attention should be given to energy conservation trends in future energy projections.

<sup>1</sup>“World oil price” is defined as the average cost to U.S. refiners, including transportation and fees, of imported crude oil. This average reflects differences in quality among the various imported crudes purchased by U.S. refiners.

- Oil price increases also provided incentives for development of energy resources other than oil.
- The recent decline in world oil prices has added a new dimension to the uncertainty about future market conditions. Now, investment planners must be concerned about the potential for future price breaks.
- Under all but extreme assumptions, the United States and the rest of the world will remain dependent to some extent on oil supplies from OPEC for at least the next 20 years.

Nothing more clearly illustrates the difficulty in projecting future energy trends than does a review of past NEP and NEPP world oil projections. In less than five years (1979 to 1983), energy projections have changed dramatically. For example, mid-case projections of the 1985 world oil price, measured in 1982 dollars, have varied from a high of about \$47 (NEPP-1981) to a low of about \$25 (both NEP-1979 and NEPP-1983). Projections concerning free-world oil demand have varied from an increase of 1.5 to 2 percent per year until the year 2000 (NEP-1979) to slowly declining demand between 1980 and 2000 (NEPP-1981) to steady but moderately increasing demand (less than 1.0 percent per year on average) beginning in the mid-1980s through the remainder of the century (NEPP-1983). New information and changes in the world situation are the primary reasons for variations in these projections.

### ENERGY PRICE PROJECTIONS—1983

As a result of the unexpectedly low demand for OPEC oil, world oil prices have declined steadily since 1981, rather than climbing at a 2- to 3-percent-per-year real increase as assumed in NEPP-1981. Lower demand for OPEC oil has occurred primarily because of increased non-OPEC oil production, oil conservation, and fuel switching in response to the price increases of 1973–74 and 1979–80, lower energy demand caused by worldwide recession in 1981–82, and worldwide drawdown of crude oil and petroleum product inventories. A key question now is: How are current market conditions and trends likely to evolve both in the near and longer term?

For long-term planning purposes, oil prices are projected to follow a relatively smooth path; however, the actual price path most likely will repeat the volatile behavior of the past in response to economic conditions, unusually cold or warm weather, and other erratic events that directly affect world oil

demand and supply. Each smooth price scenario should be viewed as an average of many equally plausible but erratic paths. The short-term volatility is important since price fluctuations can increase the uncertainty of consumers and producers about the true state of longer term price trends. In any given year, the world oil price could be considerably above or below its underlying long-term trend.

Although there are large inherent uncertainties about future world oil prices, the current projection is that world oil prices will tend to fall in real terms until the middle 1980s. Beyond 1990, prices may rise in real terms, in which case, the major question would be whether (after averaging out fluctuations) they would rise only slightly faster than inflation or much more rapidly.

Other aspects of NEPP-1983 price projections include the following:

- World oil prices are likely to stabilize in the \$23- to \$30-per-barrel range in 1983 and 1984 (1982 dollars), unless the Iran-Iraq war suddenly ends (increasing world oil production) or the rate of world economic recovery slows (decreasing world oil demand) in 1984.
- Between 1985 and 1990, demand for OPEC oil is projected to increase as world economic activity expands. Sometime between 1986 and 1990, demand for OPEC oil is projected to reach 24 million to 26 million barrels per day. This level of demand should create significant upward price pressure in the world oil market.
- By 1990, the world oil price in 1982 dollars is likely to be between \$26 and \$40 per barrel. Thus, the price in 1990 is projected to be about the same as the \$34-per-barrel price just before the sharp real price decline observed in 1982.
- Beyond 1990, world oil prices are extremely uncertain and speculative, but are projected in real terms to reach between \$36 and \$80 per barrel by the year 2000 and between \$55 and \$110 per barrel by 2010. By that time, however, the emergence of alternative energy sources (or technological changes that cannot be anticipated) render current projections of dubious value.
- One conditioning factor influencing the projected range of price increases during the 1990 to 2010 time period is the assumption that the cost of unconventional oil sources such as shale oil and coal liquids will be in the \$50- to \$80-per-barrel range (1982 dollars) as opposed, for example, to the \$35- to \$50-per-barrel range assumed by NEP-1979.

## **U.S. ENERGY TRENDS—1983**

### **Primary Energy Consumed by the United States**

Before 1950, U.S. energy consumption grew at a slower rate than real economic output. From 1950 to 1973, energy consumption grew at about the same rate as economic growth, or about 3.8 percent per year. In NEPP-1983, the quantity of energy consumed between 1982 and 2000 is projected to increase at only about 1.3 percent per year, less than half the 2.8-percent projected annual rate of U.S. economic growth during that period. This amounts to an increase in energy con-

sumption during the period 1982 to 2000 of about 27 percent, from just under 35 million barrels per day oil equivalent (MMBOE) to 44 MMBOE.

From 1960 to 1977, there was a trend of steadily increasing reliance on oil imports that peaked at 24 percent of total U.S. energy consumption in 1977 (about 8.6 million barrels per day). Reaction to higher oil prices has reversed this trend. By the year 2000, U.S. net oil imports are projected to account for about 12 percent of total energy consumption (about 5 million barrels per day), compared to the 1982 level of 12 percent of total energy consumption (about 4.3 million barrels per day).

Starting in 1982, if U.S. energy consumption were to grow at the 2.8-percent rate projected for economic growth, the amount of energy consumed in the year 2000 would be more than 121 quadrillion Btu's (quads), about 30 percent more than the 93 quads projected, with an energy consumption increase of 1.3 percent per year. Consequently, improved energy efficiency in the economy is projected to be a very significant factor in determining long-term U.S. energy consumption patterns.

### **Energy Produced by the United States**

U.S. oil and natural gas production peaked at about 45 quads (about half oil and half gas) in the early 1970s. NEPP-1983 projects that increased investment in oil and gas development will maintain domestic production at close to 37 to 40 quads per year through the 1980s. Beyond 1990, oil and gas are likely to become increasingly difficult to find and develop, although unexpected breakthroughs in theories of where large undiscovered quantities might be found could alter this projected production path.

Coal, nuclear, and renewable energy use are projected to increase substantially over the long term. In particular, coal production is projected to increase in absolute terms more than that of any other fuel between 1980 and 2000. Contributing to coal's growth is an estimated 4-percent-per-year growth in U.S. coal exports (from about 90 million tons in 1980 to about 200 million tons by the year 2000). The chief uncertainty here is to what extent the costs associated with the use of coal could reduce its competitive advantages and, therefore, be reflected in lower coal production.

### **U.S. Primary Electricity Inputs**

Primary U.S. electricity inputs are projected to continue the historical trend of increasing as a percentage of total primary energy consumption (from 18 percent in 1960 to 31 percent in 1980 and a projected 42 percent of primary energy consumption by the year 2000).

Coal's share of electricity generation is expected to increase from about 50 percent in 1980 to 59 percent by 2000. Oil and gas are projected eventually to be priced out of most utility markets so that oil and gas generation drops from 27 percent in 1980 to about 8 percent by 2000. Oil and gas generation already has dropped to 17 percent since 1980; thus, a little more than half the projected decline already has occurred.

Nuclear expansion is expected to slow temporarily in the early 1990s once facilities currently under construction are completed. Nuclear's share of electricity inputs, however, is



projected to increase to more than 25 percent by the year 2010. The share of electricity generation provided by all renewables (hydropower, geothermal, wind, solar, etc.) is expected to increase from 12 percent to around 15 percent by the year 2010. During this period, hydropower's contribution is expected to drop from 12 percent to 8 percent, while the contribution of all other renewables grows to 7 percent of total electricity generation.

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As noted throughout this chapter, considerable uncertainty is attached to projections of future energy trends. Relatively

small changes in the assumptions upon which projections are based can result in significant changes to the energy outlook. New information and changing world conditions will alter NEPP-1983 projections as well as those of other analysts. No single set of projections is sufficiently reliable as the sole basis for future planning. The range of future energy projections and the expert opinions that appear in the technical report *Energy Projections to the Year 2010*, however, are sufficient to warrant two conclusions: our energy future will continue to be marked by uncertainty; and flexibility (which is best provided by relying on market forces and on the availability of a balanced mix of energy resources) offers the greatest opportunity for ensuring an effective response to uncertain conditions.

# V

## PUBLIC COMMENTS

### BACKGROUND

Title VIII of the Department of Energy Organization Act of 1977 requires that the President prepare and submit to Congress biennially a National Energy Policy Plan and that the views and proposals of all segments of the economy be taken into account in the preparation and formulation of the Plan. The Department of Energy solicited comments through a notice published in the January 20, 1983, *Federal Register*. The notice invited public comment at a series of public hearings that were held in Detroit, Tulsa, Atlanta, Washington, D.C., Burlington (Vt.), Sacramento, and Denver. Written comments also were solicited in the notice.

The Department received testimony from 136 persons at the hearings, as well as 111 written responses to the *Federal Register* notice. Comments were received from Members of Congress; state, local, and territorial officials; regional governmental organizations; officials representing industry, utilities, and professional organizations; public interest groups; religious and social service organizations; educational institutions; and individuals. Transcripts of the hearings and copies of the written comments are available in the Department of Energy's Freedom of Information Office Reading Room in Washington, D.C.

### SUMMARY OF COMMENTS

The comments received covered a broad spectrum of energy-related issues. Some offered general suggestions about energy policy; others included specific, detailed recommendations. The comments, which do not necessarily reflect the views of the Administration, have been categorized according to broad issue areas and are summarized below.

Energy security and emergency preparedness—specifically dependence on oil imports and the ability of the United States to respond adequately to an oil supply interruption—were issues of concern mentioned frequently. Many commentators expressed the view that the Nation cannot be completely secure until our dependence on oil imports from unstable and unreliable sources is considerably reduced or eliminated. Some believe that free-market forces during an emergency would ensure fair and equitable allocation of supplies; others suggested that the federal government should intervene during an energy emergency. Some indicated that federal intervention should be primarily in the role of coordinator, for establishing priorities and allocating supplies, while others felt that price controls or set-asides would be necessary.

Many believed that the development of the Strategic Petroleum Reserve (SPR) is an effective means for ensuring against supply disruption. Comments on the SPR ranged from a belief that the filling of the SPR should be accelerated to satisfaction with the current fill rate. Some concern was expressed about regional issues pertaining to the SPR, such as the potential distribution inequities in an emergency situation.

Issues related to conservation and renewable resources were of concern to many. Those who supported government conservation and renewable energy programs expressed concern that these programs were underfunded and that current policies favor nuclear programs at the expense of solar and conservation programs. Many respondents encouraged the continuation of business and residential tax credits for conservation and renewable investments. Commentors also urged continued federal support for state and local energy conservation programs, especially for the Weatherization Assistance Program and the Low Income Energy Assistance Program, separate from general block grants to the states.

It was suggested that the Residential Conservation Service (RCS) should be ended because sufficient market incentives already exist for home energy audits and that the cost of subsidized audits is not justified and burdens utility ratepayers. Others, while saying that the RCS program needed some reform, contended that it nevertheless was beneficial. Energy education and information programs also received attention, with some respondents maintaining that support for additional or expanded programs was important.

Comments pertaining to specific renewable energy resources included objections to preference being given to applications by municipally owned utilities and rural electric cooperatives in cases involving the relicensing of hydroelectric power plants; support for increased federal assistance for the production of alcohol fuels; and support for additional funding for photovoltaics.

Many respondents expressed concern about the role of nuclear energy in the Nation's future and questioned the continued funding—described by some as subsidization—of nuclear power in light of the Administration's commitment to free-market forces. Others supported the development of nuclear power because it would increase the Nation's energy independence. Other nuclear-related issues concerned regulations, particularly those associated with permitting and licensing; nuclear waste disposal and nuclear safety; and breeder technology. Opinion concerning nuclear waste generally

avored programs to deal with nuclear waste disposal. Opinion on all other nuclear issues ranged from urging more federal involvement to cancellation of nuclear power plant projects.

Comments pertaining to oil issues included opposition to additional taxes on oil, including an oil import fee; support of repeal or the phasing out of the windfall profit tax; and both support for and opposition to removing restrictions on mineral exploration of public lands, particularly the Outer Continental Shelf.

Issues pertaining to natural gas, particularly natural gas decontrol and problems associated with the Natural Gas Policy Act of 1978 (NGPA), were mentioned quite frequently in the comments. Partial or complete decontrol of natural gas prices was both supported and discouraged. Problems associated with the NGPA were mentioned repeatedly, and various solutions were offered, including support for amending or repealing the NGPA. Some suggested that legislative changes were needed to alter current contract provisions between gas producers and distribution and pipeline companies.

A number of comments favored increasing coal production and use, coal exports, and federal support for coal research and development. Reducing regulatory impediments to coal use also was mentioned. The major objections to increased use of coal revolved around environmental issues. Those commenting on coal transportation issues supported granting coal slurry pipelines rights-of-way across federal lands and the right of eminent domain.

Federal support for research and development in synthetic fuels, including coal gas and shale oil, also was favored as one component of a program to ensure energy security. Other

comments suggested that synthetic fuel subsidies should be reduced and that the environmental problems associated with use of these fuels should be addressed instead.

Issues related to human health and the environment were mentioned frequently. Of primary concern were health and environmental hazards associated with nuclear power, including nuclear waste, and coal and synthetic fuels. Comments included support for continued or additional control requirements and for research on the environmental effects of coal use, particularly the causes and effects of acid rain, and support for the modification or elimination of the environmental constraints on the use of fossil fuels, including modifications to the Clean Air Act that would relax air quality standards.

Some encouraged increased federal support for both basic research programs and applied research and development programs. It was suggested by some that the government should provide limited support for some demonstration projects. Opponents, however, stated that government assistance in these areas will inhibit or delay private efforts in research and development because of the possibility of obtaining federal assistance.

The views mentioned above covered the full spectrum of national opinion on energy issues. Although some of the comments may not be in accord with the views of the Administration, it nevertheless is important to have the benefit of a broad range of opinion from all sectors of the economy. This process has been designed to ensure such participation, and the comments received have been helpful.

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