



U.S. DEPARTMENT OF
ENERGY

2011

Department of Energy
Sustainability Awards



Awardees and Guests,

I am pleased to present the first annual DOE Sustainability Awards to 31 teams and individuals. Winners are honored for outstanding contributions to sustainability including accomplishments in managing pollution, waste, energy, water, and vehicle fleets.

Due to your efforts and perseverance, DOE continues to make great progress toward our sustainability goals. In FY 2010, DOE achieved its proposed reductions for Scope 1 and 2 GHG emissions, and was one of only a few Federal agencies to reduce Scope 3 emissions. DOE reduced its energy intensity by 18.4 percent from the FY 2003 baseline, exceeding the 15 percent requirement. We reduced water intensity by 12.2 percent from the FY 2007 baseline, and used eligible renewable electricity equivalent to 9.2 percent of our total electricity use. DOE is also on track to meet mandated pollution and waste sustainability goals of 50 percent by 2015.

The extraordinary efforts of our award winners help DOE maintain progress and exceed the requirements of these and other mandated goals. The 2011 winners improved the sustainability of DOE by constructing sustainable buildings; implementing innovative green purchasing practices; deploying renewable energy projects; repairing and replacing inefficient equipment; using efficient, paperless systems; installing green information technology software and hardware; increasing the use of alternative fuels and alternative fuel vehicles; reducing potable water use; minimizing the release of greenhouse gases and other contaminants; and increasing staff education, outreach, and participation in sustainable practices.

On behalf of Secretary of Energy Steven Chu and our Senior Sustainability Officer, Deputy Secretary Daniel B. Poneman, I extend my congratulations and gratitude to the awardees for their innovative and significant contributions to DOE sustainability.

Thank you again for all of your hard work and determination. We look forward to building upon these accomplishments as we work together to meet the Department's sustainability goals.

With sincere appreciation,

A handwritten signature in blue ink, appearing to read "J.C. MacDonald".

Jennifer C. MacDonald
Director
DOE Sustainability Performance Office

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U.S. DEPARTMENT OF
ENERGY

2011 DOE Energy Management Awards

The DOE Management Awards are presented for outstanding contributions to energy, water, and vehicle fleet management and associated cost savings at DOE facilities.



Exceptional Service—Awards to Individuals



Brian Costlow
*U.S. Department of Energy
Headquarters*

Brian Costlow first joined the Department of Energy (DOE) in 1988. As the current Director of the DOE's Office of Administration and the sustainability lead for DOE Headquarters, he has consistently worked to optimize sustainability improvements within DOE's two Headquarters facilities in Washington, DC, and Germantown, Maryland. Mr. Costlow has led numerous cross-cutting team efforts including installing DOE's first Headquarters 66,000 square foot cool roof; installing a solar array that tests multiple photovoltaic materials and generates 235 megawatt-hours annually; and awarding a \$26.2 million energy savings performance contract (ESPC) estimated to save \$59.5 million in avoided costs. The ESPC will save water at the Germantown complex and reduce energy consumption at the DC facility by more than 20 percent annually through LED exterior lights, steam trap repairs, a variable air volume system retrofit, and a centralized chiller plant. Mr. Costlow's efforts reduced the Headquarters executive fleet by more than 35 percent and also ensured more than 75 percent of the HQ fleet are alternative fuel vehicles. These efforts resulted in savings of more than 5,000 gallons of petroleum in FY 2010.



Michael Dunn
Argonne National Laboratory

Michael Dunn has managed Argonne National Laboratory's energy program since 2007 and in FY 2010 volunteered to create and run the Lab's sustainability program. Mr. Dunn developed and manages Argonne's Energy Savings Reinvestment Program of in-house energy projects that, as of FY 2010, has reinvested \$500,000 in new energy conservation projects. He also worked on setting up demand response programs to cut demand during peak summer months and in FY 2009 and FY 2010 Argonne demonstrated load shedding capability, resulting in more than \$475,000 in savings. Through a series of FY 2010 water recycling projects, his team saved more than 27 million gallons of potable water and \$68,000 in avoided costs. He has overseen the implementation of two major energy savings performance contracts totaling more than \$11 million in investments. Mr. Dunn and his team have also worked hard to tackle culture change through a series of efforts including a sustainability website and idea exchange, an employee contest to promote green commuting practices, and numerous presentations to employees, community leaders, and local schools.

Gene Higgins has contributed substantially to the success of DOE Hanford's complex environmental cleanup effort through his vision of integrating information management (IM) and providing leadership and coordinating information resource requirements between three DOE offices and eight prime contractors. Mr. Higgins developed and implemented a strategic plan that aligned information technology (IT) infrastructure, capacity, and services to the site's greater goal to implement green IT solutions. Under his leadership, the Integrated Project Team instituted several projects under a new green IT initiative that resulted in the consolidation of 19 computer network and telecommunications facilities to three and reducing energy consumption by 2.7 billion Btu and \$23,000 in FY 2010. Mr. Higgins obtained funding through partnerships and equipment manufacturer "buy back" programs to complete the initiative in only three years instead of 10. His strategic vision has positioned the site for thin client; cloud computing; heating, ventilation, and air conditioning upgrades, and the removal of five additional facilities from the IM infrastructure to achieve even greater reductions in future years.



Gene Higgins
Richland Operations Office

Program—Awards to Teams

Princeton Plasma Physics Laboratory (PPPL) initiated its vehicle fleet management program in 2006 to comply with Federal mandates to decrease fleet petroleum consumption and increase alternative fuel use. The program launched a biodiesel pilot program in 2007 to introduce employees to alternative fuels to minimize end-user resistance. The program began using B-20 as an alternative fuel for new utility vehicles and existing diesel-powered fleet vehicles. The successful use of this fuel in a new utility vehicle—the John Deere Gator—was groundbreaking as this was the first time B-20 fuel was used in this vehicle. PPPL also reinstated the use of natural gas powered vehicles, obtaining three new full size pickup trucks. By 2009, PPPL addressed infrastructure requirements to accommodate permanent storage and dispensing of both E-85 and B-20. As of FY 2010, 73 percent of PPPL's fleet was comprised of alternative fueled vehicles. Alternative fuel consumption was 19 times higher than FY 2005 levels, representing more than 77 percent of PPPL's total covered fleet fuel use.



Princeton Plasma
Physics Laboratory
Fleet Management Program



National Nuclear
Security Administration
Green Fleet Team

The National Nuclear Security Administration (NNSA) established its Green Fleet Team in 2005 to plan for increased alternative fuel use, alternative fuel vehicle acquisitions, reduction in petroleum use, and fleet greenhouse gas emissions reduction. To decrease the fleet's environmental impact while increasing operational efficiency, Federal and contractor team members are actively encouraged to share best practices and lessons learned and implement pilot approaches to achieve breakthrough performance. The team focuses on reducing petroleum use and miles traveled, and on "right sizing" the fleet with alternative fueled vehicles in operation. In FY 2010 NNSA sites improved vehicle maintenance and fuel efficiency and made greater use of alternative fuels where available, resulting in a 12 percent decrease in petroleum use, a 32 percent increase in alternative fuel use, and nearly \$4 million in avoided costs. The team also documented sustained results, reducing petroleum use by 36 percent since 2005 and achieving the Executive Order 13514 goal of a 30 percent reduction by 2020 in only five years. Additionally the team increased alternative fuel use by 254 percent between FY 2005 and FY 2010.



Stephanie Austad
Kimberly Frerichs
Matthew Hammond
Christopher Ischay
Tad Pearson
*Idaho National Laboratory
Sustainability Program*

The Idaho National Laboratory (INL) Sustainability Program has worked to integrate sustainability concepts into engineering design and facility operations processes, as well as into INL policies, standards, processes, and basic cultural values. Individuals across the laboratory have contributed to this effort by implementing projects, revising standards, working both internally and externally to implement sustainable criteria into new building designs, and by providing pertinent educational materials. Activities completed in FY 2010 included installing a cool roof at no additional cost from the original design; securing INL's first Leadership in Energy and Environmental Design certification for a new building; revising two design and planning standards to incorporate sustainability concepts and metrics for all INL buildings; switching from fuel oil to electricity for steam heating at the Materials and Fuels Complex; and increasing the availability and use of alternative fuels by more than 62 percent. These and other activities resulted in annual savings of more than \$1.6 million in avoided costs, 3.8 billion Btu of electricity, nearly 600,000 gallons of fuel oil, about 190,000 gallons of diesel fuel, and the equivalent of more than 10,600 metric tons of carbon dioxide.

Project—Awards to Teams

The Waste Isolation Pilot Plant (WIPP) South Access Road is used daily by employees commuting to and from the WIPP site. The project team worked to incorporate sustainable options early in the planning of reconstructing the road including reducing fresh water use and reusing existing materials for construction. Due to the region's arid climate, significant amounts of water are used during road base preparation, particularly for dust suppression. Rather than use the city's water sources available at no cost to WIPP, the team thought to reuse clean storm water held in evaporation ponds. For road base materials, the team took advantage of an extensive amount of caliche, a hardened deposit of calcium carbonate, from a salt storage evaporation pond on site. Recycled asphalt product was used for paving. Together, these actions resulted in the avoidance of \$150,000 in construction costs, 9.7 billion Btu of energy, 340,000 gallons of fresh water, and the equivalent of 640 million tons carbon dioxide. The project also enhanced the safety of the road and allows for a shorter delivery route, saving fuel and avoiding additional associated greenhouse gas emissions.



Carlsbad Field Office
*Waste Isolation Pilot Plant—
Sustainability in Road Construction*

In FY 2010 the Office of Energy Efficiency and Renewable Energy's Golden Field Office (GO) faced a major challenge. The site required significant increases in staffing to process and monitor American Recovery and Reinvestment Act funding while also trying to reduce energy consumption. GO's Information Technology (IT) staff employed an innovative "virtualization" strategy, consisting of consolidating and moving dozens of physical servers to virtual servers to reduce the hardware required in GO's data center. They also replaced energy-sapping computers with virtual desktops and invested in energy efficient in-row chillers and infrastructure software and hardware to monitor energy consumption. GO's data center now efficiently supports more than 300 virtual desktop computers and 50 virtual servers. As a result, GO IT energy consumption was reduced by 61 percent even though the number of users on its network increased by 152 percent from FY 2008. This effort saved about three billion Btu and more than \$88,000 in FY 2010 alone while also enhancing IT security and reducing desktop support. The project's success led to two other local DOE offices moving to GO's virtual servers.



Teri Harris
Tim Porter
*Golden Field Office
IT Energy Management During
Explosive Growth*



Sheila Causby
Leslie Manning
Paul Simmons
Mark Fletcher

*Oak Ridge National Laboratory
GreenIT at Oak Ridge
National Laboratory*

In FY 2010 Oak Ridge National Laboratory's (ORNL's) Green Information Technology (GreenIT) initiative completed campus-wide deployment of a computer power management software application that saved 8.1 billion Btu in less than six months. FY 2010 energy cost savings of \$143,043 more than covered the project cost. ORNL's Information Technology Services Division first conducted a limited pilot of the software in two buildings undergoing energy retrofits. The pilot proved that the software along with use of smart power strips, centralized printers, photocopiers, and fax machines, saved about 10 percent of total building energy use and reduced night and weekend energy use by 50 percent. A complete lab-wide rollout was accomplished entirely through the proactive efforts of existing IT staff in addition to their existing responsibilities. GreenIT's computer power management strategy is now institutionalized into ORNL's IT mission and standard practices. The software has been well received by ORNL's diverse and highly IT-dependent workforce, demonstrating that this strategy is transferable to even the challenging computing environments of government facilities.



Shawna Rosenkrance
Todd Shepherd

*Idaho Operations Office
Idaho Nuclear Technology and
Engineering Center Water System*

The original existing raw water distribution system supply pumps at the Idaho Nuclear Technology and Engineering Center (INTEC) became too big for the site's needs, producing too much water and using too much electricity even with minimum operation of a single pump. Additionally, four smaller pumps were used to operate a Reverse Osmosis (RO) system to prevent calcium carbonate buildup in the water distribution system. In FY 2010 the team replaced the two large pumps with smaller pumps and added an anti-fouling chemical to the raw water to prevent calcium carbonate build up in the piping to eliminate the RO system. These modifications reduced electricity and water use by 76 percent and 30 percent from their respective baselines, equating to savings of 5.7 billion Btu and 150 million gallons of water annually. The project was awarded an Idaho Power Custom Efficiency incentive rebate for more than \$162,000, the largest incentive ever awarded in the southeastern Idaho region, which helped reduce payback to less than two years.

The Advanced Mixed Waste Treatment Project (AMWTP) located at Idaho National Laboratory repackages waste from containers that do not meet Department of Transportation shipping regulations into acceptable 55-gallon containers. AMWTP houses the Department's only Supercompactor, which exerts 2,000 tons of force to process mixed transuranic waste for volume reduction. The Supercompactor is capable of compacting a 55-gallon drum to roughly one-fifth its original size, resulting in a reduction of waste volume for transportation, increased efficiency of transportation, and more efficient use of limited space in the permanent geological repository at DOE's Waste Isolation Pilot Plant in New Mexico. In FY 2010 the compaction of waste resulted in a total volume reduction of more than 2,000 cubic meters, which avoids the need to expand the repository, reduces generator wastes created at WIPP, and reduces handling activities. Repackaging of waste also increased shipping efficiency, thus reducing the number of shipments by 40 percent. This process saved 200,520 gallons of diesel fuel in FY 2010 and avoided greenhouse gas emissions equivalent to more than 2,000 metric tons of carbon dioxide.



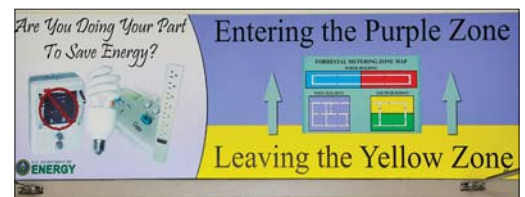
Idaho National Laboratory
*Advanced Mixed Waste
Treatment Project*

Headquarters Metering Competition

Most Monthly Victories in the Forrestral Metering Competition: Purple Zone

In January 2011, DOE Headquarters established a competition in the Forrestral Building for its five zones to reduce their electricity consumption from month to month. Meters in the building measure electricity used by lights and electrical outlets only (i.e. equipment that employees have direct ability to control). The zone with the greatest reduction in average daily energy consumption compared to the previous month is the monthly winner. Congratulations to Purple Zone Captain Tom D'Agostino and all of the Purple Zone occupants for embracing sustainability and winning the competition three times since the competition began, more than any other zone!

Congratulations for also achieving measurable results. In January 2011, the Purple Zone's average daily electricity consumption was 3,022 kilowatt hours. By September, it was down to 2,800 kilowatt hours per day. This represents a seven percent decrease – the most of any zone!



You Have The Power—Energy Champion

Energy champions are employees of the Federal government who have made extraordinary contributions to cost-effective energy management and sustainability. These individuals develop and advocate innovative practices that save energy and money and improve the efficiency of the government. They serve as role models for their fellow employees and for all Americans.

Christopher Evans leads initiatives to identify energy and water-saving opportunities at Sandia National Laboratories in Albuquerque, New Mexico and Livermore, California. He has helped the two locations develop innovative projects that achieve annual savings of 260 billion Btu, 40 million gallons of water, and \$1.7 million in costs. He has also worked on several high profile sustainability initiatives that benefit the entire Federal Government, including the development of the Energy Independence and Security Act of 2007 (EISA) Section 432 guidance for identifying energy and water efficiency measures in covered facilities; the EISA Web-based Compliance Tracking System; and the Federal Energy Management Program greenhouse gas (GHG) reporting tool used by all agencies to submit their GHG inventories to the White House Council on Environmental Quality.



Christopher Evans
Sandia National Laboratories

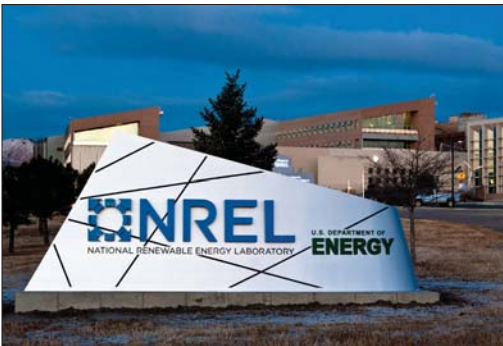


2011 EStar Awards

EStar Awards and EStar Honorable Mentions are earned by DOE sites whose projects represent exemplary environmental sustainability practices as determined by an independent panel of non-DOE judges who selected them from a set of Best-in-Class nominations.

Complete information on the following projects is available via
http://www.hss.energy.gov/pp/data_entry/reports/p_sel_accompRpt.aspx.

Office of Energy Efficiency and Renewable Energy



National Renewable Energy Laboratory
Near-Zero Materials Waste and Beyond

Integrating its 4R philosophy – Reduce, Reuse, Recycle, Re-buy – into daily practice is a key element of National Renewable Energy Laboratory’s (NREL) objective of becoming a near-zero waste campus. By making the 4Rs an integral part of its operations, NREL considers product life from cradle-to-cradle and promotes a balance among environmental, social, and financial considerations. Everyday reminders of the role of the 4Rs at NREL include the Reusable Office Supply Depot, strategically placed recycling stations that allow commingling of recyclable materials, and campus-wide campaigns promoting recycling and composting. Green purchasing practices are the basis of reducing waste and govern how goods and services are acquired at NREL. In a two-year period NREL increased its purchases of recycled-content products by 350 percent.

NREL clearly demonstrates that waste does not have to be destined for landfills. NREL diverted 76 percent of its municipal solid waste and 72 percent of its construction and demolition materials and debris from being placed in landfills, far exceeding the DOE goal of diverting 50 percent from disposal.



National Renewable Energy Laboratory
Building the Sustainable Campus of the Future

Building on its 33-year history as the only Federal laboratory solely dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency technologies, National Renewable Energy Laboratory (NREL) has consistently been a “living laboratory.” NREL integrates the technologies it developed into its new and existing facilities to build a sustainable campus that balances environmental, social, and economic goals.

A significant indicator of NREL’s commitment to sustainability is its reduction in greenhouse gas (GHG) emissions. Deploying on-site renewable energy projects offsets more than 4,300 megawatt hours of electricity and 7,400 million Btu of natural gas purchases, which, combined with purchasing renewable energy certificates, resulted in campus carbon neutrality in 2010. The GHG emission reductions were achieved through programs, policies, and physical enhancements including use of alternative fleet vehicles, telecommuting and compressed work schedule opportunities, campus-wide recycling and composting programs, and construction of high performance buildings. NREL’s Campus Master Plan guides investments in sustainability as NREL anticipates an 83 percent increase in personnel and a 240 percent increase in its footprint.

Office of Environmental Management

Uniquely applying an off-the-shelf Radio Frequency Identification Device (RFID) technology to the onsite shipping of wastes to a landfill, the East Tennessee Technology Park created a paperless shipping process that improved air quality and allowed more shipments each day. Each waste shipment previously required eight paper forms. In addition, trucks were idling as the paperwork was being completed and during the truck inspection process. Implementing the RFID system removed the need for paper forms and eliminated 25 minutes of truck idling time – resulting in roughly 260,000 pounds of carbon dioxide emissions avoided and the use of 12,000 gallons of diesel fuel eliminated. An additional but unanticipated benefit of the RFID was a reduction in shipping information errors.

RFID safety and security features include a real time dashboard display that provides alerts if trucks do not complete runs in the maximum allowed time and transportation alerts if the truck is over weight limits. Cost savings to date attributable to the RFID technology are estimated at \$8.7 million. The RFID paperless shipping technology has already been adopted by several DOE sites due to all of its associated benefits.

The Savannah River National Laboratory (SRNL) and the Economic Development Partnership of South Carolina (EDPSC) jointly develop and deploy renewable energy technologies within the local community and the State of South Carolina. The SRNL shares its expertise and knowledge of renewable energy technologies, and the EDPSC leverages its existing relationships with industry to identify and evaluate specific deployment opportunities to lower harmful air emissions.

A cornerstone of the collaboration is the Center for Hydrogen Research. Funded by Aiken County through private investment, the Center provides research and development space for over 80 engineers and scientists from SRNL, commercial companies, and universities in support of the Center’s mission to develop and deploy hydrogen and renewable energy technologies for local, state, and national missions. Hydrogen-powered vehicles, a regenerative fuel cell, and an advanced offshore wind characterization technology have been deployed in the region due to the partnership’s efforts. In addition, the SRNL-EDPSC collaboration developed fully integrated wind, solar, hydrogen, and smart grid educational platforms designed to educate K-12 students and train future South Carolina installers of renewable energy technology.



Sustainable On-Site Shipping
Sustainable On-Site Shipping



Savannah River Site
Renewable Energy Technology Development, Deployment, and Education in South Carolina—A Collaboration between Savannah River National Laboratory and the Economic Development Partnership of South Carolina



Savannah River Site
*Tritiated Debris
Remediation Project*

The Savannah River Site (SRS) designed and received regulatory approval for a thermal heating treatment process that will remove tritium from rubble and soil, as well as accelerate cleanup at a portion of SRS within the next six years. The pilot study involved reusable “thermal detritiation” treatment cells that were readily fabricated using common, inexpensive construction materials and commercially available process control and heating equipment.

The thermal detritiation process heats soil to a temperature of 212 degrees Fahrenheit and concrete to 1,500 degrees Fahrenheit resulting in treated concrete and soils that can be disposed on-site. On-site disposal versus off-site disposal results in over \$1.6 million in transportation costs avoided, exclusive of any additional packaging and handling requirements, and avoids over 400,000 truck miles. The remediation site and pilot study became a living laboratory allowing development, proof-of-principle, and implementation of an innovative, cost-effective technology to be available for use at other remediation sites. The thermal detritiation treatment cells will treat a total of 3,500 cubic yards (equivalent to 200 trailer truck loads) of contaminated concrete and soils.

Office of Fossil Energy



Strategic Petroleum Reserve
BIG - Buy It Green

The Strategic Petroleum Reserve (SPR) formed a cross-functional performance improvement team of experts in procurement, property, environmental, engineering, construction, and data systems and charged the team with developing an integrated solution to ensure compliance with sustainable acquisition requirements. This effort led to Buy It Green – BIG. Developed in-house using a Microsoft SharePoint platform, BIG is an easily accessible intranet source of purchasing requirements along with input forms for purchase documentation to allow for tracking and reporting.

BIG allows SPR employees and its prime contractor and sub-contractors to easily select products which have low or zero waste potential; have high recycled content; are produced and delivered in an environmentally sustainable manner; and demonstrate maximum durability, biodegradability, reparability, energy-efficiency, non-toxicity, or recyclability. Senior management support for BIG highlighted the significance of buying green and made it clear that buying green was not an option but a requirement. BIG brought big results: SPR achieved 100 percent affirmative procurement of environmentally preferred products and 100 percent procurement of Electronic Product Environmental Assessment Tool (EPEAT) certified products in 2010.

National Nuclear Security Administration

Reclaiming and reusing sulfur hexafluoride (SF₆) and developing monitoring systems that warn of potential SF₆ releases allowed Lawrence Livermore National Laboratory to decrease its annual release of SF₆ at its Flash X-Ray (FXR) facility from 5,000 pounds to 115 pounds. The FXR system is an induction linear accelerator used to produce x-rays for the production of high-speed radiographic images of the explosions (implosions) of high explosives. SF₆ is considered the most potent greenhouse gas and has a global warming potential approximately 23,000 times that of carbon dioxide. When compared over a 100 year period, one pound of SF₆ has the same global warming impact of 11 tons of carbon dioxide.

After determining that alternatives to SF₆ are not feasible at the FXR, the operations team focused on minimizing its use to the greatest extent possible. The team achieved this substantial reduction in SF₆ releases by significantly reducing releases during maintenance operations and purifying the retained gas to extend its life. In addition, the team's operational changes resulted in FXR operational benefits and motivated other researchers to minimize their SF₆ use.

Researching options for more safely disinfecting raw groundwater prior to entering the Pantex Plant distribution system led to the elimination of significant hazards associated with shipping, handling, and using chlorine. Technical grade chlorine gas is a highly effective means of disinfecting water, but it and its byproducts are highly toxic and corrosive. These materials are included in the Environmental Protection Agency's Toxicity Category I (indicating the highest degree of acute toxicity) for oral, dermal, eye and inhalation effects. Given the risks, potential liabilities, and available safer alternatives, it made good business sense to cease Pantex's bulk use of chlorine gas.

A Pantex team determined that a MIOX (Mixed Oxide) System would provide numerous advantages over chlorine gas while providing protection against microbial pathogens. Eliminating the use of chlorine gas also minimizes one of the largest and most dangerous potential emergency management impacts for a hazardous material release at the Pantex Plant, as chlorine gas released to the atmosphere would pose an extreme health hazard to Plant personnel.



Lawrence Livermore
National Laboratory
*Site 300 Sulfur Hexafluoride
Reduction Project*



Pantex Plant
*Elimination of Chlorine Gas
to Protect Workers and the
Environment*



Sandia National Laboratories/
New Mexico
*High Performance Computing
Water Reduction and Energy
Efficient Cooling*

The Sandia National Laboratories/New Mexico Compute System Design and Implementation Team and the Corporate Computing Facilities Infrastructure Team worked together to ensure that the newest supercomputer be faster than its predecessor. It was also designed to maximize eco-efficiency by using cutting edge technological innovations. The new Red Sky supercomputer achieved the goal of being faster and is ranked as the 10th fastest computer in the world, capable of conducting more than 500 trillion mathematical operations per second.

Red Sky also achieved its eco-efficiency goal through detailed procurement specifications that required energy efficiency. Red Sky has a carbon footprint of 203 metric tons of carbon dioxide equivalent compared to its predecessor's 912 metric tons and features a unique cooling system that is more than 95 percent efficient in cooling the system's multitude of computer racks. Red Sky uses 15 percent less power than its predecessor and achieves a power usage effectiveness of 1.27. The new supercomputer also uses 40 percent less water resulting in a savings of over five million gallons annually.



Sandia National Laboratories/
New Mexico
*Integrated Sustainability
Planning and Design*

Identifying, prioritizing, and funding cost-effective projects that contribute to achieving the sustainable energy and water goals of Sandia National Laboratories/New Mexico (Sandia/NM) are eased through an integrated process that links the planning, selection, and execution of research and development initiatives with site infrastructure projects. A corporate strategy that supports the integrated process is reducing existing power and water demands to the greatest extent possible, which then allows more flexibility in managing the remaining demand.

Every four years Sandia/NM completes energy and water management audits on the top 75 percent of its energy-consuming buildings. The audits generate a building-specific list of energy- and water-related deficiencies and opportunities to eliminate or reduce demand or use the resource more efficiently. Using energy and water more efficiently is also supported through a site commitment to achieving Leadership in Energy and Environmental Design (LEED) certifications for Sandia/NM buildings. Integrated planning and design resulted in \$1 million cost savings from 2010 investments, an overall reduction of approximately three percent in energy intensity per year, 10 percent of LEED certified building square footage, and a clear plan to achieving Sandia/NM's sustainability goals.

Metering 100 percent of water use, conducting water use surveys, and committing to reduce water use allowed the Sandia National Laboratories to reduce aggregate water intensity by 30 percent from a 2007 baseline—significantly exceeding the Executive Order 13514 requirement to achieve a 26 percent reduction in potable water intensity by 2020. The Executive Order also requires a 20 percent reduction in water used for irrigation, landscaping, and agriculture by FY 2020 from an FY 2010 baseline. Sandia’s New Mexico site reduced its irrigation use by more than 50 percent through a centralized irrigation control system.

A water balance study showed that approximately 25 percent of the water used at the New Mexico site is for cooling and 35 percent was attributed to the need for ultra-pure water for certain equipment. The study resulted in the installation of a high-efficiency reverse osmosis system, a deionized water recycle system, and a cooling tower water reclamation system which significantly reduced annual water use. To address the limiting impact of the site’s water chemistry on the amount of water used for cooling, the site instituted a pilot project using a nonchemical cooling tower treatment system which increased cooling tower cycles from 3.2 to 4.5 contributing to water as well as energy savings.



Sandia National Laboratories/
New Mexico
Water Consumption Reduction

Linking organizations (Waste Management; Infrastructure Reduction; Environmental Compliance; Legal; Property; Construction; Radcon; Facilities, Infrastructure and Services; and Production) with responsibilities on recycling at the Y-12 National Security Complex (Y-12) through the Reduce, Reuse, and Recycle Team created the framework for an integrated, campus-wide recycling program. In 2010, Y-12 implemented 84 initiatives that resulted in reusing or recycling almost 110 million pounds of materials – more than 89 percent of its total solid industrial waste stream. The avoided cost from these activities is an estimated \$4.7 million.

The team adopted Y-12’s “7S” process (Sort, Set in order, Shine, Standardize, Safety, Security, and Sustain) which facilitates the addition of new materials to the Y-12 Recycling Program. Light-emitting diode (LED) lights and sodium hydroxide bottles were added in 2010. The Reduce, Reuse, and Recycle Team is also “forward thinking” by reaching out to other organizations and programs on the front-end of their project planning to help identify materials that can be recycled rather than disposed in landfills.



Y-12 National Security Complex
*Waste Not Want Not, Y-12's
Comprehensive, Cost-Effective
Recycling Program*

Power Marketing Administration



Energy Smart Federal Partnership
Energy Smart Federal Partnership

Using utility energy services contracts and interagency agreements to contract with other Federal agencies for energy services, Bonneville Power Administration's (BPA) Energy Smart Federal Partnership completed energy efficiency projects for 21 Federal agencies. Since 2001, this partnering saved more than 170 million kilowatt-hours (kWh) per year of energy, and also achieved reductions in gas, steam, and water use throughout the Pacific Northwest. In 2009 alone, more than 30 million kWh of electric energy was saved by Federal agencies along with more than two billion gallons of water.

Through the Partnership, hundreds of Federal facilities are audited with results used to design and develop energy saving projects. Projects are funded either directly through BPA or through private, third-party financing secured by BPA. Through its "Drop Shipment Program," the Partnership provides ENERGY STAR® compact fluorescent lamps to Federal facilities throughout the Pacific Northwest as replacements for incandescent lamps.

Office of Science



Oak Ridge National Laboratory
*LEED-EB by Example,
Going for Gold Lab-wide*

Oak Ridge National Laboratory (ORNL) documented the efforts of its planning and design team as they identified energy and water efficient products and systems changes to Building 1059 to share lessons learned toward gaining Leadership in Energy and Environmental Design for Existing Buildings (LEED-EB), Gold level certification. One change is a network of sensors and controls that allows modulation of heating, ventilation, and air conditioning to maximize efficiency. The controls also trend the building's total electricity consumption and water usage, and provide that information to building occupants. Additional sustainable features include enhanced lighting control, roofing upgrade, and low flow plumbing upgrades. Sustainable practices that the team incorporated while retrofitting Building 1059 included source reduction, material salvage and reuse, and recycling.

The manual resulting from the Building 1059 certification process will streamline the LEED-EB certification of other existing buildings as ORNL works to achieve its goal of having at least 10 buildings LEED-EB certified by 2014.

Integration of the site environmental stewardship programs at Pacific Northwest National Laboratory (PNNL) is facilitated through the Environmental Management System (EMS) Core Team. The mission of the EMS Core Team is to formalize PNNL's multiple sustainability programs into an effective, efficient, and transformational operational model.

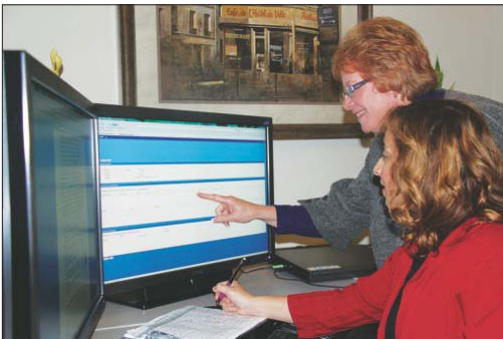
To encourage the collaboration and communication the model requires, the EMS Core Team is comprised of representatives from PNNL's research community and program leaders responsible for complying with pollution prevention, greenhouse gas emission reductions, fleet management, information technology, and energy and water use reduction requirements. This composition allows PNNL's operations experts and researchers to freely collaborate—operations staff draw on researchers' innovative ideas and researchers have the opportunity to pilot their technologies in a scalable operating environment. An outcome of this collaboration is building managers' use of a PNNL-developed advanced supervision and diagnostic tool that reduces energy use and operations and maintenance costs, and extends equipment life.



Pacific Northwest
National Laboratory
*Getting to the Core
of Sustainability*

Honorable Mentions

National Nuclear Security Administration



Lawrence Livermore
National Laboratory
*Global Security Paperless
eSystems*

Converting the Lawrence Livermore National Laboratory's Global Security Principal Directorate processes for move requests, travel approvals, and employee transfers to paperless eSystems saves paper, staff time, and money. Before the eSystems were in place, each move request (more than 3,000 a year for matters such as changes in office and computer locations, phone service, and door locks) required three different paper forms. Each travel request (about 4,000 a year) required seven approvals and several of the divisions in the directorate had different travel approval processes. Tracking the movement of employees into and out of the Global Security Principal Directorate was similarly difficult under a paper-based system.

Moving to the eSystems for move requests, travel, and employee transfers required teaming with all affected administrative units and stakeholder representatives. These efforts resulted in streamlining processes and improving communications between service organizations. Integrating the team's work into the eSystems led to reduced labor costs and improved productivity, efficiency, and accountability.



Y-12 National Security Complex
Clean Steam Team

Replacing a coal-fired boiler steam plant at the Y-12 National Security Complex with a new centralized steam plant produced significant environmental and human health benefits. The steam distribution system, which weaves together approximately seven miles of piping, supplies more than 100 facilities throughout the site.

The switch from coal to natural gas to generate the same amount of steam will reduce carbon dioxide emissions by 11 percent and nitrous oxide emissions by 72 percent. In addition to lowering greenhouse gas emissions, using natural gas instead of coal will reduce sulfur dioxide by 99.5 percent and particulate matter by 72 percent. Additional benefits include the elimination of 5,000 tons of coal ash (resulting from the 51,000 tons of coal burned each year), more than 450,000 vehicle miles traveled annually to transport coal and coal ash, wastewater treatment costing \$800,000, and stormwater runoff from the coal pile. To further advance environmental stewardship, the new steam plant was constructed on a brownfield site which gave new purpose to a previously contaminated piece of property.

Office of Science

Capitalizing on its research and development in leading edge and transformational technologies, the Oak Ridge National Laboratory (ORNL) created the Sustainable Campus Initiative (SCI) to provide an overarching support structure to capture and apply current efforts on site and accelerate future implementation of energy and transportation technologies. The multi-organizational and multi-disciplinary SCI is positioned to integrate cutting-edge technologies with operational and business processes to ensure maximum integration of sustainability in ORNL's energy and fleet management.

Examples of the impact of SCI include ORNL's construction of more than a million square feet of Leadership in Energy and Environmental Design certified office and laboratory space. Extensive energy audits have been conducted and buildings have been upgraded to be highly energy efficient. Energy requirements of computers have been significantly lowered through implementation of automated electronics management programs. In addition, the ORNL fleet has been expanded to include hybrid, electric, and flex-fuel vehicles and solar-assisted charging stations for electric vehicles have been implemented.



Oak Ridge National Laboratory
*ORNL Comprehensive
Sustainability Management*

