

Chapter 2 Background

2.1 About DOE

The Department of Energy conducts programs relating to energy resources, national nuclear security, environment quality and science. In each of these areas, the United States is facing significant challenges. Our economic well-being depends on the continuing availability of reliable and affordable supplies of clean energy. Our Nation's security is threatened by the proliferation of weapons of mass destruction. Our environment is under threat from the demands of a more populated planet and the legacies of 20th century activities. Science and technology derived from it offer the promise to improve the Nation's health and well-being and broadly expand human knowledge.

In conducting its programs, the Department of Energy (DOE) employs unique scientific and technical experts, including 30,000 scientists, engineers, and other technical staff, in a complex of outstanding national laboratories that have a capital value of over \$45 billion. Through its multidisciplinary research and development activities and its formidable assemblage of scientific and engineering talent, DOE focuses its efforts on four programmatic business lines:

- Energy Resources - promoting the development and deployment of systems and practices that provide energy that is clean, efficient, reasonably priced, and reliable.
- National Nuclear Security - enhancing national security through military application of nuclear technology and by reducing global danger from the potential spread of weapons of mass destruction.
- Environment Quality - cleaning up the legacy of nuclear weapons and research activities, safely managing nuclear materials, and disposing of radioactive wastes.
- Science - advancing science and scientific tools to provide the foundation for DOE's applied missions and to provide remarkable insights into our physical and biological world.

In support of the above four business lines, DOE provides management services to ensure that the technical programs can run efficiently. Our Corporate Management area deals with organizational and management challenges that we must address to better serve our customers, and ultimately, U.S. taxpayers, in an effective and efficient manner. Within Corporate Management, we strive for excellence in the Department's environment, safety, and health practices, together with effective management systems and efficient business practices.

The DOE Mission

To foster a secure and reliable energy system that is environmentally and economically sustainable: to be a responsible steward of the Nation's nuclear weapons: to clean up the Department's facilities: to lead in the physical sciences and advance the biological, environmental, and computational sciences; and to provide premier scientific instruments for the Nation's research enterprise.

The DOE Vision

The Department of Energy, through its leadership in sciences and technology, will continue to meet the Nation's needs in energy, environmental quality, and national security by being:

- A partner with Congress, other agencies, and stakeholders to develop and implement policies, legislation, and regulations that promote national security and address our energy and environmental needs in a balanced manner.
- A key contributor to ensure that the United States has a flexible, clean, efficient, accessible, and affordable system of energy supply with minimal vulnerability to disruption.
- A vital contributor to reducing the global nuclear danger through our national nuclear security, nuclear safety, and nonproliferation activities.
- A responsible steward of nuclear weapons and materials, cleaning up DOE sites, decommissioning our facilities, stabilizing nuclear materials, managing and disposing of waste, and preventing pollution.
- A major partner in world-class sciences and technology through our national laboratories, research centers, university research, and our educational and information dissemination programs.

- An employer noted for providing a safe and secure workplace, recognized for management excellence, and acknowledged for delivering results.

DOE Core Values

The Department will succeed only through the efforts of its employees. Our beliefs and values motivate our behavior and set standards for our individual and collective performance. The core values of the Department of Energy guide our activities as we strive to fulfill our mission.

1. We are public servants and are customer-oriented.
2. We value public safety and respect the environment.
3. We believe people are our most important resource and that they should be treated with fairness, respect and dignity.
4. We value creativity and innovation.
5. We are committed to excellence.
6. We work as a team and advocate teamwork.
7. We recognize that leadership, empowerment, and a count-ability are essential.
8. We pursue the highest standards of ethical behavior.

The Department's Background

DOE's History. The Department of Energy has its roots in the Manhattan Project of the U.S. Army Corps of Engineer, which was established 1942 to manage development of the atomic bomb. After World War II, Congress created the Atomic Energy Commission in 1946 to direct the design, development, and production of nuclear reactors and, beginning in 1954, for regulating the commercial nuclear power industry.

In 1974, Congress replaced the Atomic Energy Commission with two new agencies: the Nuclear Regulatory Commission and the Energy Research and Development Administration. The latter was created to manage the nuclear weapons, naval reactors, and energy development programs, and to research the environmental, biomedical, and safety aspects of energy technologies.

In 1977, Congress created the Department of Energy, which brought together functions and responsibilities of the Energy Research and Development Administration, the Federal Power Commission, and the Power Marketing Administrations under one cabinet-level department.

DOE's Present Scope. The Department of Energy develops and implements energy policy and manages a vast array of technical programs. The Department's nationwide complex consists of headquarters and field organizations, national laboratories, nuclear weapons production plants, power marketing administration, and special-purpose offices. DOE has almost 16,000 Federal employees and over 100,000 contractor employees working at over 50 major installations in 35 states.

The DOE complex includes unique capabilities in science and engineering that we apply to meet the Department's goals in Energy Resources, National Nuclear Security, Environmental Quality, and Science. Powerful accelerators, light sources, neutron beam facilities, plasma and fusion science facilities, genome centers, hydrodynamic testing facilities, and advanced computational centers are just some of the major instruments of science that distinguish DOE's capabilities and enhance the Nation's science base.

References:

- *U.S. Department of Energy Strategic Plan*, Washington, D.C., September 2000.
<http://www.cfo.doe.gov/stratmgt/plan/DOESPLAN.htm>
- *The Origins of Our Department*,
<http://www.energy.gov/aboutus/history/>

2.2 About EERE

2.2.1 EERE Mission, Vision, Goals, and Strategies

America's energy challenge begins with our expanding economy, growing population, and rising standard of living. Our prosperity and way of life are sustained by energy use. Meeting each of these challenges is critical to expanding our economy, meeting the needs of a growing population, and raising the American standard of living.

- **Using Energy More Wisely.** New technology allows us to go about our lives and work with less cost, less effort, and less burden on the natural environment. While such advances cannot alone solve America's energy problems, they can and will continue to play an important role in our energy future. Dramatic technological advances in energy efficiency can enable us to make great strides in conservation, from the operation of farms and factories to the construction of buildings and automobiles.
- **Repair And Expand Our Energy Infrastructure.** Our current, outdated network of electric generators, transmission lines, and pipelines has been allowed to deteriorate. An aging and inadequate network of pipelines hinders natural gas distribution. Similarly, an antiquated and inadequate transmission grid prevents us from routing electricity over long distances and thereby avoiding regional blackouts, such as California's.
- **Increasing Energy Supplies While Protecting The Environment.** Energy development initiatives will be successful only if they adequately address their impacts on natural resource values. As U.S. energy needs grow, additional innovations will be necessary to continue improving environmental conditions and to meet new environmental challenges. The federal government has a unique role in facilitating energy development while simultaneously protecting the environment and conserving our country's natural resource legacy.

EERE's mission is consistent with the Federal government's role of investing in high-risk, high-value RD&D that is both critical to the Nation's future and not likely to be independently conducted by the private sector. EERE addresses the Nation's energy challenges in two fundamental ways:

- Increasing the efficiency of devices, processes, and systems that consume energy.
- Increasing the use of clean energy technologies and practices.

EERE Mission and Vision

EERE leads the Nation in the research, development, and deployment (RD&D) of affordable, advanced clean energy. “Clean energy” describes energy-efficient technologies and practices that use less energy, and renewable energy sources and natural gas that produce power and heat more cleanly than conventional sources.

A key to the United States’ continued prosperity will be the availability of clean, reliable, and reasonably priced energy. Trends suggest continued domestic growth in energy use for the foreseeable future and accelerated energy use in many developing countries. EERE’s Strategic Plan is a direct response to these trends and is consistent with the framework of the DOE energy mission namely, to foster a secure and reliable energy system that is environmentally sustainable.

EERE’s mission is:

To lead the Nation in the research, development, and deployment of advanced energy efficiency and clean power technologies and practices, providing Americans with a stronger economy, healthier environment, and more secure future.

This mission is consistent with the Federal government’s role of investing in technologies and practices that are critical to the Nation’s strategic interests, but that do not receive adequate research and development (R&D) investment from the private sector. EERE also works with stakeholders to develop policies and programs to facilitate the deployment of advanced clean energy technologies and practices.

EERE’s vision is:

A world in which, due to EERE actions, advances in energy efficiency and clean power technologies and practices significantly contribute to a stronger economy, healthier environment, and more secure future.

Specifically, EERE envisions:

- An America that uses a higher percentage of domestic, clean energy supplies and technologies, and that is less dependent on international energy sources.
- An American economy that is thriving, in part because of the contribution of both energy-efficient technologies and ample supplies of domestic renewable and clean energy resources.
- America leading the way in reducing global greenhouse gas emissions through the widespread use and deployment of advanced energy technologies.
- Americans breathing cleaner air as pollution levels decline due to advances in energy-efficient technologies and clean energy systems.
- A competitive U.S. electricity industry reliably transmitting and distributing low-cost, cleanly generated electricity through the use of advanced energy technologies, and a fully integrated spectrum of distributed power systems.
- An America that has reduced its payments to other countries for imported fuels and is a major exporter of clean energy technologies that are recognized domestically and internationally as the best in the world.

EERE Goals

EERE has set three major goals in pursuit of its mission and vision:

- Increase the supply and use of clean energy resources and increase the reliability of the energy system.
- Increase the efficiency of the energy system.
- Continuously demonstrate EERE managerial and operational excellence.

EERE Strategies

EERE programs are aligned with the energy sectors of the economy to better link the advanced energy technologies and practices to their target markets:

- Buildings
- Industry
- Power Generation and Delivery
- Transportation
- Federal Facilities

EERE also recognizes the opportunity to link the fundamental and applied research advances that support objectives in more than one sector. Thus, it is placing greater emphasis on initiatives that cut across multiple markets. EERE advances its mission by addressing three areas that ultimately determine whether clean energy is deployed in the Nation's energy system technology, policy, and markets. Although the bulk of EERE's program activities is in the area of technology research, development, and demonstration, government policies and market factors significantly affect which technologies are commercialized. Thus, EERE's strategies include the development of key policies at the Federal, State, and local levels and the stimulation of critical end-use markets.

EERE is pursuing four principal strategies to achieve its three goals:

1. Improving energy technologies and practices through R&D.
2. Facilitating the deployment of advanced energy technologies and practices into their target markets.
3. Formulating policies and standards.
4. Implementing a corporate strategic management system.

References:

- *National Energy Policy, Report of the National Energy Policy Development Group*, Washington, D.C., May 2001. <http://www.whitehouse.gov/energy/>
- *Clean Energy for the 21st Century, Office of Energy Efficiency and Renewable Energy Strategic Plan*, DOE/GO-102000-0956, Washington, D.C., March 2000. http://www.eren.doe.gov/overview/strategic_plan.html

2.2.2 Brief History of EERE and Its Predecessor Organizations

Through almost 30 years of legislative, administrative, and market decisions and six presidential administrations, U.S. energy policy has remained consistent: to ensure clean, affordable, and diverse energy supplies and to use them efficiently.

In 1971, the Nixon Administration created an Office of Energy Conservation to supplement the Department of the Interior's coal, oil, and natural gas research and development programs. The Administration also initiated Federal programs for solar heating, solar cooling, and geothermal research in the National Science Foundation. Two years later, during the energy "crisis" of 1973, President Nixon's "Project Independence" engendered a multi-agency wind energy program involving, among others, the Federal Energy Administration, the National Aeronautics and Space Administration, and the Department of Agriculture.

In January 1975, the Ford Administration created the Energy Research and Development Administration (ERDA) to focus the Federal government's energy research and development activities within a unified agency that could promote the speedy development of various energy technologies. Congress supported this with the Energy Policy and Conservation Act of 1975. In 1977, President Carter merged ERDA and the Federal Energy Administration and placed it within the Department of Energy (DOE) to unify the government's energy research and development functions with its energy policy and regulation functions. The National Energy Conservation Policy Act of 1978 strengthened the new agency's efforts.

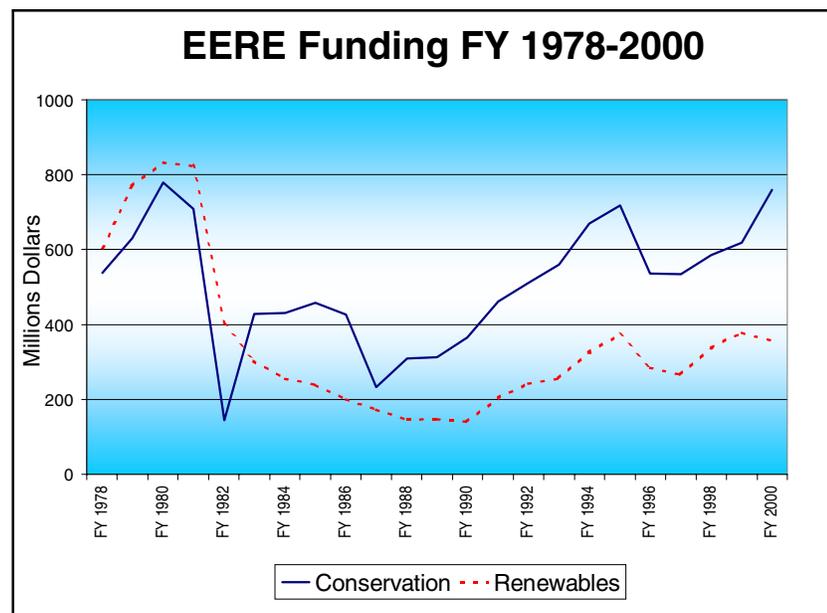
After abandoning an initial plan to abolish DOE, the Reagan Administration scaled back the energy applied research and development efforts, and narrowed the scope of EERE's predecessor organization (Office of Conservation and Solar Energy) to basic, long-term, very high-risk energy R&D. The Reagan Administration also eliminated the remaining energy regulation programs.

Applied research, development, and deployment (RD&D) activities were revived early in the Bush Administration. A detailed, top-down and bottom-up process consisting of public hearings, energy modeling, departmental task forces, and involvement of other governmental bodies yielded a new comprehensive national

energy strategy in 1991. The loudest messages heard were to increase productivity in every sector of energy and to view energy supply and use as a system. Through the Energy Policy Act of 1992, Congress supported the return to applied RD&D, using partnerships with non-Federal stakeholders.

The Clinton Administration continued to increase the level of the applied, research, development and deployment activities. It promoted industry-government-consumer partnerships to accelerate demonstration and deployment of advanced technologies. Such partnerships incorporating individual technologies in a systems approach for example, the Partnership for a New Generation of Vehicles (PNGV), Bioenergy, and Million Solar Roofs receive special emphasis.

Over EERE's lifetime, program funding levels have risen and fallen with each President's and/or Congress' view of the Federal government's role in energy technology development and deployment. Funding grew from fiscal years 1973 through 1981 during periods of "energy crisis," emphasis on national security, and an activist government role. Program funding decreased significantly during fiscal years 1982-1989 with the Reagan Administration's emphasis on a hands-off government role. Funding growth returned after 1991 during stable energy markets, only to decline again in the 1994-1995 period.



2.2.3 DOE’s Energy Context and EERE’s Role

The National Energy Policy (NEP), published in May 2001 sets forth the framework for the Nation's energy policy. The NEP goals, objectives, and recommended actions form a blueprint for the specific programs, projects, initiatives, investments, and other actions that the Federal government will develop and undertake in the area of energy. NEP includes actions toward increasing the diversity of U.S. energy supply and fuel choices and improving energy productivity. These include bringing renewable energy sources into the market, strengthening domestic production of oil and gas, and increasing the efficiency of both power and end-use technologies.

The plan stresses the importance of scientific and technological advancements that will allow the accomplishment of the policy's goals. DOE's strategic plan to reflects it enduring commitment to these goals.

National Energy Policy Goals	FY 2001 DOE Strategic Plan Energy Objectives
<ul style="list-style-type: none"> • Increase energy supplies. • Modernize our energy infrastructure. • Modernize conservation. • Accelerate the protection and improvement of the environment. • Increase our nation's energy security. 	<ul style="list-style-type: none"> • Promote reliable, affordable, clean, and diverse domestic supplies of energy. • Increase the efficiency and productivity of transforming energy to electricity and other products, while limiting environmental impacts. • Increase the efficiency and productivity of energy use, while limiting environmental impacts. • Inform public policy makers, energy industries, and the general public by providing reliable energy information and analyses. • Cooperate globally on international energy issues.

Within DOE, working under the framework of these goals, the Offices of Energy Efficiency and Renewable Energy, Fossil Energy, and Nuclear Energy, Science and Technology lead Departmental efforts. These offices manage the RD&D of advanced energy technologies in their respective areas primarily through partnerships with industry, Federal and non-Federal laboratories, univer-

sities, and State and local government agencies. DOE also leads Federal agencies in carrying assisting in bringing competition to the electricity industry.

Other support for NEP and DOE goals comes from the Energy Information Administration, which publishes energy-related information necessary for informed consumer, market, and policy decisions. The Power Marketing Administrations sell and distribute more than \$3 billion of electric power generated at Federal hydroelectric plants. DOE's Office of International Affairs and Office of Policy lead many policy-related activities supporting the energy goals. In addition, the Office of Security and Emergency Operations provides support in the prevention of energy disruption and infrastructure failure.

To ensure further that its R&D remains focused on its goals, the Department developed an Energy Resources R&D Portfolio, released in February 2000. The portfolio helps DOE to align its technology investments with broader national policy goals and plan for future investments through technology "roadmapping." The portfolio integrates activities of EERE and DOE's Offices of Fossil Energy, Nuclear Energy, Science and Technology, and Security and Emergency Operations to support NEP and DOE goals. EERE supports all of the portfolio's R&D areas.

In addition, planning efforts outside DOE helped set the context for EERE and other DOE programs. The report *Energy R&D: Shaping Our Nation's Future in a Competitive World*, conducted by leading energy experts from industry, academia, and research and commissioned by the Secretary of Energy's Advisory Board, was published in 1995. The experts recommended that DOE manage a diverse energy R&D investment portfolio through: (1) a balance of basic research and applied R&D (including industry co-funded demonstrations), (2) near and long-term R&D to provide continuing return on investment and to contribute to the health and vitality of domestic energy industries, and (3) a continuing commitment to support energy efficiency and renewable energy. DOE has aligned its Energy Resources R&D Portfolio with the key program recommendations of this report.

Also, a study conducted by an expert panel appointed by the President's Council of Advisors on Science and Technology, *The Federal Energy Research and Development for the Challenges of the Twenty-First Century*, was published in June 1999. The committee recommended specific initiatives to bolster Federal efforts

on international energy cooperation under four broad headings. Three of the four areas specifically relate to EERE programs and include:

- (1) Foundations of energy innovation and cooperation, with emphasis on capacity building, energy sector reform, clean energy technology demonstrations and cost buy-down, and financing.
- (2) Technologies for increased efficiency of energy end use, with emphasis on buildings and appliances, small vehicles and buses, energy intensive industries, and co-generation of electricity and other energy forms.
- (3) Technologies for cleaner and more efficient energy supply with emphasis on biomass and other renewable energy forms, fossil-fuel decarbonization, and carbon sequestration technologies."

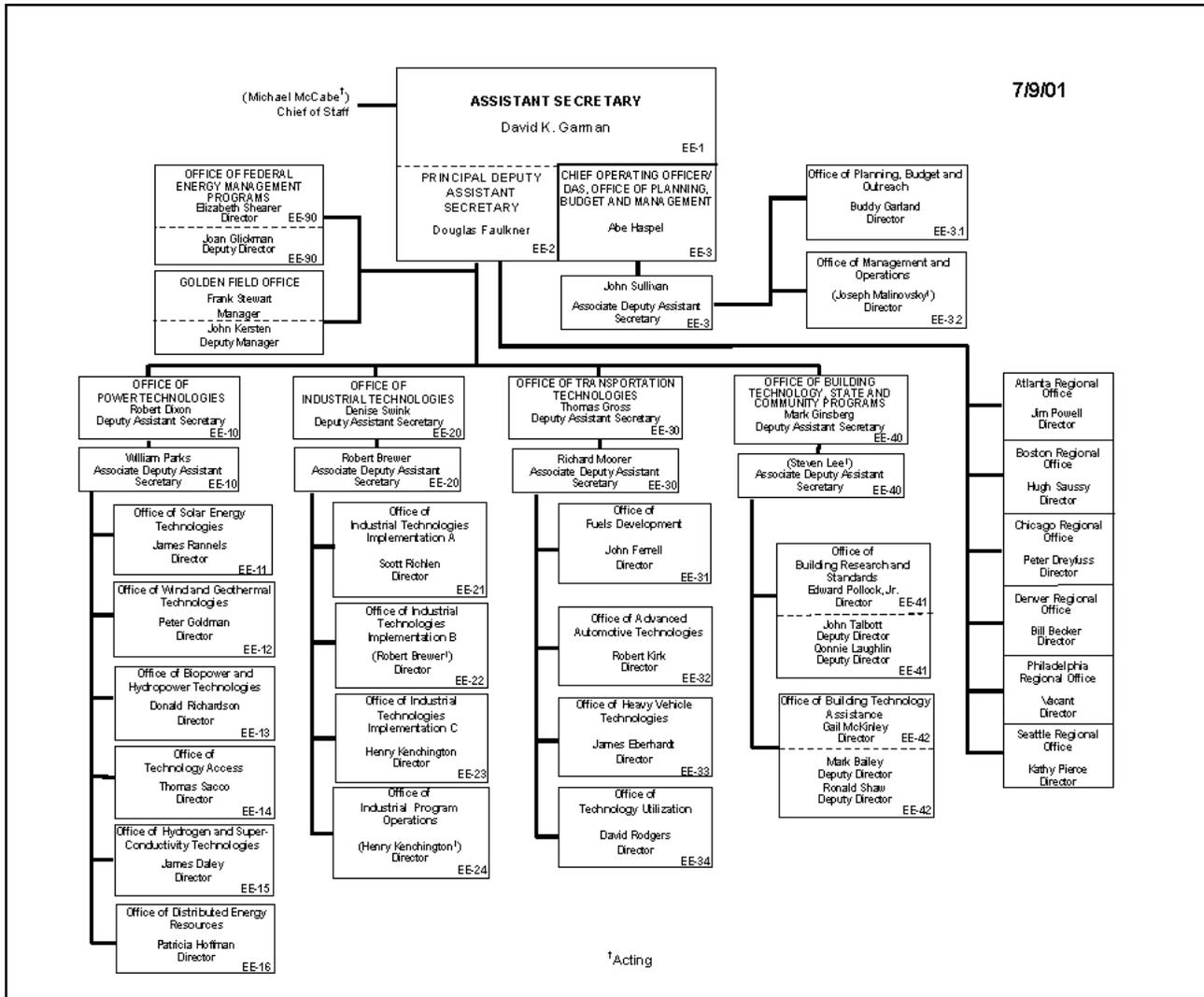
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- *National Energy Policy, Report of the National Energy Policy Development Group*, Washington, D.C., May 2001.
<http://www.whitehouse.gov/energy/>
- *U.S. Department of Energy Strategic Plan*, Washington, D.C., September 2000.
<http://www.cfo.doe.gov/stratmgt/plan/DOESPLAN.htm>
- *Energy Resources*, DOE Research and Development Portfolio, Volume 1 of 4, U.S. Department of Energy, Washington, D.C., February 2000
- Others in the text.

2.2.4 The EERE Organization

The EERE organization has several Headquarters and Field elements. EERE Headquarters, which is entirely located in the Forrestal Building, has responsibility for program planning, program management, resource management, budgeting, and evaluation. The Field elements, consisting of the Golden Field Office and six Regional Offices primarily carry out program activities. The EERE portfolio also consists of renewable energy and energy efficiency R&D facilities in the Denver metropolitan

region at the National Renewable Energy Laboratory. An updated EERE organizational chart can be found at <http://www.eren.doe.gov/organization/org-chart.html>.



Headquarters Offices

- **Office of the Assistant Secretary.** Provides the leadership for a Federal workforce of up to 591 Full Time Equivalent (FTEs) with a \$1.26 billion budget in FY 2001. This office is delegated “Program Secretarial Office” authority for the organizational structure and program management of EERE. It is also delegated “Cognizant Secretarial Office” authority for stewardship over R&D facilities. EERE is organized on the basis of these two delegations of authority.

- **Office of the Principal Deputy Assistant Secretary.** Has programmatic responsibility for five energy sector offices (buildings, industry, transportation, power generation and delivery, and Federal government facilities), the Golden Field Office, and Regional Offices.
- **Chief Operations Officer/Office of Planning, Budget and Management.** Has financial and operational responsibilities for the EERE enterprise, and responsibility for establishing an integrated, seamless operating philosophy and management system to lead EERE on its path to managerial excellence.
- **Office of Power Technologies (OPT).** Leads the Federal government’s effort to help America’s electric power industry develop clean, renewable, and more economical sources of electricity. OPT technologies include renewable energy solar, wind, geothermal, biopower, and hydro-power and Distributed Energy Resources, energy storage, hydrogen, and superconductors.
- **Office of Industrial Technologies (OIT).** Creates partnerships to research, develop, and deliver advanced energy and pollution prevention technologies for industrial customers. OIT focuses on the nine most energy-intensive industries, while also developing technologies that apply to a wide range of industries.
- **Office of Transportation Technologies (OTT).** Develops, and promotes user acceptance of transportation technologies that can decrease oil imports and reduce emissions of pollutants, including greenhouse gases. The technologies include alternative fuels and advanced technologies for cars, trucks, buses, and other heavy vehicles.
- **Office of Building Technology, State and Community Programs (BTS).** Develops, promotes, and integrates energy technologies and practices to make buildings more efficient and affordable and communities more livable.
- **Office of Federal Energy Management Programs (FEMP).** Assists Federal agencies in reducing their costs by helping them identify, finance, and implement energy-efficient technologies, renewable energy projects, and water conservation projects in their facilities and operations, and provides utility management strategies.

Field Implementation Offices

- **Golden Field Office.** The Golden Field Office (GFO) is a full-service business organization and EERE's primary field implementation center. As such, GFO is responsible for administration of the management and operating contract for the National Renewable Energy Laboratory (NREL), field management of projects assigned by EERE programs, and providing administrative services to the EERE Regional Offices.
- **Regional Offices.** EERE's six Regional Offices implement State and local grant programs and serve as EERE's principal technology deployment force in the field. The six Regional Offices are located in Boston, MA; Philadelphia, PA; Atlanta, GA; Chicago, IL; Denver, CO; and Seattle, WA.

EERE's R&D Facilities

Throughout the DOE complex, there are many large-scale R&D facilities that are "government-owned/contractor-operated." Each DOE laboratory is under the stewardship of a specifically recognized Program Office responsible for the facilities and equipment at these centers of excellence. DOE delegated the government-owned stewardship responsibilities for NREL to EERE (see Section 11). In other words, the National Renewable Energy Laboratory is EERE's only wholly-owned research and development institution. As such, EE-1, as Program Senior Official, is responsible for NREL's long-term viability including development and maintenance of NREL's physical infrastructure, scientific equipment, and scientific core competencies. NREL is operated for EERE under a management and operating contract by the Midwest Research Institute (MRI) as prime contractor. MRI is assisted in this task by subcontractors Battelle Memorial Institute and Bechtel National, Inc. to operate NREL. DOE has assigned stewardship responsibilities for other national laboratories (Oak Ridge, Sandia, and Pacific Northwest) that conduct EERE energy efficiency R&D to other DOE Program Offices.

NREL's facilities are located at three principal sites in the Denver Metropolitan Region.

- **Denver West.** NREL's headquarters offices in Golden, CO, consist of four rented buildings primarily used for administrative purposes and some "dry" lab work. The Golden

Field Office and the Denver Regional Office also share space with NREL in these offices.

- **South Table Mountain.** NREL has a 300-acre campus located at the foot of South Table Mountain in Golden, CO, which consists of multiple research labs:
 - Solar Energy Research Facility (photovoltaics, superconductivity, and materials science, housing the National Center for Photovoltaics).
 - Field Test Laboratory Building (alternative fuels, biomass-derived chemicals, and genetic engineering).
 - Thermal Test Facility (buildings research and energy efficiency, including the Battery Thermal Test Facility).
 - Photovoltaic Outdoor Test Facility.
 - Alternative Fuels User Facility and Process Development Unit.
 - Solar Radiation Research Laboratory.
 - Thermochemical User Facility.
- **National Wind Technology Center.** Sits on more than 280 acres adjacent to DOE’s Rocky Flats cleanup area (north of Golden). The National Wind Technology Center features:
 - Sixteen test stands for wind turbines.
 - Industrial User Facility.
 - Hybrid Power Test Facility.
 - Advanced Turbine Research Facility.
 - Dynamometer and Spin Test Facility.

EERE also conducts R&D activities at other DOE national laboratories including: Oak Ridge National Laboratory, Lawrence Berkeley National Laboratory, Pacific Northwest National Laboratory, Sandia National Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Idaho National Engineering and Environmental Laboratory, Los Alamos National Laboratory, and the National Energy Technology Laboratory.

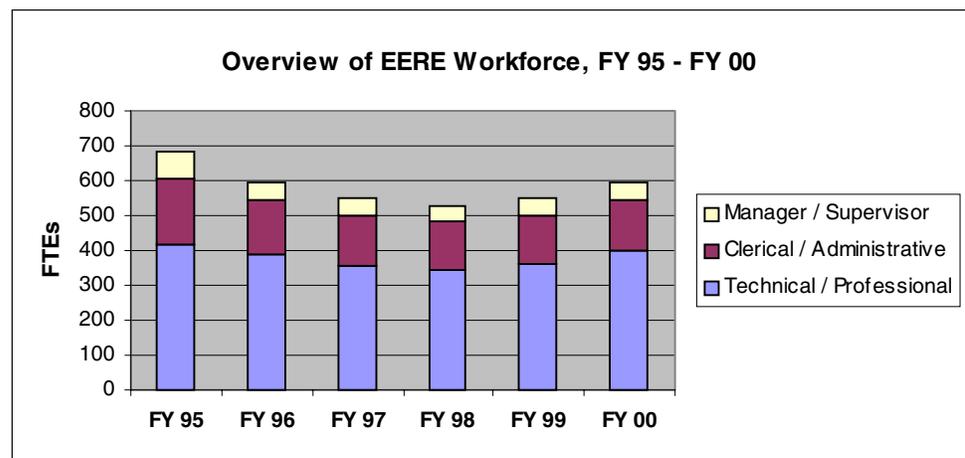
2.2.5 Budget and Staffing

Budget

The U.S. Congress funds EERE in order to promote energy security through reduced dependence on foreign oil, to create environmentally-benign alternative energy sources, and to increase the economic competitiveness of U.S. energy technology exports. Although funding levels have fluctuated over the past two decades, Congressional appropriators have recognized, to varying degrees, EERE’s strong and balanced research, development, and deployment (RD&D) efforts into clean and efficient energy technologies and practices, as well as its support for critical policies and markets. This work is a critical part of the Federal government’s responsibility of investing in high-risk, high-value RD&D that is essential to the Nation’s future and would not be independently conducted by the private sector.

Interior & Energy and Water Development Appropriations.

EERE’s budget authority is derived from two Congressional Subcommittees. The Interior Appropriation Subcommittee supports EERE’s efficiency efforts under the budget line “Energy Conservation.” These funds comprise roughly two-thirds of EERE’s budget. The Energy and Water Development (EWD) Appropriation Subcommittee supports the remainder of EERE’s work on renewable energy under the budget line “Energy Supply.” These funds total about one-third of EERE’s budget. Some crosscutting initiatives are funded jointly by both bills.



2.2.6 Sector Summaries

EERE's research, development, and deployment programs are aligned with the energy sectors of the economy to better link advanced energy technologies and practices to their target markets:

- Buildings
- Industry
- Power Generation and Delivery
- Transportation
- Federal Facilities.

Section 2.2.6 reviews the energy context in each of EERE's target markets and summarizes EERE's program activities in these five areas. The following information is included in each sector summary:

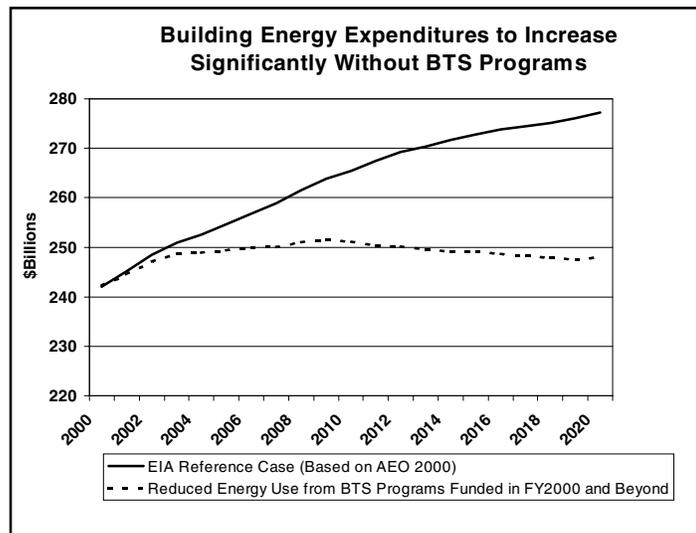
- Energy Context
- Mission
- Strategic Approach
- Program Goals

2.2.6.1.1 Buildings Sector Energy Context

As living standards continue to increase, Americans demand more and more energy to power an ever increasing array of leisure products and labor saving devices in our homes, schools and workplaces.

- In the U.S., buildings account for more than 1/3 of the annual energy consumption, including 2/3 of all electricity generated.
- Americans spend approximately \$240 billion per year to heat, cool, light, and run equipment and appliances in residential and commercial buildings.
- Adoption of energy-efficient buildings technologies and practices resulting from EERE's buildings programs are estimated to save approximately 2 quadrillion Btu annually by 2010, and approach 5 quadrillion Btu annually by 2020.

- The investment in these energy efficiency improvements are estimated to save approximately \$15 billion annually by 2010 and about \$30 billion annually by 2020.
- Building energy efficiency programs address our Nation’s escalating building energy consumption, while improving the environment and worker productivity, as well as the affordability of homes.



2.2.6.1.2 Office of Building Technology, State, and Community Programs

Mission

In partnership with industry and government, the Office of Building Technology, State, and Community Programs (BTS) develops, promotes, and integrates energy technologies and practices that make buildings more efficient and affordable.

Strategic Approach

BTS has identified three strategies to achieve its goals:

1. Accelerate the introduction of highly-efficient technologies and practices through research and development.
2. Increase the minimum efficiency of buildings and equipment through codes, standards, and guidelines.

3. Encourage the use of energy efficiency and renewable energy technologies and practices through technology transfer and financial assistance.

Partnerships with industry, academia, and government entities underlie most of the programs' successes. By bringing together relevant stakeholders, BTS is able to build the critical mass necessary to overcome many of the barriers to building advances. Chief among these barriers is the fragmentation of the design, construction, materials and equipment manufacturers and building operation and maintenance industries making it difficult to reach a consensus on new technologies or coordinate efforts on concepts like whole building design.

Integral to implementing BTS' strategic plan are four new ways of doing business: a customer-focused, team-based organization for greater accountability and results; collaboratively developed technology roadmaps to provide for a more integrated, customer driven R&D portfolio; greater competition to increase the innovation and broaden research participation; and increased peer review to assure our science is sound.

The programs use an integrated approach to energy efficiency, one that takes into account the complex and dynamic interactions between a building and its environment, among a building's energy systems, and between a building and its occupants. This "whole buildings" approach has achieved energy savings of 20 to 30 percent beyond those obtainable by focusing solely on individual building components, such as energy-efficient windows and water heaters.

2.2.6.2.1 Industrial Sector Energy Context

Industry consumes about 36 percent of all energy used in the U.S. Nine industries account for 75 percent of all energy used by U. S. industry and 30 percent of all U. S. energy use: agriculture, aluminum, chemicals, forest products, glass, metal casting, mining, petroleum and steel.

Points relevant to these nine industries:

- These industries produce more than 90 percent of the materials used in our finished products, manufacturing equipment, buildings, transportation vehicles and infrastructure. They are the foundation for the U. S. economy.

- These industries produce \$1 trillion in annual shipments, account for 5 percent of the GDP, and directly provide more than 3 million well paying jobs. They also generate four times that many additional jobs in related industries.
- Increasing global competition, ever diminishing margins, capital intensiveness of the equipment and facilities and growing investments to meet increasingly stringent environmental regulations leave sparse resources for these industries to invest in technological advances. The average investment in R&D as a percent of sales for the manufacturing sector as a whole is 3 percent; these nine industries are generally less than 1 percent of sales.

2.2.6.2.2 Office of Industrial Technologies

Mission

The Office of Industrial Technologies (OIT) partners with key, energy-intensive industries to develop and apply advanced technologies and practices that reduce energy consumption, maintain and create jobs, boost productivity, and significantly improve the global competitiveness of the United States.

Strategic Approach

By adopting more energy-efficient technologies, industry can boost its productivity and competitiveness while simultaneously strengthening national energy security and improving the environment. Through an innovative, industry driven strategy known as Industries of the Future, OIT helps industry develop and apply advanced, energy efficient technologies. The strategy optimizes the energy and environmental benefits of technology investments by focusing on nine energy intensive industries and fostering the formation of public-private partnerships. The goal of the Industries of the Future strategy is to help advance an entire industry rather than individual companies by aligning industrial resources with government resources and applying them toward industry's top priorities.

Core elements of the Industries of the Future strategy are: 1) Industry leaders outline a future vision that is defined by explicit market, business, energy, environmental and human resource

development goals. A roadmap is developed to articulate specific strategies to achieve the vision. 2) OIT issues competitive RD&D solicitations in support of the roadmaps, requiring 50 % cost share from industry partners. Projects are selected where the risks and costs of conducting the RD&D are so high or long term that it cannot attract sufficient private investment without government involvement. 3) OIT also provides supporting programs that focus on crosscutting technologies, financial assistance, and systems designs that represent the needs across multiple industries.

Recently, OIT has expanded its national efforts by initiating a State Industries of the Future. These national and state partnerships help states leverage and focus their efforts on the most vital needs as identified by their local industrial community. Through these partnerships, states can mobilize their resources while simultaneously influencing the National Industries of the Future agenda. The State Industries of the Future initiative is designed to broaden the reach of our national vision and roadmap priorities through coalescing and focusing federal and state government agencies, universities and industry efforts on critical common needs. At the same time, each state develops and refines its own agenda for action with companies located within their borders.

The Industries of the Future strategy also catalyzes much more efficient and effective access to the plethora of technologies and expertise available in the DOE Laboratory system and Universities.

2.2.6.3.1 Power Sector Energy Context

A brief situation analysis of five areas of the power sector environment that influence OPT programmatic decisions follows:

Resource Competition

Currently, coal and nuclear power account for approximately 52 percent and 19 percent of utility electricity generation respectively (Energy Information Administration (EIA), 2000). However, coal-fired generation is being affected by growing concerns over the environmental impacts of these plants, as well as by higher capital costs relative to gas-fired generation. Similarly, the role of nuclear power has been limited by public concerns over plant safety and waste disposal, and as a result, EIA projects that more than half of the existing nuclear generating capacity will retire by 2020.

Natural gas, with its relatively low price and plentiful supply, is projected to continue to provide an increasing portion of the Nation's power in the years to come; however, the need for additional pipelines may affect the expansion and costs of utilizing this resource in some areas of the U.S. Continued improvements in technology performance and cost reduction will enable renewable energy resources to capture an ever increasing share of capacity additions.

Reliability

Rising consumer demand for electricity and constraints on building new transmission and distribution (T&D) systems have the potential to negatively impact system reliability. Advanced T&D system technologies will thus be required to provide real-time systems monitoring and control and ensure power quality. Additionally, these same factors will also create more opportunities for distributed renewable and natural gas energy systems as clean, efficient, and reliable power alternatives.

Industry Restructuring

Electricity markets across the country are rapidly being opened to competition, thus allowing customers to choose among power technologies, suppliers, and types of electricity services and products. Restructuring has spurred the growth of a "green power" market offering those with an interest in cleaner energy the opportunity to purchase renewable resources. Customer choice has also promoted the further development and deployment of distributed energy resources that can be tailored to fit a variety of end-user needs, including reduced emissions, improved reliability, lower costs, and greater flexibility.

Environment

Nationally, electricity generation is the largest source of air pollution and emission of gases that may cause global warming. According to the Environmental Protection Agency (EPA), electric utilities are responsible for 64 percent of SO₂ and 26 percent of NO_x emissions. Additionally, electricity generation contributes 37 percent of U.S. carbon emissions resulting from human activities. One of the greatest challenges that fossil energy faces is a wide and expanding range of clean air regulations that pressure the industry's growth. Continued emphasis on environmental issues will be a key factor affecting the growth of renewable energy industries.

Private Sector Activities

Privately-funded electric sector R&D, particularly for renewable energy technologies, has decreased sharply in the context of marketplace uncertainty, increased competition, and the current focus on low-cost energy. In the changing power industry, utilities are switching their focus from long-term R&D projects to short-term projects and needs. Thus, the importance of Federally-supported R&D increases.

2.2.6.3.2 Office of Power Technologies

Mission

The Office of Power Technologies' (OPT) mission is to develop and support clean, competitive, and reliable renewable energy, distributed natural gas, and power technologies for the 21st century.

Strategic Approach

The Office of Power Technologies manages research and development (R&D) programs comprising an integrated portfolio of renewable and natural gas energy technologies, as well as energy storage and power delivery systems, that show promise for meeting the Nation's growing need for clean, efficient, and cost-competitive heat and power. OPT programs are structured to support Departmental Strategic Drivers as well as specific Office of Energy Efficiency and Renewable Energy and OPT goals, and are balanced across the spectrum of core research, development, and targeted technology field validations. These efforts are conducted in collaboration with various industry, Federal, State, and other partners to maximize leveraging of financial and other resources, to ensure marketplace acceptability, and achieve optimum benefits for end-users and the American public.

Program Goals

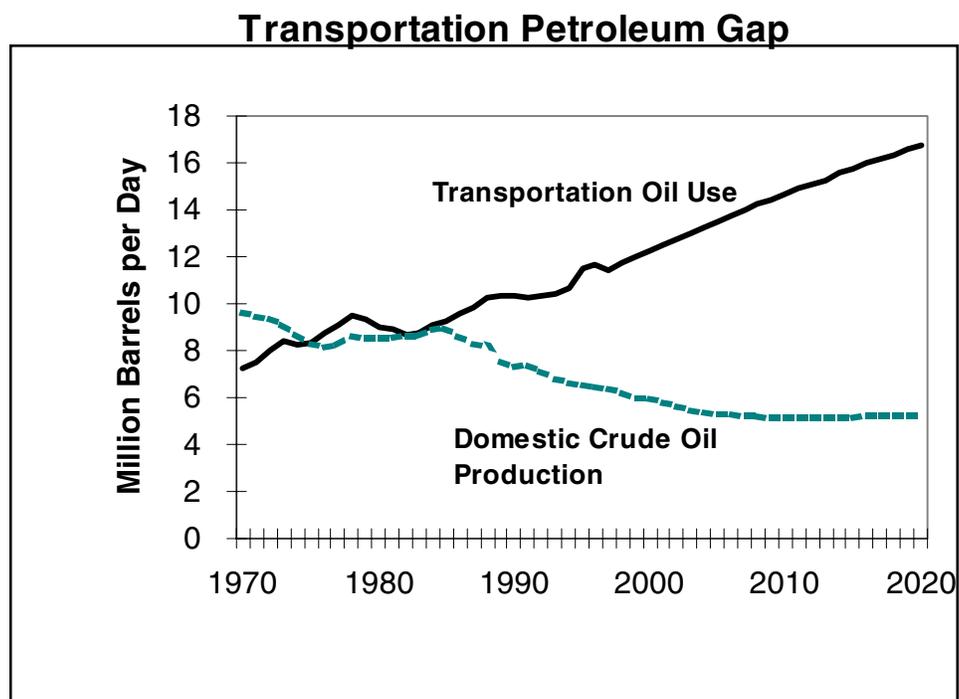
- Maintain, optimize, and enhance the reliability and quality of the Nation's electricity transmission and distribution system as the United States transitions to a competitive electricity industry.
- By 2010, increase non-hydroelectric renewable energy generating capacity to 25,000 megaWatts of installed capacity (from 6,500 megaWatts in 1996) to provide clean

power equivalent to that used by 14 million households, and maintain the current level of U.S. hydropower capacity (79,000 megaWatts) by developing technologies that are more “fish friendly.”

- Enable distributed energy resources to achieve 20 percent of new generation capacity by 2010 in the United States, compared to 5 percent of new additions in 1999.

2.2.6.4.1 Transportation Sector Energy Context

Moving people and goods accounts for 67 percent of the Nation’s oil use, and our vehicles remain 95 percent dependent on a single fuel — petroleum. Transportation’s thirst for oil has gotten our country to the point that it uses 4.7 million more barrels of oil per day — just for cars and trucks — than it produces. Imports, more than 50 percent of our consumption, are at an all time-high, currently adding an estimated \$100 million this year to our balance of payments deficit. Further, EIA projects a 1.7 percent per year growth in the transportation sector’s energy use through 2020. This growth will increase the gap between domestic consumption and production (as shown below), increase imports, and increase the pressure on global oil prices. Improving the efficiency of the cars and trucks we drive, combined with the introduction of alternative fuels (e.g., biomass, natural gas) provides the most significant opportunity to improve our energy security. If the fuel economy of every car and light truck in the U.S. could be increased by 3 miles per gallon, the “gap” between oil supply and demand would be reduced by 1 million barrels per day. The world production of conventional oil is expected to peak within the next several decades. Sound programs and policies implemented now can assure that the upcoming world oil gap can be filled by a combination of improved fuel economy and domestic fuels that are clean, renewable, and affordable.



2.2.6.4.2 Office of Transportation Technologies

Mission

The Office of Transportation Technologies (OTT) partners with industry, research organizations, State governments, and other Federal agencies to support development and use of advanced vehicle technologies and fuels which reduce demand for petroleum, decrease emissions of criteria air pollutants and greenhouse gases, and enable the U.S. transportation industry to sustain a strong, competitive position in domestic and world markets.

Strategic Approach

OTT programs provide support for research, development, and deployment programs which will reduce oil consumption by achieving: 1) significant improvements in vehicle fuel economy; and 2) displacement of oil by other fuels which are domestic, clean, and cost-competitive. The government's investment is in areas that would not be pursued by industry alone due to high risk, uncertain, and longer-term outcomes. OTT's work is primarily focused on research and development of advanced technologies, with priorities established in conjunction with cost-sharing partners, primarily industry. The work is accomplished by numerous organizations, including industry, government and uni-

versity laboratories. New initiatives, such as incentives, information, and education, will be necessary if advanced transportation technologies are to achieve market share sufficient to provide significant benefits.

Program Goal

- By 2010, reduce oil used by highway vehicles by 0.5 million barrels per day (mbpd) due to efficiency and substitution improvements. Longer-term goals for oil reduction are 1.5 mbpd in 2020 and 2.8 mbpd in 2030.

2.2.6.5.1 Federal Energy Context—Annual Federal Energy Consumption

As the nation's largest energy consumer, the Federal government can lead the nation in becoming a cleaner, more efficient energy consumer. In 1999, the Federal government spent a total of almost \$8 billion to provide energy to its buildings, vehicles, and operations. Nearly 51 percent of the government's energy bill is spent on heating, cooling, and powering its 500,000 buildings.

Legislation dating back to 1975, as well as executive orders issued under Presidents Bush and Clinton, recognize that numerous opportunities exist for improved energy management within the Federal government. Most recently, Executive Order 13123, issued in June 1999, set new requirements for energy efficiency, renewable power and water usage, and greenhouse gas generation within the Federal sector. By 2010, the resulting energy savings from compliance with the Order are expected to save taxpayers over \$750 million a year and reduce annual greenhouse gas emissions by an amount equal to 2.4 million metric tons of carbon the equivalent of taking 1.7 million cars off the road. EERE's Office of Federal Energy Management Programs (FEMP) helps agencies reach these goals and thereby realizes a significant portion of these benefits. These requirements will also expand markets for renewable technologies, reduce air pollution, and serve as a powerful example to American businesses and consumers.

Improved Federal energy management has contributed to a reduction in building energy intensity of almost 21% since 1985 and a 19.5% reduction in carbon emissions relative to 1990 levels. In 1999 alone, the Federal government reduced its annual energy bill by an estimated \$800 million as a result of projects implemented since 1985. While this progress is commendable, signifi-

cant opportunities remain to further reduce the Federal government’s energy usage in its buildings, fleets, and operations.

2.2.6.5.2 Office of Federal Energy Management Programs

Mission

The Office of Federal Energy Management Programs (FEMP) reduces the cost and environmental impact of the Federal government by advancing energy efficiency and water conservation, promoting the use of renewable energy, and managing utility costs in Federal facilities and operations, including those of the Department of Energy.

Strategic Approach

Through alternative financing vehicles, technical assistance, and outreach campaigns, FEMP helps Federal customers address their energy management needs. FEMP aids in the design and construction of energy efficient buildings, effective operation and maintenance of existing facilities, major retrofits, purchase of energy efficient products, and utility and load management. FEMP leverages both Federal and private resources to provide technical and financial assistance to Federal agencies.

Program Goals

- By 2005, achieve a 30 percent reduction in Btu per gross square foot for Federal facilities relative to a 1985 baseline; by 2010, achieve a 35 percent reduction.
- By 2005, reach a 40 percent reduction in energy use per gross square foot in DOE’s buildings compared to 1985; by 2010, achieve a 45 percent reduction.
- By 2005, achieve a 20 percent reduction in Btu per gross square foot in Federal industrial and laboratory facilities relative to 1990; by 2010, achieve a 25 percent reduction in these facilities.
- By 2010, achieve \$2.4 billion in cumulative private sector investment in Federal facilities via FEMP Super Energy Savings Performance Contracts and utility energy service.
- By 2010, achieve a 30 percent reduction in greenhouse gas emissions generated by Federal facilities relative to 1990.

- By 2005, energy consumption equivalent to 2.5 percent of the Federal government's facilities electricity consumption must come from new renewable energy sources (i.e., renewable generation installed or acquired after 1990).
- By 2005, purchase at least 3 percent of DOE's electricity from non-hydro renewable sources; by 2010, purchase at least 7.5 percent from non-hydro renewable power sources.
- Protect a \$220 million contract portfolio by intervening in State and Federal utility cases.

2.2.7 How EERE Manages Its Business—PBM

Introduction

Prior to 1999, EERE had received criticism from both external and internal sources concerning its business practices and overall management. In assessing these criticisms, the Assistant Secretary obtained independent evaluations on the effectiveness of management within EERE, including a review by a self-directed EERE Management Improvement Team and a review by the National Academy of Public Administration (NAPA). One criticism common to all of these reviews was that EERE did not have a systematic, disciplined approach to the fundamental business of planning, budget development, program execution, and program evaluation.

Recent Reforms

EERE has initiated numerous reforms to address these criticisms, including:

- Creating the Office of Planning, Budget and Management (PBM) in September 1999, to unify previously disparate functions into one organization and hiring EERE's first Chief Operating Officer, responsible for overseeing all planning, budget, management, and evaluation activities.
- Directing the implementation of a Strategic Management System in January 2000, to provide an integrated corporate approach for the business of planning, budget development, budget execution, and program evaluation across the organization.

- Issuing an EERE-wide Strategic Plan in March 2000 that sets forth the goals, objectives, and strategies of the entire organization.
- Implementing new business management systems within EERE that provide managers with critical desktop tools to track technical progress against costs and schedules.
- Initiating improved procurement planning.
- Initiating several efforts to clarify the roles and responsibilities of EERE's Headquarters, Field, and laboratory organizations, and hiring EERE's first Director of Field Management and Operations.
- Completing internal reorganizations, including the establishment of a Distributed Energy Task Force during the past year to improve program delivery.

Office Of Planning, Budget And Management (PBM)

In 1999, the Assistant Secretary for EERE determined that EERE could produce greater program benefits if the management of the overall organization were improved. Considering input from a wide group of stakeholders, including the U.S. Congress, industry, and academia, the Assistant Secretary commissioned a management improvement team to examine the EERE program in five areas ranging from budgeting to performance measurement to procurement. One of the common themes that arose from the management reviews was that EERE would benefit greatly from the establishment of a Chief Operating Officer and a supporting organization focused on managerial excellence. PBM has six functional areas that support the effective and efficient operations of the EERE enterprise:

- **Planning, Analysis and Evaluation.** Provides relevant and timely planning and analysis to support executive decision-making in the areas of resource allocation, budget formulation, national strategy development, performance measurement, and technology assessment. It also provides analyses of policy, planning, and budget issues. The Planning office manages the development and evaluation of EERE's annual Government Performance and Results Act (GPRA) metrics and updates of the EERE Strategic Plan; coordinates the inclusion of program performance measures in the EERE budget; represents EERE in the develop-

ment of the annual DOE Performance Plan, Secretary's Performance Agreement with the President, and Accountability Report, DOE's Strategic Plan, the biannual National Energy Strategy, and other DOE or Administration documents; conducts evaluations of program performance; and ensures appropriate documentation and quality control of programs' reported achievements and benefits.

- **Budgeting and Financial Management.** Provides timely and effective budget formulation and execution services based on sound planning, advances information technologies, supports EERE's technology development process, and complies with all external requirements.
- **Outreach.** Communicates the EERE mission, program plans, accomplishments, and technology capabilities to a variety of stakeholder audiences including Congress, the public, educational institutions, industry, and other government and non-government organizations. The Outreach office writes testimony and prepares briefing books; coordinates answers to Congressional questions (between 600-1000 per year); prepares speeches and presentations by EE-1 and others when requested; manages the Efficiency and Renewable Energy Network web site, EREN, and the Efficiency and Renewable Energy Clearinghouse, EREC; and coordinates reviews of EERE-related statements by other DOE offices and Federal agencies.
- **Human Resources and Organization Management.** Aligns EERE's human resources to achieve optimal program efficiency and effectiveness, while ensuring that the contribution of each staff member is valued and recognized by: (1) ensuring that management and staff work together to define each person's role, and (2) providing the proper support, training, and tools to fulfill that role.
- **Information Technology.** Promotes the use of advanced information technology to revolutionize our business operating environment by: (1) streamlining existing processes, (2) improving individual program performance, (3) using common information protocols to improve the accessibility of information and ease data validation, and (4) making systems easier to use.
- **Field Management and Operations.** Institutionalizes a corporate approach to field management and reporting by:

(1) improving collaboration, (2) clearly delineating and defining the roles, responsibilities, and authorities among all participants, and (3) embracing environmental safety and health. It also has responsibility for EERE's acquisition/procurement process by ensuring that it (1) is clearly defined, (2) is consistent across EERE Headquarters and Field Organizations, (3) complies with DOE policies and practices, (4) includes early needs assessment and ongoing accountability, (5) clarifies office authorities, and (6) properly acquires goods and services in a timely and efficient manner.

2.2.8 Regional Offices

"Energy Efficiency and Renewable Energy's (EERE) six Regional Offices (ROs) are the Federal government's principal mechanism for delivering energy efficiency and renewable energy programs at the regional, state and local levels. For most energy users, the ROs are the gateway into EERE's portfolio of technical and financial resources, designed to increase the use of efficient energy and clean power technologies in buildings, industry, transportation, power generation, and Federal facilities.

The Mission of EERE's Regional Offices is to ensure that Federal programs for efficient energy and clean power technologies get implemented at the regional, state, and local level, providing Americans with a stronger economy, healthier environment, and more secure future.

More than for any other DOE energy program, EERE's success depends on millions of individual choices at the local level be it a homebuilder, a small business, an industrial cogenerator, the car or appliance buyer, or a child turning the light switch off. All of these energy consumers or suppliers will make their decisions based on their own local and diverse geographic, environmental, and economic conditions.

Local experts know the needs of their areas best. For example, the State Energy Program is a statutory formula-grant program in which states submit annual plans for funding. There are mandated measures that each plan must address, but once the minimum requirements are met, a state may then request funds for almost any energy-efficiency program which best meets its citizens' needs. The state and local partnerships that take place through the Regional Offices are the primary vehicle through which the Department of Energy meets the needs of individual citizens, cities, counties, and states across the nation.

EERE's Regional Offices:

- Serve as EERE's front line that enables the Administration to achieve its objectives of moving Federal resources to the point of program delivery.
- Manage projects from all of EERE's sectors, integrating them to best meet the needs of customers and providing a vital link between EERE's programs and its regional, state, and local partners.
- Serve as the eyes and ears for EERE's national program managers, helping improve the effectiveness of Federal energy programs by providing feedback from state and local organizations.

The Regional Offices carry out their mission through their expertise in:

- Managing and helping deliver EERE's major technical and financial assistance programs at the regional, state, and local level.
- Serving as EERE's liaison to State Energy Offices, other state agencies, regional organizations of the National Governors' Association, and other stakeholders involved in energy and environmental quality issues.
- Supporting and helping deliver special initiatives of the President, Secretary, and Assistant Secretary.
- Creating regional, state, and local partnerships and leveraging regional, state, and local resources to maximize the impact of EERE's technologies and programs.

Besides serving from six to twelve states each, the ROs serve Washington, DC, Puerto Rico, Northern Marianas, and three U.S. territories (from now on treated as states). The ROs have a combined total of 124 Federal employees almost a quarter of EERE's workforce and administer more than \$200 million in funding each year. The ROs' role in managing grants and projects is critical to EERE's ability to accelerate the market penetration and the resulting economic, environmental, and energy security benefits of energy efficiency and renewable energy technologies."

Regional Offices



Reference:

- U.S. Department of Energy, Energy Efficiency and Renewable Energy, Regional Offices, DOE/EE-0248, Washington, D.C., 2001.

2.2.9 Golden Field Office

The mission of the Golden Field Office (GFO) is to support EERE through field project management of R&D partnerships, laboratory contract administration, and a variety of professional, technical, and administrative support functions. Golden is also accountable for funds expended under the NREL contract and for funds expended under grant programs administered through the EERE Regional Offices. Golden's Federal staff includes specialists in engineering, scientific research, project management, procurement, finance, information systems, environmental protection, law, and human resource management.

Contribution To EERE'S Mission

The Golden Field Office carries out its mission by:

- Administering the management and operating contract for the National Renewable Energy Laboratory (NREL).
- Managing the Federal Energy Management Program (FEMP) Super Energy Savings Performance Contracts and serving as the focal point for FEMP finance and procurement activities. This work includes field management of the SavEnergy audit program, implementation of inter-agency agreements with Federal agencies nationwide to support a variety of privately financed energy-saving projects, and management of the FEMP Technical Advisory and Assistance Contract which provides expertise to Federal agencies in saving energy.
- Providing procurement, legal, business management, information resource management, and technical support to the EERE six Regional Offices.
- Supporting the Inventions and Innovations Program. This program offers a unique mix of customized technical and financial assistance to independent inventors, entrepreneurs, and small businesses to develop energy-saving inventions. The program goals are increases in commercialized energy-saving technologies, with increases in domestic jobs and sales.
- Supporting the National Industrial Competitiveness through Energy, the Environment and Economics Program (NICE3). This cost-shared grant program, promotes energy efficiency, clean production, and economic competitiveness in industry by providing funding to state/industry partnerships for projects that develop and demonstrate advances in energy efficiency and clean production technologies.
- Partnering with industry and academia in joint R&D projects to further development and facilitate deployment of EERE technologies. Additionally, GFO provides management support for agreements and projects in nearly every State and in several other nations to support the EERE Offices of Buildings, Industry, Power, and Transportation Technologies.

Golden Field Office Home: <http://www.golden.doe.gov/>

2.2.10 National Renewable Energy Laboratory

Background

The National Renewable Energy Laboratory (NREL) is the world leader in developing renewable energy technologies and a primary laboratory for developing energy-efficient technologies.

Mission — NREL leads the Nation toward a sustainable energy future by developing renewable energy technologies, improving energy efficiency, advancing related science and engineering, and facilitating commercialization.

Originally called the Solar Energy Research Institute, NREL was established by the Solar Energy Research, Development and Demonstration Act of 1974 as a national center for Federally sponsored solar energy R&D. President George Bush designated the Solar Energy Research Institute a national laboratory on September 16, 1991, and changed the name to the National Renewable Energy Laboratory. NREL is a Federally Funded Research and Development Center. As such, it is a strategic advisor to and partner with DOE, assisting the Department with a full range of activities from research and development through technology demonstration to facilitating deployment of these technologies into global markets.

NREL is responsible for integrating the expertise and viewpoints of industry, academia, and DOE, and collaborates with many different organizations in accomplishing its mission. A contractor-operated laboratory owned by DOE, NREL is managed by Midwest Research Institute of Kansas City, MO (prime); Battelle Memorial Laboratory of Columbus, OH; and Bechtel Corporation of San Francisco, CA.

EERE has the primary responsibility for NREL's activities and stewardship responsibilities for NREL's long-term development. Locally, the Laboratory's contract is managed by DOE's Golden Field Office.

Areas Of Expertise

NREL's highly skilled technical staff of about 850 scientists, engineers, analysts, and support personnel is internationally known and respected. NREL represents the world's largest collection of renewable energy and energy efficiency experts.

- **Fundamental science related to renewable energy and energy efficiency technologies.** NREL expertise includes condensed-matter physics, quantum theory, solid-state spectroscopy, photoelectrochemistry, computer modeling of complex systems, photosynthesis, catalysis and photoca-

talysis, crystal growth, electrochromics, quantum dot and nanostructured materials, bioconversion, genetic engineering, and high-temperature superconductivity.

- **Development and characterization of renewable energy, energy efficiency, and industrial conversion processes and technologies.** NREL expertise covers fundamental and applied science in the areas of photovoltaics, wind energy, biofuels, buildings, biopower, concentrating solar power, hydrogen, advanced automotive technology, superconductivity, industrial technologies, resource assessment, distributed power, and more.
- **Systems and process engineering and integration for renewable energy and energy efficiency technologies.** Using engineering disciplines that span the range from structural dynamics, electrical and electronic engineering, chemical processing, heat and mass transfer, aerodynamics, and more, NREL integrates individual technologies into complete conversion or energy-saving systems.
- **Integration of efficiency and renewable technologies with conventional fuel supply sources.** NREL is developing ways to diversify the Nation's energy supply options, using its expertise to integrate renewable and energy-efficient technologies with conventional energy technologies. Examples include using alternative fuels to augment conventional transportation fuels; using photovoltaics, wind energy, and hydrogen in distributed electricity systems to offset demand on conventional electricity-generating technologies; combining engine technologies into hybrid vehicles that use multiple sources of power; and integrating passive solar, electrochromics, photovoltaics, fuel cells, and heat pumps with conventional systems to heat and cool buildings.
- **Formation of partnerships for market and technology development for renewables and energy-efficient technologies.** NREL creates and coordinates innovative partnerships with clients ranging from small businesses and Fortune 500 companies to entire industries. NREL assists in developing policies and identifying and lowering market barriers to encourage development of self-sustaining businesses and markets.

- **Analysis.** NREL conducts analyses of energy technologies, applications, markets, and policies to support program planning, policy formulation, and technology deployment efforts. The laboratory applies its deep understanding of renewable technologies and markets to analyze issues, such as the role of renewables in addressing climate change and air quality, the potential to deploy renewable technologies in developing economies, and green energy markets. In addition, the laboratory has strong capabilities in life-cycle analysis and in modeling advanced energy efficiency and renewable technologies in energy economic models.

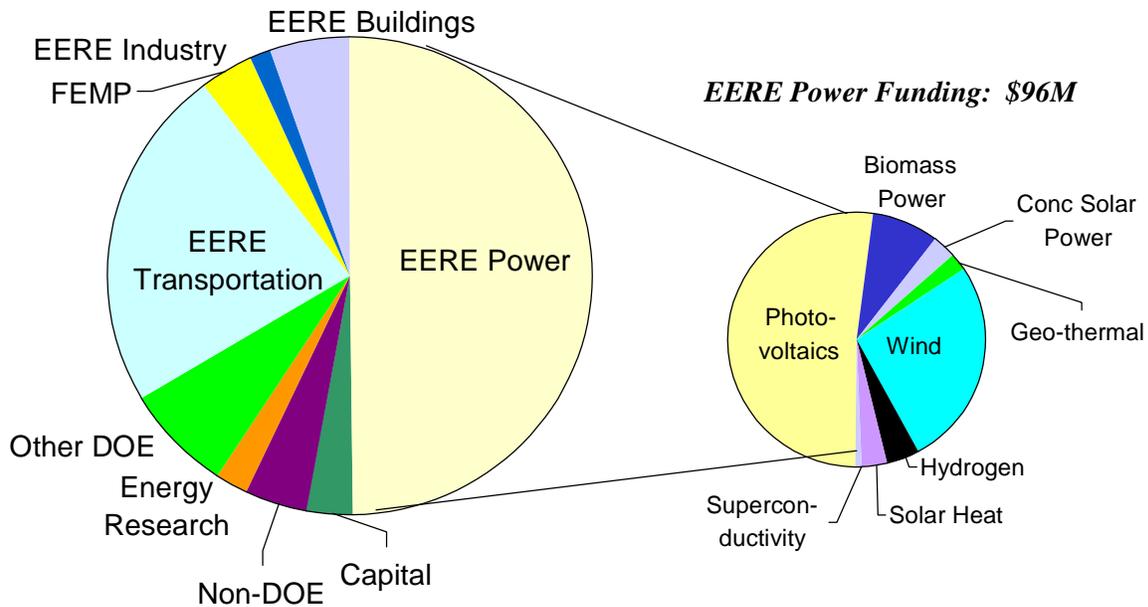
Centers Of Excellence And User Facilities

NREL's capabilities include a number of laboratories, user facilities, and centers of excellence:

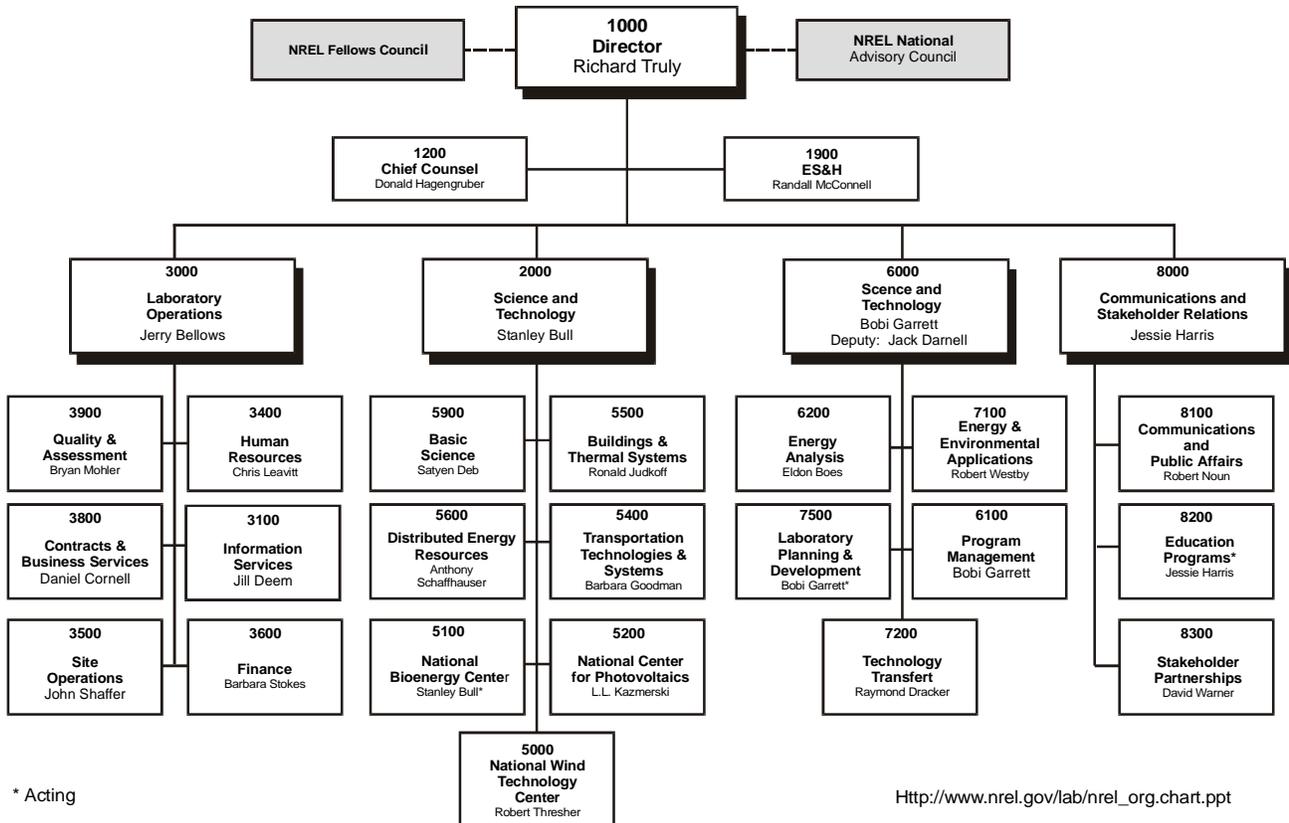
- **National Wind Technology Center.** A national center for designing and testing improved wind turbine technology, with user facilities for industry.
- **National Center for Photovoltaics.** A national center, managed jointly by NREL and Sandia National Laboratories, supporting DOE and the photovoltaic industry by conducting R&D, testing components, and designing modules and systems.
- **Solar Radiation Research Laboratory.** A facility to test, calibrate, and compare radiometers and other solar radiation measuring equipment using world radiation reference standards.
- **High-Flux Solar Furnace.** A national user facility providing highly concentrated sunlight for material and surface processing; of interest to automotive, aerospace, defense, electronic, and other industries.
- **Alternative Fuels User Facility and Process Development Unit.** A 1-ton-per-day pilot plant for converting biomass to ethanol, available to industry to pilot processes intended for larger, commercial-scale facilities.
- **Thermochemical User Facility.** A process development facility that converts biomass feedstocks and other renewable fuels into a variety of products, such as electricity, high-value chemicals, and transportation fuels.

NREL FY 1999 Major Funding Sources

Total Funding: \$193M



National Renewable Energy Laboratory



- **Battery Thermal Test Facility.** A user facility available to industry to design and test advanced batteries for electric and hybrid-electric vehicles.

2.2.11 EERE's Commitments and Requirements

EERE has many near- and long-term commitments derived primarily from Presidential Initiatives, Secretary of Energy Initiatives, and Executive Orders. These commitments take the form of programs, activities, projects, reports, or individual tasks. EERE's principal commitments and requirements from the various sources, as well as a list of unfounded requirements, follow.

Activities and funding levels identified for these initiatives cross-cut EERE programs, and often DOE programs, many of which pre-date these initiatives. Many of the initiatives are inter-agency efforts.

Presidential Initiatives

- **Bioenergy/Bioproducts.** The goal of this initiative, described in Executive Order 13134, *Developing and Promoting Biobased Products and Bioenergy Today* (1999), is a tripling U.S. use of biobased products and bioenergy by 2010. The order established three supporting groups: (1) An Interagency Council on Biobased Products and Bioenergy USDA (co-chair), DOE (co-chair), DOC, DOI, EPA, OMB, NSF to develop and present a biomass research program annually as part of the Federal budget, and to review major agency programs and activities to ensure that they effectively advance the initiative. (2) A joint USDA-DOE National Biobased Products and Bioenergy Coordination Office to ensure effective day-to-day coordination of actions implementing the initiative. (3) An outside advisory group with representatives from biobased industries, farm and forestry sectors, universities, and environmental groups. EERE supports the initiative with integrated R&D in transportation biofuels (Office of Transportation Technologies), biomass power (Office of Advanced Power Technologies), and forest products and agriculture industry technologies (Office of Industrial Technologies) programs. This will result in technologies for producing different combinations of fuels, power, chemicals, and other products from different feedstocks in different areas of the country

- **Climate Change Technology.** The Climate Change Technology Initiative (CCTI), begun in 1998, is comprised of domestic climate-related activities and policies, including those that promote energy efficiency, the development of low-carbon energy sources, sequestration of carbon, and climate science. At DOE, the initiative primarily covers R&D (EERE, FE, and SC). It also includes tax credits designed to encourage purchases of energy-efficient and renewable energy products, voluntary information programs to encourage businesses and others to conserve energy, and research into ways to sequester carbon in agriculture, in some cases as renewable fuels. R&D relating to energy efficiency and renewable energy sources is largely an evolutionary step from earlier programs, initiated in the late 1970s and early 1980s to reduce dependency on oil imports. Most of the other initiatives addressed here are either included in the CCTI programs, or overlap with them. DOE is required to submit an annual Report to Congress with the budget request outlining those budget elements included in the CCTI. DOE also provides input to OMB on their annual Report to Congress. EERE has headed up both efforts for DOE for the last several years.
- **Clean Energy for the 21st Century.** The multi-agency Clean Energy for the 21st Century Initiative (a.k.a., International Clean Energy/International Energy Efficiency), begun in January 2000, helps lay a technical and policy foundation in developing and transition countries (e.g., ex-Soviet) to build a clean energy future while building competitive markets open to U.S. firms. DOE, the U.S. Agency for International Development, the Export-Import Bank, the U.S. Trade Development Agency, and the Department of Commerce are the principal participants. EERE participates in a variety of areas, for example, appliance standards and Energy Star (Office of Building Technology, State and Community Programs), industrial best practices and assistance (Office of Industrial Technologies), and integrated renewable energy (Office of Power Technologies). FY 2001 programs continue and expand support for international solar energy programs, such as the U.S. Initiative on Joint Implementation, renewable energy outreach information, and technical assistance.

- **Environmental Justice.** The goal of this initiative is to ensure fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, directs Federal agencies to develop strategies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. EPA's Office of Environmental Justice oversees the initiative. In support, EERE focuses on helping communities comprised of people of color or low income attain their economic development and environmental objectives through the incorporation of energy-efficient and renewable energy technologies. A number of EERE competitive solicitations include environmental justice as one of the "Program Policy Factors." Participation in related interagency task forces provides EERE an excellent forum for identifying potential partners at the community level. Such task forces include the Brownfields Interagency Task Force, American Heritage Rivers Initiative, Brightfields Initiative, and Brownfields Showcase Communities.
- **Livable Communities.** The Livable Communities Initiative, begun in 1999, aligns and dedicates new and existing Federal resources to strengthen the Federal government's role as a partner with the growing number of State and local efforts to build "livable communities" for the 21st century. EERE's State Energy Program helps fund States designing and carrying out their own energy efficiency and renewable energy programs. The Office of Transportation Technology programs for high efficiency and alternative fueled vehicles contribute to increasing community transportation choices and reducing air pollution. DOE staff participate in an interagency New Initiatives Working Group that is developing a package of new livable communities initiatives.
- **Million Solar Roofs.** The Million Solar Roofs Initiative's goal is to facilitate one million solar roof installations (a mixture of solar heat/hot water and photovoltaics) by 2010. The initiative was begun in 1997. DOE already has received commitments for close to one million solar roofs. To further spur solar energy technologies, the President has proposed a 15 percent tax credit (up to \$2,000) for the

purchase of rooftop solar systems. Million Solar Roofs is implemented by the EERE Office of Power Technologies, in cooperation with EERE Office of Buildings, State and Community Programs and the Federal Energy Management Program. Under Executive Order 13123 (1999), each Federal agency must strive to expand the use of renewable energy within its facilities and in its activities by implementing renewable energy projects and by purchasing electricity from renewable energy sources, including a goal of installing 20,000 solar systems on Federal buildings' rooftops by 2010.

- **Partnership for Advanced Technology in Housing (PATH).** The goal of the PATH Initiative, begun in 1998, is to speed the creation and widespread use of advanced technologies that measurably improve the quality, durability, energy efficiency, environmental performance, and affordability of our Nation's housing. The initiative seeks to make new homes 50 percent more energy efficient, and to make at least 15 million existing homes 30 percent more energy efficient, within a decade. Projects are underway in pilot communities in Denver, Los Angeles, Pittsburgh, and Tucson. HUD (the program manager) and DOE provide leadership for overall policy direction, in cooperation with the PATH Interagency Council composed of senior representatives from DOE, HUD, EPA, FEMA, DOC, and USDA. A working group with representatives from all the Federal agencies participating in PATH helps with day-to-day coordination of Federal activities.

PATH uses a five-part approach: industry-driven research partnerships on new technologies and practices, working with industry on pilot programs building thousands of marketable houses, streamlining of Federal, State and local codes and regulations, judicious use of existing authority on standards, and an information campaign to influence consumer demand. With the interagency working group, the Office of Building Technology is developing a technology roadmap for residential building research. It coordinates State and local participation in demonstrating new heating and air conditioning duct sealing technology in Weatherization Assistance Program homes. With industry, the program develops, promotes, and integrates energy technologies and practices to make buildings more energy efficient. EERE also helps coordinate Building America projects with PATH, provides technical assistance to other

Federal agency partners, and increases outreach. The Million Solar Roofs Program is also coordinated with PATH.

- **Partnership for a New Generation of Vehicles (PNGV).** This cost-sharing partnership with industry, begun in 1993, aims to produce attractive, affordable vehicles satisfying all applicable emission and safety requirements while achieving a fuel economy three times higher than the 1994 Taurus/Lumina/Concorde vehicles selected as the PNGV baseline cars. Current priorities include development of highly efficient fuel cells and direct-injection engines that meet stringent new air quality standards, efficient energy storage systems, power electronics, batteries, and lightweight materials. EERE works with automobile manufacturers and their suppliers to develop an 80-mpg family sedan by 2004 at a cost, performance, safety, and comfort level similar to today's models. EERE's Office of Transportation Technologies supports most Federal R&D for PNGV. The rest comes from DoD, DOC, DOT, NASA, and EPA. Much of the Vehicle Technologies R&D Program in the Office of Transportation Technologies is conducted as a major element of PNGV.
- **21st Century Trucks.** This initiative, begun in April 2000, seeks to develop, by 2010, production prototype vehicles that achieve three times the fuel economy (measured in ton-miles per gallon) of heavy pickups, large urban delivery trucks, and full-sized buses. It seeks to double the fuel economy of 18-wheeler, long-haul trucks. The public-private partnership includes 18 companies from the trucking industry. DoD, DOE, DOT, and EPA cooperate on R&D toward advanced engines, fuel cells, advanced propulsion technologies, lightweight materials, vehicle design, advanced emissions control, and vehicle safety systems for long-haul trucks, heavy pickups, delivery vans, and full-size passenger buses. The initiative calls for production prototypes within 10 years. In support, EERE's Office of Transportation Technologies does R&D on advanced emissions technologies, advanced propulsion systems, advanced materials, and innovative vehicle designs. Indications are that the Secretary of Energy will be heading the initiative, and EERE Office of Transportation Technologies will be the primary participant. A Partnership Coordinating Committee, made up of senior representatives from the participating companies and government

agencies, will develop a plan detailing the initiative's goals and timetables. In addition, external peers will review the partnership committee's work each year to ensure that technological advances are on track to meet the goals set for 2010.

- **Greening the Government Through Efficient Energy Management and Greening the Government Through Federal Fleet and Transportation Efficiency.** This initiative places emphasis on improving the energy efficiency and environmental quality of the Federal sector. Executive Order 13123, Greening the Government Through Efficient Energy Management, assigns the EERE Federal Energy Management Program (FEMP) responsibility for providing technical assistance, guidance, and sometimes setting targets for Federal agencies. FEMP assists Federal agencies to identify, finance, and implement energy efficiency and renewable energy projects and to manage utility costs in Federal facilities. The agencies then act to increase energy efficiency and renewable energy use, and reduce water consumption in their buildings, facilities, and operations. FEMP has developed contractual mechanisms to attract substantial private-sector funds to improve the energy efficiency of Federal facilities.

Executive Order 13149, Greening the Government Through Federal Fleet and Transportation Efficiency, requires each Federal agency operating 20 or more motor vehicles within the United States to reduce its entire vehicle fleet's annual petroleum consumption by at least 20 percent by the end of FY 2005, compared with FY 1999 levels. Each agency must fulfill the acquisition requirements for alternative fueled vehicles established by the Energy Policy Act of 1992. The Office of Transportation Technologies facilitates evaluation and use of advanced technology vehicles by Federal agencies and helps Federal agencies acquire alternative fuel vehicles. This office also strengthens the joint DOE/General Services Administration program to promote development of alternative fuel refueling infrastructure.

Secretary Of Energy Initiatives

- **Power Outage Prevention (Short-term).** The goal of this initiative, established in 1999, is to ensure that the Nation's electric power system remains reliable as the industry transitions to competitive markets over the short term.

Participants study significant electric power outages and recommend appropriate Federal actions to avoid the recurrence of similar system disturbances in the future. EERE participants include the Offices of Industrial Technologies, Building Technology, State and Community Programs, Power Technologies, and the Federal Energy Management Program. For example, EERE programs develop standards for more efficient air conditioners, support focused research on energy storage technologies to reduce the high cost of power outages, improve power quality, and enhance technology choices in a competitive utility environment.

- **Energy Grid Reliability (Electricity Grid Component, Long-term).** The goal of this initiative, established in 1999, is to establish an integrated set of program activities for both the electricity grid and the natural gas grid that will enable the long term reliable delivery of energy services to consumers in competitive, restructured energy markets. The continued merging of energy delivery systems and telecommunications systems (the emerging InterGrid) has created the need for closer integration of programs. EERE is developing advanced technologies for reliable and cost-efficient power delivery, with an emphasis on the integration of distributed generation resources. This includes developing policies and technologies (e.g., system simulation, power storage, real-time sensors and controls, and new distributed power options) that will help increase system reliability by improving system flexibility, efficiency, and security. EERE participants include the Office of Industrial Technologies, Office of Building Technology, State and Community Programs, and Office of Power Technologies.
- **EnergySmart Schools Partnership.** The EnergySmart Schools Partnership was initiated by the Secretary in 1998 as part of an interagency effort to improve the Nation's schools by reducing energy bills, improving the learning environment, and redirecting the savings to our children's education. Schools can reduce their energy bills by 25 percent and realize potential savings of \$1.5 billion annually. The EnergySmart Schools initiative uses existing EERE programs, including the State Energy Programs, Rebuild America, Clean Cities, Energy Star, and the President's Million Solar Roofs Initiative. This public-private partner-

ship provides technical assistance, an information clearing-house, technology demonstrations, guidance in financing mechanisms and design, and education in energy awareness to school districts around the country.

- **Geopowering the West.** This January 2000 initiative seeks a dramatic increase in the use of geothermal energy to meet the electric power or heat energy needs of 7 million homes and businesses in the western United States by 2010, and at least 10 percent of the West's electricity by 2020. EERE's Office of Geothermal and Wind Technologies leads implementation of the initiative. The initiative includes education, awareness, and outreach activities aimed at a variety of stakeholders such as businesses, government organizations, Native American groups, and the general public. EERE's program also facilitates near-term priority opportunities and targeted technical support activities.
- **Lighting and Appliance Standards.** The Secretary of Energy assigned this initiative the goal of having the Office of Buildings, State and Community Programs prepare, and DOE issue, final rules for clothes washers, fluorescent lamp ballasts, water heaters and central air conditioner energy efficiency standards by late December 2000. EERE published a notice of proposed rulemaking for water heaters in the Federal Register on April 28, 2000; the comment period closed July 12, 2000. On May 23, the Secretary, with senior industry and energy efficiency advocates, announced a consensus agreement on standards for clothes washers. The final rule for ballasts was published in the Federal register on September 19, 2000. Final Notices of Proposed Rulemaking were published in October for residential central air conditioners (and heat pumps) and clothes washers.
- **Natural Gas.** This developing initiative coordinates and fosters research and market barrier actions to expand opportunities for clean and efficient natural gas technologies. Near-term goals focus on market efficiency, market opportunities, and reducing market barrier impediments to the use of such technologies. EERE's Hydrogen R&D Program supports demonstrations of residential and building-sized hydrogen/natural gas fuel cells for off-grid applications. EERE's Fuel Cell R&D program focuses on overcoming the critical technology barriers to developing

and validating viable fuel cell systems for automotive applications. This technology is also directly applicable to light truck and heavy-duty vehicle applications (e.g., buses). In order to realize the market penetration of alternative fueled vehicles, an aggressive program has been structured to support the widespread use and distribution of natural gas as a transportation fuel.

- **Pollution Prevention/Energy Efficiency (P2E2).** The 1999 P2E2 Initiative goal is to enable DOE to meet the requirements of Executive Order 13123, Greening the Government Through Efficient Energy Management. This means preventing pollution, reducing greenhouse gas emissions, reducing energy costs, and deploying energy-efficient technologies throughout DOE facilities and operations to satisfy the Administration's pollution-related requirements. EERE's FEMP, through its Departmental Energy and Utility Team, provides funding support to DOE sites for accomplishing energy management projects and expanding the use of private-sector financing for energy management, thus allowing the Department to meet the requirements of Executive Order 13123
- **Wind Powering America.** The goal of this initiative, initiated in 1999, is a dramatic increase in the use of wind energy in the United States from today's level of 2,500 megawatts. It includes tripling the number of States with more than 20 MW of wind capacity installed by 2010, providing 5 percent of Federal electricity use by 2010 with wind power, and providing at least 5 percent of the Nation's electricity by 2020 with wind power. The Office of Geothermal and Wind Technologies provides resources assessments, technical assistance, and economic analysis to potential stakeholders and potential partners. It organizes community outreach programs and regional and State wind workshops. The office also leads Federal efforts in the purchase of wind-generated power. The Federal government has set a goal of purchasing 5 percent of its electricity from wind-generated power by 2010. Over 30 Federal agencies at 130 sites in the Denver metropolitan area will soon purchase 10 megawatts of electricity generated by wind, as well as solar, geothermal, and biomass energy. The Wind Power America initiative includes a regional field verification program for competitively selected projects that address unique siting, regulatory,

electric power systems, and marketing issues in key regions of the United States.

- **Ultra-Clean Transportation Fuels.** The goal of the 1999 Ultra-Clean Transportation Fuels Initiative is, over the next seven years, to develop a portfolio of fuels that enable the high-efficiency and low-emission operation of light- and heavy-duty transportation vehicles. A planning effort between EERE's Office of Transportation Technologies and DOE's Office of Fossil Energy produced a joint program plan for Ultra-Clean Transportation Fuels that included a technical roadmap specifying near- and long-term goals, scheduled milestones, and funding requirements. The initiative supports proposals in three areas: technology for the production of ultra-clean fuels from a variety of resources; innovative emission control technologies, processes, or devices; and innovative fuel-making components, materials, processes, or technologies within the context of a system that includes fuel-engine after treatment.

Executive Orders

Executive Orders from the President specify programs, activities, goals, and objectives applying to all Federal government operations. The current Executive Orders requiring program action in EERE are listed below.

- **Greening the Government Through Efficient Energy Management, Executive Order 13123.** This initiative places emphasis on improving the energy efficiency and environmental quality of the Federal sector. It assigns EERE responsibility for providing technical assistance, guidance, and sometimes setting targets for Federal agencies. EERE's Federal Energy Management Program (FEMP) helps Federal agencies to identify, finance, and implement energy efficiency and renewable energy projects and to manage utility costs in Federal facilities. The agencies then act to increase energy efficiency and renewable energy use, and reduce water consumption in their buildings, facilities, and operations. FEMP has developed contractual mechanisms to attract substantial private-sector funds to improve the energy efficiency of Federal facilities.
- **Developing and Promoting Biobased Products and Bioenergy, Executive Order 13134.** Bioenergy/ Bioproducts. The goal of this initiative is a tripling U.S. use

of biobased products and bioenergy by 2010. These technologies will produce different combinations of fuels, power, chemicals, and other products using different feedstocks in different areas of the country. The order established three supporting groups: (1) An Interagency Council on Biobased Products and Bioenergy USDA (co-chair), DOE (co-chair), DOC, DOI, EPA, OMB, NSF to develop and present a biomass research program annually as part of the Federal budget, and to review major agency programs and activities to ensure that they effectively advance the initiative. (2) A joint USDA-DOE National Biobased Products and Bioenergy Coordination Office to ensure effective day-to-day coordination of actions implementing the initiative. (3) An outside advisory group with representatives from biobased industries, farm and forestry sectors, universities, and environmental groups. EERE supports the initiative with integrated R&D in transportation biofuels (Office of Transportation Technologies), biomass power (Office of Advanced Power Technologies), and forest products and agriculture industry technologies (Office of Industrial Technologies) programs.

- **Greening the Government Through Federal Fleet and Transportation Efficiency, Executive Order 13149.** This order requires each Federal agency operating twenty or more motor vehicles within the United States to reduce its entire vehicle fleet's annual petroleum consumption by at least 20 percent by the end of FY 2005, compared with FY 1999 levels. Each agency must fulfill the acquisition requirements for alternative fueled vehicles established by the Energy Policy Act of 1992. The Office of Transportation Technologies helps Federal agencies evaluate advanced technology vehicles and acquire alternative fuel vehicles. This office also strengthens the joint DOE/General Services Administration program to promote development of an alternative fuel refueling infrastructure.
- **Greening the Government Through Waste Prevention, Recycling, And Federal Acquisition, Executive Order 13101.** The head of each executive agency must incorporate waste prevention and recycling in the agency's daily operations. They must work to increase and expand markets for recovered materials through greater Federal government preference and demand for such products. Each must comply with executive branch policies for the acquisition and use of environmentally preferable products and

services and implement cost-effective procurement preference programs favoring the purchase of these products and services. Federal Energy Management Program and Departmental Energy Management Program. Federal agencies require EERE products and information to comply with this Executive Order provided below, but it does not assign EERE a specific role for its implementation.

- **Actions Concerning Regulations That Significantly Effect Energy Supply, Distribution, or Use, Executive Order 13211 (of May 18, 2001).** Agencies will prepare and submit a Statement of Energy Effects to the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, for those matters identified as significant energy actions. They will publish these statements, or a summary of them, in each related Notice of Proposed Rulemaking and in any resulting Final Rule. "Significant energy action" means:
 - any action by an agency (normally published in the Federal Register) that promulgates or is expected to lead to the promulgation of a final rule or regulation, notices of inquiry, advance notices of proposed rulemaking, and notices of proposed rulemaking,
 - any action deemed a significant regulatory action under Executive Order 12866 or any successor order,
 - any action likely adversely and significantly to effect on the supply, distribution, or use of energy,
 - any action that the Administrator of the Office of Information and Regulatory Affairs designates as a significant energy action.
- **Actions to Expedite Energy-Related Projects, Executive Order 13212 (May 18, 2001).** Executive departments and agencies will act to expedite projects that will increase the production, transmission, or conservation of energy. They will expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies will do so to the extent permitted by law and regulation. An Interagency Task Force will monitor and assist agency efforts. The Task Force also will help set up appropriate mechanisms to coordinate Federal,

State, tribal, and local permitting in geographic areas where they increased expect permitting activity.

References:

- Executive Orders Disposition Tables, January 9, 1939 to present, National Archives and Records Administration, <http://www.nara.gov/fedreg/eo.html#top>

2.2.12 Statutory Underpinnings

Many statutes under Titles 15 and 42 (Commerce and Trade and The Public Health and Welfare, respectively) specify programs, activities, goals, and objectives applying to EERE. For example, the Energy Policy and Conservation Act of 1975 and the National Appliance Energy Conservation Act direct DOE to set energy efficiency standards for appliances. The statutes that underpin many of EERE's programs are summarized below.

- **Solar Energy Research, Development, and Demonstration Act of 1974, as Amended.** Directs an R&D program, including design and construction of facilities, to address the major technical problems inhibiting commercial use of solar energy. Establishes a solar energy resource determination and assessment program. Details the goals of the programs. Established the Solar Energy Research Institute (now the National Renewable Energy Laboratory).

Office of Industrial Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies.

This statute, Pub. L. 93-473, Oct. 26, 1974, 88 Stat. 1431 (Title 42, Sec. 5551 et seq.), includes amendments made by the Congressional Reports Elimination Act of 1980.

- **Federal Energy Administration Act of 1974, as Amended.** Established the Federal Energy Administration by transferring functions of the Secretary of the Interior, the Chairman of the Cost of Living Council, and the Executive Director of the Cost of Living Council related to production, conservation, and allocation of all forms of energy, including DOI's Office of Petroleum Allocation, Office of Energy Conservation, Office of Energy Data and Analysis, and the Office of Oil and Gas. Provides for an economic analysis of the impact of proposed regulatory actions.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 93-275, May 7, 1974, 88 Stat. 96 (Title 15, Sec. 761 et seq.) includes amendments made by the amendments to the Federal Energy Administration Act of 1974, Energy Conservation and Production Act, Federal Energy Administration Authorization Act (1977), Department of Energy Organization Act (1977), Congressional Reports Elimination Act of 1980, Federal Reports Elimination and Sunset Act of 1995, National Defense Authorization Act for Fiscal Year 1996, Department of Energy Standardization Act of 1997.

- **Nonnuclear Energy Research and Development Act of 1974, as Amended.** Consolidated various energy R&D programs within the Energy Research and Development Administration, required development of a comprehensive plan for energy “research, development, and demonstration” for energy conservation, waste-to-fuel, recycling, clean fossil fuel, efficient electricity, geothermal, synthetic fuels, solar, and ocean thermal technologies and was the enabling legislation for the Inventions and Innovations Program. Created “corporations” for joint Federal-private initiatives in each (e.g., the Synthetic Fuels Corporation).

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 93-577, Dec. 31, 1974, 88 Stat. 1878 (Title 42, Sec. 5901 et seq.), includes amendments made by the Authorization of Appropriations for Fiscal Year 1976, ERDA, National Energy Extension Service Act, DOE Authorization Act of 1978, Civilian Applications Congressional Reports Elimination Act of 1980, amendments to Patent and Trademark Laws (1980), Congressional Reports Elimination Act of 1986, Energy Policy Act of 1992, Federal Reports Elimination and Sunset Act of 1995, National Defense Authorization Act for Fiscal Year 1996, General Accounting Office Act of 1996.

- **Energy Policy and Conservation Act (EPCA), as Amended.** Requires average fuel economy standards for passenger automobiles manufactured by any manufacturer in any model year after model year 1977, and assigns DOE responsibilities in managing the fuel economy program. Prescribes a program of test procedures for classes of consumer and industrial products specified in the law. Directs energy efficiency improvement targets for each type of covered product and procedures for prescribing the standards. Establishes an international energy program to facilitate the ability of the domestic renewable energy industry and related service industries to create new markets.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies.

This statute, Pub. L. 94-163, Dec. 22, 1975, 89 Stat. 871 (Title 42, Sec. 6201 et seq.), includes amendments made by the Energy Policy and Conservation Act Extension Amendment of 1990, Energy Policy and Conservation Act Short-Term Extension Amendment of 1990, Energy Policy and Conservation Act Amendments Act of 1990, 1994, and 1995, Naval Petroleum Reserves Production Act, Energy Conservation and Production Act (1976), Federal Energy Administration Authorization Act (1977), National Energy Conservation Policy Act (1978), Export Administration Act of 1979, Emergency Energy Conservation Act of 1979, Energy Security Act (1980), Congressional Reports Elimination Act of 1980, Omnibus Budget Reconciliation Act of 1981, Energy Emergency Preparedness Act of 1982, Renewable Energy Industry Development Act of 1983, Energy Policy and Conservation Amendments Act of 1985, Supplemental Appropriations Act, 1985, Consolidated Omnibus Budget Reconciliation Act of 1985, Omnibus Budget Reconciliation Act of 1986, National Appliance Energy Conservation Act of 1987, National Appliance Energy Conservation Amendments of 1988, Alternative Motor Fuels Act of 1988, Federal Energy Management Improvement Act of 1988, Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989, Energy Policy and Conservation Act Extension Amendment of 1990, Energy Policy and Conservation Act Short-Term Extension Amendment of 1990, Energy Policy and Conser-

vation Act Amendments of 1990, State Energy Efficiency Programs Improvement Act of 1990, Energy Policy Act of 1992, codification of existing Federal transportation law (1994), codification and amendment of specified provisions of Federal transportation law (1994), Federal Reports Elimination and Sunset Act of 1995, General Accounting Office Act of 1996, National Defense Authorization Act for Fiscal Year 1996, Balanced Budget Act of 1997, Higher Education Amendments of 1998, Energy Conservation Reauthorization Act of 1998, Amendments to the Energy Policy and Conservation Act of 1975 in 1979, 1981, 1984, 1988, 1989, 1996, and 1998.

- **Energy Conservation and Production Act (ECPA), as Amended.** Provides for the development and implementation of voluntary performance standards for new residential and commercial buildings. Encourages State and local governments to adopt and enforce such standards through their existing building codes and other construction control mechanisms, or to apply them through a special approval process. Establishes a Weatherization Assistance Program to increase the energy efficiency of dwellings owned or occupied by low-income persons, such as the elderly, the handicapped, and children, to reduce their total residential energy expenditures and improve their health and safety.

Office of Building Technology, State and Community Programs

This statute, Pub. L. 94-385, Aug. 14, 1976, 90 Stat. 1125 (Title 42, Sec. 6801 et seq.), includes amendments made by the Federal Energy Administration Authorization Act (1977), Developmental Disabilities Assistance and Bill of Rights Act, Public Utility Regulatory Policies Act, Congressional Reports Elimination Act of 1980, Congressional Reports Elimination Act of 1982, State Energy Efficiency Programs Improvement Act of 1990, Energy Policy Act of 1992, National and Community Service Trust Act of 1993, General Accounting Office Act of 1996, Workforce Investment Partnership Act of 1998, Omnibus Consolidated and Emergency Supplemental Appropriations Act (1999), Energy Conservation Reauthorization Act of 1998.

- **Electric and Hybrid Vehicle Research Development and Demonstration Act of 1976, as Amended.** Establishes a program of electric vehicle research and development.

Authorizes the introduction of electric vehicles into fleets used by Federal agencies.

Office of Transportation Technologies, Office of Power Technologies.

This statute, Pub. L. 94-413, Sept. 17, 1976, 90 Stat. 1260 (Title 15, Sec. 2501 et seq.), includes amendments made by the DOE Authorization Act of 1978-Civilian Applications, Congressional Reports Elimination Act of 1980, Congressional Reports Elimination Act of 1982, Federal Reports Elimination and Sunset Act of 1995.

- **Department of Energy Organization Act (1977), as Amended.** Establishes a Department of Energy in the executive branch. Transfers all functions of the Federal Energy Administration, the Energy Research and Development Administration, and the Federal Power Commission to the Department. Transfers specified functions from other departments and agencies to the Department.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 95-91, Aug. 4, 1977, 91 Stat. 565 (Title 42, Sec. 7101 et seq.) includes amendments made by the Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act Fiscal Year 1979, National Energy Conservation Policy Act (1978), Powerplant and Industrial Fuel Use Act of 1978, Natural Gas Policy Act (1978), General Accounting Office Act of 1980, Congressional Reports Elimination Act of 1982, Omnibus Budget Reconciliation Act of 1986, Inspector General Act Amendments of 1988, amendments to the Department of Energy Organization Act (1988), Federal Energy Regulatory Commission Member Term Act of 1990, National Defense Authorization Act for Fiscal Year 1991, Intelligence Authorization Act, Fiscal Year 1991, Energy Policy Act of 1992, National Defense Authorization Act for Fiscal Year 1994, codification of existing Federal transportation law (1994), National Defense Authorization Act for Fiscal Year 1995, Alaska Power Administration Asset Sale and Termination Act and Outer Continental Shelf Deep Water Royalty Relief Act, Federal Reports Elimination and

Sunset Act of 1995, National Defense Authorization Act for Fiscal Year 1996, Energy and Water Development Appropriations Act, 1997, Department of Energy Standardization Act of 1997, Energy and Water Development Appropriations Act, 1999.

- **National Energy Conservation Policy Act (NECPA) and Federal Photovoltaic Utilization Act, as Amended.** The National Energy Conservation Policy Act establishes guidelines, procedures, and criteria for residential energy conservation plans, weatherization grants to low-income people, and energy audits of, and conservation grants to, school and hospital facilities. Establishes a program to demonstrate solar heating and cooling technology in Federal buildings, including criteria for evaluating Federal agency proposals. Directs energy performance targets for Federal buildings. The Federal Photovoltaic Utilization Act establishes a program for procuring photovoltaic solar electric systems in new and existing Federal facilities. Establishes a photovoltaic systems evaluation and purchase program.

Office of Industrial Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 95-619, Nov. 9, 1978, 92 Stat. 3206 (Title 42, Sec. 8201 et seq.), includes amendments made by the National Energy Conservation Policy Act, Energy Security Act (1980), Consolidated Omnibus Budget Reconciliation Act of 1985, Conservation Service Reform Act of 1986, Omnibus Budget Reconciliation Act of 1986, Federal Energy Management Improvement Act of 1988, Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989, amendments to title 38, United States Code (1991), Energy Policy Act of 1992, codification of existing Federal transportation law (1994), Federal Reports Elimination and Sunset Act of 1995, Federal Reports Elimination and Sunset Act of 1995, General Accounting Office Act of 1996, Energy Conservation Reauthorization Act of 1998, Omnibus Consolidated and Emergency Supplemental Appropriations Act, (1999).

- **Powerplant and Industrial Fuel Use Act of 1978, as Amended.** Requires Federal agencies providing Federal financial assistance through loans, grants, or contracts to achieve conservation of petroleum and natural gas.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 95-620, Nov. 9, 1978, 92 Stat. 3289 (Title 42, Sec. 8301 et seq.), includes amendments made by the Powerplant and Industrial Fuel Use Act of 1978, Omnibus Budget Reconciliation Act of 1981, Congressional Reports Elimination Act of 1982, amendments to the Powerplant and Industrial Fuel Use Act of 1978 (1988), Energy Policy Act of 1992, Federal Reports Elimination and Sunset Act of 1995.

- **Energy Tax Act of 1978, as Amended.** Allows an income tax credit to an individual for energy conservation expenditures and for qualified renewable energy source expenditures. Provides for a depletion deduction, the option to deduct as expenses intangible drilling and development costs, and the minimum tax provisions for excess intangible drilling costs of individuals for geothermal resources and natural gas produced from geopressured brine located in the United States. Extends the recapture provisions for oil and gas property to include geothermal wells. Extends the risk limitation of losses that may be deducted for exploiting oil and gas to include geothermal resources.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 95-618, Nov. 9, 1978, 92 Stat. 3174 includes amendments made by the Crude Oil Windfall Profit Tax Act of 1980, Tax Equity and Fiscal Responsibility Act of 1982.

- **Methane Transportation Research Development and Demonstration Act of 1980, as Amended.** Establishes an RD&D program on methane-fueled vehicles and optimum overall specifications for such vehicles. Establishes demonstrations of the economic and technological practicalities of methane-fueled vehicles for fleet use and of methane-fueled farm equipment. Promotes the substitution of methane-fueled vehicles for gasoline- and diesel-powered vehicles currently used on farms and in fleet operations.

Office of Transportation Technologies.

This statute, Pub. L. 96-512, Dec. 12, 1980, 94 Stat. 2827 (Title 15, Sec. 3801 et seq.), includes amendments made by the Congressional Reports Elimination Act of 1982, Federal Reports Elimination and Sunset Act of 1995.

- **National Appliance Energy Conservation Act of 1987.** Amends the Energy Policy and Conservation Act to revise the list of appliances covered under the Act. Prescribes a program of test procedures for classes of consumer and industrial products specified in the law. Directs energy efficiency improvement targets for each type of covered product and procedures for prescribing the standards. Established the deadline for initial DOE rulemaking and authorizes continued rulemaking.

Office of Building Technology, State and Community Programs.

This statute is Pub. L. 100-12, Mar. 17, 1987, 101 Stat. 103 (Title 42, Sec. 6291 et seq.).

- **Alternative Motor Fuels Act of 1988, as Amended.** Amends the Energy Policy and Conservation Act to direct the Secretary of Energy to ensure that the maximum practicable number of Federal passenger automobiles and light-duty trucks be either methanol-powered or dual-energy vehicles. Sets forth other requirements regarding the use of alternative motor fuels.

Office of Transportation Technologies.

This statute, Pub. L. 100-494, Oct. 14, 1988, 102 Stat. 2441, includes amendments made by the Energy Policy Act of 1992, and an act codifying existing Federal transportation law (1994).

- **Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989, as Amended.** Authorizes and directs a program of research, development, demonstration, and commercial application with the private sector for renewable energy and alternative energy resources. Establishes long-term Federal research goals for wind, photovoltaic, solar thermal, and alcohol from biomass technologies. Directs improving the ability of the private sector to commercialize renewable energy and

energy efficiency technologies through government support of a program of demonstration and commercial application projects.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies.

This statute, Pub. L. 101-218, Dec. 11, 1989, 103 Stat. 1859 (Title 42, Sec 12001 et seq.), includes amendments made by the Energy Policy Act of 1992.

- **Clean Air Act Amendments of 1990, as Amended.** Amends the Clean Air Act to establish air quality standards for nonattainment areas. Sets requirements with respect to mobile sources and sources emitting hazardous air pollutants, sulfur dioxide, and nitrogen oxides. Establishes permit programs. Revises enforcement and penalty provisions. Establishes programs for acid deposition control and stratospheric ozone protection.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 101-549, Nov. 15, 1990, 104 Stat. 2399 includes amendments made by the General Accounting Office Act of 1996.

- **Global Change Research Act of 1990.** Establishes a comprehensive and integrated U.S. research program that will assist the Nation and the world in understanding, assessing, predicting, and responding to human-induced and natural processes of global change. Promotes international, intergovernmental cooperation on global change research. Promotes international efforts to provide technical and other assistance to developing nations that will facilitate improvements in their domestic standard of living while minimizing damage to the global or regional environment.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies.

This statute is Pub. L. 101-606, Nov. 16, 1990, 104 Stat. 3096 (Title 15, Sec. 2921 et seq.).

- **Department of Energy Metal Casting Competitiveness Research Act of 1990, as Amended.** Directs establishment of an R&D program on technology competitiveness and energy efficiency in the U.S. metal casting industry and an overseeing Industrial Advisory Board. Requires non-Federal matching contributions.

Office of Industrial Technologies.

This statute, Pub. L. 101-425, Oct. 15, 1990, 104 Stat. 915 (Title 15, Sec. 5301 et seq.), includes amendments made by the Energy Policy Act of 1992.

- **Solar Wind, Waste, and Geothermal Power Production Incentives Act of 1990.** Amends the Public Utility and Regulatory Policies Act of 1978 (PURPA) and the Federal Power Act to remove the size limitations placed upon solar, wind, and geothermal facilities eligible for PURPA regulatory benefits. Sets forth general qualification, certification application, and construction deadline requirements for such facilities.

Office of Power Technologies.

This statute is Pub. L. 101-575, Nov. 15, 1990, 104 Stat. 2834.

- **Energy Policy Act of 1992, as Amended.** Amends the National Energy Conservation Policy Act. Establishes programs, requirements, and criteria for energy efficiency in buildings, for appliance and equipment energy efficiency standards, for industrial energy use, for State and local assistance, and for Federal agency energy management. Provides guidelines for DOE to acquire alternative fueled vehicles for the Federal fleet, to report on Federal experience with alternative fueled heavy-duty vehicles, and to assist Federal agencies in procuring and placing alternative fueled vehicles. Sets minimum Federal fleet requirements for alternative-fueled vehicles. Establishes programs, requirements, and criteria for alternative fuels and fuel conservation for vehicles in non-Federal Programs and sets a timetable for the acquisition of alternative fueled vehicles by specified persons engaged in fuels transactions. Directs an electric motor vehicle demonstration program. Details

the program’s proposal parameters. Directs a five-year program to further the commercialization of renewable energy and energy efficiency technologies by soliciting proposals for demonstration and commercial application projects.

Office of Industrial Technologies, Office of Transportation Technologies, Office of Building Technology, State and Community Programs, Office of Power Technologies, Federal Energy Management Program.

This statute, Pub. L. 102-486, Oct. 24, 1992, 106 Stat. 2776 includes amendments made by the codification of existing Federal transportation law (1994), Federal Reports Elimination and Sunset Act of 1995, ICC Termination Act of 1995, Department of the Interior and Related Agencies Appropriations Act, 1996, Safe Drinking Water Act Amendments of 1996, Small Business Job Protection Act of 1996, amendments to the Uranium Mill Tailings Radiation Control Act of 1978 (1996), Hydrogen Future Act of 1996, amendments to the Energy Policy Act of 1992 (1977), Small Business Reauthorization Act of 1997, Federal Reports Elimination Act of 1998, Energy Conservation Reauthorization Act of 1998, Energy and Water Development Appropriations Act, 1999, Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999.

- **National Climate Program Act, as Amended.** Establishes a National Climate Program for research, collection, analysis, forecasting, modeling, and dissemination of data concerning climate, its variations, and their impacts on human activities. Requires five-year plans and defines the roles of Federal agencies. Requires assessing the effects of climate on agriculture, energy supply and demand, land and water resources, transportation, human health, and national security. Requires basic and applied research and requires global data collection and climate monitoring and analysis activities. Specifies requirements for intergovernmental programs. Office of Power Technologies. This statute, Pub. L. 95-367, Sept. 17, 1978, 92 Stat. 601 (Title 15, Sec. 2901 et seq.), includes amendments made by the National Climate Program Act Amendments (1980), Congressional Reports Elimination Act of 1982, Consolidated Omnibus Budget Reconciliation Act of 1985.

- **Hydrogen Future Act of 1996, as Amended.** Directs the Secretary of Energy to conduct a research, development, and demonstration program leading to the production, storage, transport, and use of hydrogen for industrial, residential, transportation, and utility applications. Section 104 directs the hydrogen R&D program: the program should give emphasis to developing an understanding and resolution of critical technical issues preventing the introduction of hydrogen, initiate or accelerate existing research in critical areas that will contribute to the development of more economic hydrogen production and use, and survey the private sector and take steps to ensure that R&D activities do not displace or compete with privately funded activities.

This Act reauthorized the Hydrogen Technical Advisory Panel, comprised of representatives of domestic industry, universities, professional societies, government laboratories, financial, environmental, and other organizations as necessary to review and make any necessary recommendations on the implementation and conduct of the DOE programs under this Act, economic, technological, and environmental consequences for the deployment of the hydrogen systems, and comments and recommendations for improvements.

Office of Power Technologies, Hydrogen R&D Program

This statute, Pub.L. 104-271, Oct 9, 1996, 42 USC 12401 includes amendments made by the Spark Matsunaga Research, Development and Demonstration Act of 1990, Public law 101-566 and Energy Policy Act of 1992.

2.2.13 Interagency Activities

Although EERE's goals and objectives reflect unique roles and responsibilities, success will depend upon closely coordinated planning and the continuation of working relationships with a number of Federal agencies, State and local governments, Tribal Nations, industry, and Congress. It is especially important to recognize the complementary role other Federal agencies play in EERE's programs. The following illustrate our efforts to coordinate with other agencies to avoid duplication of effort and reduce the cost to taxpayers.

EERE Sector	Initiative/Activity	Federal Agency Participants
Buildings, Power	Emergency Response	DoD, State, DOT, GSA, TVA, HHS, VA, NOAA, DOJ, USDA, EPA, NRC, FEMA, IAEA, National Communication System
Buildings	Greening the Government Through Efficient Energy Management	All Federal Agencies
Buildings	Interagency Committee on Indoor Air Quality	IEPA, HHS, OSHA, and 16 others
Industry	Energy-related Inventions Program	DOC (NIST)
Industry	Industries of the Future - Agriculture	DOC, DOI, EPA, NSF, USDA
Industry	Industries of the Future - Aluminum	DOC (ATP), DoD, NSF
Industry	Industries of the Future - Chemicals	DOC (NIST, ATP)
Industry	Industries of the Future - Forest Products	USDA
Industry	Industries of the Future - Glass	DOC (NIST, ATP), DoD
Industry	Industries of the Future - Metalcasting	DoD, DOT, EPA
Industry	Industries of the Future - Mining	DOC, DoD, DOI, EPA, HHS, Labor, NASA, USDA
Industry	Industries of the Future - Concrete Initiative	DOC (NIST)
Industry	Industries of the Future - Combustion	DOC (NIST), DoD, NSF
Industry	Industries of the Future - Sensors & Controls	DOC (NIST), NSF
Industry	Industries of the Future - Inventions & Innovations	DOC (NIST)
Industry	Industries of the Future - Industrial Assessment Centers	Industrial Federal facilities
Transportation	Greening the Government Through Federal Fleet and Transportation Efficiency	DoD, DOT, EPA and Other Federal Agencies
Transportation	Partnership for a New Generation of Vehicles	EPA, DOT, DOC, NSF, OMB
Power	President's Commission on Critical Infrastructure Protection	Treasury, DOJ, DoD, DOC, DOT, CIA, FEMA, FBI, NSA
Power	Hydroelectric	FERC, DOI (Bureau of Land Management, Bureau of Reclamation), Army Corps of Engineers, International Boundary and Water Commission
Power	Domestic Natural Gas Production	DOI (Bureau of Land Management)
Power, Industry	Advanced Turbine Systems	NASA, DOC (NIST), DoD, EPA
Power, Industry	Combined Heat and Power (Cogeneration)	EPA
Power, Planning	Electric Industry Restructuring	FERC, EPA, DOC, NRC
Power, Planning	Electric Utility Regulation	FERC, EPA, NRC, DOC, DOJ
FEMP	Federal Energy Management Program	All Major Federal Agencies
Transportation, Industry, Power	Bioproducts/Bioenergy Initiative	USDA, DOC, OMB, DOE, OSTP, TVA, EPA
Transportation, Industry, Power	Fundamental Research	NSF, DoD, USDA, NASA, NIH
International Programs - All Sectors	Global Environmental Issues, Trade and Market Development, Energy and Environmental Security	State, EPA, AID, DOC, USDA, DOI
Planning	U.S. Global Change Research	USDA, NOAA, NSF, NASA, DoD, HHS, DOI

EERE Sector	Initiative/Activity	Federal Agency Participants
	Program	(USGS), State, EPA, OMB, OSTP, Smithsonian Institution
Planning, International	U.N. Framework Convention on Climate Change	NOAA, State, EPA, USDA, DoD, AID, Treasury, DOJ, Labor
Bioenergy	U.S. Human Genome Project	NIH

Legend:

AID = Agency for International Development
 ATP = Advanced Technology Program
 CIA = Central Intelligence Agency
 DARPA = Defense Advanced Research Projects Agency
 DOC = Department of Commerce
 DoD = Department of Defense
 DoEdu = Department of Education
 DOI = Department of the Interior
 DOJ = Department of Justice
 DOT = Department of Transportation
 EPA = Environmental Protection Agency
 FBI = Federal Bureau of Investigation
 FEMA = Federal Emergency Management Agency
 FERC = Federal Energy Regulatory Commission
 GSA = General Services Administration
 HHS = Department of Health and Human Services

HUD = Department of Housing and Urban Development
 IAEA = International Atomic Energy Agency
 Labor = Department of Labor
 NAS = National Academy of Sciences
 NASA = National Aeronautics and Space Administration
 NIH = National Institutes of Health
 NIST = National Institute of Standards and Technology
 NOAA = National Oceanic and Atmospheric Administration
 NRC = Nuclear Regulatory Commission
 NSA = National Security Agency
 NSF = National Science Foundation
 OMB = Office of Management and Budget
 State = Department of State
 Treasury = Department of the Treasury
 TVA = Tennessee Valley Authority
 USDA = U.S. Department of Agriculture
 VA = Department of Veterans Affairs

2.2.14 State and Local Government Activities

Energy use varies substantially from region to region and from State to State. It varies as a result of population, climate, economic base, diversity of housing stock, the existing infrastructure (e.g., transportation and energy delivery systems), and other related factors. Because of this, energy needs and opportunities are not uniform across the Nation. For this reason, any strategy for the development and deployment of energy efficiency and renewable energy technologies, products, or practices should address the unique needs and opportunities presented by each State and locale. States and localities are much closer to most energy users than is the Federal government, e.g., the general public, commerce, industry, and public institutions. Over the years, State and local governments have developed considerable expertise in energy management, in outreach to the private and non-profit sectors, and in providing energy services and informa-

tion. States sponsor a good deal of energy efficiency and renewable energy RD&D. They have primary responsibility for codes and standards that affect the use of energy in the building and other sectors; they are the regulators of electric and gas utilities; and (acting individually and collectively) they manage energy emergencies. For all these reasons one cornerstone of a successful EERE strategy must be strong Federal, State, and local partnerships.

Key programmatic activities in support of these partnerships are the State Energy Program (SEP), the Weatherization Assistance Program, community energy partnership grants, and a number of special-purpose competitive grants which encourage States and localities (alone or with other public- or private-sector partners), their associations, and others to implement projects that serve both national and State/local needs. The SEP provides financial and technical support to States to develop and implement energy plans that are responsive to their own needs but that also support national goals. The Weatherization program provides both financial and technical support to States and local agencies; grants are awarded to States, which in turn fund approximately 900 local service provider agencies (mostly Community Action Agencies), which provide for the installation of energy- (and energy-cost) saving measures in the homes of eligible low-income clients. Through the SEP and Weatherization programs (administered through the six EERE Regional Offices), EERE maintains close working relationships with the State Energy Offices and the State grantee agencies for the Weatherization program. At the national level, EERE also maintains close working relationships with the National Association of State Energy Officials, which represents the State Energy Office Directors; the National Association of State Community Service Programs, representing the State Weatherization directors; and the National Community Action Foundation, the association representing the local Weatherization service providers. Other organizations with which we maintain ties include the National Conference of State Legislatures, the Urban Consortium Energy Task Force, the National Association of Counties, the National Governor's Association, the National League of Cities, and the Conference of Mayors. We recently began meeting with an umbrella group formed to represent local government associations on energy matters.

Another area of cooperation is in research and development. An example is the recently executed Memoranda of Understanding (MOU) with the California Energy Commission, the New York State Energy Research and Development Authority, and the Association of State Energy Research and Technology Transfer

Institutions to work on research projects of mutual interest, through direct contracts and through the DOE national laboratories. EERE and the States have agreed to work together on the following issues: biobased products and bioenergy, fuel cells and microturbines, petroleum industry, schools, combined heat and power and distributed generation, data acquisition, and transportation.

Collaboration between the national laboratories and State RD&D activities (particularly, in terms of coordinating research agendas, avoiding duplication, and technology deployment) has been one of the topics in which the State Energy Advisory Board (STEAB) has taken a strong interest. STEAB was established by P.L. 101-440 to advise the Department and the Congress on the operation of EERE programs, technology deployment, and related issues. The Board, through its Strategic Planning and Budget Committee, has begun to provide early input and advice to EERE on budget priorities. STEAB has been very proactive on a range of other issues ranging from Regional Office mission and structure to utility deregulation/restructuring. In addition to public meetings and day-to-day working contacts with EERE, the Board submits an annual report to the Secretary and the Congress.

Much of the interaction between EERE and individual States and localities takes place through the six EERE Regional Offices. These offices assist in grant administration, undertake outreach and liaison to State and local governments in their regions, provide or coordinate the delivery of technical assistance, and provide technology deployment assistance. They have well established relationships with State and local governments, regional commerce and industry, and local EERE customers and stakeholders. They provide an initial point of contact (and are often an aggregator of services) for State and local governments in dealing with EERE's sector offices.

Several administrative barriers, such as Federal, State, and local contracting and procurement regulations and different requirements and forms for different parts of DOE have made it difficult to execute instruments of agreement between Federal and State governments. In 1998 and 1999, the Department of Energy initiated negotiations with various State organizations to establish model agreements to address these problems. These negotiations resulted in two model agreements generally applicable to most State governments and State institutions and one model agreement specifically applicable to the California Energy Commission. The implementation of these agreements has improved the ability

of Federal and State governments to work on mutually agreed upon projects. These model agreements were developed to promote ongoing and future cooperative efforts between DOE and State governments and institutions and to expedite the contracting process.

2.2.15 Stakeholders

The attached list of stakeholders includes some organizations that have been traditional supporters of selected EERE programs. Most are nonprofit groups. The groups generally support the EERE budget request to the Congress through testimony and informational visits. Each seeks to ensure that their technology needs receive sufficient funding. The challenge is to ensure that, as each group works to gain support for their particular area of interest, they do not as a whole, work against the larger interest of all EERE programs. Meeting with the organizations, both individually, and in small groups, will help ensure that all understand the mission and goals of the overall EERE research and development portfolio.

Some EERE Stakeholders (alphabetically listed)

- Agricultural Research Institute
- Air Movement and Control Association
- Alliance to Save Energy
- Aluminum Association
- American Association of Railroads
- American Bioenergy Association
- American Boiler Manufacturers Association
- American Ceramic Society
- American Chemical Society
- American Chemistry Council
- American Concrete Institute
- American Council for an Energy-Efficient Environment
- American Farm Bureau
- American Flame Research Committee
- American Forest & Paper Association
- American Gas Association
- American Institute of Chemical Engineers
- American Iron & Steel Institute
- American National Standards Institute
- American Portland Cement Alliance
- American Public Power Association
- American Pulp and Paper Institute
- American Solar Energy Society
- American Soybean Association/United Soybean Board
- American Trucking Association
- American Welding Society
- American Wind Energy Association
- Americans for Clean Energy
- ASM International Heat Treating Society
- Association of Iron and Steel Engineers
- Business Council for Sustainable Energy
- California Trucking Association
- Carbon Product Consortium
- Cast Metal Coalition
- Center for Clean Air Policy
- Clean Fuels Development Coalition
- Combustion Institutes
- Compressed Air and Gas Institute
- Compressed Air Challenge
- Compressor Distributors Association
- Coordinating Research Council
- Copper Development Association
- Corn Refiners Association

- Cotton Foundation
- Council for Agricultural Science and Technology
- Council for Chemical Research
- Council of Industrial Boiler Owners
- Council on Superconductivity for American Competitiveness
- Edison Electric Institute
- Electric Power Research Institute
- Electric Transportation Coalition
- Electrical Apparatus Service Association
- Energy Storage Association
- Engine Manufacturing Association
- ENRON
- Environmental Defense Fund
- Forging Industry Association
- Gas technology Institute
- Gasification Technologies Council
- Geothermal Energy Association
- Geothermal Heat Pump Consortium, Inc.
- Geothermal Resources Association
- Glass Manufacturing Industry Council
- Glass Packaging Institute
- Hydraulic Institute
- Industrial Center, Inc.
- Industrial Heating Equipment Association
- Industrial Process Heating
- Institute for Local Self-Reliance
- Institute of Electrical and Electronics Engineers
- International Copper Development Association
- International Fund for Renewable Energy and Energy Efficiency
- Iron and Steel Society
- ISA, International Society for Measurement and Control
- Johnson Controls
- Manufacturers of Emission Control Association
- Materials Technology Institute of the Chemical Process Industries
- Maytag Corporation
- Measurement, Control and Automation Association
- Metal Powders Industry Foundation
- Minerals, Metals Materials Society
- National Aggregate/Stone Association
- National Association of Energy Service Companies
- National Association of Regulatory Utility Commissioners
- National Association of State Energy Officials
- National Association of State Universities and Land-Grant Colleges
- National Association of Wheat Growers
- National Corn Growers Association
- National Council for Air and Steam Improvements
- National Electrical Manufacturers Association
- National Hay Association
- National Hydropower Association
- National Insulation Association
- National Mining Association
- Natural Gas R&D Forum
- Natural Gas Vehicle Coalition
- Natural Resources Defense Council
- New Uses Council
- North American Insulation Manufacturing Association
- Northwest Mining Association
- Pellet Fuels Institute
- Primary Glass Manufacturing Coalition
- Ready Mixed Concrete Association
- Renewable Fuels Association
- Safe Energy Communication Council
- Solar Turbines, Inc.
- Solar Unity Network
- Steel Manufacturers Association
- Sugar Processing Research Institute
- Synthetic Organic Chemical Manufacturers Association
- Technical Association of the Pulp and Paper Industry
- Truck Manufacturing Association
- United States Advanced Battery Consortium
- United States Advanced Ceramics Association
- USCAR

2.2.16 Legislative Relationships

Congressional Committees

EERE is the only non-defense office within the Department that receives appropriations from two separate subcommittees: the Interior and Related Agencies Appropriations Subcommittee (approximately two-thirds of the budget) and the Energy and Water Development Appropriations Subcommittee (approximately one-third of the budget). This joint funding arrangement means that the Assistant Secretary has “double duty” with regard to hearings. EERE is within the jurisdiction of the following Congressional authorizing committees: Senate Energy and Natural Resources, House Science (all research, development, and selected deployment activities), and House Commerce Committee (State Energy Program, Weatherization Assistance Program, Federal Management Program, and selected deployment activities). Overlapping jurisdictions regarding deployment activities among authorizing committees can present problems during legislative consideration. Generally, these problems are resolved by the House Parliamentarian.

Key Members In 2001

Appropriations Subcommittees

- Senator Robert C. Byrd (D-WV), Chairman of the full Senate Appropriations Committee
- Senator Ted Stevens (R-AK), Ranking Minority Member of the full Senate Appropriations Committee and Interior and Related Agencies Appropriations Subcommittee
- Senator Robert C. Byrd (D-WV), Chairman of the Interior and Related Agencies Appropriations Subcommittee
- Senator Conrad Burns (R-MT), Ranking Minority Member of the Interior and Related Agencies Appropriations Subcommittee
- Senator Harry Reid (D-NV), Chairman of the Senate Energy and Water Development Appropriations Subcommittee
- Senator Pete V. Domenici, (R-NM), Ranking Member of the Energy and Water Development Subcommittee

- Rep. C.W. Bill Young (R-10th FL), Chairman of the full House Appropriations Committee
- Rep. David R. Obey (D-7th WI), Ranking Member of the full House Appropriations Committee
- Rep. Ralph Regula (R-16th OH), Chairman of the Interior and Related Agencies Subcommittee
- Rep. Norm Dicks (D-6th WA), Ranking Member of the Interior and Related Agencies Subcommittee
- Rep. Ron Packard (R- 48th CA), Chairman of the Energy and Water Development Appropriations Subcommittee. (Rep. Packard is retiring this year.)
- Rep. Peter J. Visclosky (D-1st IN), Ranking Member of the Energy and Water Development Appropriations Subcommittee

Authorizing Committees

- Senator Frank Murkowski (R-AK), Ranking Minority Member of the Energy and Natural Resources Committee
- Senator Jeff Bingaman (D-NM), Chairman of the Energy and Natural Resources Committee
- Rep. F. James Sensenbrenner (R-9th WI), Chairman of the House Science Committee
- Rep. Ralph Hall (D- 4th TX), Ranking Member of the House Science Committee
- Rep. Ken Calvert (R-43rd CA), Chairman of the Energy and Environment Subcommittee
- Rep. Jerry F. Costello (D-12th IL), Ranking Member of the Energy and Environment Subcommittee

Other Interested Members of Congress

- Senator James Jeffords (I-VT), supporter of increased appropriations for EERE
- Senator Tom Harkin (D-IA), strong supporter of renewables such as hydrogen

- Rep. Mark Udall (D-2nd CO), a freshman, has been a strong advocate of EERE
- Rep. Bob Weygand (D-2nd RI), active in promoting energy conservation
- Rep. Sherwood Boehlert (R-23rd NY), strong supporter of all EERE programs, but particularly transportation programs

Appropriations Subcommittees:

- Senator Robert C. Byrd chairs the Senate Interior and Related Agencies Subcommittee.
- Senator Conrad Burns is the Ranking Minority Member of the Senate Interior and Related Agencies Subcommittee.
- Senators Domenici and Reid swapped places on the Senate Energy and Water Subcommittee.

Authorizing Committees:

- Senators Murkowski and Bingaman swapped positions on the Senate Energy and Natural Resources Committee.

References:

- *Clean Energy for the 21st Century*, Office of Energy Efficiency and Renewable Energy
- *Strategic Plan*, DOE/GO-102000-0956, Washington, D.C., March 2000.
http://www.eren.doe.gov/overview/strategic_plan.html
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<http://www.cfo.doe.gov/stratmgt/plan/DOESPLAN.htm>
- *National Energy Policy*, Report of the National Energy Policy Development Group, Washington, D.C., May 2001. <http://www.whitehouse.gov/energy/>
- *U.S. Department of Energy, Energy Efficiency and Renewable Energy, Regional Offices*, DOE/EE-0248, Washington, D.C., 2001.

Web Pages:

DOE Home: <http://www.energy.gov/>

EERE Home: <http://www.eren.doe.gov/>

BTS Home: <http://www.eren.doe.gov/buildings/>

BTS Strategic Plan: <http://www.eren.doe.gov/buildings/documents/pdfs/25096A.pdf>

FEMP Home: <http://www.eren.doe.gov/femp/>

OIT Home: <http://www.oit.doe.gov/>

OPT Home: <http://www.eren.doe.gov/power/>

OTT Home: <http://www.ott.doe.gov/>

OPBM Home: <http://www.eren.doe.gov/pbm/>

Golden Field Office Home: <http://www.golden.doe.gov/>