

Sensible Energy Policies for Our Growing Economy

Fiscal Year 2002 Recommendations
for the Administration and Congress

The Sustainable Energy Coalition
March 2001

Endorsements for the Sustainable Energy Coalition's *Sensible Energy Policies for Our Growing Economy*

Alliance to Save Energy
American Bioenergy Association
American Council for an Energy-Efficient Economy
American Green
American Public Power Association
American Solar Energy Society
Biorefiner
Bob Lawrence & Association
Cascade Associates
Clean Fuels Development Coalition
Clean Fuels Foundation
Communications Consortium Media Center
Environmental and Energy Study Institute
Fuel Cells 2000
The Hamilton Group
National Environmental Trust
National Hydropower Association
Natural Resources Defense Council
Potomac Resources, Inc.
Renewable Fuels Association
Safe Energy Communication Council
The Stella Group, Ltd.
Union of Concerned Scientists

Member organizations of the Sustainable Energy Coalition do not support every item or issue adopted by the Coalition and generally focus on their issue area within the Coalition recommendations and policy positions.

The Sustainable Energy Coalition brings together more than 30 national business, environmental, consumer, and energy policy organizations. Founded in 1992, the Coalition promotes increased federal support for energy efficiency and renewable energy technologies and reduced federal support for unsafe or polluting energy resources.

Coalition members advocate federal energy policies that will lead to a cleaner environment, safe reliable energy technologies, and a secure, prosperous future for all Americans. Avenues for Coalition activity include policy decisions on the federal budget, electric utility restructuring, pollution prevention, climate change, and tax policies.

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**The Sustainable Energy Coalition's
*Sensible Energy Policies for Our Growing Economy***

FISCAL YEAR 2002

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Partial List of Acronyms

BART	Best Available Retrofit Technology
BTU	British Thermal Unit
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy Standards
CHP	Combined Heat and Power
CSP	Concentrating Solar Power
DOE	Department of Energy
DOD	Department of Defense
DOT	Department of Transportation
EIA	Energy Information Administration
EPA	Environmental Protection Agency
FFV	Flexible Fuel Vehicle
HVAC	Heating, Ventilation and Air Conditioning
IDC	Intangible Drilling Cost
IEEE	Institute of Electrical and Electronic Engineers
IRC	Internal Revenue Code
MOX	Mixed Oxide
MMT	Million Metric Tons
NRC	Nuclear Regulatory Commission
PNGV	Partnership for New Generation Vehicles
PURPA	Public Utility Regulatory Policies Act of 1978
PV	Photovoltaics
RCRA	Resource Conservation and Recovery Act
RD&D	Research, development and demonstration
RFS	Renewable Fuels Standard
RPS	Renewable Portfolio Standard
SEER	Seasonal Energy Efficiency Ratio
TEA-21	Transportation Equity Act of the 21 st Century
TRI	Toxic Release Inventory
TWH	Tera-Watt Hours

Biomass Definition

In this document, biomass refers to:

- (A) *Closed-loop biomass*, which is any organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity.
- (B) *Open-loop biomass of the following types*:
- a. any solid, nonhazardous, cellulosic waste material, which does not contain any painted, treated, or pressurized wood or wood contaminated with plastics or metals and which is segregated from other waste materials, and which is derived from-
 - i. any of the following forest-related resources: mill residues, precommercial thinnings, slash, and brush, but not including old-growth timber or black liquor, or
 - ii. waste pallets, crates, and dunnage, and landscape or right-of-way tree trimmings, but not including municipal solid waste (garbage), post-consumer wastepaper, construction and demolition debris, or
 - iii. agriculture sources, including orchard tree crops, vineyard, grain, legumes, sugar, and other crop by-products or residues, or
 - iv. landfill methane, or
 - v. animal waste.

Sensible Energy Policies for Our Growing Economy

Executive Summary

The new Administration and the 107th Congress have a rare opportunity to take a fresh look at the sources and uses of energy in the United States. The American public is being faced with significant increases in the price of gasoline and other forms of energy, and reductions in the reliability of electric utility service. Reliance on imported oil has grown, the fuel efficiency of new motor vehicles has declined, and energy issues are receiving steady news coverage. The American public is more aware of the shortcomings in U.S. energy policy than at any time in the last 20 years, and now is the time to act.

There are many drawbacks to this country's increasing reliance on fossil fuels.

- **Economic impacts**—Increased energy use leads to higher energy bills for consumers and businesses. The United States now spends over 6 percent of its GDP on energy. Nuclear power in particular has driven up the price of electricity in many parts of the country and has financially devastated some utilities and their shareholders. In addition, increased fossil fuel use leads to a net reduction in employment in the United States because of the relatively low labor intensity of the energy supply industries compared to other sectors of the economy.
- **Environmental problems**—Pollutants caused by the burning of fossil fuels result in urban smog, acid rain, and soot, which in turn harm human health, damage crops and forests, and cause global warming. Likewise, nuclear power generates radioactive waste that is building up in temporary disposal facilities.
- **National security problems**—The United States now imports over half the oil we consume, and that figure is increasing. Rising oil imports leaves our nation vulnerable to price hikes and forces the United States to spend money, use political power, and possibly risk lives to protect oil supplies from the Persian Gulf and other unstable regions.

The lack of comprehensive, strong and stable policies that promote energy efficiency and renewable energy, and discourage use of fossil fuels and nuclear power, is a major cause of our growing dependence on these less desirable, non-renewable energy sources. The United States should adopt a comprehensive energy strategy to raise energy efficiency, increase renewable energy production and cut our dependence on fossil fuels and nuclear power. By adopting the following policies, the United States could make major strides toward addressing all of the challenges listed above over the next decade.

Renewable Energy Proposals

Production and Use of Biofuels in the U.S.

Congress and the Administration should take specific steps to triple the production and use of ethanol to 4.5 billion gallons per year by 2010. (*page 13*)

Combined Heat & Power (CHP) and Grid Reliability RD&D

The Department of Energy (DOE) should explore using CHP and Distributed Power together as a way to solve the problems of rate stability and electric grid reliability. (*page 15*)

Tech / Info Transfer

The DOE should carry out a large-scale campaign to educate consumers in making informed, voluntary decisions on energy efficiency and renewable energy technologies. (*page 15*)

Federal Renewable Portfolio Standard (RPS)

Any federal electricity-restructuring bill should include a national market-based RPS that ensures steady growth in the percentage of electricity generated from renewables. *(page 16)*

Public Benefit Trust Fund

The federal government should create a national public-benefits trust fund that would provide matching funds to states for eligible public-benefits expenditures. *(page 17)*

Net-Metering & Interconnection Standards

Congress and the Administration should introduce legislative provisions that would end market barriers for distributed or on-site generation. *(page 18)*

Energy Efficiency Proposals**Tax Credits for Energy-Efficient Residential and Commercial Buildings**

Congress and the Administration should consider a package of tax credits for builders to encourage more efficient homes and other buildings. *(page 20)*

New Appliance Efficiency Standards

The DOE should use its existing authority to upgrade appliance and equipment efficiency standards where technically and economically feasible. *(page 21)*

Energy-Efficient Product Labeling and Promotion

EPA and DOE should expand the scope and level of promotion associated with the Energy Star program. *(page 22)*

Voluntary Agreements and Incentives to Reduce Industrial Energy Use

The White House and/or DOE should establish voluntary agreements with individual companies or entire sectors of industry. *(page 23)*

Two Methods to Promote Clean, High-efficiency CHP

1. Either through changes to regulation or legislation, the permitting of CHP systems should be shifted from an input-based to an output-based approach.
2. Federal legislation should address Enhanced Utility Grid Access issues in a consistent manner across states. *(page 25)*

Energy Efficiency Division at the Energy Information Administration (EIA)

The EIA should create an energy efficiency division charged with assessing and quantifying implications of current and potential measures to reduce energy intensity. *(page 27)*

Training and Education Programs for Energy Efficiency Buildings

The Federal government should initiate a program at DOE to develop curricula and otherwise reach out to builders, equipment installers, architects and engineers. *(page 27)*

Fossil Fuel Policy Proposals**Oil Industry Subsidies**

Congress and the Administration should eliminate Gas & Oil loan guarantees and the overseas refiner credit. *(page 29)*

Controls on Toxic Air Pollution from Electric Utilities

EPA must regulate toxic metals from power plants. *(page 29)*

Regulate Electric Utility Coal Combustion Waste as a Hazardous Waste

The Administration must designate these wastes as “hazardous” under the Resource Conservation and Recovery Act (RCRA). *(page 30)*

Apply Best Available Retrofit Technology (BART) to Older Coal- and Oil-Fired Electric Utility Power Plants

The EPA’s BART rulemaking should be adopted expeditiously and incorporate core elements to ensure progress in restoring clean air to our national parks. *(page 31)*

Power Plant Pollution Standards

Congress should pass one of the several comprehensive bills introduced in the 106th Congress to dramatically reduce pollution from power plants. *(page 32)*

Transportation Policy Proposals**Higher Corporate Average Fuel Economy Standards (CAFE) for Cars and Light Trucks**

The Department of Transportation (DOT) should increase CAFE standards for cars and light trucks by 5 percent per year with further improvements beyond 2010. *(page 34)*

Funding for the Clean Bus Program in the Transportation Equity Act of the 21st Century

Congress should either stop earmarking the \$200 million annual funds that are to be used to implement the Clean Bus Program or put it beyond reach of the Appropriations Committee. *(page 35)*

Promotion of High Efficiency and Cleaner Vehicles through Improved Labeling and Promotion

The federal government should initiate a number of voluntary programs to increase awareness of and interest in buying fuel-efficient and cleaner vehicles. *(page 36)*

Federal Electricity Restructuring Proposals**Prohibition of Utility Bailouts for Nuclear Investments**

Congress and the Administration should prohibit any federal or state authority from requiring consumers to pay the above-market costs of owning or operating any nuclear power plant in a deregulated electricity market. *(page 38)*

Transmission System Reform

Congress and the Administration should pass legislation that would transfer control of the nation’s transmission systems to nonprofit, independent, regional transmission organizations. *(page 39)*

Consumer Aggregation

Congress and the Administration should prevent states from creating barriers to any form of consumer aggregation, such as Community Choice. *(page 40)*

Disclosure & Consumer Information

Congress and the Administration should pass legislation that requires all electricity suppliers to uniformly label their products. *(page 40)*

Nuclear Policy and Regulation Proposals

Safe Operation of Nuclear Reactors

Congress and the Administration should ensure the safe operation of nuclear reactors by stopping the Nuclear Regulatory Commission's (NRC) attempt to deregulate nuclear safety standards under the guise of "risk-informed" regulation. *(page 42)*

Relicensing of Nuclear Reactors

Congress and the Administration should make sure the NRC follows its own safety regulations and does not extend the operating lifetime of nuclear reactor that fail to comply with safety regulations. *(page 43)*

Protecting the Public's Right to "Formal" Hearings

Congress and the Administration should prevent the NRC from eliminating formal hearings when dealing with issues arising from the safety issues. *(page 43)*

Yucca Mountain Nuclear Waste Dump

Congress and the Administration should oppose efforts to create a nuclear waste repository inside Yucca Mountain, Nevada. *(page 43)*

Mixed Oxide Subsidy Program

Congress and the Administration should terminate the proposed subsidy of fueling commercial nuclear power reactors with weapons-grade plutonium made into mixed oxide (MOX) fuel. *(page 44)*

Nuclear Waste Fund Fee

Congress and the Administration should index for inflation the Nuclear Waste Fund Fee. *(page 44)*

Tax Policy Proposals

Renewable Electric Tax Package

Congress and the Administration should adopt the following as a permanent part of the tax code; Production Tax Credit, Co-production Credit, Indian Land Tax Credit, and Credit Assignment/Tradeability. *(page 46)*

Renewable Incentives for Publicly Owned, Non-Profit Electric Utilities

Congress should consider specific principles as it develops legislation promoting national energy or as air quality measures. *(page 48)*

Tax Credits for Purchasers of Highly Fuel-Efficient Vehicles

Congress and the Administration should extend the current tax credit for electric and fuel cell vehicles through 2008, but fix the credit at a flat \$4,000 per vehicle, and offer tax credits tied to fuel-efficiency and emissions levels for hybrid vehicles. *(page 49)*

Expand the Gas Guzzler Tax to Include Light Trucks and Provide Rebates to Purchasers of Efficient Vehicles

Congress and the Administration should close gas guzzler tax loophole either by having the current tax apply to all new passenger vehicles and manufacturers, or giving consumers tax credits for vehicles that are significantly more efficient than the average fuel economy of all new vehicles. *(page 50)*

Tax Credits to Purchasers or Manufacturers of Highly Fuel-Efficient Appliances, Heating and Air Conditioning Equipment

Congress and the Administration should give either manufacturers or purchasers of highly efficient building equipment tax credits, with a focus on innovative “leapfrog” technologies. (page 51)

Adjust Depreciation Schedule to Reflect Economic Life of Combined Heat and Power Systems

CHP/district energy systems of at least 65 percent efficiency should have a depreciation schedule of 7 years, given the expected economic life of such systems. (page 53)

Mine Reclamation

Congress and the Administration should repeal the special rules that allow costs for mine reclamation to be deducted before they are actually paid. (page 53)

Stopping Tax-Free Transfers of Nuclear Decommissioning Funds

Congress and the Administration should stop the tax-free transfers of funds for nuclear reactor decommissioning. (page 54)

Capital Gains and Royalties From Coal Production

Congress and the Administration should repeal the capital gains treatment for income generated from royalty receipts from coal production. (page 54)

Tax Credits for Enhanced Oil Recovery

Congress and the Administration should repeal the 15 percent credit for enhanced oil recovery and eliminate the expensing of tertiary injectants. (page 54)

Tax Credits for Intangible Drilling Costs

Congress and the Administration should repeal the tax provisions permitting oil and gas producers to immediately deduct "intangible" drilling costs and amend the provision so the costs are deducted over time. (page 55)

Tax Credits for Non-Conventional Oil

Congress and the Administration should repeal the "nonconventional" production credit for oil produced from shale or tar sands, synthetic fuels produced from coal, and gas produced from geopressurized brine, Devonian shale and tight formations. (page 55)

Depletion Allowances

Congress and the Administration should eliminate the Percentage Depletion Allowance for uranium and fossil fuels. (page 56)

Cross-Cutting Proposals**Buydown Program for Distributed Generation and CHP**

Congress and the Administration should institute a buydown program to help technologies over the “valley of death” between R&D and commercialization. (page 57)

Comprehensive, Comparative, Full-Energy/Fuel-Cycle Analysis of Energy Risks and Benefits

Congress and the administration should fund a comprehensive, comparative, full-energy/fuel-cycle analysis of fossil and nuclear energy, energy efficiency, solar, wind, biomass power, geothermal and hydro. (page 58)

Hybrid-Diesel Displacement DD&R Program

Congress and the Administration should introduce a program to displace stationary diesel engines. (*page 59*)

Ecological Tax Reform

Congress and the Administration should enact ecological tax reform legislation that gradually would reduce existing taxes that burden work and investment, while increasing taxes on fossil fuels and eliminating tax breaks that subsidize the production or use of fossil fuels. (*page 60*)

Energy Efficiency Program Budget Recommendations -- \$984.7 million**Building Sector Budget Request -- \$397.0 million**

- Competitive Research and Development -- \$4.0 million (*page 62*)
- Residential Building Integration -- \$18.0 million (*page 62*)
- Commercial Buildings Integration -- \$10.0 million (*page 63*)
- Building Equipment, Materials and Tools -- \$80.0 million (*page 63*)
- State Energy Program -- \$44.0 million (*page 63*)
- Weatherization Assistance Program -- \$177.0 million (*page 64*)
- Community Partnerships -- \$33.0 million (*page 64*)
- Energy Star -- \$8.0 million (*page 64*)
- Management and Planning -- \$15.0 million (*page 64*)
- Other Programs -- \$8.0 million (*page 64*)

Industrial Sector Budget Request -- \$215.0 million

- Industries of the Future (Specific) -- \$93.0 million (*page 65*)
- Industries of the Future (Crosscutting) -- \$103.0 million (*page 65*)
- Management and Planning -- \$11.0 million (*page 65*)
- Other Programs -- \$8.0 million (*page 65*)

Transportation Sector Budget Request -- \$372.7 million

- Vehicle Technologies R&D -- \$179.0 million (*page 65*)
- Fuels Utilization R&D -- \$25.0 million (*page 66*)
- Materials Technologies -- \$47.0 million (*page 66*)
- Technology Deployment -- \$20.0 million (*page 66*)
- Other Programs -- \$6.0 million (*page 66*)
- Management and Planning -- \$10.0 million (*page 66*)
- Federal Energy Management Program -- \$32.7 million (*page 66*)
- Policy and Management Budget Recommendation -- \$53.0 million (*page 67*)

Renewable Energy Program Budget Recommendations -- \$719.5 million

Wind Energy -- \$55.0 million (*page 69*)

Concentrating Solar Power -- \$25.0 million (*page 69*)

Photovoltaics -- \$100.0 million (*page 70*)

Solar Buildings -- \$12.0 million (*page 71*)

Distributed Generation -- \$12.0 million (*page 71*)

Fuel Cells -- \$57.5 million (*page 72*)

Biofuels Energy Systems—Transportation -- \$60.0 million (*page 73*)

Biomass Power -- \$50.0 million (*page 73*)

Federal Energy Management Program -- \$5.0 million (*page 74*)

Green Power Insurance -- \$5.0 million (*page 74*)

Hydrogen -- \$36.0 million (*page 75*)

Geothermal -- \$60.0 million (*page 76*)

Resource Assessment and Restructuring Analysis -- \$14.0 million (*page 77*)

Hydropower -- \$11.0 million (*page 77*)

Consumer Education -- \$25.0 million (*page 78*)

Renewable Energy Production Incentive Program -- \$20.0 million (*page 79*)

International -- \$20.0 million (*page 79*)

Transmission and Distribution -- \$14.0 million (*page 80*)

Energy Storage -- \$17.0 million (*page 80*)

High Temperature Superconductivity -- \$47.0 million (*page 81*)

Other Federal Agencies -- \$74.0 million (*page 82*)

- Environmental Protection Agency -- \$10.0 million
 - Energy Star -- \$5.0 million
 - Office of Research and Development -- \$5.0 million
- Department of Defense -- \$10.0 million
 - Defense Advanced Research Program -- \$10.0 million
- Department of Housing and Urban Development -- \$4.0 million
 - Office of Energy -- \$2.0 million
 - Partnership of Advanced Technology in Housing -- \$2.0 million
- US Trade and Development Agency -- \$5.0 million
- Small Business Administration -- \$10.0 million
- Department of Commerce -- \$10.0 million
 - National Institute of Science and Technology -- \$10.0 million
- USAID Renewable Energy Programs -- \$25.0 million

Sensible Energy Policies for Our Growing Economy

The new Administration and the 107th Congress have a rare opportunity to take a fresh look at the sources and uses of energy in the United States. Coincident with our national election, 2000 presented the American public with significant increases in the price of gasoline and other forms of energy, and reductions in the reliability of electric utility service. Reliance on imported oil has grown, the fuel efficiency of new motor vehicles has declined, and energy issues are receiving steady news coverage. The American public is more aware of the shortcomings in U.S. energy policy than at any time in the last 20 years.

Before we present our energy policy recommendations for the new Administration and Congress, it is helpful to review energy production and consumption trends in the United States during the past 30 years. Figure 1 (*page 84*) shows that total U.S. primary energy use increased from about 68 quadrillion Btus (quads) in 1970 to nearly 97 quads as of 1999, an average annual growth rate of 1.2 percent. But U.S. population increased 1.0 percent per year and economic output (GDP) increased 3.2 percent per year on average during the same period. Thus, national energy intensity (primary energy use per unit of GDP) fell 42 percent between 1970 and 1999 (see Figure 2, *page 84*).

This steep decline in national energy intensity provided enormous benefits. If the United States still used as much energy per unit of GDP as in 1970, we would have consumed about 168 quadrillion Btus (quads) in 1999 rather than the nearly 97 quads actually consumed. If even half this unrealized growth in energy use had occurred, consumers and businesses would have paid at least \$3 **trillion** more for energy and the atmosphere would have received at least 8 **billion** more metric tons of carbon over the past 30 years. Gasoline would cost more (perhaps much more) than it now does, and our trade deficit would be significantly higher.

Trends with respect to renewable energy production and use also were positive but not as dramatic as those for energy intensity. Energy provided by renewable sources (hydropower, bioenergy sources, solar, geothermal, and windpower) increased from 4 quads in 1970 to 7.4 quads in 1999 (see Figure 1, *page 84*). Renewable energy contributed about 8 percent of total U.S. energy supply in 1999, meaning it helped to reduce U.S. dependence on fossil fuels and nuclear power to some degree.

The bad news is that due in part to inadequate policy support, improvements in energy efficiency and increased renewable energy production were not as great as they should have been. We are more dependent on costly, dirty fossil fuels and nuclear power today than we were 10, 20, or 30 years ago. U.S. consumption of fossil fuels (coal, oil, and natural gas) rose from 63.5 quads in 1970 to 81.6 quads in 1999. Use of nuclear power increased from 0.2 quads in 1970 to 7.7 quads in 1999. During the 1990s, U.S. fossil fuel and nuclear power use combined increased 1.5 percent per year on average. This growing dependence on fossil fuels and nuclear power has created a number of problems including:

Economic problems—increased energy use leads to higher energy bills for consumers and businesses. The United States now spends over 6 percent of its GDP on energy, money that is not available for expanding health care, improving low-income housing, cleaning up environmental hazards, or other expenditures that improve our national well being. Nuclear power in particular has driven up the price of electricity in many parts of the country and has financially devastated some utilities and their shareholders. Increased fossil fuel use puts upward pressure on energy prices and leads to a net reduction in employment in the United States because of the relatively low labor intensity of the energy supply industries compared to other sectors of the economy.

Environmental problems—burning of fossil fuels causes about 98 percent of CO₂ emissions, 95 percent of NO_x emissions, 90 percent of SO₂ emissions, 50 percent of Volatile Organic Compound (VOC) emissions, and a significant fraction of fine particulate emissions in the United States. These pollutants result in urban smog, acid rain, and soot, which in turn harm human health, damage crops and forests, and cause global warming. Likewise, nuclear power generates radioactive waste that is building up in temporary disposal facilities.

National security problems—the United States now imports over half the oil we consume and imports are rising rapidly. Meanwhile, world oil supplies are becoming increasingly concentrated in a few Middle Eastern countries. Rising oil imports leaves our nation vulnerable to price hikes and forces the United States to spend money, use political power, and possibly risk lives to protect oil supplies from the Persian Gulf and other unstable regions.

The lack of comprehensive, strong and stable policies that promote energy efficiency and renewable energy, and discourage use of fossil fuels and nuclear power, is a major cause of our growing dependence on these less desirable, non-renewable energy sources. Consider the following policy trends:

- The budget for federal research, development, demonstration and deployment programs for energy efficiency and renewable energy measures fell from over \$3 billion in 1980 to about \$700 million in 1990. The budget subsequently rose slowly to about \$1.2 billion in 2000 in constant dollars (see Figure 3, page 85). On the other hand, fossil fuels and nuclear power received tens of billions of dollars of federal budget support and tax incentives annually during the past 30 years.
- The original Corporate Average Fuel Economy (CAFE) standards on cars were adopted in 1975 and have never been updated, and the standards on light trucks are outdated as well. As a result, the fuel economy of new vehicles peaked in 1987 and declined over the past 13 years.
- The Public Utility Regulatory Policies Act of 1978 (PURPA) boosted implementation of renewable energy and efficient cogeneration systems for electricity production for about 15 years. But PURPA became outdated and less effective as the utility industry evolved during the 1990s. PURPA has not been updated or replaced with more appropriate policies for stimulating cogeneration and renewable energy deployment in today's power markets.
- Nuclear power, oil, and coal received steady and substantial tax incentives over the past 30 years. Energy efficiency and renewable energy measures, on the other hand, received sporadic and modest tax incentives.

The fact that energy efficiency and renewable energy use did not increase faster in recent years is not the result of a lack of technical or economic potential. Studies indicate that available energy efficiency measures can cut energy use by 20 percent or more in nearly all applications with energy cost savings that are two to three times the investment cost on a lifecycle basis. The cost of windpower, geothermal energy, bioenergy, and solar power has declined by a factor of ten or more over the past 20 years and is now competitive with conventional energy sources in many applications, considering the full costs associated with energy production. As a result, production of renewable energy is growing very rapidly in order to serve booming international markets as well as growing domestic markets.

Improving energy efficiency and expanding use of renewable energy resources in the United States is as important today as it has ever been, given the multiple challenges of:

- growing oil imports and the vulnerability of our economy to oil price spikes,
- mounting evidence of global warming and the need to cut greenhouse gas emissions,
- persistent urban air pollution and nonattainment of air quality standards and
- growing concerns about power outages and electric-system reliability.

The United States should adopt a comprehensive energy strategy to raise energy efficiency, increase renewable energy production and cut our dependence on fossil fuels and nuclear power. By adopting the policies recommended in this agenda, the United States could make major strides toward addressing all of the challenges listed above over the next decade. In particular, we believe that this policy agenda could have the following effects by 2010 compared to business-as-usual policies and trends¹:

- reduce U.S. energy use and energy intensity a further 15 percent,
- increase the renewable energy contribution to at least 11 quads per year,
- cut U.S. oil imports by 25 percent,
- save consumers and businesses tens of billions of dollars per year,
- save the federal government billions of dollars per year through lower energy bills and reduced tax subsidies,
- increase net employment in the United States by hundreds of thousands of jobs,
- lower carbon dioxide emissions enough to enable the United States to meet its Kyoto Protocol target primarily through domestic actions, and
- dramatically cut other pollutant emissions, improve urban air quality, and improve human health.

Our policy agenda would have positive impacts in the short, intermediate and long term, providing benefits that continue to grow after 2010. Moreover, the policies could place the United States on a path to a sustainable energy future--a future with high efficiency and high reliance on domestic renewable sources, moderate energy service costs and negligible risk of price shocks, and minimal air pollution, waste generation and emissions of the "greenhouse gases" that are causing global climate change.

¹ These estimates are based on a study and analysis of many of the key energy efficiency and renewable energy policies proposed here. See H. Geller, S. Bernow, and W. Dougherty, "Meeting America's Kyoto Protocol Target: Policies and Impacts," Washington, DC: American Council for an Energy-Efficient Economy, Dec. 1999.

Renewable Energy Proposals

Renewable energy technologies are an increasingly important element of any successful national strategy for cleaning up the environment. The exploration, generation and consumption of energy from fossil fuels are major sources of greenhouse gas emissions and other harmful pollutants. Although improved energy efficiency and stricter environmental standards help to combat the problems, these strategies alone will not solve the challenge of sustainability. The ultimate environmental solution lies with a combination of policies, practices and technologies, including the development and application of renewable energy alternatives such as wind, solar, biomass, hydrogen, geothermal and fuel cells.

The transition to a sustainable society requires long lead times, the cooperation of both the public and private sectors and the involvement of governments at all levels. Although not yet a major economic force, renewable energy technologies are more worthy of federal support than more-polluting and problematic energy resources like coal, petroleum and nuclear. Working together, industry and government can expedite the pace at which sustainable energy technologies are brought to market and become available to regulators, policymakers and consumers as weapons against the growing environmental and economic threat of pollution and climate change.

Climate change and the harmful effects of pollution are well-established facts. To respond to their challenge, within decades and not generations, requires a partnership between government and industry. The Sustainable Energy Coalition believes the following recommendations constitute a balanced and reasonable plan of investment; a plan that relies as much upon the contribution of industry as it does government; a plan that costs significantly less to implement than the costs to the nation's taxpayers to remediate the environmental damage of continued reliance upon fossil and nuclear resources.

Production and Use of Biofuels in the U.S.

Background

In the 10 years since Saddam Hussein's invasion of Kuwait, U.S. energy demand for transportation has risen, refining capacity has declined, our dependence on imported oil has grown and climate change continues to threaten our environment. Today the U.S. imports nearly 800,000 barrels of crude oil a day from Iraq, double what it imported 10 years ago, and imports nearly twice as much oil as at the height of the energy crisis in 1973. The American Petroleum Institute noted recently that "We import some 55 percent of our crude oil, meaning that we are at the mercy of foreign oil producing companies." The need for clean burning, renewable, domestically produced fuels has never been greater.

Ethanol, currently mostly derived from the starch contained in corn, is a high-octane fuel that delivers improved automobile performance while reducing air pollution. Ethanol and other biofuels provide value-added markets to bolster agriculture and rural America, and can be produced domestically, reducing our imports of foreign oil and creating jobs. Despite these benefits, the U.S. uses only about 100,000 barrels per day of domestically produced ethanol.

Executive Order 13134 established a Bioenergy Initiative that calls for tripling the use of biofuels and other bioproducts by 2010. At present, the U.S. fuel ethanol industry is producing at record levels, having set several new monthly production records in 2000, and numerous new plants have been built or planned. But to ensure the necessary financing and to spur production, certain demand for biofuels is required.

Proposal

As a means to triple the production and use of ethanol to 4.5 billion gallons per year by 2010, Congress and the Administration should:

Require an increase in the use of biofuels by enacting laws such as:

- a Renewable Fuels Standard (RFS) similar to “The Federal Reformulated Fuels Act of 2000,” contained in S.2962 and passed by the full Senate Environment & Public Works Committee;
- the transition of all federal, non-combat diesel engines to biodiesel and/or oxygenated diesel by 2005; and
- the immediate phase out of lead in aviation gasoline to be replaced by ethanol and ethanol blends to be completed by 2005.

Develop a nationwide ethanol education program that promotes consumer benefits, such as enhanced engine performance, job creation, improved air quality, reduction in greenhouse gases, and reduced oil imports.

Encourage government agencies to make biofuels use a main concern by;

- making government research a priority to reduce the cost of ethanol production;
- accelerating efforts between the Departments of Energy (DOE), Agriculture, Interior, Commerce and the Environmental Protection Agency (EPA) to rapidly commercialize biofuels concepts and technologies;
- encouraging the DOE to make biofuels a priority in the Partnership for Next Generation Vehicles; and
- encouraging the Department of Agriculture to aggressively explore the synergy between high levels of efficiency and combinations of renewable energy technologies.

Oppose California’s request for a waiver from the oxygenate requirement.

Encourage continued development and growth of flexible fuel vehicles (FFVs) by;

- aggressively promoting the establishment of E-85 refueling stations to better meet the needs of the growing number of FFVs; and
- adjusting the engine in the FFV to accommodate 113-octane ethanol instead of 87-octane gasoline, which will increase mileage by 20 percent.

Impacts

These proposals will increase the competitiveness and market penetration of and consumer confidence in renewable fuels such as ethanol. Tripling the production and use of biofuels will have a measurable impact on fossil fuel displacement and reduced oil imports, while at the same time significantly reducing emissions of carbon monoxide, air toxics and hydrocarbons, and greenhouse gases.

An economic analysis, done for the Governors' Ethanol Coalition, looked at increasing the demand for ethanol to 3.2 billion gallons (compared with 4.5 billion recommended here) and estimated the cost of expanding the ethanol industry at \$1.9 billion. Direct expenditures resulting from the expansion of the corn ethanol industry alone would add \$11.7 billion to final demand in the economy (real GDP will be \$11.7 billion higher). The increased economic activity resulting from the expansion of the ethanol industry will put an additional \$2.5 billion of income in the pockets of American households, and create more than 47,800 new jobs across the entire economy. These figures are expected to be commensurately greater with the increase to the 4.5 billion gallons recommended here.

Combined Heat & Power (CHP) and Grid Reliability RD&D

Background

One of the most pressing national problems is rate stability and electric grid (power) reliability.

Cross-cutting approaches are increasingly recognized by the DOE as effective ways to encourage the development of emerging renewable energy technologies. Over the last few years the DOE has established CHP and Distributed Power programs that use cross-cutting research, development, and deployment (RD&D) for renewable energy development. While it is too early to tell whether these programs will be successful, they have created many new RD&D and commercial relationships that will further technology development and utilization.

Proposal

The DOE should explore using CHP and Distributed Power together as a way to solve the problems of rate stability and electric grid reliability. The proposal builds on the cross cutting RD&D attempts of the recent past by establishing an RD&D program that utilizes CHP and Distributed Power technologies (some of which are one-in-the-same) in commercial and industrial and utility applications to achieve power reliability in a replicable, standardized and cost-effective manner.

Biopower, concentrated solar power and fuel cells, all of which give off heat while producing electricity, may be accelerated into use for their dual benefits and have far-reaching impact in stabilizing rates and reliability. Utilization of greater analysis, cost-shared demonstrations, and evolutions of technologies to better address these benefits and attributes should be encouraged.

Impacts

Expectations are that such a program will

- increase technology sales by 20 percent over four years and
- establish some regional demonstrations that will lessen power outages and stabilize rates.

Tech / Info Transfer

Background

One of the biggest barriers to the greater use of efficiency and renewable energy products is a lack of consumer awareness and, since 1986, information programs within the Energy Efficiency/Renewable Energy Section of the DOE have been substantially downgraded. While there are websites, publications and some laboratory-outreach programs, they are small and poorly funded. This limited outreach is in stark contrast to the high-visibility and heavily funded programs of EPA, such as Energy Star, which has employed print, radio and television public service ads.

Proposal

The DOE should carry out a large-scale campaign to educate consumers in making informed, voluntary decisions on energy efficiency and renewable energy technologies. This means using television, radio and print ads to present consumers with cost-effective options for capping energy costs, providing back-up power and saving money on energy expenses.

Targeted education programs for schools (energy is the third highest cost for education), businesses (such as power reliability to insure against lost business) and residential consumers (such as energy savings and rate stability) are critical elements of any technology transfer program. They are real solutions for real problems.

The purpose of the campaign is to bridge the gap between federally supported RD&D and a successful implementation of new technologies. Many renewable-energy companies are reluctant to invest much time or money in new technologies because they then must try to sell higher-cost technologies to uninformed consumers. Greater purchases of these energy efficiency and renewable energy technologies will lower costs through economies-of-scale and deployment, but before this can be achieved, it is essential to build public awareness and receptivity.

Impacts

The basic goal of the program is to increase sales of clean energy technologies by an additional 30 percent per year, which will double the anticipated growth rate of these technologies, services and products over the next five years.

Federal Renewable Portfolio Standard (RPS)

Background

Renewable energy can provide a significant portion of electric supply in the United States, creating many public benefits, including environmental improvement, increased diversity and national security, and economic development. These benefits, however, are not reflected in electricity prices, placing renewable energy at a disadvantage when competing with fossil fuels and nuclear power.

The RPS, already initiated at the state level, can increase the use of renewables significantly. Many states that have undergone restructuring have recognized the importance of supporting the increased use of renewable energy. In addition to environmental benefits, renewable energy improves the reliability of regional electric supply by increasing diversity of power sources, and creates new economic development and export opportunities.

Numerous restructuring bills have been introduced in Congress, so national electrical industry restructuring may occur in the next several years. That possibility provides an opportunity to ensure that the environmental performance and reliability of the industry is optimized along with its economic performance. A national standard will create an efficient national market for renewables that will reduce the costs of renewable energy development, increase equity among states, and minimize demands on the inter-state transmission system.

Proposal

Any federal electricity-restructuring bill should include a national market-based RPS that ensures steady growth in the percentage of electricity generated from wind, biomass, geothermal and solar energy in the United States. An RPS requires that a minimum percentage of each electricity generator or supplier's resource portfolio come from renewable energy. It creates a minimum commitment to a sustainable energy future that builds on and enhances the investment already made, and ensures that the new electricity markets value the unique environmental and economic benefits provided by clean renewable electricity. These goals can be accomplished using a market-based approach that provides the greatest amount of clean power for the lowest price and an ongoing incentive to drive down costs. By using tradable "renewable energy credits" to achieve compliance at the lowest cost, the RPS would promote inter-regional sales without increasing the burden on the inter-state transmission system. It would function much like the Clean Air Act credit-trading system, which permits lower-cost, market-based compliance with air pollution regulations. The renewable requirement should increase gradually over the next 20 years, reaching at least 20 percent of electricity generated by these renewable resources.

Impacts

Lawmakers from both houses and both parties introduced RPS proposals in the 106th Congress, ranging from 3 percent in 2005 to 20 percent in 2020. The Clinton Administration's legislative proposal supported a 7.5 percent requirement by 2010. Twelve states have enacted minimum renewable-electricity standards.

Numerous studies have been conducted recently that model the effects of RPS implementation. Studies completed by the Energy Information Administration (EIA), the Department of Energy (DOE) and the Union of Concerned Scientists (UCS) all conclude that the price of electricity in a restructured market with an RPS would decline over time, and the RPS would restrain natural gas prices due to less demand.

Although the use of natural gas would increase considerably in all scenarios, the added competition from renewables in the RPS cases would keep gas prices from increasing as quickly. In the case of a 7.5 percent RPS by 2010, the EIA found that natural gas savings offset roughly half the cost of the RPS from 2006-2014, and actually produced net savings in the years after 2016.

There are many benefits to an RPS. One of the most apparent is the impact on the environment. Under an aggressive RPS of 20 percent by 2020, carbon dioxide emissions from electricity generation would remain at the year 2000 level through 2020, while reducing the emissions that cause acid rain, smog, and respiratory problems. In addition, the electricity system would be more reliable because of increased diversity of fuel sources. The electricity market also would be more insulated from price shocks, such as the natural gas price increases that are hitting consumers this year.

Public Benefit Trust Fund

Background

Electric utilities historically have funded programs to encourage more efficient energy use, assist low-income families with home weatherization and energy bill payment, promote the development of renewable energy sources, and undertake research and development. However, increasing competition and restructuring have led to a decline in these "public benefit expenditures" over the past five years. Total utility spending on all demand-side management programs (i.e., energy efficiency and peak-load reduction) fell by nearly 50 percent from a high of \$3.0 billion in 1993 to \$1.6 billion in 1998 (1998 dollars).

Proposal

The federal government should create a national public-benefits trust fund that would provide matching funds to states for eligible public-benefits expenditures to ensure that energy efficiency programs and other public benefits activities continue in the aftermath of restructuring. This program would provide matching funds to states for eligible public benefits expenditures, similar in concept to the public benefits fund included in the Clinton Administration's federal utility restructuring proposal. The fund would encourage states and utilities to continue or expand energy-efficiency programs and other public benefits activities. The recommended size of the trust fund is based on a non-bypassable wires charge of two-tenths of a cent per kWh, which is approximately 3 percent of the average price of electricity now paid by electricity consumers in the United States. Fifteen states already have enacted state public-benefit funds to support energy efficiency and other programs.

Once a public-benefits fund is adopted, utilities, state agencies or some other state-designated "fund manager" would carry out the energy efficiency programs and other activities. In a more

competitive, “restructured” utility market, these programs typically focus on assisting consumers unlikely to receive energy -efficiency services by the private sector (i.e., low-income households or small businesses), expanding the private energy services industry, and encouraging market transformation. The programs lead to efficiency improvements in areas where there are still enormous cost-effective energy efficiency potentials, such as appliances, lighting, HVAC systems and motor systems.

Impacts

American Council for an Energy-Efficient Economy (ACEEE) performed an analysis² that showed an incremental end-use electricity savings of

- 131 TWh (3.6 percent) in 2005,
- 343 TWh (8.8 percent) in 2010, and
- 756 TWh (17.4 percent) in 2020.

Most of these savings are likely to be in the residential and commercial sectors since they are the main focus of state/utility efficiency programs using public benefits funds. The total investment in efficiency measures stimulated by the federal public benefits fund is estimated to be \$106 billion, while energy-bill savings are expected to reach \$238 billion (net present value through 2020), meaning net benefits of \$132 billion. Furthermore, ACEEE estimates that this policy will reduce carbon emissions by 103 MMT by 2010 and 207 MMT by 2020, when implemented together with other energy-efficiency and renewable-energy initiatives.

Net-Metering & Interconnection Standards

Background

In a truly deregulated market, electric customers at the end-use side must have the right to generate their own power in an unfettered, safe and reliable manner. For this to happen, there must be specific market rights that encompass the following three basic principles:

- a national technical interconnection standard, just as mandated in telephone deregulation, to insure a safe and easy inter-connection;
- the authorization of conventional and existing liability policies in contracts to keep them short, simple and unlikely to deter the market; and
- credit at least once per year for excess power generation for renewable energy systems under 100 kw (biomass, geothermal, solar and wind) and for distributed technologies for fuel cells (as long as it does not deter use of renewables).

More than half of the state governments have passed similar principles over the past two years.

Proposal

To address the above three principles, Congress and the Administration should include legislative provisions that would:

- allow owners of small power systems to safely and economically connect their systems to the grid, with standards established by the Federal Energy Regulatory Commission;
- allow owners of grid-tied, renewable energy sources of 500 kW or less to reduce their electricity bills by the amount of electricity produced (and be paid the spot market price for any net electricity generated); and

² This study is based only on the result of a federal public benefits trust fund, not any programs already underway. It assumes that: states gradually expand their eligible programs, using 90percent of the maximum funds available by 2005 and thereafter; energy efficiency programs represent 59 percent of all public benefits expenditures; energy savings typically cost \$0.03/kWh on a levelized basis; and 20 percent of all participants are “free riders” (i.e., consumers who would invest in efficiency measures in the absence of state/utility programs).

- prohibit local restrictive covenants against solar fixtures on buildings, as federal law has required on building-mounted satellite systems because they are restrictions on interstate commerce.

This system will end market barriers for distributed or on-site generation. Percentage caps on interconnection may be allowed for the first five years to insure grid stability but should be waived after that time. The basic principle should be, "no prohibitions on distributed technologies."

Energy Efficiency Proposals

Improvements in U.S. energy efficiency during the past decade were not as great as they should have been.

- The average fuel economy of new passenger vehicles (cars, SUVs, and other light trucks) declined from a high of about 26 miles per gallon (MPG) in 1988 to less than 24 MPG today;
- only a small fraction of households have adopted state-of-the-art efficiency measures such as condensing gas furnaces, low-emissivity windows, resource-efficient clothes washers, or air-duct sealing;
- only about 10 percent of motors used in industry are high efficiency and the application of innovative energy efficiency technologies is far below the cost-effective potential;
- the average efficiency of electricity generation in the U.S. has remained virtually constant for the past 40 years and
- buildings in the service sector consume far more energy for heating, cooling and lighting than is necessary.

Public policies for promoting energy efficiency are just as outdated and limited as our technologies.

- Fuel-efficiency standards for new vehicles are 25 years old;
- the DOE is badly behind schedule in issuing new appliance efficiency standards;
- R&D budgets for energy efficiency and renewable energy are less than half of their levels 20 years ago; and
- the federal government is providing relatively little in the way of financial incentives to stimulate greater adoption of energy-efficiency measures.

These energy-efficiency proposals pertain to the buildings and industrial sectors (transportation proposals are presented separately). They cover a wide range of policy mechanisms: better information and training; financial incentives; voluntary agreements; and mandatory, cost-effective regulations. They include policies that the federal government would implement on its own (e.g., stronger appliance standards); policies the federal government would implement together with states and utilities (e.g., a national public-benefits trust fund); and policies the federal government would implement jointly with the private sector (e.g., voluntary agreements for industrial energy-intensity reduction. There is no one “silver bullet” for making our nation more energy-efficient. Instead, a broad range of policies is needed to transform energy use throughout the economy.

Tax Credits for Energy-Efficient Residential and Commercial Buildings

Background

The energy needed to operate U.S. buildings accounts for roughly one-third of total energy use and more than 35 percent of air pollution in this country. Few Americans realize that operating their home creates approximately double the pollution annually as does operating their cars. In addition, each summer the use of air conditioning creates severe shortages in electricity supply in many areas of the country. More energy-efficient buildings can positively impact all of these problems.

The use of existing technologies can improve the energy efficiency of buildings by at least 50 percent over current standard building practices. But these technologies have slightly higher up-front costs to builders, and it is owners, not the builders, who reap the benefits of savings in energy expenses. Therefore, builders have little incentive to construct more efficient buildings. Programs to give builders incentive to utilize these technologies will result in both energy savings

and an increase in awareness of energy-efficient technologies, bringing them into mainstream building practices.

Proposal

Congress and the Administration should consider a package of tax credits to encourage more efficient homes and other buildings, including:

Tax Credits for Builders of Efficient Homes

There are a variety of existing proposals to provide tax credits for builders of energy-efficient homes. The most common type of proposal has focused on providing a two-tiered credit to homes that reach a level of efficiency 30 and 50 percent above the International Energy Conservation Code of 1998. The size of the credit is between \$750 and \$2000 for a 30 percent home, and \$2000 and higher for a 50 percent home.

Tax Credits for Builders of Efficient Buildings

Commercial buildings account for approximately 40 percent of overall building energy use in the U.S. and the tendency for commercial buildings to carry heavy air conditioning loads at peak power consumption times has exacerbated reliability problems. Efficient design of new commercial buildings can reduce energy use by more than 50 percent over traditional designs. The primary proposal to provide tax incentives for commercial buildings is included in S. 2718 (106th Congress), introduced by Sen. Bob Smith. This would provide a deduction of up to \$2.25 per square foot of commercial space that is heated and cooled by highly efficient equipment.

Impacts

The public benefits of more efficient buildings include lower criteria air pollution, economic benefit to owners, increased electricity reliability, and reduced emissions of greenhouse gases. The long-term increase in utilization of energy-efficient technologies will result in sustained benefits through time.

New Appliance Efficiency Standards

Background

Appliance efficiency standards are one of the U.S.'s most effective strategies for saving energy. The standards pioneered by a few states in the 1970s and subsequently adopted at the national level in 1987 already have cut national electricity use by 3 percent, equivalent to the power supplied by 30 large power plants. By 2010, those standards will have cut U.S. greenhouse gas emissions by about 65 MMT of carbon or its equivalent. The standards will be a key part of our national effort to limit global warming. In addition, consumers and businesses will save \$160 billion net from efficiency standards that already have been adopted. Additional energy, carbon emissions and dollar savings are achievable through upgraded or new standards on a wide range of products.

Proposal

The DOE should use its existing authority to upgrade appliance and equipment efficiency standards where technically and economically feasible. This should include high priority rulemakings over the next five years on central air conditioners and heat pumps as well as transformers, refrigerators and freezers, furnaces and boilers, commercial packaged air conditioning equipment, commercial boilers and dishwashers. The standards should be set at the highest levels justified under the current law, and should be issued without further delay.

Minimum efficiency standards should be set, either via rulemaking or new legislation, on a variety of products for which the DOE is not currently considering standards. The DOE has

never used its authority to extend standards to additional types of products where standards would be technically and economically feasible and would save a significant amount of energy. In particular, the standards should be extended to TVs, commercial clothes washers, light fixtures, commercial refrigeration equipment, and furnace fan motors.

Impacts

National appliance efficiency standards on products such as refrigerators and room air conditioners have been upgraded previously. Appliance and equipment efficiency standards were extended to additional products including motors, various types of lamps, and heating and air conditioning equipment used in commercial buildings as part of the Energy Policy Act of 1992. Efficiency standards on TVs and standby power consumption for some products have been enacted in Japan.

Adopting stringent new appliance standards could lead to widespread adoption of key energy efficiency technologies, such as

- central air conditioners and heat pumps with a minimum seasonal energy efficiency ratio (SEER) rating of 13.0,
- condensing-type gas furnaces, and
- low-loss transformers.

Benefits from additional standards on

- light fixtures could lead to replacement of inefficient and dangerous halogen torchiere lamps with fluorescent-based torchieres,
- furnace fan motors could make variable speed motors the norm, and
- water heaters could be based on top-rated conventional products (i.e., they do not require advanced technologies such as condensing gas water heaters or heat pump electric water heaters).

According to ACEEE, by 2010 new appliance efficiency standards could save approximately

- 105 Tera-watt/hours (TWh) of electricity,
- 0.12 quads of natural gas (end-use only), and
- 27 MMT of carbon equivalent in CO₂ emissions.

By 2020, the savings could grow to approximately

- 230 TWh of electricity,
- 0.25 quads of natural gas, and
- 55 MMT of carbon equivalent in CO₂ emissions.

For the products already covered where DOE has started rulemakings, the cumulative investment in efficiency measures needed to realize the savings is \$18 billion while the energy bill savings would reach about \$47 billion through 2020, meaning net savings of nearly \$30 billion.

Energy-Efficient Product Labeling and Promotion

Background

The Energy Star labeling program, implemented by EPA and the DOE, covers a wide range of residential and commercial products including appliances, heating and cooling systems, office equipment, and lighting. Power management can reduce the energy use of office equipment by up to 50 percent. Approximately 80 percent of new personal computers, 95 percent of monitors, 99 percent of printers, and 65 percent of copiers now have the Energy Star label. Consumers bought more than 100 million Energy Star products in 1999 and, as a result, are saving more than

29 billion kWh, or about \$2.3 billion, annually. Recognition of the Energy Star label, the national symbol for energy efficiency, is rapidly growing.

Proposal

EPA and DOE should expand the scope and level of promotion associated with the Energy Star program. The program should be extended to additional types of electronic products (cable boxes, telephone equipment, battery chargers, etc.), commercial refrigeration equipment (vending machines, freezer cases, etc.), microwave ovens, motors, and other mass-produced products not currently covered. Also, the program should set standards for and cover high-quality solar water heating and building-integrated photovoltaic (PV) systems. For commercial buildings, the program should cover sectors other than schools and offices, including retail buildings, healthcare, and lodging. Currently, the Energy Star program recognizes office buildings that are within the top 25 percent of energy performance of all buildings of a particular type. And more funding is needed to expand promotion and training activities in the Energy Star Small Business and New Homes programs, as well as to increase consumer awareness and market penetration of energy-efficient Energy Star products of all types.

Impacts

The EPA and DOE have managed to expand the Energy Star program despite the failure of Congress to provide adequate funding levels in recent years. Energy Star programs have begun for:

- TVs, VCRs, and audio systems with low standby power consumption, and similar efforts are planned for other types of electronic products;
- highly efficient new homes, with over 1,500 builders participating and more than 17,000 new homes built that use 35 percent less energy for heating and cooling on average compared to the current “good practice” homes; and
- commercial buildings.

Funding for EPA’s portion of the Energy Star program (a large majority of the program is operated by EPA) will increase in FY2001 in order to support these and other new activities.

According to ACEEE estimates, extending Energy Star labeling to additional types of electronic products, microwave ovens, and commercial refrigeration equipment could save:

- about 13 billion kWh/yr by 2010, and
- 19 billion kWh/yr by 2020.

Expansion of the Energy Star homes program and commercial building benchmarking program new appliance efficiency standards could save just as much if not more energy, as could additional publicity and promotion of all elements of the program. Assuming these combined efforts save 40 TWh/yr by 2010 and 60 TWh/yr by 2020, the avoided CO₂ emissions would reach about 9 MMT of carbon equivalent in 2010 and 12 MMT in 2020. Consumers would realize substantial cost savings—on the order of \$2-3 billion by 2010 and \$3-4 billion by 2020—since there usually is little or no incremental first cost for upgrading products and buildings to the Energy Star levels. [Note: These savings are in addition to those from ongoing Energy Star activities.]

Voluntary Agreements and Incentives to Reduce Industrial Energy Use

Background

Industry accounts for about 39 percent of total U.S. energy consumption, two-thirds of which is from manufacturing, which is in turn dominated by six energy-intensive sectors (petroleum refining, chemicals, primary metals, paper and pulp, food and kindred products, and stone, clay,

and glass products). There is substantial potential for cost-effective efficiency improvement in both energy-intensive and non-energy-intensive industries. For example, an in-depth analysis of 49 specific energy efficiency technologies for the iron and steel industry found a total cost-effective energy savings potential of 18 percent.

Proposal

In order to stimulate widespread energy-efficiency improvements in the industrial sector, the White House and/or DOE should establish voluntary agreements with individual companies or entire sectors in which they would pledge to reduce their overall energy and carbon emissions intensities (energy and carbon per unit of output) by at least 15-20 percent over 10 years. The government would encourage participation and support implementation by:

1. providing technical and financial assistance if requested by participating companies,
2. developing stronger regulatory or tax measures if a large portion of industries participate and achieve their goals, and
3. expanding federal RD&D programs.

If enough companies or industries are not entering into voluntary agreements, the government might need to take more drastic action, such as carbon-emissions standards or energy-efficiency standards on major types of industrial processes (e.g., steelmaking, aluminum production, paper and pulp making, and petroleum refining), and/or carbon-emissions taxes.

Impacts

A number of major companies are demonstrating that it is possible to reduce energy and carbon intensity significantly, while enhancing productivity and profitability. For example,

- Johnson and Johnson set a goal in 1995 of reducing energy costs 10 percent by 2000 through adoption of “best practices” in its 96 U.S. facilities, and as of April 1999, they were 95 percent of the way to this goal.
- British Petroleum announced in 1998 that it would voluntarily reduce its carbon emissions to 10 percent below 1990 levels by 2010, representing an almost 40 percent reduction from projected emissions levels in 2010 given “business-as-usual” emissions growth.
- DuPont announced it would reduce its greenhouse gas (GHG) emissions worldwide by 65 percent relative to 1990 levels while holding total energy use flat and increasing renewable energy resources to 10 percent of total energy inputs by 2010. DuPont is on track for achieving earlier commitments to reduce energy intensity 15 percent and total GHG emissions 50 percent by 2000, relative to 1990 levels.

Voluntary agreements between government and industry similar to the ones proposed here have resulted in substantial energy intensity reductions in some European nations such as Germany, the Netherlands, and Denmark. In the Netherlands, for example, the energy intensity of a wide range of industries improved 17 percent on average during 1989-98, with industries on track to achieve the targeted improvement of 20 percent by 2000.

Based on a recent detailed analysis of voluntary agreements by a team from national laboratories, we estimate that widespread adoption of voluntary agreements and supporting activities could reduce primary energy use in the industrial sector by about 4.2 quads (11 percent) in 2010 and 6.9 quads (16 percent) in 2020. About 40 percent of this savings comes from electricity (measured on a primary energy basis), with smaller portions coming from petroleum products, natural gas and coal. There would be corresponding reductions in CO₂ emissions of 71 MMT by 2010 and 95 MMT by 2020.

In order to realize these energy savings, a cumulative investment in efficiency measures of about \$36 billion through 2020 is needed. But the energy bill savings would equal around \$98 billion, leading to net economic benefits of about \$60 billion (all values are in discounted 1996 dollars).

Two Methods to Promote Clean, High-efficiency CHP

Background

CHP technology is a system that produces multiple usable energy forms (e.g., electricity and steam) from a single fuel input. These combined systems can achieve much greater efficiency than separate systems because they recover heat that would be wasted in separate power production, and displace the fuel that otherwise would be used to produce heat in a separate boiler. Because of greater efficiency achieved, the total emissions from CHP systems are usually lower than the combined emissions required to produce the same output from separate systems.

1. Environmental Permitting Flexibility

Most stationary air-quality permitting regulations are based on either the emissions per unit of fuel burned or the concentration of a pollutant in the stack. This “tail-pipe” approach makes no adjustment in allowable emissions rates for efficiency. Thus, a CHP system receives no credit for net total emissions reductions achieved when compared to separate systems meeting the same end-use.

Proposal

Either through changes to regulation or legislation, the permitting of CHP systems should be shifted from an input-based to an output-based approach. Output-based levels equivalent to current input-based levels for separate heat and power should be used for these systems. EPA should undertake a study of utility emissions displaced by onsite generation and set reasonable displaced emission “credit” levels. Since these regulations will be implemented at the state level, the government should fund the EPA to educate state environmental officials about this change, and assist them in implementing these regulatory changes.

Precedents

Output-based standards clearly are within the scope of the Clean Air Act (CAA). In fact, they are applied to all mobile sources (e.g., grams per mile traveled for passenger cars), and for stationary reciprocating engines (grams per horsepower-hour). The revised New Source Performance Standards (NSPS) and the NO_x State Implementation Plan (SIP) guidance both include provisions for moving to output-based emissions. In fact, EPA issued specific guidance on implementing output-based allocations in a SIP guidance document issued in May of 2000.

2. Enhanced Utility Grid Access

CHP and other distributed generation technologies have encountered hurdles to interconnecting with the electric utility system, which has led to a hostile environment for CHP in many utility service territories.

These hurdles include:

- a lack of standard technical specifications, which resulted in each utility developing its own specification, some of which made unreasonable requirements, such as expensive equipment or project studies; and
- discriminatory pricing and contractual practices by some utilities, such as:
 - “exit fees” intended to recover a utility’s stranded assets resulting from the customer’s installation of on-site generation. In some cases these require the customer to bear the full cost of any investment in generation, transmission and

distribution that the utility has made whether it can be shown to be required to serve that customer.

- terms and conditions of service, which includes rates charged for supplemental power, standby power and capacity, and rates at which the utility will buy back excess on-site generation.

Significant progress has been made in standardizing technical specifications. DOE has supported the fast-track development of a distributed power interconnect standard by the Institute of Electrical and Electronic Engineers (IEEE). This standard should be finalized in the spring of 2001, but is only the first step; state regulators then must adopt it. The discriminatory pricing issues are more varied and less amenable to straightforward solutions.

Proposal

Federal legislation should address these issues in a consistent manner across states. The legislation should require that CHP facilities be interconnected with the local distribution facilities if the CHP owners comply with the IEEE standards and pay the directly related costs. The costs should be

- determined by the appropriate State regulatory authority,
- just and reasonable, and not unduly discriminatory, and
- comparable to the costs charged by such local distribution utility for interconnection by any other similarly situated generating facility to the distribution facilities.

In addition, the CHP facility should have a right to back-up power sold at rates, terms, and conditions that are determined by the appropriate State regulatory authority and are reasonable and not unduly discriminatory or preferential; and states should be mandated to exempt CHP facilities from exit fees that are not directly related to service of the customer (e.g., service lines and transformers).

Precedents

The adoption of national voluntary consensus standards related to interstate commerce is a well-accepted precedent. In addition, the Public Utility Regulatory Policies Act of 1978 (PURPA) mandated that qualifying facilities must be granted non-discriminatory access to the local distribution utility for purchase of standby and supplemental power, and for the purchase of excess power by the utility at reasonable rates. Eleven states have exempted CHP facilities from all or most of these exit fees based on the greater public benefit that would result from the encouragement of CHP.

Impacts

It is difficult to assess the impact of these measures in isolation. Currently, CHP systems face hurdles in both environmental permitting and utility interconnection. While the removal of one barrier is likely to allow some projects to move forward, removal of both barriers is required to allow this efficient technology to compete fairly in the marketplace. With both barriers removed, it has been projected that 50 gigawatts (GW) of additional CHP capacity could be brought to market by 2010. This new CHP capacity would result in cumulative savings of over 1.5 Quads, and emissions reduction of 42.6 MMT of carbon equivalent, 0.81 MMT of SO₂, and 0.37 MMT of NO_x.³

³ Howard Geller, et. al. 1998. *Approaching the Kyoto Targets: Five Key Strategies for the United States*. Washington, DC: American Council for an Energy-Efficient Economy.

Energy Efficiency Division at the Energy Information Administration (EIA)

Background

Energy issues are becoming an increasing problem in the U.S. We face a world of significantly higher energy prices than predicted only a year ago; the reliability of the electricity supply in the short term has come into question in California and other areas; and emissions of gases causing global climate change are increasing. Energy efficiency is a fundamental solution to each of these concerns, and a continuing economic driver of prosperity in the nation.

According to the EIA, investment in energy efficiency measures saved the U.S. 26.7 quadrillion Btus of energy in 1999. Energy displaced or recycled back into the market by energy efficiency ranks second only to oil as a contributor to energy supply in this country. Despite this huge impact on our economy, there is no division at EIA charged with analyzing the economic, environmental and supply contributions of energy efficiency measures and technologies. Efficiency is not even listed as a subset of energy information on EIA's website.

Energy efficiency is under-quantified as a force in the economy. Because few large-scale attempts have been made to assess its contribution, we are forced to rely on snapshots and limited data sets to project its effect. Though EIA collects voluntary reporting data, many of its methods have not kept pace with restructuring of the electricity industry and other market shifts of the past few years. We need updated, statistically accurate information with which to make the best-informed energy decisions.

Proposal

The EIA should create an energy efficiency division charged with assessing and quantifying the economic, environmental and energy-supply implications of current and potential measures to reduce energy intensity in the U.S. A more rigorous and comprehensive examination of energy efficiency is an absolutely necessary tool for a national energy and environmental strategy.

Training and Education Programs for Energy Efficient Buildings

Background

Over the past several years, the Federal government and the private sector have developed numerous energy efficient and renewable energy technologies for application in America's homes, businesses and industrial facilities. But these technologies tend to be underused when first introduced to the market because government and private efforts have not focused on optimizing overall effectiveness, efficiency, economics and comfort in America's buildings by integrating these systems. It is clear that the vast majority of efficiency gains for the near term will come from deployment of existing technologies and their intelligent integration.

Proposal

The Federal government should initiate a program at DOE, with the involvement of Housing and Urban Development (HUD), the Department of Commerce and the EPA, to develop curricula and otherwise reach out to builders, equipment installers, architects and engineers. This program should include sufficient funding to educate homebuilders, commercial builders, the architectural and engineering community, and installers of dealer distributed equipment (such as HVAC and water heaters). The focus should be on developing curricula for engineering schools and for advanced credits for engineers, developing design tools, demonstration of efficient technology integration, and web-based educational programs targeting various audiences. Content should include extensive information about the various high efficiency options available as well as how to integrate these systems.

The Federal government should assign a central organization to take the leadership role in deployment with a private sector advisory group as a partner and participant. This group then can help coordinate all efforts across the government to educate professionals involved with the building industry about energy efficient and renewable energy technologies and their integration.

Fossil Fuel Proposals

Fossil fuels currently account for 85 percent of the United State's fuel consumption. This fossil fuel reliance has significant disadvantages including; significant damage to the environment, fossil fuels are the main source of the heat-trapping gases that cause global warming; and a reliance on other countries for U.S. fuel supply, the U.S. imports more than half its petroleum, a figure that continues to increase and represents the single largest component of the trade debt.

Numerous current policies in the U.S. encourage this continued dependence. The oil industry receives significant subsidies, and pollution standards for utilities are not as strict as necessary. The U.S. needs to enact policies that will move the reliance from fossil fuels onto forms of renewable energies. To do this, the government first must eliminate the policies that are designed to make it easier for the fossil fuel industry to exist.

To this end, the government must eliminate the tax breaks that subsidize the fossil fuel industry and more adequately regulate emissions and waste from fossil fuel utility plants. The proposals below will help to end the unfair advantage the fossil fuel industry has received over renewable sources of energy.

Oil Industry Subsidies

U.S. taxpayers subsidize the oil industry in several ways. The following are two such subsidies that should be eliminated:

Gas & Oil Loan Guarantees

The government established a program in 1999 that provides guaranteed loans of up to \$10 million to oil and gas producers that meet broad eligibility criteria. The total amount that can be loaned is capped at \$500 million. Although the loans are financed through private banking and investment institutions, taxpayers guarantee them, making taxpayers liable for up to \$500 million should the companies default. That number jumps to \$600 million if the administrative costs associated with the program are included. *Congress and the Administration should eliminate Gas & Oil loan guarantees.*

Overseas Refiner Credit

U.S. taxpayers subsidizes the oil industry by over \$400 million per year by paying their overseas refinery taxes, which increases refinery capacity overseas rather than within our own borders.

Loss of U.S. refinery capacity is a critical national security issue for two reasons:

1. If the U.S. taps into its strategic petroleum reserves, there may not be sufficient refinery capacity to utilize the stored resource.
2. Currently the U.S. imports more than half of its petroleum, which represents the single largest component of trade debt. It is unwise to encourage greater dependence on overseas resources.

If the U.S. petroleum industry wants to move refineries closer to the source of energy, they should do so without taxpayer subsidy. *These subsidies should be phased out as oil prices start moving down so as to have minimal impact on energy consumers.*

Controls on Toxic Air Pollution from Electric Utilities

Background

According to the EPA's Toxic Release Inventory (TRI), electric utilities released over one billion pounds of toxic pollution in 1998, more than any other industry in the U.S. except for metal mining, which releases most of its toxics to land. Electric utilities emit more toxic air pollution

than the chemical, paper, plastics and refining industries combined. The vast majority of this pollution is a result of coal- and oil-fired power plants, which together released nearly 9 million pounds of toxic metals and metal compounds to the air in 1998, including many known or suspected carcinogens and neurotoxins. But unlike many other industrial facilities, such as incinerators, steel mills and refineries, power plants have no required controls for toxic metals.

When Congress amended the Clean Air Act in 1990, it adopted special provisions for regulation of toxic emissions from electric utility sources and ordered the EPA to prepare a utility air toxics report, and to make a determination on whether to regulate utilities for their toxic emissions. When the EPA finally released the study in February 1998, it asserted that it did not have enough information to make a positive regulatory determination. In December 2000, EPA concluded that mercury emissions from power plants should be regulated. EPA committed to proposing an electric utility mercury rule by 2003 and adopting a rule by 2004.

Proposal

EPA must regulate toxic metals from power plants. Utility boilers are still the largest source of mercury emissions in the U.S. and have been found to increase mercury exposure in sensitive populations above levels considered safe. And, in July 2000, a National Academy of Sciences assessment on the human health effects of mercury found that utility boilers are a significant source of mercury in the environment, and that exposure may cause neurological problems in 60,000 children born in the U.S. each year.

The EPA must

- level the regulatory playing field and evaluate control strategies for utility boilers as it has done for numerous other mercury sources, and
- strictly regulate electric utility toxic air emissions so that, at a minimum, power plants meet the same standards other industries meet for mercury and other toxic air pollution.

Regulate Electric Utility Coal Combustion Waste as a Hazardous Waste

Background

Combustion wastes are the solid and liquid waste left over from burning coal and oil to make electricity, including ash, sludge and boiler slag. Each year more than 100 million tons of these wastes are produced at nearly 600 coal- and oil-fired power plants. Seventy-six million tons are disposed of primarily at the power plant site in unlined and unmonitored wastewater lagoons, landfills and mines.

Incredibly, disposal of these toxic solid and liquid wastes has been exempt from EPA rule by Congress for the past 20 years. This means that they are subject to no federal rule whatsoever and only operate under state rules that frequently are far less protective than rules for household trash. These highly toxic wastes contain concentrated levels of contaminants like arsenic, mercury, chromium and cadmium that can damage the nervous systems and other organs, especially in children. Analyses performed for EPA show that some of these pollutants eventually migrate and contaminate nearby groundwater.

Despite the overwhelming evidence of danger posed by coal-combustion waste, in April 2000 the EPA decided against regulating these wastes as toxic hazardous waste. Instead, the EPA said it would issue federal standards that urge states to require liners and regular monitoring of water sources near such sites and that if states and the industry did not take steps to ensure these wastes are disposed of safely, the EPA would revisit the issue. However, states have shown time and again that they are unwilling to impose even minimal protective standards. Only a handful of states have adequately protective programs.

Proposal

The Administration must designate these wastes as “hazardous” under the Resource Conservation and Recovery Act (RCRA). Coal and oil power plant combustion wastes require federal regulatory oversight because of the toxicity of their components and the demonstrated and documented danger they pose to public health and the environment. State rules are inadequate to control or mitigate these risks and dangers. The effect of a federal designation of these wastes as hazardous would be significantly tighter controls on disposal. It is time for the EPA to recognize power plant combustion waste disposal facilities for what they are: huge, unregulated toxic dumps. It is time for power plants to face the full cost of operating under all environmental performance standards, including solid waste disposal.

Apply Best Available Retrofit Technology to Older Coal- and Oil-Fired Electric Utility Power Plants**Background**

Electric power plants, which release millions of tons of air pollution annually, are the principal source of the pervasive haze that shrouds our national parks and wilderness areas. The Clean Air Act calls for more stringent emission controls on power plants that were “grandfathered” out of air pollution control requirements when initially constructed. More than 20 years ago Congress recognized that cost-effective control measures are available to cut the harmful air pollutants from these sources, and provided for the implementation of the best available retrofit technology (“BART”). However, although EPA has drafted regulations to implement this long-standing Clean Air Act requirement, those regulations have yet to be proposed and adopted.

Proposal

It is imperative that EPA’s BART rulemaking be adopted expeditiously and that it incorporate the following core elements to ensure progress in restoring clean air to our national parks:

- A comprehensive solution to this regional air pollution problem. The BART rulemaking should ensure that all the “grandfathered” power plants over broad geographic regions do their fair share in cleaning up this problem.
- Require that “grandfathered” power plants install the best pollution controls available. The highest level of emissions reductions achieved under the Clean Air Act’s acid rain control program and other recent retrofits should serve as the stringency floor for BART determinations.
- Owners claiming that controls should not be imposed because of an imminent plant retirement must be required to:
 - (1) enter into a binding, federally-enforceable permit obligation to retire the affected unit swiftly and permanently; and
 - (2) achieve “best available” interim controls prior to shutdown.
- Updated BART guidelines that reflect advances in pollution control technologies and consider utilization of cleaner fuels as an option to meet the BART.
- Trading programs only if they deliver visibility improvements superior to those achieved through imposition of BART. The EPA’s rulemaking should ensure that alternative measures to BART are well-designed and do not occasion any delay in emission reductions.

Impacts of the Above Three Proposals

There is no cost to the U.S. Treasury for regulating air and waste pollution from electric utility power plants. Industry will bear the costs of controls, and any program proposed by EPA will be accompanied by a thorough cost-benefit analysis that will be open to public comment.

While no cost-benefit analysis for regulating these pollutants has been completed yet, an EPA study completed in 2000 showed that the benefits of Clean Air Act regulations from 1970 to 1990 have outweighed costs by a large margin. The study showed that the direct benefits include

- reduced incidence of a number of adverse human health effects,
- improvements in visibility, and
- avoided damage to agricultural crops.

The estimated economic value of these benefits ranges from \$5.6 to \$49.4 trillion, in 1990 dollars, with a mean, or central tendency estimate, of \$22.2 trillion, while the direct costs of implementing the Clean Air Act over the same period, including annual compliance expenditures in the private sector and program implementation costs in the public sector, totaled \$523 billion in 1990 dollars. Given EPA's findings, it is likely that the benefits of reducing air and waste pollution from power plants, such as, such as less damage to health and the environmental, far outweigh the costs of implementation.

Power Plant Pollution Standards

Background

In the high-tech new economy, the U.S. electric industry is stubbornly clinging to technologies of the past. To an alarming extent, it relies on several hundred older, coal-burning power plants, built between 1930 and the late 1970s, that have inadequate or no pollution controls. These plants emit more than ten times the pollution emitted by modern fossil plants, including

- two-thirds of the sulfur dioxide (SO₂) pollution that causes formation of deadly fine particles,
- nearly 40 percent of the nation's carbon dioxide (CO₂) emissions, the leading contributor to global warming,
- more than one-third of the toxic mercury that has rendered the fish in thousands of American rivers unsafe to consume, and
- one-quarter of the nitrogen oxide (NO_x) pollution that causes formation of smog, which sends more than 150,000 people to emergency rooms each summer and causes more than 6 million asthma attacks annually.

This situation persists, in part, because of loopholes in current pollution laws that apply to power plants. When Congress wrote the Clean Air Act it was assumed that new plants soon would replace the older plants and, industry argued, it would be wasteful to invest in emission controls for plants that soon would be defunct. Therefore, Congress applied pollution limits to the new plants only. As a result, there are no limits on emissions for carbon dioxide and mercury. To protect public health and the environment, we must modernize the electric power plant fleet.

Proposal

Congress should pass one of the several comprehensive bills introduced in the 106th Congress to dramatically reduce pollution from power plants. This will dramatically improve our air quality, save lives, and reduce harmful environmental impacts. The proposal gaining the most widespread support was the Waxman-Boehlert Clean Smokestacks Act (H.R. 2900), with 119 cosponsors.

The key features are:

1. Mandatory, enforceable nationwide caps on the four most harmful power plant pollutants: SO₂, NO_x, CO₂ and mercury.
2. A requirement that older plants meet the same emission standards as modern plants for NO_x and SO₂ by their 30th year of operation.
3. A trading system for two of the three pollutants (NO_x, SO₂ and CO₂). The Administrator of the EPA would adopt a market-based program for implementing the caps, as long as local communities are protected from adverse public health impacts that could result from a trading program.

Impacts

Regulatory certainty benefits the industry and reduces compliance costs. Under existing law, the electric industry faces a future of multiple and hard-to-predict regulatory obligations, including rules on regional haze, air toxics and particulate matter. It is difficult for utilities to make sound investment decisions without knowing what their future regulatory obligations will be. For this reason, a number of the biggest utility companies, including American Electric Power and Cinergy, have called for a comprehensive program addressing all of the key power plant pollutants. The heads of four utilities testified to the need for certainty at a Senate Environment and Public Works Committee hearing in 2000. While the industry has not endorsed any specific levels of reductions or timelines, it has endorsed the concept of a comprehensive bill.

The current Clean Air Act uses a cap-and-trade system to reduce acid rain (Title IV). The NO_x and SO₂ caps in this policy would build upon this with the Acid Rain program. There are similar rulemakings pending in Massachusetts, New York and Connecticut.

For other proposals related to Fossil Fuels, please see:

- Capital Gains and Royalties from Coal Production, page 54.
- Tax Credits for Enhanced Oil Recovery, page 54.
- Tax Credits for Intangible Drilling Costs, page 55.
- Tax Credits for Non-Conventional Oil, page 55.
- Depletion Allowances, page 56.

Transportation Proposals

Since the first energy crisis of 1974, a clear intent of the U.S. Government has been reducing and then eliminating the nation's dependence on imported oil. In addition, as concerns have grown over the environment, the Government has hoped to reduce air pollution. More recently, concerns have been mounting about the level of greenhouse gases being emitted from automobiles, trucks, engine-powered equipment and airplanes. The Sustainable Energy Coalition's transportation proposals address these issues by encouraging

- higher fuel economy for cars and light trucks and
- the use of Department of Transportation (DOT) funding for sustainable technologies.

With these proposals, the Coalition aims to accelerate the transition from a transportation sector dependent on fossil fuels to one increasingly reliant on renewable fuels. Implementing these programs would result in energy savings, avoided carbon emissions, net economic benefits of billions of dollars and the consolidation of national efforts supporting clean alternatives. These recommendations will have a very positive impact on America's national and energy security; reduce air and toxics pollution and greenhouse gases; stimulate the economy with increased industrial and agricultural activity, and job creation; and regain leadership for the United States in providing the world's best vehicles and engine-driven equipment.

Higher CAFE Standards for Cars and Light Trucks

Background

The average fuel economy of new cars and light trucks has declined from a high of 25.9 miles per gallon (mpg) in 1988 to 23.8 mpg in 1999. This decrease is due to

- increasing vehicle size and power,
- the rising market share of light trucks, and
- the lack of tougher Corporate Average Fuel Economy (CAFE) standards.

The original CAFE standards for cars were adopted in 1975 and reached their maximum level in 1985. The standard for light trucks has just increased 0.2 mpg since 1987. For the past five years, Congress has prevented the DOT from carrying out a rulemaking to consider raising CAFE standards.

Proposal

The DOT should increase CAFE standards for cars and light trucks by 5 percent per year with further improvements beyond 2010. If the standards for cars and light trucks are kept separate, by 2010 they would reach

- 45 mpg for cars by 2010 and 65 mpg by 2020, and
- 34 mpg for light trucks by 2010 and 48 mpg by 2020.

Or, if the standards for cars and light trucks were combined into one value for all new passenger vehicles, the standards would reach

- 39 mpg by 2010 and 55 mpg by 2020 for all new cars and light trucks combined.

This level of fuel economy improvement is technically feasible and cost effective for consumers. Studies by ACEEE and the Union of Concerned Scientists (UCS) estimate that the 2010 fuel efficiency target can be met with an average incremental vehicle cost of \$830 and the 2020 target at an average incremental cost of \$1,755 (retail cost expressed in 1996 dollars). In addition, Ford has indicated that it will achieve an improvement of 5 percent annual fuel economy in its SUVs over the next five years. Tougher CAFE standards can be met through technological improvements, both with refinements to conventional vehicle designs in the near term, and with advanced vehicle technologies in the medium term.

Impacts

The CAFE standards enacted in 1975 largely were responsible for the near doubling in the average fuel economy of cars and more than 50 percent increase in light truck fuel economy from 1975 to 1987. The standards were met largely through cost-effective technologies such as weight reduction and engine-efficiency improvements, and without negative side effects. On the contrary, cars became both safer and less polluting as they became more fuel efficient, and the traffic fatality rate declined by about 50 percent between 1975 and 1997.

The DOT has the authority to raise the standards via a rulemaking; however Congress has prohibited it from doing so despite overwhelming public support for raising these standards.

The CAFE standards proposed here could result in about 4 quads of energy savings by 2010 and 8 quads by 2020, relative to modest improvements in new vehicle fuel efficiency in the absence of the policies. These savings are equivalent to about 1.9 million barrels of petroleum per day by 2010 and 3.8 million barrels per day by 2020. The avoided carbon emissions would reach about 82 MMT of carbon equivalent by 2010 and 164 MMT by 2020.

In order to realize these energy and carbon savings, a cumulative investment of about \$115 billion in vehicle-efficiency measures is needed through 2020. But the energy bill savings over the same time period would reach about \$500 billion, leading to net economic benefits of about \$385 billion (all values in discounted 1996 dollars).

Funding for the Clean Bus Program in the Transportation Equity Act of the 21st Century

Background

Diesel vehicles, which dominate our public transportation systems, are egregious emitters of particulate matter and ozone precursors, greenhouse gases, and toxins such as benzene, arsenic, dioxins, and formaldehyde. The State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials published a report in 2000 that determined 125,000 Americans may contract cancer as a result of diesel pollution. Transit buses are prime candidates for clean fuels and advanced technology deployment because they are mostly government-owned and centrally-fueled.

National, state and local air quality agencies are increasing their efforts to reduce health impacts from heavy-duty diesel vehicles, and transit buses in particular.

- The EPA has proposed rules to tighten regulations for diesel fuel and heavy-duty vehicle emissions.
- Rep. Jerrold Nadler and former Rep. Brian Bilbray both introduced legislation to ban federal spending on diesel transit buses.
- California's South Coast Air Quality Management District and The California Air Resources Board both have passed regulations requiring the move toward alternative-fuel vehicles.
- Both the New York and Washington Metropolitan Transit Authorities are planning on adding natural gas or hybrid electric buses to their fleets.
- Daimler-Chrysler has expressed their intent to increase their development and deployment of fuel-cell and hybrid technologies in transit buses.

With the increasing attention on diesel emissions and transit buses, now is the time to consolidate national efforts that support clean alternatives. As this transition continues to solidify, transit fleets will become the largest vehicle fleets to move away from dependence on oil, which will create greater opportunities for all other classes of vehicles to convert. This momentum needs to be supported and accelerated by the federal government. Regulations, legislation, and research

and development are underway across the country, but there is no integration of these efforts or national source of dedicated funding for deployment.

Clear support for federal funding of clean fuels was confirmed by the 1998 passage of the TEA-21's \$1.2 billion Clean Fuel Formula Grant Program (the Clean Bus Program). Unfortunately, this program has not been implemented because Congress has directed most of the funds to diesel buses. Minor changes are needed to ensure funding goes to clean alternatives and not diesel buses.

Proposals

Congress should stop earmarking the \$200 million annual funds that are to be used to implement the Clean Bus Program. However, the short history of the past three fiscal years illustrates that this may not be a viable political option. Over the past two years, significant but unsuccessful efforts have been made by dozens of Members of Congress to stop this earmarking by the Appropriations Committee.

As an alternative, the authorizing Committees could make minor adjustments to the Clean Bus Program to put it beyond the reach of the Appropriations Committee. It was conceived as a unique combination of a formula program and a discretionary funding program but, recently, the Transportation Appropriations Committee has earmarked more and more of the discretionary funds. The authorizing committees could redesign the program to be formula funds only, thereby putting it beyond the reach of the appropriations earmarks. In addition, the legislation should ensure that no funds go to diesel-only internal combustion engines, including so-called "clean diesel." This could be done as a part of a technical corrections bill for TEA-21 in 2001, or during reauthorization in 2003.

Promotion of High Efficiency and Cleaner Vehicles through Improved Labeling and Promotion

Background

There is considerable variation in the fuel economy and emissions levels of new vehicles within vehicle classes (compact cars, minivans, large SUVs, etc.). This variation is growing as manufacturers introduce relatively fuel-efficient and low-emitting hybrid vehicles, such as the Honda Insight and Toyota Prius, as well as conventional "ultra low emissions" vehicles. Some efforts are underway to better identify and promote these vehicles, including a DOE/EPA-sponsored web site and the ACEEE Green Book, which provides overall environmental ratings of new cars and light trucks. However, more should be done to promote the purchase of "best-in-class" and innovative vehicles.

Proposal

The federal government should initiate a number of voluntary programs to increase awareness of and interest in buying fuel-efficient and cleaner vehicles. These would complement other policies such as stronger CAFE standards, expansion of the gas guzzler tax, and tax credits to promote the commercialization and sales of hybrid, fuel-cell, and other innovative highly efficient vehicles, as part of a comprehensive market transformation strategy.

First, the Energy Star label should be expanded to include high fuel-efficiency and low-emitting cars and light trucks. This would make it easier for

- consumers to identify "greener vehicles",
- manufacturers or others to promote greener vehicles and
- fleet owners to commit to "buying green".

The Energy Star designation or ratings should

- be based on a combination of fuel economy and tailpipe emissions,
- recognize the best vehicles in each vehicle category,
- allow comparison across vehicle categories, and
- give credit to vehicles that use cleaner, renewable-based fuels (through dedicated fuel vehicles, not so-called flex-fuel vehicles).

The eligibility requirements for the Energy Star designation should change over time as manufacturers introduce more-efficient and cleaner vehicles. Manufacturers should be encouraged to display the Energy Star label on cars in showrooms and dealers trained to properly explain the label.

Second, owners of vehicle fleets, both public sector organizations and private companies, should be encouraged to commit to buying only Energy Star vehicles. And fleet owners could be organized into “green vehicle buying cooperatives” with the cooperatives or the federal government negotiating discounts from vehicle manufacturers. The government could promote purchase commitments and buying cooperatives, along the lines of the promotion being carried out and product discounts being obtained for other Energy Star products.

Impacts

The Energy Policy Act of 1992 (EPAct) includes fleet purchase targets and requirements for alternative fuel vehicles (AFVs). DOE initiated a “Clean Cities Program” to promote purchase of and build infrastructure and markets for AFVs at the local level, though actual purchase of AFVs is well below Energy Policy Act targets due to limited vehicle availability, relatively high cost of these vehicles, and limited fueling infrastructure. Even if the AFV targets were met, there still would be significant potential for promoting commitments to buy highly efficient and low emitting gasoline-fueled vehicles on the part of public and private fleet owners. ACEEE estimates that the target fleet market (after deducting the EPAct AFV requirements) is over 1 million vehicles per year.

ACEEE has estimated the potential energy savings and avoided carbon emissions from a “best-in-class” vehicle labeling and promotion program. Assuming a very strong program that affects 30 percent of fleet purchases and 15 percent of the general market, the estimated energy savings is about 0.4 quads (2.5 percent of passenger vehicle fuel use) by 2010, equivalent to 7 MMT of avoided carbon emissions that year. Of course, if participation is lower, the energy savings and avoided carbon emissions would be reduced. It also should be recognized that if improved labeling and promotion are carried out in combination with stronger CAFE standards, these savings should be subsumed under those from the CAFE standards.

For other proposals related to Transportation, please see:

- Tax Credits to Purchasers of Highly Fuel-efficient Vehicles, page 49.
- Expand Gas Guzzler Tax to Include Light Trucks and Provide Rebates to Purchasers of Efficient Vehicles, page 50.

Federal Electricity Restructuring Proposals

The delivery of electricity to households, businesses and industry is an extremely critical part of our economy, not to mention our well-being and safety on the family level. In our society we have come to expect reliable and reasonably priced electricity. We also expect that our electricity should come from cleaner sources of energy than in the past. However, with the onset of electricity restructuring in many states, some of these expectations are being challenged as they have never been challenged before.

One only need look at the recent developments in California to see some of the potential problems on the horizon as restructuring and/or deregulation of the industry takes hold. At present there is great uncertainty regarding the deregulation/restructuring process.

It is our belief that a great deal of this uncertainty could be adequately addressed if policies are carefully adopted on the national level to make sense out of the patchwork quilt of deregulation schemes that have moved forward at the state level. To that end we provide here suggested national policies to encourage diversity of energy sources, to encourage greater reliability, to encourage clean renewable energy, and to protect consumers from unscrupulous business practices and monopolies.

Prohibition of Utility Bailouts for Nuclear Investments

Background

About two dozen states have enacted laws deregulating their electric utilities. In most of these states, electric utilities convinced state legislatures and regulators to cover the costs of their uncompetitive investments (stranded costs) in nuclear power during the transition to competitive markets. Consumers now are in the process of spending approximately \$200 billion to bail out utilities through non-bypassable charges for a failed technology that was largely responsible for the move to deregulation in the first place.

Proposal

Congress and the Administration should prohibit any federal or state authority from requiring consumers to pay, directly or indirectly, the above-market costs of owning or operating any nuclear power plant in a deregulated electricity market.

Utilities assert that the basis for stranded cost recovery is a "regulatory compact" between utilities and regulators, in which utilities are obligated to serve the public with universal, reliable, reasonably-priced electricity in return for an exclusive monopoly franchise and the opportunity to earn a fair return on prudent, used and useful investments. With the onset of deregulation, utilities have insisted that regulators are contractually obligated to ensure that utilities fully recover investments that were incurred under the regulatory regime. But no utility has produced a binding legal document establishing this purported regulatory compact. In addition, the Supreme Court of New York has rejected utility claims for full stranded-cost recovery based on the supposed regulatory compact

The U.S. Constitution's Commerce Clause prohibits states from erecting trade barriers to protect in-state producers at the expense of out-of-state producers. Stranded cost payments to an in-state utility could be considered trade barriers that functionally keep out-of-state electricity providers from competing in the market.

Impacts

The prohibition of non-bypassable charges to recover past utility investments in nuclear power would result in more vibrant and competitive electricity markets and a reduction of market entry barriers to alternate service providers of renewable energy products and energy efficiency services.

The bailout of past nuclear investments provides a huge subsidy to a dangerous and polluting technology, making it more difficult for cleaner sources of electricity to compete. Non-bypassable charges to recover past nuclear investments keep electricity rates above the national average for most of the consumers living in deregulated states, and reduces the shopping credit available to consumers considering alternate providers. This dramatically reduces the market opportunities for green power producers and marketers. Moreover, the utilities receiving these subsidies are engaging in a frenzy of mergers and acquisitions, reducing the number of potential market competitors while increasing the market power of surviving companies.

Transmission System Reform

Background

Electricity is a public-interest commodity, and the institutions that govern its production and transmission must ensure that the public interest is served. Currently, transmission system ownership is dominated by profit-making entities that have an interest in managing the system to enhance their bottom line. This domination of transmission results in decisions that constrain competition, especially small power producers that have little leverage to influence the decisions that get made by the transmission owners. In addition, transmission owners have no incentive to encourage energy efficiency and distributed energy, which provides significant cost and reliability benefits to consumers.

Proposal

Congress and the Administration should pass legislation that would transfer control of the nation's transmission systems to non-profit, independent, regional transmission organizations.

These organizations should:

- have strong authority to operate, plan, maintain and expand the transmission system in ways that reduce costs to consumers while protecting the environment,
- have boards of directors composed of individuals with no financial interest in any transmission owner, power supplier, or power marketer, and
- be governed by statutes and regulations ensuring that:
 - all consumers and power suppliers have equal and nondiscriminatory access to transmission services;
 - energy efficiency and distributed energy resources are included as options for improving transmission operation and reliability;
 - consumers and suppliers have equal access to all information needed for transmission operation, maintenance and planning;
 - transmission improvements reduce costs to consumers, improve reliability and protect the environment;
 - transmission pricing policies do not discriminate against intermittent electricity resources such as wind;
 - new power plants, whether central-station or distributed, can be interconnected to the grid on a nondiscriminatory basis, regardless of ownership;
 - the “pancaking” of multiple transmission charges is eliminated, thereby expanding the geographical scope of electricity markets and increasing the opportunity for power suppliers to serve regional electricity markets; and

- power suppliers and power marketers, which may also own transmission facilities, cannot manipulate electricity markets.

Consumer Aggregation

Background

Through a program called Community Choice, recently adopted by Massachusetts and Ohio, municipalities purchase electricity on behalf of residents and businesses. This gives communities the leverage to negotiate lower prices for electricity by combining the buying power of residential and business consumers. Community Choice can be initiated through a city council vote or referendum. Participation is voluntary: consumers and businesses who prefer to select their own electricity supplier can “opt out” with no penalty. By combining the buying power of residential, business and municipal electricity users, the program can lower rates and improve service in states that have restructured their electric utilities. But several states have created barriers to Community Choice and other types of consumer aggregation.

Proposal

Congress and the Administration should prevent states from creating barriers to any form of consumer aggregation, such as Community Choice (also known as municipal aggregation). They should promote policies that would overcome these barriers and allow consumers to combine their buying power.

Community Choice is beneficial to the environment. Communities can

- negotiate with electricity suppliers to include electricity from renewable energy sources, such as wind, biomass, geothermal, and solar power, and
- design their own energy-efficiency programs, which can save money and reduce pollution.

Disclosure & Consumer Information

Background

Many citizens are not aware of how the electricity they use is generated. Citizens deserve to be informed, especially since surveys indicate that consumers prefer to receive electricity generated by clean and renewable technologies. If consumers have accurate information, they will be able to choose a supplier that most closely matches their preferences.

Proposal

Congress and the Administration should pass legislation that requires all electricity suppliers to uniformly label their products. These “disclosure labels” would be analogous to the nutrition labels on food products. The information provided would include the following:

- contact information (including phone numbers);
- the price of the electricity;
- a percentage breakdown of the sources of electricity (specifically biomass, coal, hydro, natural gas, nuclear, oil, solar, wind, power from municipal waste incinerators, and other resources);
- a piechart showing the percentage breakdown;
- a table showing actual pollutant emissions (specifically particulate matter, carbon dioxide, nitrogen oxides, sulfur dioxide, mercury, high-level nuclear waste, and low-level nuclear waste); and
- a customer’s previous usage.

The disclosure labels must be uniform, simple and easy to understand. Failure to disclose this information should be a deceptive act in commerce under the Federal Trade Commission Act.

Impacts

Both Republicans and Democrats in Congress have introduced many bills over the past few years that would require this type of disclosure. It is a generally accepted principle that in a deregulated electricity environment, consumers will need this information in order to make informed choices.

Disclosure will result in a more informed citizenry, and consumers will be able to tailor their energy purchases to support cleaner technologies. This proposal should provide benefits such as a cleaner environment, lower health care costs, and a lower number of deaths due to air pollution. The cost of disclosure would be minimal since electricity companies already need to communicate with their customers on a regular basis, though there may be some added costs associated with tracking the source of the electricity purchased by the provider.

For other proposals related to Federal Electricity Restructuring, please see:

- Federal Renewable Portfolio Standard, page 16.
- Public Benefit Trust Fund, page 17.

Nuclear Policy and Regulation Proposals

Although no new nuclear power plant has been ordered since the 1970s, nuclear power continues to provide the U.S. with about 20 percent of its electricity. Over time, nuclear power has received billions of dollars in subsidies from taxpayers and ratepayers, which allowed reactors to be built and operated although cheaper ways to produce electricity have always been available.

Nuclear power also has produced about 50,000 tons of radioactive waste which will remain dangerous to humans and animals for more than 1 million years. The nuclear power industry and the federal government have yet to determine a safe way to deal with this radioactive legacy.

Instead of pouring ratepayer and taxpayer dollars down a nuclear hole, Congress and the Administration should support programs to develop safe, clean and cost-effective energy technologies that use renewable energy resources. Also, the federal government should provide increased support to developing ways to conserve energy, and to use energy more efficiently in our homes, businesses, and factories.

Below are a several proposals that Congress and the Administration should adopt to protect American families, their pocket books, and the environment.

Safe Operation of Nuclear Reactors

Background

The Nuclear Regulatory Commission (NRC) is attempting to lower nuclear safety standards out of a fear that nuclear reactors will be unable to compete in deregulated electricity markets if forced to comply with the regulations currently on the books. NRC's effort to "risk inform" nuclear safety regulations based on past performance is an attempt by the agency and the nuclear industry to lower safety standards based not on safety considerations but on considerations of cost and profits.

Tightening nuclear safety standards is a critical need for the U.S. An accident at a U.S. nuclear power plant could kill more people than were killed by the atomic bomb dropped on Nagasaki, and the financial repercussions could be catastrophic. The 1986 accident at the Chernobyl nuclear plant cost the former Soviet Union more than three times the economic benefits accrued from the operation of every other Soviet nuclear power plant between 1954 and 1990.

According to the Nuclear Energy Institute (NEI), the lobby for the nuclear industry, the NRC has already begun to "risk inform" the regulations that govern fire protection and nuclear reactor security. The Nuclear Energy Institute testified before the Senate oversight committee that lowering of safety standards was possible because of the improved safety record of the nuclear industry. However, the fact that the U.S. nuclear industry has not melted down a nuclear reactor in the last 20 years is not a sufficient reason for dropping the requirements that helped achieve that record.

Proposal

Congress and the Administration should ensure the safe operation of nuclear reactors by stopping the NRC's attempt to deregulate nuclear safety standards under the guise of "risk-informed" regulation.

Relicensing of Nuclear Reactors

Background

One of the nuclear industry's biggest shortcomings has always been its failure to address unresolved safety problems associated with nuclear reactor design, operation and maintenance. The key difference between safe and unsafe plants is a plant owner's ability to meet minimum safety standards. The NRC is supposed to establish and enforce minimum standards but simply has not done its job. It has extended the operating lifetime of several reactors (through a process known as relicensing) even though their operational blueprints do not conform with safety regulations.

Proposal

Congress and the Administration should make sure the NRC follows its own safety regulations and does not extend the operating lifetime of nuclear reactors that fail to comply with safety regulations.

Protecting the Public's Right to "Formal" Hearings

Background

The NRC has asked the Senate to approve a shift from formal hearings, which give the public the right to obtain documents through discovery and to cross-examine hearing participants, to informal hearings, in which the public can do neither. By attempting to change the rules, the NRC is renegeing on a deal made in the late 1950s in which the nuclear industry agreed to formal hearings with meaningful public participation if it was given exemption from state and local regulation. If the Senate approves the shift, citizens will be unable to participate fully in hearings on the proposed nuclear waste repository at Yucca Mountain, located near Las Vegas, Nev., and on safety issues at more than 100 U.S. nuclear reactors.

Proposal

Congress and the Administration should prevent the NRC from eliminating formal hearings when dealing with issues arising from the safety issues such as operation of nuclear reactors and handling of nuclear waste.

Yucca Mountain Nuclear Waste Dump

Background

Yucca Mountain is the only site being considered by the DOE as a "permanent disposal" site for the United States' highly radioactive nuclear waste. This spent nuclear fuel and high-level waste is currently located at 77 nuclear plants across the country and would have to be transported by truck or rail to Yucca Mountain if that site is approved as a geologic repository.

Studies of Yucca Mountain have revealed a host of potential problems at the site. Besides being sacred land of the Western Shoshone Indian Tribe, Yucca Mountain sits on top of an aquifer that is a source of drinking and irrigation water for people living in the nearby Amargosa Valley. Furthermore, Yucca Mountain is located in an extremely active earthquake zone. These problems and others make it likely that nuclear waste deposited in Yucca Mountain will contaminate the environment, potentially exposing people to radiation and exposing taxpayers to billions of dollars of future cleanup costs.

Nuclear waste would have to be transported by truck or rail to Yucca Mountain if the site is approved as a nuclear waste repository. Several thousand shipments of nuclear waste would travel through 43 states—past the homes of 50 million Americans—for 25 years. Property values would

decline significantly along nuclear waste routes. Using the Department of Energy's own data, between 70 and 310 accidents and over 1,000 incidents would occur during the nuclear waste shipping campaign if trucks are used as the preferred mode, and between 50 and 260 accidents and over 250 incidents if trains are used as the preferred mode. The Department of Energy also estimates that a severe accident in a rural area releasing a small amount of radiation would contaminate 42 square miles for well over one year. A similar accident in an urban area would have devastating consequences to the economy and public health.

Proposal

Congress and the Administration should oppose efforts to create a nuclear waste repository inside Yucca Mountain, Nevada.

MOX Subsidy Program

Background

The federal government currently is pursuing two options for the disposal of roughly 50 metric tons of surplus weapons-grade plutonium:

1. immobilize the plutonium with other highly radioactive waste in glass or ceramic and dispose of the combination in a geological repository; or
2. mix it with depleted uranium to make MOX fuel, which then would be used in commercial power plants to produce electricity.

The immobilization of plutonium in glass or ceramic form involves fewer steps, less handling and transportation, and would cost approximately \$1.8 billion. The MOX option, by contrast, would cost at least \$2.6 billion, keep plutonium in use, increase handling, transportation, and security risks, take more time to implement and create more radioactive waste.

MOX will result in increased levels of plutonium in both low-level and high-level reactor wastes, increasing the risk of groundwater contamination. Using MOX fuel in reactors would reduce the stability of reactor cores, necessitating increased expenditures on reactor modifications to restore the same level of control as with uranium fuel. Moreover, the consequences of reactor accidents, should they occur, would be more severe.

Proposal

Congress and the Administration should terminate the proposed subsidy of fueling commercial nuclear power reactors with weapons-grade plutonium made into mixed oxide or MOX fuel.

Nuclear Waste Fund Fee

Background

To offset the costs associated with high-level nuclear waste generation, nuclear utilities pay into a fund for the long-term costs of disposing of the waste. Since 1983, this payment has been a flat fee of one-tenth of one cent per kilowatt-hour (one mill per kilowatt-hour). However, this rate of contribution will not cover the costs originally anticipated, let alone new costs. Without adequate funds, finding and implementing a safe solution for the disposal of nuclear waste will be impossible. On the other hand, charging nuclear operators the full cost for nuclear-generated electricity would help to level the economic playing field for cleaner, more-efficient energy sources.

Proposal

Congress and the Administration should index for inflation the Nuclear Waste Fund Fee, which has been set at a flat rate of one-tenth of one cent per kilowatt-hour since 1983. Indexing the

Nuclear Waste Fund Fee for inflation would save taxpayers millions of dollars and more fully incorporate future costs into the market price of nuclear power.

Without adjusting the fee, taxpayers may be held responsible for cost overruns associated with handling nuclear waste.

Impacts

According to a 1995 Congressional Budget Office analysis, indexing the fund for inflation would have saved \$315 million between 1996 and 2000.

For other proposals related to Nuclear Policy and Regulation, please see:

- Stopping Tax-Free Transfers of Nuclear Decommissioning Funds, page 54.

Tax Policy Proposals

Many of our nation's most important objectives are advanced through features of the Federal Tax Code. Although frequently assailed for its complexity, the tax laws offer many incentives for private individuals and companies to help advance the public interest. From deductions for charitable giving to incentives for home ownership, the tax code signals what we value as a nation and where we are willing to commit new fiscal resources. The code has also attracted special interests seeking special benefits, and frequently maintains these benefits in place far longer than needed to accomplish a recognized public purpose.

The proposals for tax policy offered in this *Agenda* are a combination of additions to the tax code to advance innovations in energy efficiency and renewable energy, and a culling out of obsolete and counterproductive tax subsidies for fossil and nuclear fuels and nuclear plant decommissioning. Many of the new initiatives are proposed to automatically expire at a date certain, to concentrate their benefit toward the early stages of the entry of new technology into the marketplace. In contrast, the tax subsidies for fossil and nuclear fuels have outlived their usefulness and serve to perpetuate an unfair market advantage for mature technologies and polluting fuels.

Taken together, these tax policy initiatives would encourage rapid development of clean renewable sources of energy, spur investment in new energy efficient technology, and reduce the environmental impacts of natural resource extraction and energy consumption.

Renewable Electricity Tax Package

Background

Section 45 of the Internal Revenue Code provides for a "production tax credit" for electricity produced from new facilities using wind energy and closed-loop (dedicated crops) biomass⁴ resources. However, because of the high capital cost of growing dedicated biomass crops, the tax credit has exclusively benefited the deployment of wind energy facilities. The Energy Policy Act of 1992 established both the wind and closed-loop biomass credits; the Tax Relief Act of 1999 extended wind and closed-loop biomass provisions, adding poultry litter to the definition of biomass.

As Congress stated in 1992, "The Credit is intended to enhance the development of technology to utilize the specified renewable energy sources and to promote competition between renewable energy sources and conventional energy sources." Today, there is a need to extend the credit to all

⁴ The Sustainable Energy Coalition endorses specific forms of biomass:

- (A) *Closed-loop biomass*: any organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity.
- (B) *Open-loop biomass of the following types*:
- a. any solid, nonhazardous, cellulosic waste material, which does not contain any painted, treated, or pressurized wood or wood contaminated with plastics or metals and which is segregated from other waste materials, and which is derived from-
 - i. any of the following forest-related resources: mill residues, precommercial thinnings, slash, and brush, but not including old-growth timber or black liquor, or
 - ii. waste pallets, crates, and dunnage, and landscape or right-of-way tree trimmings, but not including municipal solid waste (garbage), post-consumer wastepaper, construction and demolition debris, or
 - iii. agriculture sources, including orchard tree crops, vineyard, grain, legumes, sugar, and other crop by-products or residues, or
 - iv. landfill methane, or
 - v. animal waste.

renewable electric technologies to encourage their utilization, and ensure fair treatment of renewable technologies.

Wind, solar, geothermal, biomass and incremental hydropower have significant environmental advantages over fossil fuels. They provide benefits to society in terms of energy security, improved environmental quality, better public health, and other ways. Many of these benefits, however, are not reflected in the market price of electricity and this market failure should be corrected by the extension of a tax credit to qualifying renewable resources as described below.

This credit will also allow these renewable technologies to compete on a more even footing with conventional fossil fuel technologies. Solar, wind, geothermal and biomass are all slightly higher in their first cost than conventional sources, and generally have a higher risk for investors. Encouraging incremental hydropower capacity achieved at existing hydroelectric facilities by the means of efficiency improvements and capacity upgrades using new, advanced technology turbines will allow for environmentally responsible expansion of hydropower to meet U.S. energy needs.

A production tax credit will enable these renewable technologies to continue to develop and mature, help drive down their costs, and provide Americans with more clean, emissions-free electricity generation

Proposal

As a means of promoting the deployment of renewable electricity generating technologies, the following proposal should be proposed by the next Administration and adopted by Congress as a permanent part of the tax code:

Production Tax Credit

There should be a tax credit of 1.5 cents/kwh, adjusted for inflation, for the first ten years of electricity production from all new renewable energy facilities, otherwise generally following the terms of the existing Section 45. Eligible biomass facilities should include open loop biomass (using organic residues to produce electricity). Co-firing with biomass should receive a pro-rated tax credit of 1 cent/kWh for the electricity production attributable to the biomass fuel.

Co-production Credit

The tax credit should include an additional credit of 0.25 cents/kwh for the first ten years of electricity production from renewable energy facilities eligible above, or existing facilities that add co-production after date of enactment, if it produces heat, mechanical power, or minerals on a continuous basis in addition to electricity, provided that the annual value of the co-production is equal to at least 10 percent of the value of the electricity produced.

Indian Land Tax Credit

It should provide an additional credit of 0.25 cents/kwh for the first ten years of electricity production from renewable energy facilities eligible above if it is located on Indian Land and operates with the explicit approval of the Indian Tribe having jurisdiction over those lands.

Credit Assignment/Tradeability

To adopt the credit to new marketplace realities and a deregulated generating system, the renewable energy tax credit for any facility may be assigned to the company that purchase or sells the electricity from the eligible entity, and for nonprofit organizations the credit is tradable or refundable.

No Double-Dipping

The tax credits provided by this section shall be in lieu of any other federal investment tax credit.

Impacts

The adoption of a renewable-energy production tax credit will successfully drive the production of new renewable generation from wind, solar, geothermal and biomass facilities and encourage more output on an incremental basis from hydropower plants.

The Department of Energy has averred that these technologies could make major contributions to our Nation's energy needs over the next decade, presuming such positive tax benefits. For example, DOE has estimated that we could increase our generation of geothermal energy almost ten-fold, supplying 10 percent of the energy needs of the West, and expand wind energy production to serve the electricity needs of ten million homes. Biomass and solar potential are equally dramatic, but all renewable production will greatly depend upon their economic competitiveness in the newly deregulated market place -- making recognition of the non-price environmental and economic benefits of renewable through a production tax credit vitally important.

Growing renewable energy industries will also help provide growing employment opportunities in the U.S., and help U.S. renewable-technologies firms compete in world markets. This is particularly important given the fact that the markets for wind, solar and geothermal technologies are the three fastest-growing energy markets worldwide, and U.S. firms will be at a disadvantage in competing in international markets if they do not have a strong domestic marketplace.

Renewable Incentives for Publicly Owned, Non-Profit Electric Utilities**Background**

The public power sector has a long-standing position as a proponent of the development and pursuit of renewable energy. Through the membership and committee process, the American Public Power Association (APPA) has developed the following principles on renewable energy policy.

Proposal

Congress should consider these principles as it develops legislation promoting national energy or as air quality measures.

1. Public power recognizes the importance to the power generation sector of increasing the use of renewable energy and green technologies.
2. Such increased use can be best achieved through competitively neutral incentives that treat public power entities on an equivalent basis with non-public power entities.
3. Incentives should be structured to assist power-generator entities to overcome existing barriers to increased renewable energy use and deployment of other green technologies.
4. Incentives should be structured to provide comparable benefits to each region of the country and allow power generator entities to be most responsive to the needs and preferences of their customers and the competitive market.
5. The incentive should be easy to administer and provide sufficient documentation for easy verification.

Renewable Incentive Available to Non-taxpaying Entities

There should be creation of new refundable or tradable investment and production credits in the Internal Revenue Code (IRC) for publicly owned electric utilities that produce electricity from eligible renewable energy projects. These tax credits would be for use by energy producing

entities unable to take advantage of existing renewable energy tax credits.

- The amount of credit would be calculated along the same guidelines EPAAct programs.
- The option would make such credits available under the Treasury Department.
- Non-taxpaying entities would be eligible to claim a tax credit similar to the section 45 credit (the amount of credit would not be affected by the amount of federal tax liability but instead would be calculated along the same guidelines as Sec. 45 projects.).
- Participants would be given a refund based on a 1.5 cents (adjusted for inflation) per kWh of electricity generated from solar, wind, geothermal and biomass as defined by PURPA.
- Entities eligible for this refund would be prohibited against "double dipping" the benefits of this program with any other tax or appropriated incentive program designed to promote renewables.

Such a proposal would require an amendment to the IRC to provide a refundable credit against Federal taxes for tax-exempt, as well as taxable, electric utilities that produce electricity from eligible renewable energy projects.

Tax Credits to Purchasers of Highly Fuel-Efficient Vehicles

Background

Although the average fuel economy of new cars and light trucks is not rising, a great amount of R&D and demonstration of innovative vehicle fuel efficiency measures has occurred over the past decade as part of the Partnership for New Generation Vehicles (PNGV) and other programs. Vehicle manufacturers are starting to commercialize fuel-efficient hybrid electric vehicles such as the Honda Insight and Toyota Prius, which achieve 50–85 percent greater fuel economy than equivalent conventional vehicles. Other manufacturers plan to introduce hybrid electric vehicles in the next few years. Fuel-cell electric vehicles have the potential for even greater fuel economy and lower emissions than hybrid electric vehicles, which still employ an internal combustion engine along with an electric motor. Some vehicle manufacturers have indicated that they will start mass-producing fuel cell electric vehicles starting around 2005, and a limited number of fuel-cell electric buses already have been produced and field-tested.

Cost is a major obstacle to the widespread production and sale of highly efficient hybrid and fuel cell vehicles, and Honda and Toyota are selling their initial hybrid vehicles at a loss. While costs are expected to decline over time as technology advances and economies of scale occur, it is unclear how fast this will occur and whether or not hybrid and fuel cell vehicles will reach cost competitiveness and widespread market shares without significant public support. Given the enormous public benefits of lower oil consumption, lower criteria pollutant emissions, and lower greenhouse gas emissions that such vehicles promise, it is reasonable for the government to provide financial incentives initially in order to stimulate mass production and support initial sales of these innovative vehicles.

Proposal

Congress and the Administration should extend the current tax credit for electric and fuel cell vehicles through 2008 but fix the credit at a flat \$4,000 per vehicle, a modification of the proposal by the Clinton Administration and U.S. auto manufacturers. This proposal will give manufacturers further incentive to reduce the cost and price of electric and fuel-cell vehicles.

Congress and the Administration also should offer tax credits tied to fuel-efficiency and emissions levels for hybrid vehicles, similar to the Clinton Administration's 1999 proposal. However, the credits should

- start in 2001;

- be extended to all high-efficiency, and not just hybrid, vehicles that are at least 50 percent more efficient than typical new vehicles in any particular class;
- end or phase down by 2006 or so;
- be given only to vehicles meeting forward-looking emissions standards such as the California Ultra Low Emissions Vehicle or Super Ultra Low Emission Vehicle standards; and
- be extended to purchasers (or manufacturers) of hybrid and fuel-cell buses or medium-duty trucks.

Such provisions would reward fuel-efficiency innovation of all types and ensure significant energy and environmental benefits.

Impacts

It is reasonable to assume that on the order of 0.5-1.0 million electric and fuel cell vehicles and 1.0-1.5 million hybrid electric (or equivalent high fuel efficiency) vehicles would qualify for the tax credits suggested above, assuming the former run through 2008 and the latter through 2006. Roughly speaking, this is the number of qualifying vehicles assumed by the Clinton Administration in their estimates of costs and impacts from their tax credit proposals. Participation on this scale would have relatively modest direct impacts on energy use and CO₂ emissions— energy savings of around 0.1 quads and avoided carbon emissions of 1.5-2.5 MMT per year. However, if the credits are successful in helping to build markets and advance the technologies so that these innovative vehicles become competitive in the marketplace and markets continue to grow after the credits are phased out, the indirect impacts could be many times greater than the direct impacts; e.g., providing a total carbon emissions reduction of at least 10 million metric tons by 2015. On the other hand, if the tax credits are adopted in conjunction with stronger CAFE standards, then it is important not to double-count savings. Thus, the savings from the tax credits should be subsumed under those from the CAFE standards if both policies are adopted.

Expand the Gas Guzzler Tax to Include Light Trucks and Provide Rebates to Purchasers of Efficient Vehicles

Background

As noted earlier, the average fuel economy of new passenger vehicles is declining due to the growing market share of inefficient light trucks (SUVs, pickups, and minivans) and the lack of standards or financial incentives stimulating higher fuel economy in all new vehicles. Relatively inefficient cars, those with composite fuel economy rating below 22.5 MPG, are subject to a gas guzzler tax. The tax starts at \$1,000 for vehicles 21.5-22.5 MPG and increases to a maximum of \$7,700 as fuel economy drops. This policy, enacted in 1978, was fairly successful in “pulling up” the bottom end of the vehicle fleet and few new cars are subject to the gas guzzler tax today. However, due to a loophole, the millions of light trucks that are sold today for use as passenger vehicles are not subject to this tax, which encourages production and marketing of these inefficient and polluting vehicles. Furthermore, the revenue generated by the gas guzzler tax goes to the general Treasury rather than being used to stimulate greater production and purchase of efficient “gas sipping” vehicles.

Proposal

First, the gas guzzler tax loophole should be closed by having the current tax apply to all new passenger vehicles. Given the sales and fuel economy of light-duty SUVs, pickup trucks, and minivans sold in 1999, automakers would have paid an additional \$10.2 billion in gas guzzler taxes on their vehicles that year if this policy had been in place. Since the objective is to discourage sales of gas guzzlers and improve fuel economy, the actual revenue collected after this policy is announced and takes effect could be significantly lower. But it is likely that the policy, at least initially, would generate billions of dollars in new tax revenue each year.

Second, manufacturers or consumers should be given tax credits for vehicles that are “gas sippers” –significantly more efficient than the average fuel economy of all new vehicles. The credits could start at around 20 percent above the average fuel economy of new vehicles and increase as the fuel economy rating increases, mirroring the way the gas guzzler tax is designed. Or, the credits could be normalized based on some measure of vehicle size (e.g., vehicles would need to be a certain percentage more efficient than the average for the vehicle class rather than the overall average for all new vehicles). In either case, a sliding scale should be used and the reference point should be adjusted as the overall fuel economy of new vehicles increases. Also, vehicles should be ineligible for these tax credits if they receive separate tax credits offered to innovative hybrid and fuel cell vehicles.

Impacts

The combination of fees on gas guzzling vehicles and rebates or credits on gas sipping vehicles is sometimes referred to as “feebates,” which have been proposed at both the federal and state level. There were several bills proposed in the 102nd Congress, and the California and Maryland state governments both have proposed similar plans.

A study by Lawrence Berkeley Laboratory showed that relatively modest rebates of up to about \$1,000 per vehicle could have a significant impact on the average fuel economy of the new vehicle fleet, leading to about a 10-20 percent improvement in rated fuel economy of new vehicles within 10 years. In the short run, consumers would shift towards more fuel-efficient vehicles available in the marketplace and in the long run, the selection of vehicles being marketed would change as manufacturers respond by adding efficiency measures. Fuel savings could reach 7-8 billion gallons of gasoline annually by 2010.

If feebates are adopted in conjunction with stronger CAFE standards, then it is important not to double-count savings. Thus, the savings from feebates should be subsumed under those from the CAFE standards if both policies are adopted and the standards are relatively stringent. Feebates and tougher fuel economy standards are complementary, with the incentives helping to move the market toward regulatory compliance.

Tax Credits for Purchasers or Manufacturers of Highly Fuel-Efficient Appliances, Heating and Air Conditioning Equipment

Background

There are a host of innovative technologies that could significantly reduce the energy use of, and thus the pollutant emissions associated with, heating, cooling and appliances used in residential and commercial buildings. For example:

- electric heat pump water heaters cut electricity consumption for water heating by 50–70 percent compared to conventional electric water heaters;
- gas-fired heat pumps are about twice as efficient for heating as typical new gas furnaces and provide space cooling using natural gas as the energy input;
- super-efficient electric air conditioners, refrigerators and clothes washers use 25-50 percent less energy than typical new models sold today; and
- fuel cell cogeneration systems offer the potential to power and heat homes or commercial buildings very cleanly and at high overall efficiency.

However, none of these technologies are produced on a large scale yet. High first cost is a major barrier preventing more widespread production, marketing, and sale. Without financial incentives, these technologies may never overcome the “initial high cost” barrier and be mass-produced.

Given the potential public benefits of lower energy consumption, increased electric-grid reliability, lower criteria-pollutant emissions, and lower greenhouse gas emissions that such

technologies promise, the federal government should provide financial incentives to stimulate mass production and support initial sales of these innovative technologies. The incentives should be of limited duration and possibly phase down over time so that the cost to the government is limited and the technologies eventually compete without subsidies.

Proposal

Either manufacturers or purchasers of highly efficient building equipment should be given tax credits, with a focus on innovative “leapfrog” technologies such as those mentioned above. This would minimize the number of “free riders” and provide the biggest impact on market transformation.

The tax incentives should be either fixed in value or calculated as a fraction of the first cost (with a cap on the value) for the following products;

- electric heat-pump water heaters,
- gas-fired heat pumps,
- electric air conditioners and heat pumps with SEER > 13.5,
- building fuel-cell cogeneration systems,
- super efficient refrigerators and clothes washers, and
- highly efficient ground-source heat pumps.

The credits should be approximately 20 percent of the first cost for the most efficient products, with a sliding scale or lower tier(s) for less efficient but still innovative products. This approach has been followed in the climate technology tax credit proposals put forward by the Clinton Administration. They should remain in effect for around 5 years, and could decrease in magnitude in the final year or two.

Impacts

The Clinton Administration proposed tax credits for heat-pump water heaters, gas-fired heat pumps, fuel-cell cogeneration systems, and high-efficiency central air conditioners and electric heat pumps. These proposals, or components of them, were incorporated in a number of bills introduced in the 106th Congress, as was a proposal by energy efficiency advocates and appliance manufacturers.

It is likely that there would be millions of qualifying products sold during the 2001-2005 time period. The total cost to the Treasury might reach on the order of \$1.5-2.0 billion, with high efficiency central air conditioners likely being the most costly component of the package. Sales of fuel cell cogeneration systems might reach 200-500 MW of total installed electric capacity, with the credits for this product costing the Treasury \$80-200 million.

Participation on this scale would have a relatively modest direct impact on energy use and CO₂ emissions, saving on the order of 0.05 quads of primary energy and 1.0-1.5 MMT of carbon emissions per year by the end of the eligibility period. However, if the credits help to establish these innovative products in the marketplace and reduce the first-cost premium so that the products are viable after the credits are phased out, the indirect impacts could be many times greater than the direct impacts. Total energy savings could reach 0.25-0.5 quads and avoided carbon emissions could reach 5-10 million metric tons by 2015 if the credits are successful.

Adjust Depreciation Schedule to Reflect Economic Life of CHP Systems

Background

CHP systems (including district energy distribution systems) can provide a high-efficiency means to deliver energy services in the form of electricity as well as industrial process steam and/or hot water for space- and water-heating purposes. Conventional fossil-fired power generation in the United States is slightly more than 30 percent efficient, because two-thirds of the energy used to generate electricity is lost in the form of waste heat. Capturing and using this waste heat prevents pollution and can make dramatic cuts in greenhouse gas emissions as well as criteria air pollutants. CHP systems can be from 60 to more than 90 percent efficient. However, CHP/district energy distribution systems are capital-intensive and currently the components are subject to a variety of depreciation schedules. Current depreciation treatment places such systems on a sloping playing field with conventional power generation technologies.

Proposal

CHP/district energy systems of at least 65 percent efficiency should have a depreciation schedule of 7 years, given the expected economic life of such systems. Use of CHP/district energy should be encouraged rather than discouraged by tax treatment and other barriers. There should be periodic review of such technology depreciation/tax treatment; for this technology, such review last occurred in 1986.

Impacts

Many European countries have provided preferential tax treatment to CHP/district energy systems, since they are viewed as a highly desirable means to use energy efficiently in an environmentally friendly way.

The impact of this provision is difficult to assess in isolation since CHP faces other barriers in environmental permitting and utility interconnection. With the removal of these barriers and a change in depreciation, it has been projected that 50 GW of additional CHP capacity could be brought to market by 2010. This would result in a cumulative savings of more than 1.5 Quads, and emissions reductions of 42.6 MMT carbon equivalent, 0.81 MMT of SO₂, and 0.37 MMT of NO_x.

Mine Reclamation

Background

A provision in the U.S. tax code allows mining companies to deduct reclamation and closing costs as soon as they begin to mine, although the closing and reclamation of the mine site will not occur for some time. Without this provision, general tax rules would require the companies to wait until the mine site is closed and restored, and the costs associated with these activities are paid, before being able to deduct these costs. Taxpayers could be forced to pay for the closing and reclamation of mines for which mining companies have already claimed a deduction. A current deduction without a requirement to post an adequate bond raises the possibility that closing and reclamation will never occur. Simply put, there is no guarantee that there will be money available for clean-up or mine closing, and taxpayers could end up paying the expenses.

Proposal

Congress and the Administration should repeal the special rules that allow costs for mine reclamation to be deducted before they are actually paid.

Since 1977, there have been more than 6,000 coal mines closed but not reclaimed. Mining companies also should post adequate reclamation bonds and establish a national program to clean up abandoned mines. These actions would save taxpayers \$200 million.

Stopping Tax-Free Transfers of Nuclear Decommissioning Funds

Background

Nuclear utilities are proposing an amendment of current U.S. tax law that would allow utilities to avoid tax liabilities associated with the transfer of decommissioning funds established to clean up reactor sites after the reactors are permanently closed. These proposals would

- facilitate the sale and continued operation of uneconomic nuclear plants, and
- encourage the dangerous trend toward further consolidation of the nuclear power industry.

Proposal

Congress and the Administration should stop the tax-free transfers of funds for nuclear reactor decommissioning. Nuclear power is unsafe and produces highly toxic waste, and nuclear utilities should not be provided with yet another subsidy. This industry avoids bearing its fair share of the public tax burden. Moreover, the nuclear power industry has a history of receiving massive federal subsidies. According to the Congressional Research Service, 59 percent (\$66 billion in constant 1999 dollars) of the Department of Energy's research and development spending on energy during FY1948-FY1998 went to nuclear power. By contrast, 23 percent (\$26 billion) went to fossil, 11 percent (\$12 billion) went to renewables and only 7 percent (\$8 billion) went to energy efficiency.

The House-passed fiscal year 2001 budget resolution estimates that this tax subsidy to the nuclear industry would cost the federal government at least \$800 million through 2004.

Capital Gains and Royalties From Coal Production

Background

Since 1952 the Internal Revenue Code has contained a provision allowing coal-mining companies to treat income from royalties as capital gains. This permits

- individuals who lease mining rights and receive royalty payments to treat these payments as capital gains rather than ordinary income, and
- companies to secure reduced tax rates instead of the higher tax rates normally applied to income.

This provision gives coal companies a higher profit margin at taxpayer expense, encourages leasing, and unnecessarily subsidizes coal production. In 1996, 940 million tons of coal was consumed, and the total value of coal production was more than \$19 billion. Clearly the coal industry doesn't need this tax break.

Proposal

Congress and the Administration should repeal the capital gains treatment for income generated from royalty receipts from coal production and save taxpayers \$380 million over five years.

Tax Credits for Enhanced Oil Recovery

Background

Oil companies can be eligible for a 15 percent income tax credit for the costs of recovering domestic oil as long as they use qualified "enhanced oil recovery" methods. These methods involve injecting fluids, gases and other chemicals into the oil reservoir, or using heat to extract

oil that is too viscous to be extracted by conventional techniques. Costs covered by the tax credit include the equipment, labor, supplies, repairs and injectants.

In addition, oil companies can expense, or immediately write off, so-called tertiary injectants used in enhanced oil recovery. This allows companies to write off the costs of machinery and equipment faster than it wears out. The beneficiaries of this tax break, such as oil companies, have lower tax bills and maintain higher profit margins while the Treasury and taxpayers lose revenue.

Proposal

Congress and the Administration should repeal the 15 percent credit for enhanced oil recovery and eliminate the expensing of tertiary injectants. The tax credit and immediate expensing encourage overproduction from sources that would not otherwise be economically viable. The nation does not need more subsidized oil, no matter what the source. Moreover, this tax credit gives the already profitable petroleum industry an advantage over cleaner emerging technologies.

Tax Credits for Intangible Drilling Costs

Background

Provisions in the tax code allow integrated oil and gas companies such as Exxon-Mobil and Chevron immediately to deduct 70 percent of their intangible drilling costs (IDCs). The other 30 percent must be deducted over five years. IDCs generally are defined as the cost of wages, fuel, repairs, hauling, supplies and site preparations associated with drilling. Under normal tax rules that apply to other businesses, such “capital” costs are investments in property like buildings or oil wells. Because these properties last longer than one year, their costs should be written off over time as the property wears out, or oil is depleted. Immediate deduction, or expensing, allows companies to write off costs of machinery and equipment faster than they actually wear out, and before the oil is depleted. The result is that tax bills in the earlier, more profitable life of the investment are lower. Thus, oil and gas companies save by returning less to taxpayers and the Treasury.

Proposal

Congress and the Administration should repeal the tax provisions permitting oil and gas producers to immediately deduct "intangible" drilling costs and amend the provision so the costs are deducted over time. Immediate expensing of IDCs provides a tax subsidy for capital investments in the oil and gas industry. Capital costs covered by IDCs amount to 75 to 90 percent of the cost to get an oil or gas well into production. The special treatment of oil and gas expenses effectively sets taxes on oil income to zero. IDCs also cause investment decisions to be based on tax rather than economic considerations. While wealthy oil companies save, other taxpayers pay the bill for the subsidy.

Tax Credits for Non-Conventional Oil

Background

Section 29 of the Internal Revenue Code allows oil and gas companies to take a production tax credit for fuels produced from nonconventional sources. Qualifying fuels include oil produced from shale or tar sands, synthetic fuels produced from coal, and gas produced from either pressurized brine, Devonian shale, tight formations or biomass and coal-bed methane. The production credit is more than \$6.00 per barrel of liquid fuels and more than \$1.00 per thousand cubic feet for gaseous fuels. The credit phases out when oil prices range from \$40-\$50 per barrel.

The credit is a remnant of the \$88 billion “synfuel” program under the Carter Administration and, in theory, was supposed to decrease American reliance on foreign oil by increasing the production of nonconventional fuel substitutes. Instead, most of the credit has gone to oil and gas production and has been used to develop drilling and production technologies. The subsidy has not led to major increases in alternative fuel production and has not helped to decrease U.S. reliance on foreign oil. Moreover, the program has significantly exceeded its original estimated costs.

In addition, the credit has had unintended environmental consequences. For example, coal-bed methane developers in states such as Colorado, New Mexico, Wyoming and Alabama have been overlaying a new grid of wells on top of older fields of abandoned oil and gas wells that have not been properly plugged. When new methane wells are drilled, the gas not only moves up into the new wells, but also can move into underground aquifers and escape through older oil and gas wells and water wells. The result has been contaminated drinking water and irrigation systems, and even explosions. As a whole, the credit simply adds to the volume of tax-subsidized fossil fuels and the pollution that results from burning them.

Proposal

Congress and the Administration should repeal the "nonconventional" production credit for oil produced from shale or tar sands, synthetic fuels produced from coal, and gas produced from geopressurized brine, Devonian shale and tight formations.

Depletion Allowances

Background

In the current tax code, certain oil, gas, coal and uranium producers receive a huge subsidy through the percentage depletion allowance. Companies participating in these activities can deduct or write-off capital investments, based on the declining value of the mine or well. Companies that mine fuel minerals or drill for fossil fuels can deduct 10 percent for coal mining, 15 percent for oil and gas and 22 percent for uranium mining. Deductions for independent oil and gas companies can amount to 100 percent of the net income of a drilling operation. Coal and uranium mines can deduct up to 50 percent of their taxable income. In both instances, total deductions can frequently exceed the original investment costs of buying and preparing the land for resource extraction.

The percentage depletion allowance distorts the market by attracting investments that could be used more productively elsewhere in the economy. Furthermore, since the deduction can amount to 100 percent of net income for oil and gas companies, and up to 50 percent for coal and uranium companies, these companies can experience significantly higher profits at the expense of taxpayers and the Treasury.

Proposal

Congress and the Administration should eliminate the Percentage Depletion Allowance for uranium and fossil fuels, which would save taxpayers more than \$3.6 billion over five years. Environmental Protection Agency studies show that carbon emissions could be reduced by 1.1 MMT by the year 2010 simply by eliminating this tax break. This subsidy also encourages the mining of uranium, a highly toxic fuel and results in more tailing piles, toxic byproducts and disturbed habitats.

For other proposals related to Tax Policy, please see:

- Ecological Tax Reform, page 60.
- Tax Credits for Energy Efficient Residential and Commercial Buildings, page 20.

Cross-Cutting Proposals

This section contains proposals that rely on more than one single technology or energy source, and utilize a combination of technologies, or address policy measures beyond the technology sector. These proposals work to reduce our dependence on foreign oil and fossil fuels and to shape an economy that utilizes a reliable energy system from a variety of energy sources.

The Sustainable Energy Coalition proposes a "buydown" program to pay a portion of the incremental cost of distributed generation and combined heat and power technologies during the transition from R&D to full and cost-effective commercialization. We also propose to displace current stationary diesel engines by promoting single technology and hybrid technology distributed generators, such as micro-hydro, modular biomass, fuel cells, solar dish/engine, photovoltaics, wind, mini-geothermal and advanced batteries.

The new Administration and Congress should consider proposals that transcend individual technologies and energy sources, such as ecological tax reform. The SEC also proposes a comparative, comprehensive, full-energy/fuel-cycle analysis of the risks and benefits of fossil fuel and renewable energy resources, as well as energy efficiency measures. Such an analysis would determine preferred courses of action in establishing a viable energy strategy for the nation.

Buydown Program for Distributed Generation and CHP

Background

The U.S. is experiencing a period of frequent brown and black outs and the reliability of the electric system is being called into question. Meeting electricity demand in California will require building eight new power plants a year for the next several years. In addition, because of their reliance on sensitive computer equipment, more companies and individuals are demanding electric power that is not subject to the fluctuations of an overtaxed and sometimes antiquated electric distribution system.

Clean, distributed generation is the most advantageous solution to increasing problems with power supply. Distributed generation and CHP are clean options that emit little or no greenhouse gases, and are beginning to break through from the R&D stage. The U.S. government has committed vast intellectual and monetary resources to developing these technologies, but additional support is necessary for the commercialization step, which is often extremely difficult for new technologies.

Proposals

Congress and the new Administration should institute a buydown program to help technologies over the "valley of death" between R&D and commercialization. The program should provide a pool of money that would cover a portion of the incremental cost of distributed generation and combined heat and power technologies during the transition from R&D to full and cost effective commercialization

- The proposed buydown amount is 20 percent of the cost of the fuel cell, microturbine or reciprocating engine up to \$500 per kW.
- The suggested size range is 4 kW through 400kW for distributed generation, which would account for residential applications through all building types and some industrial applications.
- For CHP applications, any pairing of technologies with a 65 percent system efficiency or better and prime mover size limit of 500 kW.

The buydown would be available to:

- public entities (state, local and Federal) that are unable to take advantage of any potential tax incentives for these types of technologies and systems integration project; and
- private entities that are not utilizing any other proposed tax incentives for distributed power or CHP systems.

Suggested qualifying technologies include:

- Fuel cells that have an electricity-only generation efficiency of greater than 35 percent, and a generating capacity of between 5 kW and 500kW.
- Microturbines with a generation efficiency greater than 30 percent and a generating capacity of between 20kW and 500 kW.
- CHP that utilizes thermal energy for overall efficiencies of at least 65 percent and has a maximum engine size of 500 tons.
- Reciprocating Engine Technology of up to 200 tons with an efficiency of at least 40 percent and minimal emissions.

Impacts

The DOE and Department of Defense (DOD) have run a very small buydown program for years targeted to fuel-cell technology. The DOE's National Energy Technology Laboratory has run the program quite successfully through periodic solicitations for application sites. A larger-scale program could be run in a similar fashion to capitalize on past experience:

- The DOE solicits for proposals for the buydown funds, which will be provided to purchasers (whether a private, public, utility or other entity).
- Should the distributed generation of CHP technology be small (such as residential units), an entity such as the state, the utility or any other, may want to aggregate the buydown application for a group of installations.
- The funding would come from appropriated dollars or from subjecting a tax on the energy costs of Federal agencies.
- Other options include state funding or some combination thereof.

The suggested size of the program is \$100 million to \$300 million per year depending on included technologies, size restrictions and the potential for duplicative tax incentives for some of the technologies.

A Comprehensive, Comparative, Full-Energy/fuel-cycle Analysis of the Risks and Benefits of Fossil and Nuclear Energy, Energy Efficiency, Solar, Wind, Biomass Power, Geothermal and Hydro

Background

As the nation's reliance on fossil fuels increases along with the knowledge that these fuels have immense drawbacks, a viable energy strategy for the nation has become critical. In almost all cases, the science and technology of forms of energy are sufficient for commercialization. But the controlling factors are political will, resource availability, and the skills and capabilities of governments to wisely allocate research, development and deployment of public resources.

In theory, the marketplace is preferable to the government in allocating resources and establishing comparative costs. But past fossil-fuels and nuclear subsidies permitted these industries to gain market share, develop capital advantages, purchase vast tracts of land and mineral resources, and position themselves to ward off future competition. Current subsidies give the fossil fuel and nuclear industries a distinct advantage over renewables in the marketplace. In addition, the long-

term positive effects of renewables on the environment, human health, natural resource depletion, greenhouse gas increases, and national and energy security factors are not taken into account in the marketplace.

Proposal

The U.S. needs a comparative, comprehensive, full-energy/fuel-cycle analysis of the risks and benefits of fossil (oil, gas and coal) nuclear energy, solar, wind, biomass (power, fuels and chemicals), geothermal, hydro and hydrogen. Free market forces could best serve America and the world if all risks and benefits can be quantified and included in the price of all forms of energy.

To do so has been one of the goals of the EIA for a number of years, and some progress has been made. The Government Accounting Office, the Congressional Research Service, the Rocky Mountain Institute and other organizations have developed tools to quantify energy externalities. The next step is for the U.S. to host a meeting of the world's experts in these areas to finalize a set of tools to accurately price the true costs to society of competing sources of energy. This will in turn provide the U.S. and other nations of the world with the tools and calculations to move forward on a logical and economically sound schedule in meeting energy needs while transitioning to a sustainable energy future.

Hybrid-Diesel Displacement DD&R Program

Background

More than 50 percent of the stationary diesel engines in the United States are 20 years old and older, which means that the particulate emissions are three times over proposed EPA rules. Broken diesels drop diesel fuel, which is a major cause of groundwater pollution. If more efficient technologies were used in place of current diesels there would be a reduction in the U.S. of;

- petroleum use of almost 1 percent, and
- comparable energy costs in three key sectors: agriculture, small business and the construction industries, of 30 percent.

Proposal

Congress and the Administration should introduce a program to displace stationary diesel engines. The program should

- cost \$50 million and be cost-shared among industrial users, local governments, and lending institutions;
- promote single technology and hybrid technology distributed generators (1 kW - 250 kW range) including micro-hydro, modular biomass, fuel cells, solar dish/engine, photovoltaics, wind, mini-geothermal and advanced batteries; and
- be a multi-agency demonstration and lending program supported by the Departments of Agriculture (USDA) and Energy, EPA's State and Local Program, and lending programs of the Small Business Administration and the Department of Agriculture's Farmers Housing Administration and (FmHA and RUS).

Owners who are receiving other tax credits should not take advantage of this program.

Aside from immense environmental benefits and improved electric power reliability, the greatest benefit would be stable price scenarios for small business in the three key industries mentioned above that are very susceptible to energy price shocks. In three years this program would double the size of the U.S. photovoltaics and small wind-turbine industries and increase the size of the fuel-cell, modular biomass and micro-hydro sectors by 30 percent.

Lending programs would only establish specialized windows for easy application, fast-track approval, and amortize loans from 10 to 25 years based on the length of the manufacturer warrantee. In most cases, the longer loan terms would allow users to pay less for their monthly loan installment than they would pay per month for diesel fuel. This would allow immediate cost relief and drive a wide range of new technologies and unique technology hybrids.

Specialized RD&D programs in DOE, EPA, and USDA would validate technologies, accelerate market penetration by logging performance, and educate end-user classes most expected to benefit. EPA would concentrate in those areas where diesel emissions cause the greatest contribution to Clean Air Act non-attainment. Such a program would create 5,000 new U.S. jobs within five years, primarily through increased manufacturing, system assembly and installation, with a natural and even dispersment geographically from Florida to Alaska, Arizona to Michigan.

Ecological Tax Reform

Background

U.S. consumers and businesses currently make energy choices based on prices that do not reflect the true costs to society of fossil fuels. Such costs, called "externalities," include damages from air and water pollution and climate change, as well as the increased national defense costs incurred to protect our access to imported fossil energy. In addition, federal tax breaks and other government incentives subsidize fossil fuel production and use and can lower fossil fuel prices. If energy prices more accurately reflected the public health, environmental and other negative consequences of fossil fuel use, investment in renewable energy and energy efficiency would be more attractive to businesses and consumers.

Economists endorse the use of market-based instruments, like taxes and tradable emissions permit systems, as efficient policy tools for addressing environmental problems, including climate change. Such market-based tools can constitute an important part of a cost-effective energy-policy mix.

Proposal

Congress and the Administration should enact ecological tax reform legislation that gradually would reduce existing taxes that burden work and investment, while increasing taxes on fossil fuels and eliminating tax breaks that subsidize the production or use of fossil fuels. Such a phased-in shift in the federal tax burden would ensure that businesses and consumers bear at least some of the health and environmental costs associated with fossil fuels.

Some of the tax relief should be specifically targeted to mitigate transition costs and avoid undue burdens on the poor and low-income workers from increased energy taxes. In addition, some of the tax relief could be targeted in the short- to mid-term specifically to encourage technological innovation.

Impacts

Germany, the United Kingdom, and a number of other European countries have enacted ecological tax reform plans intended to yield both economic and environmental benefits. Several of these initiatives utilize energy taxes to account for adverse effects from fossil fuel production and consumption in energy prices, while reducing payroll taxes in order to stimulate employment. Some countries also provide specific incentives for investments in energy efficiency or renewable energy. Many European energy-tax initiatives impose a relatively low burden on industry to avoid negative effects on competitiveness.

In the U.S., state-level ecological tax reform initiatives have support among grassroots activists and some legislators, particularly in New England, the Midwest and the Pacific Northwest. Although no such state initiatives have been enacted yet, they are attracting increased interest.

An ecological tax reform initiative would encourage greater technological innovation and adoption of energy-efficient and renewable-energy technologies by businesses and consumers. In addition, economic benefits could result from the reduction in taxes on work and investment, as well as from increased growth in U.S. advanced energy technology exports.

Eliminating tax breaks and other subsidies for fossil-fuel production and use would reduce government support for polluting activities. The revenues saved could be used for reducing taxes on work and investment, or for limited-term incentives to further spur innovation and reduce market barriers for renewable-energy and energy-efficient technologies.

DOE Energy Efficiency Program
FY '02 Budget Recommendations
\$984.7 million

Energy efficiency has been cited as one of the least expensive and most effective ways to reduce pollution, including greenhouse gases; cut energy costs; and save our finite energy sources. Awareness of energy efficiency has been growing since the energy crisis in the seventies. In recent years, however, artificially low energy prices and budgetary constraints have moved attention away from any efforts to save energy, even though energy efficiency has accounted for almost 22 percent of our energy mix in recent years. U.S. energy use per unit of gross domestic product (GDP) declined 1.2 percent per year on average during the 1990's, compared to a drop of 2.4 percent during the period of 1973-86.

The DOE plays a critical role in U.S. research, development and demonstration activities in the energy field. For relatively small amounts of funding, the DOE is able to leverage large amounts of private sector funds for research, development and deployment activities that benefit American manufacturers and consumers. In these times of serious fiscal restraint both in corporate America and in the government, the DOE brings together research partners and facilitates implementation efforts. A relatively small amount of funding and effort can go a long way towards improving the Nation's energy efficiency, environmental quality and economic performance while decreasing our reliance on foreign sources.

Building Sector Budget Request (\$397.0 million)

The U.S. building sector uses approximately 30 quadrillion BTUs annually and accounts for nearly 1/3 of all U.S. energy use. With average energy costs per household of \$1,200, there is a myriad of opportunities to save energy and money through energy efficiency measures. The Energy Policy Act of 1992 authorizes a number of buildings-related energy efficiency activities at the DOE. The Sustainable Energy Coalition advocates a building research and development budget that will allow full implementation of the Energy Policy Act and provide the greatest benefits to American consumers.

Competitive Research and Development (\$4.0 million)

The Buildings Program has been working hand in hand with industry, academia and other partners to develop research and development plans (roadmaps) for each segment of the building industry. While the roadmapping process is substantially complete, continued funds are still necessary for competitively awarded research and development activities proposed by partners. Although it is expected that all areas of DOE's contract R&D are will be openly competed, the call for proposals should focus on cross-programmatic research and innovative technology development not necessarily included in the roadmaps. Projects should be evaluated on the basis of energy savings, industry participation, cost realism and the capabilities of the proposer.

Residential Building Integration (\$18.0 million)

Recent research and development activities have shown that energy efficiency and cost efficiencies can be gained through innovation in the homebuilding industry. DOE and industry have undertaken a residential buildings roadmap, from which a residential research and development agenda emerged. Funding is expected to focus on the Building America program and residential technology integration into all types of homes. This will include basic research and development on systems within the house, technology transfer to the building industry and demonstration of systems in both individual homes and whole developments. The program has historically provided improvements in efficient and sustainable technology and techniques and

should continue to try to reach out to the building community. Some funding should be used to support the upgrading of voluntary residential building energy codes.

Commercial Buildings Integration (\$10.0 million)

The way in which buildings are assembled and integrated is critical for reducing energy use and thus the cost of the U.S. building stock. The commercial buildings roadmap, completed in calendar year 1999, has delineated a research agenda that focuses on working with the design and construction community, developers, owners and operators, and equipment companies to increase the efficiency and usability of the Nation's commercial buildings. Integration, use of on-site CHP, and advanced technologies are expected to figure centrally in the cost shared research. Additionally, indoor environment assessment, use of passive solar and testing of new technologies with particular developers should be undertaken. Building commissioning and diagnostic tools development are important areas that should receive greater emphasis. Commercial building codes should also be part of this area of funding.

Building Equipment, Materials and Tools (\$80.0 million)

The DOE program works closely with manufacturers and others to ensure development of the most efficient and affordable equipment for America's buildings. The Sustainable Energy Coalition is encouraged by the roadmapping that has taken place and is beginning to provide results. The research agendas are shaping up to be cooperative, multi-partnered efforts that will provide benefit to the industrial partners as well as to society as a whole. The Coalition would like to see more robust efforts in lighting, HVAC (including duct sealing), roofing materials, appliances, and advanced windows areas.

The Sustainable Energy Coalition is pleased that its FY 2001 recommendation was taken to heart and DOE has now combined its HVAC program, including the fuel cell micro-cogeneration program and natural gas cooling program into a single, combined cooling, heating and power initiative. These efforts are also being closely coordinated with industrial combined heating and power to reap the benefits of crosscutting activities. While we feel this is a very positive and significant step, we would like to additional emphasis in this area on systems integration, including development of plug and play controls, integrated, packaged systems, design tools and educational outreach. Combined cooling, heating and power in buildings has the ability to bring efficiencies up to 85 percent and can be one of the most effective means of mitigating environmental damage,

In the codes and standards area, the DOE has committed to an aggressive schedule for issuing a number of new appliance standards. Sufficient funding will be necessary to complete the analyses and rulemakings and update test procedures. New standards on clothes washers, water heaters, central air conditioners and heat pumps, and fluorescent lighting ballasts, scheduled to be issued in 2000, could result in 0.6 quads of energy savings by 2010 and over \$15 billion in net cost savings for consumers.

State Energy Program (\$44.0 million)

The grants portion of the Energy Efficiency budget is very important for ensuring that energy efficiency is available throughout the economy, as well as assisting in technology transfer to ensure that the benefits of federal investments are realized on behalf of U.S. consumers. The State Energy program leverages large amounts of non-federal governmental and private financing to improve energy efficiency and promote renewable energy throughout all sectors of the economy. Innovative projects have operated in every state for homeowners, small businesses, the agricultural sector and more. With the restructuring of the electric utility industry and subsequent disappearance of demand side management programs, these programs have become even more important.

Weatherization Assistance Program (\$177.0 million)

The Weatherization Assistance Program helps improve the energy efficiency of over 60,000 residences of low-income Americans each year. A recent study by Oak Ridge National Laboratory showed dramatic savings of over 23 percent annually in space conditioning energy use for each weatherized residence. This program helps senior citizens, the disabled, and other low-income Americans make their residences more affordable in both warm and cool climates. This may become increasingly important as current patterns of utility restructuring indicate that electricity prices for low income consumers may very well increase – not decrease.

Community Partnerships (\$33.0 million)

The Community Partnerships Program provides information and technical and financial assistance to communities to increase their use of innovative and cost effective building technologies, strategies, practices and codes. Goals should include recruiting new Rebuild America partners and communities, developing tools for implementing new voluntary commercial and Federal commercial energy codes, assisting school districts, and upgrading energy codes. Additionally, the Partnership for Technologies in Housing (PATH) should be funded to provide information and outreach on energy efficiency reduction of waste and better building practices in the residential market. The Sustainable Energy Coalition further encourages support of the Cool Communities Program within the Community Partnerships activity.

Energy Star (\$8.0 million)

The Sustainable Energy Coalition believes Energy Star to be one of the most effective programs for getting advanced technologies into the mainstream retail market. In FY2002, the program should focus on phasing in new qualifying levels for refrigerators, promoting Energy Star products in more than 4,000 new retail stores, and by thirty new utility companies, and increase Energy Star window partners by at least 200 partners. The DOE should also work to get the Energy Star label incorporated into the FTC label by manufacturing partners.

Management and Planning (\$15.0 million)

The SEC believes it important that the DOE has adequate resources for administering these programs. Funds under this category should be used to support planning and evaluation activities, as well as for other tasks essential to prudent and effective management.

Other Programs (\$8.0 million)

This category of funding includes cross-cutting science research, a competitive solicitation for innovation in energy efficiency, and the State program. Additionally, international activities that cut across the various technologies in Buildings should also be funded from this area. The President's Council of Advisors on Science and Technology (PCAST) recently recommended a substantial expansion of U.S. international cooperation on energy efficiency R&D and deployment. In particular, PCAST calls for an investment of \$60 million across the government for four areas: buildings and appliances, transport vehicles, advanced industrial processes and combined heat and power. The SEC supports this initiative and urge that half of this amount be distributed to the DOE for the four activities.

Industrial Sector Budget Request (\$215.0 million)

The industrial sector accounts for 37 percent of U.S. primary energy use and 33 percent of carbon dioxide emissions. DOE's Office of Industrial Technologies (OIT) is working with industries to improve their energy efficiency, environmental performance, and productivity. OIT has a very strong track record for developing and delivering new technologies that are cutting energy use, waste generation, and emissions. OIT has tracked the results and impacts of over 100 completed projects which together have saved about 1.0 Quads of energy, cut industrial energy costs by \$2.1

billion, and eliminated 80 million tons of carbon dioxide emissions. Funding for OIT should be increased in order to achieve even greater benefits in the future.

Industries of the Future (Specific) (\$93.0 million)

The Industries of the Future (IOF) specific program is working with nine industrial sectors including all major energy-intensive manufacturing sectors on innovative technologies that would cut energy use, cut waste generation and pollutant emissions, and improve productivity.

Additional funding above the FY 2001 request is recommended for key advanced technologies such as biomass and black liquor gasification with the paper and pulp industry, new electrolytic cells with the aluminum industry, and direct iron-making with the steel industry. Additional funding also is needed to expand new programs with the mining and agricultural sectors.

Industries of the Future (Crosscutting) (\$103.0 million)

The IOF crosscutting program covers a wide range of activities including R&D of enabling technologies such as new materials, combustion and cogeneration technologies, and technical and financial assistance. The program has already helped to develop and commercialize new ceramic and composite materials as well as an advanced industrial turbine. Also, the assistance programs are playing a very useful role in demonstrating new technologies and educating industrial consumers. Continued emphasis on improvements in microturbines and engines should be combined with a systems integration (combined heat and power) approach. Additional funding above the FY2001 request should be dedicated to R&D on new materials and micro-turbines, the successful Industrial Assessment Centers program, and the Combined Heat and Power Challenge program.

Management and Planning (\$11.0 million)

The SEC believes it important that the DOE have adequate resources for administering these programs. Funds under this category should be used to support planning and evaluation activities, as well as for other tasks essential to prudent and effective management.

Other Programs (\$8.0 million)

As within the Buildings program, these funds are for cross-cutting science research and development funding, which is a competitive solicitation, as well as the State program. Increases in the international programs, per the President's Council of Advisors on Science and Technology (PCAST) recommendation, should also be funded in this area. In the industrial area, international funding should focus on industrial process activities that increase energy efficiency both in the U.S. and abroad.

Transportation Sector Budget Request (\$287.0 million)

The transportation sector accounts for 27 percent of U.S. primary energy use and 32 percent of carbon dioxide emissions. DOE's Office of Transportation Technologies (OTT) supports the development and adoption of innovative vehicles and fuels that would cut petroleum use, reduce criteria air emissions, and reduce greenhouse gas emissions. A major focus is the Partnership for a New Generation of Vehicles (PNGV), which is attempting to develop a production ready car capable of getting 80 mpg. The program also addresses issues pertaining to alternative fuels as well as the development of light, medium and heavy duty vehicles able to run on alternative fuels.

Vehicle Technologies R&D (\$179.0 million)

This is the largest portion of the program that covers R&D for a wide range of technologies. The Coalition recommends greater funding (relative to the FY2001 request) for R&D on fuel cell system and hybrid vehicles since they show great promise for delivering both significant fuel savings and emissions reductions. The Coalition supports greater R&D on cleaner and more

efficient heavy vehicle technologies and recommends de-emphasizing funding for R&D on diesel engines for light vehicles (cars and light trucks) since these engines are not likely to meet future emissions standards. The R&D program needs to focus on accelerating the scale up of fuel processors with PEM fuel cell stacks, sensors, controls and management systems, that would be automobile sized systems that incorporate renewable fuels.

Fuels Utilization R&D (\$25.0 million)

The Coalition recommends placing greater emphasis on R&D of alternative fuels within this program and less funding for R&D on advanced petroleum fuels. In the alternative fuels area, the focus should be on improving the efficiency and reducing the emissions of alternative fuel vehicles—both light vehicles and medium-duty and heavy trucks.

Materials Technologies (\$47.0 million)

The program funds important R&D on new engine materials as well as materials and techniques for reducing vehicle weight. Funding should be expanded relative to the FY2001 budget request particularly on lightweight materials R&D, in areas such as composite materials and greater use of aluminum I vehicles. The program should continue its work with industry partners to reduce the costs and weight of vehicles through the development of new materials.

Technology Deployment (\$20.0 million)

This program includes initiatives such as the Clean Cities program, which works with state and local governments, to promote the purchase of alternative fuels and fuel-efficient vehicles. During 2000, applications for funds exceeded funding by more than 10 times. This trend is expected to continue as our urban areas focus increasingly on pollution issues and as alternative vehicle technology become more accessible. Some new funding should be dedicated to testing, promoting, and purchasing top-rated fuel-efficient vehicles by fleet purchasers, as well as the general public.

Other Programs (\$6.0 million)

As within the Buildings and Industrial programs, these funds are for cross-cutting science research and development funding, which is a competitive solicitation, as well as the State program. Increases in the international programs, per the President's Council of Advisors on Science and Technology (PCAST) recommendation, should also be funded in this area. In the industrial area, international funding should focus on technology transfer of efficiency vehicle technology, infrastructure and methodology.

Management and Planning (\$10.0 million)

The SEC believes it important that the DOE have adequate resources for administering these programs. Funds under this category should be used to support planning and evaluation activities, as well as for other tasks essential to prudent and effective management.

Federal Energy Management Program (\$32.7 million)

The Federal Energy Management Program in DOE is responsible for providing project financing and technical assistance to Federal agencies in meeting the twin federal goals of reducing energy use and the emissions produced by federal buildings. The Coalition believes that in the short-term the program should focus on ensuring the expeditious processing of energy savings performance contracts with private sector entities who have come forward with both financing and technical expertise to improve the federal building stock. Additionally, DOE should continue to perform its education and training role in support of Federal energy managers and contract personnel alike. In this capacity, FEMP must continue to issue technology alerts, provide feasibility studies and energy audits, provide funds for equipment purchases and advocate the further integration of renewable energy technologies into the Federal building sector.

Policy and Management Budget Recommendation (\$53.0 million)

The Office of Policy and Management provides analytic support to the other energy efficiency sectors and integrates research and development across various programs. The Coalition is pleased to see increased cooperation between sectors, particularly on distributed generation/combined cooling, heating and power activities and encourages sufficient funding to continue this trend. Two programs, in particular, warrant special mention within Policy and Management.

\$5 million should be dedicated in FY2002 to the Information and Communication Program. This program provides the link between research and development and the public by disseminating information on energy efficiency and renewable energy technologies via a telephone hot line (the Energy Efficiency and Renewable Energy Clearinghouse – EREC) and a website (the Energy Efficiency and Renewable Energy Network – EREN). Full funding would enable EREC to respond to over 100,000 in-depth phone calls per year. Both EREC and EREN should develop more customer-oriented materials to meet increased consumer demand. Adequate funding to keep up with the rapidly changing technology of the Internet and to better integrate programs and applications is strongly recommended. EREN and EREC should serve as the centralized information sources for all energy efficiency and renewable energy programs, providing public information and technical support for all sectors.

Additionally \$ 5 million should be dedicated to the International Market Development program, which provides critical assistance to both the U.S. energy efficiency industry and developing countries by promoting the export of energy efficient technologies abroad. These programs enable information exchange and facilitate the connection between U.S. companies and foreign governments and businesses, helping to target and create key markets for domestic goods, while assisting new economic players to develop efficiently and in an environmentally sound manner. Since its inception the program has successfully increased energy efficient exports to Asia and Latin America.

DOE Renewable Energy Program
FY '02 Budget Recommendations
\$719.5 million

Federal investments in sustainable energy have resulted in the development of a host of technologies poised to make a major contribution to several of today's most perplexing and persistent problems including:

- a deteriorating environment;
- national dependence upon petroleum reserves that are in environmentally or politically sensitive and unstable areas;
- the New Economy's need for uninterrupted power;
- price and supply problems associated with deregulating the electric utility sector;
- price and supply problems resulting from corporate decisions more attentive to the "bottom-line" than to the public's welfare; and,
- the inability of the utility infra-structure to keep up with economic growth and the growing importance of distributed generation.

Problems of the environment, supply/price and national security have become standard accoutrements of the modern energy sector. Many of today's issues are simply more recent versions of the circumstances resulting in the supply (and price) crises of the 1970s. Because the often competing environmental and economic demands placed upon public policymakers, consumers and private investors are unlikely to change in the foreseeable future, many of tomorrow's challenges will simply be variations of today's themes. Sustainable energy alternatives are not an immediate cure-all, however, they do offer the capacity to ease present symptoms and to contribute to the ultimate cure.

Had national political leaders in the 1970s not made the investments they did in solar, biomass, wind and other renewable energy technologies, answers to these problems would be years more away from development. If tomorrow's challenges are to be met successfully, then today's national decision-makers must be willing to continue that investment. Becoming a sustainable society requires the cooperation of both the public and private sectors and the involvement of governments at all levels. It requires a stable commitment from public and private investors and the development and implementation of measured steps towards realistic and achievable goals.

The following SEC proposals recommend continued support for basic research and development based upon both the performance and potential of sustainable energy technologies. Recommendations are as well being made to increase support of state and local governments that are grappling with historic changes within the electric utility sector and increased responsibility in environmental matters. As importantly these proposals recognize the growing need of consumers for information in an era of deregulation.

The Sustainable Energy Coalition believes that the following recommendations appropriately build upon the progress already made and accurately reflect new directions that may be profitably taken. Most of all the Coalition believes that these recommendations reflect the importance placed upon energy and the environment by voters and serve as the basis for a successful bi-partisan strategy for addressing some of today's most pressing and persistent problems.

Wind Energy (\$55.0 million)

Status And Potential

The recommended budget would provide continued funding for this valuable cost-shared industry/government partnership. This federal program has been very successful in lowering the cost of wind energy by more than 80 percent since the early 1980's. Today, utility-scale wind energy prices are in the range of 3 to 5 cents per kilowatt-hour. Continued efforts through DOE's wind energy program are aimed at achieving costs in the range of 2.5 cents per kilowatt-hour.

Budget History

In FY2001, the wind budget received its first significant increase in 5 years. Included in the funding level was not less than \$5 million for small wind systems (rated at 100 kilowatts or below).

Program Emphasis And Justification

Continued federal funding should be used to support DOE's wind energy program, including: a comprehensive wind energy research program; wind turbine research; and support for the development of utility, industry, and international wind energy projects.

Specific goals of the program should be to:

- develop advanced wind turbine technologies by 2002 capable of bringing the cost of wind energy into the range of 2.5 cents per kilowatt-hour
- establish by 2005 the U.S. wind industry as an international technology leader with 25 percent of world capacity
- achieve 10,000 megawatts of installed wind generating capacity in the U.S. by 2010

DOE's Wind Powering America Initiative, a program to promote the increased use of wind energy throughout the country, also should be funded with a portion of the proposed appropriations. The goals of this initiative are to:

- supply at least 5 percent of the nation's electricity needs with wind power by 2020
- double the number of states with more than 20 megawatts of wind capacity by 2005, and
- increase the federal government's use of wind generated electricity to 5 percent by 2010

Additional funding should be used to aid the small wind program at DOE. Small wind turbines, suitable for rural homes, farms and small businesses, have a high market potential with improvements in technology and reliability. The program has received little attention at DOE compared to the large wind turbine program belying the potential and importance of this market sector.

Concentrating Solar Power (\$25.0 million)

Status And Potential

Concentrating Solar Power (CSP) can provide both heat and power for baseload energy demand. The three primary CSP technologies that are emerging today are: solar troughs; solar-driven dish/engines; and concentrators for creating new materials and detoxification applications, such as removing pollutants from water. Using energy storage technology and hybrid designs, CSP systems provide high-value power from renewable resources, allowing for energy production even when the sun is not shining. CSP systems ranging from several kilowatts (dish systems) to multi-megawatts (troughs and towers) are expected to contribute over 5000 megawatts of

electricity worldwide by 2010 and eliminate 1.3 million metric tons of carbon annually in the U.S. alone.

Budget History

In FY 2001, the CSP program was allocated \$13.8 million, \$1.2 million below the requested level. This level is only slightly below the previous year's allocation, with the power tower program eliminated altogether.

Program Emphasis And Justification

Of the proposed \$25 million budget, a portion (40-50 percent) should be reserved for basic research and technical assistance directed by industry but administered through the national laboratories and universities. Of the remainder a portion should be cost-shared directly with U.S. industry for applied research, development, and deployment. DOE should develop cooperative technology validation projects funded in collaboration with state and local governments in an effort to speed the commercialization process and to make these technologies available to consumers.

Funding should be used to: achieve a mean time between failure rate of 4,000 hours for field-tested dish/engine systems; develop and test thermal storage techniques for trough systems; field test dish/engine systems in a variety of user environments; and to scale-up efforts to field-test the ability of advanced trough components to generate power for less than 10 cents per kilowatthour.

Photovoltaics (\$100.0 million)

Status and Potential

The recommended budget for Photovoltaics RD&D would provide the resources necessary to build upon the achievements of this DOE program. Between 1995 and 2000, the cost of PV was halved, an achievement not equaled by many emerging technologies. Significant cost reductions has prompted a threefold growth of the industry in less than a decade. By 2005, the costs of PV can be halved again, making it competitive with all other distributed electricity options available in the US marketplace. The potential of photovoltaics, quite simply, is a cost-competitive sustainable energy resource within the next decade.

Budget History

In FY2001, the Photovoltaics RD&D budget received an increase in funding. In part, the increase was due to effective program management and goals in developing new materials, overcoming technological hurdles in automation, creation of new building-based materials, and achieving increased efficiencies keeping the U.S. a world leader technologically.

Program Emphasis and Justification

Continued federal funding should be used to enhance the diversity and success of the Photovoltaics RD&D program in key RD&D areas of new materials development (thin film partnership), new building materials (building integrated photovoltaics, breakthroughs in manufacturing technologies (pv manufacturing initiative) and deployment validation through a host of enduse collaboratives.

Specific goals of the program should be to:

- develop integrated materials for the outer shell of buildings to further reduce material and installation costs;
- increase output and manufacturing efficiencies through cost-shared RD&D projects;

- stimulate the creation of technology validation partnerships to increase confidence by endusers that photovoltaics can viably and cost-effectively meet real needs

Having met its goals and objectives over the past years the DOE program offers a proven opportunity for government and industry to cooperate in the creation of a competitive domestic industry. The events of 2000 suggest the importance of sustainable energy alternatives to both the economy and the environment.

Solar Buildings (\$12.0 million)

Status and Potential

The recommended budget would provide continued funding for one of the few federal RD&D programs that provides a series of renewable energy technological options for homeowners and apartment owners. Among its achievements the federal program has successfully established performance and certification criteria that can predict actual performance of solar water heating systems and improve their efficiencies while lowering unit costs. Additionally, the new program direction has resulted in large-scale home builders integrating a host of solar, energy efficiency and renewable technologies into their designs.

Program Emphasis and Justification

Continued federal funding should be used to enhance the new direction of the Solar Buildings RD&D program, specifically driving RD&D into Zero Energy Buildings technology integration.

Specific goals of the program should be to:

- develop integrated technology packages that builders can install that when integrated into a mortgage, can provide energy competitive in today's market;
- establish by 2005 an integrated solar thermal, solar electric, passive solar design, and blended technology interface with energy efficiency and other renewable-based and natural gas technologies;
- meet the domestic million solar roof target; and,
- implement the Zero Energy Buildings RD&D Initiative, a program to promote and make economically feasible, an amalgam of affordable renewable energy building technologies.

Distributed Generation (\$12.0 million)

Status And Potential

The Distributed Power program at DOE is emerging as a strong, new initiative. Because of electric utility restructuring, competition, and increasing customer choice in the electric industry, the advancement of modular generation like photovoltaics, fuel cells, microturbines, and other technologies, distributed power is seen as an effective new energy service option for consumers. Moreover, distributed generation technologies promise to improve environmental quality and lower future electric costs as they avoid the need for expansion of the infrastructure needed to support centralized generating facilities.

Budget History

The distributed power program was established in January of 1999 and has received funding of \$3 million per year for the last two years. Distributed generation could have a significant near-term impact on problems prompted by economic expansion and electric utility restructuring if greater federal programming efforts were undertaken.

Program Emphasis And Justification

A budget of \$12 million per year would support the distributed power program goal to be captured an electricity market in which customers can sell power, employ load management, and provide operations support services to the grid as easily as a utility. Program funds should be used to support; systems research of advanced system control, and systems integration with field performance testing to identify issues and provide solutions for integrating small modular generation and storage technologies into the electric distribution system. In addition, the program should undertake demonstrations of hybrid systems with a goal of integrating combined heat and power. Tools should be developed to evaluate the efficacy of both combined heat and power and distributed generation. Institutional and infrastructure barriers to the deployment of distributed power systems can be addressed through cooperative work with industry and state and local governments. Finally, education of consumers and other stakeholders will be critical for distributed generation to gain a foothold in the electric market.

Fuel Cells (\$57.5 million)**Status And Potential**

Fuel cells combine significant fuel savings with emissions reductions, thereby promising to become one of the most attractive energy options of the future. The past two years have seen major achievements in DOE's fuel cell programs, as well as strong private sector interest. High risk R&D in the transportation program has not only achieved success in automotive applications but has also jumpstarted US industry competitiveness in buildings, small stationary and portable power applications. The 2002 programs will continue to build on these successes. Fuel cell programs are a wise investment in a sustainable energy future offering the ability to utilize alternative and renewable fuels, high efficiency, low emissions and energy security for the nation.

Program Emphasis And Justification

The SEC is proposing \$52 million for transportation programs and \$5.5 million for building applications. Federal investment in transportation fuel cells is one of the great success stories of the past decade--providing leadership and vision when fuel cell power passenger vehicles were widely regarded as fantasy. Fuel cell vehicles are expected to achieve double or triple the fuel economy of today's passenger vehicles, while allowing a transition to cleaner fuels. The dramatic progress achieved in the DOE program has drawn significant private sector interest and funding.

The proposed level of \$52 million would better enable the existing transportation programs to pursue and expand various cost reduction strategies, systems tests, and evaluations. Despite the increase in private investment, the DOE program continues to play a crucial role for U.S. industry. Current market pricing of fuels and vehicles, consumer preferences, and the risks associated with fuels and vehicle R&D provide little incentive for the private sector to invest in fuel cell technology unilaterally. The transportation program bridges this gap by supporting high-risk research and development to help bring fuel cell vehicles to eventual commercialization.

There is an international race under way. DOE's investments in U.S. industry foster competition as they help to drive down costs and improve performance. Moreover federal support of the US industry helps to achieve parity with foreign corporations supported by their respective governments. The program has already paid off handsomely. This modest additional investment will build upon that success.

The Fuel Cells in Buildings program is designed to take advantage of the advances made in the transportation program to develop fuel cell systems for homes, apartments and commercial buildings. This is an area of potential explosive growth for the fuel cell industry. The modest DOE program supports technology development and customization to meet the special needs of

buildings. The program also supports the development of fuel cells as combined heat and power systems, utilizing the heat generated by the fuel cell to achieve even higher energy efficiencies.

By maintaining the current funding of \$5.5 million, the building program can focus on solving the technical, institutional and regulatory barriers that currently impede usage of fuel cells in buildings and in a combined heat and power system.

Biofuels Energy Systems—Transportation (\$60.0 million)

Status And Potential

The Biofuels Energy Systems program supports research, development and demonstration of technologies to produce and convert cellulosic biomass materials to liquid transportation fuels, focusing on the production of ethanol. Biofuels provide a means of diversifying the fuel base with a domestic renewable fuel and are viewed as the most feasible supply side transportation option to significantly reduce carbon emissions by the year 2020.

Budget History

In FY 2001, biofuels received \$46.16 million, an increase of nearly 19 percent over fiscal year 2000 funding (\$38.9 million).

Program Emphasis And Justification

We are proposing a budget of \$60 million per year. This appropriation level would allow the biofuels program to meet its goal of developing and demonstrating technologies capable of producing 2.2 billion gallons of cellulosic ethanol at \$1.02 per gallon by 2010 and support the requirements in Executive Order 13134 and the National Sustainable Fuels and Chemicals Act (PL 106-224). Ethanol production costs could become competitive in the oxygenate market using low cost biomass. The budget recommendations include support for leveraged partnerships with industry involving the operation of ethanol facilities using biomass wastes and one with the corn ethanol industry to complete testing of ethanol production with corn stover.

Biomass Power (\$50.0 million)

Status And Potential

Biomass Power Systems program supports the development of advanced conversion systems capable of using biomass-derived fuels more cleanly and efficiently. Success would result in a domestic renewable energy supply offering vital economic stimulus to rural America. Through the integration of feedstock and power conversion systems, biomass can provide baseload electricity that is cost competitive and significantly better for the environment than conventional fossil fuels.

Budget History

In FY 2001, biomass power received \$40 million, an increase of nearly 25 percent over fiscal year 2000 funding (\$31.8 million.) Because of budgetary limitations, however, the actual amount of funding received by the program was significantly less.

Program Emphasis And Justification

We are proposing a budget of \$50 million per year. This proposed budget level would allow the biomass power program to ramp up research and development activities at a time when readily available alternatives to petroleum are needed. The proposed increases would as well compensate the programs for funding they did not receive in the prior year and support the requirements of the National Sustainable Fuels and Chemicals Act (PL 106-224).

By 2010, biomass power could provide an additional 3000 megawatts of electric capacity in the U.S., increasing the total contribution of this sustainable energy supply to 10,000 megawatts of capacity. The three major technology areas include: co-firing biomass with coal and natural gas; small modular biomass systems; and advanced biomass gasification. Modifying coal plants to derive 3-15 percent of their fuel requirements from energy crops and other biomass sources will significantly improve the environment while offering U.S. farmers with new market opportunities. The Small Modular Biomass Initiative can help bring viable biomass systems (less than 5 megawatts) into the marketplace in the near term reducing pressures to expand the central grid. Strong emphasis should be placed on the Biomass Power for Rural Development program with more than 100 megawatts of new capacity waiting installation. Research in advanced gasification technologies is beginning to show success; these technologies can play a stronger role in the long term, producing electricity at up to twice the efficiency and with fewer emissions than direct-fired biomass systems.

Federal Energy Management Program (\$5.0 million)

Status And Potential

Previous funding for renewable energy projects at federal facilities has led to the installation of over 400 pieces of renewable energy system hardware. The use of these technologies saves the Federal government over \$1 million annually in conventional energy costs, reducing conventional energy consumption by at least 8 million kilowatt-hours per year, and reducing the amount of annual carbon emissions associated with energy use by more than 2400 metric tons.

Budget History

While most of the Federal Energy Management Program (FEMP) is funded in the Interior appropriations bill (see Energy Efficiency Budget section), in FY 1999 and 2000, Congress appropriated \$3.7 million to the DOE to help Federal agencies purchase renewable energy systems and related equipment. In FY 2001, DOE requested funding for the DOE energy management program rather than for continuing to develop these renewable energy projects. This line was appropriated \$2 million and projects were given no funding.

Program Emphasis And Justification

We propose funding FEMP at a \$5 million level in Energy and Water. The allocation should be dedicated to developing renewable energy projects at federal sites and to purchasing green-electricity. The types of renewable energy systems purchased with these funds could include solar water heaters, solar electric (photovoltaic) energy systems, geothermal heat pumps, wind systems, and ventilation-air preheating units, among others. These installations will help the Federal government reduce costs and meet the provisions of various energy-related laws calling for increased energy efficiency and greater use of cost-effective, nonpolluting, renewable energy technologies in government facilities, including the purchase of green-electricity. Previous year funding has been awarded to agencies whose facilities serve Native American populations; additional awards could further create economic opportunities in tribal communities as well as provide clean energy systems. This program has been a valuable source of funding for Federal agencies that want or need to acquire renewable energy systems. As has been done in previous years, each installed project would be documented for future reference and replication.

Green Power Insurance (\$5.0 million)

Status And Potential

The green power insurance initiative has been vetted with renewable energy industries and investors. While most agree that it is a good idea, no formal program has been established at the DOE. We believe that, with modest investment, this program could leverage 1000 to 2000

megawatts of new private-sector funded renewable energy projects over the next five years. This would increase expected renewable energy projects by 30-50 percent during this period. This approach works well in areas where renewables mandates do not exist, thus promoting “free market” development of clean energy generation.

Budget History

To date, Green Power Insurance has been funded at approximately \$2 million total over the last two years by cross-cutting dollars within specific renewable energy R&D funds. A more appropriate place for funding this program would be in its own line item. The effectiveness of this program could then be measured separately and a determination made as to the veracity of continued funding for green power insurance.

Program Emphasis And Justification

We propose a \$5 million annual budget, to sunset at the end of five years. By combining federal with matching state funds, this program would provide insurance that can lower the risk for renewable resource developers and green power marketers. This insurance would provide a key portion of the security required by project developers as they work to gain financing for new renewable energy facilities. This initiative would ensure that the increasing number of consumers who choose clean power sources actually see these renewable energy projects develop and provide them with power.

Hydrogen (\$36.0 million)

Status And Potential

Hydrogen is an important energy option for the U.S. and the world. It has the potential to replace fossil fuels in nearly every sector of the economy and provide future generations with clean, secure and reasonably priced energy choices. Hydrogen can be produced from a variety of renewable-based options including biomass, solar and wind. The development of hydrogen energy technologies represents a large potential export market for the US that is just beginning to emerge.

According to an independent Hydrogen Technical Advisory Panel (HTAP), established by Congress and appointed by the Secretary of Energy, the goal of eventually utilizing significant amounts of renewable hydrogen energy in the transportation and electricity supply markets cannot be achieved in light of current funding levels.

Program Emphasis And Justification

Increasing the budget by 20 percent to \$36 million would reflect the growing worldwide interest in hydrogen as a motor fuel and continue to provide a strong base upon which hydrogen technology research and validation can continue to develop. Hydrogen faces the chicken-and-egg problem familiar to other new energy technologies: the inability to achieve economies of mass production with low initial demand. To achieve marketplace penetration, a unique set of problems must first be resolved involving the production, storage and utilization of hydrogen. Specific research needs include improving renewable-based production technologies, improving storage technology, adapting internal combustion engines to run on hydrogen, and integrating new pumps, seals and safety criteria

The DOE’s Hydrogen Program continues to address these challenges through partnerships with national laboratories, universities, and private companies. In recent years the Hydrogen Program has not only experienced growth in the number of core R&D projects, but also has begun expanded efforts to validate and demonstrate the technology in various projects. Industry participation and cost sharing are important facets of this growth and have resulted in the

formation of strong links between government and industry. The SEC recommends strengthening these links through support for new partnership efforts.

Industry is investing substantial amounts in the development of hydrogen technologies necessary for fuel cell applications. The world automobile industry alone has spent more than one billion dollars to develop a cost-effective fuel cell. GM has plans to eventually manufacture more than a million fuel cell vehicles, while the Chairman of Ford states that fuel cells “will end the 100-year reign of the internal combustion engine.” The stationary power industry is focused on utilizing hydrogen fuel cell systems to deliver clean, quiet, and cost-effective premium electricity.

Geothermal (\$60.0 Million)

Status And Potential

Geothermal energy supplies about 6 percent of the electricity in California, 10 percent of the power in Northern Nevada, about 25 percent of the electricity for the Island of Hawaii (the Big Island), and significant power in Utah. These states together with Arizona, Colorado, Idaho, New Mexico, Oregon and Washington could produce nearly 20,000 megawatts with enhanced technology. U.S. geothermal technology also results in significant export business. Currently, the U.S. geothermal industry enjoys a lead in the international market, but has stiff competition a market that could exceed \$25 billion over the next ten to fifteen years.

Program Emphasis And Justification

In recent years, the program has been funded at about one-half of what internal multi-year plans and outside reviews indicate would be a warranted funding level. The geothermal energy Strategic Plan, the National Research Council review, and the geothermal industry all support an annual budget level of roughly \$60 million for geothermal energy research and development. This budget level also would be consistent with recommendations made in 1997 by the President’s Committee of Advisors on Science and Technology (PCAST). The SEC is recommending a similar amount for FY 2002.

Critical technical needs include the development of advanced drilling, exploration and reservoir sensing, energy conversion and metals recovery, and enhanced reclaimed water injection. The recommended \$60 million for DOE Geothermal programs should be directed predominantly towards implementing the Department’s Strategic Plan through cost-shared activities that will expand geothermal energy production in the west, including exploration, drilling, resource characterization, injection and reservoir enhancement.

1. Ten million dollars (\$10 million) should be appropriated for the Federal Geothermal Loan Guarantee Program (30 USC 1141) to support development of new small power projects, commercial and community district heating and direct use projects, and combined direct-use and power facilities.
2. Fifteen million dollars (\$15 million) of the renewable energy funds allocated to Basic Energy Sciences should be directed towards establishing an earth sciences center of excellence, with a specific mission to engage in the long-range, breakthrough research needed to dramatically expand our ability to identify and access geothermal resources. This level of funding for the center should be guaranteed on an annual basis for at least the next five years.

Enhanced geothermal technology research would have numerous benefits. With sustained funding federal programs could be expected to result in a tripling of domestic geothermal electricity production, supplying the needs of 18 million people in the US and to contribute 10,000 MW of power in developing countries, making geothermal technology the leading US energy export.

Resource Assessment and Restructuring Analysis (\$14.0 million)

Status And Potential

The Resource Assessment program at the National Renewable Energy Laboratory (NREL) and other national laboratories (such as Oak Ridge and Sandia) has been the DOE's primary activity for developing and disseminating information about renewable energy resources for the U.S. and the world. The program supports development of information describing the amount and characteristics of solar, wind, geothermal and biomass resources. By presenting data in maps and tables, this information can show how resources vary in different places and different years, days, and even hours. Knowing a region's renewable energy characteristics permits designers, planners, developers, and manufacturers of these technologies to make the most effective use of available renewable resources. Resource assessment provides that help. Resource assessment information has proven invaluable in opening up renewable energy markets around the world and has reduced reticence to use deploy renewable energy systems by removing uncertainties and reducing associated with new technologies.

Budget History

The Resource Assessment program has received no direct funding since 1997. The program has survived with modest contributions from DOE technology programs. The laboratories have also supported limited assessment activities through by contracting with developing countries and domestic businesses. The restructuring analysis component of the program has received annual funding of about \$1 million through internal resources within the Office of Power Technologies at DOE.

Program Emphasis And Justification

A budget of \$10 million budget for the resource assessment program is recommended. A program in advanced resources assessment and mapping techniques, coupled with high quality, reliable, long-term measurements, will build the knowledge base required by public and private planners to incorporate renewable energy resources into the mix of energy sources needed to power the economy, improve the environment and stabilize the spikes in price and supply that have come to characterize fossil fuels.

Understanding the potential contribution of renewable energy has become particularly important as states grapple with the complexities of opening their electric markets to competition and the environment. A strong analysis program can help them determine the appropriate policy measures to take in protecting consumers and the environment while sustaining local economic growth. The SEC is recommending that an additional \$4 million be appropriated for these analytical activities.

Hydropower (\$11.0 million)

Status And Potential

Hydropower is the nation's most available renewable resource – accounting for about ten percent of the United States' electricity. It is an emissions-free and very reliable source of energy. More importantly, hydro helps our nation meet its clean energy goals and reduces health problems associated with high levels of air pollution. Supply of hydropower is waning, however, and America is in danger of losing significant hydropower capacity at a time when it is most needed.

The DOE's Strategic Plan (September 2000) sets a clear course for meeting the nation's growing energy needs. That strategy calls for policies that "promote the development and deployment of energy systems and practices that will provide current and future generations with energy that is clean, efficient, reasonably-priced and reliable." Hydro meets all of these criteria.

Program Emphasis And Justification

For FY 2002, the SEC recommends funding at the level recommended by the 1997 President's Committee of Advisors on Science and Technology (PCAST) – \$11 million.

In the early 1990's, the Advanced Hydropower Turbine Systems (AHTS) program was initiated by industry with a request to DOE for matching funds. The goal was to develop advanced turbines and other systems to improve safe fish passage while maintaining the operational efficiency. This important program should be funded to its completion, including field verification. Completion of the program would:

- minimize environmental impact to aquatic life;
- increase facility efficiency – savings that can be passed along to the consumer;
- improve relicensing negotiations;
- lower government's regulatory enforcement costs;
- increase government revenue from idled federal projects that will benefit from this new technology; and
- encourage cooperation over conflict between industry, government and environmental advocates.

Consumer Education (\$25.0 million)**Status And Potential**

Rising prices for petroleum and short supplies of home heating fuels continue to threaten both national and personal economic well-being. Continued reliance upon foreign fossil fuel sources is harmful to the nation and to the environment. It is possible to alleviate the danger of fossil fuel reliance by increasing the use of sustainable energy alternatives, e.g., wind, biomass, geothermal, etc. Increased use of domestic sustainable energy technologies can also help to alleviate the types of pricing spikes seen in the California electricity market after deregulation.

Growing consumer support of green electricity programs offered by local utilities and independent power producers is evidence of the contribution that consumers are willing to make personally to national security and environmental quality. Although federal and state policies and programs are important, enlisting consumer support will greatly expedite the introduction of commercially successful sustainable energy products and designs.

Education plays an important part in consumer decisions. Most consumers do not really understand the relationship of petroleum, coal and nuclear energy choices and environmental quality. Educating consumers about the consequences of their choices and the alternatives available to them will expand the market for clean energy alternatives, improve the environment and leverage government investment in technological development.

Program Emphasis And Justification

We recommend that \$25 million be made available in the form of cooperative grants and contracts with state and local governments, universities and colleges, philanthropic foundations and other non-governmental organizations to support consumer education projects. Project decisions should be made on a competitive and cost-shared basis and designed to inform consumers of the relationship of their energy choices to environmental quality, as well as offering information on the many technological alternatives, including green-electricity, that are available.

As important as financial incentives consumer information can condition the private market to increase its demand for sustainable energy alternatives. An expanded domestic sustainable energy market would in the future help to protect the nation from the types of supply interruptions and price spikes recently seen in the petroleum and natural gas markets.

Renewable Energy Production Incentive (REPI) Program (\$20.0 million)**Status And Potential**

At the recommended FY 2002 budget request of \$20 million, most of the REPI projects for the first time since 1996, would receive nearly full payments for electricity generated from eligible renewable energy projects. This level would assist in reimbursing nearly 1 billion kWh of electricity that has been generated from renewable energy resources by program applicants.

Program Emphasis And Justification

Congress established the REPI program in large part to provide benefits commensurate with those available to investor-owned utilities through tax credits. REPI authorizes the DOE to make payments of 1.5 cents per kWh of energy produced from eligible renewable energy sources to consumer-owned electric utilities. Payments are completely dependent on annual appropriations.

The potential success of REPI is reflected in the increasing number of projects that have come on line – from 6 projects in 1995 producing 43 million kWh of electricity from renewable resources to 19 projects in 1999 producing more than 529 million kWh of clean electricity.

Funding shortfalls for the program began in FY1997. While tier 1 projects (wind, solar, geothermal and closed-loop biomass) have received adequate payments, all of tier 2 projects (methane-gas-to-energy) have received, most recently, only 5 percent of the eligible amount.

A fully funded REPI program would provide public power utilities a tremendous opportunity through methane gas recovery programs to reduce harmful greenhouse gases to the atmosphere. There is potential to reduce 39 million metric tons of carbon equivalent from the 600 potential new landfill gas to energy projects that exist.

International (\$20.0 million)**Status and Potential**

The overseas marketplace provides enormous opportunities for renewable energy technologies in general, and for U.S. industry in particular. The World Bank projects that energy consumption globally will double in the next 15 years, with the bulk of this growth to occur in the developing world. With 2 billion people in these countries - a staggering one third of the world's population - lacking access to modern forms of energy, and the increasing global pressures to provide this energy in an environmentally sustainable manner, a multi-billion dollar market exists for solar, biomass, hydro, geothermal and wind technologies.

The benefits of renewable energy in developing country markets are significant. These technologies are: environmentally beneficial; able in many instances be sited at the load without costly grid extension; competitive today for a variety of applications, and able to rely upon locally available resources, thus reducing fossil fuel imports and enhancing national security issues in host countries. Today, with a range of renewable energy and distributed options available, the U.S. can assist countries to identify and adopt the clean energy technologies that best reflect their needs and resources.

Program Emphasis and Justification

The DOE should support efforts, in cooperation with industry, to enhance U.S. market position in these overseas markets. In particular, DOE should:

- Institute a Secretarial level cooperative working agreement with the renewable energy industries to facilitate and support US market position.

- Establish an interagency working group (IWG) to work with renewable energy trade associations and their member companies to make more effective use of federal resources in strengthening the position of the U.S. renewable energy industry in a highly competitive global marketplace. This IWG will help enhance coordination and cooperation among federal agencies.
- Support the application of small-scale renewable energy projects using the Village Power Program to help establish partnerships between government, non-government and private sector organizations.
- Utilize national labs to assist and cooperate with industry in international resource assessment and verification of biomass, geothermal, hydro, fuel cells that use renewable sources of hydrogen or biomass, solar and wind energy resources.

Transmission and Distribution (\$14.0 million)

Status and Potential

Critical to the widespread use of renewable energy sources is the efficient and reliable transmission and distribution of large quantities of electrical power over substantial distances. In this way, the vast wind, solar, and geothermal potential found in more remote areas of the West can be captured and sent on to more heavily populated areas.

Increasing the efficiency of transmission and distribution systems is not a challenge unique to renewables. Competition in the electric utility sector will require significant improvements in the current transmission and distribution infra-structure if consumers and regulators are to be given cheaper choices.

Program Emphasis and Justification

To date, the DOE Transmission and Distribution program has concentrated on computer descriptions of our present transmission reliability problems. The program should be expanded to include potential hardware solutions, e.g., Aluminum Matrix Composite conductor replacements for present transmission cable and advanced, high speed, solid state switches for large quantities of electric power.

Current transmission technologies and practices result in electricity as it is sent from the generating facility to the end-user. The overall efficiency of US transmission and distribution system has gotten much worse just in the past few years. It is estimated, for example, that the inefficiency of the system has grown from 7 percent to 11 percent--or an increase in wasted electric generation of almost 50 percent! Much of this increase is attributable to restructuring decisions at the state level as competition will increase the need to transfer more power over longer distances.

The negative consequences of inefficient transmission and distribution are three fold: inefficiency requires the production of significantly more electricity than is needed; inefficiency places continuous upward pressure on retail price; and greater production levels and losses continue to threaten the environment. A relatively modest increase in DOE programs will result in near-term improvements that can significantly reduce these negative consequences.

Energy Storage (\$17.0 million)

Status and Potential

If widespread distributed generation is to become a reality, then better storage options are a necessity, in order to broaden the applications to those which are not grid-connected. Better storage options relieve the need for other, generally inefficient and environmentally harmful

alternatives (such as fossil fuels) for responding to the peak power demands of central station generators. Energy storage also is also important in a restructured electricity market for load leveling.

In an openly competitive market long distance wheeling will be prevalent; storage technologies can assist in leveling loads, thereby avoiding the potential problems posed by too great a demand being placed on the grid at any one time. Moreover, leveling loads can reduce overall electric rates. Power generated at peak times, e.g., 5pm-9pm, is more expensive than power generated at other times. Avoiding demand during these periods means paying a lower price.

Improved storage technology is also required to realize the full potential of renewable energy technologies, e.g., wind, photovoltaics and fuel cells. Improvements in storage technology, for example, will lead to the availability of electricity generated by photovoltaics even during periods of darkness.

Program Emphasis and Justification

The DOE Energy Storage budget is well below the level justified by the growing need for improved energy storage technologies. Application-specific storage options need to be pursued for use in conjunction with renewable energy technologies, e.g., wind and photovoltaics.

For geothermal applications, which are normally base load, advanced storage options can handle peaking requirements, thereby enhancing the prospects and applications for this renewable technology. Advanced battery options, such as lithium polymer batteries, need to be developed for such stationary applications. To date, the main thrust of battery development has been in support of transportation applications, which are very different battery designs from those needed stationary applications.

The program is in critical need of funding to cover component development of batteries for stationary applications particularly applications using wind and photovoltaics technologies. More work also needs to be done on energy storage systems/components that can be used by power providers in a restructured electric market.

One battery development using lithium technology is proceeding, and a program examining the stationary usage of Electric Vehicle batteries, after their useful EV life is over, is about to begin.

High Temperature Superconductivity (\$47 million)

Status and Potential

High Temperature Superconductivity is one of the most promising technologies in recent years. The technology has dramatic promise in all areas of the electricity marketplace, from generation to end use. It also has applications of dramatic significance in medicine, and communications. Superconductivity is the physical capability to transfer electricity from one point to another with no resistance, or in other words, with zero losses.

The ongoing DOE program has a base of technology development, examining second generation wire technologies, and several, competitive, Superconductivity Partnership Initiatives, each pursuing a different product, and each involving a utility, a national laboratory, an academic institution, and a potential product manufacturer. The program has won many R&D 100. Successes have been dramatic, and marketplace introduction in the reasonably near future is expected.

Program Emphasis and Justification

There is little question that superconducting technology will make a substantial impact on the way electric power is generated, transmitted, distributed, and used. Although the potential benefits of low temperature, superconducting materials have been known for some time, their widespread use has been precluded by the cost and energy required to achieve the very low temperatures of liquid helium and liquid hydrogen.

Superconducting properties were originally known to exist only at these very low and hard to reach temperatures. All this changed when, in 1986, eight new materials were found which exhibited superconducting properties at the temperatures of liquid nitrogen (77 K), a temperature far easier to achieve, and far less costly in energy and dollars than that of liquid hydrogen and helium. Since 1986, substantial R&D programs in the U.S., Europe, and Asia have pursued the utilization of these high temperature superconducting (HTS) materials and their use in common electrical equipment.

There are five classes of equipment being developed under the DOE program: electric motors, transformers, generators, underground cable, and fault current limiters. In each of these classes, major, international programs are now under way to develop and commercialize HTS equipment in a time frame from the present to the year 2020.

Environmental benefits from the installation of HTS technology accrue in two forms. First, the higher efficiency of electric generation, transmission, distribution, and utilization results in a lowered generated power requirement, resulting in lower greenhouse emissions to the atmosphere. Second, the highly efficient characteristics of HTS transmission and distribution (T&D) make it more viable economically to generate and transmit electricity from renewable resources.

Cumulative economic benefits are projected to be between \$61.2 billion and \$49.77 billion by 2020.

Other Federal Agencies

Although the bulk of federal funding for sustainable energy technologies is within the budget of the DOE, the Sustainable Energy Coalition believes that it is the duty of all federal agencies and departments to contribute where they can to improving the environment. Whether by applying sustainable energy technology and designs in their construction programs, assisting US companies to compete in overseas markets or buying electricity generated from renewable energy resources all federal agencies are in a position to help curb pollution and reduce greenhouse gas emissions.

Environmental Protection Agency (\$10 million)

EPA research and development programs should be developing analytical tools that assist public and private decisionmakers to quantify the environmental benefits of using sustainable energy sources and the cost of externalities attributable to fossil fuel use. As well EPA's Energy Star program should be expanded to include sustainable energy technologies like solar, photovoltaics, geothermal, fuel cells, etc.

Energy Star	\$ 5 million
Office of Research and Development (ORD)	\$ 5 million

Department of Defense (\$10 million)

Defense Advanced Research Program (DARPA)	\$10 million
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Department of Housing and Urban Development (\$ 4 million)

Office of Energy \$2 million

Partnership of Advanced Technology in Housing \$2 million

US Trade and Development Agency (\$5 million)

A fund in support of small projects and tailored to the project preparation needs of small businesses should be established.

Small Business Administration (SBA) (\$10 million)

SBA should be offering targeted assistance to renewable energy enterprises both domestically and overseas.

Department of Commerce (\$10 million)

National Institute of Science and Technology (NIST) \$10 million

USAID Renewable Energy Programs (\$25 million)

USAID should work in collaboration with industry to reduce market barriers to renewable energy in developing countries (policy, awareness, institutional and financing). Further, USAID should link renewable energy market development activities to non-energy sector programs in the areas of agriculture, health, micro-enterprises, water, etc.

Figure 1
U.S. Energy Consumption: 1970-1999

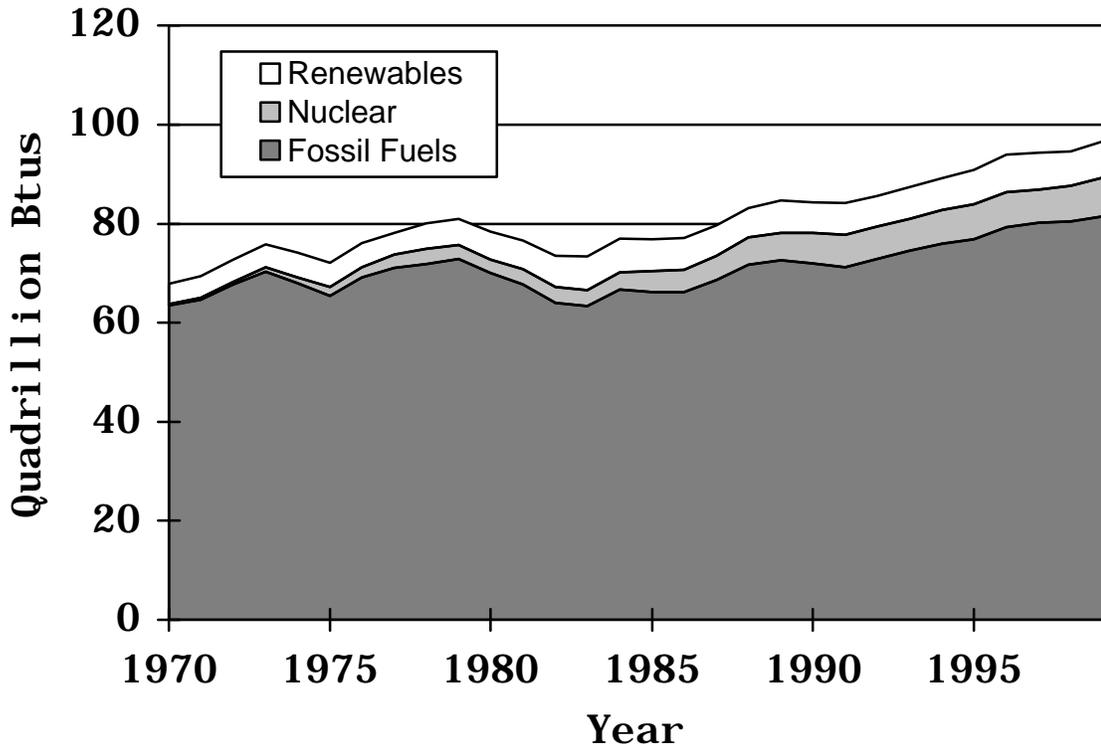


Figure 2
US. Energy Intensity Trend (E/GDP): 1970-1999

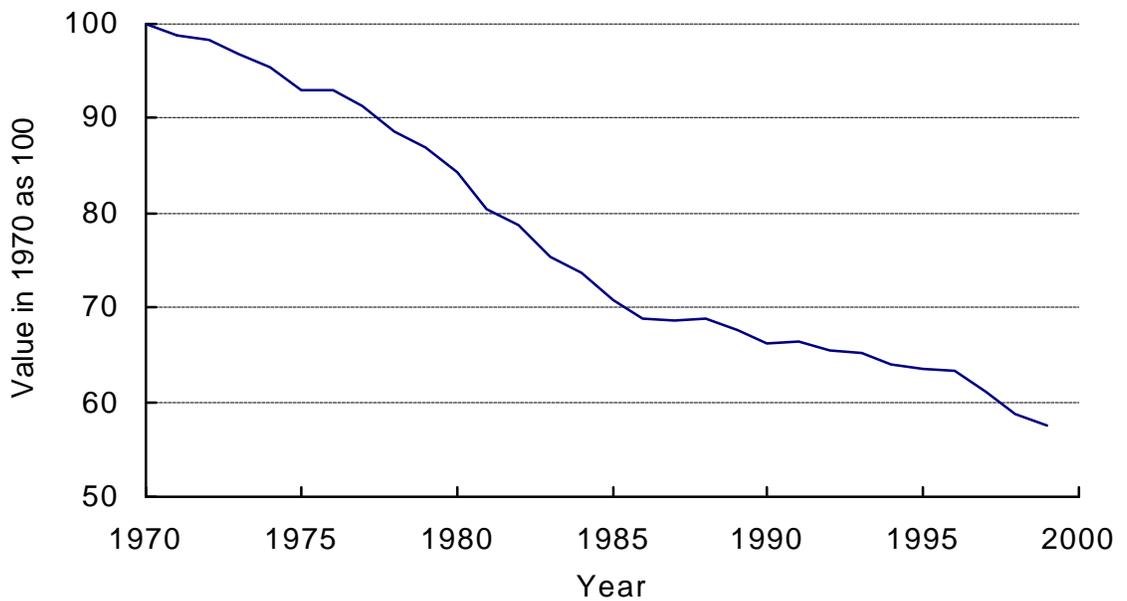


Figure 3
DOE Energy Efficiency and Renewable Energy Budget Trends: 1980-2000

