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OA/ID Number:	29154
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Folder Title:
National Energy Strategy (1 of 2) 1991 [1]

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A Process for Finalizing the National Energy Strategy

Admiral James D. Watkins
Secretary of Energy

Third EPC Principals Meeting

December 12, 1990

Secretary of Energy

Admiral James D. Watkins

DRAFT

DEC 12 1990

Third EPC Principals Meeting
December 12, 1990

- **Readiness to present NES package to the President**

- **Two issues remain from last EPC Principals Meeting:**
  - **Strategy paper**
  - **Enhanced R&D**

- **Strategy paper describes an integrated, balanced NES package**

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- **NES package includes:**
  - **All consensus options**
  - **Some "High-Leverage" non-consensus options:**
    - **Alternative fuels**
    - **Enhanced R&D**
    - **CAFE**

- **NES package responds to:**
  - **President's NES Charter**
  - **Situation in Persian Gulf**
  - **Need to provide leadership in the face of Congressional activity**
  - **Legislative requirement for National Energy Policy Plan by April 1, 1991**

NES Package -- Package B
Consists of the 37 Consensus Options Plus the Following

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SUPPLY MEASURES

* **Renewable Energy Production Incentive**

Hydro Regulatory Reform

NPR Leasing

Energy Impact Analysis for Environ. Rulemaking

Oil Pipeline Deregulation

Nuclear Waste Management Alternative

* **ALT. FUELS PACKAGE**

Remove CAFE Incentive Cap for Alternative Fuel Vehicles

Alt. Fuel Vehicle Fleets (including Federal Fleet)

Use of Non-Petroleum Motor Fuels Blends (10% by 2005)

DEMAND-SIDE MEASURES

* **IRP & Tax Free Treatment of Utility Rebates**

* **Stimulate Mass Transit/Ride Sharing**

* **Set CAFE Standard after Reform CAFE Law (assumes 35 MPG in 2000)**

Equipment Standards or Labeling

Building Energy Efficiency

Fund for Federal Efficiency Investments

* **ENHANCED R&D PACKAGE**

Oil and Gas Recovery Technologies

Biofuels Technologies

Electric Vehicles

Vehicle Propulsion

High Speed Rail and Magnetic Levitation

Aeronautics and Aviation Technologies

Intelligent Vehicle/Highway Systems

Telecommuting

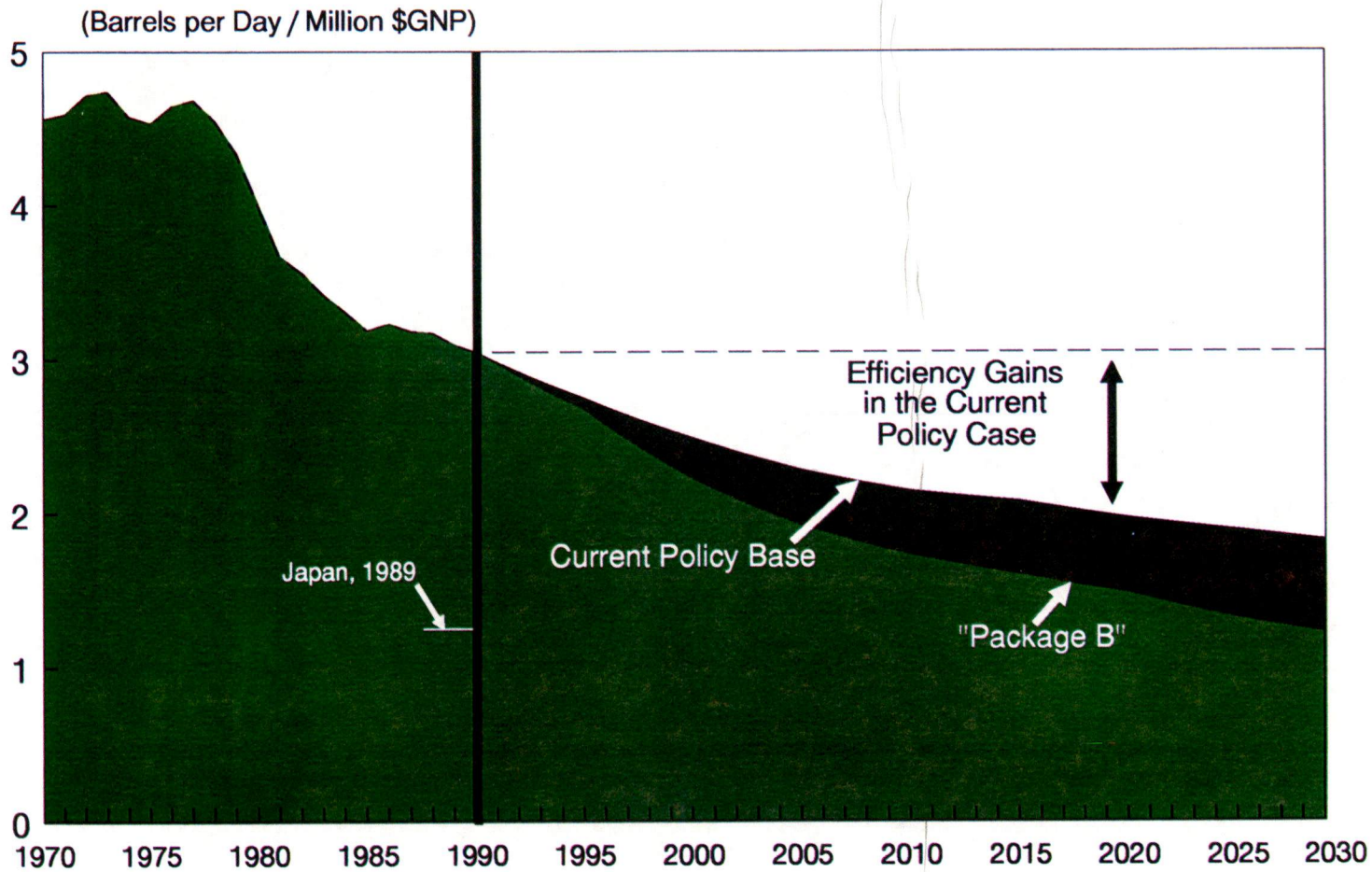
Efficient Industrial Technologies

Basic Research

* **Asterisk (*) indicates High-Leverage non-consensus options detailed in the following charts. The Enhanced R&D package is the product of an EPC Working Group made up of EPC-staff, OMB, Treasury, CEA, DOE, USDA, Commerce, NASA, DOT, OSTP, and Defense.**

Reduced Oil Use in the Economy

"Package B"



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"High-Leverage" Non-Consensus Items
(Energy Security -- Oil)

Supply-Side Measures	Cost/Barrel*	Year 2000	Year 2010
Alternative Fuels Package ($0.76 billion, over 5-years)	$2 to $7	700 mB/D	2,200 mB/D
Enhanced R&D ($1.2 billion, over 5-years -- DOE only)	$1 to $10	1,700 - 2,000 mB/D	2,500 - 3,000 mB/D
Demand-Side Measures			
Set CAFE Standard after reform	- $10 to + $20	200 mB/D (35 MPG assumed)	600 mB/D
Stimulate Mass Transit & Ridesharing	$1 to $5	120 mB/D	100 mB/D

* Discounted to present value. CAFE range depends upon methodology regarding net economic benefits. Enhanced R&D range reflects uncertainty of R&D success. FY-91 level of Federal support (all agencies) for NES-related R&D is $0.4 billion.

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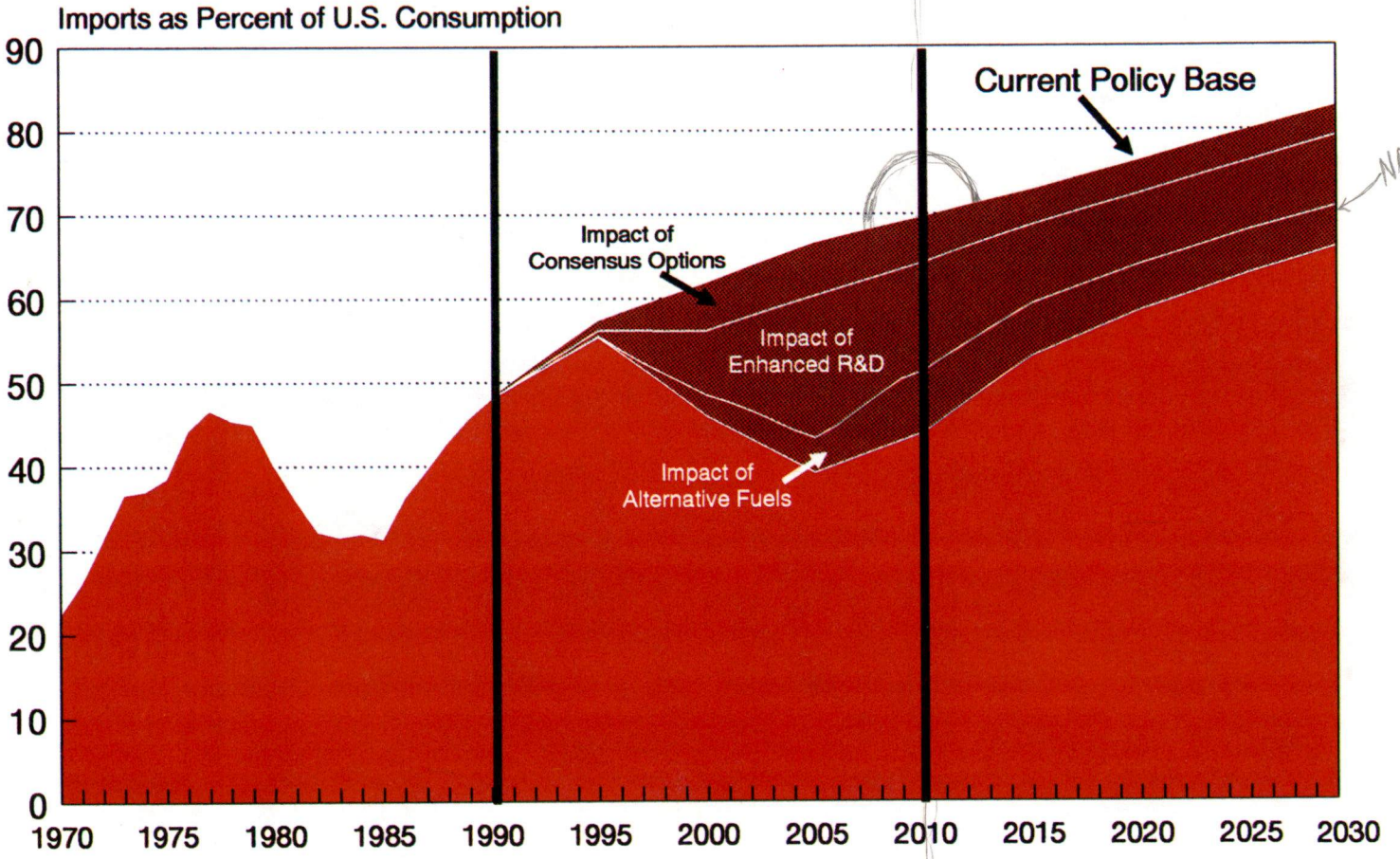
CONSENSUS OPTIONS

Option #	Option
2	Allow Access to OCS Consistent with President's 1990 Decisions
3	Allow Access to ANWR
4	Alaskan North Slope Development
5	Gas Pipeline Construction without Federal Certification
6	Gas Pipeline - Coordinated NEPA Review
7	Deregulate Pipeline Sales Rates
8	Reform Pipeline Rate Design
9	Improve Pipeline Transportation
10	Eliminate DOE Import/Export Regulation
11	Reform CAFE Law
12	Accelerate Scrappage of Older Cars
16	Low Income Home Efficiency
24	Stimulate Oil and Gas Production Outside Persian Gulf
26	PUHCA Reform - Greater Competition
27	Transmission Access for Wholesalers
30	Facilitate Expansion of Nuclear Power
31	Nuclear Waste - Comprehensive Solution
33	Encourage Clean Coal in Electric Utilities
35	Municipal Solid Waste to Energy
36	Reform PURPA - Remove Size Cap
37	Reform PURPA - Relax Co-firing Limits
41	Mortgage Financing Incentives
43	Improve the Efficiency for Public Housing
44	Reducing Environmental Impacts of Energy Systems
45	Global Climate Change - Integrate NES
47	Added Global Climate Change Research
48	Reduce Delays in Siting and Permitting
50	Emissions Trading for Environmental Compliance
51	Modified New Source Applicability
52	Encourage Waste Minimization in Industry
53	Dual Regulation of Radionuclides
54	Re-align Federal R&D Priorities
55	DOE Basic Research Capabilities
56	Leverage NES-Related R&D Resources
57	Reform the National Technology Transfer Service
58	Spur the Export of Energy Technologies
59	Math/Science Education Initiative

Impact on Oil Imports
"Package B"



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"High-Leverage" Non-Consensus Items
(Electricity)

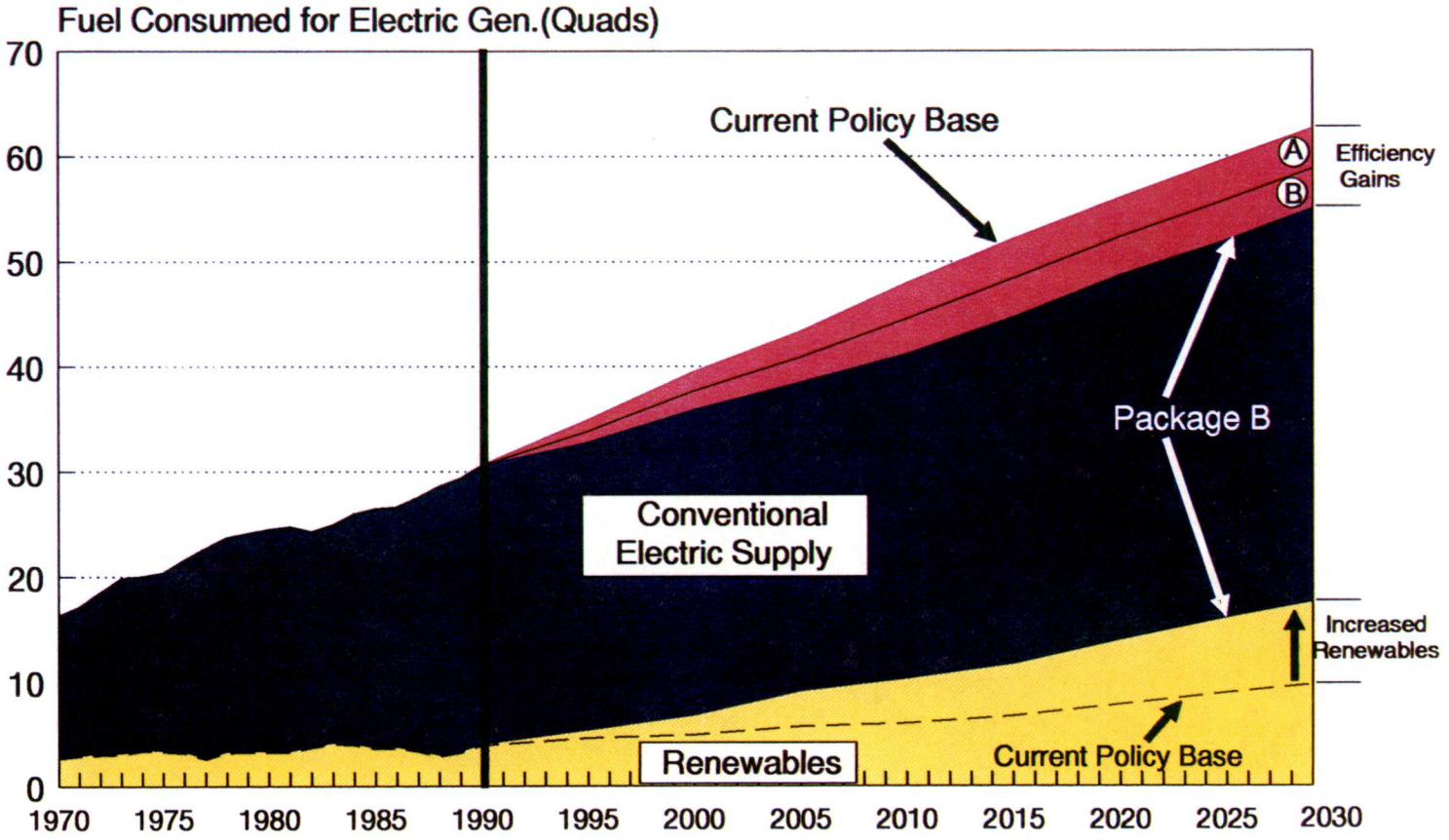
Supply-Side Measures	Cost/Kwhr.*	Year 2000	Year 2010
Renewable Energy Production Incentive ($2.6 billion, over 5-years)	0.2 to 0.7 cents	45% increase in renewable electric production	38% increase
Demand-Side Measures			
IRP and Tax Free Treatment of Utility Rebates ($0.46 billion, over 5-years)	0.1 to 0.3 cents	1.1 Quads of electricity saved	2.3 Quads

* Discounted to present value.

8

Fuel Inputs to Electricity Generation

"Package B"



Ⓐ Integrated Resource Planning

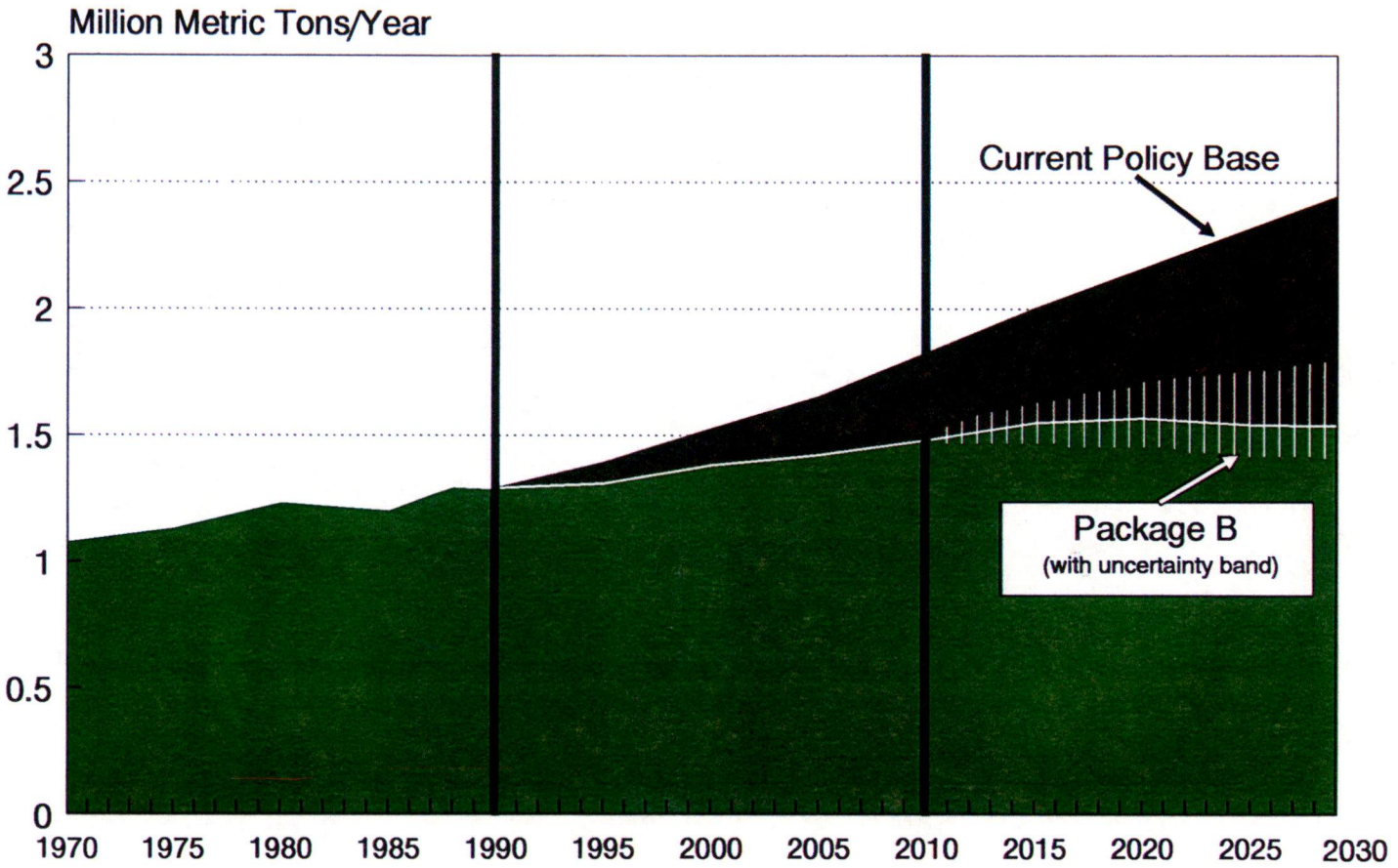
Ⓑ Building Efficiency and Equipment Standards, and other misc. non-consensus options

Package B Enhances Environmental Quality

- Reduces SO_x by 30% from projected levels in 2030
- Reduces NO_x by 25%
- Reduces VOC (volatile organic compounds) by 10%
- Slows growth in U.S. CO_2 emissions significantly
- Cuts projected increase in U.S. CO_2 emissions by 60%
- Reduces U.S. share of global CO_2 emissions from 23% to 14%

Carbon Dioxide Emissions

"Package B"



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PACKAGE B PROVIDES

- **Credible balance between:**
  - **Supply and demand-side measures (ANWR/OCS/Reg. Reform - held hostage)**
  - **Conventional and alternative energy development**
  - **Short-term and long-term strategic responses**
- **Significantly reduced vulnerability by 2000 -- even greater reductions in the longer-term**
- **Growth-oriented approach:**
  - **Takes advantage of U.S. intellectual and physical resources**
  - **Builds on President Bush's regulatory reform and alternative fuels initiatives**
- **Opportunity for President to break stalemate on energy, just as he did on Clean Air**
- **Solid domestic support for the President's Gulf policy**

12

Back-Up Information

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CONSENSUS OPTIONS

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41	Mortgage Financing Incentives
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47	Added Global Climate Change Research
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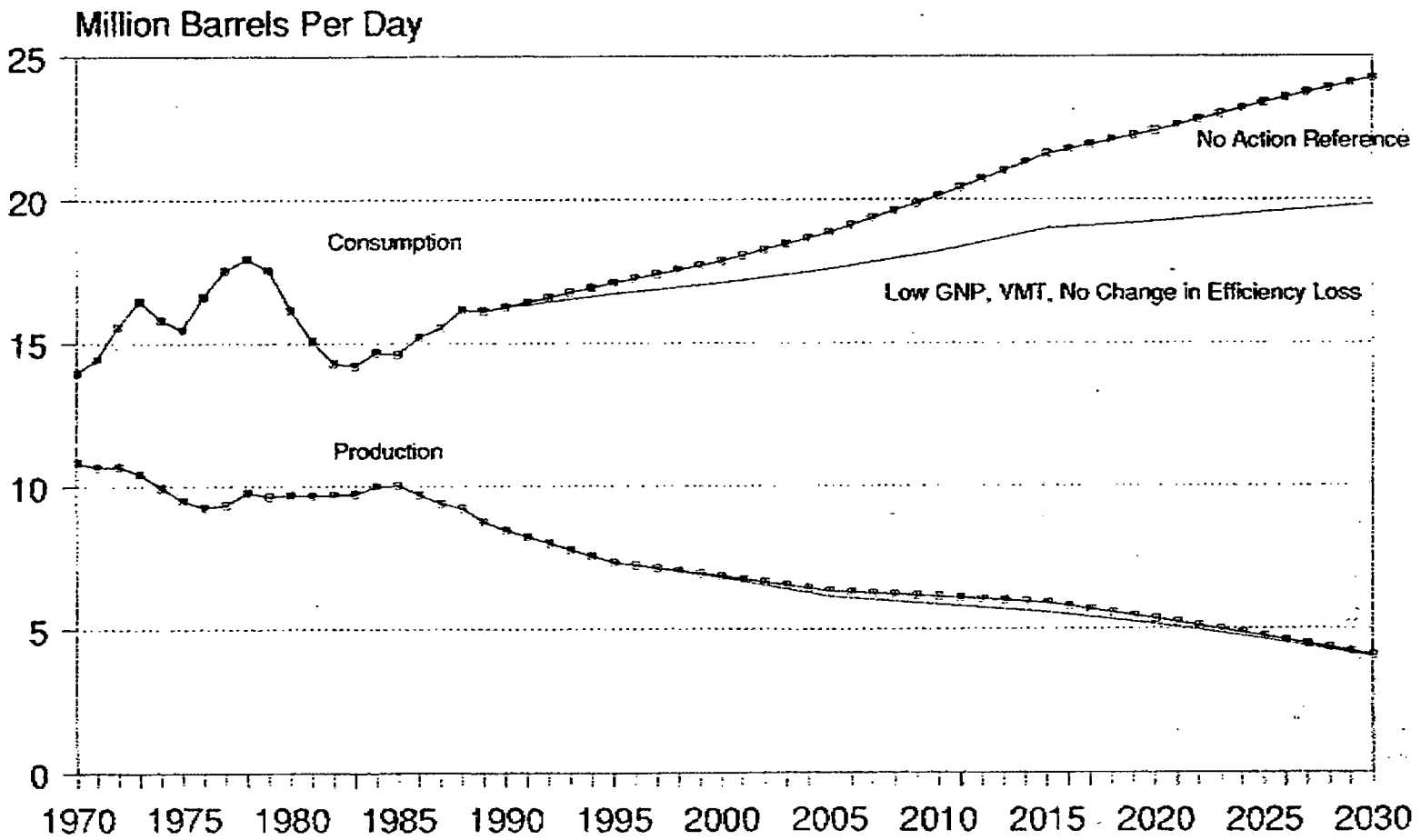
55	DOE Basic Research Capabilities
56	Leverage NES-Related R&D Resources
57	Reform the National Technology Transfer Service
58	Spur the Export of Energy Technologies
59	Math/Science Education Initiative

U.S. Oil Consumption and Production

No Action vs Low GNP,VMT,& No Change in Efficiency Loss(20%)



New sources of oil & natural gas such as the Soviet Union offshore gas supplies, Vietnam, offshore Korea

EPC

Roosevelt Rm

11:00 a.m.

(9/25)

THE WHITE HOUSE

WASHINGTON

December 10, 1990

MEMORANDUM FOR ECONOMIC POLICY COUNCIL

FROM: OLIN L. WETHINGTON, EXECUTIVE SECRETARY

SUBJECT: NATIONAL ENERGY STRATEGY
EPC MEETING, WEDNESDAY, DECEMBER 12, 1990,
THE ROOSEVELT ROOM, 11:00 A.M.

The Economic Policy Council will meet on Wednesday, December 12, 1990 at 11:00 a.m. in the Roosevelt Room to continue consideration of the National Energy Strategy.

The enclosed documents have been prepared for discussion at the meeting:

- An overall NES strategy paper prepared by DOE. This paper seeks to integrate goals for the NES with a set of policy options from the package developed interagency. The DOE paper also summarizes the aggregate effects of this set of options. Attached to this strategy paper are three Appendices:

  Appendix I: A list of interagency consensus options;
  Appendix II: A list of significant options without full interagency agreement; and
  Appendix III: A list of miscellaneous options for subsequent subcabinet resolution.

- Addendum A on alternative fuels options. The previously distributed alternative fuels options have been refined and consolidated into the enclosed package.

- Addendum B on an enhanced research and development options package, which was prepared in response to the EPC's request at the November 28 meeting. This package describes a set of potential high payoff R&D priorities, as well as a set of alternative mechanisms for enhanced government support of these priorities. The R&D package is specifically directed at the transportation-oil link and does not purport to cover other energy-related R&D matters.

- Addendum C on other significant nonconsensus options. This addendum provides the text of the options listed in Appendix II of the strategy paper (with the exception of those included in Addendum papers A and B).

The Wednesday EPC meeting will review the attached strategy paper and provide an opportunity to discuss the merits of the options contained in Addendum papers A, B, and C noted above.

Due to the sensitive nature of these materials, this package should be closely held.

Attachments

Document No._____ CA

THE WHITE HOUSE OFFICE OF CABINET AFFAIRS
STAFFING MEMORANDUM

Date: DECEMBER 12, 1990 **Due by:** _____

Subject: EPC - NATIONAL ENERGY STRATEGY

From: OLIN WETHINGTON, EXECUTIVE SECRETARY

	Action	FYI
ALL CABINET MEMBERS	☐	☐
Vice President	☑	☐
Agriculture	☑	☐
Commerce	☑	☐
Defense	☑	☐
Education	☑	☐
Energy	☑	☐
HHS	☑	☐
HUD	☑	☐
Interior	☑	☐
Justice	☑	☐
Labor	☑	☐
OMB	☑	☐
State	☑	☐
Transportation	☑	☐
Treasury	☑	☐
USTR	☑	☐
Veterans	☐	☐

	Action	FYI
CIA	☑	☐
CEA	☑	☐
CEQ	☐	☐
EPA	☑	☐
GSA	☐	☐
NASA	☐	☐
National Science Foundation	☐	☐
ONDCP	☐	☐
OPM	☐	☐
OSTP	☑	☐
SBA	☐	☐
UN	☐	☐
Cicconi *(For WH Staffing)*	☑	☐
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01. Paper	National Energy Strategy (66 pp.)	12/09/90	P/5	

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Series: Sununu, John, Files
Subseries: Issues Files
WHORM Cat.:
File Location: National Energy Strategy (1 of 2) 1991 [1]

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(Document Follows)
By JP (NLGB) on 10/28/05

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Re-review Case #:	2005-0426-S	**Appeal Disposition:**	
P-2/P-5 Review Case #:		**Disposition Date:**	
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AR Disposition:		**MR Disposition:**	
AR Disposition Date:		**MR Disposition Date:**	

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P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

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(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
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(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

12/09/90

A National Strategy: Setting The Course On Energy

Introduction:

As recent events have demonstrated, energy is closely linked to economic prosperity at home and abroad. The market oriented energy policies of the 1980s have substantially improved the ability of the U.S. economy to withstand disruptions in world oil markets. Oil import costs as a percentage of GNP fell from 2.8 percent in 1980 to 1.0 percent in 1989. Nevertheless, the U.S., as the largest oil consumer in the world, remains vulnerable to world oil market disruptions. In addition, the drive to enhance global environmental quality places new pressures on energy production, distribution and consumption.

Recognizing that energy policy should not be shaped by crises, the President directed the development of a National Energy Strategy (NES) in July 1989. As he requested, the NES balances our increasing need for energy at reasonable prices, our commitment to a cleaner and safer environment, our determination to foster economic growth, and our goal to reduce our vulnerability and that of our friends and allies on potentially unreliable energy supplies. The NES continues the successful policy of market reliance, recognizing, however, that all energy markets are influenced by political or regulatory interventions designed to achieve other objectives, often in the areas of environmental quality and National security.

The NES, developed in concert with the American people, charts a course for reduced vulnerability to oil disruptions, a more efficient and technologically diverse electricity sector, an unconstrained natural gas industry, enhanced environmental quality, and availability of ample supplies of reasonably priced energy to fuel a growing economy. It has been shaped by consideration of the role that petroleum plays in the security of the U.S. and other nations; by the influence that regulation in the electricity sector exerts on technology choices, economic efficiency and environmental quality; and by the promise of science and technology. Goals are established by the NES, and the means to achieve them, in energy security, electricity, science and technology and the environment.

THE WHITE HOUSE
WASHINGTON

Chart p. 5
Note B16 decline
in 1977–85 period.
That's what prices
can do.

ENERGY SECURITY:

The goal of the NES is to reduce our vulnerability to oil market disruptions. Measures to achieve this goal include:

- Securing and maintaining unrestricted flows of oil from all major producing regions
- Reducing the importance of oil use in the U.S. economy by using oil more efficiently and replacing it with other fuels
- Developing and maintaining contingency mechanisms, including international strategic oil reserves and stocks, and "excess" world production capacity
- Reducing underlying tensions that threaten major world oil producing regions, via foreign policy mechanisms
- Diversifying the sources of supply outside the Persian Gulf into producing regions such as the U.S. (OCS, ANWR), the Western Hemisphere, Europe and Asia

The United States uses oil to transport people and goods (62%), in buildings (8%), in industry (25%) and to generate electricity (5%). The availability of world oil supplies for the foreseeable future will be substantially influenced by a limited number of producers holding both large reserves and excess production capacity.

Sixty-five percent of the world's known oil reserves lie in the Gulf region, where oil can be produced at lowest cost. Recent events have once again illustrated the risks inherent in reliance on a key energy source that is found in greatest abundance in this historically unstable area of the world.

Moreover, oil imports play a substantial role in the U.S. balance of trade. The U.S. trade deficit for the third quarter of 1990 was $30.7 billion, driven in part by higher oil prices. In the past four years, oil's share of total imports has more than doubled, from 23 percent in 1986 to 52 percent in the first nine months of 1990.

Between August 1 and December 1, 1990, U.S. consumers paid $21 billion more to oil producers ($8 billion to foreign

producers) than would have been the case without the Iraqi crisis. Worldwide, $83 billion were transferred from oil consumers to oil producers in the same period.

Under a policy of market reliance, and given existing Federal/ State barriers to new exploration and development, U.S. imports of oil are forecast to rise from 42% of domestic consumption in 1989 to 62%, or about 11 mmB/D in 2000, and to nearly 70% in 2010. The U.S. oil and gas import bill is forecast to rise by between $25 an $30 billion (in 1989 real dollars) in 2000, and by about $90 billion in 2010. Gulf producers will supply an estimated 30% of the world's oil in 2000.

The United States could, at great economic cost, slow this trend by instituting a series of policy measures aimed at radically curtailing oil imports. These measures would include an oil import fee; large taxes on gasoline, subsidies for the production of liquid fuels from coal, shale and gas; rapid introduction of alternative transportation fuels; and sharply higher fuel efficiency standards that would force auto makers and consumers to choose smaller cars. The combined impact of these measures would be to reduce oil imports dramatically or substantially depending on the level, type, and phase-in of subsidy or taxation. But the result would be unacceptable GNP losses and unemployment increases. Moreover, these policies would not shield the U.S. economy from future oil market disruptions.

Energy independence is neither an achievable or a useful goal. First, the U.S. is concurrently a large producer and consumer of oil, so that whatever the direction of international oil price fluctuations, some part of our economy is negatively affected. Second, an increase in the world price of oil, brought about by any event, anywhere, would raise the price of U.S. oil, and the price of oil to our allies and trading partners, regardless of the degree of import dependence. In 1979, for example, Great Britain, which was almost totally self-sufficient in oil, suffered the same oil price shock as other Western nations. Japan, which was (and is) totally dependent on foreign oil experienced virtually no economic downturn.

Oil use in the U.S. economy, measured as the ratio of barrels per day of oil used per $1 million of annual GNP, has been substantially reduced over the last 30 years (from 4.5 to about 3.1). Japan, however, uses about 1.2 barrels per day per $1 million of annual GNP.

There are many reasons for this disparity. Some are structural and can never be changed. For example, Americans travel greater distances because of the large land area, and because development patterns have induced more dispersed settlement. Japan is roughly the size of California, but has a population about half the size of the U.S. Reflecting geography and development patterns, the U.S. has 5.1 times as many highway miles as Japan.

Other aspects of U.S. oil consumption lend themselves to improved efficiency and fuel diversity, which can be brought about by policy changes and application of new or improved technology for private and public transportation. Policies and R&D need to address U.S. energy consumption patterns which are shaped, for example, by the fact that nearly 90% of American passenger travel is by private vehicle, compared to less than 45% in Japan.

Taking the above supply and demand factors into account, real improvement in U.S. energy security requires efforts on two fronts: (1) support the environmentally responsible development of oil production capacity around the world, including the U.S., and increase strategic reserves; and (2) reduce the use of oil in the U.S. economy through increased efficiency and fuel switching, and by broader use of alternative fuels to decrease the transportation sector's near total reliance on petroleum.

A. Specific measures to increase strategic reserves and production capacity around the world, including U.S. production:

   1. Improve the investment climate in nations such as the Soviet Union to encourage the necessary foreign investment to rehabilitate and expand the hydrocarbon industry; stimulate exploration and production in promising developing countries; and increase capacity in all Western Hemisphere producing Nations. (Option 24)

   2. Substantially increase the level of worldwide strategic reserves by the year 2000; review the conditions under which these reserves would be used so as to affect the expectations of oil market participants and maximize the deterrent value of the reserves. Expansion of the U.S. strategic reserve would be funded, at least in part, by leasing the Naval Petroleum Reserve and using the proceeds to acquire SPR stocks. (Option 23)

3. Development of ANWR, Alaska's North Slope, and areas of the OCS unrestricted by Presidential decision, under strict environmental safeguards. (Options 2, 3, and 4)

4. Expanded Aggressive research and development for enhanced oil recovery; deregulation of oil pipelines. (Options 60 and 25)

B. Specific measures to reduce the use of oil in the U.S. economy through higher efficiency and fuel switching, and by broader use of alternative fuels to decrease the transportation sector's near total reliance on petroleum.

1. Set CAFE standards at cost effective, safe, and technically achievable levels provided the Corporate Average Fuel Economy (CAFE) law is reformed to eliminate discriminatory treatment of, and criminal penalties for domestic manufacturers. (Options 11 and 11a)

2. Establish Federal/State incentives to scrap old cars and remove tax disincentives to mass transit and ride sharing. (Options 12 and 14)

3. Remove cap on fuel efficiency incentives to manufacturers of alternative fuel vehicles by amending the Alternative Motor Fuels Act of 1988; expand alternative fuel use in all commercial light and heavy duty vehicle fleets, including Federal fleets; and increase non-petroleum content of fuels sold in the U.S. (New Alternative Fuels Package - Addendum A)

4. Enhance research and development of auto efficiency technology and develop new technology for intra and inter city movement of people and goods. (Option 60)

5. Reform natural gas pipeline construction regulations and pipeline rate design; deregulate pipeline sales rates; improve non-discriminatory access to pipeline transportation; and eliminate DOE import/export regulation. (Options 5 through 9)

Taken together, these measures will reduce oil imports to 45% of U.S. consumption in 2000, and 40% of U.S. consumption in 2010.

Domestic oil production will increase by 1.7 mmB/D above levels projected for 2000, largely due to enhanced oil recovery,

triggered by new investments in Federal R&D. Domestic production will increase by 3.3 to 5.3 mmB/D above projected 2010 levels, due primarily to EOR (2.5 mmB/D), increase OCS (0.4 - 1.3 mmB/D)[1], and ANWR (0.4 - 1.5 mmB/D)[1].

U.S. oil consumption will decrease by 1.2 mmB/D in 2000, largely due to displacement of oil by gas in electric utilities and by reduction in electricity demand (0.5 mmB/D); and alternative fuels (0.7 mmB/D). In 2010, oil consumption will decrease by 2.7 mmB/D, due mainly to increased penetration of alternative fuels in combination with higher fuel efficiency (2.2 mmB/D), increase national gas use and reduction in electricity demand (0.5 mmB/D).

Natural gas consumption will increase by 1 tcf in 2000 and by 1.1 tcf in 2010.

The projected cost of oil imports is reduced by about $30 billion ('89 real dollars) in 2000, due to reduced oil import levels and an assumed oil price of $27.90/barrel. In 2010, the projected cost of oil imports is reduced by about $80 to $110 billion ('89 real dollars) due to reduced import levels and an assumed oil price of $37.20/barrel.

Under the Low Economic Growth Case projections, the net changes in oil production and consumption are similar. Oil imports are reduced by 2.9 mmB/D in 2000 and 6 to 8 mmB/D in 2010. Changes in the cost of oil imports and vehicle efficiency are also similar.

ELECTRICITY

> The goals of the NES are to provide more reliable, lower cost service to consumers, increase efficiency in the electricity sector and foster fuel and technology diversity, including renewable energy technologies, in electricity generation and end use.

In 1970, electricity accounted for 24% of primary energy consumption. This figure is expected to rise to 36% in 1990 and to 42% in 2010. Because our economy is becoming increasingly electrified, the technologies and systems used to produce and deliver electricity must be efficient, reliable and protective of the environment.

---

[1] Range represents mean conditional to 5% probability case and currently envisioned Interior Department leasing schedule.

The Nation presently has about 700 gigawatts (GW) of installed electric generating capacity. It is estimated that, under conservative assumptions, a minimum of 200 GWs of new capacity will be required to meet demand in the next 20 years.

The electric utility industry is one of the most highly regulated sectors of the U.S. economy. Thus, what capacity will be built, by whom, with what technology/fuels, and with what environmental consequences, will to a large degree depend on the Federal/State regulatory regime that governs investment decisions in electricity supply and demand.

Statutory and regulatory provisions impede construction of new hydroelectric capacity or expansion of capacity at existing dams. The State-Federal impasse on construction of a high-level nuclear waste repository, an impossibly cumbersome nuclear licensing process, and the loss of public confidence in our ability to manage the technology, have contributed to halting the development of new nuclear capacity to a halt.

New coal technologies offer substantial efficiency and emissions reduction benefits, but excessively risk-averse regulators and utilities will make it difficult for these new technologies to enter the marketplace, especially given the requirements of the Clean Air Act Amendments of 1990. Use of wind, solar, geothermal, and biomass technologies, though promising for the longer term, is constrained to varying degrees by location, economics, or technical limitations that will not be fully overcome before 2000. Siting new generating facilities of <u>any</u> kind has become all but impossible in some parts of the country.

On the supply side, competition among wholesale electricity producers, on a regional or inter-regional scale, was not considered feasible when PUHCA was passed. Since the enactment in 1978 of PURPA, limited competition has emerged, but under PUHCA some of the most able potential competitors cannot participate, a result seemingly at odds with the public interest in reliable supplies of electricity at the lowest reasonable cost.

On the demand side, wide-ranging experimentation is taking place at State and local levels to increase efficiency and reduce consumption. Key factors that influence demand choices include technology, efficiency standards, prices, regulatory policy, tax policy, and consumer behavior. For each of these elements an opportunity exists for Federal and State governments to achieve progress through constructive partnerships.

Integrated Resources Planning (IRP) (also known as "Least Cost Utility Planning") is the process increasingly used by public utility commissions to determine the relative cost-effectiveness and desirability of new investments in electricity supply additions and demand reductions. Although the development of this process has been supported by the Federal government, its adoption by Federally-owned power producers and marketers has been limited. Moreover, Federal tax policy currently impedes the achievement of efficiency improvements from utility investments in demand side management.

Successful implementation of measures proposed in the National Energy Strategy will free electric utility markets from outdated regulatory and statutory barriers to greater competition; revitalize technology choices whose benefits have been overwhelmed by regulatory uncertainty, imbalance, and cost; eliminate Federal tax disincentives to efficiency investments; impose discipline on the currently fragmented nuclear and hydroelectric licensing processes; establish clearer Federal/State responsibility for setting performance standards; and improve the environmental performance of electricity generation.

Specific measures to achieve a more efficient, technologically diverse electricity sector include:

A. Regulatory/Statutory Reform

1. Amend PUHCA to increase wholesale power generation options with protection for consumers. (Option 26)

2. Amend PURPA to permanently eliminate size caps for all renewable generation sources selected by a competitive bidding process, and reduce co-firing limits. (Options 36 and 37)

3. Pursue wholesale transmission access under current authority to assure that greater competition in supply is not hampered by uncertain access to transmission. (Option 27)

4. Reform hydropower licensing in order to reduce current uncertainty and costs; deregulate licensing of small dams of up to 5 MW; expand capacity at existing Federal and non-Federal dams. (Option 29)

5. Reform nuclear power licensing and obtain legislation to implement the high level waste repository. (Options 30 and 31)

B. Technology Development and Transfer

1. Accelerate renewable energy R&D to reduce cost and increase market penetration rates. (Option 60)

2. Accelerate deployment of clean coal technologies through regulatory treatment. (Option 33)

3. Develop standardized advanced light water reactors design certified by the NRC. (Option 30)

4. Accelerate energy efficiency technology R&D and transfer. (Option 60)

5. Transform the renewable energy investment tax credit due to expire in 1991 into a production credit. (Option 34)

C. Federal, State and Private Efficiency Measures

1. Eliminate taxation of utility efficiency rebates. (Option 38)

2. Require IRP processes for all Federal power producers; increase financial assistance for State IRP. (Option 38)

3. Extend current appliance standards and labeling to commercial lighting and other equipment. (Option 39)

4. Assist States in promulgating and implementing improved building standards. (Option 40)

5. Encourage more widespread use of mortgage incentives for energy efficient housing. (Option 41)

6. Create a self-financing fund for Federal efficiency investments. (Option 42)

7. Increase emphasis on home weatherization under existing low income energy assistance programs. (Option 16)

8. Improve the energy management of Federally funded public housing. (Option 43)

These measures would reduce electricity consumption by up to 7% in 2000 relative to projected no action basic case, and by 12% in 2010. This is equivalent to generation of power from about 80 (1000 Megawatt) power plants in 2000 and about 150 plants in 2010, although the reduction in capacity needs will lag reduction in energy use by several years. The measures would increase renewable electricity generation capacity by 20% in 2000 and 40% in 2010, and nuclear power generation capacity by 10% in 2010.

SCIENCE AND TECHNOLOGY

The goal of the NES is to expand the role that energy science and technology plays in achieving energy, economic and environmental objectives.

Technology development, application and management is the foundation of future U.S. economic and energy security. New technology is also a prerequisite to achieving global environmental objectives.

The primary responsibility for technology development and commercialization lies with the private sector. But the Federal government plays a critical role in basic and applied scientific research, which is the basis for technological breakthroughs. Through its extensive system of National research laboratories and its support of academic and private research, the Federal government substantially influences the scope and pace of energy technology development.

The results of laboratory research do not always reach the market place in a timely fashion, nor are they necessarily applied in areas of special national concern. To the extent that investments in technology development or improvement are likely to yield near term economic benefits, private firms have strong incentives to undertake them. In areas where future prospects are clouded by price and other economic or policy uncertainties, private investments are less likely.

Three areas of technology development are key to the successful implementation of the NES:

o Technologies that reduce the transportation sector's near total reliance on oil either by increasing efficiency of oil

use, introducing alternative fuels and technology, and diversifying travel modes;

- o Technologies that increase production of domestic energy resources, especially oil and gas; and

- o Technologies that improve energy efficiency and increase technological choice and competition in all sectors of the economy.

Cooperative technology development efforts between industry and government reduce private sector investment risks and increase the likelihood of timely commercialization of R&D results. Specifically proposed in the NES are: greater industry-led, cost shared research, expanded use of R&D tax credits, and encouragement of major innovation through a national prize/award program.

The NES will foster investment in a diversified portfolio of research that will offer the possibility of major breakthroughs, or major improvements, in technologies deemed critical to meeting U.S. energy, economic and environmental objectives in the late 1990's and in the first decade of the 21st century.

Specific high pay-off R&D measures under consideration for the NES, and subject to budget negotiations between the agencies involved and OMB, comprise:

1. Advanced Oil Recovery Technologies: Expanded R&D aimed at reducing per barrel recovery costs to $20 - $30.

2. Advanced Transportation Fuels From Biomass Technologies: Expand research aimed at reducing the production cost of ethanol to $.60/gal.

3. Aeronautics and Air Systems: Research on new materials and engine designs

4. Basic research to support advanced energy technologies.

5. Electric Vehicles: Expanded R&D on batteries to increase vehicle range and performance.

6. High Speed Rail and Magnetic Levitation (Maglev) transportation: Research on advanced propulsion and guideway construction methods.

7. Industrial Technologies: Research aimed at reducing oil use in energy intensive industrial processes.

8. Intelligent Vehicle/Highway Systems: Implementation of the DOT Intelligent Highway System Initiation as a means to reduce oil consumption and increasing safety.

9. Telecommuting: R&D to promote technical solutions to increased use of telecommunications that could reduce work related travel.

10. Vehicle Propulsion: Enhanced R&D on ceramic components to increase market potential for more efficient alternative vehicles such as gas turbines.

Additionally, the NES recognizes that America's energy security, future energy technology growth, and workforce competitiveness are directly linked to the quality of our national mathematics and science education. By all accounts, American student achievement in these areas is below desired levels. The National Education Goals, developed by the President and the Governors following the Charlottesville Education Summit, provide a framework for achieving excellence in American education, and include the goal that "By the year 2000, U.S. students will be first in the world in science and mathematics achievement."

The National Energy Strategy contains key recommendations for improving and increasing the technical competence of the American workforce through improved math, science, technology and engineering education. The Federal role -- a mere 6% of total funding at the precollege level -- must be integrated with that of the States and the private sector to achieve maximum results. Special emphasis must be placed on recruiting women and underrepresented minorities into the technical workforce, to recruiting and preparing qualified math and science teachers for our schools, and to broadening the base of public science literacy.

The Secretary of Energy also chairs the Committee on Education and Human Resources of the Federal Coordinating Council on Science, Engineering and Technology. This sixteen agency group is preparing the first coordinated report and budget for direct Federal spending on math and science education, which will accompany the President's FY 1992 Budget submission to Congress in February.

The budget cost of the NES enhanced R&D measures has been estimated at a total of $1.2 billion for five years (DOE only). Based on the NES current policy case, oil consumption in 2030 is expected to be 25.4 mmB/D. By 2005, if fully successful, the enhanced oil recovery R&D could produce an additional 1.4 - 3.1 mmB/D. Overall, the proposed R&D initiatives could achieve combined oil savings of 5 to 8 mmB/D by 2030.

ENVIRONMENTAL QUALITY

> The goal of the NES is to improve environmental quality through policies that emphasize clean, efficient energy sources and technologies, without sacrificing economic growth or affordable energy.

Energy policies that do not enhance environmental quality and protect public health cannot be sustained. Environmentally sensitive energy policies, plus science and technology, can substantially reduce the impacts of energy production, distribution and consumption on the biosphere.

Electric utilities produce approximately two thirds of total national SOX emissions. Other air pollutants -- NOX, CO, and VOCs -- result primarily from transportation energy use. Also, power plants, petroleum refineries, coal and uranium mines and some oil wells produce waste that unless carefully managed, adversely affects water quality. About 20% of all point sources discharges to surface waters in the U.S. are energy related.

Notwithstanding current statutes, which are more comprehensive than those enacted by any other Nation, the current policy case forecasts increased environmental stress, largely due to growth in population, cars and vehicle miles travelled, unless the American standard of living is to be reduced.

The 1990 Clean Air Act Amendments will limit, and in many cases reduce from current levels, the major air pollutants from power plants, transportation use and energy using industries. The NES, coupled with existing DOE R&D programs, such as the development of alternative fuels for transportation, clean coal technologies, and energy efficiency improvements, would further reduce air and water pollutants and waste from projected levels.

NES measures are estimated to reduce sulfur dioxide emissions by 30 percent, nitrogen oxide by 25 percent and volatile organic compound emissions by 10 percent in the year 2030 from estimated

projections. To offset the volumes of waste from energy production, the NES proposes measures to reduce current regulatory inefficiency, and development of new technologies that minimize wastes.

Although there remains a great deal of scientific uncertainty, growing international concern regarding the potential for climate change is causing many nations to consider measures to reduce greenhouse gases, in particular carbon dioxide (CO2). Since 1950, the U.S. share of total CO2 emissions has declined from about 42% to 23%. By 2025, the U.S. share is projected to be 14% of the world total. By contrast, developing countries have increased their share of CO2 contributions from 9% in 1950 to 30% today. By 2025, their share is projected to be about 48% of world total.

The measures set out in the NES would reduce the rate of growth of U.S. CO2 emissions by about 60% of the projected growth from 1990 to 2030. Greater use of nuclear power, renewable energy, and improvements in energy efficiency in the electricity and transportation sector, would be the major contributors to this reduction.

Implementation of the measures proposed in the NES will substantially improve environmental quality while improving economic efficiency and maintaining reasonably priced energy. The cost to the Nation of environmental regulation is over $100 billion per year and growing (1.5% of GNP). The NES proposes to reduce these costs through more efficient management of environmental compliance. It calls for wider use of emissions-trading and other market mechanisms that will be demonstrated in the implementation of the CAA, and should be extended to other environmental protection programs. Also, to reduce the costs of energy, the NES proposes measures to expedite the siting, permitting and licensing of new energy facilities.

Ultimately, the key to meeting National requirements for energy, for economic well being, and for environmental quality, will be new technology. For these reasons, the NES concerns itself not only with the historical Federal role in basic science and research, but also with technology transfer and with the quality of the educational system that will train future technology developers and managers.

Specific measures to better harmonize energy and environmental objectives include:

1. Implementing greenhouse gas emission reduction measures that also make sense for other environmental energy security, and economic reasons. (Option 45)

2. Pursuing research aimed at resolving uncertainties associated with potential global climate change. (Option 47)

3. Greater use of mechanisms such as emissions trading and marketable allowances to reduce compliance costs. (Option 50)

4. Development and use of waste minimization technologies in all energy using sectors. (Option 52)

5. Clarifying the application of new source review requirements to existing power plants. (Option 51)

6. Improving analysis of the impacts of environmental regulation on energy supply and use. (Option 49)

7. Using model programs to expedite siting, permitting and licensing of energy facilities. (Option 48)

8. Assuring that State programs to regulate radionuclide emissions are promulgated only if they improve health and environmental protection, and are applied equally against risks from all sources. (Option 53)

Conclusion

As a National Energy Strategy, these measures advance the national interest by:

- Securing adequate energy supplies at reasonable cost
- Reducing our vulnerability to oil market disruptions
- Increasing efficiency in the production and use of energy
- Removing barriers to the development of domestic energy resources
- Exerting U.S. leadership in energy research, science and technology.
- Enhancing environmental quality.

The NES, as constructed by the measures identified in this paper, satisfies the President's directive to improve energy security, enhance environmental quality, and provide the energy necessary to fuel a healthy economy.

APPENDIX I

CONSENSUS OPTIONS

Option #	Option
2	Allow Access to OCS Consistent with President's 1990 Decisions
3	Allow Access to ANWR
4	Alaskan North Slope Development
5	Gas Pipeline Construction without Federal Certification
6	Gas Pipeline - Coordinated NEPA Review
7	Deregulate Pipeline Sales Rates
8	Reform Pipeline Rate Design
9	Improve Pipeline Transportation
10	Eliminate DOE Import/Export Regulation
11	Reform CAFE Law
12	Accelerate Scrappage of Older Cars
16	Low Income Home Efficiency
24	Stimulate Oil and Gas Production Outside Persian Gulf
26	PUHCA Reform - Greater Competition
27	Transmission Access for Wholesalers
30	Facilitate Expansion of Nuclear Power
31	Nuclear Waste - Comprehensive Solution
33	Encourage Clean Coal in Electric Utilities
35	Municipal Solid Waste to Energy
36	Reform PURPA - Remove Size Cap
37	Reform PURPA - Relax Co-firing Limits
41	Mortgage Financing Incentives
43	Improve the Efficiency for Public Housing
44	Reducing Environmental Impacts of Energy Systems
45	Global Climate Change - Integrate NES
47	Added Global Climate Change Research
48	Reduce Delays in Siting and Permitting
50	Emissions Trading for Environmental Compliance
51	Modified New Source Applicability
52	Encourage Waste Minimization in Industry
53	Dual Regulation of Radionuclides
54	Re-align Federal R&D Priorities
55	DOE Basic Research Capabilities
56	Leverage NES-Related R&D Resources
57	Reform the National Technology Transfer Service
58	Spur the Export of Energy Technologies
59	Math/Science Education Initiative

APPENDIX II

NON-CONSENSUS OPTIONS

Option #	Option
11 (a)	Higher CAFE Standards
14	Policies to Stimulate Mass Transit/Ride Sharing
New	Alternative Fuels Package (replaces options 17-21)
28	Phase-out Federal Electricity Subsidies
34	Renewable Energy Production Incentive
38	IRP and Tax Free Treatment of Utility Rebates
60	Enhanced R&D

APPENDIX III

MISCELLANEOUS OPTIONS FOR SUB-CABINET RESOLUTION

Option #	Option
23	NPR Leasing
25	Oil Pipeline Deregulation
29	Hydropower Regulatory Reform
32	Nuclear Waste - Alternative to Federal Management
39	Equipment Standards or Labeling
40	Strengthen Building Energy Efficiency Standards
42	Fund for Federal Efficiency Investments
49	Energy Impact Analysis for Environmental Rulemaking

ADDENDUM A

ALTERNATIVE FUELS OPTIONS

DRAFT

DEC 0 9 1990

Overview, NES Alternative Fuel Options

Use of alternative transportation fuels can enhance U.S. energy security by reducing U.S. oil use. The Clean Air Act Amendments of 1990 (CAA) established several programs that involved use of alternative fuels on the basis of their potential to reduce CO, ozone forming hydrocarbons, and toxic emissions. We estimate that the CAA will displace, by 2010, about 400 mB/D of U.S. oil imports due to these provisions.

However, in order to more significantly reduce U.S. oil imports, three alternative fuel options are included in the National Energy Strategy (NES) that would, by the year 2010, add 2 million barrels per day of oil displacement beyond that achieved in the CAA. These options are:

1. Cafe Incentive for Alternative Motor Fueled Vehicles: Would eliminate the cap on the Corporate Average Fuel Economy (CAFE) credits that are earned by motor vehicle manufacturers from the production of dual fueled or fuel flexible vehicles.

2. Alternative Fueled Fleets: Would require owners of centrally fueled fleets to purchase alternative fueled vehicles.

3. Non-Petroleum Motor Fuel: Would require that at least 10% of U.S. motor fuel be non petroleum based. This could be accomplished by blending 10% non petroleum feedstocks into all gasoline and diesel fuel, or an equivalent use of alternative motor fuels in alternative fueled vehicles.

The combination of the three options offers benefits over a single option, assuring the achievement of oil displacement goals at the lowest possible total cost and minimum risk to any one player (vehicle manufacturers, consumers, fleet operators, fuel producers, and fuel distributors).

The requirement that motor fuels contain a minimum level of non petroleum fuel (with credits and trading) would encourage refiners and fuel distributors to provide alternative motor fuels for vehicles capable of using them. Providing neat alternative motor fuels is likely to be a less costly way of satisfying the blend requirement.

The demand by centrally fueled fleets for alternative fueled vehicles provides a ready market for vehicles produced in response to the CAFE incentive. In addition, the likelihood that private purchasers of fuel flexible vehicles would use alternative motor fuels is greatly enhanced by the incentives provided to refiners to market these fuels.

The additional cost (relative to the cost of imported oil) per barrel of oil displacement provided by this package of options is estimated to be as low as $4 per barrel, by general use of alternative fuels compared to up to $21 per barrel by blending non-petroleum feedstocks into gasoline and diesel fuel. We expect that because of the credit and trading system, the total cost of these options would be at the low end of this range since market forces would dictate the most cost effective approach.

In order to maintain Federal leadership, the NES options also include:

4. Larger Federal Alternative Fueled Fleet: Would accelerate Federal purchase of alternative fueled vehicles and conversion of conventional vehicles to operation on natural gas.

While this option is not estimated to displace a significant amount of oil, it demonstrates Federal leadership and sets an example to State and local governments to use alternative fuels.

DRAFT

DEC 0 7 1990

Title: CAFE Incentives for Alternative Fuel Vehicles

Option: Increase or eliminate the cap of 1.2 mpg CAFE credit available to manufacturers for the production of light duty alternative fuel flexible or dual fueled vehicles.

Discussion: The Alternative Motor Fuel Act of 1988 (AMFA) provided CAFE credits for vehicles powered by alcohol or natural gas. The CAFE credit resulting from production of flexible or dual fueled vehicles is limited to 1.2 mpg (MY 1993 - 2004) or 0.9 mpg (MY 2005 - 2008). This incentive is insufficient to stimulate the manufacture of more than a few hundred thousand fuel flexible vehicles per year. While dedicated alternative fuel vehicles receive an unlimited CAFE credit, dedicated vehicles are likely to be limited to well defined niche markets.

Without government intervention, it is unlikely that alternative fueled vehicles would be introduced in sufficient numbers to have any impact on U.S. energy security for at least two decades. A large number of alternative fueled vehicles and fueling outlets are required, in addition to the supply of a very large quantity of at least one alternative transportation fuel. All three pieces - vehicles, fueling outlets, and fuel supply - are unlikely to come to the market simultaneously. No single party - vehicle manufacturers, fuel distributors, or alternative fuel suppliers - have enough incentive to act unless they are confident that the other two parties are simultaneously acting. In addition, vehicle manufacturers and fuel distributors would have to make substantial investments to achieve a sufficient number of vehicles and fueling outlets before the widespread distribution of any alternative fuel would be economic. Therefore, the parties making the earliest investments would not likely reap any benefits, since the actual demand for alternative fuel vehicles or fuel would not develop until many years after those earliest investments were made.

This option, in combination with other NES alternative fuel options, is designed to break this bottleneck in the least obtrusive way. This option includes no mandated sales of vehicles or fuel. Alternative fuels would only be purchased by consumers when they were competitive.

PROS: Would provide a significant incentive to produce alcohol flexible vehicles and an additional incentive to produce dual fueled CNG powered vehicles to satisfy clean fuel vehicle requirements of the Clean Air Act.

Provides an alternative to manufacturers that may be more cost effective than increasing automobile fuel economy. For example, GM would improve its MY 1995 CAFE by about 4 mpg if it converted its large and luxury class cars to flexible fuel capability.

Provides only incentives, not mandates - the response of the motor vehicle industry is voluntary.

Leaves the actual choice and use of alternative fuels to the private sector and consumers.

Estimated to result in oil displacement of 150 mB/D in 2001, growing to 825 mB/D in 2005, to 2.2 mmB/D in 2010, to 2.3 mmB/D in 2015.

The present value (1990) of the estimated reduction in oil prices resulting from this level of oil displacement is $22 billion. This compares to an estimated present value of costs of about $5 billion. This estimate is based on the limiting assumption that OPEC does not react to reduced U.S. oil demand by reducing OPEC oil production. If OPEC did react, the reduction in oil prices, and consequent benefits, would be reduced.

The increased cost of vehicles per barrel of oil displaced is estimated to be $4. This estimate does not include the potential savings to consumers of alternative fuels relative to conventional fuels.

Provides a large market for future U.S. alcohol production using advanced technologies from cellulosic, waste, and coal resources. Advancing these technologies to a commercially competitive stage are major research objectives of the Department of Energy.

CONS: Alternative fuels must be produced in sufficiently large volumes, and at competitive prices, and fuel distributors must choose to make them available, in order for this option to produce benefits. Otherwise the fuel flexible vehicles will merely be run on conventional fuels.

Would increase present value of future vehicle costs by $5 billion.

Would reduce oil imports, but would increase methanol imports.

This option may lead to reduced light duty vehicle fuel efficiency by reducing the effectiveness of mandatory fuel economy standards.

Action Required and by Whom: The Administration would propose legislation to modify the Motor Vehicle Cost and Savings Act. The required legislation and regulations would be jointly developed by DOE, EPA, and DOT.

DEC 0 7 1990

DRAFT

Title: Alternative Fuel Fleets

Option: This option would require that all fleets of 10 or more vehicles that are centrally fueled or capable of being centrally fueled purchase, by 1995, 10% alternative fueled vehicles, growing to 90% by 2000. The vehicles covered include light duty cars and trucks, and medium to heavy duty trucks. Over-the-road Class 8 vehicles, or other trucks not capable of being centrally fueled are not included. In addition, Federal fleets would convert to alternative fuel use on an advanced schedule. Alternative fueled vehicles are defined to be vehicles that use motor fuels or energy sources that contain 15% or less petroleum based product. Alternative fueled vehicles are also defined to include LPG.

Discussion: This option would require nationwide use of alternative fuel vehicles in fleets. The Clean Air Act has a similar provision with the following differences:

- The CAA requirements begin in 1998 and apply to 30% of new purchases growing to 70% by 2000.
- The CAA requirements only apply in 26 nonattainment areas (30% of the population).
- The CAA requirements do not require use of alternative fuels, but rather, require vehicles to meet "California Low Emission Vehicle Requirements" (LEV) of 0.075 gpm NMHC, 3.4 gpm CO, and 0.2 gpm NO_x. It is estimated that gasoline powered vehicles may be able to meet these requirements.

Vehicles satisfying this option would also have to meet CAA requirements. Therefore, by 1998, covered alternative fueled vehicles in the 26 nonattainment areas would have to meet the LEV standards. The CAA requirements would remain unchanged except that now these LEVs would have to be powered by alternative fuels to meet both program requirements.

PROS: Would provide a significant incentive to improve alternative motor vehicle technology.

Leaves the actual choice of alternative fuels to the private sector and consumers.

Would displace 900 mB/D of oil (2005). The CAA program would displace 0 to 95 mB/D (2010) depending on whether gasoline or alternative fuel powered vehicles are used to satisfy the program.

CONS: By year 2000, the annual increased cost for vehicles would be $2 billion. The present value of these costs is $8.6 billion (1990 at 10% discount rate).

The total refueling infrastructure cost would be $3.5 billion. The present value of these costs is $1.4 billion (1990 at 10% discount rate).

The cost of infrastructure and vehicles per barrel of oil displaced is:

1995	$32.50
2000	$10.50
2005	$6.10

The cost of infrastructure and vehicles per barrel of oil displaced is high in the earliest years because of the need to provide refueling infrastructure for relatively few vehicles.

Action Required and by Whom: The Administration would propose legislation to require purchase of alternative fuel fleet vehicles and requirements to fuel these vehicles with alternative fuels (in the case of dual fueled or fuel flexible vehicles). The required legislation and regulations would be developed by DOE.

DEC 0 7 1990

DRAFT

Title: Non-Petroleum Motor Fuel

Option: This option would require that refiners and motor fuel importers offer for sale motor fuels that have at least 10% non-petroleum content on an energy equivalent basis (by 2005, 5% by 2000). Credits and trading would be provided to allow fuels that contain more than 10% non-petroleum content to offset fuels that contain less. Therefore, sale of alternative motor fuels would generate credits that would allow sale of conventional gasoline via trading and credits.

Discussion: This requirement would be partly met by blending MTBE, ETBE, and ethanol (all oxygenates) into gasoline. In this regard, it may viewed as a nationwide extension of the reformulated gasoline provisions of the Clean Air Act Amendments of 1990. In addition to blending oxygenates into gasoline, this requirement would also stimulate use of shale oil, tar sands, and coal liquids ("non-conventional oil"). We estimate that of the 15 billion gallons per year of non-petroleum blend stocks, 9 billion would be comprised of oxygenates, and 6 billion would be "non-conventional oil." It is also likely that the 15 billion gallon per year requirement may be reduced through credits and trading if a significant number of alternative fueled vehicles are introduced due to CAA or other NES programs.

Pros: Displaces 1 mmB/D of imported oil by 2005.

The reduced oil demand is estimated to lower world oil prices by about $1 per barrel and save $3-4 billion per year in reduced U.S. oil expenditures.

Encourages purchase and use of alternative fuel vehicles by fleets through credit and trading program.

Leaves choice of non-petroleum fuels to market.

Cons: Would cost as much as $7 billion per year, raising the average cost of all motor fuel by as much as 5 cents per gallon.

Non-petroleum fuels are estimated to cost $21 per barrel more than the motor fuel they displace.

Would entail substantial administrative apparatus to assure that feedstocks are non-petroleum. Refiners would have to keep a paper trail of feedstock acquisitions and the Federal government would set up an enforcement process to prevent fraud.

Could cause substantial competitive dislocation in the refining and marketing sectors. Independents would be particularly disadvantaged.

This is a mandate that could become uncontrollable in the Congress. If the percentage requirements and deadlines are moved up, the costs would escalate dramatically.

Action Required and by Whom: The Administration would propose legislation to require minimum levels of non-petroleum feedstocks. The required legislation and regulations would be developed by DOE.

Title: Larger Federal Alternative Fuel Vehicle Fleet

Option: The Federal government would accelerate its purchase of new alternative fuel vehicles and would initiate the conversion of existing vehicles to CNG operation consistent with the requirement of the Clean Air Act.

Discussion: The Federal government purchases 44,000 light duty vehicles per year and operates a civilian fleet of 200,000 cars and light trucks. About one-third of these vehicles are controlled by GSA; the remainder are owned and operated by individual agencies, e.g., DOD. We expect that, in 1991 and 1992, up to 1000 alternative fuel vehicles will be purchased under the auspices of the Alternative Motor Fuel Act of 1988 (AMFA). Because the available alternative fuel models are larger, more luxurious, and more expensive than the vehicles that would otherwise be purchased by the Federal government, we expect that the incremental cost of the AMFA vehicles purchased in 1991 and 1992 will be $4000 to $7000. Until there is sufficient fleet demand for a basic compact alternative fuel car, the manufacturers are unlikely to make such a car available. In addition, the AMFA CAFE credits (see "CAFE Incentives for Alternative Fuel Vehicles") encourage manufacturers to produce large and luxury fuel flexible vehicles instead of compact cars. We assume for the cost analysis provided below that these problems are partially overcome and that the incremental vehicle cost would be $2500 for a methanol fuel flexible vehicle. This assumption is plausible only if a large and continuing demand were established for these vehicles. The cost of converting an existing vehicle to CNG operation is estimated to be $2500.

Recently enacted Clean Air Act Amendments established a new mandatory alternative fuel program for all fleets of ten or more vehicles in 26 cities designated as serious, severe and extreme non-attainment areas. Under this requirement, fleets must be converted to alternative fuels in a manner that will achieve specific emission standards by 1998.

Pros: A Federal alternative fuel vehicle fleet program could help initiate and facilitate implementation of the new Clean Air Act requirements.

A program to provide 60,000 vehicles by 1995 would displace 1,300 barrels per day of oil use by 1995.

Demonstrates Federal leadership and sets an example for State and local governments and the private sector. Could indirectly generate oil savings by encouraging greater use of alternative fuel vehicles.

Would reduce emissions of volatile organic compounds (VOCs) by 0.002%.

Use of CNG vehicles may reduce fuel costs and maintenance costs.

CONS: Refueling facilities would cost about $150 million through 1995 with most of this cost occurring in the early years. In addition, GSA estimates additional costs of $45 million due to higher operation costs and lost disposal revenue (or cost to reconvert or remove tanks, etc.). The net present value of the costs of this option is $244 million. The nominal annual costs, assuming 4% annual inflation, are shown in the table below.

Federal Alternative Fuel Fleet Cost
(all nominal dollars)

Year	Millions
1991	49
1992	51
1993	103
1994	106
1995	181

If the program cost were attributed to reducing VOCs, VOC reductions would cost over $200,000 per ton in 1995.

If the program cost were attributed to reducing oil use, oil displacement is achieved at over $180 per barrel displaced in 1995.

Program is not cost effective unless non-Federal fleet purchases, in combination with Federal fleet purchases, generated sufficient demand for low cost alternative fuel vehicles. If the expanded Federal fleet program were implemented in advance of private sector fleet conversions under the Clean Air Act, demand would not be sufficient to drive down costs.

Conversion of existing vehicles to use of CNG would void their warranties and could result in increased Federal maintenance costs. Also, resale of these vehicles would require removal of CNG equipment, adding further costs to the program.

Would require changes in agency refueling practices.

Would require installation of alternative fuel refueling outlets.

Action Required and by Whom: The President would issue an executive order requiring alternative fuel vehicle purchases and conversions consistent with the geographic and schedule requirements of the Clean Air Act Amendments. GSA and other purchasing agencies would change their regulations to allow for purchase of available alternative fuel vehicle models. Authority to purchase alternative fuel vehicles is provided by the Alternative Motor Fuels Act of 1988. In addition to the authority provided under this Act, additional funding authorization and appropriation would be required. Additional funding could be provided via the AMFA program (DOE) or directly to GSA and/or user agencies. GSA would establish higher rates to recover these costs.

ADDENDUM B

ENHANCED R&D

DRAFT

DEC 10 1990

POTENTIALLY HIGH PAYOFF TECHNOLOGIES FOR REDUCING U.S. OIL VULNERABILITY

Option: Increase funding and provide alternative approaches for enhanced research and development efforts to promote NES goals for reducing oil vulnerability.

Discussion: This option deals with two separable R&D issues: the identification of high payoff technologies for reducing U.S. oil vulnerability and the mechanisms for funding those technologies. The focus of this option is on oil and for that reason does not include other worthy R&D opportunities that support the NES. In particular, some members of the EPC have expressed their support for additional R&D in other areas such as advanced nuclear power. Furthermore, it must be pointed out that the discussions of the various technologies in this paper describe the potential of these technologies and do not consider the funding mechanism that ultimately might be used.

The primary responsibility for technological development, particularly its commercialization, lies with the private sector. To the extent that investments in development and improvement of existing technologies are likely to yield economic benefits, firms will have strong incentives to undertake them. However, in some key areas, the private sector may not have adequate incentives to undertake long-term basic research or to ensure that the overall portfolio of research investments is sufficient to address energy security concerns. For this reason, an important component of the NES should be to support a diversified set of research that offer the possibility of major breakthroughs that would benefit energy security. It must be understood that these investments are directed toward long-term benefits and may never pan out.

High Payoff Technologies: The R&D programs that are believed to offer the greatest potential for reducing oil vulnerability include the following (listed alphabetically):

- Advanced Oil Recovery Technologies
- Advanced Transportation Fuels from Biomass Technologies
- Aeronautics and Air Systems
- Basic Research to Support Advanced Energy Technologies
- Electric Vehicles
- High Speed Rail and Maglev
- Industrial Technologies

- o Intelligent Vehicle/Highway Systems
- o Telecommuting
- o Vehicle Propulsion

These areas were selected on the basis of (1) potential for reduced demand for petroleum or increased supply of substitutes, and (2) potential for performance improvements and/or cost reduction through enhanced R&D. Significant advances in any of these technology areas could lead to significant commercial potential under a range of possible future oil price paths. All of these technologies could yield significant impacts between 2000 and 2030.

Mechanisms for Implementing an Enhanced R&D Initiative: In addition to identifying potentially high payoff technology R&D areas, there is a related issue of how best to implement the initiative. New mechanisms appear to be needed to increase the prospects for success than historically has been the case. For example, the Federal Government has had a substantial, broad-based energy R&D program since the 1973 oil embargo. From FY 1980 through FY 1990, the Federal Government has invested about $21 billion in energy technology R&D. Much of the past energy R&D was funded in Federal laboratories, or contracted to firms with little private sector decision-making or cost-sharing. However, this approach did not necessarily make the best use of the private sector to increase the effectiveness and ultimate commercialization of the R&D. This is especially important when considering that new energy technologies ultimately must be both <u>produced</u> and <u>used</u> outside the Government.

<u>Alternative Implementation Mechanisms</u>

1. <u>Cost-Shared, Joint Government-Industry-University R&D</u>: This approach would involve industry-led, joint Government-Industry-University R&D planning and management with some degree of cost sharing. The research would be performed by industry (except in situations where Government labs had unique research and testing capabilities or by universities through the use of grants). The formation of industry R&D consortia would be encouraged where feasible (e.g., in the pre-competitive R&D stages). This mechanism would maximize the involvement of the ultimate technology users, enhancing the technology transfer process, and would minimize Government overhead. (This issue is discussed in more detail in the Technology Transfer option paper.)

Intellectual property rights would be assigned to the industry participants consistent with current laws and policies. Each technology R&D venture would have well-defined goals, end products and schedules, with a mechanism for evaluation of results. This approach would seek to take advantage of the large pool of technical talent and financial resources in the private sector.

In the case of the basic research initiative, universities should play a major role. Active university involvement in aviation R&D worked successfully with NASA and DOD. In addition, a byproduct would be a cadre of newly trained university graduates with specialization in advanced fuels, lubricants, materials, structures, aerodynamics, electronics, and other oil reduction technologies.

2. Tax Credits for Enhanced R&D. An enhanced energy technology R&D initiative could be supported through new tax incentives, that could take several forms:

   - a modification to the current research and experimentation (R&E) credit that would provide an increased credit (e.g., 40 percent) for R&D in specifically-defined areas of high payoff energy technology R&D.

   - a production tax credit, applicable to first-of-a-kind commercial ventures (e.g., pioneer alternative fuels processing facilities), designed to offset the high initial costs of new ventures. This credit would have specific limitation on the number of ventures and length of time, and would not be an open-ended long-term production credit to subsidize otherwise uneconomic alternative energy ventures.

   The tax credit options would give maximum flexibility to the marketplace to select among qualifying R&D projects those with the highest potential payoff. However, these credits also have several disadvantages. First, a priority of this Administration is to make the present 20 percent R&D credit permanent. (The present credit, which generally applies to energy-related research, expires on December 31, 1991.) Attempts to increase the credit for certain energy technologies would substantially increase the cost of the credit and would undercut this effort. Second, by targeting the credit to certain specially-defined technologies, the proposal would reduce the flexibility of the marketplace to select other areas with possibly greater potential payoff. Third, these credits would be difficult to administer.

3. Prizes/Awards. Under this approach, a national award program, with large cash grants, would be established for major innovations in new energy technologies. This program would be Government-funded, and administered by a special board with broad-based representation. The board could issue specific national challenges (e.g., an electric vehicle that can travel 200 miles at 50 mph on a single charge), or award prizes to the best unsolicited applications. This approach appears to have strong incentive in other areas (e.g., Baldrige Award, Nobel Prizes), and could spur a new round of entrepreneurial innovation. However, a prize may not be a sufficient incentive in technology areas where R&D costs are particularly high. For this reason, a prize/award program may be more suitable as a complement, rather than a substitute for other mechanisms (cost-sharing, tax credits).

Expected Benefits/Impacts: Supporting the development and deployment of new technologies can have significant economic, environmental, and energy security benefits. It is estimated that by 2030 between 5 and 8 million barrels a day could be saved/produced, depending upon the success of the R&D programs. The increased budgetary costs are not known, but are believed to be modest, and would not occur until FY 1993. The investment required to commercialize these technologies likely will be substantial, but cannot be estimated at this time. As the attachment shows, modest increases in Federal energy-related R&D, on a sustained basis, could result in substantial benefits, especially when leveraged through significant cost-sharing with industry.

Pros:

- o Targeted investments in potentially high payoff technology R&D offers the potential to achieve substantial import reductions without resort to new regulatory or subsidy programs.
- o The enhanced oil-vulnerability reduction R&D program proposed here could help ensure a balanced (supply/demand side) and comprehensive NES.
- o The expanded use of cost-sharing and prizes/awards will engage private interest earlier in the technology development process and help spread the modest Federal investment described in this option across a broader base of technologies.

Cons:

- o An enhanced oil-vulnerability reduction R&D program may be less successful than envisioned resulting in high costs with little or no tangible benefits.

Furthermore, the critical issues in the commercialization of new technology are often driven by economic, institutional and political concerns, not necessarily technology. Consequently, even if successful, R&D may not be enough if oil prices are too low or consumer preferences are unresponsive.

- Even if successful, a strategy of enhanced R&D will likely achieve energy security benefits later than other regulatory alternatives.

- The program may displace some private sector R&D investments, even with substantial cost-sharing.

- An enhanced R&D initiative will be particularly popular, but will likely be expanded and diluted with Congressional and other special interest projects.

Recommended Actions:

1. The R&D priorities stated above would be refined based upon a more complete estimate of potential payoffs and costs. The agencies and OMB would reach agreement on the amount of additional R&D funding to be phased in over a 5-year period. The exact amount of additional funding has not been determined. To the maximum extent feasible, this R&D will be conducted through greater use of joint government/industry cost-sharing and awards for innovation. Working closely with the private sector, the responsible Federal agencies (DOE, DOT, NASA, etc.) would develop collaborative implementation plans.

2. If the EPC wishes to consider the tax credit mechanism, the Treasury Department would conduct on an interagency basis an assessment of the advantages of pursuing new tax incentives for promoting R&D in specifically defined areas of high payoff energy technology that support NES objectives.

3. The Office of Science and Technology Policy through the Federal Coordinating Council for Science, Engineering and Technology will monitor ongoing Federal R&D programs that could contribute to the NES objective of reducing oil vulnerability.

ATTACHMENT A

SUMMARY OF R&D OPTIONS

Summary of R&D Options

The analyses in the following summaries are based on the assumption that each technology is independent of the others in terms of their ability to penetrate the marketplace. These technologies will, to some extent, compete with one another in the market. Consequently, the estimates of energy savings provided below overstate the individual contributions each technology might achieve. The individual contributions should not be added -- the combined effect of these technologies will be less than the sum of the individual expected benefits.

Based on the NES current policy case, oil consumption in 2030 is expected to be 25.4 million barrels per day (mmB/D). If fully successful, these technologies could achieve combined oil savings of 5 to 8 mmB/D by 2030.

Advanced Oil Recovery Technologies

Advanced oil recovery technologies will permit production of portions of the two-thirds of known U.S. oil that are normally not recovered using present techniques. Full R&D success could dramatically increase U.S. proved reserves and increase daily production between 1.8 - 3.2 mmB/D in 2010. Advanced oil recovery technologies includes intensive drilling based on advanced geological/geophysical reservoir interpretation and the injection of chemicals, gases, or heat to overcome viscous, capillary and permeability barriers to production. Targeted technological advances include: interdisciplinary geoscience advances in improving the definition of reservoir flow paths and better underground instrumentation and interpretation techniques; chemicals that are stable and cost effective at elevated temperatures and salinities; improved wellbore insulation and downhole steam generation; and methods for enlarging the portion of the amount of the reservoir that can be effectively swept by chemicals and steam.

Advanced Transportation Fuels from Biomass

Ethanol is produced commercially from starch and sugar crops such as corn and sugar cane; however, lignocellulosic feedstocks (biomass) such as trees and grasses have not yet been converted to ethanol on a commercial scale in the U.S. Successful R&D could provide a major alternative to gasoline which is domestic, renewable, and competitively priced. Research to date has reduced the projected selling price of ethanol from biomass from $3.60/gallon in 1980 to $1.27 today. A wide range of technical opportunities have been identified to bring the price down to about $0.60/gallon. The primary obstacle is the need to conduct

integrated process experiments to show that the process steps will work as a system and can be scaled up to commercial scale.

Feedstock improvements and research on conversion process are also sought, in conjunction with USDA. Successful R&D could result in the attainment of cost goals and initial commercialization by the year 2000, leading to a 10-15% reduction in oil use by 2030, or 2.5 - 4 mmB/D.

Aeronautics and Air Systems

In 1989, U.S. air carriers logged 446 billion passenger revenue miles, consuming about 1 mmB/D of jet fuel and aviation gasoline. General aviation aircraft consumed an additional 0.07 mmB/D. World air travel is forecast to double in the next 10 years and to continue sustained growth of over 5 percent annually thereafter.

NASA supports long-term high risk R&D on enabling technologies for aeronautics with potential application to both the commercial and military sector. Current areas of research with high potential payoff in terms of energy efficiency include: composite airframe materials for weight reduction in primary aircraft structures, specifically wing and fuselage; propulsion materials and components applicable for high efficiency unducted and ultra-high bypass ducted engines; applications of hybrid laminar flow wings and nacelles for increased aircraft efficiency through drag reduction; advanced wing designs with minimum induced drag and improved flap systems; close coupling between engine and aircraft controls to allow engines to run more efficiently; technology for fly-by-light and power-by-wire control systems for both aircraft and engines that reduce weight and permit optimal power management and distribution; and automation aids for the air traffic control system to optimize aircraft scheduling and control for increased flight path precision and reduced runway occupancy time, and other methods to support capacity and reduce delays.

The aircraft technologies alone could increase energy efficiency by 30-60 percent over current commercial aircraft. Improvements in the air traffic control system could increase energy efficiency by 5-10 percent.

Basic Research to Support Advanced Energy Technologies

Increasing basic research in selected high priority areas can accelerate the development of advanced technologies, which can reduce the demand for oil, increase oil supply or provide substitutes for oil. These basic science areas include: (1) advanced materials -- to lower cost and increase performance for a wide variety of energy technologies; (2) superconductors -- to

develop efficient magnets for maglev vehicles and sensors for increasing efficiency in industry; (3) geosciences -- for underground imaging to better search for oil, gas, and geothermal water sources; (4) biosciences -- to find new plants that better absorb carbon dioxide and new liquid fuels in the biomass area; and (5) catalysis research -- to develop robotic devices for more efficient industrial processing, and to reduce wear and friction in machinery. Research is currently proceeding in all of the above areas. Increased support in selected areas can stimulate private sector interest, accelerate the time of developing new technology, and increase the probability of success.

Electric Vehicles

Federal and private R&D has been conducted on electric vehicles for the last 15 years. The remaining technical obstacle for more widespread use of electric vehicles is the development of batteries that can provide the desired range and power at an acceptable cost. Vehicle range is currently under 100 miles, and potential use is limited to urban fleets. An increase to 120 miles would make electric vehicles attractive for commuting. A 200-mile range would widen the potential applications further. A consortium of vehicle manufacturers, battery companies, and utilities is being formed to accelerate development of improved batteries with government support. Consideration is also being given to development of hybrid vehicles, which would use a small engine to overcome the limitations of battery power. With successful R&D, electric vehicles could capture 20% of the market by 2030, leading to 1.6 mmB/D of oil savings.

High Speed Rail and Maglev

High speed rail and magnetic levitation (Maglev) transportation offers the potential for efficient, high-speed travel; it appears to be best suited for trips of 200-600 miles in length, competing with both long distance automobile travel and short haul air travel. Surface and air travel are expected to double in the next 20 to 30 years. If a significant portion of that petroleum fueled travel could be displaced by high speed rail and Maglev, a reduction in petroleum demand would be achieved. Maglev vehicles are levitated and propelled by magnetic fields, and are capable of attaining speeds of more than 300 mph. The Federal Maglev initiative is focusing on safety issues of the German Transrapid system and on studying the research, development and demonstration needs of a Maglev technology if the U.S. decides to pursue it. An economic feasibility study by the Department of Transportation is due to be completed in 1992, which will refine both cost and benefit estimates.

High speed rail and Maglev are capital intensive -- perhaps $7-$16 million per mile compared with $3 million per mile for suburban interstate highways. However, because of the technology, it is expected that Maglev may have lower operating and maintenance costs than other surface modes. Furthermore, they may be attractive alternatives in existing transportation corridors and may have the potential to reduce the need for federal spending in highways and airports.

Industrial Technologies

Industry accounts for 27% of petroleum use in the U.S., including 1.7 mmB/D for process energy and 1 mmB/D for feedstocks. Opportunities for petroleum savings exist in process and equipment improvements and the substitution of alternate fuels and feedstocks. Increased funding would permit expansion of research in biotechnologies, high temperature materials, cogeneration, and other areas of relatively long-term, high-risk R&D unlikely to be pursued aggressively by industry alone. Since the range of technologies involved is broad and since there are multiple paths to the same efficiency outcome, success does not hinge on any single technical breakthrough. Successful R&D could achieve oil savings by 2030 of up to 1 mmB/D.

Intelligent Vehicle/Highway Systems (IVHS)

Traffic congestion is a major factor reducing highway fuel efficiency. For example, in 1987, it was estimated that urban freeway congestion was responsible for 2 billion gallons of wasted fuel, two-thirds of which was attributed to non-recurring incidents. IVHS technologies offer opportunities during such times for pricing incentives and disincentives. For example, it could reduce fares to encourage transit use or increase the cost of parking or freeway tolls to discourage use. One study of the possible overall savings from advanced traffic management involving commercial vehicles showed an annual fuel savings of 333,000 barrels a day or $7 billion per year.

IVHS will use state-of-the-art electronics, communications and computer technology to improve traffic control systems, warn drivers of dangerous situations, and make more efficient use of the existing road system. Public transit systems will also receive major benefits from IVHS developments.

Advanced Traffic Management Systems permit real-time adjustments of traffic control systems. The movement of traffic is detected by road side sensors and using this information, traffic lights can be altered to reflect priorities in traffic flows. Advanced Traveler Information Systems permit communications between the

drive and an information center. Continuous advice can be transmitted regarding traffic conditions and likely delays ahead. Additionally, specific advice would be possible in route planning and directions to the location of a specific destination. Advanced Vehicle Control Systems would employ advanced technology to help the driver control the vehicle. Examples are the application of radar to identify obstacles ahead, to keep cars at a set distance apart when travelling at high speeds, to judge velocity of oncoming vehicles at junctions. Finally, the most futuristic idea proposed under IVHS -- automated vehicle control systems, where the highway can also provide power to vehicles, holds vast potential to perhaps double vehicle capacity. Alternative energy sources could be used to generate electricity which could be inductively coupled to the vehicle using the roadway. Furthermore, such "powered" highways could be used to charge electric battery vehicles, thus extending their range.

Telecommuting

It is estimated that between 40 and 50% of passenger vehicle miles and travelled (VMT) is for work-related purposes. Telecommuting is an attractive alternative for workers in the information sector (and some in the service sector, but not agricultural and industrial workers) who now constitute the majority of the workforce. Broadband transmission networks, power and inexpensive desktop work stations, easy-to-use software, and extensive remotely-accessible databases constitute the necessary infrastructure. Communication and supervision are the prime obstacles to be overcome in making telecommuting more widespread. R&D can aid the emergence of technological solutions, particularly in the area of networks. Computer networks today are not interconnected and it is difficult to send information between any two systems. For example, broadband, fiber optic connects exist between cities and exchanges, while cable television networks connect to individual locations in many areas. R&D and other investments to permit increased interconnection of networks and enhanced capabilities for digital data would greatly facilitate telecommuting. In 1981, there were ready 300,000 flex-place workers. Today there are an estimated 3.6 million. Estimates are that there are about 46 million potential telecommuters in the Nation. The fuel saving potential of these 46 million telecommuters averages to about 260,000 barrels of oil per day.

Vehicle Propulsion

Enhanced R&D on automotive gas turbines, fuel cells and high efficiency internal combustion engines (both gasoline and diesel fueled) would increase the commercial viability of these advanced technologies and accelerate their entry into the market. Turbines,

which could go into production in this decade, would be 30% to 40% more efficient than the internal combustion engine and would also be capable of operating on alternative fuels. Fuel cells, envisioned for introduction after the year 2000, would be 60% to 80% more efficient and clearly would use alternative fuels. The use of advanced ceramic materials for engine components is the critical technical step in turbine development, as turbines derive their efficiency by operating at high temperatures without cooling. High efficiency internal combustion engines, incorporating ceramics and other new materials, could operate at higher temperatures without the need for cooling systems, and also would be more capable of operating on alternative fuels. For example, a successful gas turbine R&D program could allow it to capture 25% of the market by 2030, leading to 2.0 mmB/D of oil savings.

ADDENDUM C

NON-CONSENSUS OPTIONS

#11

DRAFT NOV 23 1990

Title: Reform CAFE Program

Option: The current CAFE law has several major problem areas, which are outlined below. In addition, there is a need for a comprehensive analysis of feasible fuel economy levels, considering technology, economics, and the impacts of the new Clean Air Act amendments and other recent regulatory requirements. To address these issues, DOT and DOE will develop proposed legislation to remedy some of the flaws in the present CAFE law. In consultation with DOE and other relevant Executive branch agencies, DOT will perform an independent study on the potential for improving new vehicle fuel economy. It is expected that the revised legislation, together with the results of the study, will serve as the basis for a rulemaking process to establish new vehicle fuel economy requirements.

Discussion: The current CAFE law has several major problem areas:

1) The law imposes the same standard on full line and limited line manufacturers. Because of this, the full line manufacturer has to market small cars with much better fuel economy than the standard to offset the large car end of the product line, as compared to a manufacturer specializing in only small cars, whose small cars need only meet the standard.

2) The import/domestic fleet distinction can distort the production plans of both U.S. and import manufacturers without providing any improvement in overall U.S. fuel efficiency, and can result in an adverse impact on the U.S. domestic automotive industry (i.e., employment, capacity utilization).

3) To the extent that CAFE standards require extensive size and weight reductions, they result in increased highway fatality and injury rates.

4) The legislation works only on the "supply side" of fuel economy without corresponding market or regulatory incentives on the "demand side." If manufacturers produce smaller cars, cars with reduced performance, or cars with improved fuel economy technologies to meet CAFE requirements, CAFE provides no "demand side" incentives for consumers to buy them or use them in a fuel-efficient manner.

5) U.S. manufacturers view penalties imposed for non-compliance as criminal sanctions that may expose management to stockholder suits. The current law explicitly identifies noncompliance with CAFE standards as "unlawful conduct."

DOT and DOE recognize that the current international energy situation strongly argues in favor of reducing automotive fuel consumption, and that a modified CAFE law may be a necessity to accomplish this. DOT and DOE will develop proposed legislation to correct some of the flaws and inequities of the current CAFE statute, plus enhance its flexibility. This will be new legislation, not simply a re-work of S. 1224. The scope of future CAFE rulemaking will, be partly determined by enactment, of legislation to reform the CAFE statute. Among the items under consideration are:

1) Elimination of import/domestic fleet distinction. This would allow manufacturers to include all cars sold, regardless of their foreign or

U.S./Canadian content, in a single fleet for the determination of CAFE compliance.

2) CAFE credit trading and averaging would allow manufacturers that have higher than required CAFE to sell credits to manufacturers that have lower than required CAFE. Also, would allow manufacturers to transfer earned credits within the company from passenger cars to light trucks or vice-versa to comply with CAFE standards. This would provide manufacturers producing cars and light trucks with increased flexibility and compliance options.

3) Elimination of "unlawful conduct" provisions and substitution of noncompliance fee for current civil penalties. Would limit the economic cost of CAFE compliance by providing manufacturers a clearly legal alternative to meeting CAFE requirements.

4) Alternative forms of CAFE standards: A volume average fuel economy (CVFE) standard would include the average interior volume in the determination of a manufacturer's average automobile fuel economy. With size- or weight-based fuel economy standards, manufacturers would need to meet the standards only for those classes of vehicles which they manufacture, based on size or weight. With "percentage increase" standards, each manufacturer's standard would be based on its CAFE performance in a baseline year. Under any of these approaches, manufacturers that currently produce large cars would be required to meet a lower average fuel economy requirement than manufacturers that produce smaller cars.

In addition, in preparation for rulemaking process that would affect vehicles produced in the mid to late 1990s, DOT will initiate a study on potential increases in car and light truck fuel economy levels.

The study will be performed in two phases. Phase One will determine feasible future fuel economy levels for auto manufacturers, considering technology, capital and manufacturing costs, the industry's clean air and safety commitments, and the financial and other resource constraints faced by these companies. Phase Two will examine in more detail the costs to all auto manufacturers and U.S. consumers of making these improvements, the need for domestic manufacturers to enhance their competitiveness, the state of the national economy and its impacts on manufacturers' abilities to afford these changes, consumer acceptability issues associated with more fuel-efficient vehicles, and the need of the nation to reduce its reliance on insecure sources of oil.

This two-phased study should be underway by the end of December 1990. Phase One is to be completed by the end of June 1991. Phase Two will take more time. In addition, the NES/EPC interagency working group will form a study steering committee and study other relevant issues in the future as necessary.

PROS: Provides the Administration with a concrete plan of action to address both the need to eliminate inequities in the CAFE law and to consider further improvements in vehicle fuel efficiency.

Legislative proposals would be designed to (1) reduce or eliminate discrimination of current CAFE standards against full line and large car manufacturers, (2) reduce regulatory interference with manufacturers' market strategy vis a vis size mix, source of parts, and manufacturing location, (3) provide manufacturer flexibility in allocating fuel economy improvements between cars and light trucks, and (4) make the CAFE improvements more cost effective.

Could result in improved motor vehicle fuel economy.

CONS: Endorses regulatory approach and, notwithstanding relative benefits, is somewhat inconsistent with Administration's reliance on market principles.

A CAFE credit trading program would have to be carefully structured to avoid a windfall benefit for manufacturers specializing in small cars. As a minimum, accumulated past CAFE credits could not be traded.

"Percentage increase" standards restrict consumer choice by not letting all manufacturers fully complete in large/luxury/performance markets, may be GATT-illegal, and have negative safety consequences because manufacturers of lightest, most fuel-efficient cars must make the greatest mpg improvement.

May not satisfy Congressional demands for higher and more certain fuel efficiency requirements.

Any legislative initiative is subject to modification by Congress.

Action Required and by Whom: The Administration (DOT and DOE) will develop and propose legislation to implement changes in the CAFE statute as a precondition to consideration of higher fuel efficiency standards. DOT will initiate a study of fuel economy capabilities, with DOE, EPA, Commerce, and other relevant Executive branch agencies contributing data and comments. It is expected that these actions will serve as a basis for a rulemaking process to establish new fuel economy standards.

Title: Higher CAFE Standards

Option: If the "Reform CAFE Law" option is adopted, a rulemaking could be instituted to consider an increase in the CAFE standard beginning no earlier than 1995. This option discusses the impact of increased standards. For the purposes of estimating the likely costs and benefits, two higher levels of fuel economy standards were considered that reflect DOE's estimate of the capabilities of domestic automobile manufacturers.

New Vehicle Fuel Economy (MY 2001)

	Cars	Light Trucks
No Change	31	23
Level II	34	25
Level III	36	27

These increases (Level II and Level III) are rough estimates of the range of standards that might emerge from a CAFE rulemaking.

Discussion: Efficient operation of the market for fuel efficient cars may be hampered by externalities associated with petroleum consumption. Other factors may exist that hamper efficient market operation, but agency staffs do not agree on these. CAFE standards are a long term means of reducing fuel consumption since it takes a number of years for changes in new vehicles to work their way through the vehicle fleet. While increased CAFE standards could be set by DOT under existing statutory authority it is expected that this option would only be exercised under reformed CAFE standards.

Net National Economic Benefit: This option has a net present value (benefits minus costs) of +$6 (Level II) to -$7 billion (Level III) (1990$, 10% rate of discount) if world oil prices are assumed to change in response to this option, and $0 (Level II) to -$18 billion (Level III) if they are assumed to stay the same. The net present value does not include any values associated with either an energy security premium or environmental benefits/costs. This option is expected to save 2.2 billion to 4.0 billion barrels of oil over the 1990 to 2020 time period.

PROS: CAFE levels II and III are estimated by DOE to be achievable with slight performance losses and some weight reductions (6% for Level III) from expected future levels. However, automakers may choose additional weight or performance reductions as an alternative option for improving fuel economy.

Oil savings of 250 mB/D (Level II) to 450 mB/D (Level III) by 2005.

Oil savings of 350 mB/D (Level II) to 600 mB/D (Level III) by 2010.

The present value of consumer fuel cost savings is $19.2 billion to $38.9 billion (Level II to Level III) for the NES reference case.

The present value of oil price reductions caused by reduced U.S. oil demand is estimated to be $6 to $11 billion (Level II to Level III, NES reference case). These estimates are based on the limiting assumption that OPEC does not react to reduced U.S. oil demand by reducing OPEC oil production to prevent, or reduce, the decrease in price. If OPEC did react, the

reduction in oil prices, and consequent benefits, would be reduced or possibly eliminated.

U.S. CO_2 emissions are reduced by 0.7% to 1.2% compared to projected future U.S. CO_2 emissions (2010) (Level II to Level III).

Improved fuel economy is estimated to more than offset the VMT related increase in VOC emissions resulting in VOC reductions of 0.3% to 0.5% in 2010.

CONS: Would increase single vehicle passenger car crash fatalities by 180 and serious injuries by 850 in 2010 due to weight reductions used to meet Level III CAFE estimates. The present value of these losses is estimated to be $0.5 billion (included in net benefits estimates above). Fatalities and injuries would also increase in multi-vehicle and light truck crashes. However, because of changes in technology, safety features, and manufacturing techniques, past data is not necessarily a reliable guide to future relationships between vehicle weight and size, and injuries and fatalities.

Would increase vehicle prices ($160 to $495 for Level II and Level III, respectively) and reduce MY 2001 domestic vehicle sales by 100,000 to 400,000 (Level II to Level III, respectively). The present value of these vehicle price increases is estimated to be $19 billion to $56 billion (level II to Level III, respectively).

Increased VMT (2% by the year 2020), resulting from reduced costs of driving, will increase criteria pollutant emissions. The estimated net effects for 2010 are: CO, +0.4% to +0.8%; NO_x, +0.1% to +0.2%.

This increased VMT would increase traffic congestion resulting in economic loss of $0.5 to 1 billion (Level II to Level III, respectively) (included in net benefit estimates above).

This increased VMT could also result in an additional 1,100 deaths per year and 21,000 moderate and serious injuries. We estimate that consumers will choose to increase VMT because of lower costs of driving.

Contrary to Administration's reliance on market principles.

Regulating fuel efficiency is not the most direct way to reduce fuel consumption.

Action Required and by Whom: DOT could issue an Advance Notice of Proposed Rulemaking soliciting comments on increasing CAFE requirements for MY 1996 and beyond. Subsequent rulemaking actions would determine the maximum feasible fuel economy subject to rulemaking criteria. Under current law, standards could be lowered at a later date if market conditions reduce the maximum feasible fuel economy level.

#14

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Title : Policies to Stimulate Mass Transit and Ridesharing

Option: Remove the tax incentives for automobiles commuting by increasing the amount of transit benefits employers may provide tax-free to employees, or taxing employer provided parking.

Discussion: Employers may provide up to $15 a month in tax-free transit benefits to employees although they may provide unlimited tax-free parking benefits.

The Federal tax code, by permitting parking benefits to be treated as a tax-free fringe benefit, provides a strong economic incentive to employers to provide parking. It also creates a strong incentive for commuters to drive to work because fuel costs are minimal relative to parking costs in large urban areas. DOT estimates that employer parking subsides amount to between $25 and $50 billion annually.

The economic incentive to Single Occupancy Vehicle (SOV) commuting can be reduced by removing the tax exemption for parking benefits or by increasing tax-free transit benefits to a comparable level. While removing the parking exemption would have greater impact on transit use and in encouraging carpooling, removing the parking tax benefit may be technically difficult to implement.

About a third of all commuting energy in light duty vehicles is expended in the 21 largest metropolitan areas.

A DOT study indicates that, "The best estimate appears to be that approximately 20% of those who drive alone and receive free parking would form carpools or begin using transit for the trip to work if required to pay for parking."

The effectiveness of these policies would depend upon the availability of alternatives to single occupant vehicle (SOV) use and their attractiveness. In most locations where parking is likely to cost more than $50/month, ridesharing and transit are likely to be viable alternatives to SOV use, although even in these areas some automobile users do not have access to adequate transit service.

The various options for increasing employer provided transit benefits are less controversial and easier to implement. They include permitting tax-free transit passes at higher levels, for example, $50 a month or higher, as well as requiring employers who provide free parking to also provide free transit passes, as is currently required in Los Angeles.

These policies would reduce congestion, air pollution and energy use. The impact would grow over time, as more employers and employees became aware of the benefits.

Estimated Benefits:

Options	Decrease in SOV Use	Oil Savings
Raise Transit Benefit Cap to $50 a month	up to 2% in 5 years, 0.3% in first year	up to 50 mbd in 5 years, 10 mbd yr 1
Require Employers to Provide Free Transit Passes if they Provide Free Parking	up to 4%	up to 120 mbd

Tax parking benefits

PROS: Reduced traffic congestion.

Reduced parking spaces required.

Reduced urban emissions.

Improved transit service (benefits to the transit dependent).

Increase in Treasury revenues if parking benefit exemption is removed.

CONS: Short term increases in employer costs (transit pass requirement option).

Small reduction in Treasury revenues if transit deduction is increased.

Requiring transit passes is inconsistent with Administration opposition to employer mandates.

Increased parking fees would penalize households that must drive (no HOV opportunities).

Reduces labor market flexibility somewhat.

Action Required and by Whom: New legislation required. Proposed legislation would be developed by Treasury, DOT, and DOE.

#28

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FEDERAL ELECTRICITY SUBSIDIES

Option: Initiatives to Phase Out Federal Subsidies for Electricity

- Phase out preferential access to Federal power. Sell Federal electric power at "PURPA" prices or market prices. This change could be implemented gradually over a 10-year period through a combination of actions, including:

  -- Reform Federal Power Marketing Administration debt repayment practices and direct DOE to administratively reform PMA debt repayment wherever possible.

  -- Institute a "falling water charge" on Federal hydropower to bring prices up to market levels where power is sold below cost and sales are committed by contract.

  -- Where contracts are up for renewal or do not now exist, auction the power or sell it on the grid at prices estabished by a process comparable to that used under PURPA.

- Phase out all REA subsidies over ten years.

- Establish an interagency working group to develop specific proposals that all agencies could support. The task force would offer recommendations for Congress to consider, as well as, propose administrative changes which FERC, DOE and other agencies may undertake to eliminate the inequities associated with Federal electricity subsidies.

Type of Utility	No. in each group	Number of customers		Sales Revenue 1/			Federal capital subsidy	Access to Fed. hydro	Pays Fed. Taxes
		MM	%	$B	%	Cents /KWH			
Investor -owned	236	74	76	113	79	6.50	No	Limited	Yes
Coopera-tives	938	10	10	10	7	6.70	REA	Yes	No
Muni-cipals	1,811	12	12	15	11	5.69	No	Yes	No
Federal	10	--	--	2	2	3.47	Yes	NA	No
Other public entities	135	2	2	3	2	4.37	No	Limited	No
Totals	3,130	98	100	143	100	6.28			

Discussion: Federal policies currently provide lower electricity prices and preferential treatment to different classes of utilities and their customers. By phasing out the special treatment and subsidies certain utilities and their customers now receive from the Federal Government, all of the country's electric utilities would be put on a more equal footing. The true cost of producing Federal power would be reflected in prices and the inequities arising from some customers or regions of the country receiving preferential treatment, would be ended.

As the table indicates, most of the country's utility customers are served by investor owned utilities (IOUs). IOUs compete for funds in private capital markets, have limited access to low cost Federal hydropower and are subject to the normal Federal tax code. One fourth of the country's electricity customers, however, are served by utilities that receive some form of special treatment from the Federal Government.

REA borrowers who provide service to more than 10 percent of the electricity customers in the U.S., borrow money from the Rural Electrification Administration at subsidized rates (5% interest) and most pay no Federal income taxes.

Municipal utilities serve about 12 percent of America's electric users. Although they are no longer able to raise tax free capital they do receive preferential access to Federal hydropower and they are exempt from paying Federal income taxes.

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[1]Source for sales data is a EIA publicatoin "Annual Outlook for U.S. Electric Power 1986."

However, the deepest subsidies go to the customers of certain Federal power agencies. After IOUs, the U.S. Government is the next largest producer of electricity in the country. The Federal Government sells power from over 159 Federally built dams and, in the case of the Tennessee Valley Authority, from fossil and nuclear plants as well. The 5 Power Marketing Administrations (PMAs) of the Department of Energy wholesale about 200 billion kwh of power annually. The PMAs receive Federal appropriations, significant Federal interest subsidies from the Treasury and, in addition, they are allowed liberal debt repayment terms by DOE. The average wholesale price for PMA power is 2.2 cents per kwh and the average retail price is the lowest of all categories of U.S. utilities. Even when compared with hydropower-only utilities, whose wholesale rates average about 3.7 cents per kwh, the PMAs rates are low. PMAs pay no Federal taxes and sell their power wholesale to preferential customers including industrial and commercial users.

The Tennessee Valley Authority (TVA) provides about 32,000 MW of power to 3 million customers in a seven state region in the Southeast. Since 1959 TVA has received subsidized financing through its ability to borrow from Treasury's Federal Financing Bank. As with the PMAs, TVA pays no Federal taxes, has part of its program funded by Federal appropriations and is not subject to State PUC regulation.

Historically, these subsidies and special treatment by the Federal government were intended to achieve certain desirable social goals. Special treatment for the REA cooperatives and municipal power was originally intended to accelerate electrification of non-urbanized areas which were beyond the reach of large power companies. TVA also aided in the electrification of rural areas but TVA also was intended to demonstrate an alternative to the large electrical trusts. The PMA's predecessor agencies, have had a legitimate role in promoting regional development by providing low cost power to areas which were once relatively undeveloped. In addition, the PMA preference provisions were intended to serve customers in less urbanized areas where IOUs were unable or unwilling to go.

The Power Marketing Administrations

The DOE's policy has been to allow PMA's to sell power at a price which is below the Government's cost of providing it. To date this below-cost pricing policy has cost the Treasury over $4 billion. Over the life of the existing loans the subsidy will cost the Federal government over $15 billion (nominal).

The below cost pricing policy also has the effect of undercutting energy conservation while inducing additional demand for Federal power. This policy is antithetical to the "sound

business principles" requirement of the 1944 Flood Control Act, under which most PMA power is sold.

By law, the PMAs are required to recover all of their operating and capital costs. But PMAs have not paid back most of the taxpayers' investments and their interest rates on this debt are well below market interest rates. Historically, dam construction early in the century was done at interest rates which were above then existing Treasury long term rates. Since the 1950's the PMAs interest rates have been well below the Treasury's cost of borrowing the money at the time the projects were built. Most of this low interest debt is of relatively recent vintage.

- Between 1980 and 1988 a total of 24 major power project improvements or additions were initiated in the Bonneville Power Administration's (BPA) system at a cost of $1.14 billion. The Treasury's average cost of long term borrowing during this period was 10.58%. Under current practices Bonneville will repay this investment at an average annual interest rate of only 3.55%. BPAs interest subsidy through 1988 for these projects alone, has reached almost $365 million. BPA through 1989 has repaid only $15 million of the $1.14 billion in principal owed on these 1980's projects.

The PMA argue that thir rates are based on "embedded cost pricing", unfortunately the definition of embedded cost does not include the full Treasury cost of financing the projects.

The impacts of the various policy options differ, of course, based on which options are chosen. In general, the options would have the following advantages and disadvantages:

Pro:

- Establishes a "level playing field" and is consistent with market economics, a prerequisite for efficient resource development.

- Stimulates energy conservation, is environmentally sound and enhances DOE's credibility as a supporter of energy conservation. Requiring Treasury-cost financing for the PMAs would eliminate multibillion dollar <u>energy consumption subsidies</u> at a time when DOE is expanding <u>energy conservation subsidies</u>.

- Equitable. Eliminates programs that have served their purpose and that now provide subsidies for certain electricity customers at the expense of other customers within the region or in other regions not served by low cost Federal power.

#34

Title: Renewable Energy Production Incentive

Option: Enact a performance-based production incentive for certain renewable electric energy technologies in place of the capital-based investment tax credits.

Description: This option would provide up to a 2 cent/kWh credit against taxable income to utilities or private power producers for the production of renewable electric energy from new facilities. The tax credit would be based on the actual amount of energy produced during the first seven years of system operation. The incentive would be in effect for 10 years with the credit's value being phased down from 2 cents to zero during the last five years. The value would be adjusted for inflation as reflected in the Consumer Price Index.

In the current marketplace, renewable electric technologies are forced to compete with established power technologies which, in many cases, have the advantages of (1) a large existing industrial infrastructure, (2) a low-risk investment position based on low capital costs and the use of mature technologies, and (3) a financial and regulatory environment that discourages capital-intensive investment. Several financial incentives were considered to reduce or eliminate these impediments, including production credits, investment tax credits, accelerated depreciation schedules, and low-interest or guaranteed loans. The production incentive was identified as the preferred approach to enable renewables to overcome these impediments. The most desirable feature is that the incentive is tied directly to the desired result, namely energy production. Thus, the incentive provides support to industry but only for quality technology. Moreover, the phase-down over the last five years is expected to provide a powerful stimulus to continued technology development. Both electric utilities and private power producers are eligible for this credit. Mature renewable technologies are excluded to avoid windfalls. Eligible technologies include geothermal (except dry steam), biomass (except those using wastes for fuel), wind, solar thermal and photovoltaics.

The following illustrates how the current financial and regulatory environment tends to discourage renewable energy investments. Utilities today must generally rely more on equity financing than in the past. In this context, most renewables, which are capital-intensive with little or no fuel costs, require higher revenues to provide the same after-tax return as low capital-cost, high fuel-cost generation systems. Put simply, increased capital costs increase taxes while increased fuel costs do not, since they are "expensed" for tax purposes. For example, federal taxes paid per kwh of electricity generated from wind would be 25 to 100% higher than taxes per kwh of energy generated from a natural gas-fueled intermediate power plant. While this difference does not affect economy-wide federal tax receipts, it, together with other capital-related impediments, biases the selection of power generation technologies in favor of low capital cost options.

Net National Economic Benefit:

This option will advance in time both performance improvements and cost reductions that are projected for these technologies. This effect was modelled by using the Accelerated Case for renewable cost projections by technology, described in the *Renewable Energy Technology Evolution* document (October 5, 1990). Based on this analysis, the Net Present Benefit through the year 2030 for this option, relative to the NES Reference Case, is:

Net Present Value of Consumers' Surplus	$12.00B
Net Present Value of Incentive Costs	$7.89B
Net Present Benefit	$4.11B

net present value does not include any values associated with either an energy security premium or environmental benefits/costs.

Other Estimated Benefits -- Energy And Capacity:

This option is projected to result in earlier renewable energy capacity and production additions relative to the NES Reference Case:

	Year 2000	Year 2030
Electric Capacity Addition	19.1 GW	88 GW
Additional Annual Electric Energy Production	130 billion kWh or 1.4 quads	350 billion kWh or 3.6 quads

Note that cumulative energy production impacts can be calculated in two ways. First, those systems that result directly from the incentive through the year 2000 will produce a total of 34 quads over their system lifetimes, which were assumed to average 25 years. However, the incentive also strengthens the renewables industries and improves their competitive position relative to other energy technologies. This effect has also been modelled, and including this effect provides a cumulative estimate of 87 quads resulting from this incentive through 2030. (This latter estimate does not count any energy produced after 2030.)

Other Estimated Benefits -- Environmental:

s option is projected to provide the following environmental emissions reductions and corresponding benefits:

	Annual		
	2000	2030	Program Life
SOX Reductions, million tons	0.8	- 0.1	6.7
NOX Reductions, million tons	0.4	0.2	8.9
Carbon Reductions, million tons	27	42	1300

Pros: This option provides a stimulus for near-term renewables contributions and will result in increased market penetration rates for renewables even after the production incentive has expired. The option pushes aggressive technology development because of the phase down and because it only supports actual energy production. If systems fail to perform, or if renewable penetration is reduced for any reason, incentive costs are also reduced accordingly. Renewables make use of a domestic energy resource and provide for greater energy diversity.

Cons: The Program costs are estimated to be $1.77B for the first 5 years and $17.3B total over the life of the Program (in constant 1990 $). This is a unit cost of 0.5 cents per renewable kWh, counting lifetime outputs for only those systems resulting from the incentive through 2000; counting all energy produced through 2030 for all systems resulting from the incentive results in unit costs of 0.2 cents per renewable kWh.

ion required and by whom: DOE and Treasury draft proposed legislation.

BD 11/1/90

DRAFT

FEDERAL SUPPORT FOR INTEGRATED RESOURCE PLANNING (IRP) IN ELECTRICITY MARKETS

Option: The Department of Energy (DOE) should support IRP by:

- Financially assisting State-based IRP processes through DOE's existing IRP Program, while taking full account of competitive procurement of generation and conservation resources
- Supporting legislation to remove Federal taxation of utility efficiency rebates
- Facilitating IRP implementation through the Federal Power Marketing Administrations (PMAs)
- Encouraging FERC to foster integrated resource markets

A significant potential exists in the U.S. for increased efficiency in electricity markets by fostering competitive approaches to resource acquisition. Federal efforts to support current trends toward greater economic efficiency through IRP, including encouraging efficiency in electricity production and end-use, conservation investments, and efficient procurement of new generation capacity, can improve and accelerate these trends, thereby providing substantial benefits.

IRP is a process where supply- and demand-side resource options are evaluated together in determining how to serve the electricity needs of consumers at the lowest reasonable cost. IRP is hampered by regulatory and market imperfections that forestall its development and reduce its effectiveness. These include: (1) the lack of a well defined market in which supply and demand options can be evaluated together; (2) State regulatory procedures that discourage utility involvement in IRP; (3) need for improved methodologies and procedures to develop, implement, and measure the results of IRP; (4) lack of consumer awareness of, and involvement in, IRP; (5) Federal tax policies that discourage consumer participation in utility-sponsored IRP programs; (6) embedded cost pricing policies that reflect historical rather than marginal costs; and (7) Federally subsidized power, which accounts for about 10% of total U.S. supply.

Application of IRP to the electricity industry is essentially a matter for local entities including utilities, State commissions, consumers, developers, and other third-party suppliers. However, due to the critical importance of the electricity industry and the national benefits that result both from more efficient generation and demand-side investments (e.g., energy security, economic growth, reduced environmental impacts), the Federal Government has an important role to play to ensure that IRP is consistent with market mechanisms, promotes economic efficiency, and avoids mechanisms that contribute subsidies for particular IRP activities.

DOE could support IRP at the national and State levels through several mechanisms. For example, these include:

A. FINANCIALLY ASSIST STATE IRP PROCESSES

DOE can provide support for IRP by providing Federal assistance to States to develop and implement IRP processes, particularly by finding ways for demand and supply options to be evaluated together.

The DOE is providing assistance to the States to develop and implement IRP processes through its existing IRP Program. This program provides technical and informational assistance to the States so that IRP processes may be developed and implemented to their fullest extent.

For fiscal year (FY) 1990, DOE funding for its IRP Program totaled $1.3 million, and for FY 1991 it is $3 million. Federal assistance to the States could be continued to assist implementation of IRP and expand IRP processes to other energy markets.

Estimated Impacts: Estimates of electricity demand reductions due to increased Federal support and State implementation of IRP are 47 gigawatts (GW) in 2010 and 91 GW in 2030. The net economic benefit from these savings is estimated at $34.7 billion for the period 1990-2030. The net present value of the cost of the Federal program to support State IRP programs is $86.4 million for the same period of time.

Pros:

- Federal assistance to the States could stimulate implementation of IRP.
- Significant national benefits can be achieved with minimal Federal involvement and funding.

Cons:

- IRP processes may expand monopoly involvement from electricity supply to end-use markets.
- IRP may contribute to subsidies for some end-users at the expense of others, and to other inefficiencies if not implemented carefully.
- Some States have already adopted or are considering IRP principles with little or no Federal assistance. Some IRP benefits will occur without Federal assistance.

Action Required and by Whom: DOE would expand its IRP Program.

B. ELIMINATE TAXATION OF EFFICIENCY REBATES

At the national level, the Administration can provide support for IRP by supporting elimination of Federal taxation of utility efficiency rebates to consumers.

Utilities often provide rebates to consumers to encourage their participation in the demand-side parts of IRP programs. These rebates reduce the cost to consumers of investments in electricity conservation and efficiency. Utility rebates increase consumer participation rates in IRP and produce net benefits to society when the total cost of the investment is less than the cost of the electricity saved.

The Internal Revenue Service (IRS) has determined that utility rebates to consumers represent taxable income. Taxation of these rebates reduces their value to consumers, thereby reducing their participation in IRP programs. The result is reduced energy savings. The IRS also should clarify its position regarding the tax status of (1) discount coupons provided to consumers and redeemed by a utility, and (2) credits provided to consumers on their utility bills for conservation activities.

Taxing electric utility efficiency rebates to consumers is estimated to produce approximately $400 million in Federal tax revenue during the period 1991 through 1995. It is estimated that taxing these rebates will increase the cost of residential efficiency investments by about 20 percent and commercial and industrial investments by about 25 percent. The cost of the resulting reduction in electricity conservation is likely to outweigh the loss of revenue to the Treasury from eliminating this tax.

Legislation has been introduced in the House of Representatives, H.R. 4249, that would exclude from gross income for Federal tax purposes utility efficiency rebates for energy (natural gas and electricity) and water conservation. Passage of this legislation would result in a revenue loss to the U.S. Treasury, but would encourage energy efficiency.

Pros:
- Eliminating Federal taxation of utility efficiency rebates, (including discount coupons and billing credits) would encourage energy conservation.
- Other benefits such as reduced environmental impacts and improved energy security also would be enhanced.
- The benefits of eliminating this tax (i.e., the value of the resulting energy conservation) is likely to outweigh its cost (i.e., lost revenue to the Treasury).

Cons:
- Elimination of the tax (for electric utilities only) will result in a revenue loss to the U.S. Treasury of about $400 million over 1991-1995.

Action Required and by Whom: The Department of the Treasury could examine legislative and administrative alternatives to remove utility efficiency rebates from taxable income.

C. IMPLEMENT IRP THROUGH THE FEDERAL POWER MARKETING ADMINISTRATIONS

DOE could provide Federal support for IRP by facilitating implementation of IRP through the Federal Power Marketing Administrations (PMAs).

Federal power producers develop and operate hydroelectric and other generation facilities and market this power through the PMAs. The PMAs market Federal power primarily to local distribution utilities (municipal, cooperative, and public power district utilities), as well as to some large industrial customers and investor-owned utilities.

Federal power producers account for about 9 percent of total U.S. generation capacity and generate about 8 percent of total U.S. electricity. Annual revenue received from the sale of this generation amounts to about $2 billion. Indirectly, these agencies provide all or a part of the electricity requirements of about 24 percent of the nation's electricity consumers.

The PMAs operate IRP technical assistance programs to encourage conservation and renewable energy applications by customer utilities. For example, the Bonneville Power Administration (BPA) has offset approximately 291 MW of demand by implementing energy efficiency programs at an average cost of about 2 cents/kwh.

DOE could work with BPA on development and implementation of enhanced IRP principles. DOE also could work with the PMAs to (1) expand technical assistance efforts that further encourage efficient procurement of new generation and cost-effective conservation and renewable energy implementation efforts, (2) expand efforts to facilitate adoption of economically efficient IRP principles by customer utilities.

Prices for PMA power are based on embedded cost principles that result in prices well below market levels and encourage energy use. An alternative to encouraging energy conservation, rather than promoting IRP, could be to reform PMA pricing methodologies.

Pros:
- Implementation of IRP through the PMAs will produce significant electricity savings and contribute to environmental and energy security goals.
- PMA involvement in IRP will encourage efficient use of a valuable renewable resource, displacing--to a large extent--less environmentally benign energy sources.

Cons:
- Implementation of IRP through the PMAs would largely be outside traditional market mechanisms. Unless carefully implemented, these processes could produce uneconomic results.
- Involvement of the PMAs in IRP could add stature to these Federal agencies at a time when the Federal Government is considering limiting or ending its participation in the electricity industry.
- Modifying PMA pricing methodologies would be a more direct way to encourage conservation and efficiency investments.

Action Required and by Whom: DOE could support activities through the PMAs that would result in the development and implementation of cost-effective IRP measures.

D. ENCOURAGE FERC TO FOSTER INTEGRATED RESOURCE MARKETS

DOE could encourage the FERC to foster IRP within wholesale power markets.

The FERC could promote IRP in wholesale power markets by making a positive pronouncement that, in approving a rate for a wholesale power transaction, the Commission does not prevent a State regulatory agency from disallowing recovery of a portion of that rate when the transaction does not represent the purchasing utility's least cost option, as determined by a State IRP program.

In addition, the FERC could: (1) encourage wholesale transactions, such as wheeling of electric power for third party suppliers; and (2) consider instituting efficient pricing policies for short-term and long-term power transactions, such as spot-pricing and marginal cost-based pricing, that promote economic efficiency and lower aggregate regional supply costs throughout regional markets.

Here, the policy choice is whether regional cost minimization is an appropriate Federal goal. Clearly, such a goal is implicit in the FERC's recent actions to ease restrictions on transmission access. Integrated resource markets covering multistate regions have been developed throughout much of the nation. FERC authority could be exercised to further improve the efficiency of those markets.

Pros:

- FERC attention to efficiency in regional markets could facilitate adoption of the integrated resource market concept, lowering costs in electricity bulk power markets. Procedures would need to be developed to resolve inconsistencies among State plans to avoid harming regional economies.
- Supply- and demand-side investments would be put on a more equal footing over larger regional areas.

Cons:

- Regional cost minimization might be inconsistent with State- -level cost minimization.

Action Required any by Whom: FERC would adopt a policy promoting integrated resource markets to ensure that firm wholesale transactions are consistent with State IRP programs.

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