5. ENERGY

Table 5–1. Federal Resources in Support of Energy
(In millions of dollars)

Function 270	2000 Actual	Estimate					
		2001	2002	2003	2004	2005	2006
Spending:							
Discretionary Budget Authority ...	2,706	3,095	2,773	2,869	3,100	3,199	3,299
Mandatory Outlays:							
Existing law	–4,019	–3,701	–3,296	–3,150	–3,704	–3,626	–3,582
Credit Activity:							
Direct loan disbursements	1,423	1,896	2,246	2,461	2,735	2,817	2,907
Guaranteed loans	152	52	105	100	100	100	100
Tax Expenditures:							
Existing law	2,030	2,100	2,120	1,930	1,620	1,770	1,890

Federal energy programs contribute to energy security, economic prosperity, and environmental protection. Funded mainly through the Energy Department (DOE), they range from protecting against disruptions in petroleum supplies, to conducting research on renewable energy sources, to cleaning up DOE facilities contaminated by years of nuclear-related research activities. The Administration proposes to spend nearly $2.8 billion for these programs. In addition, the Federal Government allocates about $2.1 billion a year in tax benefits, mainly to encourage development of traditional and alternative energy sources.

The Federal Government has a longstanding and evolving role in energy. Most Federal energy programs and agencies have no State or private counterparts. The federally-owned Strategic Petroleum Reserve, for instance, protects against supply disruptions and the resulting price shocks. DOE's applied research and development (R&D) programs in fossil, nuclear, solar/renewable energy, and energy conservation are intended to speed the development of technologies to use energy more cleanly or efficiently, often through cost-shared partnerships with industry.

Energy Reserves

Strategic Petroleum Reserve (SPR): DOE maintains SPR to protect against petroleum supply disruptions and reduce the economic impact of any disruptions. SPR was authorized in 1975, in response to the oil embargoes of the early 1970s. The Reserve now holds 541 million barrels of crude oil in underground salt caverns at four Gulf Coast sites. SPR helps protect the economy and provide flexibility for the Nation's foreign policy in case of a severe energy supply disruption.

In 2001, the two-million barrel Northeast Home Heating Oil Reserve was established. Operated by the private sector, the Reserve helps ensure adequate supplies of heating oil in the event that colder than normal winters occur in the Northeastern United States. The President has committed to continue support for the Reserve.

- In 2002, DOE will maintain its capability to reach a SPR drawdown rate of about four million barrels a day within 15 days and to maintain that rate for at least 90 days.

Applied R&D

DOE's energy R&D investments cover a broad array of resources and technologies to make the production and use of all forms of energy, including solar and renewables, fossil, and nuclear, more efficient and more environmentally sound. The applied R&D programs fund research at DOE's national labs and engage in a variety of partnerships with industry for technology development and deployment.

Energy Conservation: DOE's energy conservation programs, for which the budget proposes $795 million, are designed to improve the fuel economy of various transportation modes, increase the productivity of our most energy-intensive industries, and improve the energy efficiency of buildings and appliances. They also include grants to States to fund energy-efficiency programs and low-income home weatherization. The weatherization program is slated for a significant increase in 2002, as part of the President's commitment to increase funding for the program by $1.4 billion over 10 years. Each of these activities benefits our economy and the environment. Many rely on partnerships with the private sector for cost-sharing and commercialization.

In 2002:

- The world's first automotive-scale (50 kilowatt, (kW)), fully integrated, gasoline-powered fuel-cell system will be delivered by a contractor to the DOE test facility at Argonne National Laboratory. Validation of low-cost ($10/kW) fuel-cell technology will be completed.
- Initial testing will be completed on light trucks with advanced diesel engines that provide a 35 percent improvement in fuel economy while meeting Tier 2 emissions standards.
- The Office of Industrial Technologies will continue R&D partnerships with energy-intensive industries, resulting in an estimated additional $200 million energy savings and productivity gain.
- Local recipients of DOE Weatherization Assistance program grant funds will weatherize approximately 116,000 low-income homes, improving their energy efficiency, and safety, and reducing the residents' energy bills. This is an increase of approximately 51,000 homes over 2001.

Solar and Renewable Resources: Solar and renewable resources programs focus on technologies that will help the Nation use its renewable resources such as wind, solar, and biomass to produce energy. The United States is the world's technology leader in wind energy, with a growing export market and production costs that have fallen dramatically. In addition, photovoltaics (PV) are becoming more useful in remote power applications, and new biofuels plants are being constructed.

Solar and renewable energy will benefit from the Administration's legislative proposal to open a small part of the Arctic National Wildlife Refuge (ANWR) to oil and gas leasing and production. This process will generate bidding bonuses for the Federal government estimated at $1.2 billion, to become available in 2004, which will be made available over a series of years to increase the funding for solar and renewable energy technologies.

In 2002:

- A 100 kW cold-weather wind-turbine, winner of an "R&D 100" award in 2000, will begin experimental operation and testing in an Alaskan village. These turbines are expected to provide reliable power options for small villages and remote installations in extremely harsh arctic environments.
- DOE's biofuels program will complete development of a yeast that can ferment most biomass-derived sugars to meet the cost goals for production of ethanol from cellusic feedstocks.
- The PV program will develop a 17-percent efficient cadmium-telluride thin-film PV cell. This laboratory achievement will be about seven percent more efficient than the best available commercial thin-film PV units of any type.
- The biopower program will complete technical feasibility testing of using closed-loop, short-rotation wood (fast-growing willows) as a dedicated fuel source for power generation at two retrofitted coal power plants in New York State.

Electric Energy Systems: These activities are managed by DOE's Office of Energy Efficiency and Renewable Energy. The programs focus on technical advances in electricity transmission and storage and on the efficiency and reliability of the Nation's electrical grid. The largest activity is in high-temperature superconductivity R&D, which can greatly increase the efficiency of generators and heavy electrical machinery, and dramatically increase the carrying capacity of high-voltage transmission lines.

- In 2002, operational testing will be completed on the world's first commercial-service superconducting utility power cable. This single cable has four times the electrical capacity of the copper cable it replaced, and will supply power to 14,000 residents in a Detroit neighborhood.

Fossil Energy R&D: Fossil fuel energy R&D programs, for which the budget proposes $449 million, help industry develop advanced technologies to produce and use coal, oil, and gas resources more efficiently and cleanly. Federally-funded development of clean, highly-efficient gas-fired and coal-fired generating systems aims to reduce gas emission rates, while reducing electricity costs compared to currently available technologies. These programs also include efforts to discover effective, efficient, and economical means of sequestering carbon dioxide. In the past, the oil and gas program has funded research on activities that had already been commercialized by the private sector. The budget targets funds to projects that will not compete with private sector investment and will improve the longer-term technologies to foster increased, environmentally sound, domestic energy production.

Through a new $150 million Clean Coal Power initiative, the Department will create an industry consortium to direct research toward the most critical barriers to expansion of coal use for power generation in the United States. This cooperative effort, totaling more than $2 billion over 10 years, will require industry to share in the cost of the research work, with the industry share increasing as technologies approach commercial stages. Participating companies will be asked to take part in selection of technologies and evaluate the progress of R&D efforts, with the goal of accelerating development and deployment of coal technologies that will economically meet environmental standards.

In 2002, DOE will:

- develop a new consortium of coal companies, utilities, and generating equipment vendors to direct coal research toward the most important problems faced by the entire industry;
- complete technology evaluations to make available, by 2003, advanced control technologies seeking to achieve cost competitive, deep nitrogen oxides (NOx) reductions in power plant flue gas emissions in response to the Clean Air Act standards, at 25 percent lower cost than available technology; and
- conduct integrated research and field demonstrations of carbon dioxide (CO_2) sequestration in deep, unminable coal seams and depleted oil reservoirs and develop sufficient data to determine reservoir integrity and fate of injected CO_2. If the CO_2 does not escape the formations where it is injected, a safe and economical method of disposal might be developed based on this knowledge.

Nuclear Energy R&D: Twenty percent of our Nation's electricity and about 17 percent worldwide is made today with nuclear power plants. R&D addressing the issues that threaten the acceptance and viability of nuclear fission in the United States will help determine whether nuclear fission can continue to supply increasing amounts of economically-priced energy while reducing emissions.

In 2002, DOE will:

- continue peer-reviewed, competitively-selected R&D projects that address nuclear energy's cost-effectiveness and acceptability, including plant economics, operational safety, proliferation, and waste disposal;
- maintain the advanced radioisotope power system program and facility operations and capabilities for current and future space and national security missions, and explore fission power systems to support future human exploration of space;

- manage its resources and capabilities at Nuclear Energy (NE) managed sites to ensure that the Department can meet its mission requirements, that the NE sites are maintained in a safe, secure, environmentally-compliant and cost-effective manner, and ensure the protection of the workers, the public, and the environment; and
- continue to provide, through the isotope program, a supply of radioactive and stable isotopes for medical and other research.

Environmental Quality

Environmental Management: For the Non-Defense Environmental Management and Uranium Facilities Maintenance and Remediation programs, the budget proposes $592 million to manage part of the Nation's most complex environmental cleanup program, the result of more than five decades of research and production of nuclear energy technology and materials. This will reduce environmental risk and manage the waste at: 1) sites run by DOE's predecessor agencies; 2) sites contaminated by uranium and thorium production from the 1950s to the 1970s; 3) DOE's inactive uranium processing facilities; and 4) the Paducah Gaseous Diffusion Plant operated by the United States Enrichment Corporation. (For information on DOE's Defense Environmental Management program and performance measures, see Chapter 2, "National Defense.")

Office of Civilian Radioactive Waste Management

This office is responsible for ensuring the safe, geologic disposal of radioactive wastes from civilian and defense uses. The budget increases funding for DOE's Civilian Radioactive Waste Management Program in order to help the program stay on schedule toward a formal Site Recommendation in 2002, and a formal License Application at the end of calendar year 2003. In addition, the budget request will enhance the program's effort to achieve a competitive design effort, leading to a robust license application. This design effort will include: 1) an analysis of concepts that span the full range of repository operating conditions, and 2) the development of modular concepts that will lead to outyear budgetary savings for the program.

In addition, the Administration supports efforts to use the nuclear utilities' budgetary receipts for their intended purposes. DOE will submit to Congress an updated report regarding alternative approaches to finance and manage the program by June 30, 2001, as directed by the House report language accompanying the 2001 Energy and Water Development Appropriations Act. DOE will identify in this report models of effective organizations that might benefit the operation of its civilian program.

Energy Production and Power Marketing

Power Marketing Administrations: The Federal Government operates programs that produce, distribute, and finance electric power. The four Federal Power Marketing Administrations, or PMAs, (Bonneville, Southeastern, Southwestern, and Western) market electricity generated at 131 multi-purpose Federal dams and related facilities, and manage more than 33,000 miles of federally-owned transmission lines in 34 States. The PMAs sell about five percent of the Nation's electricity, primarily to preferred customers such as counties, cities, and publicly-owned utilities. The PMAs face growing challenges as the electricity industry moves toward open, competitive markets.

- In 2002, each PMA's goal is to operate its transmission system to ensure that service is continuous, reliable, and balanced—that is, that the system achieves a "pass" rating each month under the North American Electric Reliability Council performance standards. These measures are used industry-wide and indicate the reliability and quality of power provided by utilities.

Tennessee Valley Authority (TVA): TVA is a Federal Government corporation and one of the five largest electric power companies in the country. It generates three percent of the Nation's electric power and transmits that power over its 17,000-mile transmission network to 158 municipal utilities and rural electric cooperatives that serve eight million people in seven States. TVA also promotes economic activity in the area it serves by operating a complex river management system that

provides navigation, flood control, hydropower, water supply, and recreation services.

The Nation's electric power industry is changing so that customers benefit from competition in the industry. To prepare for that change, TVA is cutting its costs wherever possible. In the past four years, TVA has paid down its outstanding debt by over $1.7 billion, roughly six percent.

In 2002, TVA will:

- reduce its debt by an estimated $260 million; and
- keep the navigable waterway TVA manages on the Tennessee River open to commercial traffic 99 percent of the time, up from the 94 percent level TVA achieved in 2000.

Rural Utilities Service: In 2002, the Agriculture Department's Rural Utilities Service (RUS) will make $2.6 billion in direct and guaranteed loans to rural electric cooperatives, public bodies, nonprofit associations, and other utilities in rural areas for generating, transmitting, and distributing electricity. Its main goal is to finance modern, affordable electric service to rural communities. Included within this funding is $100 million loans originated by the private sector and guaranteed by RUS, which will help rural utility borrowers better position themselves in a competitive, deregulated environment. RUS will also make $495 million in direct loans to companies providing telecommunications services to rural communities, and $27 million in grants and $400 million in loans for distance learning, telemedicine, and broadband technology. RUS borrowers continue to provide service in some of the poorest counties in rural America and to the majority of counties suffering from recent population out-migration.

In 2002, RUS will:

- upgrade 187 rural electric systems, which will benefit over 2.8 million customers and create or preserve approximately 60,000 jobs;
- provide more than 50 telecommunication systems with funding for advanced telecommunications services benefiting more than 300,000 rural customers by providing broadband and high-speed Internet access; and
- provide distance learning facilities to 300 schools, libraries, and rural education centers, and telemedicine equipment to 150 rural health care providers, benefiting millions of residents in rural America.

Energy Regulation

The Federal Government's regulation of energy industries is designed to protect public health, achieve environmental and energy goals, and promote fair and efficient interstate energy markets.

Appliance Efficiency Rules: DOE specifies minimum levels of energy efficiency for major home appliances, such as water heaters, air conditioners, and refrigerators, and for commercial-scale heating and cooling components. The initial efficiency standards were established in legislation, and DOE periodically issues rules to revise those standards or to create standards for new categories of equipment.

- In 2002, DOE will issue a final rule for residential air conditioning products for specialized applications, and will begin rulemakings for residential furnaces and boilers, commercial air conditioning products, and electrical distribution transformers—all of which are scheduled to be completed by the end of 2004.

Federal Energy Regulatory Commission (FERC): FERC, an independent agency within DOE, regulates the transmission and wholesale prices of electric power, including non-Federal hydroelectric power, and the transmission of oil and natural gas by pipeline in interstate commerce. FERC promotes competition in the natural gas industry and in wholesale electric power markets.

In 2002, in order to promote competitive, well-functioning energy markets, FERC will measure the response of prices to external conditions in natural gas and electricity, the level of price volatility and changes in price volatility in electricity and gas, and the correlation of commodity prices across regions.

Nuclear Regulatory Commission (NRC): NRC, an independent agency, regulates the Nation's civilian nuclear reactors, the medical and industrial use of nuclear materials and their safeguards, and the disposal of nuclear waste to ensure adequate protection of the public health and safety, to promote the common defense and security, and to protect the environment. NRC international activities support U.S. interests in nonproliferation and the safe and secure use of nuclear materials in other countries. To meet the challenges of a restructured and deregulated electric utility industry, NRC is committed to adopting a more risk-informed and performance-based approach to regulation. This regulatory framework will focus NRC and licensee resources on the most safety-significant issues, while providing flexibility in how licensees meet NRC requirements.

The budget increase accommodates the increasing demand NRC is facing to renew nuclear power plant licenses for an additional 20 years of plant operations, approve reactor license transfers associated with electricity industry restructuring, and support industry initiatives to increase the Nation's electricity supply. In addition, the budget proposes to reduce the burden on licensees to pay fees for NRC expenses that do not provide a direct benefit to them. In 2002, the NRC will recover approximately 96 percent of its total costs through licensee fees, and this will decline to 90 percent by 2005.

In 2002:

- NRC's nuclear reactor strategic goal is to prevent radiation-related deaths and illnesses, promote the common defense and security, and protect the environment in the use of civilian nuclear reactors;
- NRC's nuclear materials strategic goal is to prevent radiation-related deaths and illnesses, promote the common defense and security, and protect the environment in the use of source, by-product, and special nuclear material; and
- NRC's nuclear waste strategic goal is to prevent significant adverse impacts from radioactive waste to the current and future public health and safety and the environment, and promote the common defense and security.

Management and Procurement Reform

Program and contract management at DOE is a priority management objective of the Administration because more than 90 percent of the Department's budget is spent on contracts to operate its facilities. DOE has made insufficient use of competitive, performance-based contracts, and the Administration will increase the use of such contracts for DOE in 2002.

Industry cost-sharing requirements in DOE's applied R&D programs have not been uniformly implemented, and in some programs as few as 20 percent of the projects obtain any cost-sharing. In 2002, DOE's applied energy R&D programs will be implementing a rigorous and consistent cost-sharing policy that applies to all contracts, grants, cooperative agreements, or other funding mechanisms for industry-performed R&D. The cost-sharing policy will provide for an absolute minimum requirement for industry cost-sharing in any project, with graduated steps based on technological maturity and risk, up to a requirement for more than 50 percent cost-sharing for demonstration or commercialization activities. The policy will also include explicit consideration of factors such as estimated time to a commercialization decision, technical progress and change in risk as a result of previous funding phases, and existence of external incentives for industry to perform similar work.

More aggressive and consistent cost-sharing will reduce corporate subsidies, free up funds for other priority projects, and create an internal incentive for industry to terminate projects that are not making adequate progress or are not meeting performance goals.

DOE will also better define its performance measures across the Department, and particularly in its R&D programs. In the past, some performance measures were outside the scope of the Department's influence and gave a distorted vision of the role of the Government and its ability to affect outcomes (e.g., "Ensure a competitive electricity industry is in place that can deliver adequate and affordable supplies with reduced environmental

impact.") Future performance measures will better match the strategic goals identified by DOE.

Tax Incentives

Federal tax incentives are mainly designed to encourage the domestic production or use of fossil and other fuels, and to promote the vitality of our energy industries and diversification of our domestic energy supplies. The largest existing incentive lets certain fuel producers cut their taxable income as their fuel resources are depleted. An income tax credit helps promote the development of certain non-conventional fuels. It applies to oil produced from shale and tar sands, gas produced from a number of unconventional sources (including coal seams), some fuels processed from wood, and steam produced from solid agricultural byproducts. Another tax provision provides a credit to producers who make alcohol fuels—mainly ethanol—from biomass materials. The law also allows a partial exemption from Federal gasoline taxes for gasolines blended with ethanol.

Provide Tax Credit for Residential Solar Energy Systems: Current law provides a 10-percent investment tax credit to businesses for qualifying equipment that uses solar energy to generate electricity, to heat or cool or provide hot water for use in a structure, or to provide solar process heat. No credit is available for non-business purchases of solar energy equipment. The Administration proposes a new tax credit for individuals that purchase solar energy equipment used to generate electricity (PV equipment) or heat water (solar water heating equipment) for use in a dwelling unit. The credit would be available only for equipment used exclusively for purposes other than heating swimming pools. The credit would be equal to 15 percent of the cost of the equipment and its installation. The credit would be nonrefundable and the lifetime maximum credit allowed to an individual would be limited to $2,000 for PV equipment and $2,000 for solar water heating equipment. The credit would apply only to solar water heating equipment placed in service after December 31, 2001, and before January 1, 2006, and to PV systems placed in service after December 31, 2001, and before January 1, 2008.

Extend and Modify the Tax Credit for Producing Electricity from Certain Sources: Current law provides taxpayers a 1.5-cent-per-kilowatt-hour tax credit, adjusted for inflation after 1992, for electricity produced from wind, closed-loop biomass (organic material from a plant grown exclusively for use at a qualified facility to produce electricity), and poultry waste. The electricity must be sold to an unrelated third party and the credit is limited to the first 10 years of production. The current credit applies only to facilities placed in service before January 1, 2002. The Administration proposes to extend the credit for electricity produced from wind and biomass to facilities placed in service before January 1, 2005. In addition, eligible biomass sources would be expanded to include certain biomass from forest-related resources, agricultural sources, and other specified sources. Special rules would apply to biomass facilities placed in service before January 1, 2002. Electricity produced at such facilities from newly eligible sources would be eligible for the credit only from January 1, 2002, through December 31, 2004, and at a rate equal to 60 percent of the generally applicable rate. Electricity produced from newly eligible biomass co-fired in coal plants would also be eligible for the credit only from January 1, 2002, through December 31, 2004, and at a rate equal to 30 percent of the generally applicable rate.

Modify Treatment of Nuclear Decommissioning Funds: Under current law, deductible contributions to nuclear decommissioning funds are limited to the amount included in the taxpayer's cost of service for ratemaking purposes. For deregulated utilities, this limitation may result in the denial of any deduction for contributions to a nuclear decommissioning fund. The Administration proposes to repeal this limitation. Also under current law, deductible contributions are not permitted to exceed the amount the IRS determines to be necessary to provide for level funding of an amount equal to the taxpayer's post-1983 decommissioning costs. The Administration proposes to permit funding of all decommissioning costs (including pre-1984 costs) through deductible contributions. The IRS would continue to determine the amount necessary to provide for level funding of the taxpayer's decommissioning costs. The

Administration also proposes to permit a nuclear decommissioning fund to receive transfers from certain funds that do not qualify as nuclear decommissioning funds for Federal tax purposes (nonqualified funds). Under this proposal, a taxpayer would be permitted to transfer amounts that have been irrevocably set aside in a nonqualified fund pursuant to the requirements of a State or Federal agency exclusively for the purpose of funding the decommissioning of the nuclear power plant. Any portion of the amount transferred that exceeds the amount deducted (or excluded from the taxpayer's gross income) on account of transfers to the nonqualified fund would be allowed as a deduction ratably over the remaining useful life of the nuclear power plant. These proposals would be effective for taxable years beginning after December 31, 2001.