

# Clean ENERGY

— for the —  
*21st Century*



## Office of Energy Efficiency and Renewable Energy **Strategic Plan**

U.S. DEPARTMENT OF ENERGY  
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY



# The Office of Energy Efficiency and Renewable Energy is...

The Office of Energy Efficiency and Renewable Energy (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, which use less energy, and renewable energy sources and natural gas, which produce power and heat more cleanly than conventional sources.

This leadership is provided by a Federal workforce of more than 500 individuals and is principally organized around five energy sectors—(1) buildings, (2) industry, (3) transportation, (4) power generation and delivery, and (5) Federal Government facilities. EERE's FY 2000 budget of \$1.07 billion comprises approximately 6 percent of the U.S. Department of Energy (DOE) budget.

EERE's mission is advanced through a strong and balanced RD&D portfolio of clean energy technologies and practices, along with support for critical policies and markets. EERE works with its Colorado field office, six regional offices, the National Renewable Energy Laboratory, other national laboratories, other Federal agencies, state

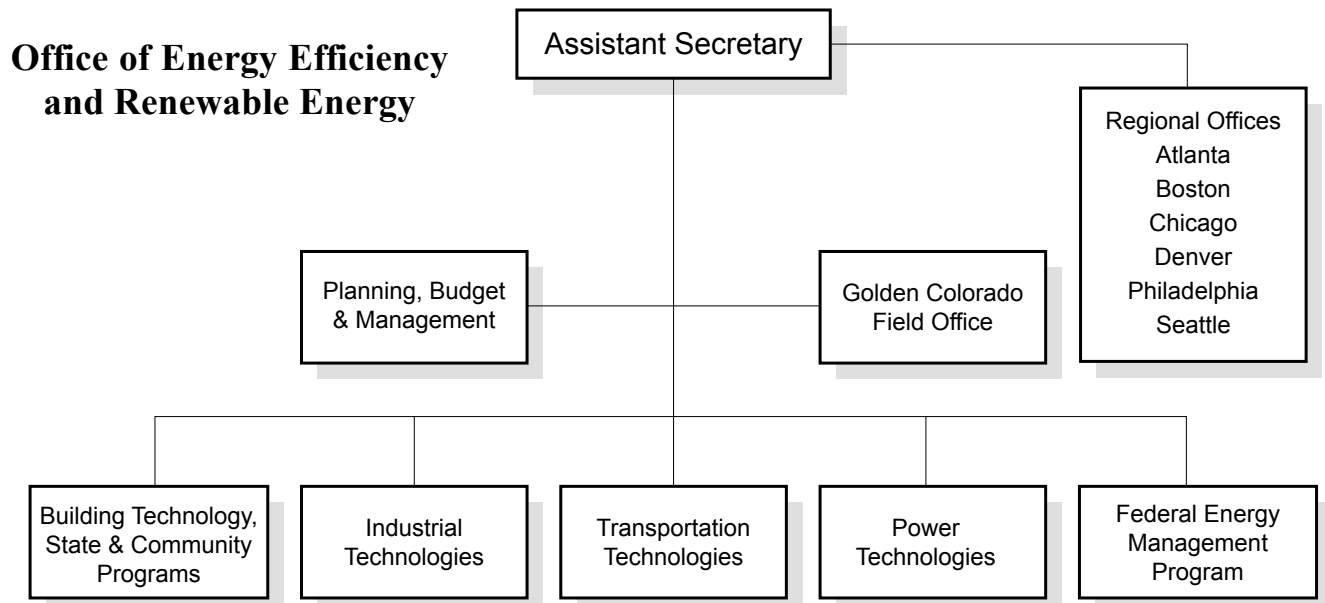
energy offices, industry, universities, nongovernmental organizations (NGOs), and other stakeholders to research and develop advanced energy technologies and practices, and to facilitate their deployment. These activities will play a critical role in providing clean energy for the twenty-first century.

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 would not be independently conducted by the private sector.

EERE addresses the nation's energy challenges in two fundamental ways:

1. Increasing the efficiency of devices, processes, and systems that consume energy
2. Increasing the use of renewable energy and natural gas technologies and practices.

To learn more about EERE, visit our Web site at [www.eren.doe.gov](http://www.eren.doe.gov), or see our *Clean Energy for the 21st Century* brochure, which can be obtained by calling (800) DOE-EREC.



# Message from the Assistant Secretary


I am proud to present the Strategic Plan for the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE). This Plan is important because it addresses the energy-related challenges and opportunities facing our country, and identifies the goals and strategies EERE will pursue in the years ahead to address them.

As we begin a new decade—and a new millennium—it is useful to consider several energy trends that have emerged over the last decade and that will drive great change in the next decade: (1) *Energy Security*—Just 10 years ago, crude oil imports were 30 percent less than they are today and this increased reliance on foreign sources is placing ever greater stress on the nation's security, as recent oil price spikes have demonstrated; (2) *Economic Competitiveness*—The end of the Cold War has helped unleash a global economy that is forecast to consume almost twice as much electricity in 2020 as it does today, providing new challenges and opportunities for U.S. energy technology exports and employment; (3) *Climate Change*—Over the last 10 years, our confidence in the science of climate change has made greenhouse gas emissions an issue of concern for policymakers around the world, significantly changing our view of the role of energy efficiency and clean power in the country's energy economy; (4) *Clean Air*—In the past decade, we have seen increased regulatory support for urban and rural areas to mitigate their pollution problems by deploying energy efficiency and clean power technologies; (5) *Electricity Industry Restructuring*—The 1990s saw significant change in electricity regulatory policies, with wholesale competition occurring across the country and about half of the states implementing retail competition, providing significant new market opportunities for clean energy technologies, as well as new challenges.

In this changing environment, strategic planning is critical to ensure that EERE's research, development, and deployment portfolio is adequately addressing the country's clean energy needs. In addition to strengthening EERE's traditional sector work, EERE's strategic planning activities are leading to an increased emphasis on a number of cross-cutting initiatives that allow us to leverage our resources across multiple markets. These include, for example, cross-sector work in distributed power, bioenergy, and energy management in schools.

In EERE, we understand that good corporate management practices are necessary to achieve program goals. This Strategic Plan is a key part of our Strategic Management System, which is an integrated method of performing the corporate processes of planning, budgeting, procurement, program execution, evaluation, and analysis.

I view this document as part of a continuing dialogue with EERE's stakeholders and customers on how best to provide clean energy for the twenty-first century, and I invite your participation and insights.



Dan W. Reicher  
Assistant Secretary

## Challenges and Opportunities for the 21<sup>st</sup> Century

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.

This EERE Strategic Plan is a direct response to these trends and is consistent with the framework of the DOE energy mission, which is to foster a secure and reliable energy system that is environmentally sustainable.

Many indicators in the United States and the world suggest that a new, cleaner, and more efficient energy future is desirable and attainable in the twenty-first century.

- Health and environmental quality continue to rank high on surveys about Americans' greatest concerns; when given a choice, Americans prefer clean energy technologies.
  - Commitments are emerging among state and local governments and industry to use energy efficiency and renewable energy technologies to improve air quality.
  - Clean energy technologies and practices are helping a growing number of companies increase their profit margins and competitiveness.
  - Scientific evidence continues to affirm the link between greenhouse gas emissions and climate change.
  - "Green power" and "green-pricing" programs are appearing across the country as the electricity sector transitions to a competitive market.
- Industry, universities, and laboratories continue to make significant advances in reducing the price and increasing the reliability of clean energy technologies.
  - Major fossil-fuel firms are investing in renewable energy subsidiaries.
  - Developing countries are increasingly focusing on clean energy as a way to achieve sustainable development.

*The United States faces major energy-related challenges as it enters the twenty-first century. Our economic well-being depends on reliable, affordable supplies of energy. Our environmental well-being—from improving urban air quality to abating the risk of global warming—requires a mix of energy sources that emits less carbon dioxide and other pollutants than today's mix does. Our national security requires secure supplies of oil or alternatives to it, as well as prevention of nuclear proliferation. And for reasons of economy, environment, security, and stature as a world power alike, the United States must maintain its leadership in the science and technology of energy supply and use.*

*Federal Energy Research and Development for the Challenges of the Twenty-First Century by the President's Committee of Advisors on Science and Technology (PCAST), November 1997*

## The EERE Mission

The mission of the Office of Energy Efficiency and Renewable Energy 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.**

EERE's 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.

This approach enables EERE programs to advance America's energy systems by:

- Helping ensure adequate, affordable supplies of clean energy
- Reducing U.S. vulnerability to energy supply disruptions
- Encouraging energy efficiency
- Advancing renewable energy and natural gas technologies
- Increasing energy choices for all consumers
- Reducing the environmental impact of energy use.

## The EERE Vision

The vision of the Office of Energy Efficiency and Renewable Energy is:

**A world in which, due to EERE actions, advances in energy efficiency and clean power technologies and practices have significantly contributed 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 is less dependent on international energy sources.
- An American economy that is thriving, in part because of the contribution of both energy efficiency technologies and ample supplies of domestic renewable and clean energy resources.
- The United States leading the way in reducing global greenhouse gas emissions through the wide-scale use and deployment of advanced energy technologies.
- Americans breathing cleaner air as pollution levels decline due to advances in energy efficiency technologies and clean energy systems.
- A competitive U.S. electric 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.
- A United States 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:

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

**Goal 1**  
**Increase the Supply &  
Use of Clean Energy  
Resources and Increase  
the Reliability of the  
Energy System**

### Goal 1: Objectives and Benefits

- By 2010, triple domestic use of bio-based products and bioenergy from 1999 levels, which could lead to the creation of as much as \$20 billion a year in new income for farmers and rural communities.
- By 2010, increase non-hydroelectric renewable-energy-generating capacity to 25,000 megawatts of installed capacity to provide clean power for approximately 14 million households, and maintain the current level of U.S. hydropower capacity by developing hydro technologies that are more "fish friendly."

- By 2010, increase the amount of the nation's distributed power to 20 percent of new electricity capacity to mitigate transmission and distribution constraints by increasing U.S. on-site power generation capability.
- By 2010, double the capacity of combined heat and power systems in the United States from the 1999 level to make use of thermal energy normally wasted in the generation of power.
- By 2005, increase the use of dedicated alternative fuel vehicles from 400,000 operating in 1998 to 1.5 million, thereby displacing at least 130,000 barrels per day of petroleum.
- Maintain and enhance the reliability of the nation's electricity transmission and distribution system as the United States transitions to a competitive electricity industry.

**Goal 2**  
**Increase the Efficiency of  
the Energy System**

### Goal 2: Objectives and Benefits

- By 2010, reduce energy consumption in Federal facilities by 35 percent relative to the 1985 consumption level, saving taxpayers \$12 billion from 2000-2010.
- By 2010, increase the average fuel efficiency of new cars and light trucks by 20 percent relative to the U.S. Environmental Protection Agency's reference fuel efficiency level for that year, saving 395 million barrels of oil from 2000-2010 and reducing carbon emissions by 33 million metric tons.

- By 2010, increase the average fuel efficiency of large trucks by 7 percent relative to the 1998 efficiency level, saving 180 million barrels of oil from 2000-2010 and reducing carbon emissions by 20 million metric tons.
  - By 2010, reduce industry energy consumption per dollar of output 25 percent below its 1990 level, increasing the competitiveness of U.S. industries by reducing cumulative industry energy costs by more than \$30 billion from 2000-2010.
  - Through 2010, improve the energy efficiency of 25 percent of the new building stock by 50 percent, and the energy efficiency of 15 percent of the existing building stock by 20 percent, saving over \$65 billion in cumulative building energy costs.
  - By 2010, achieve \$3 billion in annual export sales of energy efficiency technologies, creating about 100,000 jobs in the United States.
- programs are focused on national energy needs and demonstrate technical excellence.
- Implement "best management practices" by ensuring that EERE programs are performance-based, and that program progress results are tracked and reported on a monthly basis.
  - Improve employee development programs that train and reward employees, and build and retain a diverse workforce to increase employee excellence and satisfaction, and improve the delivery of program benefits.

### **Goal 3**

#### **Continuously Demonstrate EERE Managerial and Operational Excellence**

#### **Goal 3: Objectives and Benefits**

- Implement an integrated corporate system for program planning, budgeting, execution, and evaluation that is seamless and transparent.
- Base annual budget requests on sound program analysis and evaluations and formal peer reviews to help ensure that EERE RD&D

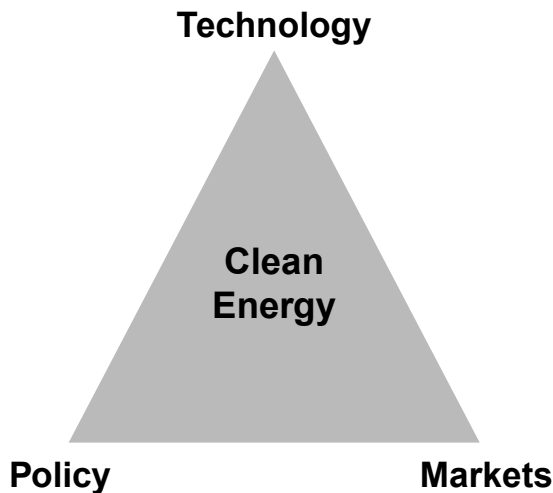
## EERE Strategies

EERE RD&D programs are aligned with the energy sectors of the economy to better link the advanced energy technologies to their target markets:

- Buildings
- Industry
- Transportation
- Power Generation and Delivery
- 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 are in the area of technology RD&D, government policies and market factors significantly affect which technologies



### Examples of Cross-Cutting EERE Initiatives

**Bioenergy Initiative**—This initiative coordinates government efforts and partners with the private sector to develop an integrated bioenergy industry to produce power, fuels, and other bio-products from biomass. An Executive Order signed by President Clinton in August 1999 established a Cabinet-level Council on Bioenergy, led by DOE and the U.S. Department of Agriculture. The President also established a goal of tripling the use of bio-energy and bio-based products by 2010.

**Distributed Energy Resources**—Four initiatives—distributed energy, combined heat and power, energy grid reliability, and power outage prevention—will be consolidated into a single EERE sector from the three sectors in which these activities are currently being carried out. The distributed energy and combined heat and power work seeks to expand on-site distributed electrical and thermal power production. The energy grid reliability and power outage prevention work is intended to enhance the reliability and security of the nation's electricity and natural gas infrastructure and to prevent power outages, including increased use of distributed power and more energy-efficient air-conditioning systems.

**EnergySmart Schools**—This initiative is a DOE-led partnership that brings together public- and private-sector resources to reduce energy bills in our nation's schools and redirect the savings to our children's education. The initiative works to improve the learning environment through smart energy improvements and increases the energy awareness of students, teachers, and local communities.

**International Programs**—EERE's International Programs help developing countries leap-frog conventional approaches to energy production and instead make the best use of clean energy technologies. The program currently provides technical assistance to more than 60 countries, helping to build new markets for renewable energy and energy efficiency technologies while creating new sales opportunities for U.S. clean energy industries.

**Million Solar Roofs Initiative**—Announced by President Clinton in June 1997, this presidential initiative, led by EERE, is supporting the installation of one million solar energy systems on U.S. buildings by 2010. Working through more than 40 state and local partnerships joined with the solar industry, utility service providers, government agencies, and other organizations, the initiative eliminates barriers to solar energy use and assists in developing market demand.

**Wind Powering America**—This initiative establishes partnerships between public and private organizations to encourage the increased use of wind energy. This initiative has set a goal of providing 5 percent of the nation's electricity from wind by 2020, with the Federal Government setting the example by obtaining 5 percent of its electricity from wind energy by 2010.

**GeoPowering the West**—This DOE initiative will link public- and private-sector efforts to bring geothermal electricity and geothermal heat to widespread portions of the West. The short-term goal is to double the number of states with geothermal electric power facilities to 8 by 2006. The long-term goal is to supply at least 10 percent of the electricity needs of the West by 2020 with 20,000 megawatts of geothermal energy capacity.



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 clean energy goals. They are:

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

These strategies are described in the following sections, along with examples of accomplishments.

**Strategy 1**  
**Improve Energy Technologies and Practices through R&D**

### **Investing in Clean Energy R&D**

Improvements in energy use and production technologies and practices through R&D programs will provide the building blocks for a cleaner, more efficient, and diverse energy economy in the twenty-first century. The imperative of investing in a strong R&D portfolio is now reinforced by recognition of the long periods of time associated with significant change in our energy infrastructure. Research and development itself often takes one or two decades to yield technological break-

throughs. The life expectancy of major energy supply and end-use technologies also extends to many decades. Decisions made every day about energy production and use commit the nation to an energy path for what can be a considerable period of time. To the extent that economically attractive, clean, and efficient technologies are chosen, both the economy and the environment benefit. Thus, a robust energy R&D program is needed to enable the country to achieve a healthy and prosperous future.

Advances spawned through EERE's R&D investment will range from improvements seen directly in our everyday lives—much more efficient light-bulbs, cars, appliances, motors—to new approaches for large baseload energy sources and combined heat and power systems. In particular, EERE will invest in energy efficiency R&D that provides the technologies to enable the nation's industries and citizens to more cost effectively manage energy use in the buildings, industry, transportation, and government sectors. In addition, EERE will invest in a balanced portfolio of programs designed to improve the performance and reduce the costs of clean energy production technologies, alternative fuels, and related storage and power delivery technologies.

EERE will continue to work closely with its authorizing and appropriating committees in Congress to assure that sufficient resources are made available for investment in these technologies and programs.

### **Implementing Field Verification Projects**

While progress in the laboratory is critical to the eventual deployment of advanced clean energy technologies, many of these technologies are seen as "high-risk" investments by commercial companies and financial institutions because they have not been proven in commercial settings. EERE is helping to build confidence in advanced energy technologies and practices by conducting inde-

pendent, unbiased field valuation projects that monitor their performance, cost, and reliability. The data collected from these field verification activities also provides important information that is used by scientists and engineers in their R&D activities to bring about further advances in clean energy technologies.

## Creating R&D Partnerships

EERE's strategy includes creating R&D partnerships among energy companies, energy-intensive industries, universities, and our national laboratories to advance the development of new energy technologies and practices. Such R&D alliances

## R&D Accomplishments

EERE-funded researchers have won 25 R&D 100 Awards from 1996 to 1999. The R&D 100 Awards are judged each year by a panel of 75 highly respected scientists and are given by *R&D* magazine for the most outstanding technology developments with commercial potential. Samples of the 1999 EERE-funded R&D 100 Awards are provided below:

**Clean Diesel Technology**—New operating technology will enable diesel engines to operate more cleanly and efficiently. Oxygen is added to the engine's air supply to enable it to burn diesel fuel more completely. The oxygen-rich air is produced from ambient air using membranes that act as a chemical filter. This technology reduces visible smoke and minimizes production of both particulate matter and nitrogen oxides. (Argonne National Laboratory)

**Frostless Heat Pump**—The heat pump features a new design that greatly reduces, by a factor of 5, defrosting requirements. Indoor thermal comfort is significantly improved because the average air supply temperature is increased by 4°F and the heating capacity is increased 21 percent at 33°F ambient temperature. (Oak Ridge National Laboratory and Tennessee Valley Authority)

**Mechanically Fluidized Vacuum (MFV) Reactor for Bulk Powders**—Using a combination of vacuum-furnace and fluidized-bed technologies, the MFV reactor is the first powder furnace system to simultaneously control all powder-processing parameters for operations used in the aircraft, automotive, and other industries. This improves both product quality and yield while reducing waste and pollution. By decoupling fluidation from gas flow, the reactor reduces gas consumption by as much as 3 orders of magnitude. (W.E. Kemp, Kemp Development Corp., and ACTON Materials Inc.)

**Advanced Direct-Contact Condensers**—This technology increases the efficiency and generating capacity in electric power plants while reducing pollution by using sophisticated geometric shapes to provide the best surface area for condensing spent steam. Geothermal power plant operators

using the technology in California improved electricity production efficiency by 5 percent, increased potential generating capacity by nearly 17 percent, and cut in half the cost of emissions treatment. (National Renewable Energy Laboratory and Alstom Energy Systems, Inc.)

**High-Efficiency Photovoltaic (PV) Modules**—This technology converts sunlight into electricity using copper indium diselenide-based solar cells. Tests have demonstrated efficiencies of more than 12 percent, by far the highest of any commercial thin-film module. Thin-film PV modules have the potential of greatly reducing the cost of solar electricity and providing a wide range of new products with mass appeal. (Siemens Solar Industries and National Renewable Energy Laboratory)

**Rolling Assisted Biaxially Textured Substrates (RABiTS)**—This technology could make it possible to manufacture long lengths of ultra-high-performance superconducting wires that could significantly increase the carrying capacity of the electricity grid. RABiTS substrates can be mass-produced at a cost of \$0.10/cm<sup>2</sup>, compared to \$15-\$135/cm<sup>2</sup> for traditional single crystals. Long lengths, flexibility, low cost, and single-crystal-like current-carrying capabilities make RABiTS ideal for high-temperature ceramic superconductor wires, the market for which is expected to reach \$100 billion by 2010. (Oak Ridge National Laboratory)

**Submersible Robotic System**—The robotic system, called Maverick, is the only robot certified to inspect aboveground storage tanks containing hazardous, potentially explosive fuel. The size of a suitcase, Maverick easily fits through manways on top of the tanks, is self-righting, and moves on four traction wheels at walking speed. Maverick eliminates the need for hand-probe inspections, which traditionally disable tanks for four-week periods. The robotic inspection also costs three times less than a manual inspection while providing much more data. (Idaho National Engineering and Environmental Lab and Solex Robotics Systems, Inc.)

help maximize the efficiency of the technology R&D process by leveraging public and private R&D resources, and bringing together interdisciplinary teams of scientists, engineers, and analysts to deliver technology results acceptable to energy markets.

EERE works with its domestic and international partners in both the planning and implementation phases of its R&D programs. In recent years, EERE has been making greater use of technology "visions" and "roadmaps" to develop shared goals among diverse groups within each sector and provide a framework for cooperative technology development efforts and market transformation activities. The roadmaps also serve to align government R&D resources with the high-priority needs identified by stakeholders. For instance, recent EERE planning activities have suggested that changes in its portfolio mix are necessary to place more emphasis on hybrid and distributed power technologies.

## Strategy 2

### Facilitate Deployment of Advanced Technologies and Practices

Realizing the benefits of advanced technologies requires that they find their way into the marketplace so they can be used by consumers. Market forces determine which technologies make this transition to the market; however, major informational, financial, institutional, and infrastructure barriers must often be overcome in order for clean energy technologies to become a part of our overall energy system. As a consequence, EERE's strategy in this area is designed to address and mitigate the barriers, both domestic and international, to marketable products, as well as the barriers faced by the

## Deployment Accomplishments

Some of EERE's accomplishments in the area of deployment are:

**Building America**—Building America partners are producing homes that require far less energy. One hundred Building America partners are producing homes that require far less energy for heating and cooling than conventional practice at no additional cost. These homes show how innovative building practices can be cultivated by a consortium of builders, contractors, and suppliers, in combination with DOE field support.

**Industrial Assessment Centers**—EERE's Industrial Assessment Centers are helping firms save millions of dollars in energy costs. Working through 30 universities, this deployment program has provided more than 7,600 energy and industrial process audits as of 1998 to small and mid-size manufacturing firms, generating recommendations that could save participating firms \$300 million through 2000.

**Clean Cities**—Government/industry partnerships formed through the Clean Cities program have helped deploy 139,000 alternatively fueled vehicles over the last 5 years, reducing gasoline and diesel fuel use by an estimated 380 million gallons through 1998 and reducing carbon emissions by an estimated 660,000 tons.

**Federal Energy Management Program (FEMP)**—This program is developing new ways to reduce energy use in Federal Government facilities through the use of innovative financing arrangements with the private sector that enable agencies to implement energy-savings projects at no first cost to the government and leverage hundreds of millions of dollars.

**Climate Challenge Initiative**—Partnerships with more than 600 utilities under the Climate Challenge program have led to reductions of more than 40 million metric tons in utility carbon emissions.

**Weatherization Assistance Program**—This program is helping low-income families reduce their energy bills by implementing energy-saving measures. Since 1976, the Weatherization Assistance Program has cut the utility bills of 4.7 million households nationwide, allowing low-income families to use more of their hard-earned dollars for food, education, and other needs.

end users of those products. EERE facilitates the deployment of advanced energy technologies and practices through a variety of mechanisms, which are discussed below.

### **Leveraging External Organizations**

The market of energy users is broad and diverse, including hundreds of millions of residential, commercial, and transportation users, hundreds of thousands of industrial users, and millions of users in the power sector. To enable deployment of advanced energy technologies and practices, EERE works with the leadership of high-leverage public and private organizations, such as states, universities, associations, unions, technology companies, utilities, and civic/community groups who have the direct constituencies, markets, and resources that can influence energy decisions. In addition, EERE will work with the banking, insurance, and bonding industries that determine where and how much capital is invested in the energy economy to look for opportunities to partner on initiatives that advance our mutual interests.

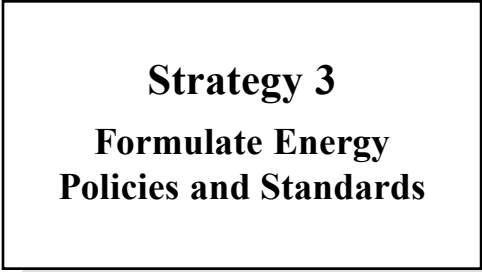
### **Providing Financial Assistance**

Adoption of advanced energy technologies is thwarted by consumer hesitancy to accept products based on unproven new technologies, lowest first-cost procurement policies, tax disincentives, and a lack of credibility about professed benefits. To help overcome these barriers, Congress makes funds available to EERE that are awarded to states and communities in targeted grants to help them promote energy efficiency and the use of clean power technologies. EERE has also established innovative energy efficiency financing programs such as Energy Savings Performance Contracts, in which private-sector companies finance and implement energy conservation projects for Federal agencies.

### **Removing Institutional Barriers**

Established business practices and regulations can act as barriers to the adoption of energy efficiency or

renewable energy technologies and practices, both domestically and internationally. EERE is working with public- and private-sector officials and foreign governments to identify and remove these barriers in government procurement systems, design and construction practices, financing practices, insurance practices, and in codes and standards.



**Strategy 3**  
**Formulate Energy**  
**Policies and Standards**

In some cases, energy policies are in conflict with environmental and energy security goals, presenting significant challenges to the market penetration of clean energy technologies.

EERE works in close collaboration with other DOE offices, the rest of the Federal Government, state and local energy officials, Congress, industry, environmental organizations, energy consumer groups, and foreign governments to look for opportunities to mitigate the impact of regulatory barriers to the commercial success of clean energy technologies. EERE also supports the formulation of policies to encourage the adoption of clean energy technologies.

EERE is directed by Congress to establish cost-effective energy efficiency standards that provide a substantial increase in the average energy performance of buildings and energy-related equipment. With the involvement of stakeholders, EERE expects to maximize the benefits and minimize the burdens of utilizing new, cost-effective, and environmentally friendly technologies through the targeted use of efficiency standards.

EERE is currently involved with policy and standard-setting efforts to:

- Increase the energy efficiency of appliances

- Increase use of biodiesel fuel in fleets
- Support the use of efficiency and renewables in the evolving, restructured electricity sector
- Include energy efficiency and renew-able energy technologies as options in State Implementation Plans, under the Clean Air Act
- Reduce mobile-source emissions (with the U.S. Environmental Protection Agency and the transportation industries)
- Assist states and local governments with more advanced, energy-efficient building codes.

## Policy and Standards Accomplishments

EERE policy and regulatory accomplishments include:

**Refrigerator energy efficiency standard adopted in 1997**—A refrigerator energy efficiency standard was adopted in 1997 that will require all refrigerators and freezers manufactured or imported in the United States after July 1, 2001, to be 30 percent more efficient than the pre-standard baseline.

**Room air conditioner energy efficiency standard set in 1997**—EERE amended the existing energy conservation standards for room air conditioners in 1997. EERE projects the standards will save 0.64 quads of energy through 2030, which is likely to result in a cumulative reduction of emissions of approximately 54 million tons of carbon dioxide.

**Ballast energy efficiency standard agreement reached in 1999**—An agreement was reached between DOE, lamp-ballast manufacturers, and energy efficiency advocates to improve the energy efficiency of fluorescent lighting in commercial and industrial applications. Adoption of the efficiency standard is expected to save between 2 and 5 quads of energy over a 30-year period, or enough energy to supply 12 to 26 million homes in the United States for 1 year.

**Federal renewables portfolio standard proposed by the Clinton Administration**—EERE worked with the White House to draft a Federal Renewables Portfolio Standard provision for the Administration's Comprehensive Electricity Competition Plan to ensure that renewables account for at least 7.5 percent of the electricity generated in the United States by 2010.

**EERE working to remove barriers to the deployment of combined heat and power (CHP) technologies**—EERE is working to remove barriers to the penetration of combined heat and power technologies by including CHP-friendly strategies in Federal restructuring legislation,

supporting tax credits and changes to depreciation as economic incentives to CHP, educating state officials about things they can do to encourage CHP, and increasing awareness about the benefits of CHP and the barriers limiting its increased implementation.

**Regulatory definition of "alternative fuel" expanded**—EERE has published a final rule to add another new substitute for gasoline, called the "P-series fuels," to the regulatory definition of "alternative fuel." P-series fuels are designed to operate in flexible-fuel vehicles that can run on E85 (85 percent ethanol mixed with 15 percent gasoline), or gasoline, or any blend of the two.

**Executive Order to develop and promote bio-based products and bioenergy**—President Clinton recently announced a bioenergy initiative, to be led by EERE, that will develop a comprehensive national strategy, including research, development, and private-sector incentives, to stimulate the creation and early adoption of technologies needed to make bio-based products and bioenergy technologies cost competitive in large national and international markets. Bio-based products and bioenergy technologies can create new markets for farm and forest waste products, new economic opportunities for underused land, and new value-added business opportunities.

**Executive Order to "green the government" through efficient energy management**—President Clinton recently issued Executive Order 13123 to significantly improve the Federal Government's energy management through cost-effective life-cycle measures that strive to reduce energy consumption and expand the use of renewable energy. This Order is designed to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change. EERE's Federal Energy Management Program (FEMP) is responsible for working with the agencies to ensure that they meet the goals of this order and report their progress.

**Strategy 4**  
**Implement a Corporate Strategic Management System**

Based on the complexity of our nation's energy markets, the range of energy technology options that could be pursued, and the need to invest Federal resources wisely, it is essential that the EERE programs be carried out with superior corporate management and business acumen. Our programs must be properly planned, funded, and executed to meet the nation's needs in the areas of energy efficiency and clean energy production. In addition, EERE must demonstrate the proper analytical underpinning to justify the pursuit of our individual and integrated RD&D programs, while continuing to focus on our collective technology advancement goals.

Excellence in business management is essential to accomplishing the EERE mission and goals. The government cycles often involve the management of up to four budget years at any one time. To do this in the most effective manner, an orderly, systematic approach is needed that is transparent, integrated, and seamless as it relates to the business of planning, budget formulation, budget execution and program analysis and evaluation.

A key approach in EERE has been the creation of the Strategic Management System (see figure below for more details). This system takes these complex processes of Federal management and links them into a cohesive whole based on common terms and definitions, and applies them with a consistent set of principles, procedures, and information management systems. This integrated, systematic approach to management envisions a deliberate and proactive approach to the business of EERE. Implementing this system is the key to ensuring overall management excel-

lence on a par with the technological excellence of the EERE programs. In support of the Strategic Management System, there are a number of related and supportive strategies that EERE is pursuing, including:

- Institutionalizing a systematic program analysis and evaluation activity, using peer reviews and independent analyses to aid decision making
- Implementing an integrated baseline management system that tracks programmatic execution across all of EERE

**Corporate Management Accomplishments**

Some of EERE's recent corporate management accomplishments include:

**Laboratory management contracts competed at the National Renewable Energy Laboratory and Oak Ridge National Laboratory**—The contract to manage the National Renewable Energy Laboratory (NREL) was competed by EERE in 1998—the first time in 15 years—and awarded to the Midwest Research Institute-Battelle-Bechtel Team. EERE also assisted with the competition of the Oak Ridge National Laboratory management contract, which was awarded to the University of Tennessee, Battelle LLC in 1999.

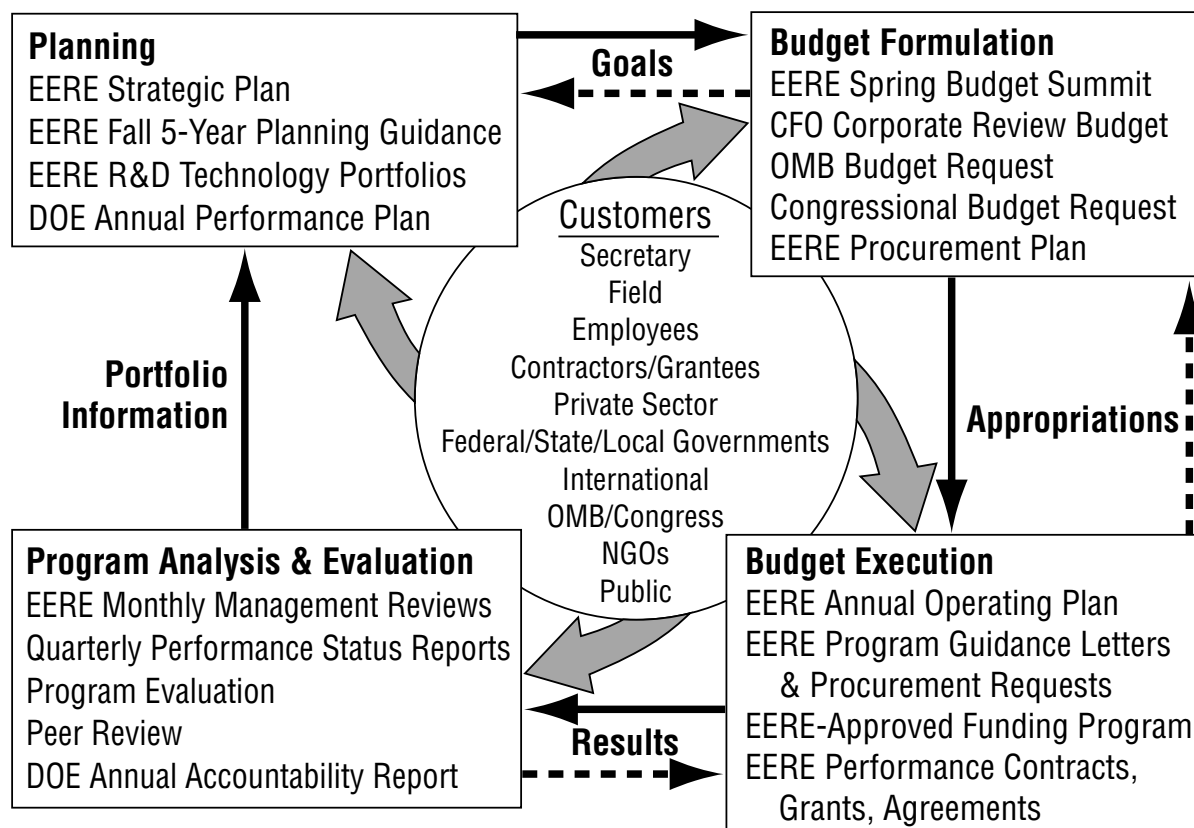
**Larger percentage of Discretionary Financial Assistance awarded on a competitive basis**—The proportion of EERE Discretionary Financial Assistance (DFA) funding awarded on a competitive basis increased from 24 percent of DFA funding in FY 1996 to 86 percent in FY 1999.

**Merit-review practices and procedures strengthened**—EERE has strengthened its merit-review practices and procedures through increased guidance and training of its staff.

**Office of Planning, Budget, and Management established within EERE**—In 1999, EERE established a Chief Operating Officer to direct the new Office of Planning, Budget, and Management that oversees all corporate EERE planning, budget, and management activities.

- Institutionalizing a corporate approach to field management that clearly delineates and defines the roles, responsibilities, and authorities among all participants in the EERE system
- Continuing to seek cross-cutting opportunities that leverage EERE technical capabilities and resources across program organizations
- Consistently communicating with customers and stakeholders to increase understanding and acceptance of EERE technologies and policies. EERE is organizing its communications and outreach programs around the Clean Energy for the 21st Century theme to deliver a single compelling message about the goals and outcomes of EERE’s programs. EERE is investing time and resources in "clean energy" information development and dissemination activities to support this effort, including publications, Web-based outreach, speeches, conference participation, and other outreach activities.
- Institutionalizing EERE’s core values:
  - Be customer-oriented
  - Value public safety and respect for the environment
  - Demonstrate that people are EERE’s most important resource
  - Value creativity and innovation
  - Be committed to excellence
  - Work as a team and advocate teamwork
  - Recognize that leadership, empowerment, and accountability are essential
  - Pursue the highest standards of ethical behavior.

### EERE Strategic Management System



# Further Information

The newly implemented EERE Strategic Management System envisions that strategic planning will lay the foundation for our programs and decision-making. However, this Strategic Plan is a living document and will be revisited annually for new insights and approaches. We welcome the views and suggestions of the many people and organizations who have a stake and interest in our programs. Please send comments to the following address:

Office of Energy Efficiency and  
Renewable Energy  
U.S. Department of Energy  
Washington, DC 20585-0121

To obtain print copies of this document or any DOE/EERE publications, contact:

Energy Efficiency and Renewable Energy  
Clearinghouse (EREC)  
P.O. Box 3048  
Merrifield, VA 22116  
Fax: (703) 893-0400  
BBS: (800) 273-2955  
Phone: (800) DOE-EREC  
(800-363-3732)  
E-mail: [doe.erec@nciinc.com](mailto:doe.erec@nciinc.com)

EREC can also answer questions concerning clean energy technologies.



U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0121

National Renewable Energy Laboratory  
a DOE national laboratory

DOE/GO-102000-0956  
March 2000



Printed with renewable-source ink on paper containing at least 50% wastepaper, including 20% postconsumer waste

## Visit Our Web Sites

- U.S. Department of Energy  
[www.doe.gov](http://www.doe.gov)
- Energy Efficiency and Renewable Energy Network (EREN)  
[www.eren.doe.gov](http://www.eren.doe.gov)
- Office of Building Technology, State and Community Programs  
[www.eren.doe.gov/buildings](http://www.eren.doe.gov/buildings)
- Office of Industrial Technologies  
[www.oit.doe.gov](http://www.oit.doe.gov)
- Office of Transportation Technologies  
[www.ott.doe.gov](http://www.ott.doe.gov)
- Office of Power Technologies  
[www.eren.doe.gov/power](http://www.eren.doe.gov/power)
- Federal Energy Management Program  
[www.eren.doe.gov/femp/](http://www.eren.doe.gov/femp/)
- Clean Energy for the 21st Century  
[www.eren.doe.gov/cleanenergy](http://www.eren.doe.gov/cleanenergy)
- DOE/EERE's Regional Offices  
[www.eren.doe.gov/rso.html](http://www.eren.doe.gov/rso.html)
- DOE Golden Field Office  
[www.eren.doe.gov/golden/](http://www.eren.doe.gov/golden/)
- State Energy Program  
[www.eren.doe.gov/buildings/state\\_energy/](http://www.eren.doe.gov/buildings/state_energy/)
- Weatherization Assistance Program  
[www.eren.doe.gov/buildings/  
weatherization\\_assistance/](http://www.eren.doe.gov/buildings/weatherization_assistance/)
- Center of Excellence for Sustainable Development  
[www.sustainable.doe.gov](http://www.sustainable.doe.gov)