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National Energy Strategy 2/20/91 [OA 6855]

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(Lange/Cawley)  
February 15, 1991  
11:00 A.M.  
[ENERGY.DOC]

PRESIDENTIAL REMARKS: ENERGY POLICY BRIEFING  
ROOM 450, OEOB  
1:15 P.M.  
WEDNESDAY, FEBRUARY 20, 1991

Admiral Watkins... [acknowledgements].

This afternoon I'm pleased to release our comprehensive National Energy Strategy -- to ensure that our energy future is secure, efficient, and environmentally sound.

Thanks to Admiral Watkins and the ~~heroic~~ efforts of many, we now have a carefully-balanced strategy that will diversify America's energy sources; spur efficiency, conservation and competition throughout the energy sector; give Americans greater choice among fuels; and improve U.S. research and development in new technologies.

The driving force behind this strategy is straightforward. It relies on the power of the marketplace, the common sense of the American people, and the responsible leadership of industry and government.

Every American will benefit from the policies we're laying out today. Over the next two decades this strategy will make America ~~27-percent~~ more energy efficient -- without energy taxes or oil import fees. It will save consumers ~~at least \$750 billion~~ in energy costs ~~and~~ <sup>it will</sup> assure our energy security, by reducing our ~~total~~ <sup>extracted</sup> oil imports by a third.

~~Some will suggest that reducing our energy vulnerability won't be enough that we need more drastic measures. But~~ We're

Let's talk about some facts:

Foreign Oil consumption has been climbing for — years. And now stands at —. Too much of our imports come from sources in troubled parts of <sup>2</sup> ~~the world~~ <sup>the world</sup>. We also know that a long way from total energy independence. — and we must avoid unwise and extreme measures ~~that~~ <sup>to reduce oil imports</sup> would seriously hurt American consumers, American jobs, and American industries. ~~So~~ Instead, we must pursue an energy strategy that is judicious and comprehensive.

This strategy strikes a reasonable balance, by increasing production and reducing demand. It will help us to find more sources of reliable energy -- through uncompromisingly safe and environmentally sound development. And it will help us do more with less -- by encouraging alternative fueled vehicles, conservation, and mass transit.

With this strategy, we envision an energy future of unprecedented choice and flexibility.

Instead of only finding gasoline at the corner station, we want Americans to be able to choose from a range of environmentally sound fuels -- like methanol, ethanol, electricity, propane, and natural gas.

Where Americans were once able to buy energy for their homes from one utility company, we want to make it easier for other companies to enter the industry, and give consumers alternatives.

And where the nation's overall energy well-being used to be dictated by big cartels and powerful interests, we want to build an energy future based on <sup>a range of</sup> diverse sources.

This approach will give Americans the flexibility, opportunity and knowledge they need to conserve, to change fuel sources, and to cut their energy bills.

Finally, we believe this strategy will keep America on the cutting edge of new energy technology. We intend to build a joint industry-government partnership, for accelerated research in technologies like biomass and alternative fuels, electric vehicles, fusion, high speed rail, renewable sources like solar and wind power, and nuclear technologies of unprecedented safety and security.

Together with our Clean Air Act, this National Energy Strategy will maintain our uncompromising commitment to energy security and environmental protection. And it will put America on the road to continued economic growth, in the decades ahead.

# # #

A NATIONAL STRATEGY

How We Expect To Produce and Use Energy in the Future

The National Energy Strategy lays the foundation for a more efficient, less vulnerable, and environmentally sustainable energy economy. It defines international, commercial, regulatory, and technological policy tools that will substantially diversify U.S. sources of energy supplies and offer more flexibility and efficiency in the way energy is transformed and used. Specifically, it will spur more efficiency and competition throughout the energy sector, expand the fuel and technology choices available to the Nation, improve U.S. research and development (R&D) know-how, and support the international leadership the United States exercises in energy, economic, security, and environmental policy.

The objective of the National Energy Strategy, as established by President Bush in July 1989, is—

achieving balance among our increasing need for energy at reasonable prices, our commitment to a safer, healthier environment, our determination to maintain an economy second to none, and our goal to reduce dependence by ourselves and our friends and allies on potentially unreliable energy suppliers. (4)

The President directed that "a keystone of this strategy" be continuing the successful policy of market reliance. Wherever possible, markets should be allowed to determine prices, quantities, and technology choices. In specific instances where markets cannot or do not work efficiently, government action should be aimed at removing or overcoming barriers to efficient market operation.

The goals of a healthy environment and reduced dependence on insecure suppliers represent national security, foreign policy, and social benefits to which markets are unlikely to give adequate weight. Hence, government must act, alone or in

concert with private markets, to appropriately incorporate these considerations. However, regulations and other government interventions are extremely blunt tools that always impose unforeseen costs by reducing the flexibility of the economy. Therefore, government intervention in markets must be justified by rigorous cost-benefit analysis and rely to the maximum possible extent on economic incentives to allow the economy to achieve our energy security and environmental goals at the lowest possible cost.

This is the framework we used to evaluate the proposals for this Strategy that were submitted by people and organizations all across the country. These submissions were essential to building a National Energy Strategy that fully addresses the energy challenges and opportunities before us.

The Strategy also builds upon a number of Bush Administration initiatives. These include: (1) the 1990 revisions to the Clean Air Act; (2) natural gas wellhead decontrol legislation in 1989; (3) incentives provided to domestic renewable and fossil energy producers in the fiscal year 1991 budget agreement; (4) the unprecedented international consensus forged in the wake of the Persian Gulf crisis; (5) the fiscal year 1991 and 1992 realignments of the Department of Energy's research and program priorities; (6) the Administration measures in response to the Iraqi oil disruption; and (7) the science and mathematics education initiatives by the Secretary of Energy. (7) adopted

domestic energy supply and demand

Future energy use will be more efficient because of the market-driven use of new technology in place of older technologies, and because of ongoing public and private sector efforts to promote energy efficiency (for example, State efforts to promote integrated resource planning). We estimate

that under current policies,<sup>1</sup> the amount of energy used in the United States to create a unit of gross national product (GNP) will decrease by almost 12 percent in the year 2000 and more than 20 percent in the year 2010 over today's energy-efficiency levels. This represents a savings of 13 quads<sup>2</sup> of energy in 2000 and almost 30 quads in 2010.

slightly

more than

The challenge of the National Energy Strategy is twofold: (1) to reinforce these current policy measures to make sure that the progress we believe is probable is actually achieved, and (2) to accomplish even greater improvements in energy efficiency, in security, and in the reduction of energy environmental impacts than would be achieved by current policies alone. To meet these challenges, the Strategy calls for action by Federal, State, and local governments and by domestic and international energy producers and consumers. This National Energy Strategy provides a roadmap to a more secure and cleaner energy future through greater energy and economic efficiency and new technology.

low-priced imported oil with the foreign policy risks and the security costs of ensuring oil's free flow. These two decades have shown that sudden, dramatic changes in world oil prices are far more harmful to the United States and other nations than a persistent but gradual rise in price—even if the average price over the long term in both sets of circumstances is identical. Popular opinion aside, our vulnerability to price shocks is not determined by how much oil we import. Our vulnerability to oil price shocks is more directly linked to: (1) how oil dependent our economy is; (2) our capacity for switching to alternative fuels; (3) reserve oil stocks around the world,<sup>3</sup> and (4) the spare worldwide oil production capacity that can be quickly brought on line.

The contrasting experiences of Great Britain and Japan in 1980, after the Iranian revolution triggered an increase in oil prices to more than \$40 per barrel, offer a classic example of how oil imports alone are an inadequate gauge of "oil vulnerability." Great Britain was almost totally self-sufficient in oil, but it suffered economically more from the oil-price shock than most countries.<sup>3</sup> Japan, which ~~was~~ (and ~~is~~) totally dependent on foreign oil, experienced only a slowing of its economic growth to a very respectable 3.4 percent from 5.3 percent before the shock.

### Achieving Greater Energy Security

Much of the oil on which we and the rest of the world depend is produced in politically volatile regions of the globe. The oil fields of the Persian Gulf alone provide one-fourth of the oil the world presently consumes. They contain nearly two-thirds of the world's proved oil reserves.

For nearly 20 years, U.S. Administrations have sought to balance the economic benefits of using

In short, as Figure 1 illustrates, we are part of a complex and interdependent world oil and refined-petroleum products market. Products flow to where the demand is greatest, as reflected by the highest price. Any increase in the world price of oil, brought about by any event, in any place,

still does import all the oil it uses

#### Current Policy Base

1. The "Current Policy Base" case depicts a hypothetical energy future based on the very unlikely scenario of no change to, or a "frozen," current energy policy, including the effects of existing laws except for the Clean Air Act. The purpose of this case is not to forecast, but to provide a reference, something to measure from. (A more detailed explanation of the Current Policy Base case ~~can be found~~ in Appendix C.)  
*is contained*

Amendments of 1990.

2. A "quad" (1 quadrillion British thermal units, or Btu) is a standard unit used in comparing large amounts of energy derived from diverse sources, or used in differing applications—based on converting the respective total energy contents into heat equivalents. For example, 1 quad is roughly ~~the same as 1 year's worth of oil used at the rate of 500,000 barrels, per day~~ the energy contained in the oil that would be used in one year if daily

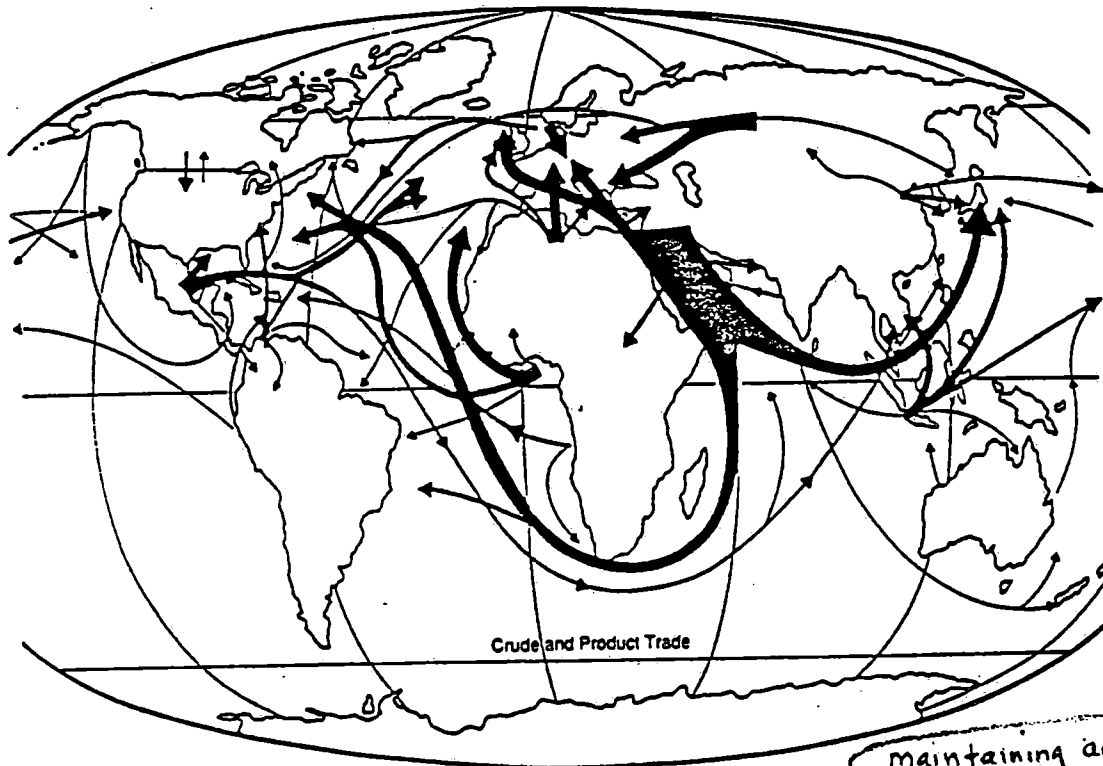
Projected energy effects of these amendments are included in the strategy results

3. British GNP growth moved from +2.4 percent prior to the shock to -2.0 percent after the shock.

curriculum was

3 unless separately indicated

Figure 1. World Petroleum Market  
Complex and Interdependent



Source: U.S. Department of Energy

would raise the price of U.S. oil and the price of oil to our allies and trading partners, regardless of the degree of our import dependence. Recognizing our energy *interdependence* allows us to focus our efforts on those things that will enhance global energy security, and, by so doing, enhance ~~our~~ *our own* America's security.

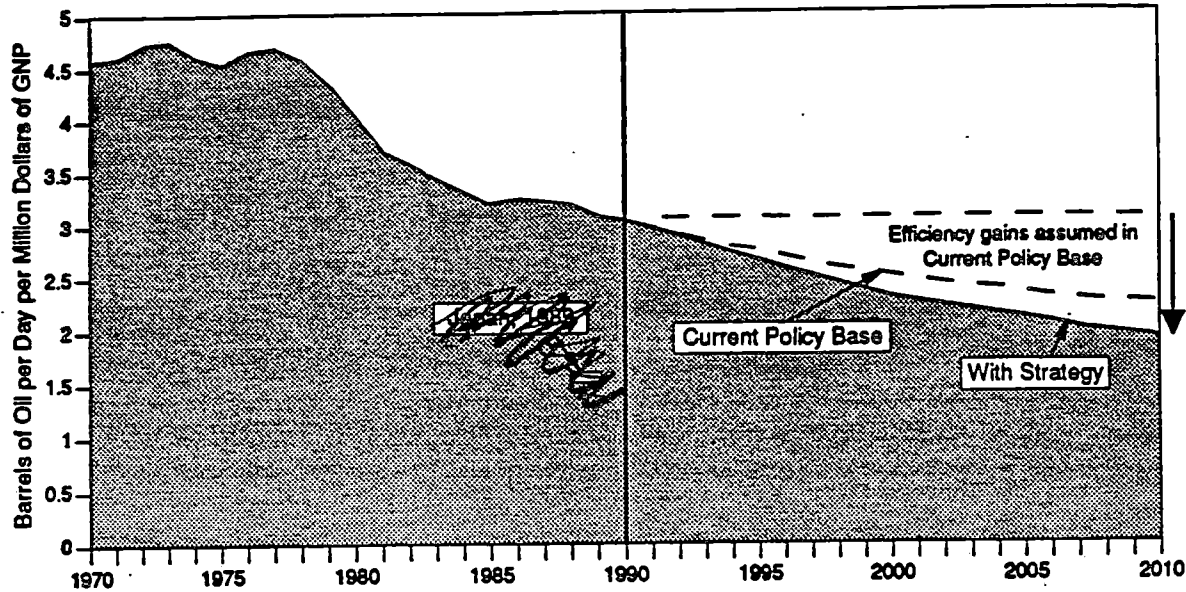
The National Energy Strategy review confirmed that no feasible combination of domestic or international energy policy options can make us completely invulnerable to oil supply disruptions during the foreseeable future. Indeed, it revealed that our Nation and the world are likely to depend *more* on Middle East oil suppliers under any realistic scenario for the foreseeable future. Nevertheless, if fully implemented, the National Energy

Strategy *will* make our country less prone to economic damage from violent fluctuations in either the supply or the price of petroleum.

No single policy tool can substantially increase America's energy security. The basic vulnerability involves oil, but reducing this vulnerability requires a broad array of actions; ~~from~~ increasing the efficiency of our entire fleet of cars, trucks, trains, planes, and buses; ~~to~~ increasing U.S. petroleum production in an environmentally sensitive manner; ~~to~~ further deregulation of the natural gas industry; and ~~to~~ using alternative transportation fuels.

Since our vulnerability cannot be completely eliminated, it is not in our interest to adopt measures

Figure 2. Reduced Exposure to Oil Price Shocks



that reduce imports but impose high economic or environmental costs. Policy measures should be chosen that balance economic, environmental, and energy security objectives.

The National Energy Strategy aims to diversify the sources of oil supply *outside* the Persian Gulf by encouraging environmentally sensitive production in the United States (including certain areas of the Outer Continental Shelf (OCS) and the Arctic National Wildlife Refuge (ANWR)), other parts of the Western Hemisphere, Europe, and Asia and to further develop and maintain contingency mechanisms (including strategic oil reserves and stocks) and excess world production capacity.

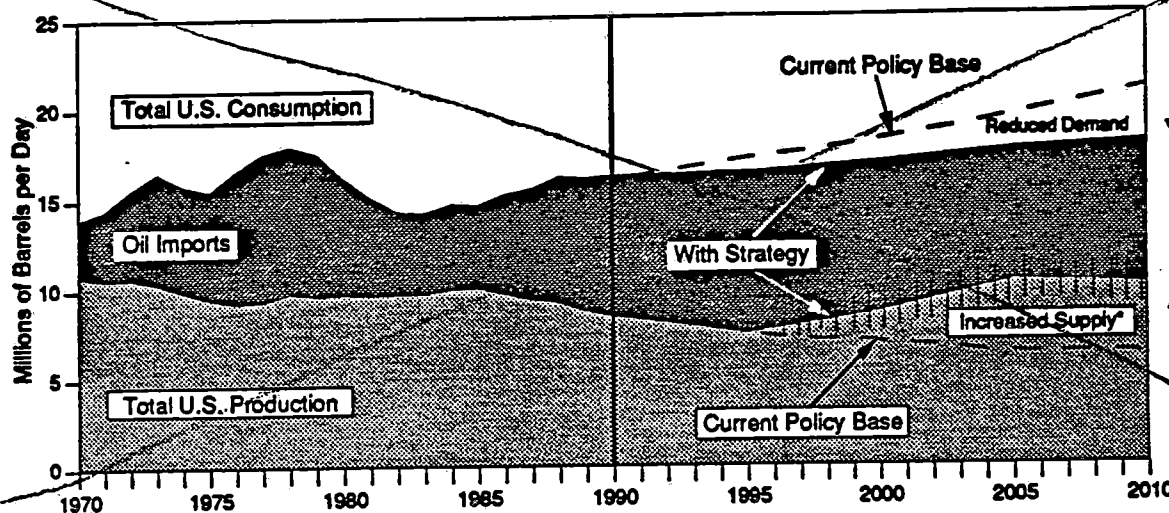
Simultaneously, as Figure 2 illustrates, the National Energy Strategy would reduce the importance of oil to the U.S. economy—through conservation, efficiency improvements, and oil displacement by the use of improved technologies and alternative fuels.

shown in  
As Figures 3 and 4 show, the Strategy's petroleum supply and demand reduction measures will substantially reduce U.S. dependency on insecure supplies of energy, keeping oil import levels at less than 50 percent of U.S. consumption after 2000. These projections, like any other in the uncertain world of energy supply and demand, should be regarded as illustrative, not as predictions. However, the Department of Energy estimates that domestic oil production would increase by 1.8 million barrels per day above the levels projected for the year 2000—largely because of the use of advanced oil recovery technology made possible by new investments in Federal and private-sector R&D and by environmentally responsible development of promising areas like ANWR and OCS. By 2010, domestic oil production could be augmented by 3.8 million barrels per day.

On the demand side, U.S. oil consumption in the year 2005 is expected to be 2 million barrels per day less than it would be in the absence of National Energy Strategy initiatives—largely because of displacement of oil by alternative fuels in vehicles, <sup>by 1.3 million</sup> barrels per day below projected year 2000 levels and <sup>by 5.4 million barrels</sup> 5 per day below projections for the year 2010.

move to after next  
NES initiatives could INCREASE

Figure 3. Oil Consumption and Production



\*Production range represents uncertainty associated with R&D.

~~and electric utilities.~~ As alternative fuels (compressed natural gas, electricity, and alcohol from natural gas, biomass, and coal) and the technologies to use them become more cost-competitive, they will become available across the country to a large and growing fleet of fuel-flexible and dedicated alternative-fuel vehicles and gradually erode petroleum's dominant role in the transportation sector. The effects of these initiatives on total U.S. oil consumption is shown in Figure 3.

~~By reducing the volume of imports and our share of world oil demand, National Energy Strategy measures would also reduce the projected cost of oil imports in 2000 by as much as \$36 billion (in 1989 dollars). In 2010, the projected cost of oil imports would be reduced by as much as \$115 billion (again, in 1989 dollars).~~

As Figure 3 (and 4) of the National Energy Security Strategy illustrates, these economic and energy security benefits are accomplished over the next two decades by a sustainable, balanced strategy to increase supply and reduce demand. This first National Energy Strategy will be adjusted over time as technologies, markets, and knowledge change.

The Strategy is not specifically targeted at the problems of the moment. With regard to the short term, the Strategy builds upon a decade of energy market deregulation that has allowed the rapid and appropriate market response to the Iraqi crisis. In addition, the Strategic Petroleum Reserve, used as part of a coordinated international response, has demonstrated its capability to effectively address short-run oil market disruptions.

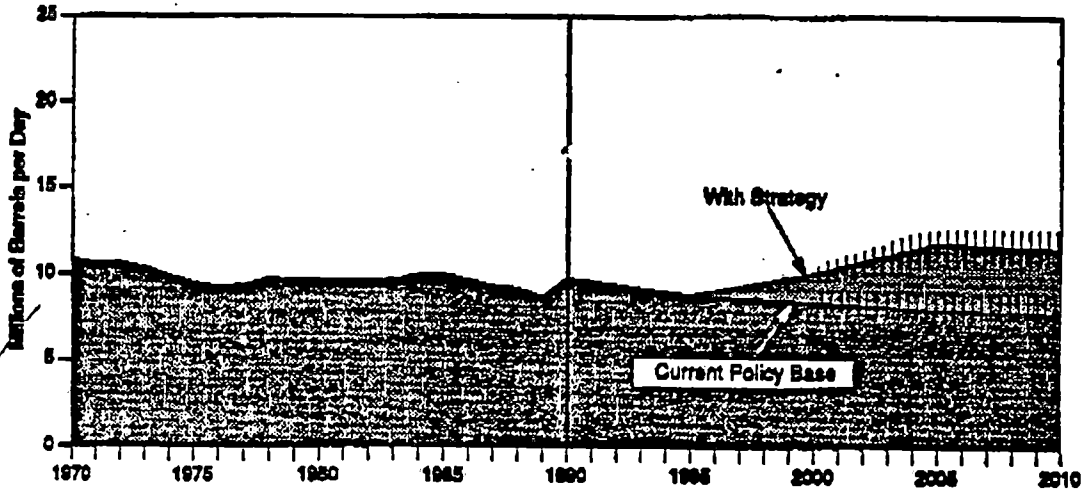
Some will suggest that this progress in enhancing our energy security is not enough, that we should embark on measures such as oil import fees; large taxes on gasoline; subsidies for the production of liquid fuels from coal, shale, and natural gas; broadly mandated use of alternative transportation fuels; and sharply higher fuel-efficiency standards that would compel the use of smaller, possibly less safe, cars. These and other similar measures were all carefully examined in the development of the National Energy Strategy. Oil imports could be reduced substantially, depending on the level, type, and phase-in of subsidy, taxation, or mandate. But the cost would be very high—in higher prices to American consumers, lost jobs, and less competitive U.S. industries. More-

approach  
Strategy embodies

2 words

4

**Figure 5. Summary of the Effects of National Energy Strategy Actions on U.S. Oil Production**



3

**Figure 6. Summary of the Effects of National Energy Strategy Actions on U.S. Oil Consumption**

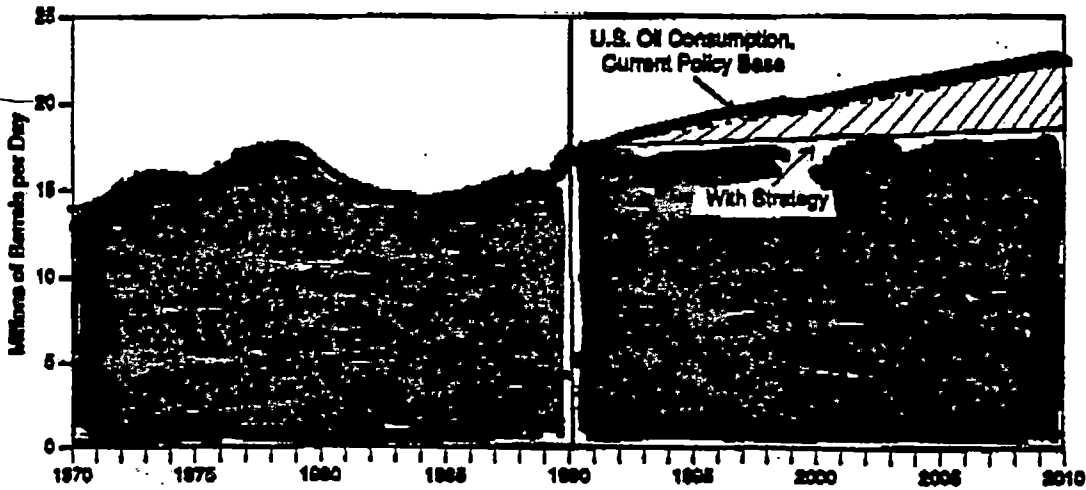
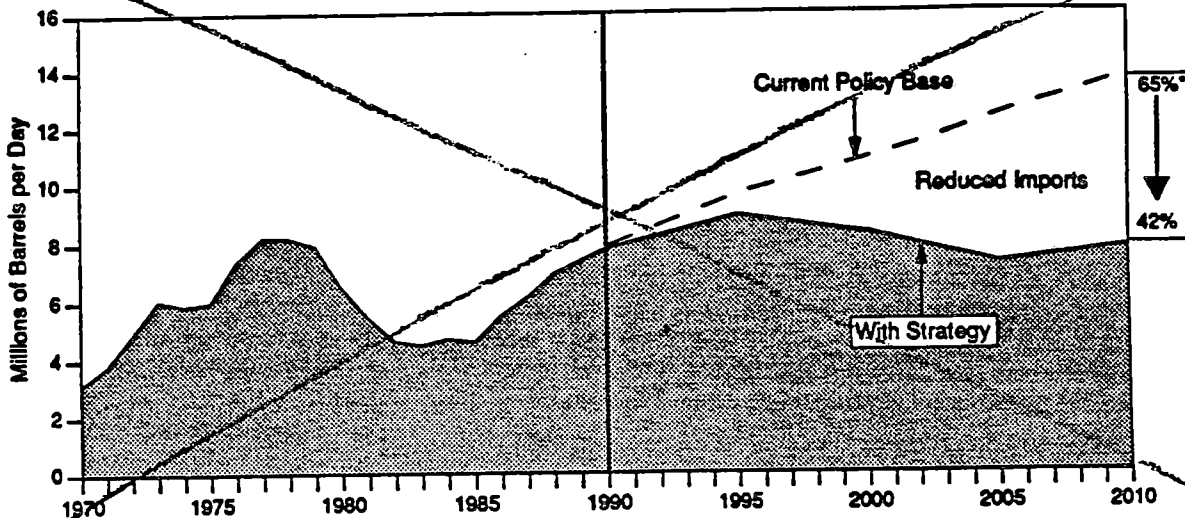


Figure 4. Reduced Oil Imports



\*Note: Imports as percent of total oil consumption.

over, as the experience of Great Britain in 1979 pointed out, these tax, subsidy, and mandate measures would *not* necessarily shield the U.S. economy from the effects of future world oil market disruptions, not even if the United States were to eliminate virtually all oil imports. The economic impacts depend more on *price*, as set by the world market, than on the level of our imports.

What does the Strategy offer instead? A balanced program of greater energy efficiency, use of alternative fuels, and the environmentally responsible development of all U.S. energy resources.

### *Increasing Energy and Economic Efficiency*

This National Energy Strategy reflects a National commitment to greater efficiency in every element of energy production and use. Greater energy efficiency can reduce energy costs to consumers, enhance environmental quality, maintain and enhance our standard of living, increase our freedom and energy security, and promote a strong economy. A common feature of every new technolo-

gy supported in this National Energy Strategy is its potential to more efficiently transform energy raw materials into the energy services we need. Under this heading are the National Energy Strategy initiatives designed to increase the efficiency with which we use energy, in the generation and use of electricity, in our residences and offices, in the industrial sector, and in transportation.

### **Increasing Efficiency in Electricity Generation and Use**

The United States is becoming increasingly electrified. By 2010, we project that 41 percent of our primary energy will be consumed in electricity generation, up from 36 percent today. Accordingly, it is extremely important that we produce, distribute, and consume electricity as efficiently and as cleanly as possible.

About 700,000 megawatts (MW) of electric generating capacity is now installed in the United States. For most of this century, U.S. electricity demand has increased at roughly the same rate as GNP. Even with aggressive conservation and

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Require Federal Power Marketing Administrations to sell power at rates that will cover government costs. Not only will electricity conservation be enhanced, but Federal receipts will increase with minimum impact on PMA rates. efficiency efforts, and assuming that the existing 700,000 MW is maintained through refurbishment and replacement, we will need about 200,000 MW more than the present total to meet the electricity requirements of a growing U.S. economy in 2010. The Federal-State regulatory regime that governs investment decisions in electricity supply and demand will profoundly influence the types of new capacity to be built, who will build it, what technology and fuels are used, and what the full consumer and environmental consequences will be.

consumers receive for investments they make in energy efficiency. PMA

- Reduce Federal Subsidies for Electricity. Phase-out PMA debt subsidies.
- Expand Access to Electricity Transmission for Wholesale Buyers and Sellers. Existing policies and programs under the Federal Power Act will be reviewed to ensure that transmission services and facilities are adequate for the emerging competitive generation market. Expansion of transmission access and promotion of efficient pricing for these services would use existing electricity generation facilities most efficiently and provide lower electricity prices for the Nation's industries, shops, and homes.
- Improve Siting of New Generating Plants and Transmission Lines. Joint efforts with State and regional authorities are necessary to develop mechanisms to promote the timely, efficient siting of electricity generation and transmission facilities without jeopardizing public participation and environmental protection.

These new capacity decisions are further complicated by the difficulty in finding sites for new generating and transmission facilities of any kind in many parts of the country. Moreover, outmoded legislation (some from half a century ago) unnecessarily prevents some of the most able builders and operators of electric powerplants from engaging in the wholesale electricity generation business.

Specifically in the electricity area, the National Energy Strategy will:

- Amend the Public Utility Holding Company Act of 1935 (PUHCA). Allow builders of powerplants to build, own, and operate powerplants in more than one area, while ensuring continued protection of consumer interests. Reform would
- Expand Integrated Resource Planning (IRP). IRP is a process for meeting consumer electricity needs by demand reduction or supply addition, whichever is most cost-effective. The existing IRP Program at the Department of Energy will be expanded to provide more accurate and timely information and analytical tools to consumers, utilities, and State commissions. In addition, the Department will promote IRP by the Federal power marketing administrations (PMA's), and work with the Federal Energy Regulatory Commission (FERC) to foster IRP through FERC's regulation of wholesale power markets.
- Provide Tax-Free Treatment of Utility Efficiency Discounts. The Internal Revenue Service will treat as exempt from Federal taxation utility bill discounts that electricity

Increasing Residential and Commercial Energy Efficiency

In residential and commercial buildings, the National Energy Strategy seeks to maintain or enhance comfort, indoor air quality, and affordability, while reducing energy use. The National Energy Strategy proposes the following actions:

- Expand Research and Development. The Department of Energy is significantly expanding its support for R&D on a wide range of more energy-efficient building technologies. Working together with private industry, universities, and other organizations, the Department will continue its efforts to accelerate the development and use of such technologies.
- Continue Support of State and Utility Programs. The Department of Energy and other Federal agencies will continue to provide

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assistance to States and utilities in their efforts to improve energy efficiency in residential and commercial buildings. These efforts include the weatherization of homes occupied by low-income households, the retrofit of institutional buildings, incentives for the purchase of energy-efficient appliances, and a wide range of consumer information programs.

- **Expand Use of Mortgage Financing Incentives for Residential Energy Efficiency.** To encourage the more widespread use of mortgage financing for energy efficiency, the Departments of Energy and Housing and Urban Development will increase financial and technical support to develop and encourage the voluntary acceptance of efficiency ratings and their use in home financing. After at least 5 years of support for voluntary adoption, it will be required that information on energy efficiency and information on the available mortgage financing options be provided to home buyers prior to sale.
- **Improve the Efficiency of Public Housing.** The Department of Housing and Urban Development, with technical support from the Department of Energy, will establish energy indicators to identify public housing projects where significant savings can be achieved, develop innovative incentives for managers and tenants to use energy more efficiently, and more thoroughly monitor and evaluate the savings from significant energy-related investments.
- **Set Cost-Effective Appliance and Equipment Standards and Provide Information to Consumers Through a Labeling Program.** The Department of Energy has established efficiency labeling and standards for 13 categories of residential appliances and for fluorescent lighting system ballasts. The Administration will support legislation to require energy-efficiency labeling for certain other types of equipment, including light bulbs.
- **Develop and Encourage Use of Building Efficiency Standards.** The Administration

will strengthen building energy-efficiency standards by providing technical assistance to State and local governments to promulgate and implement these standards. All new buildings subsidized by Federal funds or federally insured mortgages will be required to meet cost-effective energy-efficiency standards, which, at a minimum, are equivalent to the standards or codes currently recognized by major national organizations.

- **Improve Federal Energy Efficiency.** The Administration will issue and implement an Executive order directing Federal agencies to continue and strengthen their efforts to improve the efficiency and management of energy use in Federal buildings and other facilities.

### Increasing Industrial Energy Efficiency

The National Energy Strategy seeks to improve energy efficiency and flexibility in the industrial sector, thereby reducing petroleum use and overall production costs. Industrial waste generation is targeted through support of increased waste recycling and measures to increase our ability to use wastes as feedstocks.

The National Energy Strategy proposes the following actions:

- **Increase Funding for Industrial Process Efficiency Research and Development.** Funding for cost-shared R&D projects to improve industrial energy efficiency and productivity will be increased. These efforts will concentrate on major energy-using industries and processes.
- **Minimize Industrial Waste.** Industrial R&D funding will be increased to sponsor cost-shared projects with industry. Reducing the generation of wastes and using wastes as feedstocks improve the competitiveness of industry and reduce the consumption of oil. In addition, improved energy and material efficiency reduces the cost of pollution control. Process innova-

tions, modification of feedstocks and products, and recycling promise substantial payoffs.

- **Expand and Develop Energy Audits.** States and utilities will be encouraged to expand or develop programs to speed up adoption and use of existing improved energy-using technologies. Many cost-effective opportunities to reduce industrial use of energy currently exist. Audits of manufacturing plants can identify opportunities to improve efficiency. Current industrial energy use audit programs are being expanded.
- **Examine Regulatory Policy.** Federal regulatory programs will be examined in cooperation with the Environmental Protection Agency to ensure that the use of waste minimization technologies is ~~not discouraged~~. New legislation or modification of regulations will be proposed where needed.

### Increasing Transportation Energy Efficiency

The National Energy Strategy seeks to reduce the amount of energy we use to move people and goods by improving the efficiency of *all* the vehicles on the road, and by increasing the overall efficiency of the transportation system itself.

Specifically, the National Energy Strategy will:

- **Expand Efforts to Develop Advanced Technologies.** Advanced transportation technologies—including intelligent vehicle-highway systems, magnetic-levitation and other high-speed trains, and advanced air traffic control systems—can save significant energy in the transportation sector. *(in the long-term)*
- **Accelerate Scrappage of Older Cars.** Older vehicles have higher emissions and, generally, lower fuel economy than new cars. This initiative will promote State and local government and private-sector programs that offer a "bounty" for older cars of a designated model year. Implementation of the Clean Air Act Amendments of 1990 will provide the opportunity to

encourage State and local governments and the private sector to establish such programs.

- **Evaluate Corporate Average Fuel Economy (CAFE) Program.** A comprehensive analysis of feasible fuel economy levels, considering safety, technology, economics, and the impacts of the new Clean Air Act Amendments and other recent regulatory requirements will be undertaken. Should these studies warrant them, changes to the current standards will be considered, including providing credit trading and averaging among manufacturers, eliminating distinctions between import and domestic vehicles, revising noncompliance penalties, and establishing alternative forms of corporate average fuel economy standards (for example, standards based on vehicle size). These changes may permit cost-effective improvements in vehicle fuel economy without compromising highway safety.

- **Improve Consumer Information on Fuel Economy and System Efficiency.** Additional efforts will be undertaken to increase the distribution of the Gas Mileage Guide, encouraging Americans to "drive smart" and adopt more energy-efficient driving and commuting habits. A year-long advertising campaign will inform the public about simple, commonsense measures that can help reduce oil use. The cooperative efforts with private foundations and educational institutions will be expanded to promote greater awareness of energy-efficiency opportunities.

- **Promote Mass Transit and Ride Sharing.** A series of measures will be implemented to encourage increased use of carpools, vanpools, and transit. These measures will include the ability of employers to provide increased tax-free transit subsidies, increased availability of high-occupancy vehicle right-of-way, and improved public transportation services.

*mass*

10 gas turbines, electric vehicles, fuel cells and low-brake technology diesel engines in the mid-term, and

## Securing Future Energy Supplies

### Oil

For the foreseeable future, oil will remain a critical fuel for the United States and all other industrialized nations. In 1990, imported oil accounted for 43 percent of U.S. oil use, the highest percentage since 1979. During 1990, payments for net oil imports exceeded \$55 billion. In the absence of new energy policy initiatives, U.S. oil imports are projected to rise to 57 percent of domestic oil consumption by the year 2000 and to 65 percent in 2010. The net U.S. oil import bill could double by 2000 and increase to nearly \$200 billion by 2010 (in 1990 dollars).

In addition to the measures previously discussed that will make the U.S. economy less dependent on oil, the National Energy Strategy proposes initiatives to (1) reduce the economic consequences of disruptions in world oil markets, and (2) increase domestic oil and petroleum product supplies.

### Measures To Reduce Impact of Oil Market Disruptions

- Increase Oil Production in Countries Outside the Persian Gulf. Barriers to investment in petroleum development will be addressed on a priority basis, thereby increasing and diversifying world production capacity.
- Improve Emergency Preparedness. Expand the Strategic Petroleum Reserve (SPR) to 1 billion barrels, assess whether regional petroleum reserves are needed for Hawaii, and test refined-product reserves.

Gulf Coast

- Diversify Transportation Fuels. To reduce the dependence of the transportation sector on oil, the Strategy will: (1) remove the cap on CAFE credits for manufacturing of vehicles capable of operating on alternative fuels; (2) accelerate the purchase of alternative-fuel vehicles for the Federal fleet; and (3) require the use of alternative fuels in car, truck, and bus fleets. These measures will complement aggressive R&D efforts to improve the technology for the production and use of alternative fuels.

that can be called by

ogy for the production and use of alternative fuels.

### Measures To Increase Domestic Production

- Open Access to Environmentally Responsible Development of the Coastal Plain of the Arctic National Wildlife Refuge and to Certain Offshore Areas. ANWR and new areas in ~~the~~ offshore are potentially major sources of domestic oil and gas production, both now and for the future.

Environmentally Responsible

- Facilitate Development of New Alaskan North Slope Resources. Five major discovered fields on the Alaskan North Slope are undeveloped. These fields could add an estimated 1 billion barrels of recoverable oil and condensate to domestic oil production over the next several decades.

- Lease Elk Hills Reserve. Operation of the producing Elk Hills Reserve field by market-driven private companies will lead to increased oil and natural gas production at lower costs.

- Deregulate Oil Pipelines. Eliminating oil pipeline regulation, except for pipelines not subject to competition, will reduce consumer costs and encourage the most efficient use of the oil pipeline system.

- Implement Oil and Gas Tax Incentives. The oil and natural gas tax measures enacted in 1990 as part of the budget reconciliation legislation will raise production by about 400,000 barrels per day oil equivalent by the year 2000.

- Promote Horizontal Well Drilling. Increased levels of domestic production will be encouraged by removing State regulatory barriers to horizontal drilling and by facilitating transfer of horizontal drilling technology.

- Increase Production of California Heavy Oil. Lack of demand in the United States for California heavy oil and the existing prohibition against export of this oil are inhibiting California heavy oil production. Access to export

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technical and  
institutional issues such as

by legislation

an information clearinghouse and closer liaison with U.S. representatives in other countries. Interagency coordination of Federal programs pertinent to these exports will be strengthened. Current programs and policies for facilitating the financing of coal-related projects abroad will be reviewed and improved.

- **Remove Barriers to Construction of Coal Slurry Pipelines.** Coal slurry pipelines, using a mixture of water and coal, can compete effectively with railroads and barges as a low-cost way to transport coal, but proposed pipelines must obtain rights-of-way to cross competing railroad lines. They also raise water use concerns in areas where water is scarce. The Administration supports legislation to grant Federal eminent domain to applicants that have satisfied regional and State water use concerns.

Specifically, the National Energy Strategy will:

- **Reform the Nuclear Power Licensing Process.** The licensing process for new nuclear powerplants must be reformed, to provide for early resolution of emergency planning issues prior to construction, and to reduce uncertainty associated with the postconstruction hearing, while improving the public's opportunity in the licensing process to address valid safety questions. The Department of Energy will also support renewing the licenses of existing nuclear plants, where this can be done safely.

The duration of and

must be reduced

during

Administration

- **Properly Manage and Dispose of High-Level Nuclear Waste.** All Federal agencies must fully support the Department of Energy's efforts under current law to site and license a permanent waste repository and a monitored retrievable storage facility. Federal agencies also must assist the Nuclear Waste Negotiator's efforts to identify potential hosts for these facilities. In addition, Federal legislation should be enacted that, while preserving existing due-process and regulatory requirements, will ensure that the Nation's need for facilities to isolate high-level waste is met in a timely manner. Finally, the Department of Energy will consider alternatives to current Federal management of the high-level radioactive waste program, including management by a federally chartered, independent corporation.

- **Develop New <sup>and</sup> Passively Safe Designs.** The Department of Energy is working toward Nuclear Regulatory Commission certification for two "next generation" light-water reactors (with simplified designs and better engineered safety systems) and two more advanced light-water reactors (incorporating the concept of "passive safety") by 1995. The Department also will continue R&D on other advanced nuclear systems that show promise.

Standard reactor designs, combined with licensing reform and improved construction management, could reduce the cost of electricity generated via nuclear power by as much as one-third. Without successful implementation of the Strategy initia-

nuclear

Nuclear Power

Nuclear power can <sup>if:</sup> cleanly and safely meet a substantial portion of the additional base-load electricity generating capacity the United States will require by 2030 (1) ~~if~~ the operating lifetimes of existing nuclear plants are extended (where this can be done safely with appropriate Federal oversight and technical support), and (2) utility executives once again consider the "nuclear option" technically, politically, and economically feasible when new capacity is planned.

The State-Federal impasse on construction of a high-level nuclear waste repository, an impossibly cumbersome nuclear licensing process, and the loss of full public confidence in our ability to manage civilian nuclear power technology have all contributed to the hiatus in the construction of new nuclear capacity. The National Energy Strategy proposes a number of measures to address these issues that would, if implemented, increase nuclear power generation in 2010 by almost 10 percent and in 2020 by more than double ~~above~~ that in the Current Policy Base case projection.

tives, the contribution of nuclear power to our electricity supply could decline substantially after 2010. *With* the Strategy initiatives, nuclear power could be generating, safely and cleanly, as much as 21 percent of our total electricity needs by the year 2030.

## Renewable Resources

Public comment received during development of the National Energy Strategy revealed virtually unanimous support for the development and use of renewable energy resources because of their environmental and energy security advantages. As a result of this overwhelming interest and support, extensive analytical efforts have been made to better understand the potential of each renewable energy resource and the barriers—technological, marketplace, or otherwise—that might block renewable energy resources from achieving their full potential.

This <sup>meeting</sup> analysis leads to several important conclusions. First of all, renewables can play a larger role in our energy economy. The fraction of our energy supplied by renewables has been increasing, and that increase is projected to continue. Second, we can accelerate the growth in renewable supplies over the next 40 years without resorting to permanent subsidies or mandates. This is because several renewable technologies are on the verge of successful commercialization into the mainstream energy marketplace. These technologies have experienced significant technical progress over the past 10 years. Their commercialization does not require scientific breakthroughs.

<sup>translate</sup> What is needed is the opportunity to reduce R&D progress to practice, removal of market barriers to renewables, and continued, focused R&D to realize the full potential of these technologies.

Adding renewable technologies to the menu of <sup>through the export of new products and technologies</sup> available energy choices can contribute to a growing economy—domestically, by spurring competition and innovation, and internationally, by ~~providing new products and technologies for export~~ and contributing to the balance of trade. Renewable technologies represent an important opportunity, but not a panacea for the U.S. energy econo-

my. Their long-term contribution is predicated on overcoming remaining technical and cost barriers, mainly through intensified R&D.

The National Energy Strategy's renewable energy initiatives are based on these conclusions and on a clear understanding of the contributions that renewable energy can and cannot be expected to make. For example, given policies to address existing regulatory barriers and market imperfections, solar thermal or photovoltaic electricity technologies can compete today to provide electricity generation in remote locations and for peaking purposes. In addition, wind, geothermal, and biomass energy systems already can make limited contributions to meeting base and intermediate electrical loads. However, additional technical progress is needed to reduce the costs and enhance the competitiveness of renewable electric options, particularly for base-load applications.

Finally, the National Energy Strategy is based on the premise that for renewables, as for other emerging technologies, investment in R&D to increase technology performance and reduce costs is a more appropriate role for the Federal Government than is using taxes or regulations to subsidize or mandate the use of particular technologies.

Specifically, the National Energy Strategy will support renewable energy electricity and transportation fuel technologies through eight measures:

### Electricity

- **Extend and Expand Investment Tax Credits for Emerging Renewable Technologies.** The existing investment tax credit for solar and geothermal technologies will be extended ~~until~~ <sup>through</sup> 1998 and broadened to apply to investments in wind and certain biomass technologies.
- **Amend PURPA To Extend Benefits to Larger Renewable Facilities.** The Public Utility Regulatory Policy Act (PURPA) should be amended to remove permanently the qualifying size limit imposed on small power producers, but only in States that use competitive

Expand Efforts to Develop Advanced Renewable Technologies.

procurement programs for new electricity generating facilities.

- **Amend PURPA To Allow More Flexibility in Renewable Plant Design.** In addition to legislative removal of the size cap, PURPA should be amended to ease its restrictions on the percentage mix of renewable resources and other fuels qualifying small power producers are allowed to use, but only in States that use competitive procurement programs for new electricity generating facilities.

- **Reform Hydropower Regulation.** FERC should be designated as the sole decision-making agency for non-Federal projects at existing dams while ensuring the disciplined, nonduplicative participation of State and other Federal agencies. FERC should not regulate small hydro projects (up to 5 MW). These actions are intended primarily to replace outdated equipment, facilitate relicensing of, and promote construction of additional capacity at existing hydroelectric facilities.

- **Convert Municipal Solid Waste to Energy:** The Department of Energy will work with the Environmental Protection Agency, States, local jurisdictions, and industry to collect and disseminate information and to conduct research on technologies to integrate waste-to-energy systems into comprehensive waste management programs.

These measures would increase renewable electricity generation in the year 2000 by 14 percent, and in 2010, renewable electricity generation would be increased by 18 percent as compared with

16  
**Transportation Fuels**

the Current Policy Base case projections.

- **Support Ethanol and ETBE.** The ethanol and ethyl tertiary butyl ether (ETBE) tax credits passed in 1990 as part of the budget reconciliation legislation will support the use of ethanol and the ethanol-based additive ETBE as transportation fuel components over the next decade.

- **Develop New Energy Crops.** An accelerated program carried out by the Departments of Energy and Agriculture will aim to develop "energy crops"—nonfood feedstocks for liquid fuels—and the technology to use these feedstocks to produce cost-competitive transportation fuels by the year 2000.

- **Develop and Use Cost-Competitive Alternative Fuels and Technologies.** ~~Provisions in the Clean Air Act Amendments of 1990 and the National Energy Strategy alternative fuel initiatives, which would provide greater incentives for manufacturers to produce alternative-fuel vehicles and use them in Federal and private fleets, will provide significant new market opportunities for renewable alternative fuels and electric vehicles.~~ **will**

Combined with provisions in the Fusion Energy Clean Air Act Amendments of 1990, the Strategy

For the longer term, the National Energy Strategy looks to fusion energy as an important source of electricity-generating capacity. The Department of Energy will continue to pursue safe and environmentally sound approaches to fusion energy, pursuing both the magnetic confinement and the inertial confinement concepts for the foreseeable future. International collaboration will become an even more important element of the magnetic fusion energy program and will be incorporated into the inertial fusion energy program to the fullest practical extent. The current National Energy Strategy goal is to have an operating demonstration plant (using either technique) by about 2025 and an operating commercial powerplant by 2040.

### Enhanced Research and Development for Energy Security

Any meaningful effort to ensure future energy supplies must address the role of advanced technology. The National Energy Strategy deems three areas of technology development particularly vital:

- Technologies to reduce the transportation sector's near-total reliance on oil, by making oil use more efficient, by introducing alternative

fuels and technology, or by diversifying travel modes;

- Technologies that increase the environmentally protective production of domestic energy resources; and
- Technologies that improve energy efficiency and increase the range of economical, clean technology choices.

A major element of the National Energy Strategy will be increased investment in advanced energy technology R&D. The fiscal year 1992 budget includes \$903 million, an increase of \$227 million, or 34 percent, for increased investments in R&D in support of the Strategy's R&D initiatives governmentwide. The budget proposes \$653 million for Department of Energy National Energy Strategy-related R&D, an increase of \$134 million, or 26 percent. Over the 5-year period 1992 through 1996, the Department of Energy would invest \$3.5 billion in National Energy Strategy R&D initiatives discussed in this section. This initiative looks to a future where alternative technologies are available to reduce energy consumption and increase fuel-flexibility.

above the fiscal year 1991 budget

To ensure that the R&D efforts pursue useful goals and result in ultimate commercialization of the technologies, the National Energy Strategy R&D initiatives will utilize industry cost-sharing and be carried out as joint government-industry programs in which industry participants have a significant say in the nature, organization, and locus of research efforts.

will

A brief description of the major initiatives follows:

- **Advanced Transportation Fuels From Biomass.** Accelerate research, development, and demonstration of new feedstocks and conversion technologies to provide initial commercialization of cost-competitive alcohol fuels by the year 2000.
- **Vehicle Propulsion Technologies.** Enhance R&D on gas turbine engines, low-heat-rejection diesel engines for use in heavy-duty trucks, and

on fuel-cell vehicles to produce cost-effective alternatives over the long term.

- **Electric Vehicle Technology.** Expand R&D on batteries and electric vehicles, in conjunction with an industry-led consortium that has just been formed.
- **Aeronautical Technologies.** Enhance long-term R&D on new, more energy-efficient aircraft technologies.
- **High-Speed Rail and Magnetic Levitation.** The Department of Transportation, the Department of Energy, and the Corps of Engineers will pursue high-speed rail technologies and the National Maglev Initiative, to explore alternatives for both long-distance automobile travel and short-haul air travel.
- **Intelligent Vehicle/Highway Systems (IVHS).** The Department of Transportation, a number of States, and the auto industry will work cooperatively to advance IVHS technology in the United States. IVHS has the potential to reduce congestion, improve traffic flow, reduce idling at traffic signals, and allow drivers to choose more efficient routes to their destinations, all of which can improve the energy efficiency of transportation.
- **Telecommuting.** R&D on faster, easier-to-use computer networks and software can help make telecommuting more widespread.
- **Air Traffic Control Systems.** The Federal Aviation Administration's Air Traffic Control System can enhance its efficiency and performance, with a significant impact on fuel use.
- **Advanced Oil Recovery Technologies.** Enhance R&D on technologies that will permit greater production of the two-thirds of known U.S. oil reserves not normally recovered using present techniques. production
- **Industrial Technologies.** Accelerate R&D for improved industrial processes and equipment and for alternative fuels and feedstocks.

- **Advanced Light-Water Nuclear Reactors.** Advanced light-water nuclear reactors will incorporate major advances in design, including passive safety features. The Department of Energy is currently supporting first-of-a-kind engineering work that will assist companies in their efforts to have the Nuclear Regulatory Commission certify the new standardized designs.

supplies of affordable energy while enhancing the quality of our environment.

Motivating our technology and resource choices must be an improved understanding of total fuel-cycle costs of all energy sources ~~(that is, the total fuel cycle costs of producing, transporting, dispensing, and using a given energy resource, including the costs of health and environment impacts)~~. Existing analytical tools are not capable of doing this with any reasonable precision; however, developing and sharing the capability to make such total fuel-cycle cost assessments is a National Energy Strategy priority. Building on what we know now, the National Energy Strategy proposes action that will improve public health; ~~the quality of our air, water, and land;~~ and the global environment.

*Handwritten notes:* "that is, the total fuel cycle costs are the entire." (circled)

- **Advanced Nuclear Reactor Concepts.** Advanced nuclear reactor concepts will have safety features that go beyond the standardized designs currently envisioned. Researchers have demonstrated that both high-temperature gas-cooled reactors and liquid-metal reactors can shut themselves down safely under conditions that would be extremely serious for present-day reactors. The Department of Energy continues R&D support for both of these advanced concepts.

### Energy and the Quality of Our Air, Water, and Land

In addition to these specific initiatives, a national awards program will be created, offering large cash grants for major innovations in energy technologies that can reduce U.S. oil vulnerability. The program will set forth specific energy-related technological challenges and award prizes for meeting those challenges.

*Handwritten note:* "prizes" (circled)

In air quality, the National Energy Strategy seeks to reduce energy-related emissions to achieve and maintain the National Ambient Air Quality Standards for carbon monoxide and ozone; to develop cost-effective, flexible control strategies to reduce energy-related emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>); and to ensure that other air-quality concerns are incorporated into policies for energy supply and use.

*Handwritten note:* "protect" (circled)

By 2030, ~~this~~ <sup>these</sup> R&D initiative <sup>s</sup> ~~will~~ <sup>could</sup> save between 5 million and 8 million barrels per day of oil, depending on the success of the proposed R&D programs. ~~It~~ will improve U.S. competitiveness in world markets and help make this Nation a cleaner, safer, more desirable place than ever in which to live and work.

*Handwritten note:* "they" (circled)

In waste management, the National Energy Strategy seeks to develop technologies, procedures, and safeguards to ensure that wastes are treated, stored, and disposed of in a manner that protects human health and the environment, and the Strategy supports efforts to develop cost-effective, environmentally sound techniques to reduce the quantity, persistence, and toxicity of energy-related and other industrial wastes.

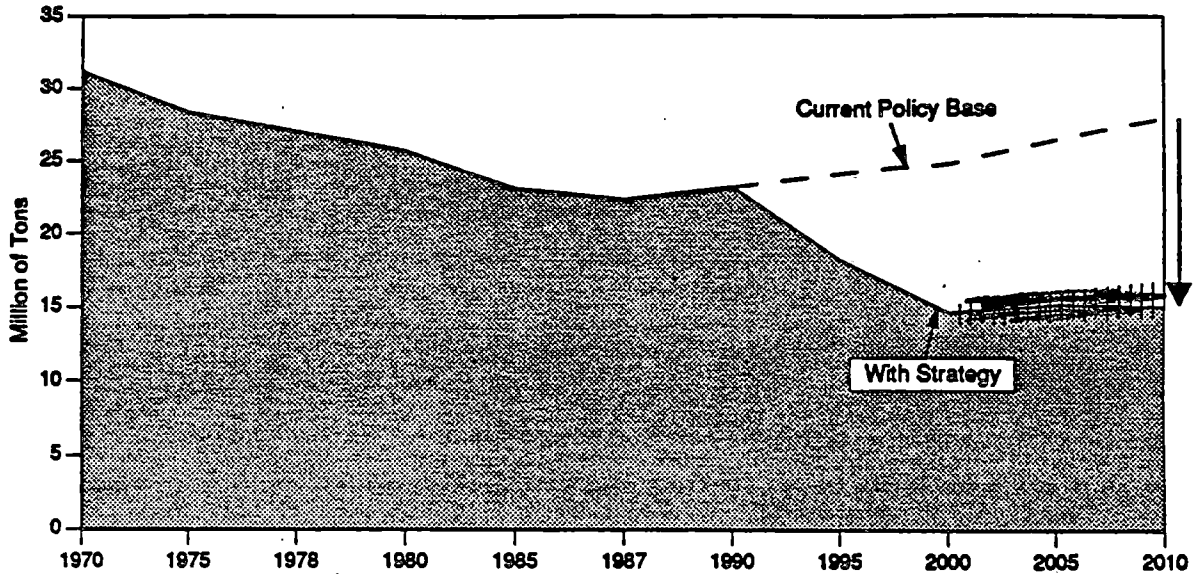
### Enhancing Environmental Quality

Concern for the environment runs throughout the National Energy Strategy and is reflected in all the initiatives previously discussed. Reasonable and sustainable energy policies will benefit both the environment and the economy. The keys are advanced technology and improved energy use practices that can help us maintain adequate

In water and land use, the National Energy Strategy seeks to ensure that activities associated with energy production and use protect surface-water and groundwater resources, and to develop and implement improved procedures to incorporate environmental concerns into energy facility siting and land use. ~~will also be developed and implemented.~~

*Handwritten note:* "will also be developed and implemented." (circled)

Figure 5. Reduced Emissions of Sulfur Dioxide



The 1990 Clean Air Act Amendments, which are an integral component of the National Energy Strategy, will limit the major air pollutants from powerplants, vehicles, and industry. In many cases, pollutants will be reduced from current levels—despite economic growth and increased use of energy.

As Figures 5 and 6 illustrate for air emissions, National Energy Strategy initiatives (coupled with existing Department of Energy R&D programs—such as the development of alternative fuels for transportation, clean coal technologies, and improvements in energy efficiency) should reduce air and water pollutants and waste even further from projected levels. For example, while advanced propulsion technologies will significantly increase efficiency, they should also reduce vehicle pollutant emissions by as much as 90 percent. National Energy Strategy measures are expected to ~~cut down~~ <sup>reduce</sup> emissions of carbon dioxide (CO<sub>2</sub>) by an estimated 1.0 billion tons, SO<sub>2</sub> by 12.4 million tons, and NO<sub>x</sub> by 5.0 million tons in the year 2010.

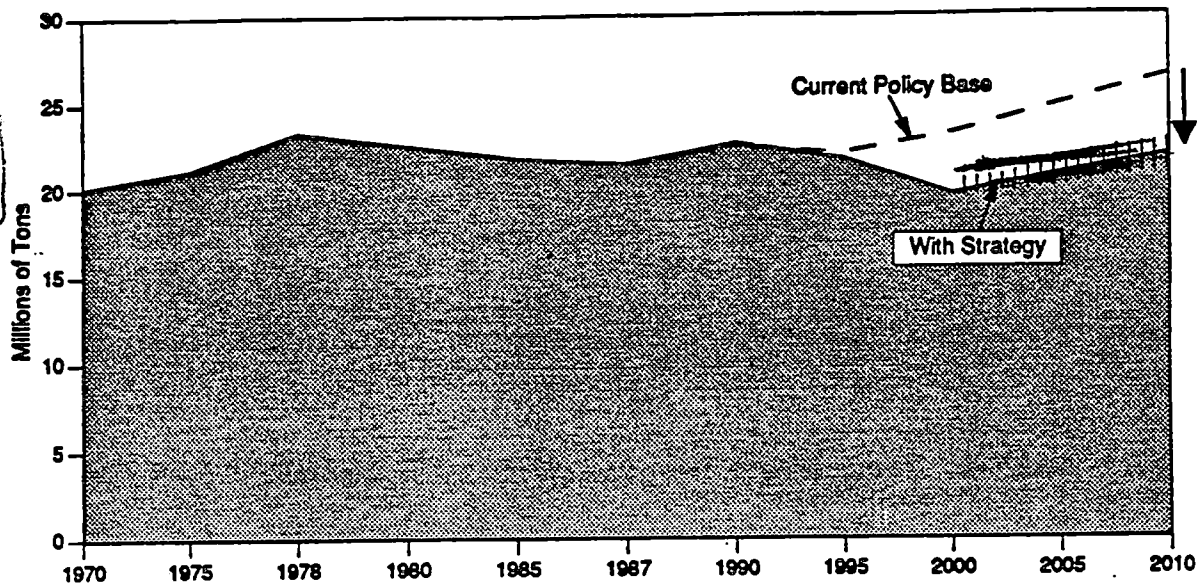
It is projected that the Clean Air Act Amendments of 1990 and the National Energy Strategy ~~would~~ <sup>are estimated to</sup>

reduce SO<sub>2</sub> emissions by 40 percent, in the year <sup>30</sup> 2030; NO<sub>x</sub> by 25 percent, and volatile organic compound emissions by 25 percent from the projected levels of emissions in 2030, based on policies that were in place prior to 1990. In addition, the National Energy Strategy includes a pledge to develop new technologies that minimize wastes. It also recognizes that current inefficiencies in the way wastes are regulated contribute to the problem and should be eliminated.

The National Energy Strategy proposes the following actions to better harmonize energy and environmental objectives and protect our air, land, and water:

- **Use Market Mechanisms.** Make maximum use of market-based mechanisms (informed by full fuel-cycle cost analyses) to most effectively protect the environment, minimize costs, and provide the flexibility necessary to maintain ample energy supplies.
- **Increase Efficiency.** Increase efficiency in every phase of energy production, transformation, and use.

**Figure 6. Reduced Emissions of Nitrogen Oxides**



- **Increase the Use of Natural Gas.** Increase the availability and use of natural gas.
- **Develop Cost-Competitive Renewable Energy Supplies.** Increase R&D and investment incentives for renewable energy technologies.
- **Develop and Use Alternative Transportation Fuels.** Develop and promote the use of cleaner transportation fuels, including reformulated gasoline.
- **Develop and Use Clean Coal Technologies.** Develop and facilitate the use of clean coal technologies.
- **Improve Cumulative Energy Impact Assessments.** Improve analyses of the effects of environmental regulation on energy supply and demand.
- **Improve Siting Processes.** Drawing upon State model programs, improve the processes used to site energy facilities, including refineries.

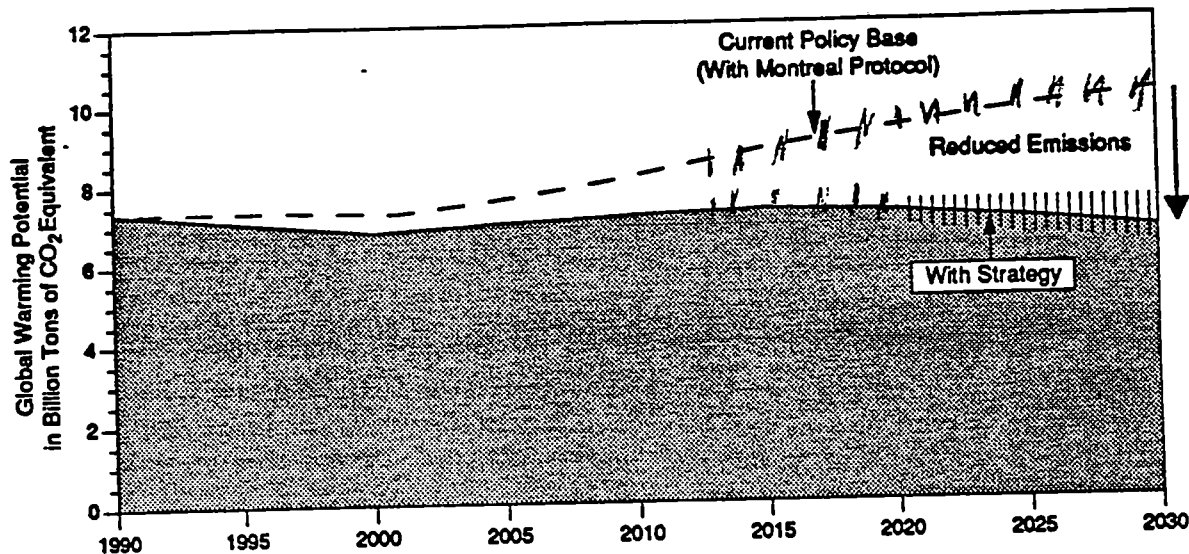
- **Minimize Wastes.** Develop cost-effective, environmentally sensitive techniques to reduce energy-related and other industrial wastes and improve environmental restoration.

One goal of these measures is to protect and enhance environmental quality while minimizing the projected costs of environmental regulation in this country (now more than \$100 billion per year and growing) through more efficient management of environmental compliance.

### Energy and Global Environmental Issues

Despite large uncertainties regarding potential climate change, there is sufficient credible scientific concern to start acting to curb the buildup of so-called greenhouse gases—several of which are related to the production and use of energy. These gases include carbon dioxide, carbon monoxide, methane, and chlorofluorocarbons. Figure 7 illustrates the greenhouse gas emission reductions that would be produced by the National Energy Strategy. These reductions are achieved by: (1) greater use of nuclear power and renewable energy and

**Figure 7. Reduced Potential for Global Warming**



Note: Global Warming Potential (GWP)—Unit of 100-year global warming potential measured in million metric tons of CO<sub>2</sub> equivalents. Greenhouse gases vary in their atmospheric lifetimes and in their ability to absorb and reradiate heat. This chart is based on converting the projected volumes of greenhouse gases to one common measure, Global Warming Potential. If indirect gases that form tropospheric ozone (nitrogen oxides and volatile organic compounds) were to be included, a slightly lower GWP for the National Energy Strategy scenario would result.

improved energy efficiency in both the electricity and the transportation sectors; and (2) other actions already taken by the United States (for example, the Clean Air Act Amendments of 1990). With all of these initiatives, the United States' contribution to potential global warming would, in the National Energy Strategy scenario, ~~remain at or below present levels for the foreseeable future.~~ While the accuracy of any future projections diminishes as the time horizon under consideration lengthens, the National Energy Strategy will significantly reduce greenhouse gas emissions relative to any current policy baseline.

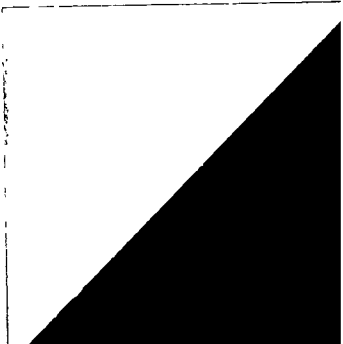
The National Energy Strategy actions are consistent with the recommendations of the United Nations' Intergovernmental Panel on Climate Change. Under its precepts, this country has taken a lead in adopting prudent strategies to reduce greenhouse gases that are also justified on grounds other than climate change (for example,

reforestation, greater energy efficiency, and reducing the emission of chlorofluorocarbons and other substances that deplete the Earth's protective ozone layer).

Taken together, these actions accomplish both reductions in emissions from the sources of greenhouse gases and enhancement of sinks (for example, trees) that absorb gases. Consideration of both sources and sinks of all greenhouse gases allows for a comprehensive approach to the climate change issue, including scientific and economic research, monitoring, technology development, and action plan development.

New Chart

ing



## Fortifying Foundations

### Fundamental Science and Engineering Research

The key to new knowledge and innovation in energy ~~and environmental areas~~ is basic science and research. Of course, there must also be *focused* R&D—both to advance new technologies and to ~~assess the effects of~~ existing technologies, of ~~new issues~~. better understand

A major part of the National Energy Strategy is to expose and expand the role that science and technology can play in achieving U.S. objectives for energy security, economic growth, and enhanced environmental quality. History is full of instances where technology revolutionized both our energy sources and our effectiveness in putting them to human service. New insights about geology, new extraction techniques, and the exploration of new geographical frontiers more than once have "re-stocked" domestic petroleum reserves, notwithstanding declarations that those reserves were about to be exhausted. During the 1980's, new technology helped to break the one-to-one relationship that had long existed between total primary energy consumption and economic growth.

The private sector is primarily responsible for developing and commercializing technology, but the Federal Government has a critical role in basic and applied scientific research. The extensive system of national research laboratories and Federal support of academic and private research can profoundly influence the focus, scope, and pace of energy technology development.

Accordingly, the National Energy Strategy seeks to maintain U.S. preeminence in fundamental science and engineering research, sharpen the focus of Strategy-related research in energy science and technology, and promote excellence and productivity throughout the U.S. research establishment. The following areas are particularly important:

- **Maintain Basic Research Portfolio.** Maintain a balanced and diverse Federal portfolio of research investments in fundamental science

and engineering research, estimated to be in excess of \$11 billion annually across 10 Federal agencies.

- **Establish Federal Research and Development Priorities.** Establish a continuing inter-agency review of energy-related applied Federal R&D, estimated to be approximately \$3 billion in annual investments across seven Federal agencies, to identify top-priority technical opportunities and ensure that research investments support key Strategy goals and technical objectives.
- **Encourage Industrial Research.** Encourage industry to increase its energy research investments through financial incentives for research consortia, permanent tax credits for research and experimentation investments, increased use of personnel exchanges, and prizes and awards.
- **Strengthen University Research.** Strengthen individual investigator capabilities, increase cost sharing in funding proposals, and upgrade university equipment and instrumentation.
- **Maintain User Facilities.** Ensure the viability of top-priority, world-class research facilities that are available to university and private investigators, and explore alternative means for supporting them in the longer term.
- **International Collaboration.** Pursue bilateral and multilateral international agreements to construct and operate high-cost, long-term experimental research facilities.

### Technology Transfer

In the area of technology transfer, the National Energy Strategy seeks to <sup>(1)</sup> increase the use of joint industry-government efforts in R&D and in the commercialization of new technologies; <sup>(2)</sup> increase the participation of the Federal Government in the technology transfer process; and accelerate the process of transferring technology to private industry and commerce. <sup>(3)</sup>

in order to  
enhance  
U.S.  
competitiveness.

The National Energy Strategy proposes the following actions:

- **Increase Industry Participation.** Increase industry participation in R&D and in the commercialization of new technologies by making the 20-percent tax credit for industrial research and experimentation permanent and by encouraging collaborative, cost-shared R&D.
- **Ensure Adequate Protection for Intellectual Property.** Provide copyright protection for technical data and software, both at home and abroad. Broaden the National Cooperative Research Act of 1984 to include certain types of product development activities, and reform product liability laws. Revise classification policies to improve industrial access to laboratories and facilities that could contribute to enhancing U.S. competitiveness, while continuing to protect national security interests. Finally, revise Federal procurement regulations and practices to promote greater efficiency and innovation.
- **Promote Technology Exports.** Improve the coordination of Federal agencies in export promotion efforts, particularly for developing and Eastern European countries. *and*
- **Increase the Participation of the Federal Government in Technology Transfer.** Develop and implement comprehensive agency policies supporting technology transfer as a fundamental mission of the Federal Government. Provide adequate funding for technology transfer, including support for cost-shared programs that help demonstrate the technical feasibility of generic, enabling technologies and that provide technical assistance for the development of spinoff applications by industry.
- **Accelerate the Technology Transfer Process.** Improve the delivery of technology transfer services nationwide through careful reform of the infrastructure. Ensure that Federal approval for procurement and technology transfer activities are sufficiently speedy and flexible.

## Education: Investing in Human Resources

Without a population literate in ~~math~~ ~~mathematical~~ and science, we cannot expect to develop, manage, or properly appreciate the new energy technologies we will need to provide a secure, clean energy future for all Americans. It is for these reasons that the National Energy Strategy contains key recommendations for improving math, science, technology, and engineering education. The Federal role—a modest but critical 6 percent of total funding at the precollege level—must be integrated with those of the States and the private sector to achieve the best results. Special emphasis must be placed on recruiting women and underrepresented minorities into the technical work force, to recruiting and preparing qualified math and science teachers for our schools, and to broadening the base of "science literacy" among the U.S. public. *use*

The President and the Governors provided a framework for achieving excellence in U.S. education following the Charlottesville Education Summit. This part of our "national strategy" has already been well publicized, and it includes the goal that "by the year 2000, U.S. students will be first in the world in science and mathematics achievement."

The Secretary of Energy chairs the Committee on Education and Human Resources of the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET-CEHR). This 16-agency group prepared the first coordinated report and budget for direct Federal spending on math, science, and engineering education, which accompanied the President's fiscal year 1992 budget submission to Congress. *for*

~~In education,~~ The National Energy Strategy seeks to increase Americans' understanding of the role of energy in their lives, and its attendant costs and benefits, and to ensure a reliable supply of highly skilled scientists, engineers, and technicians in energy-related fields. The National Energy Strategy proposes the following actions:  
*emphasizes the need to:*

EXECUTIVE SUMMARY

Working Draft  
02/09/91 8:18am

- Improve precollege mathematics and science education in support of the National Education Goals.
- Encourage precollege reform through government agencies and school partnerships.
- <sup>Strengthen</sup> ~~Emphasize~~ and update the math and science curriculum.
- Promote positive images of mathematics and the sciences.
- Initiate and expand incentives for careers as mathematics and science teachers.
- Make math and science teachers full partners in the scientific community.
- Maintain close linkages with the States and the private sector through FCCSET-CEHR.
- Support public science literacy through mass media and parent-child programs.
- Continue to assist energy education through development of materials and school curricula.
- Broaden public science literacy programs.
- Provide fellowships and equipment to colleges.
- Provide technical and on-the-job training.
- Increase programs relating to undergraduate curriculum and materials development in the sciences.
- Support the increased participation of all population groups, including women, minorities, and the disabled, in science and technology careers.

supply, for specific aspects of environmental quality, and in building a firm foundation for the future in both general and expert understanding of how energy can be applied to our best overall national interest and welfare.

<sup>complete</sup>  
The rest of this document gives more detail of specific actions to be taken to implement the National Energy Strategy in various areas of energy consumption, in diverse sources of energy

will remove regulation, except where necessary to protect consumers, while enabling all segments of the industry to expand by taking advantage of market opportunities.

EXECUTIVE SUMMARY

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- Evaluate Effects of Environmental Regulations on Domestic Refining Capacity. The Department of Energy has commissioned the National Petroleum Council to conduct a two-phase study. The first phase will produce a report by June 1991 that will address the capabilities of the U.S. refining industry to meet consumer needs, considering especially the requirements of the Clean Air Act Amendments of 1990. The second phase, to be completed in 1992, will provide analysis of the time and investments necessary to meet new environmental regulations, and their effects on petroleum product supply and prices.

would still have to comply with all applicable State and Federal environmental laws, but would not be subjected to delay by competitors.

- Streamline the National Environmental Policy Act Process Associated With Natural Gas Pipeline Construction. FERC would be the sole agency responsible for administering National Environmental Policy Act (NEPA) environmental reviews of proposals to build new natural gas pipelines. FERC would still be required to consult and solicit comments from other agencies, but other agencies would not be allowed to delay the approval process by failing to meet deadlines or by preparing independent NEPA documents.

preparing and could change applicants for related expenses.

- Deregulate Pipeline Sales Rates. Unless a pipeline is found to have market power in the sale of natural gas, the price at which a pipeline sells natural gas would be deregulated if the pipeline provides comparable transportation and other services to all customers, regardless of whether they are purchasing gas from the pipeline or from other sources.

- Reform Natural Gas Pipeline Rate Design. The traditional pricing structure for pipeline services would be reformed to ensure that existing pipeline and storage facilities are operated efficiently. Rate reform initiatives would include exempting natural gas pipelines from rate regulation except for pipelines found to have market power in their transportation function, promoting incentive regulation for pipelines found to have market power in their transportation functions, authorizing capacity holders to resell capacity rights, and allowing greater pricing and contracting flexibility for new pipelines.

- Improve Access to Natural Gas Pipeline Transportation Services. Remaining impediments to third-party use of pipeline facilities on an open-access basis would be removed by promoting the use of pricing mechanisms

Natural Gas

This regulation, initially designed to protect the consumer, frequently has the opposite impact.

Natural gas is a domestically abundant source of clean energy. Although all price controls on natural gas at the wellhead will be eliminated by January 1993, under the Wellhead Decontrol Act of 1989, the natural gas industry continues to be hampered by inefficient and outmoded regulation. The National Energy Strategy addresses the regulatory barriers currently preventing natural gas from reaching its full potential in the U.S. energy mix. If fully implemented, the National Energy Strategy measures would increase U.S. consumption of natural gas by almost 1 trillion cubic feet (approximately 5 percent) over what it would have been in the year 2000 under pre-Strategy policies.

Specifically, the National Energy Strategy will expedite

- Allow Gas Pipeline Construction, Without Federal Certification. New natural gas pipelines could be built without a certificate of public convenience and necessity from FERC. Pipelines constructed under this approach

The measures are a tax credit for enhanced oil recovery, a 2-year extension of the section 29 credit, modifications to the percentage depletion rules, and alternative minimum tax relief for independent producers.

Under several options, including shortening or eliminating the process for obtaining

Pipelines would be given the opportunity to negotiate arrangements for the transportation or sale of natural gas without regulatory approval. Parties unable to reach such agreements with pipelines could seek regulatory intervention of these arrangements.

conditions that are not unduly discriminatory.

EXECUTIVE SUMMARY

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*Producers and other shippers could seek orders directing pipelines to receive gas into their facilities.*

rather than government rules to balance supply and demand. Efficient pricing would be facilitated by unbundling transportation, marketing, gas purchasing, and storage services. ~~Transportation services should be offered to those purchasing gas from other suppliers comparable to those provided by the pipeline when it is the seller of gas.~~

- Eliminate the Department of Energy's Import and Export Regulation. The Department of Energy would end its regulatory oversight of natural gas import and export transactions.
- Encourage the Use of Natural Gas as an Alternative Transportation Fuel. Through accelerated purchases of alternative-fuel vehicles for the Federal fleet and through a nationwide private-fleet alternative-fuel program, the National Energy Strategy will expand market opportunities for natural gas as a transportation fuel.

## Coal

If we as a nation are to benefit in the future from our enormous, low-cost coal reserves, a variety of efforts are necessary to (1) develop and demonstrate new "clean coal" technologies; (2) reduce uncertainty over environmental regulation and allow electric powerplants (which use more than four-fifths of all the coal consumed in the United States) maximum flexibility in their actions to comply with the Clean Air Act Amendments of 1990; (3) provide regulatory incentives to offset financial risks in commercial deployment of new clean coal technology; (4) reduce the cost, investment risks, and environmental impacts of producing liquid fuels from coal; and (5) confront head-on the need to reduce carbon dioxide emissions associated with the use of coal.

New clean coal technologies can <sup>substantially</sup> improve efficiency and reduce emissions from powerplants, ~~substantially~~. Until they are proven at commercial scale, however, their use entails more risk for utilities than conventional technologies. This additional risk could make it difficult for these new technolo-

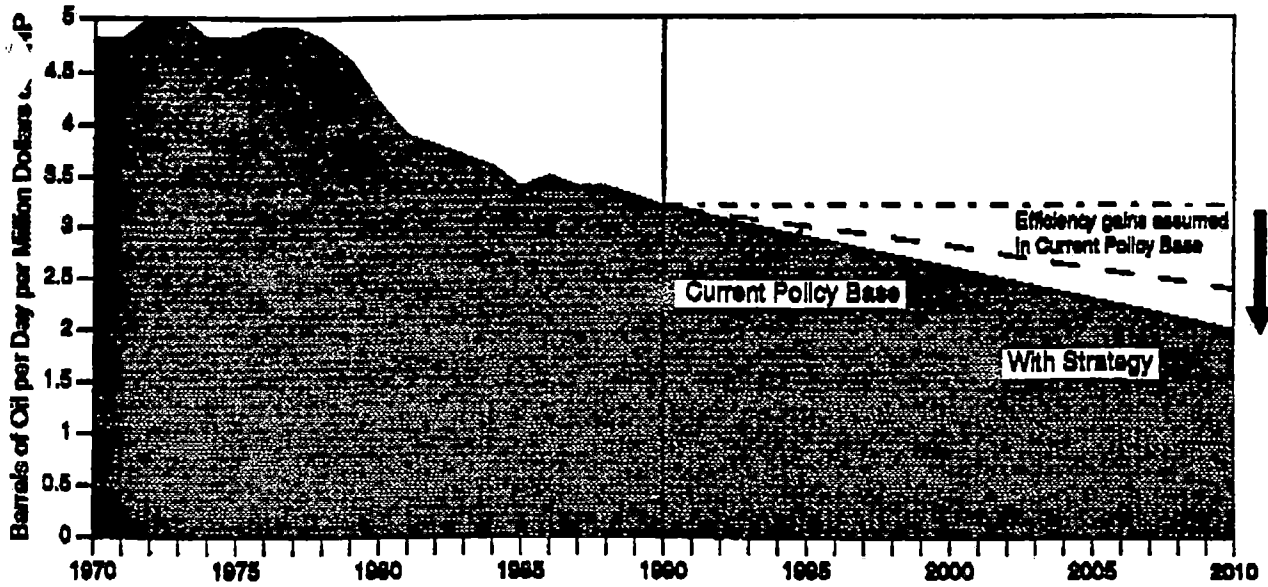
gies to enter the marketplace quickly, especially given the tight deadlines of the Clean Air Act Amendments of 1990. The Clean Coal Technology Program, the single largest technology development program in the Department of Energy, is designed to help overcome this risk by offering the Federal Government as a financial partner in demonstrating worthy projects.

By promoting the export of clean coal technologies, the National Energy Strategy will also help other nations (especially in Eastern Europe and the developing world) to achieve common goals: a cleaner environment and less dependence on oil.

Specifically, the National Energy Strategy will:

- Accelerate Use of Clean Coal Technology. The Administration will encourage State regulatory authorities to act in concert with appropriate Federal agencies and provide regulatory incentives for utilities to invest in projects using innovative clean coal technologies. The object of the regulatory incentives would be to offset the additional risks associated with investment in technologies that are not fully proven on a commercial scale.
- Clarify Applicability of the Clean Air Act's Prevention of Significant Deterioration (PSD) and "New Source Review" Provisions to Existing Powerplants. Current PSD and new-source-review policy discourages certain types of maintenance, repair, and fuel-switching activities by deeming these actions to be "modifications," thus subjecting an existing powerplant that undertakes such an activity to stringent "new source" and PSD requirements. This policy would be altered by Environmental Protection Agency administrative action (and, if necessary, by new legislation) to clarify what changes in plant equipment or operation should trigger PSD and new source review. *will*
- Create Favorable Export Climate for U.S. Coal and Coal Technology. To improve the climate for coal-related exports, the National Energy Strategy will improve the visibility of U.S. firms and their products by establishing

### Figure 2. Reduced Exposure to Oil Price Shocks



Note: The vertical strokes on the Strategy's projections indicate the imprecise nature of estimating future impacts.

SU-G  
6.5in. x 3.5in

61621

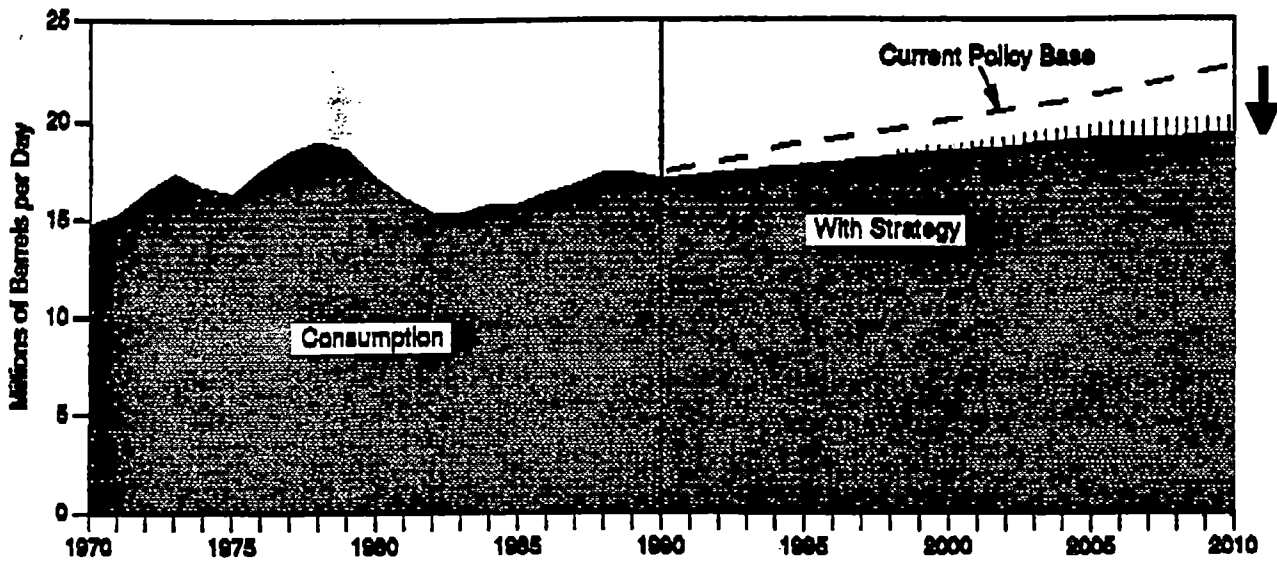
Beep

1547 (Abe)

Beep

(X →)

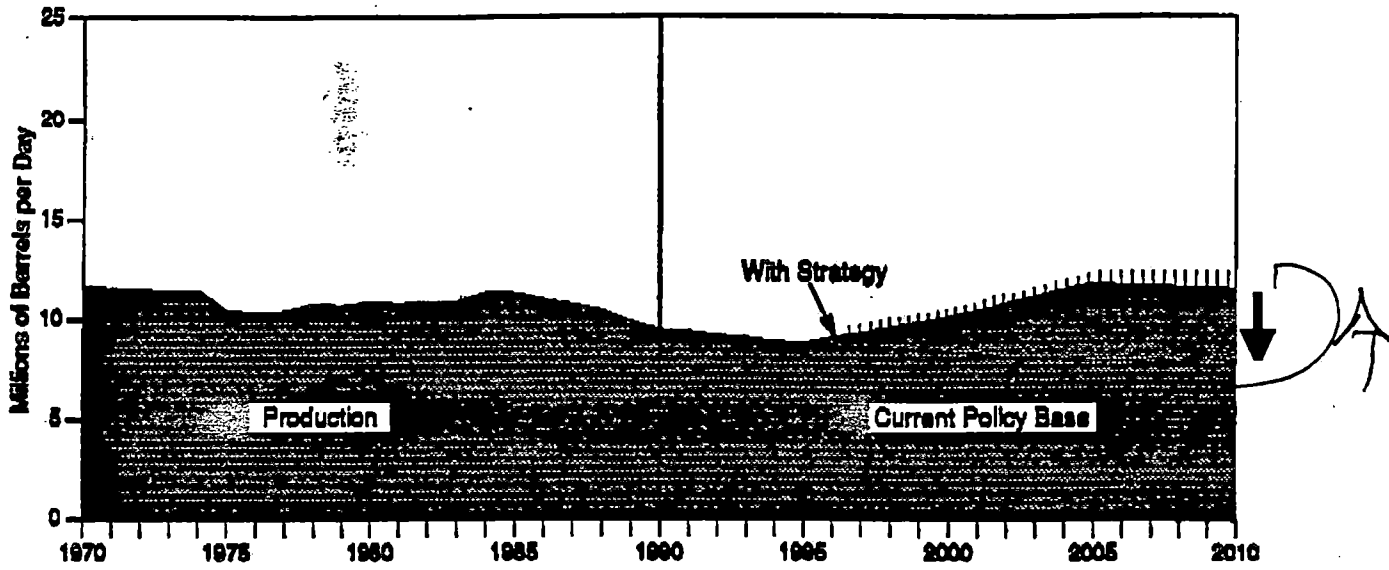
**Figure 8. Summary of the Effects of National Energy Strategy Actions on U.S. Oil Consumption**



Note: The vertical strokes on the Strategy's projections indicate the imprecise nature of estimating future impacts.

SU-M  
6.5inW x 3.5 inL

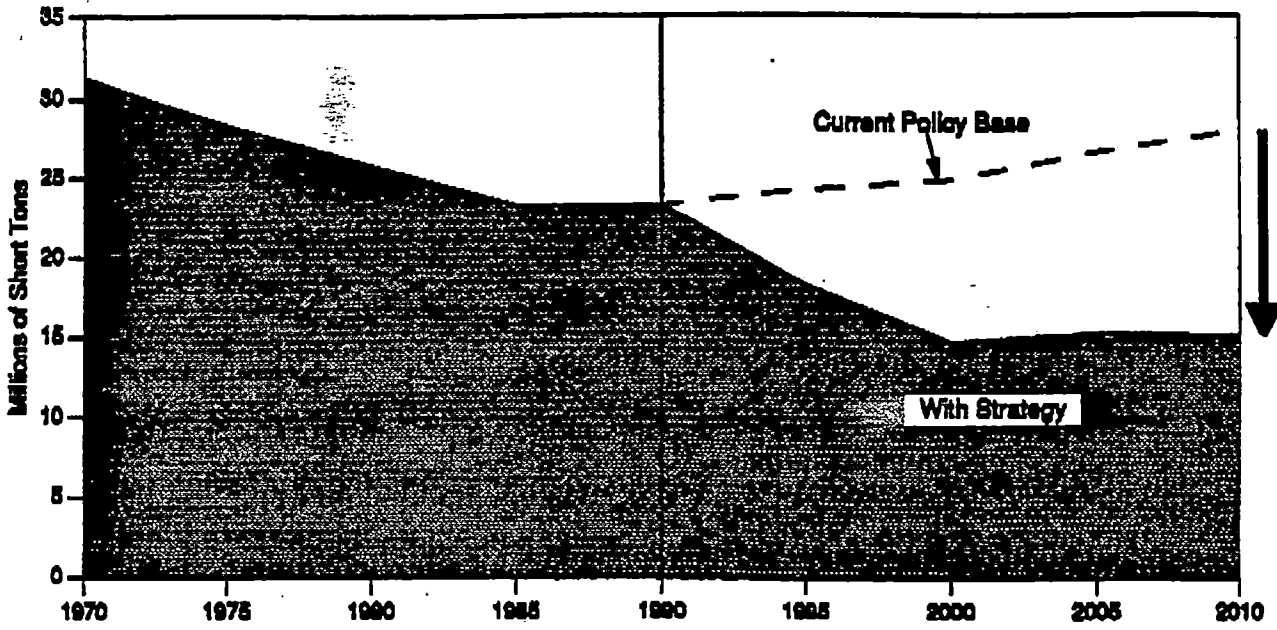
**Figure 4. Summary of the Effects of National Energy Strategy Actions on U.S. Oil Production**



Note: The vertical strokes on the Strategy's projections indicate the imprecise nature of estimating future impacts.

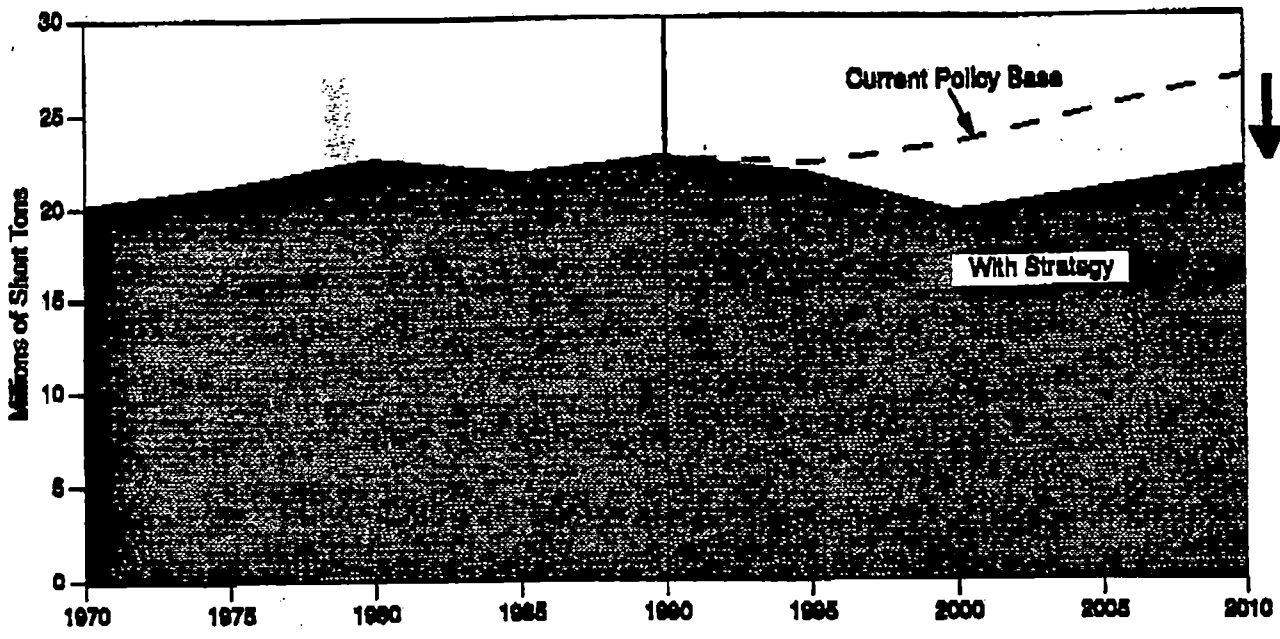
SU-N  
6.5inW x 3.5inL

**Figure 5. Reduced Emissions of Sulfur Dioxide**



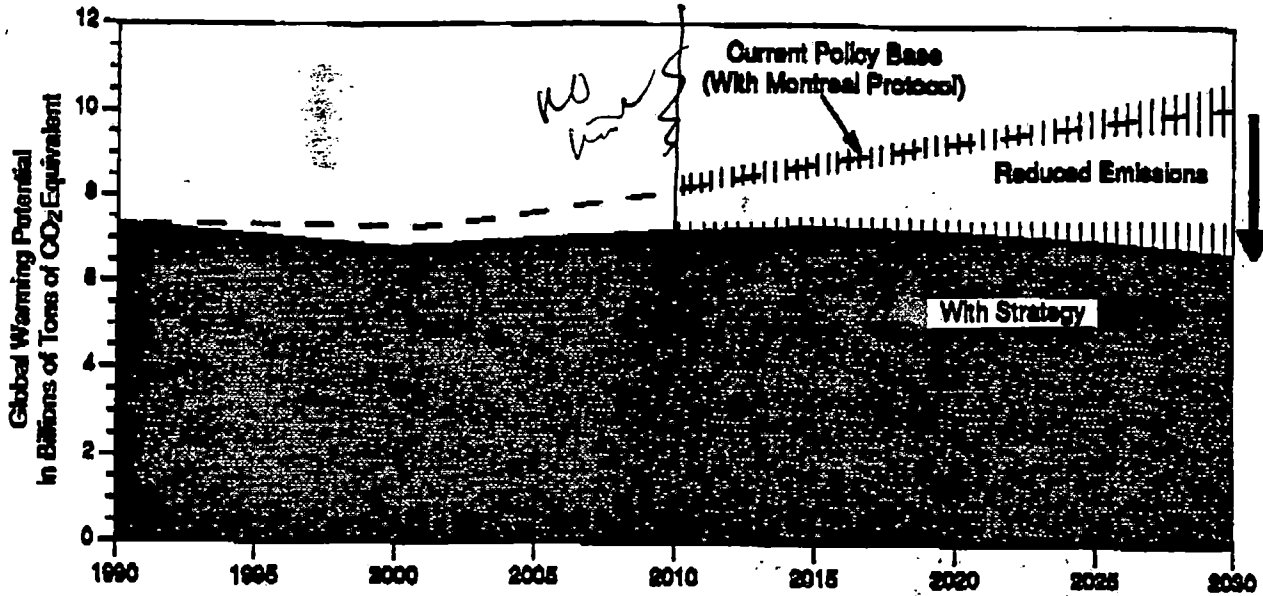
SU-J Also ALW-A  
6.5inW x 8.5inL

**Figure 6. Reduced Emissions of Nitrogen Oxides**



SU-L, also ALW-B  
6.8inW x 3.5inL

### Figure 7. Reduced Potential for Global Warming



Notes: Global Warming Potential (GWP)—Unit of 100-year global warming potential measured in billion metric tons of CO<sub>2</sub> equivalents. Greenhouse gases vary in their atmospheric lifetimes and in their ability to absorb and reradiate heat. This chart is based on converting the projected volumes of greenhouse gases to one common measure, Global Warming Potential. If indirect gases that form tropospheric ozone (nitrogen oxides and volatile organic compounds) were to be included, a slightly lower GWP for the National Energy Strategy scenario would result. The vertical strokes on the Strategy's projections indicate the imprecise nature of estimating future impacts.

SU-K Also GL-8  
6.5inW x 4.25inL

(Lange/Grossman)  
February 19, 1991  
6:30 P.M.  
[ENERGY.DOC]

PRESIDENTIAL REMARKS: ENERGY POLICY BRIEFING  
ROOM 450, OEOB  
1:15 P.M.  
WEDNESDAY, FEBRUARY 20, 1991

Congressmen Dingell, ~~Wallop~~, ~~Johnston~~, ~~Lent~~, ~~Sharp~~, and  
Moorhead; Governors ~~Hickel~~, ~~Ashcroft~~, ~~Sinner~~, and ~~Romer~~; Admiral  
Watkins, ~~Henson Moore~~, and Linda Stuntz -- thank you all.

This afternoon I'm pleased to release our comprehensive  
National Energy Strategy -- a strategy for an energy future that  
is secure, efficient, and environmentally sound.

Thanks to Admiral Watkins and the efforts of many, we now  
have a carefully balanced energy strategy, designed to diversify  
America's energy sources; encourage efficiency and conservation;  
spur competition throughout the energy sector; give Americans  
greater choice among fuels; and enhance U.S. research and  
development in new technologies.

The driving force behind this strategy is straightforward.  
It relies on the power of the marketplace, the common sense of  
the American people, and the responsible leadership of industry  
and government.

Every American will benefit from the policies we're laying  
out today. Over the next two decades, this strategy will make  
America more energy efficient -- without new energy taxes. It  
will mean savings for consumers in energy costs. And it will  
improve our energy security, and reduce our vulnerability in the  
years ahead.

Let's talk about reality. We've already made progress toward reducing ~~that~~ energy vulnerability. We've diversified our suppliers, so that we are not unduly reliant on any single source. What's more, through the <sup>SPP</sup> Strategic Petroleum Reserve, we have vastly improved our ability to respond flexibly to supply interruptions. And we have already begun moving on the path toward improved energy efficiency.

But we're <sup>are - 1st to concede</sup> a long way from total energy independence. Our imports of foreign oil have been climbing since 1985, and now stand at 42 percent of our total consumption. Too many of those oil imports come from sources in troubled parts of the world.

We know that for domestic oil production, certain areas are justifiably <sup>so</sup> off limits, for environmental reasons. Developing new, alternative energy sources takes time. Some sources of power face political problems. So America will have to continue to import energy for years to come.

We also know that unwise and extreme measures to reduce oil imports would seriously hurt American consumers, <sup>to</sup> American jobs, and American industries. <sup>in the C, working 24/7</sup>

In the face of these realities, we <sup>must</sup> ~~need to~~ act with care -- <sup>but</sup> ~~and we need to~~ <sup>must</sup> act comprehensively. Our National Energy Strategy strikes a sound, reasonable balance -- and it will achieve greater energy security without <sup>unduly</sup> burdening consumers or the economy.

To minimize our vulnerability to foreign oil disruptions, <sup>tl</sup> <sup>retain on</sup> ~~and~~ this strategy takes a multifaceted approach. It will help us to

find more reliable sources of energy -- through uncompromisingly safe and environmentally sound development. Domestic oil production will rise by 3.8 million barrels a day.

This strategy will also help us use energy more efficiently -- by encouraging new technologies, alternative fueled vehicles, and conservation.

With this strategy, we're working to give Americans unprecedented choice and flexibility. Instead of only finding gasoline at the corner station, we want Americans to be able to choose from a range of environmentally sound and cleaner fuels -- like ethanol, methanol, electricity, propane, natural gas, and cleaner gasoline. Alternative transportation fuel production will rise by up to 2.5 million barrels of oil equivalent per day.

Where America's towns and cities were once able to buy electricity [for their homes] from only one utility company, we want to help spur competition in the electric power business -- and bring lower prices to consumers. And we plan for electricity produced from renewable sources to rise by 16 percent. \\

We want to build an energy future based on a range of diverse sources, so that never again will this nation's energy well-being be swayed by events in a single foreign country.

Our approach will give Americans the flexibility, opportunity and knowledge they need to conserve, to change fuel sources, and to cut their energy bills.

Finally, we believe this strategy will keep America on the cutting edge of new energy technology. It promotes partnerships

between industry and government, for accelerated research in technologies like biomass and alternative fuels, electric vehicles, high speed rail, renewable sources like solar and geothermal power, and nuclear technologies of unprecedented safety and security.

Together with our <sup>recently passed</sup> Clean Air Act, this National Energy Strategy will maintain our uncompromising commitment to energy security and environmental protection. And it will put America on the road to continued economic growth. *Not have status quo for America - want to go to new*

Nobody should assume that meeting our needs for abundant energy, a strong economy, and a sound environment will be easy. *going to* This strategy strikes a delicate balance. As always, there will be critics in every corner -- but none of them will propose a plan that is more comprehensive, or <sup>in my view</sup> more carefully thought out.

I believe this strategy is a good one, because along with our abundant natural resources, it draws on <sup>our</sup> this nation's remarkable resourcefulness.

From the company that finds more energy-efficient ways to do business -- to the scientist who makes a new power source practical -- to the individual American at home, who finds <sup>some new</sup> a way to save energy -- I think we can rely on the most remarkable source of <sup>choice</sup> power the world has ever seen: the American people.

Thank you all -- and may God bless the United States of America.

# # #

*So I fully endorse this - advice Wallop - Rodoff - NH - PopUS will be fully endorsed - get message out*  
*We will be strongly involved and we want to get it done right. Please I will do my part*

(Lange/Cawley)  
February 15, 1991  
5:45 P.M.  
[ENERGY.DOC]

PRESIDENTIAL REMARKS: ENERGY POLICY BRIEFING  
ROOM 450, OEOB  
1:15 P.M.  
WEDNESDAY, FEBRUARY 20, 1991

Admiral Watkins... [acknowledgements].

This afternoon I'm pleased to release our comprehensive National Energy Strategy -- to ensure that our energy future is secure, efficient, and environmentally sound.

Thanks to Admiral Watkins and the efforts of many, we now have a carefully-balanced strategy that will diversify America's energy sources; spur efficiency, conservation and competition throughout the energy sector; give Americans greater choice among fuels; and improve U.S. research and development in new technologies.

The driving force behind this strategy is straightforward. It relies on the power of the marketplace, the common sense of the American people, and the responsible leadership of industry and government.

Every American will benefit from the policies we're laying out today. Over the next two decades, this strategy will make America more energy efficient -- without energy taxes or oil import fees. It will mean savings for consumers in energy costs. And it will improve our energy security in the years ahead.

Let's talk about some facts: We're a long way from total energy independence. Our imports of foreign oil have been

climbing since 1985, and now stand at 42 percent of our total consumption. Too many of those oil imports come from sources in troubled parts of the world.

A few more facts: We know that for domestic oil production, certain areas are justifiably off limits, for environmental reasons. Developing new, alternative energy sources takes time. Some sources of power face political problems. So America will have to continue to import millions of gallons of oil, for years to come.

We also know that unwise and extreme measures to reduce oil imports would seriously hurt American consumers, American jobs, and American industries.

In the face of these facts, our strategy strikes a reasonable balance -- and starts us down the road to real security.

To minimize our vulnerability to foreign oil, this strategy increases domestic production -- and reduces demand. It will help us to find more reliable sources of energy -- through uncompromisingly safe and environmentally sound development. And it will help us do more with less -- by encouraging alternative fueled vehicles, conservation, and mass transit.

With this strategy, we're working to give Americans unprecedented choice and flexibility.

Instead of only finding gasoline at the corner station, we want Americans to be able to choose from a range of

environmentally sound fuels -- like methanol, ethanol, electricity, propane, and natural gas.

Where Americans were once able to buy energy for their homes from one utility company, we want to make it easier for other companies to enter the industry, and give consumers alternatives.

And where the nation's overall energy well-being used to be dictated by big cartels and powerful interests, we want to build an energy future based on a range of diverse sources.

This approach will give Americans the flexibility, opportunity and knowledge they need to conserve, to change fuel sources, and to cut their energy bills.

Finally, we believe this strategy will keep America on the cutting edge of new energy technology. It promotes partnerships between industry and government, for accelerated research in technologies like biomass and alternative fuels, electric vehicles, fusion, high speed rail, renewable sources like solar and wind power, and nuclear technologies of unprecedented safety and security.

Together with our Clean Air Act, this National Energy Strategy will maintain our uncompromising commitment to energy security and environmental protection. And it will put America on the road to continued economic growth.

Does this strategy have all the answers? Not at all. Nobody should assume that meeting our needs for abundant energy, a strong economy, and a sound environment will be easy.

But I believe we'll do it. Because along with our abundant natural resources, we can draw on this nation's resourcefulness.

From the company that finds more energy-efficient ways to do business -- to the scientist who makes a new power source practical -- to the individual American at home, who finds a way to do more with less -- I think we can rely on the most remarkable source of power the world has ever seen: the American people.

Thank you all -- and may God bless the United States of America.

# # #

productive people  
are 2% of pop. supply 75% of world's goods

Year 2027 Energy Study (EIA)

Energy studies: mostly in night time.  
and just about since 1930  
1/3 low energy  
1/3 low energy  
1/3 low energy  
70's and 80's  
non-peak periods  
condens. & gas liquid  
diverse sources  
int'l coop.  
diverse sources

high level investment for prod. following energy crisis.  
"crisis" "energy"  
a impulse to think we ~~can~~  
cost saving program.

reduced  $E/GDP$   
Both decreased demand  
(incr. production)

the single @ domestic  
measures

24% → 8%

new Fed. in energy - elec. ind.

There was a time when there dependent on one industry

Example 3: say you're a farmer: not one product - after an abundant food harvest

Wills - again in case of other critical source

for important sources

by control

[computation...]

Going to take a long time to have new sources; nuclear power is

So what do we do. <sup>judiciously</sup> ~~balance~~ <sup>suppression</sup> ~~of~~ <sup>pol. difficulty.</sup> ~~balance~~ Certain ~~are~~ <sup>are</sup> off limits, because ~~energy~~ <sup>energy</sup> ~~concerns~~ <sup>concerns</sup>

Area will continue to import oil, gas for gas to use.

Away other things, our strat. for 10 min. for oil imports  
one way ~~to~~ <sup>to</sup> increase domestic prod.  
we double it.

Depositing our  
oil. imports (07% of ADINA)

another - reduce or hold constant  
real for oil consumption - this str.  
another ~~to~~ <sup>to</sup> all sources - this  
strat. x, y, z.

~~This strat will allow our country to produce same amt.  
of prod~~ 27%

SPP ↑  
sites other than Gulf  
OIL/ONP ↓



Department of Energy  
Washington, DC 20585

Facsimile Cover Sheet 91 FEB 19 P 1: 18

for

The Office of Policy, Planning and Analysis

Date: 2-19-91

To: Jennifer

Organization: WH

Phone/Fax Number: 456-7750

From: Mark Kerigan

Subject/Comments:

This fax contains 10 pages, including this cover. If you did not receive all of the pages or if illegible, please phone

Ann at (202) 586-4159.

*Revised  
2-18 9:15 AM*

Office of the Press Secretary

For Immediate Release

February 20, 1991

FACT SHEET:

THE NATIONAL ENERGY STRATEGY

President Bush today proposed a comprehensive and balanced program to ensure all Americans an energy future that is secure, efficient, and environmentally sound. By providing leadership in international, regulatory, and technological arenas, the National Energy Strategy will diversify U.S. sources of energy supplies and offer more efficiency and flexibility in the way energy is used.

The National Energy Strategy will accomplish these goals without sacrificing economic growth. A keystone of the National Energy Strategy is continuing the successful policy of market reliance. Over the next two decades, the Strategy will make the U.S. more energy efficient--without resorting to heavy-handed regulations or import fees that can hurt consumers and our allies.

Implementation of the Strategy will lead to greater opportunities for developing energy supplies. A goal of the National Energy Strategy is to reduce the U.S.' vulnerability to oil supply disruptions. Yet the Strategy acknowledges that the U.S. is part of an energy interdependent world. It is not in our interest to adopt measures that may reduce imports but inflict severe economic or environmental damage. Therefore, the National Energy Strategy balances economic, environmental and energy security objectives.

Over the next twenty years, this balanced approach to production and conservation will yield a U.S. economy less dependent on energy. At the same time, the U.S. will produce more of the energy it uses. By the year 2010

- o the U.S. will consume <sup>38/16</sup> 38 percent less oil for each unit of GNP we produce *today*.
- o domestic oil production will rise by 3.8 million barrels per day.
- o electricity produced from renewable sources will rise by 16 percent.

*38/16*

\*- 38 percent includes base case projected improvements, 16 percent is NES measured specifically.

- of oil equivalent*
- o alternative transportation fuel production will rise by up to 2.5 million barrels per day.

Not only will U.S. production climb, but the environment will benefit. By 2010, the National Energy Strategy will contribute to

- o reducing the potential threat of global warming by reducing U.S. emissions of greenhouse gases at or below 1990 levels.
- o enhancing air quality by reducing emissions of pollutants contributing to acid rain and smog. Sulfur dioxide emissions fall by 40 percent, nitrogen oxide emissions by ~~25~~ 20 percent, and volatile organic compounds by ~~30~~ 20 percent.
- o enhancing water quality by scaling down solid effluent <sup>20</sup>
- o addressing solid waste problems by reducing coal ash waste 25 million tons per year, and ~~but~~ lowering coal cleaning wastes by 50 million tons per year. *by*

*check these figures*

The Strategy builds on a number of Bush Administration initiatives. These include (1) the 1990 revisions to the Clean Air Act; (2) natural gas well-head decontrol legislation; (3) incentives provided to domestic renewable and fossil energy producers in fiscal year 1991 budget agreement; (4) the unprecedented international consensus forged in the wake of the Persian Gulf crisis; (5) the fiscal year 1991 and 1992 realignments of the Department of Energy's research and program priorities; (6) the Administration's domestic energy supply and demand measures adopted in response to the Iraqi oil disruption; and (7) the Administration's science and mathematics education initiatives.

To meet the challenges ahead, the National Energy Strategy calls for action by Federal, State, and local government and by domestic and international energy producers and consumers. This National Energy Strategy will provide a more secure and cleaner energy future through greater energy and economic efficiency and new technology.

### INCREASING ENERGY AND ECONOMIC EFFICIENCY

#### Transportation Efficiency

##### Highlights

The National Energy Strategy will increase transportation efficiency by:

- o scrapping high pollution, low efficiency vehicles

- o increasing use of public transit, vanpooling and ridesharing through larger tax-free commuter subsidies
- o requiring centrally-fueled fleets to use alternative fuel vehicles, by increasing Federal purchases of such vehicles, and by lifting the cap on CAFE incentives for automakers who build alternative fuel vehicles.
- o accelerating research and development of more efficient technologies, including electric, gas turbine, and high efficiency aircraft engines
- o reducing technological barriers to MAGLEV and high-speed rail and by widely implementing Intelligent Vehicle/Highway systems

These measures will displace 1.8 million barrels of oil per day by 2010, reduce the transportation sector's total reliance on oil, and increase consumer choice without penalizing consumers of U.S. industry competitiveness. The number of passenger miles driven could rise 50 percent, but the volume of gasoline purchased by consumers would fall 13 percent.

Electricity Generation and Efficiency <sup>60</sup> <sup>from 1990</sup>

Highlights

The National Energy Strategy will raise electricity efficiency by:

- o amending the Public Utility Holding Company Act (PUHCA) to enhance competition in the electricity industry and allow power suppliers to build, own, and operate plants in more than one area.
- o expanding efforts to treat electricity conservation programs equitably with power plant additions (Integrated Resource Planning).
- o reforming the Public Utility Regulatory Policies Act (PURPA) to modify size and fuel use restrictions for small power producers.
- o providing tax-free treatment of utility discounts on consumers' electricity bills for efficiency investments.
- o expanding access to electricity transmission for utility and non-utility wholesale buyers and sellers.
- o phasing-out Federal subsidies to the debt of Federal Power Marketing Administrations.

These measures will reduce electricity demand growth by <sup>1.6</sup>~~4.5~~ quads in 2010 and save consumers \$26 billion in electricity costs

through greater use of competitive forces and new technologies.

### Residential and Commercial Building Efficiency

#### Highlights

The National Energy Strategy will raise efficiency levels for residential and commercial buildings by:

- o accelerating research for building technologies and supporting State and utility programs that use it.
- o expanding mortgage financing incentives for energy efficient homes.
- o setting cost-effective appliance and equipment standards and expanding labeling programs to include light bulbs and other equipment.
- o strengthening building efficiency standards and providing technical assistance to States to expand their use.
- o improving Federal energy efficiency.

<sup>0.5</sup> These measures will reduce building energy demand in 2010 by at least ~~0.4~~ quads. The amount of floor space in malls, office buildings, and other commercial building will grow by 57 percent, but the energy needed to heat, cool, and light that space will grow by less than half that amount. The U.S. will have 24 percent more occupied housing than today, but we will use only 10 percent more power to service the housing. At the same time, these measures will increase the affordability of housing, especially for low-income consumers, and improve indoor comfort and air quality.

### Industrial Energy Efficiency

#### Highlights

The National Energy Strategy will raise industrial energy efficiency by:

- o increasing research and development for industrial processes and industrial waste minimization.
- o expanding the use of energy audits and speeding up adoption of high efficiency technology.
- o removing regulatory disincentives to using waste minimization technology.

By the year 2010, these measures will help industrial output grow 80 percent, yet use only 27 percent more energy to power all of our factories, plants, mills, and similar facilities. In

addition, the environmental impacts of industry will decline.

### SECURING FUTURE ENERGY SUPPLIES

#### Securing Petroleum Supplies

##### Highlights

The National Energy Strategy will reduce our vulnerability to oil supply disruptions by:

- o removing institutional and trade barriers to oil production outside the Persian Gulf, with emphasis on Western Hemisphere energy cooperation.
- o expanding worldwide strategic stocks.
- o increasing Federal and private investment in enhanced oil recovery technology.
- o providing environmentally responsible access to discrete areas of the coastal plain of ANWR and resolving technical and regulatory barriers to greater Alaska North Slope oil development.
- o allowing environmentally responsible access to discrete Outer Continental Shelf areas.
- o deregulating oil pipelines in competitive markets.
- o increasing production of California heavy oil and allowing access to export markets.
- o evaluating the refining sector's ability to meet future demand for a variety of liquid fuels.

These measures will increase domestic oil production by up to 3.6 million barrels per day in 2010, and raise economically recoverable resources by 25 to 70 billion barrels.

#### Securing Natural Gas Supplies

##### Highlights

The National Energy Strategy will promote domestic and international natural gas production by:

- o streamlining gas pipeline construction reviews and developing more efficient environmental review procedures.
- o deregulating pipeline sales rates in competitive markets and reforming gas pipeline rate designs.

- o supporting environmentally responsible exploration and development in certain currently restricted areas
- o improving third party access to pipelines transportation services.
- o eliminating certain import/export regulations
- o expanding use of natural gas in alternative fuel vehicles and enhanced oil recovery

These measures will displace up to <sup>600,000</sup> 900,000 barrels of oil per day by 1995, and increase natural gas consumption by almost 1 trillion cubic feet in 2000. Residential consumers will save ~~\$140 million in 2000 and \$1 billion in 2010.~~ <sup>\$200 million</sup> <sup>\$850 million</sup>

*step* →  
*except numbers*

*OK*  
*good*  
*but*  
*let*  
*show*

Securing Future Coal Supplies

Highlights

The National Energy Strategy will promote the use and export of clean coal resources by:

- o accelerating use of clean coal technology through Federal and State regulatory incentives.
- o clarifying the applicability of New Source Review provisions for refurbished power plants under the Clean Air Act.
- o creating favorable export markets for U.S. coal and coal-burning technologies.
- o removing barriers to constructing coal slurry pipelines.
- o pursue research and development on environmental protection during mining and studying global climate change implications.

These measures will achieve Clean Air Act objectives at lower cost and minimal disruption to regional coal markets, jobs, and economic activity. They will also allow the U.S. coal industry to capture a major share of the growing international coal and coal technology markets, while maintaining our ability to take advantage of large U.S. supplies of low cost coal.

Securing Nuclear Power

Highlights

The National Energy Strategy will promote new nuclear power capacity by:

- o reforming the nuclear plant licensing process, as well as

the process for siting and licensing of waste facilities.

- o developing standardized designs for current generation power plants.
- o accelerating research and development of advanced technology, inherently safe reactors.

These measures will enhance the nuclear technology option by reducing costs and increasing safety and reliability. Nuclear power production would increase by 10 percent by 2010 and the U.S. would maintain its technological leadership and its leadership in achieving global climate change mitigation objectives.

### Securing Renewable Resources

#### Highlights

The National Energy Strategy will promote the development and use of renewable resources by:

- o extending the current investment tax credit through 1992.
- o streamlining hydropower licensing processes and eliminating unwarranted Federal regulation of small hydro projects.
- o amending PURPA to encourage renewable power production by small power producers.
- o supporting conversion of municipal solid waste to energy as part of a comprehensive waste management strategy.
- o developing cost-competitive liquid fuels from non-food crops with high priority research and development investments.

These measures will increase electricity generation from renewables by 1.1 quads in 2010 and production of liquid fuels from biomass by 0.4 quads in 2010 and 3.3 quads in 2030. In addition, they will reverse the losses of hydropower generation capacity and increase fuel and technology choices for transportation.

### Securing Fusion Technology

The National Energy Strategy will intensify international collaboration in fusion research and focus investments in magnetic and inertial confinement reactor concepts.

Through these efforts a demonstration plant could be developed by 2025 and an operating commercial plant could cost-effectively supply power by 2040.

### Enhancing Research and Development for Energy Security

The National Energy Strategy includes a major commitment to advanced energy technology. The fiscal year 1992 budget includes \$903 million, or 34 percent above 1991 levels.

To ensure ensure that research and development efforts pursue useful goals and result in ultimate commercialization of technologies, these initiatives will utilize industry cost-sharing and will be carried out as joint government-industry programs. In addition, a national awards program will be created, offering large cash prizes for energy-related innovations that meet specific technological challenges.

Major research initiatives include: advanced transportation fuels from biomass, vehicle propulsion technologies, electric vehicle technology, aeronautical technologies, high speed rail and magnetic levitation, intelligent vehicle/highway systems, telecommuting, air traffic control, advanced oil recovery technologies, industrial technologies, and advanced light water nuclear reactors concepts.

By 2030 these research and development initiatives could save between 5 million and 8 million barrels per day of oil. They will improve U.S. competitiveness and help make the U.S. a cleaner, safer, more desirable place than ever in which to live and work.

#### ENERGY AND THE QUALITY OF AIR, LAND AND WATER

##### Highlights

The National Energy Strategy will enhance environmental quality by:

- o making maximum use of market mechanisms, informed by fuel cycle costs analysis, to protect the quality of air, land, and water.
- o increase the use of natural gas, renewable, and alternative energy.
- o improve ~~summarize~~ energy impact assessments and regulatory structures.
- o develop model programs for energy facilities siting.
- o minimize waste from energy production, transformation, and use.

These measures, in conjunction with the Clean Air Act Amendments, will reduce sulphur dioxide emissions by 40 percent, nitrogen oxides by 30 percent, and volatile organic compounds emissions by 25 percent from projected levels. In addition, they will improve the economics and efficiency of environmental compliance, which

by 2030

currently costs over \$100 billion per year and is rising.

### ENERGY AND THE GLOBAL ENVIRONMENT

The National Energy Strategy and previous Bush administration actions, coupled with ongoing Federal research aimed at reducing scientific uncertainty on the potential for global climate change, will reduce greenhouse gas emissions and demonstrate U.S. international leadership on this issue.

In 2010, U.S. greenhouse gas emissions will remain at their 1990 levels, despite steady increases in U.S. economic growth.

### FORTIFYING FOUNDATIONS: Science and Engineering Research, Technology Transfer, Science and Math Education

The National Energy Strategy will continue the administration's commitment to science and engineering research, technology transfer, and science and math education by:

- o maintaining Federal basic science research portfolio valued at over \$1 billion annually.
- o making Federal research and development priorities congruent with National Energy Strategy goals.
- o ensuring the viability of world class U.S. facilities and pursuing international agreements to support high-cost facilities.
- o increasing industry participation in research and development and commercialization.
- o protecting intellectual property rights.
- o promoting technology exports
- o strengthen and update math and science curricula and expanding career incentives for teachers.
- o providing Federal technical assistance and on-the-job training for teachers.
- o broaden public science literacy programs.

These measures are but a few of the many initiative aimed at securing an energy future in which the U.S. has skilled professionals that can develop and enhance new technologies, which will increase economic growth and the quality of life.

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**HOW THE NATIONAL ENERGY STRATEGY (NES) BENEFITS ALL AMERICANS**

Energy is basic to our quality of life -- to the standard of living expected by all Americans. Because of this, we have developed a NES dedicated to the goals of assuring that the nation secure supplies of reasonably priced energy produced and used in environmentally responsible ways.

The NES harnesses the strength of market forces, the common sense of the American people, responsible leadership of industry and government, and the unique advantages provided by our natural and human resources.

The NES benefits all Americans by reducing energy costs.

- Between now and 2010 consumers will save \$750 billion<sup>1</sup> in gasoline, home heating oil, and other liquid petroleum fuel expenditures.
- Consumers will save over \$130 billion<sup>1</sup> in electricity bills between 2000 and 2010.

The NES benefits all Americans by enlarging and diversifying the nation's energy supply base.

- Increases electricity produced from renewable sources by 18 percent in 2010.
- Expands alternative transportation fuel production by up to 2.5 million barrels per day in 2010.
- Speeds development and use of clean coal and safe nuclear power technologies.

The NES benefits all Americans by protecting the environment.

- In conjunction with other Administrative actions, reduces U.S. greenhouse gas emissions, measured by their potential to warm the atmosphere, to 1990 levels or below.
- Reduces emissions of air pollutants contributing to acid rain and smog.
- Reduces the need to build new power plants through more efficient use of energy and new technologies.
- Makes us 27 percent more energy efficient than today by the year 2010 through new polices and enhancement of existing programs.

The NES benefits all Americans by enhancing energy security.

- Shrinks oil demand by 3.4 million barrels per day in the year 2010.
- May more than double our domestically producible oil resources.
- Reduces projected oil imports in 2010 by one-third, from 65 to 40-45 percent of consumption.

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<sup>1</sup> In 1989 dollars.

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## HOW THE NATIONAL ENERGY STRATEGY (NES) WILL BENEFIT THE ENVIRONMENT

The production and use of the energy we need to maintain our quality of life substantially affects the environment. The NES will lessen those impacts first by reducing the overall amount of energy we need. Second, by reducing air pollution, cutting down on the generation of solid wastes, limiting water pollutants, and lessening risks to sensitive environments.

### The NES results in less energy use.

- Allows us to power an economy in 2010 that is 77 percent larger than today with only 30 percent more energy through new initiatives and enhancement of existing programs.
- Lowers the amount of energy needed in 2010 by the equivalent of 3.5 million barrels of oil per day.

### NES results in the production of 11 percent more environmentally advantageous renewable fuels in 2010.

The NES in conjunction with other Administration initiatives, reduces the potential threat of global warming by reducing U.S. emissions of greenhouse gases at or below 1990 levels.

### The NES enhances air quality by reducing emissions of pollutants contributing to acid rain and smog -- by 2010:

- Achieves a 40 percent reduction in annual emissions of SO<sub>2</sub>.
- Results in a nearly 25 percent reduction in annual emissions of NO<sub>x</sub>.
- Yields a 30 percent reduction in annual emissions of VOC's.

### NES benefits water quality.

- Scales down total suspended solid effluents.
- Cuts oil and grease effluents.

### NES addresses our solid waste problem -- by 2010:

- Brings down production of coal ash waste by 25 million tons per year.
- Lowers generation of coal cleaning wastes by 50 million tons per year.

NES shrinks the threat of oil spills in our coastal waters by reducing our future import requirements thereby lessening visits by foreign oil tankers by 1,700 per year in 2010.

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## HOW THE NATIONAL ENERGY STRATEGY (NES) WILL BENEFIT THE CONSUMER

Everybody is an energy consumer. At home, at work, and at play we depend on the availability of reliable supplies of energy at reasonable prices to maintain our standard of living.

The NES contains no new taxes -- there is no gasoline tax, no oil import fee, and no carbon tax.

### The NES reduces consumer energy costs:

- Home heating oil and gasoline prices each decline almost by 10 percent in the year 2010.
- Between now and 2010 consumers will save about \$750 billion<sup>1</sup> in gasoline, home heating oil, and other liquid petroleum fuel expenditures.
- Consumers will save over \$130 billion<sup>1</sup> in electricity bills between 2000 and 2010.
- The nation will save \$500 billion<sup>1</sup> in total energy costs.

### Consumer costs are kept down by NES policies that:

- By the year 2010, will make us 27 percent more energy efficient than today through new initiatives and enhancement of existing policies.
- Lower costs by streamlining facility siting and permitting process.
- Produce a more competitive market place with more energy options.
- Leave choices up to consumers rather than attempting to dictate consumer decisions through new taxes or regulations.

### The NES keeps oil dollars at home and reduces vulnerability to world oil market disruptions by:

- Lowering demand for oil by 3.4 million barrels per day in 2010.
- Increasing our domestic production by 3.8 million barrels a day by 2010.
- Cutting our oil import bill in half in 2010 thereby preventing more than 300 million dollars<sup>1</sup> a day from being sent overseas to buy foreign oil. *by 7 million barrels a day*
- Enhancing oil reserves and increasing production capability around the world.

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In 1989 dollars.

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## HOW THE NATIONAL ENERGY STRATEGY (NES) BENEFITS ENERGY SECURITY

The Iraqi invasion of Kuwait reminds us of our vulnerability to world oil market disruptions. Because oil will continue to play a pivotal role in maintaining our quality of life for decades to come, a broad effort is necessary to reduce dependence by ourselves and our allies on insecure energy suppliers.

Import reductions are achieved by an approach balanced between lowering oil demand on the one hand and increasing domestic production on the other.

The NES will reduce demand for oil in the year 2010 by 3.4 million barrels per day by:

- Encouraging the manufacture of alternative fueled vehicles.
- Using alternative fuels instead of petroleum products.
- Promoting conservation and mass transit.
- Developing cleaner, more efficient automobile, airplane and truck engines, along with high speed trains.

The NES will increase domestic oil production by up to 3.8 million barrels per day in 2010 by:

- Developing and using better technology to recover the oil left behind by conventional production methods.
- Providing access to the coastal plain of the Arctic National Wildlife Refuge under strict environmental safeguards.
- Providing environmentally sound access to the Outer Continental Shelf, consistent with the President's decisions on the need for additional study and data for certain OCS areas.
- Remove regulatory barriers to greater use of horizontal drilling.
- The NES will better prepare us for future world oil market disruptions by expanding worldwide production capacity and strategic stocks.

The NES will reduce projected oil imports in 2010 by 1/3, from 65 to 40-45 percent of consumption.

- Import reductions will be 7 million barrels per day in 2010.
- In 2010, import reductions save more than \$300 million<sup>1</sup> per day from going overseas to buy oil.

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<sup>1</sup> In 1989 dollars.

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## **HOW THE NATIONAL ENERGY STRATEGY (NES) ENHANCES CONSERVATION**

Conservation means wise and careful use, the avoidance of waste.

The NES results in significant improvements in energy conservation and does so while allowing the public the freedom to make its own energy choices.

The NES relies on the common sense and enterprise of our citizens and the market place -- the very factors that allowed the United States economy to grow by almost one-third percent with only a 9 percent increase in energy use between 1980 and 1990. The NES keeps us on this conservation path through new initiatives and enhancement of existing policies.

The NES consciously rejects policies that substitute the judgment of the Federal government for that of individual energy consumers. It does not contain legislative or regulatory targets and proposals intended to force the public to make energy choices deemed "correct" by anybody other than the individual actually making the decision.

Instead, the NES accomplishes its conservation gains through efforts that make the market place work better; that expand energy choices available to consumers; through research and development that improves the efficiency with which we use energy; and by eliminating present regulatory barriers blocking conservation efforts.

### Between 1990 and 2010 this approach yields the following results:

- A 77 percent growth in our economy requiring only 30 percent more energy.
- The number of passenger vehicle miles driven increases by about 60 percent and the number of passenger vehicles grows by 35 percent while the amount of energy used in the transportation sector increases by 29 percent and the volume of gasoline used declines 13 percent.
- The amount of floor space in malls, office buildings, and other commercial buildings grows by 57 percent but the energy needed to heat, cool, and light that space grows by only 26 percent.
- Industrial output increases some more than 80 percent yet the amount of energy needed to power the industrial sector -- all our factories, plants, mills and similar facilities -- increases by only 27 percent.
- In 2010 we expect to have 24 percent more occupied housing than today yet we will use only 10 percent more energy to heat it, cool it, light it and to power all the appliances in it.

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## **PETROLEUM AND THE ARCTIC NATIONAL WILDLIFE REFUGE (ANWR)**

### **Arctic National Wildlife Refuge:**

ANWR is 19,000,000 acres in size, of which 8 million acres are wilderness. Overall, Alaska contains more than 100 million acres in parks, preserves, wildlife refuges, and wilderness areas.

Within ANWR, the 1.5 million acre coastal plain is the region of potential oil and gas development. The most promising areas are about 65 miles east of the existing producing oil fields at Prudhoe Bay that presently provide about 25 percent of the nation's domestic oil production. If oil were found in commercial quantities in the coastal plain, full development is expected to directly impact 13,000 of its 1,500,000 acres.

Very few species of large animals reside on the coastal plain year around and those that do are present in small numbers. The most numerous species is musk ox of which there are some 350 individual animals. Fewer than ten brown bears are thought to use the area in winter while three polar bear dens have been identified.

Except for caribou, the number and kind of large animals is also small in the summer with populations of wolf, brown bear, and moose being under 100 individuals.

The Porcupine Caribou Herd numbers 180,000 individuals and during the summer uses portions of the coastal plain for calving. Its full range covers 60,000,000 acres in the U.S. and Canada.

Several species of migratory birds are present in large numbers during summer months.

### **ANWR's oil potential:**

If oil is discovered, there is a 46 percent chance of finding at least 3.6 billion barrels of oil in ANWR and a 5 percent chance of finding at least 8.8 billion barrels. A 46 percent chance of success is extremely high in an industry where a 10 percent chance of finding oil in commercially producible amounts is often judged a good risk. The 3.6 to 8.8 billion barrels of potentially producible oil make the area the most promising in the U.S. for major new oil finds.

At present consumption rates, 3.6 billion barrels represents over 200 "days" of total current national oil consumption. Over the past 100 years, more than 80 percent of all onshore oil fields ever discovered in the U.S. contained less than one day's supply of oil.

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The total value of 3.6 billion barrels is over \$100 billion and that of 8.8 billion barrels is over \$250 billion<sup>1</sup>.

The oil we will need must come from somewhere. If it comes from ANWR, then our oil import bill will be reduced between 100 and 250 billion dollars.

ANWR production will create large numbers of jobs at home and generate billions in tax revenues to pay teachers, build roads, buy park land, and for other public purposes.

#### Oil and the environment on Alaska's North Slope:

At Prudhoe Bay, adjacent to ANWR's coastal plain, oil exploration and production has occurred for over 20 years.

The Prudhoe Bay area is used by the Central Arctic Caribou Herd every summer and the members of today's herd have not known life without oil development -- without pipelines, roads, drilling pads, and the sights, sounds, and scents of human activity.

Since the advent of oil activities, the population of the Central Arctic Caribou Herd has tripled.

Wildlife studies completed to date show that oil development at Prudhoe Bay has not adversely impacted the population of any species of wildlife that uses the North Slope of Alaska.

Full development of ANWR's coastal plain would directly effect 13,000 acres through the building of infrastructure such as pipelines, roads, and drilling pads. That is 0.9 percent of the plain or .07 percent of ANWR. For perspective, 0.9 percent of a 1,200 square foot home with living room, dining room, three bedrooms, and 2 baths is 11 square feet -- about the size of a bathtub -- while .07 percent is 1 square foot, smaller than the welcome mat at front door.

The environmental record of oil development at Prudhoe Bay and the numerous studies done concerning the potential environmental impacts of oil development on the coastal plain, have clearly established the fact that the nation can obtain the extensive benefits associated with oil development in an environmentally responsible way.

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<sup>1</sup> In 1989 dollars.

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## **THE NATIONAL ENERGY STRATEGY (NES) AND ELECTRICITY**

The nation is becoming increasingly electrified. Energy used to generate electricity is projected to grow by 30 percent over the next two decades. The NES reduces the amount of fuels needed to generate electricity, increases the diversity of those fuels, increases the efficiency with which we use electricity and reduces the environmental impact of electricity production.

The NES lessens electricity demand growth by 4.5 quads in 2010.

The NES results in a national savings of \$26 billion in electricity costs in the year 2010 through greater use of competitive forces and new technologies in the industry.

The NES promotes competition and flexibility in electricity supply.

- Amends the Public Utility Holding Company Act to allow firms to build and operate power plants in more than one area.
- Utilizes existing FERC and DOE authority to promote expanded transmission access and efficient pricing of transmission services.
- Provides support for electricity conservation and efficiency programs by State regulators, utilities, the Federal Power Marketing Administrations, and the FERC.
- Modifies the Public Utility Regulatory Policies Act to reduce size and fuel use restrictions on small power producers utilizing renewable energy resources.
- Modifies and streamlines Federal licensing procedures for non-Federal hydroelectric facilities.
- Supports nuclear licensing reform and development and implementation of a high-level radioactive waste management program.

The NES provides for diversity in electricity technologies and fuel choices.

- Provides support for research, development, and demonstration of electricity technologies, such as clean coal, advanced design nuclear power plants, renewable energy and waste-to-energy technologies, electricity storage and transmission technologies.
- Supports development of methods to determine the full costs and benefits of various technologies used to generate electricity.

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## **HOW THE NATIONAL ENERGY STRATEGY (NES) WILL ADVANCE RENEWABLE ENERGY**

The NES will stimulate renewable energy development. This will increase our energy security, contribute importantly to our supply of reasonably priced energy, and lessen the impact of energy use on the environment.

NES will provide for the production of 11.8 quads of energy from renewable sources by 2010, 11 percent greater than would be provided otherwise.

The NES will encourage additional investment in renewable energy facilities by:

- Extending through 1992 the investment tax credit for emerging renewable technologies.
- Removing legislative impediments to renewable energy development.

Regulatory barriers to the use of renewables will be reduced by:

- Streamlining licensing and relicensing procedures that will yield a 12 percent increase in electricity generated by hydroelectric power by the year 2010.
- Overcoming regulatory constraints on the development of municipal waste-to-energy systems, yielding potentially a more than 100 percent increase in electricity generation by the year 2010.

NES research and development aims to decrease cost and increase performance of emerging renewable technologies. These forms of renewable energy could contribute 8.1 quads to the nation's energy base in 2010, including:

- Biomass fuels
- Geothermal
- Solar thermal
- Photovoltaics
- Wind

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## HOW THE NATIONAL ENERGY STRATEGY (NES) WILL ENCOURAGE ALTERNATIVE FUEL USE

The NES will increase the use of alternative transportation fuels in the U.S., thereby reducing oil imports and encouraging new cleaner vehicle and fuel production technologies.

The NES will create incentives for about 10 million alternative fuel vehicles each year.

- Fuel economy credits will be available to car and truck manufacturers for producing alternative fuel vehicles.
- Private and Federal fleet purchases will create a market demand for almost 2 million alternative fuel vehicles per year.

The NES could increase alternative fuel use by 2.5 mmB/D by 2010.

- Having alternative fuel vehicles on the road will break the "chicken and egg" dilemma and create a ready market for cost competitive alternative fuels:
  - Ethanol, ETBE
  - Methanol, MTBE
  - Propane
  - Natural gas

Combined with the Clean Air Act, the NES will result in reduced emissions.

- The NES initiatives complement Clean Air Act requirements for cleaner fuels by providing a larger market and improved technology at potentially lower cost.
- Early use of fuel flexible vehicles will lead to an expanded fuel distribution infrastructure and ease the transition to very low emission dedicated alternative fuel vehicles.

NES increases the potential for domestically produced biomass-based fuels through cost reduction and increased market opportunities.

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## **THE IMPORTANCE OF PETROLEUM TO THE NATIONAL ENERGY STRATEGY (NES)**

Petroleum will remain a vital component of the nation's energy base for decades to come. It presently supplies 42 percent of our nation's energy, and almost 97 percent of the energy needed for transportation. NES policies result in a strong domestic petroleum industry that will make a significant contribution to our national energy security and our economy.

The NES calls for exploration and development in carefully targeted portions of frontier areas that could increase producible resources by more than 16 billion barrels.

- Arctic National Wildlife Refuge -- as much as 8.8 billion barrels valued at over \$250 billion in 1989 dollars.
- Outer Continental Shelf -- as much as 7.5 billion barrels valued at over \$200 billion in 1989 dollars.

NES addresses existing information vacuums that inhibit informed decision making when trying to balance energy and environmental goals by:

- Establishing a process to provide new guidance on how to assess and consider the effects of environmental regulations on domestic energy production.
- Initiating a National Petroleum Council study to help determine the impact of environmental regulations on the domestic refining industry and its ability to meet future U.S. refined product needs.

NES provides for increased production of oil reserves from existing fields through R&D that could

- Lead to the additional production of 20-65 billion barrels.
- Improve oil recovery in underdeveloped reservoirs.
- Reduce well abandonment.

The NES promotes removal of regulatory and other barriers that impede:

- Transfer of horizontal drilling technology to producers.
- Drilling of horizontal.
- Development of 5 major Alaskan fields containing up to 1 billion barrels of oil.

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## **THE IMPORTANCE OF COAL TO THE NATIONAL ENERGY STRATEGY (NES)**

Coal, which currently provides about one-fourth of our nation's energy needs, is also our most abundant fossil energy resource. The energy contained in U.S. coal exceeds that of all the oil in Saudi Arabia, Kuwait, Iraq, Iran, and Libya combined. In 1989, 86 percent of U.S. coal consumption was for electricity generation. Coal accounted for 55 percent of total domestic electricity generation.

The NES contains measures designed to ensure that coal can continue to be a stable and economic energy resource, while meeting our national objective of increased environmental quality. The NES also promotes the export of U.S. coal and coal technologies.

### The NES supports our continued ability to produce coal at competitive prices while complying with all environmental regulations.

- Continues the strict enforcement of existing regulations governing coal mining, land reclamation and mine safety.
- Maintains the Federal Coal Leasing Program to ensure the timely use of federal coal lands.
- Improves mine safety and productivity by implementing productivity-based safety standards, where appropriate.

### The NES promotes the continued, and expanded, use of coal in compliance with all evolving environmental standards.

- Promotes commercialization of advanced Clean Coal Technologies through the Clean Coal Technology Demonstration Program.
- Removes barriers to the construction of coal slurry pipelines.
- Promotes a regulatory environment which will reduce the risks of deploying new clean coal technologies.
- Addresses global climate change concerns through the development of high-efficiency coal technologies that reduce CO<sub>2</sub> emissions.

### The NES promotes the export of U.S. coal and coal technologies.

- Enhances the visibility of U.S. firms by creation of a coal technology export clearinghouse, and establishing a closer liaison with U.S. embassies.
- Improves coordination among U.S. agencies to support exports.
- Facilitates financing of export projects, and encourages the use of export trading companies.

**THE IMPORTANCE OF NATURAL GAS TO THE  
NATIONAL ENERGY STRATEGY (NES)**

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Natural gas is domestically abundant and clean burning. It currently provides nearly one-fourth of the energy consumed in the United States. The NES will remove impediments that are presently preventing natural gas from better serving American consumers.

Natural gas consumption is projected to increase from 18.4 Tcf in 1990 to about 24.2 Tcf in 2000, partially in response to NES initiatives.

The NES will promote an efficient natural gas market by:

- Expediting the building of new pipelines.
- Eliminating rigid and unnecessary regulation.
- Improving access for third parties to pipeline transportation and other services.
- Removing regulatory barriers to international natural gas trade.

The NES enhances domestic production by supporting:

- Exploration and development in some currently restricted areas.
- Research and development to promote technological improvements in natural gas exploration and production.
- President Bush's recently enacted natural gas production tax incentives.
- Actions to better inform the public with regard to the adequacy of the natural gas resource base.

Increased use of natural gas will:

- Help the environment because natural gas emits fewer pollutants than other fossil fuels.
- Promote energy security by diversifying the energy supply mix and reducing the need for oil imports.
- Provide an alternative fuel source in the generation of electricity and for vehicles in fleets.

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## **THE IMPORTANCE OF NUCLEAR POWER TO THE NATIONAL ENERGY STRATEGY (NES)**

Even with aggressive conservation, the United States will need 200,000 MW of new installed generating capacity by the year 2010 to meet growing electricity demand. There are substantial benefits to producers and consumers alike by keeping all electricity supply options open.

Nuclear power presently provides 20 percent of our electricity. Without NES, nuclear power would drop below 10 percent of electricity production by 2015 and virtually cease by 2030. With the NES, nuclear power's contribution to electric generation could grow from today's levels.

NES has established strategic objectives for revitalizing nuclear power and target dates for meeting those objectives.

- Certify four standardized Advanced Light Water Reactor designs with enhanced safety features by 1995, so that a plant can begin operating by 2000.
- Continue R&D on Advanced Reactors (i.e. Advanced Liquid Metal Reactor and Modular High Temperature Gas Reactor) with special features that could be important in post-2000 period.
- Set attainable milestones for implementing nuclear waste management solutions.

NES shows that Government is willing to support the industry and share costs of developing and certifying new nuclear plant designs.

- Programs to demonstrate provisions of NRC's new license reform rule, which includes early site permits and certification of new reactor designs.
- DOE and industry co-funding a program to produce standardized designs.

NES provides for the introduction of legislation to improve the nuclear plant licensing process.

- Seeks stable and predictable licensing process, while retaining public participation and strong emphasis on safety.