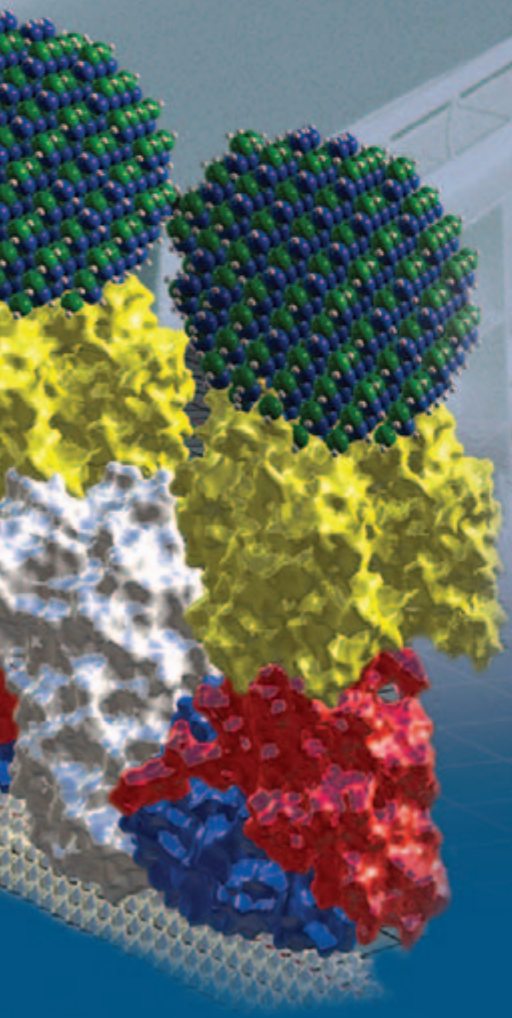
A national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy

NREL National Renewable Energy Laboratory

Innovation for Our Energy Future



National Renewable Energy Laboratory

NREL FY 2004 Performance Story

Message from the Director

"At NREL, effective delivery of operational and business services helps us fulfill our core mission to advance renewable energy and energy efficiency technologies from concept to application."

Society finds its greatest engineering and scientific challenges at the intersection of energy use, the environment, our economic well-being, and our national security. In all its myriad forms, energy is a fundamental element of all our lives. It is not optional. We employ energy to accomplish the important work of our society — our livelihood, our health, our education, our security, and our great national goals.

The National Renewable Energy Laboratory (NREL) was created to help discover and develop clean, reliable, secure, and inexpensive energy technologies. As the U.S. Department of Energy's (DOE) premier laboratory for renewable energy and energy efficiency research and development, NREL is developing new energy technologies to benefit the environment, the economy, and national security.

At NREL, effective delivery of operational and business services helps us fulfill our core mission to advance renewable energy and energy efficiency technologies from concept to application. As a result of our commitment to performance-based management and continuous improvement, the Laboratory and its customers are realizing the benefits of cost reductions, efficiency gains, and productivity improvements. These gains ensure that we are maximizing the use of dollars invested at NREL toward our R&D mission.

I welcome your interest in NREL and I invite you to read this report for more information about our Laboratory. If you would like additional information, please visit us at **www.nrel.gov.**

Richard H. Truly
Director

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MISSION: NREL develops renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers knowledge and innovations to address the nation's energy and environmental goals.

On the cover:

- Artist's rendition of quantum dots aligned with proteins for use in solar cells.
- Model of NREL's Science & Technology Facility, a state-of-the-art research center to be completed in FY06.

Foreword

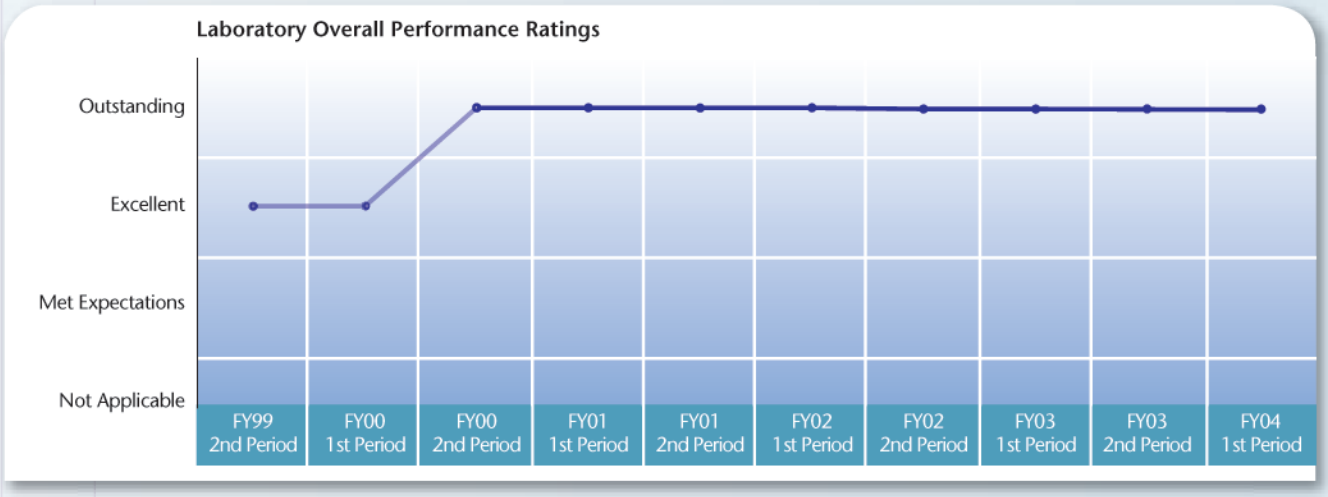
The National Renewable Energy Laboratory is a world-class science and technology facility whose mission is the advancement of renewable energy, energy efficiency, and related technologies and practices. NREL, a Federally Funded Research and Development Center (FFRDC) managed and operated by the integrated management team of Midwest Research Institute (MRI) and Battelle, is a partner and strategic adviser to DOE. In this capacity, NREL integrates and responds to shifts in priorities that affect energy pathways, while strengthening its world-class competencies to carry out RD&D agendas in collaboration with DOE's Office of Energy Efficiency and Renewable Energy (EERE). NREL conducts a broad spectrum of basic and applied research, development and demonstration activities; and facilitates deployment of technologies in U.S. and international markets.

NREL's research and development mission and programs support those of DOE through efforts in fundamental and applied science, energy and environmental sciences and technologies, and national security. NREL provides highly skilled staff who support multidisciplinary efforts to rapidly translate scientific discoveries into applications.

A key enabler of NREL's science and technology mission is strong and cost-effective business and operational management. NREL consistently strives to be the best-value provider to DOE, delivering business management and operational infrastructure that is efficient, effective, and responsive — and that maximizes R&D output per dollar invested at the Laboratory.

NREL approach to performance excellence.

This report profiles NREL, emphasizing the management, delivery, and continuous improvement of business and operational support products and services that enable mission success. ■

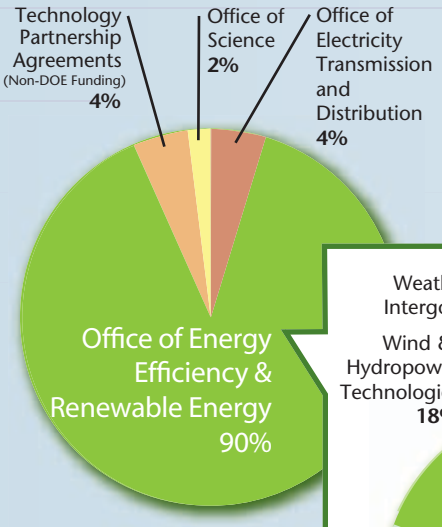


DOE's evaluations of the Laboratory acknowledge NREL's exceptional performance. As a result, NREL has received an overall evaluation of "Outstanding" for its past eight performance periods.

NREL FY04 Budget Authorization

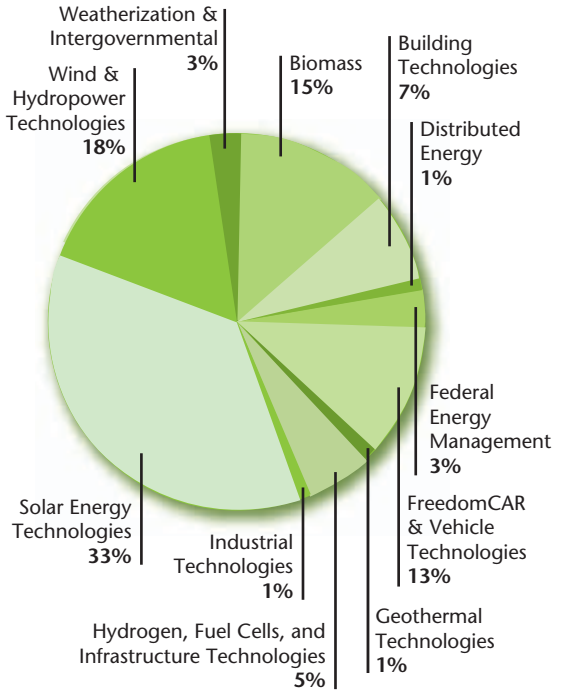
As DOE's primary laboratory for renewable energy and energy efficiency research and development, NREL provides effective program oversight and execution, yielding significant accomplishments that advance EERE objectives. In partnership with EERE, which has stewardship for the Laboratory and oversight of the majority of its program portfolio, NREL is developing and transferring the scientific knowledge and technology that will enable a sustainable energy future. NREL's efforts cover nearly 50 areas of scientific and technical investigation, advancing the 11 EERE program goals. In FY04, NREL received 90% of its total funding from EERE. In addition, NREL conducted research in support of the Office of Science and the Office of Electricity Transmission and Distribution in key areas that further the Laboratory's mission.

The Laboratory also works with, and for, a wide range of groups outside DOE, including industry, universities, state and local governments, other federal agencies, and domestic and international nongovernment organizations. Through industrial partnerships, the return on DOE's investment in NREL is realized when knowledge is created and put to use by industry to develop energy-related products and services. Using a broad range of in-house, subcontracted, and cost-shared partnerships, NREL helps reduce market barriers to the use of renewable energy and energy efficiency technologies. The Laboratory's technical support to governmental and private organizations also helps increase the rate of commercial penetration for EERE-supported technologies worldwide. ■



Total FY04 Funded Activities:

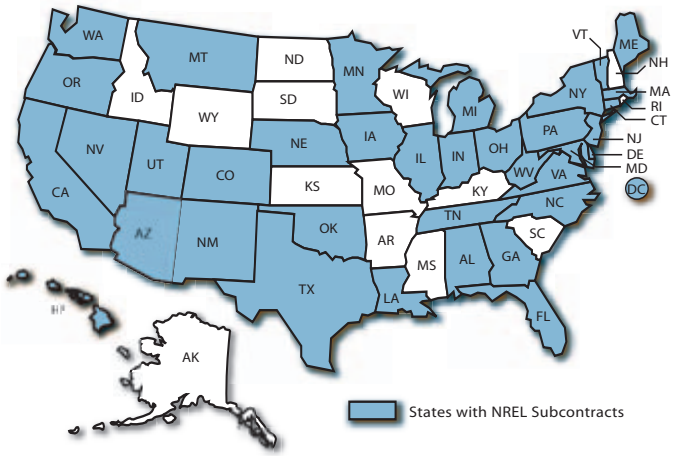
Consistent with historical trends, 96% of NREL work in FY04 supported DOE's Office of Energy Efficiency and Renewable Energy, the Office of Electricity Transmission and Distribution, and the Office of Science. Non-DOE sources provided approximately 4% of additional funding to NREL.



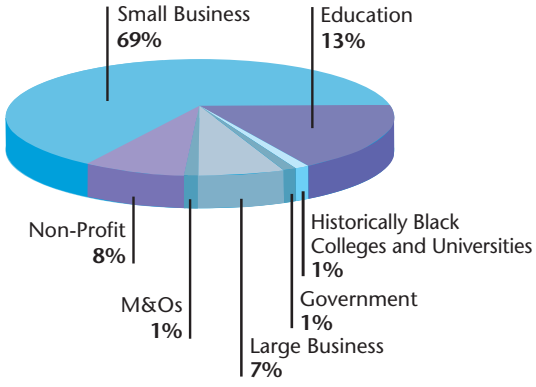
FY04 Funding from EERE:

NREL's work spans a variety of sectors and a wide array of energy sources and types, which positively impacts a broad range of energy issues. Actual FY04 funds received from EERE were approximately $190.5 million.

NREL subcontracts approximately 42% of its work to outside entities. In FY04, subcontractors in 36 states and Washington, D.C., helped the Laboratory advance renewable energy and energy efficient technologies.



NREL FY04 Subcontract Awards



Reflective of its commitment to effective and meaningful competition, the Laboratory continued to award the majority of its subcontracts to small businesses.

Science and Technology

NREL strives to execute its programs and projects with innovation and excellence, ensuring that work conducted is of the highest quality. Through its programs and projects, NREL's scientists and engineers provide technical expertise to help solve the world's toughest energy related-problems.

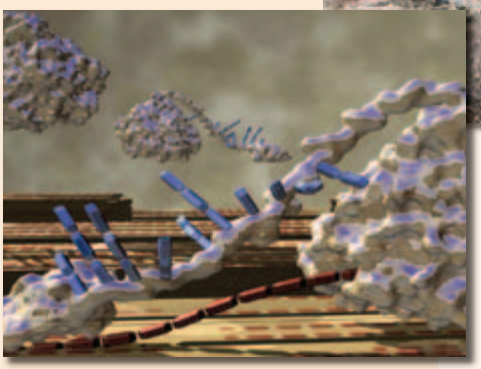
In-depth discussions of NREL's FY04 research accomplishments are highlighted in the Laboratory's annual Research Review, available by visiting **http://www.nrel.gov/research_review**.

In FY04, NREL received two R&D 100 Awards, considered the "Oscars of Invention," for development of a flexible, thin-film solar transportable power and for its enzymatic cellulose hydrolysis technology. Since 1982, the Laboratory has received 37 R&D 100 Awards, a remarkable track record.

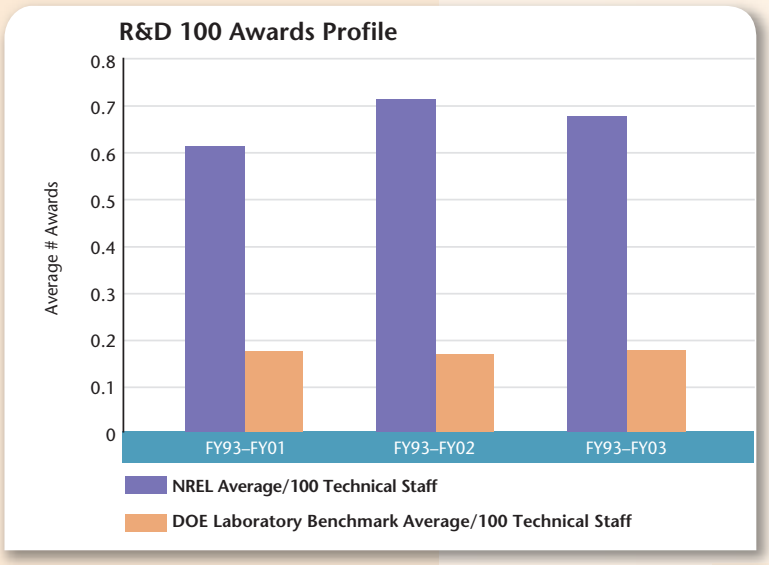
NREL participated in 18 peer reviews of research plans and progress involving the majority of its program areas. Results from these peer reviews, often cited as the most effective form of research assessment, consistently acknowledged the importance, relevance, and quality of the work conducted. These reviews often help inform new program direction as well as provide recommendations for improvement.

The quality of NREL research was also evidenced by accolades marking the leadership and accomplishments of individual staff. Awards won by NREL and its researchers can be viewed at **http://www.nrel.gov/awards**. Clearly, NREL has earned an international reputation for excellence in leading-edge research and development innovation in a wide range of science and engineering domains.

Flexible, thin-film solar transportable power for worldwide military use.



Artist's conception of CBH1 cellulase acting to hydrolyze cellulose.



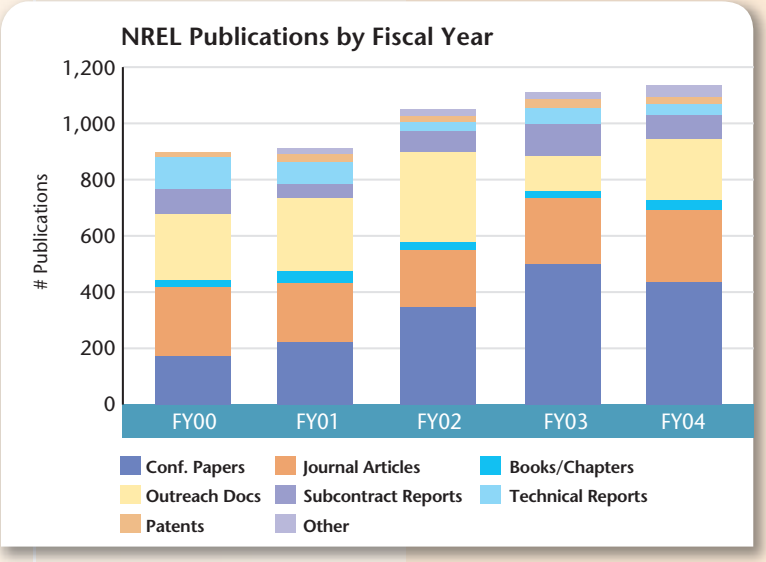
NREL consistently maintains a strong record of innovation.

External recognition is measured, in part, by comparing NREL's performance per 100 technical staff against the composite of other DOE labs. The benchmark for FY93-FY03 does not extend through FY04 because all data sets are not available until nine months after the fiscal year closes.

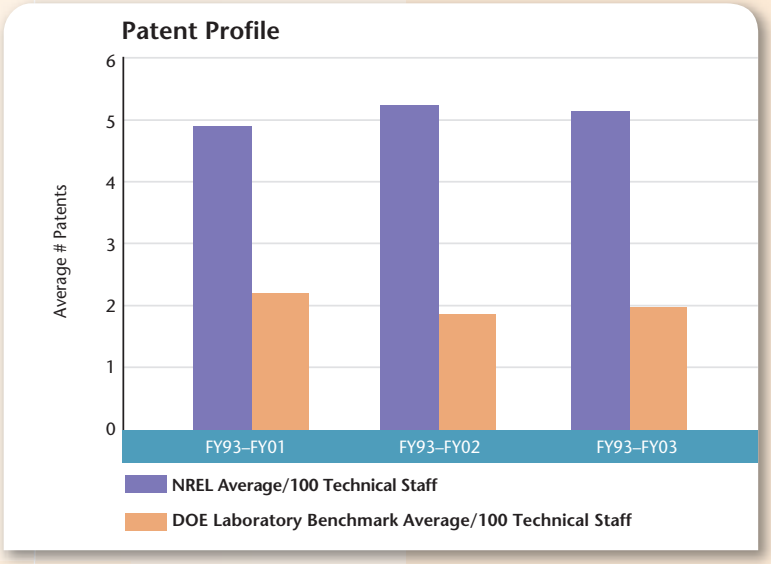
**Technical Staff = Number of scientists and engineers*

***Labs used for benchmark: Ames, ANL, BNL, LANL, LBNL, LLNL, ORNL, PNNL, SNL*

Science and Technology



NREL produced 1,131 outreach documents, of which 80% were technical. Of these, 232 appeared in peer-reviewed journals.



A measure of overall NREL scientific productivity compared to other DOE laboratories.

External recognition is measured, in part, by comparing NREL's performance per 100 technical staff against the composite of other DOE labs. The benchmark for FY93-FY03 does not extend through FY04 because all data sets are not available until nine months after the fiscal year closes.

**Technical Staff = Number of scientists and engineers*

***Labs used for benchmark: Ames, ANL, BNL, LANL, LBNL, LLNL, ORNL, PNNL, SNL*

In September, NREL received accreditation for the ISO 17025 standard for testing and calibration laboratories from the American Association for Laboratory Accreditation. This designation makes NREL one of only two laboratories in the world with ISO 17025 accreditation for conducting photovoltaic secondary reference cell calibrations. This formal accreditation also provides an internationally recognized credential denoting the quality of work to Laboratory customers and stakeholders.

Equally important to producing high-quality science and technology is timely dissemination of the knowledge produced to the scientific community and the marketplace. The quality of NREL's work was acknowledged through cover stories (Macromolecular Materials and Engineering), selection as one of the top stories of the year (American Institute of Physics), prominent articles in exceptionally prestigious journals such as *Science*, or being solicited for interviews to share our scientific expertise in highly respected public venues (*PBS Newshour with Jim Lehrer*, National Public Radio, *Wall Street Journal*, *ABC News*).

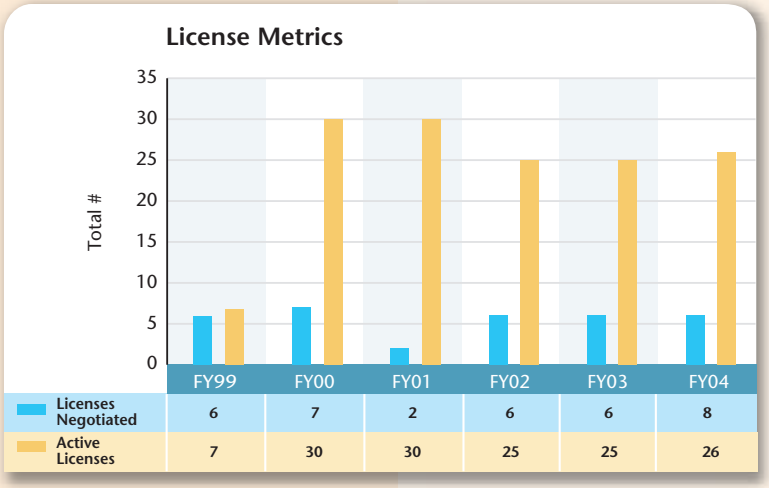
Researchers use green algae to produce hydrogen directly from water and sunlight.

Science and Technology

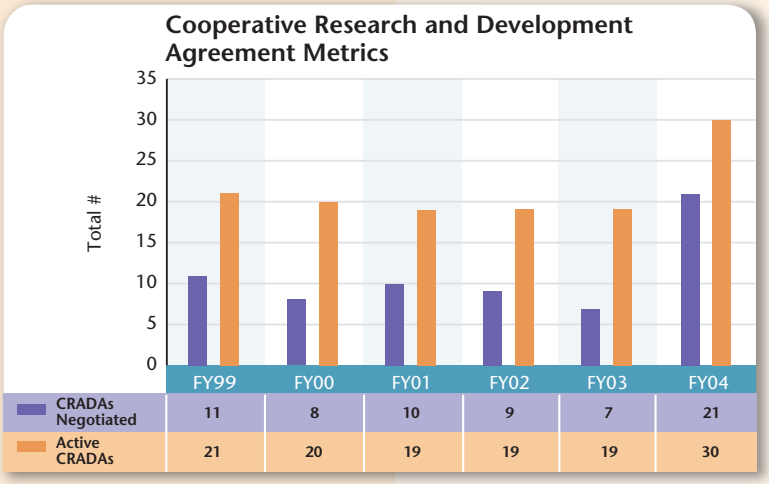
Recognizing the uniqueness and value of NREL's innovations, the Laboratory received eight U.S. patents and four foreign patents. Through its new patent strategy, the Laboratory continued to emphasize the quality and long-term impact of its intellectual property. This strategic approach has resulted in a 77% savings in maintenance, annuity, and prosecution costs from FY03.

NREL also transfers intellectual property, knowledge, and know-how through industrial partnerships, helping to remove barriers and bring its energy-efficiency and renewable energy technologies to market more quickly. Licenses and Cooperative Research and Development Agreements (CRADA) provide industry with a protected position that is requisite for investing in commercialization.

In FY04, the Laboratory's technology transfer efforts were recognized by receipt of three awards from the Federal Laboratory Consortium for technology transfer and regional development, and an award for sustainable design.

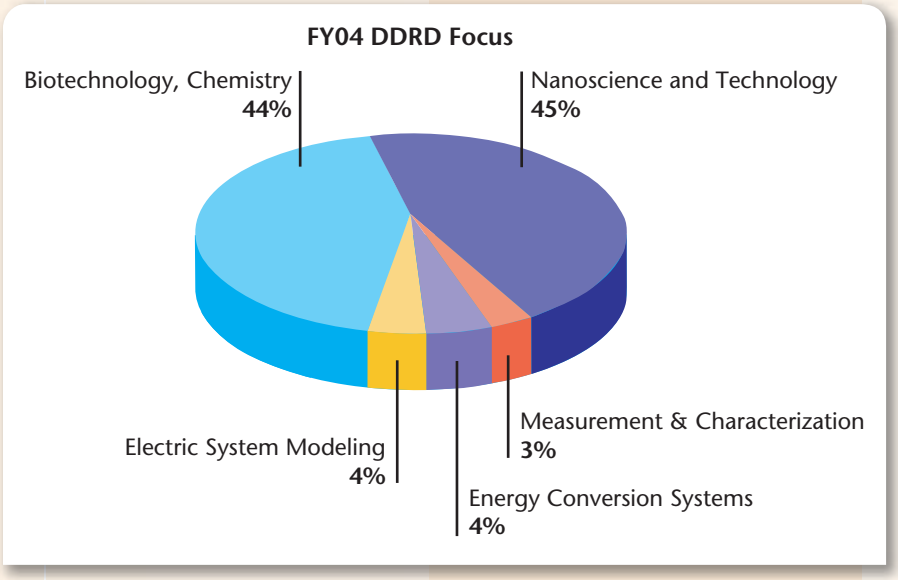


NREL continues its strong trend of licensing its technologies, and uses licenses to transform its expertise and technology into commercially available products.



NREL demonstrates economic value through the development of technology partnerships that transfer NREL technology to the commercial market and leverage DOE R&D investments.

Chemists conducting compositional analysis of agricultural residue (corn stover) for carbohydrate and lignin content.



The early-stage concepts explored through the DDRD program provide a basis for proposing new technical directions important to the EERE mission.

NREL has taken a leadership position in working with the business development and investment community through focused efforts such as the Industry Growth Forum, the Energy Analysis Forum, the National Alliance of Clean Energy Incubators, and a Technology Day. For example, the Laboratory continued to advance clean energy companies through its unique partnership with key business incubators in the National Alliance of Clean Energy Incubators. Ninety-nine clean energy companies associated with the Alliance employ 1,158 people, produce more than $122 million in total revenues, and significantly leverage funds invested by DOE.

To fulfill its role as an FFRDC, the Laboratory continually focuses on the future and what it means to the energy efficiency and renewable energy landscape. The Director's Discretionary Research & Development (DDRD) program provides the important link between new ideas and advanced solutions by investing in new science and technologies that strengthen the NREL commitment to solve energy challenges. These investments enable NREL to respond to the needs of EERE, DOE, and the nation directed toward a safe, secure, and environmentally sound energy future. ■

Laboratory-Level Business Management Outcomes

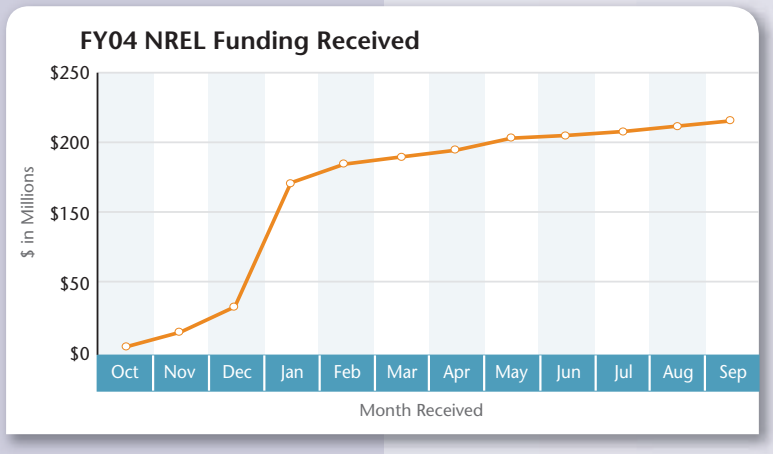
Effective management of well-integrated financial systems enabled smooth operation of the Laboratory. NREL effectively responded to a number of difficult challenges such as rising pension and medical costs and the delayed receipt of funding due to continuing resolutions.

NREL's commitment to strong fiscal stewardship delivers exemplary results. EERE funding at NREL consists of three categories of funds: Operating; Program Capital, GPP, and GPE; and the Science and Technology Facility (S&TF) Construction funds. NREL's continued strong financial management performance further reduced the EERE Operating, Program Capital, GPE, and GPP funding uncosted balances, resulting in an overall 14.2% decrease from FY03 balances.

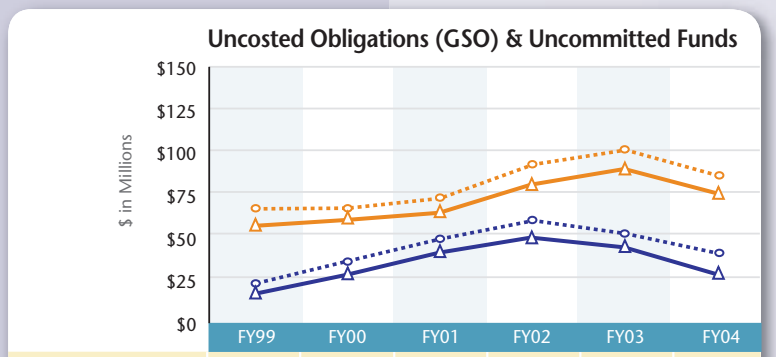
In partnership with DOE-GO, strong internal collaborative efforts resulted in the closeout of all FY99 Limited Term Appropriations. The process was completed on schedule for the second year in a row, ensuring effective use of funding and avoiding a situation in which planned program work cannot be completed due to lack of funds.

Solid bank performance is important to effectively manage federal funds. The Laboratory's recent banking recompetition resulted in a 50% reduction of banking costs while improving overall bank performance. Efforts such as these reflect NREL's commitment to continuous improvement.

Continued emphasis on effective foreign travel management yielded a significant reduction to the closeout backlog and resulted in recognition by DOE Headquarters of NREL's performance as first in closeout rates. Since October 2003, NREL continued to improve its ability to meet or exceed the 90% goal for successful closeouts. ■



FY04 marked the third year in a row where receipt of funding was delayed due to continuing resolutions. Late receipt of funding presents challenges in initiating work and subcontracts and can influence year-end Goods and Services on Order (GSO) balances. Careful and aggressive financial management allowed the Laboratory to mitigate these challenges to the degree possible.

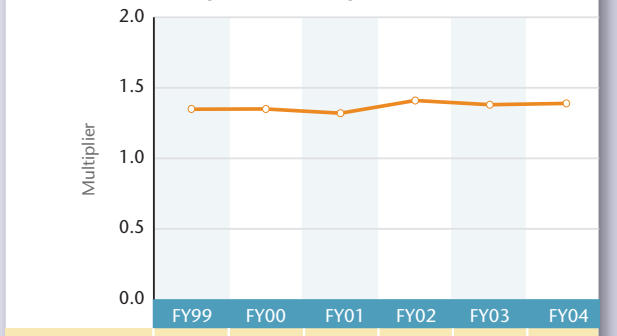


	FY99	FY00	FY01	FY02	FY03	FY04
Total Uncosted Obligations	$64	$65	$72	$91	$100	$86
Total Uncommitted	$22	$33	$47	$57	$51	$38
EERE Uncosted Obligations	$54	$57	$62	$79	$88	$73
EERE Uncommitted	$14	$26	$38	$47	$41	$26

Notwithstanding the delayed receipt of funding, NREL achieved a near deminimis GSO level necessary for prudent business management. This will assure that the Laboratory meets all legal, contractual, and financial obligations.

Laboratory-Level Business Management Outcomes

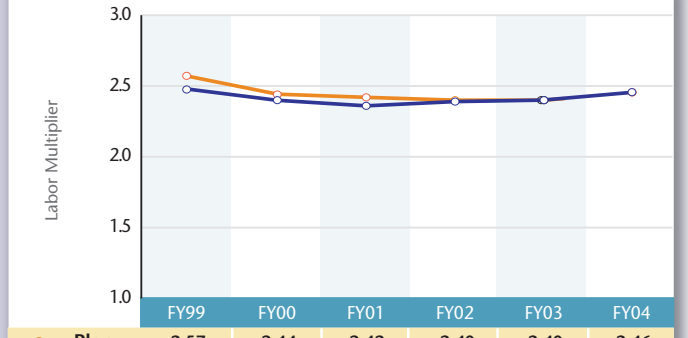
Composite Multiplier



	FY99	FY00	FY01	FY02	FY03	FY04
Composite Multiplier	1.34	1.35	1.32	1.41	1.38	1.40

NREL monitors the overall ratio of total support costs to Laboratory in-house and subcontracted efforts. Careful management of this ratio between direct and indirect costs allows NREL to remain a best-value provider within the DOE laboratory system.

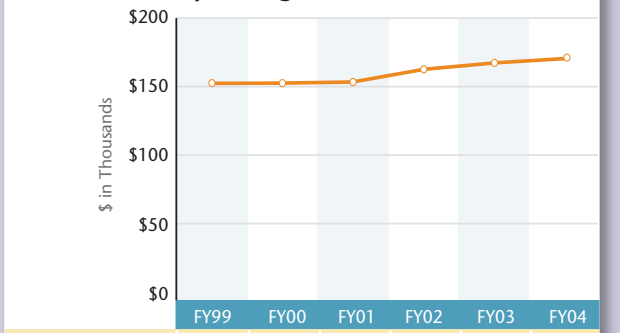
Labor Multiplier Performance to Plan



	FY99	FY00	FY01	FY02	FY03	FY04
Plan	2.57	2.44	2.42	2.40	2.40	2.46
Actual	2.48	2.40	2.36	2.39	2.40	2.46

Continued pension and medical cost escalation (factors outside the Laboratory's control) dictated a need to increase the labor multiplier slightly in FY04. Proactive management and timely response to changing requirements and priorities enabled NREL to keep the multiplier to as low a level as practical.

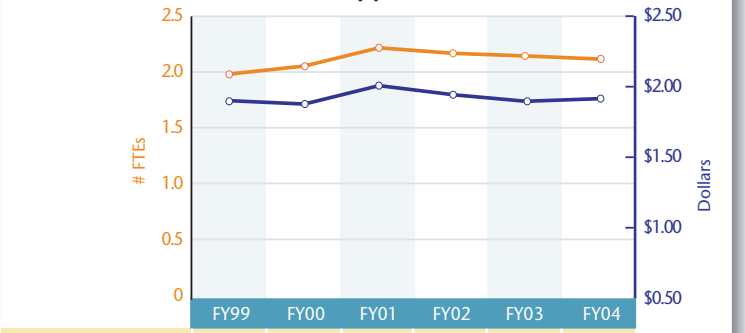
Operating Cost in $/FTE



	FY99	FY00	FY01	FY02	FY03	FY04
Operating Cost in $/FTE	$152	$151	$152	$163	$167	$171

Operating cost per research Full-Time Equivalent (FTE) is a measure of cost effectiveness and overall operating efficiency. Operating costs include labor, facilities overhead, recharge costs, and other indirect costs. The chart reflects actual costs, as well as rising pension and medical costs, and is not adjusted for inflation.

Research to Support Ratios



	FY99	FY00	FY01	FY02	FY03	FY04
Research/ Support in FTEs	1.98	2.06	2.22	2.17	2.15	2.12
Research/ Support in $	$1.90	$1.88	$2.00	$1.95	$1.90	$1.87

The ratio of research (direct) to support (indirect) FTEs indicates that more NREL staff are working directly on the science and technology, relative to those providing the support products and services required to conduct NREL's mission work. Approximately two of every three dollars invested at NREL are spent directly on producing research, development, field verification and testing, technical analysis, and technical assistance outcomes and results.

Contracts and Procurement

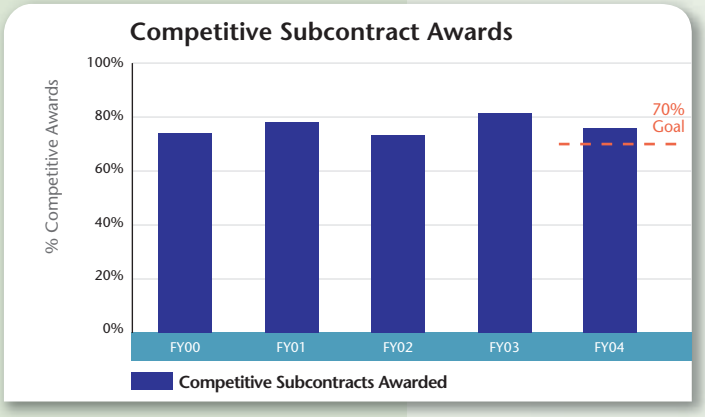
In accomplishing its mission, NREL subcontracts almost half of its operating budget to external sources, making effective and efficient award and closeout of subcontracts critical. NREL's advanced procurement process ensures that subcontracts are ready to place as soon as funding becomes available, and timely closeouts ensure that unused contract funds are returned to the programs for redeployment in other critical mission areas.

All of NREL's Balanced Scorecard goals or targets, the metrics used to gauge performance, were met or exceeded in FY04. Successful achievement of these goals reflects continued emphasis on enhanced productivity through reengineering and streamlining processes.

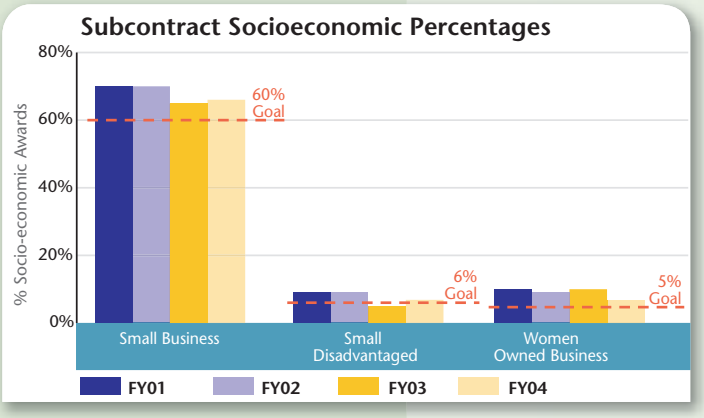
Competitive awards, based on "best value" (evaluated qualitative merit and evaluated cost or price), yielded outstanding results in a number of areas of the balanced scorecard. The 76% of competitive awards placed in FY04 demonstrates exemplary performance for a Laboratory doing complex scientific and engineering tasks.

Growing pressures to meet its small business goals were exacerbated as energy efficiency and renewable energy continued to attract the interest of larger companies in FY04. In spite of the challenges, the Laboratory successfully met all of its socioeconomic goals.

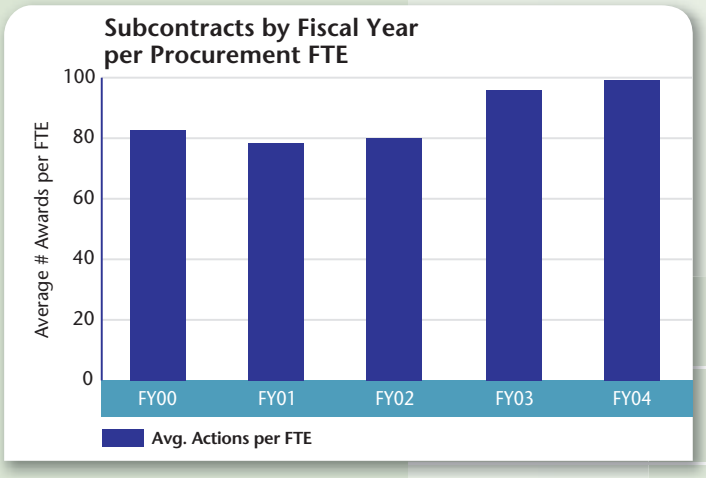
Subcontracting, which was 20% above plan with the second highest dollars awarded per FTE in five years, exceeded the goal of $4 million/FTE.



Indicative of NREL's commitment to effective and meaningful competition, more than three-fourths of the Laboratory's subcontracts were competitively bid in FY04.

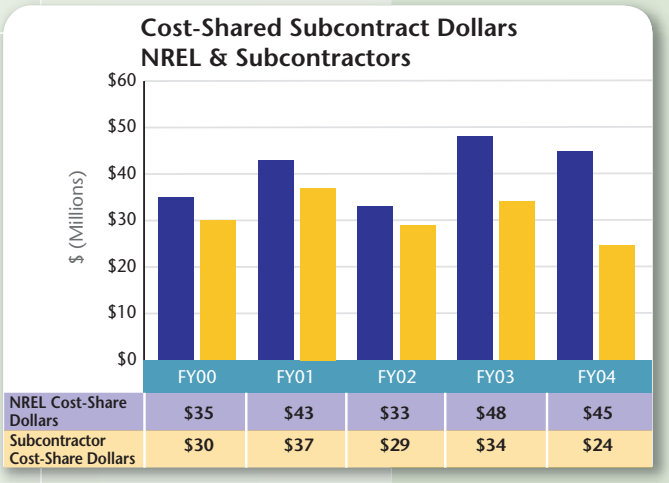


Socioeconomic awards to small, small-disadvantaged, and women-owned businesses remain at significantly high percentages.

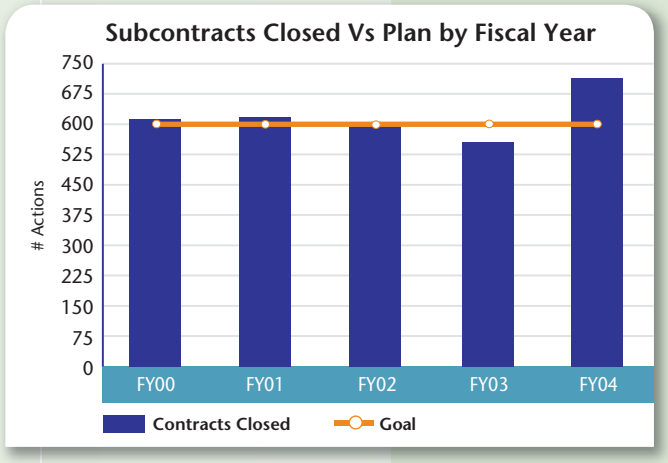


With 99 average actions per FTE, the Lab surpassed its goal of 80 actions per FTE with no increase in cycle time (FY04 average cycle time = 32 days).

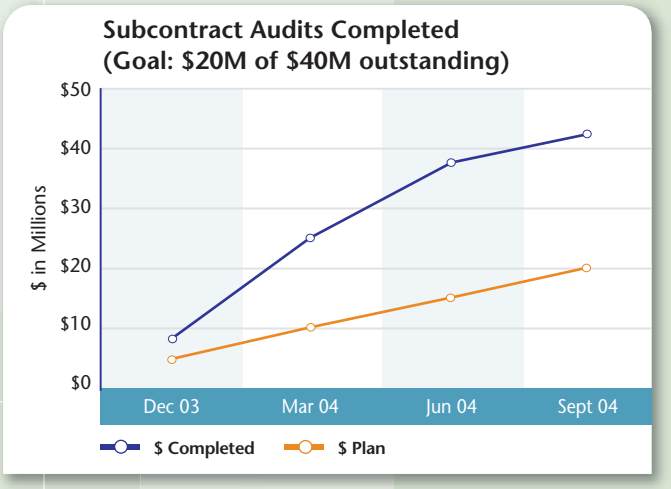
Contracts and Procurement



NREL's cost-share is 65% of the 228 cost-share subcontracts awarded in FY04 ($68.2 million).



Acceleration of the modified subcontract closeout process resulted in dramatic performance improvement.



Efficiencies of NREL's subcontract closeout processes rely on strong and integrated cost/price analysis and subcontract audit support. Audits of completed subcontracts doubled, while cycle time was reduced and cost/price services were added — all with no increase in staff.

Industry cost-shared subcontracts continue to provide increased leveraging of DOE R&D funding and comprise a significant component of NREL's portfolio. One of the highest cost-shared actions in the Laboratory's history was awarded in FY04.

NREL closed a record number of subcontracts (714), exceeding the Laboratory's goal by 19%. This achievement includes a reduction in the subcontracts backlog, surpassing the NREL goal by approximately 20%. As a result of these efforts, $4.1 million was returned to programs for other uses in FY04. NREL also achieved the highest-ever number of cost-type subcontract closures in its history (157), demonstrating the Laboratory's commitment to aggressively addressing subcontract closeouts. This effort was supported by strong and integrated cost/price analysis and subcontract auditing. ■

Human Capital Management

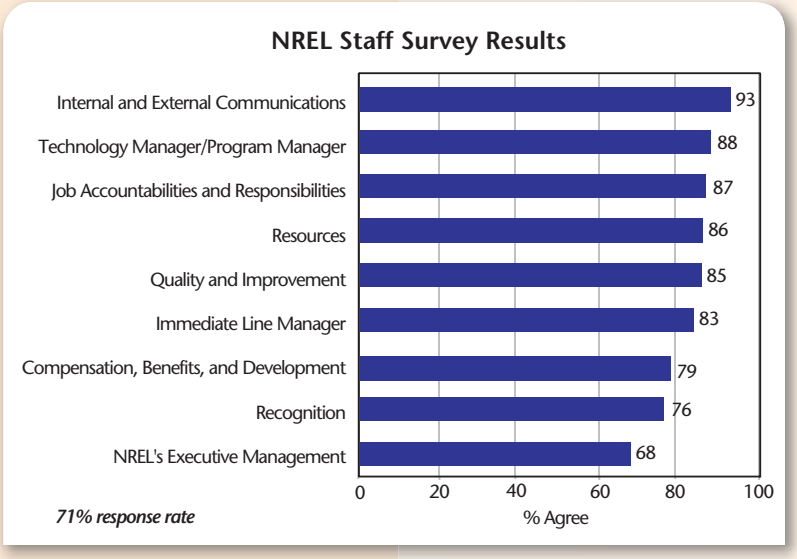
Effective human resource management allows the Laboratory to align its staff with the mission and strategy of NREL, as well as to maintain a culture in line with the Laboratory's values. In FY04, strategic hires addressed key staffing needs, employee productivity improved, and significant cost savings were achieved.

Hiring the right person to do a job is important to any enterprise; however, it is essential to a national laboratory. In FY04, the Laboratory made strategic hires in hydrogen systems integration, biomass, transportation, and analysis. NREL was successful in attracting new staff with a 98% acceptance rate — compared to the 2004 DOE Contractors' average acceptance rate of 82.96%. Insights gained by recent benchmarking activities will be incorporated into the Laboratory's strategic planning initiative.

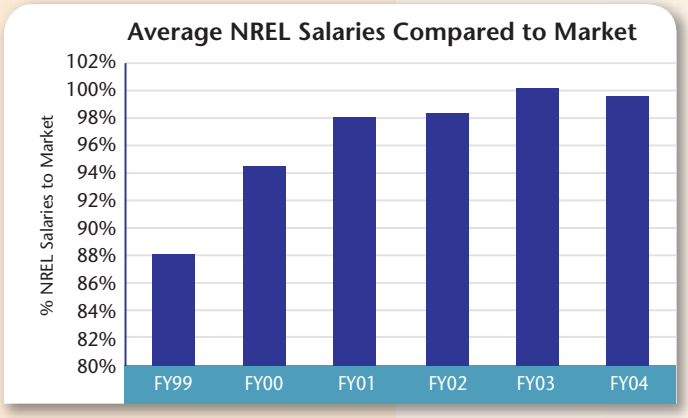
NREL continued to raise awareness of its commitment to diversity by enhancing outreach and recruitment efforts. The Laboratory designed and published a new diversity brochure to be distributed at job fairs and other events, improved its diversity Web site, and continued active participation in DOE's Hispanic Employment Plan initiative and the Corporate Outreach and Recruitment Council. As part of the Hispanic Employment Plan (HEP) initiative, representatives from the National Bioenergy Center and the Education Office are also working with HR to develop HEP activities. By participating in these groups, the Laboratory expects to enhance recruitment opportunities and increase Hispanic representation at NREL.

NREL recognizes the significance of knowing which services and issues are the most important to its workers. The Laboratory regularly administers staff surveys, which provide opportunities for all staff to help identify areas for improving the work environment and/or processes.

Compensation is an important tool for attracting and retaining valuable staff. NREL's average salary compares favorably to market (99.4% overall). A targeted market adjustment was made to the salaries of employees in the research engineer, project leader, and scientist classifications (these positions were deemed below the Laboratory's average). The adjustment was a cost-effective measure that supported efforts to maintain appropriate compensation levels.



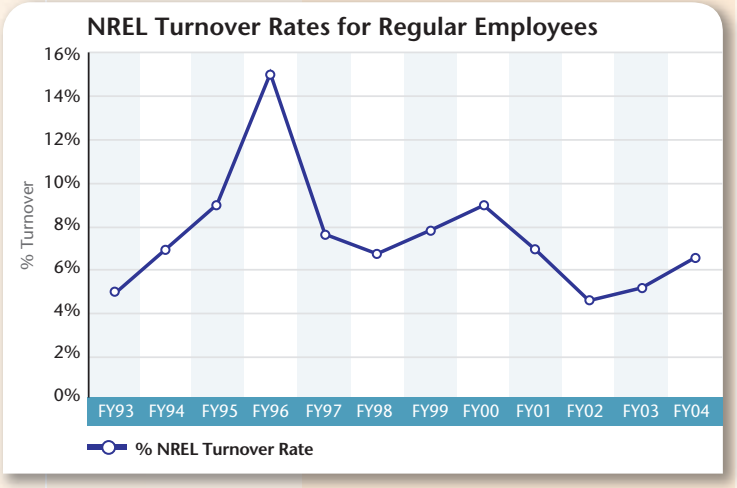
Seventy-one percent of the Laboratory's staff responded to the FY04 Staff Survey. The generally high percentage of positive responses across all question groups represents a very favorable result for a survey of this kind within an organization as diverse as NREL.



The Laboratory's extensive benchmarking efforts and flexible compensation design provide a solid basis for continued efforts to recruit and retain talented staff. During the past five years, significant progress was made to bring salaries to a very competitive level.

Human Capital Management

FY04 Staff Survey Question	Favorable Responses
My roles and responsibilities are clearly defined.	87%
I understand how my job contributes to NREL's mission.	86%
I contribute appropriately to my Center/Office's planning processes.	78%
NREL policies and procedures provide useful guidance.	80%



NREL's extensive benchmarking efforts, flexible compensation design, and compelling mission help keep staff turnover ratio low. The Laboratory experienced increased turnover in FY04, reflecting an increase in the number of layoffs due to isolated cases of reduced program funding and retirements.

Once staff join the Laboratory, it is important that they understand their roles and responsibilities. Two key processes continue to be enhanced to strengthen this understanding. NREL's **planning, budgeting, and assessment** process effectively aligns staff performance to the Laboratory's mission by engaging staff at all levels of the process. NREL's FY04 staff survey confirmed the success of this system, with almost 9 out of 10 staff responding that they understand how their job contributes to NREL's mission. Translating and communicating NREL operating and business requirements helps workers do their jobs safely and efficiently. The Laboratory's comprehensive **Requirements Management System** (RMS) interprets requirements, such as those derived from the prime contract, DOE directives, NREL business and operating practices, organizational changes, and executive management priorities; and conveys those requirements to workers through policies, procedures, and forms.

Costs associated with human resources have also been continually decreased. NREL's Personal Time Off (PTO) Benefit Program, implemented in FY04, resulted in an increase in productive labor to projects and decreased use of unplanned sick time and absences. Largely due to the new PTO Program, NREL's fringe rate dropped nearly 2%, resulting in approximately $1 million savings to the Laboratory. At the same time, the program provides increased flexibility to staff by giving them more control over how they use their time off.

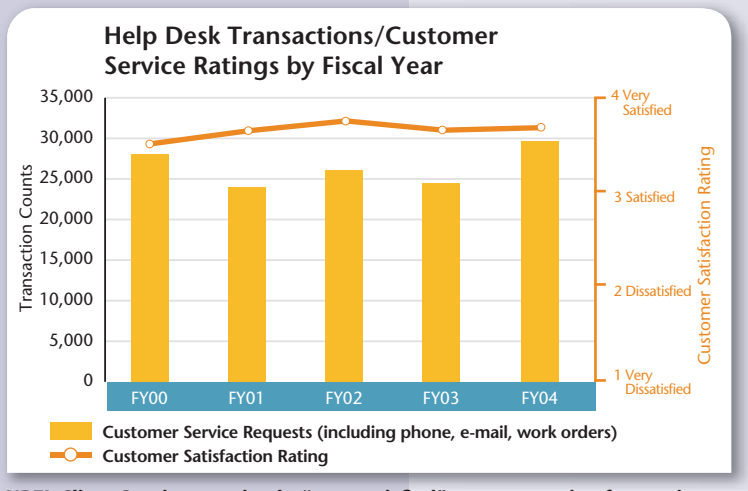
NREL responded effectively to the unanticipated change in the Fair Labor Standards Act (FLSA). The Laboratory's strict interpretation of the FLSA provisions was validated by its comprehensive review of position exemption classifications and policies related to the salary basis test. This project was a well-coordinated effort and was successfully completed by the compliance deadline. Moreover, this extensive effort validated the integrity of the Laboratory's overall compensation program. ■

Information Services Management

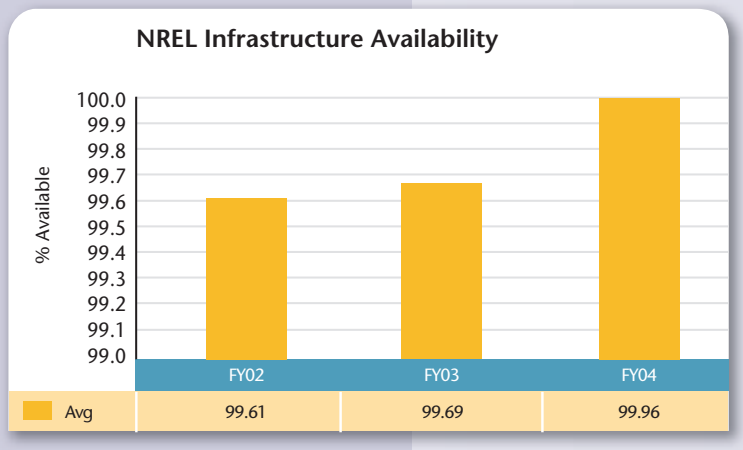
Information services and information technology have a tremendous positive impact on an organization's effectiveness and its employees' productivity. NREL maintained its high level of IT resource availability and expanded several programs to boost access to information and worker productivity.

NREL continually refines and reviews its performance and its plans to address the most significant risks to its technology infrastructure, as well as all policies, technical standards, and procedures to ensure their currency, effectiveness, and completeness. The Laboratory continued to improve its network-based virus prevention by deploying 101 updates to more than 1,300 devices — indicative of the increasing number and complexity of cyber-security threats. Computer Incident Advisory Capability (CIAC) Advisories increased 41% and cyber-security incidents more than doubled from FY03, yet NREL experienced no downtime attributed to cyber incidents. In spite of escalating cyber activity, NREL's 99.95% infrastructure availability enabled research to progress without interruption, making FY04 the most stable year ever for the Laboratory's IT infrastructure.

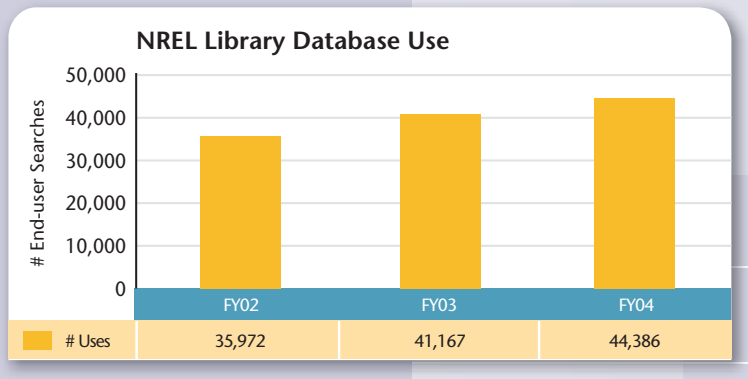
Effective management of NREL's library services provides a channel for NREL researchers to more easily and expeditiously share their findings, as well as access to the latest research from around the world. Efficient use of technology enables the Laboratory to manage the challenges associated with ever-increasing costs and availability of services.



NREL Client Services received a "very satisfied" customer rating for services and support even with limited resources and a 20% increase in transactions.

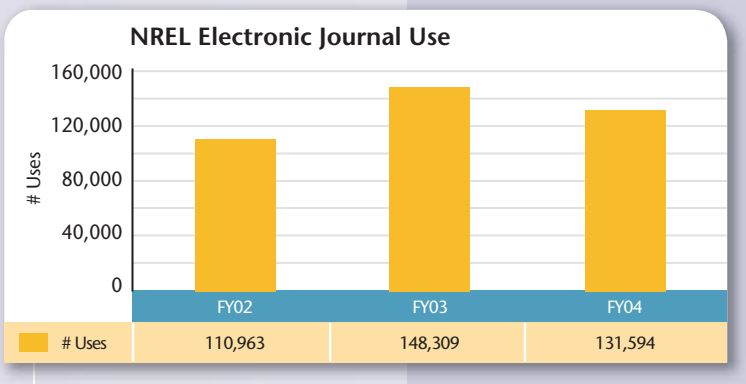


Effective management of NREL's IT infrastructure resulted in network service availability greater than the Laboratory's 99.7% goal. (Includes NT, UNIX, Oracle, Mail, Telecommunications, Networks, and Internet Systems)

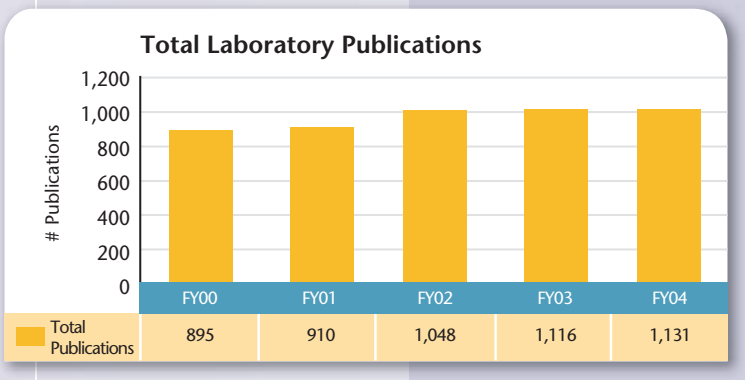


The high number of end-user searches completed through major science and technology databases continues to increase.

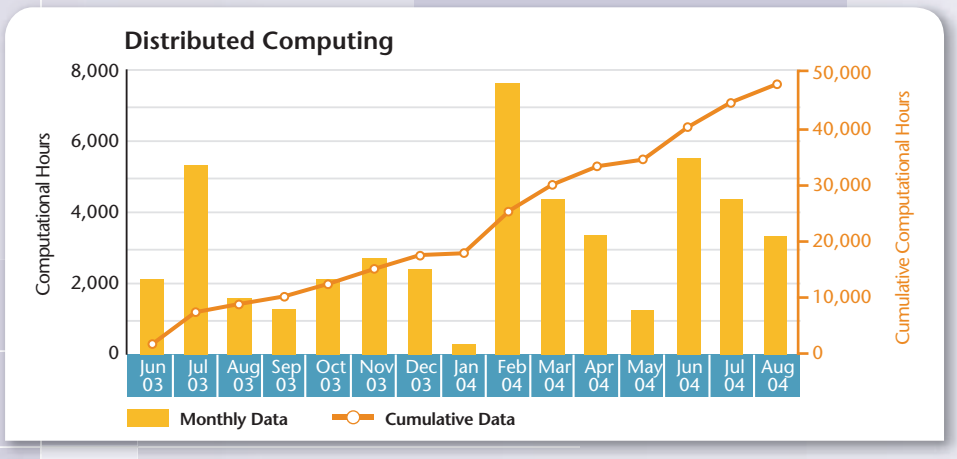
Information Services Management



E-journal use allows resource sharing among NREL researchers, other DOE laboratories, industry, and the public.



NREL's Publication Database plays a key role in supporting the dissemination of important research and program information to the public. Total publications are effectively managed through the database.



A distributed computing tool took advantage of individual processor downtime to provide more than 40,000 additional computation hours in one year.

Flat-screen computer monitors use a fraction of the energy of traditional monitors, which means they introduce less waste heat to the space.

Through innovative use of existing resources, NREL computational capabilities were dramatically increased. Utilizing the combined downtime of 50 individual processors, a distributed computing tool was implemented that successfully increased computing power in the Laboratory's transportation and buildings research areas with minimal cost. ■

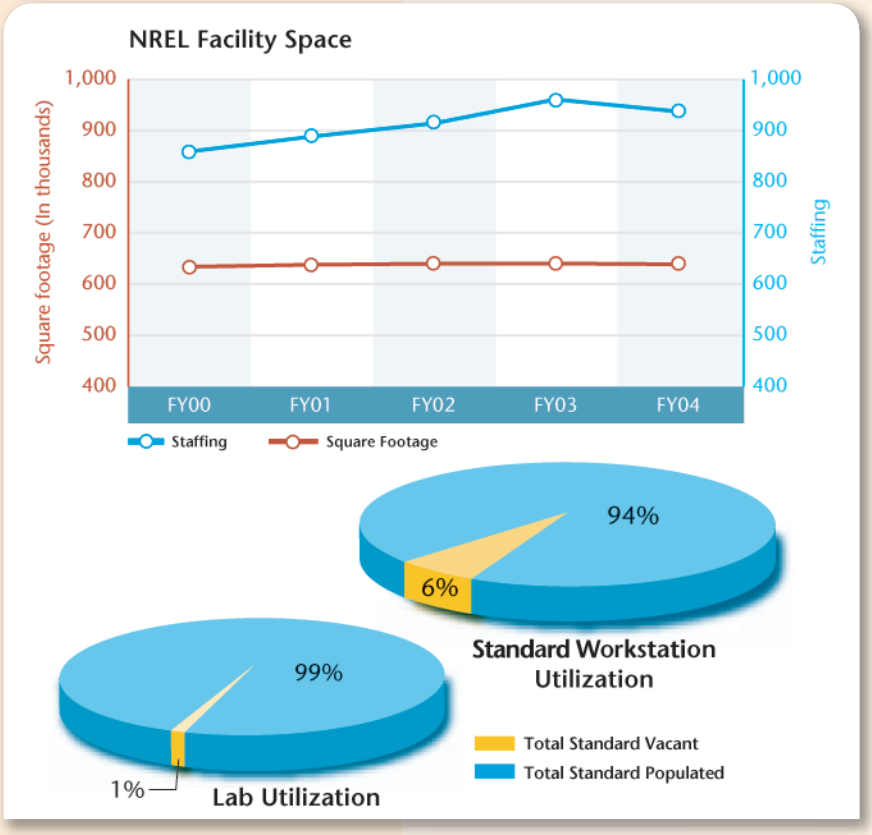
Site and Facilities Management

The Laboratory provides exceptional stewardship and protection of DOE facility and equipment assets and investments to ensure they are adequate to carry out the Science and Technology mission today and well into the future. NREL is also committed to seizing opportunities that incorporate sustainable concepts — and implementing actions that lead to a sustainable operating culture at the Laboratory.

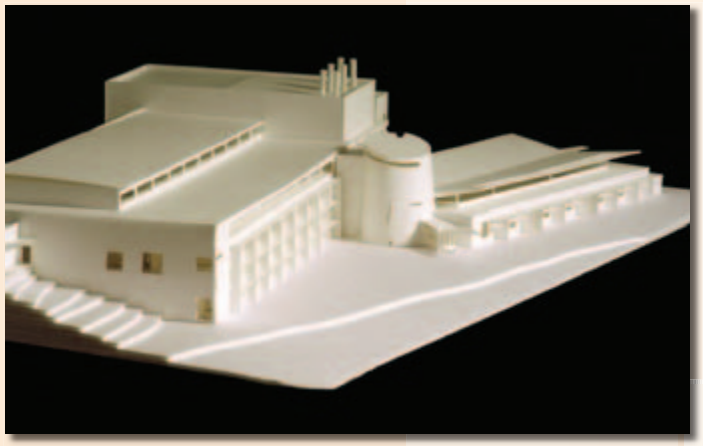
NREL actively manages space assignments and the condition of its facilities and equipment to ensure that they are adequate to successfully and safely accomplish the Laboratory's mission.

The Laboratory's facility and space planning is done in the context of NREL's 25-year General Development Vision, which can be viewed at: **http://www.nrel.gov/docs/gen/fy04/33696.pdf**. This vision provides the conceptual framework for major facilities needed to accomplish NREL's mission. Several new facilities are in the design, construction, and/or approval process. The Science and Technology Facility (S&TF), a new facility scheduled for completion in FY06, will facilitate successful accomplishment of many DOE program objectives, and will help U.S. manufacturers keep pace with foreign competitors. NREL also gained approval to proceed with the conceptual design of the Large Wind Turbine Test Facilities, critically needed to further the U.S. wind industry development of cost-effective wind energy in low-wind-speed areas.

NREL's managing partner, MRI, worked aggressively, by expending corporate resources and financial support, to maintain momentum on an innovative option for a signature Research Support Facility (RSF). An RFP was issued and more than a dozen proposals were received from architect and engineering firms experienced with LEED facilities. MRI is prepared to award an A&E contract, contingent on the issuance of a supporting DOE policy on third-party financing. Ultimately, an RSF would enable moving staff and laboratories out of leased facilities.

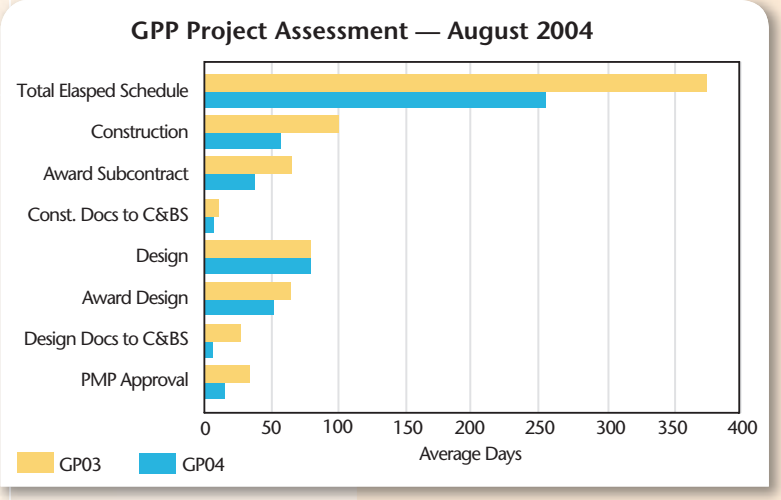


NREL workstation and laboratory space remains at a premium.

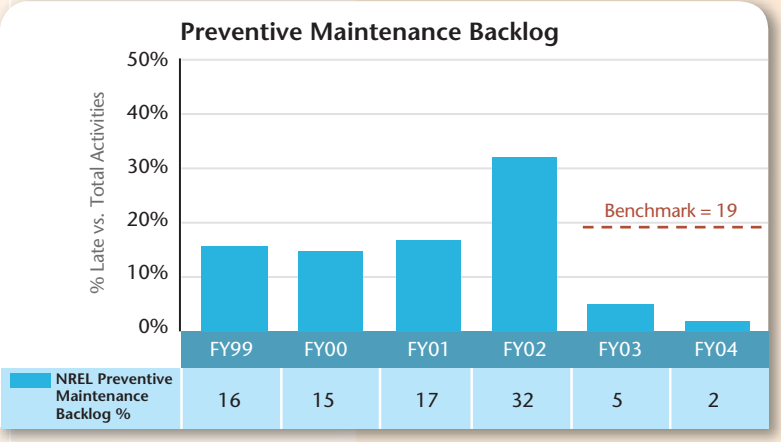


A model of the Science and Technology Facility. FY04 groundbreaking brought the Laboratory another step closer to realizing its vision for this state-of-the-art LEED facility.

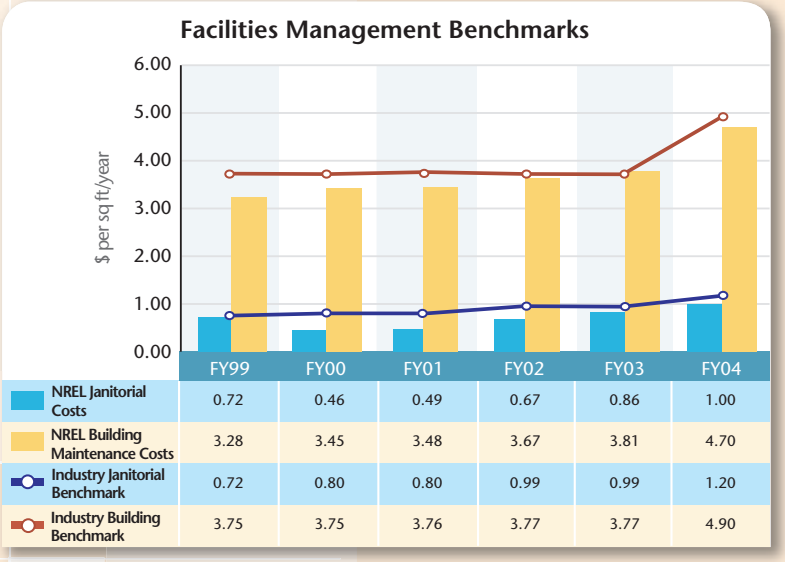
Site and Facilities Management



Effective management of Laboratory GPP resources reduced the average number of elapsed days to complete GPP projects by approximately 33%.



Continued efforts reduced the Laboratory's Preventative Maintenance backlog to 2%, significantly lower than DOE's facility benchmarks.



NREL continued to demonstrate stewardship through daily management of facility and site services. Janitorial and building maintenance costs continue to fall well within established industry benchmarks.

NREL also enhanced its hydrogen and vehicle research facilities, and awarded a subcontract for construction of the Biomass Surface Characterization Laboratory. In addition, successful negotiations were completed for a new lease agreement that will enable NREL to achieve increased efficiency and productivity levels by consolidating administrative staff and functional groups.

In spite of a continuing resolution, and as a result of the Laboratory's ongoing improvements in management of its GPP/GPE resources, all (except one) GPE projects were completed in FY04, and all FY04 GPP projects will be completed by the end of the 2004 calendar year.

NREL completed an analysis of its capital assets, including buildings, site infrastructure, information equipment, and research equipment. This analysis fostered a better understanding of the value and condition of the physical assets at the Laboratory, and the levels of investment needed to maintain these assets at their intended functionality and state of effectiveness.

While obtaining necessary new facilities, the Laboratory also managed existing facilities effectively and efficiently through proactive maintenance and operations that ensure the facilities meet applicable fire and safety codes — and that ensure responsible energy consumption is standard practice in all NREL facilities. NREL's preventive maintenance backlog of 2% remains significantly below the DOE facility benchmark of 19%. NREL's janitorial and building maintenance costs have again been held below benchmarks.■

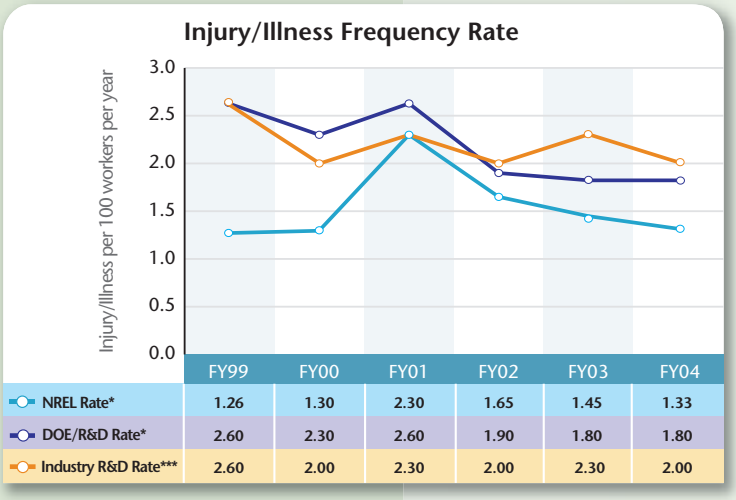
Environment, Safety, and Health

Maintaining a high level of environment, safety, and health performance — while maximizing the use of available resources — remains a priority for the Laboratory. Proactive and integrated risk-management tools are used to control ES&H hazards, coincident with application of a rigorous business-case approach, resulting in excellent performance results.

The Laboratory's ES&H performance is demonstrated by an injury/illness frequency indicator better than DOE and industry averages, and injury/illness severity indicators that are approaching best-in-class. These results are indicative of a business-case approach recognizing that controlling injury severity is as important as controlling frequency.

Ergonomics-related injuries present a substantial risk to NREL, and the Laboratory deploys tools that help management and staff focus on and control this risk. A particularly effective tool is the Successful Ergonomic Case Rate, an NREL-specific metric that emphasizes early reporting and aggressive treatment of ergonomics-related symptoms. The Laboratory's strong training and equipment programs minimize the impact of ergonomic injuries when they do occur.

NREL is committed to "walking the talk" when it comes to maintaining a sustainable environment in the workplace by using minimal resources (energy, materials, water, etc.) while receiving the maximum value from those resources used along with balancing environmental, economic, and human impacts. NREL's sustainability efforts are highlighted in the *Sustainability Report 2003–2004* which can be viewed at: **http://www.nrel.gov/docs/fy05osti/36786.pdf**.

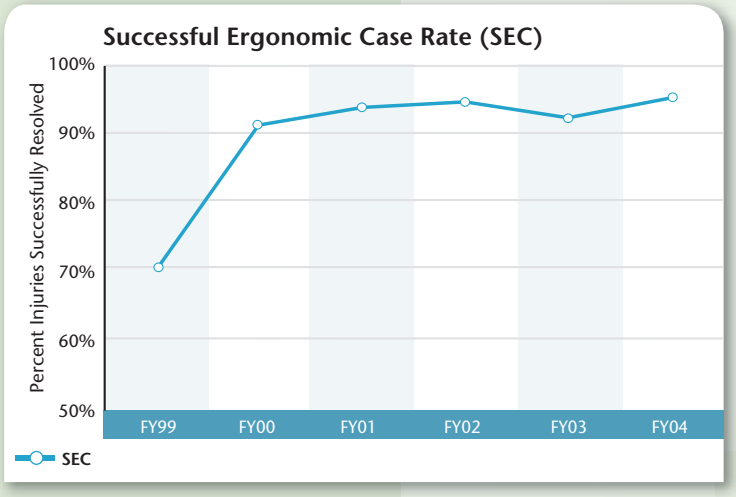


NREL emphasizes reporting of all injuries, regardless of how minor they appear, in order to ensure they receive proper and timely medical management. While this "over-reporting" approach can drive up the frequency rate of injuries and illnesses, NREL maintains an injury/illness frequency rate below that of the DOE and private-industry R&D complex.

* *Bureau of Labor Statistics (BLS) formula – number of recordable injuries and illness per 100 workers per year. Includes all workers on NREL sites (employees, agency temporaries, subcontractors, and volunteers).*

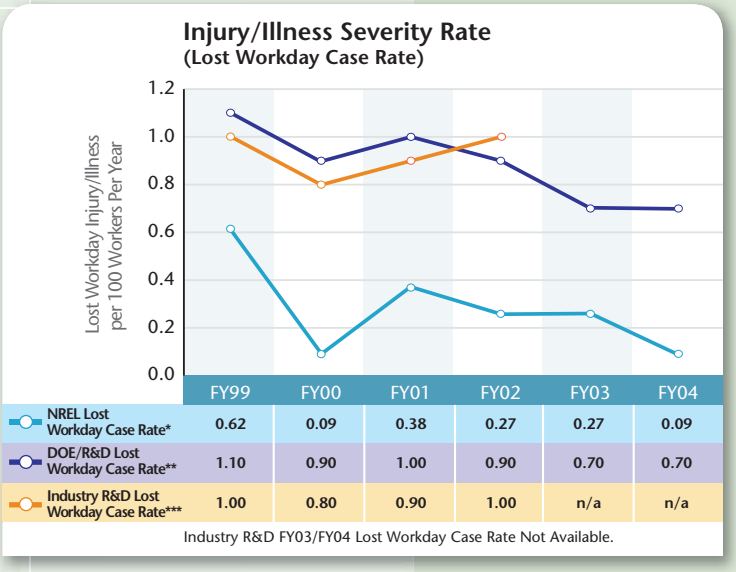
** *BLS formula – average rate for all DOE R&D operations. Typically does not include all workers on site.*

*** *BLS formula – average rate for private industry R&D operations (SIC code 8730).*



An indicator of injury severity is how effectively ergonomic-related injuries are resolved when they do occur, demonstrated by the percentage of ergonomic injury cases that are resolved without lost workdays or invasive medical treatment.

Environment, Safety, and Health



	FY99	FY00	FY01	FY02	FY03	FY04
NREL Lost Workday Case Rate*	0.62	0.09	0.38	0.27	0.27	0.09
DOE/R&D Lost Workday Case Rate**	1.10	0.90	1.00	0.90	0.70	0.70
Industry R&D Lost Workday Case Rate***	1.00	0.80	0.90	1.00	n/a	n/a

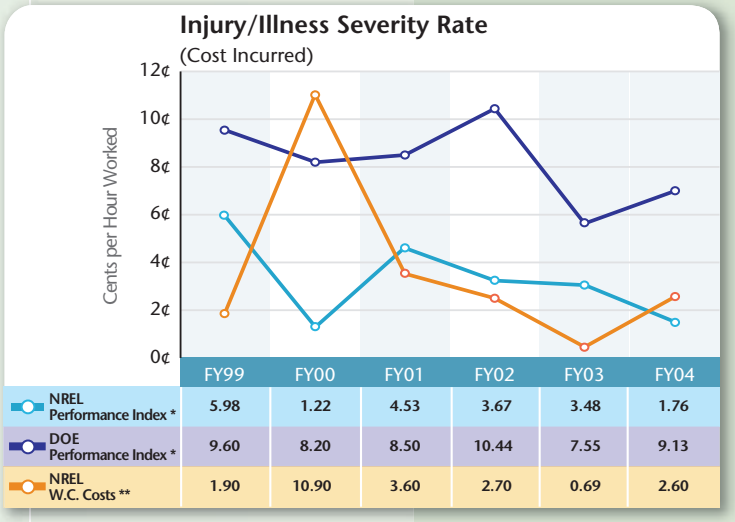
Industry R&D FY03/FY04 Lost Workday Case Rate Not Available.

The rate at which injuries result in lost workdays is an indicator of injury severity. NREL maintains a lost workday case rate significantly lower than the DOE and private-industry R&D complex.

**Bureau of Labor Statistics (BLS) formula* – *number of injuries and illness resulting in lost workdays per 100 workers per year. Includes all workers on NREL sites.*

***BLS formula* - *average rate for all DOE R&D operations. Typically does not include all workers on site*

****BLS formula* - *average rate for private industry R&D operations (SIC code 8730).*



	FY99	FY00	FY01	FY02	FY03	FY04
NREL Performance Index *	5.98	1.22	4.53	3.67	3.48	1.76
DOE Performance Index *	9.60	8.20	8.50	10.44	7.55	9.13
NREL W.C. Costs **	1.90	10.90	3.60	2.70	0.69	2.60

Another indicator of injury severity is the cost incurred for medical services, lost time, etc. This cost can either be estimated via the DOE Performance Index (PI) formula, or directly calculated via actual Workers' Compensation expenses. The NREL PI is well below the DOE R&D complex average, and the actual Workers' Comp costs demonstrate a low trend.

**DOE formula* – *approximate rating of injury and illness severity in cents per hour worked. No direct comparison to private industry.*

***Actual Workers' Compensation costs in cents per hour worked. Comparison data not available for DOE and private industry. Performance of 25 cents per hour worked or lower is considered good.*

NREL achieved recognition of its Environmental Management System (EMS) through memberships in the EPA National Environmental Performance Track (NEPT) and the Colorado Environmental Leadership Program (CELP). To further ensure the effectiveness of the NREL EMS, a rigorous audit was conducted by the Laboratory and DOE utilizing DOE, EPA, and ISO criteria. The audit validated the integration of the EMS across Laboratory management systems, and identified opportunities for continuous improvement.

A yearlong wildlife survey was initiated on the South Table Mountain Site to identify resident and transient species. Best-management practices identified by the survey are being used to minimize NREL's impact on wildlife as the site is developed. To facilitate recreational use of the site, the Laboratory has worked with Jefferson County Open Space to develop the first phase of a network of publicly available hiking trails over very scenic terrain. The trails on the NREL site connect with a larger trail and park network extending through the adjoining communities. ■

National Environmental Performance Track
U.S. Environmental Protection Agency

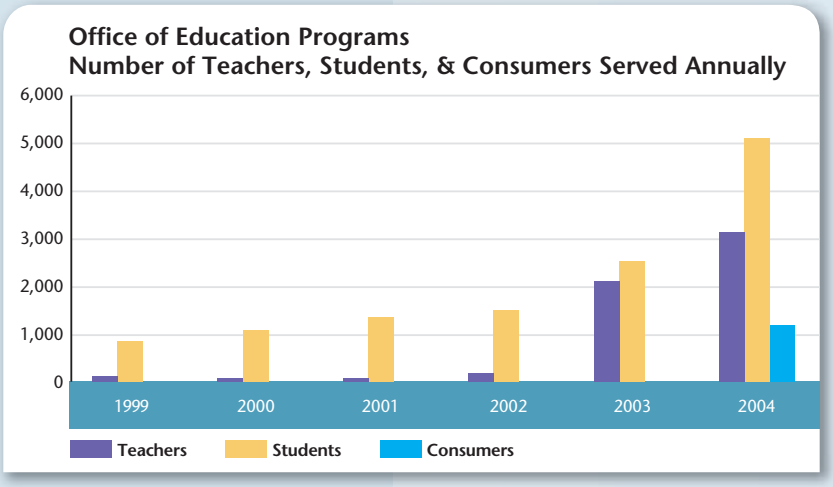
Colorado Environmental Leader

Educational Science and Engineering Outreach

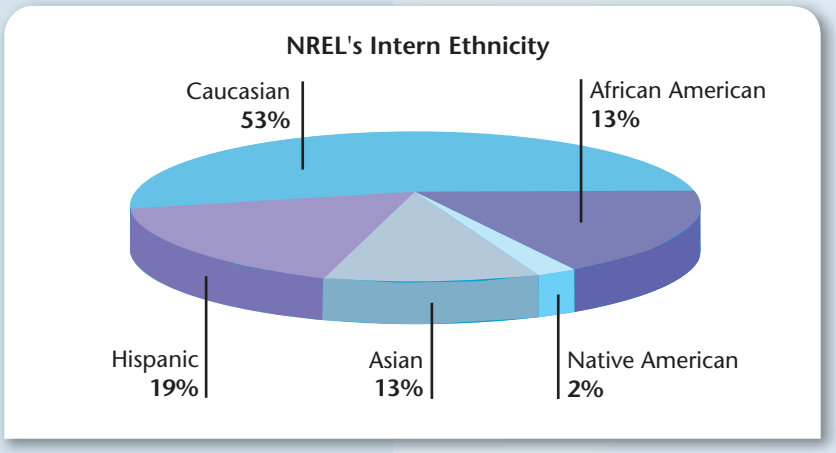
Effective use of strategic partnerships increased outreach and leveraging of DOE investments and enhanced DOE and NREL's visibility, further promoting the EERE mission. Through numerous education and outreach programs, NREL reached more educators, students, and consumers than ever before, further instilling an appreciation of science, mathematics, technology, and engineering.

The Laboratory successfully managed and conducted local, regional, national, and international "Energy Education Days," demonstrating renewable energy and efficiency technology as well as educating thousands of students, teachers, and consumers. Hundreds of classroom-ready education modules were distributed to science teachers and university professors during these events. Each Energy Education Day increased DOE/EERE/NREL visibility among students, educators, and stakeholders.

Internships further expanded awareness and understanding of EERE science and technology, educating students and teachers returning to their schools and universities nationwide to share the knowledge gleaned at the Laboratory. NREL received a 27% increase in Office of Science Workforce Development funding for its summer interns, reflecting outstanding evaluation scores for program delivery and student satisfaction of NREL research placements. Partnerships with NASA, DOE's Office of Economic Impact and Diversity, and the Office of Fossil Energy resulted in the highest number of NREL interns to date, representing 42 universities. The summer intern program continued to increase access to the Laboratory for women (52%) and for minority students (47%).

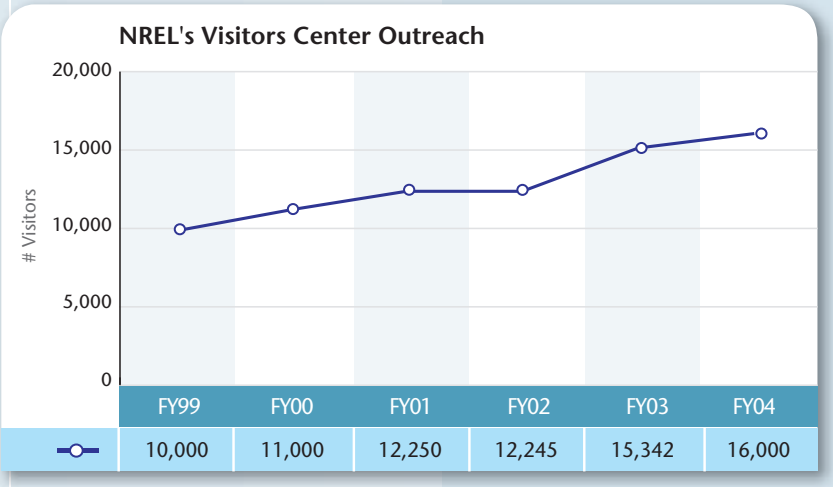


Through innovative education programs, NREL reached more teachers, students, and consumers than ever before.



Education outreach efforts resulted in greater participation of minorities.

Educational Science and Engineering Outreach



Increase in visits to NREL's Visitors Center is indicative of the Laboratory's growing reputation as a resource for consumer information and educational opportunities.

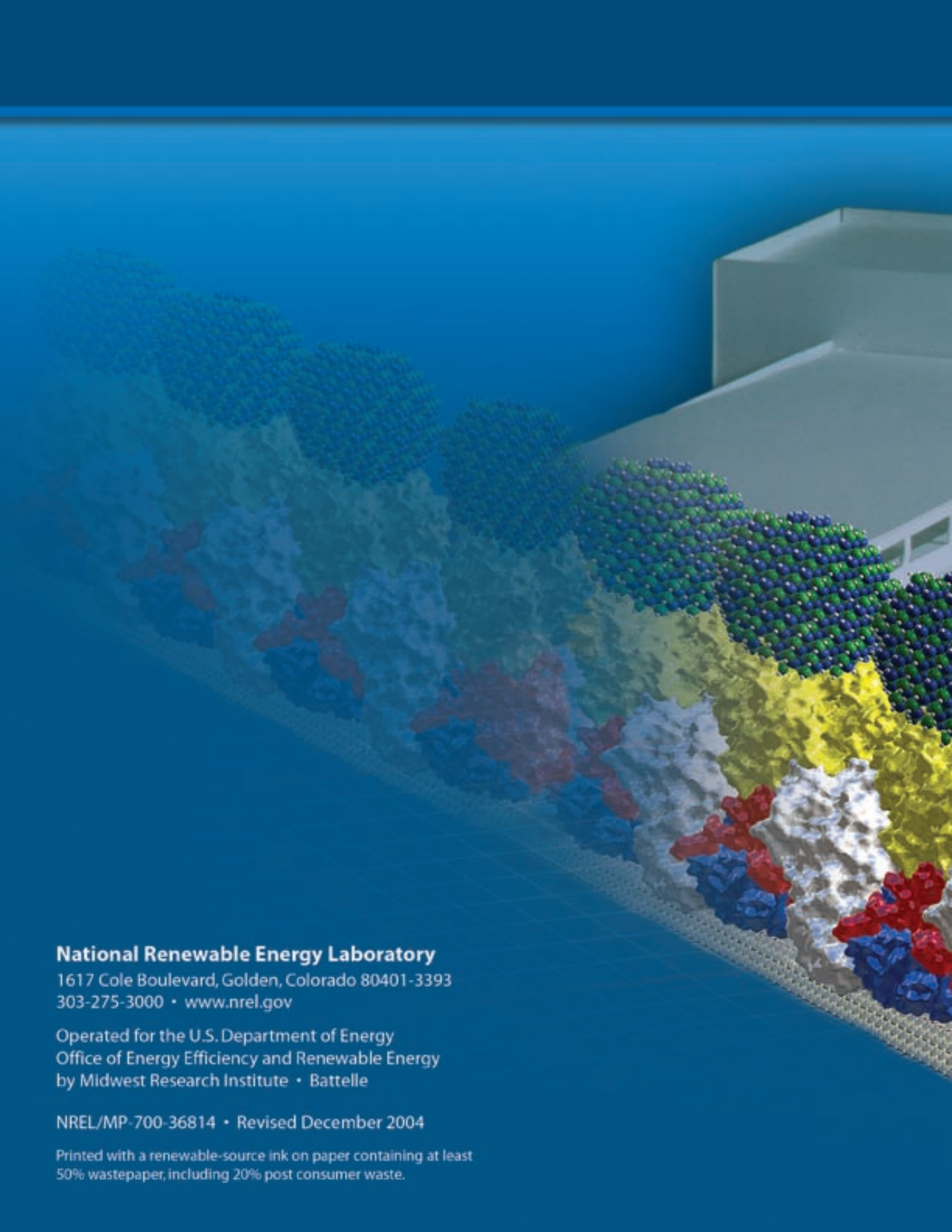
Biomass conversion is as old as the first wood fires humans ever made—to cook food or maybe just to stay warm during a long, cold night. And like everything old, it's new again—and moving in some exciting new directions at NREL.

NREL summer intern working on new solar cell research.

To help attract a broader student population, the Lab benchmarked intern programs at other laboratories and organizations and developed a centralized intern opportunity Web site, including a centralized database for tracking interns from their experience at NREL through their final career choice. The Laboratory employed four of its past interns and continued funding research for four more. Teacher intern opportunities enhanced the delivery of national science education and research skills through educators who share their research experience and knowledge gained at NREL with their students – affecting current and future generations.

Quality student research reaped national awards highlighting EERE and NREL research. During their NREL internships, two students published their research in national juried publications. Of 450 national undergraduate research papers submitted to DOE, NREL had the highest rate of publication across all 11 DOE national laboratories. Twenty-five percent of all DOE-selected interns who presented their research findings at AAAS were from NREL.

NREL's Visitors Center outreach increased awareness and understanding of renewable energy and energy efficiency technologies among the public and students. Innovative programming at the Visitors Center, combined with new outreach strategies, resulted in a record number of visitors in FY04. ■



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