



Beyond Buildings



SUSTAINABLE INL

Meeting today's needs without compromising future generations



Sustainability Beyond Buildings

INL is taking sustainability efforts “beyond buildings” by recognizing that our actions make an impact on others, and by integrating the triple bottom line of environmental, economic and social factors into every aspect of laboratory operations.



Idaho National Laboratory is a science-based, applied engineering national laboratory dedicated to supporting the U.S. Department of Energy's missions in nuclear and energy research, science, and national defense.



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Sustainable INL

INL will carry out its mission of ensuring the nation's energy security with safe, competitive and sustainable energy systems without compromising the ability of future generations to meet their own needs.



What is Sustainability?

INL is working toward becoming a sustainable laboratory by pursuing economic, social and environmental goals – the three equally balanced priorities for sustainability. Sustainability, in the real sense, is the simultaneous consideration for people, planet and prosperity.

The concept of sustainability emphasizes making decisions and meeting our needs today without compromising options for the future. The everyday opportunities vary from using advanced technologies to simply turning lights off when leaving a room, recycling or purchasing environmentally friendly products.

Economic, environmental and social policies endorsed today will directly impact future generations. Policy established through presidential executive orders has clarified many of INL's goals to become more sustainable. These goals include energy efficiency, acquisition, renewable energy, toxics reductions, recycling, sustainable buildings, electronics stewardship, greener fleets and water conservation. The

laboratory is also working toward greenhouse gas reductions and the full implementation of sustainable programs.

INL strives toward sustainability by embracing recognized sustainable practices and spreading the message to the community. INL employees are working together to achieve this goal. By doing so, employees recognize that they can personally benefit and improve their communities.



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In addition to preserving the environment to meet human needs, environmental sustainability encourages the maintenance of healthy ecosystems and biodiversity.

¹Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management" signed in 2007 and Executive Order 13514, "Federal Leadership in Environmental, Energy and Economic Performance" signed in 2009.

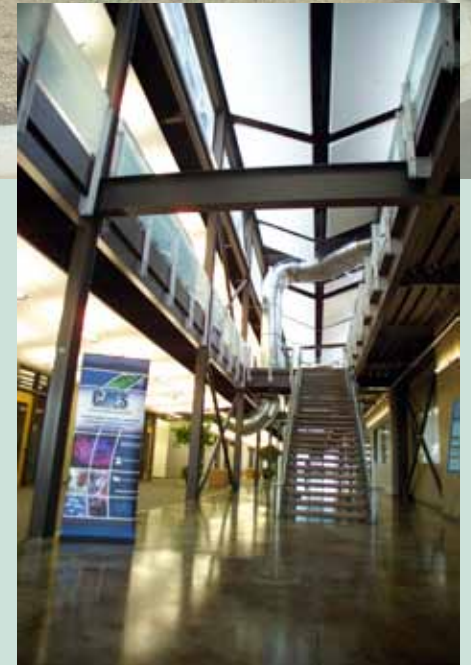
Environmental Sustainability



At INL, the concept of environmental sustainability has been addressed for many years. In 1969, the National Environmental Policy Act was passed as one of the first legislative frameworks of any country to protect the environment. This concept of protecting the environment is called environmental sustainability, and it is a key component of INL's

sustainability program. INL efforts toward environmental sustainability include re-evaluating our fleet fuels, increasing office waste recycling, conserving water and making our facilities more energy efficient.

"The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired in value."
—Theodore Roosevelt, 1910



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INL Fleet Fuel

INL consists of an 890-square-mile area in southeastern Idaho typically referred to as the “Site,” along with additional laboratories and administrative buildings located approximately 50 miles east in the city of Idaho Falls. The remoteness of the Site and great distances between facilities presents significant transportation needs. A mass transit system was established in 1953 and today uses more than 80 buses to transport 3,250 employees to and from the Site each day.

In addition to the bus system, INL also has a vehicle fleet composed of light-duty vehicles fueled by gasoline and ethanol. Medium- and heavy-duty vehicles include over-the-road buses and a complex assortment of trucks and equipment fueled by diesel and biodiesel. Typically, employees drive 9.5 million miles annually and log more than 50,000 hours on heavy equipment. INL is pursuing significant opportunities to help the Department of Energy (DOE) reduce its use of petroleum-based fuels.



INL expects to meet or exceed DOE requirements by reducing petroleum fuel usage by 2 percent each year and increasing alternative fuels usage by 10 percent each year. That means a 20 percent reduction in petroleum fuels by 2015 and a 100 percent increase in the use of alternative fuels. As the goal pertains to total fuel usages, the best way to decrease the use of petroleum fuel is to increase the use of alternative fuels.

INL has achieved significant progress in these two areas by providing both E85 and biodiesel for most Site locations. The light-duty fleet is being rapidly replaced with factory flex-fuel vehicles. To date, INL has decreased

petroleum fuel usage by 25 percent and increased alternative fuel usage by 22 percent.

INL has also reduced the total number of bus routes and centralized passenger pickup locations to further reduce vehicle miles, operating time and fuel usage.

INL bus drivers have reduced idling vehicle engines. Now, bus engines are frequently turned off while waiting to load passengers. With INL's large bus fleet, the savings can easily reach 1,000 gallons of fuel per month. The use of INL light-duty vehicles has also declined as INL encourages employees to ride its shuttle buses and vans, which run on a regular schedule to remote INL facilities.

INL's new passenger buses get 25 percent better mileage than their predecessors. Modernizing its fleet along with implementing other strategic conservation measures has enabled INL to reduce petroleum consumption by 25 percent -- while increasing the use of biodiesel and E85 ethanol fuel.

²DOE Order 430.2B implements a base year of Fiscal Year 2005 and a goal of Fiscal Year 2015.

INL is making great progress that is dependent on employee participation. Employees have assisted with this important effort by:

- Using the bus system whenever possible, including the shuttle buses.
- Not using government vehicles to travel to and from the Site unless absolutely necessary and using the most fuel-efficient vehicle available.
- Using E85 whenever possible in flex-fuel vehicles even if it is less convenient.
- Considering teleconferencing and videoconferencing where they are rather than driving to a meeting.
- Taking advantage of increasing Park and Ride opportunities as they are established to reduce the amount of fuel used in the buses.



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Recycling

INL's Pollution Prevention program oversees the recycling of office waste at INL with goals of reducing materials headed for the landfill and reducing the consumption of raw materials while simultaneously meeting relevant executive and DOE orders.

Co-mingled recycling at INL facilities allows employees to recycle materials such as plastics, aluminum, metal cans and assorted paper products (including newspaper, magazines, paperboard and corrugated cardboard) in a single container. After the co-mingled



A private contractor supports shredding and recycling of paper from the laboratory's Idaho Falls facilities.

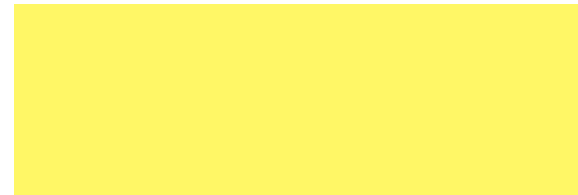
The success of INL's co-mingled recycling program relies on employees using bins to recycle items like magazines, plastics and aluminum soda cans.

Making recycling an easy choice for employees has paid off for INL, with positive environmental and financial results.

recycling program was introduced at Idaho Falls facilities, the amount of trash collected by the city was reduced nearly 25 percent. All office paper collected for recycling in Idaho Falls is shredded onsite by a subcontractor and then recycled. Shredding helps to ensure

greater security when disposing of office paper, and also addresses export control concerns. Currently available at several locations, an initiative to expand co-mingled recycling and paper shredding to all INL facilities is under way.

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Water Usage

INL facilities are located on land classified as high desert and surrounded by a vast agricultural interest. Conserving water protects the Snake River Aquifer, from which INL draws much of its water, and also saves the energy required to pump and treat water. Because energy costs money, the less the laboratory spends on water usage, the more money it can focus on INL missions.

INL is working to reduce its water consumption 2 percent per year for a total 16 percent reduction by 2015. Significant contributions toward this effort will be done through facility upgrades at INL's Materials & Fuels Complex (MFC). Oil-fired boilers that are approximately 50 years old are being replaced, and most of the leaking condensate system is being taken out of service. This will result in an annual reduction of 3,500,000

gallons of water, nearly 1 percent of the INL total.

Switching to Idaho-generated hydropower electricity for heating at MFC also contributes to lowering carbon dioxide emissions. Converting to electric boilers and heating will help reduce carbon dioxide emissions by some 12.8 million pounds annually. The money saved each year will pay for the project over time.



A worker cuts the metal beam bracing one of the MFC boiler stacks that were removed during facility upgrades. Removal of the boiler stacks was visible evidence of INL's commitment to reduce greenhouse gas emissions and reduce water waste.

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“Economic sustainability is the emerging concept that economic growth and development must take place, and be maintained over time, within the limits set by ecology . . .”

—William D. Ruckelshaus,
1989

Economic Sustainability

INL keeps a close watch on the economic climate. The laboratory is working toward a sustainable economy through methods that many would usually categorize as environmental efforts.

Basic economic models are defined by the balance of supply and demand. As there is an increasing scarcity of natural resources such as intact forests, healthy air and clean energy, these resources are becoming more valuable, and awareness of the connection between environmental and economic sustainability is increasing.

If natural resources become unavailable, and there is no alternative, then economic and social instability are inevitable. INL’s energy research and energy-savings efforts are designed to help balance natural resources. It is one path to economic sustainability.

The laboratory is also using energy, fuel and water more efficiently at its facilities. A

recent Energy Savings Performance Contract at the Materials & Fuels Complex will reduce annual electricity use by 5 percent and carbon dioxide emissions by 12.8 million pounds per year. While these savings are great for the environment, they also help INL’s bottom line. The savings from these upgrades will pay for the \$33 million cost in 16 years.

As the lab becomes more efficient, its viability also increases, thus establishing INL’s model for economic sustainability.

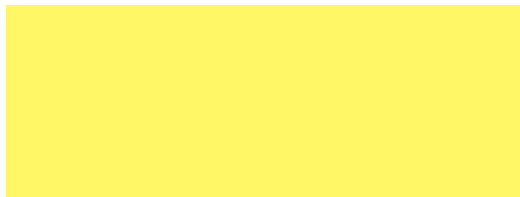


Electronics Stewardship



INL has taken a close look at the way it purchases, uses and disposes of electronics in order to address their negative environmental and human health effects. In 2007, INL made a commitment to electronics stewardship and became a Federal Electronics Challenge (FEC) partner. Electronics stewardship considers the environmental impacts of electronics over their life cycles.

INL has emerged as a leader in electronics stewardship by winning several FEC awards since 2007 (Bronze in 2007 and 2008, Silver in 2009 and 2010). These awards recognize INL’s commitment to purchase computers registered as environmentally friendly and to ensure that power-management settings are enabled on employee computers.



High-Performance Sustainable Buildings

INL supports sustainable buildings, also known as high-performance or green buildings. These structures minimize the impact on the environment by using less energy and water, reducing solid waste and pollutants, and limiting the depletion of natural resources.

As INL develops programs in support of a premier nuclear energy research laboratory, the physical infrastructure is established to support that mission. This infrastructure will incorporate high-performance design features in order to be environmentally responsible and reflect INL's innovative spirit.

INL's goal is that all new construction results in sustainable buildings that meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED™) Gold certification.

INL's Ten-Year Site Plan

Focus on the Future: As INL's three main campuses expand, INL strives to develop and maintain the laboratory's infrastructure to create a pre-eminent nuclear laboratory. INL's Ten-Year Site Plan outlines how it will enable the site's mission through high-performance sustainable infrastructure design and acquisition.



INL is developing plans for the Research and Education Laboratory to be located in Idaho Falls. The 131,000-square-foot office building is being designed to meet LEED™ Gold certification standards.



INL is expanding its use of renewable thermal energy through the addition of two new solar walls being constructed at the Materials & Fuels Complex as part of the ongoing Energy Savings Performance Contract.

One of INL's newest leased buildings, the 55,000-square-foot Center for Advanced Energy Studies, achieved a LEED™ Gold certification.



Beyond Buildings

Partnering Mechanisms

Through technology transfer partnerships, INL becomes far more cost-effective because it is able to leverage research and technology development while increasing the skills and capabilities for America's government and private businesses.

Business Programs

Economic partnerships and collaborations among INL and the many regional economic development organizations are making significant contributions toward economic sustainability for the laboratory and the community.

Cooperative Research and Development Agreements

A Cooperative Research and Development Agreement (CRADA) is a written agreement between a nonfederal partner and INL's management and operating contractor, Battelle Energy Alliance, to work together on a project. A CRADA allows the federal government and nonfederal partners to optimize their resources, share technical expertise in a protected environment, share intellectual property emerging from the effort and advance the commercialization of federally developed technology.

Invest Idaho

INL partnerships with economic development groups helped earn approval for the new Invest Idaho regional center, which allows foreign entrepreneurs to earn permanent U.S. residency by investing in Idaho.

Work for Others

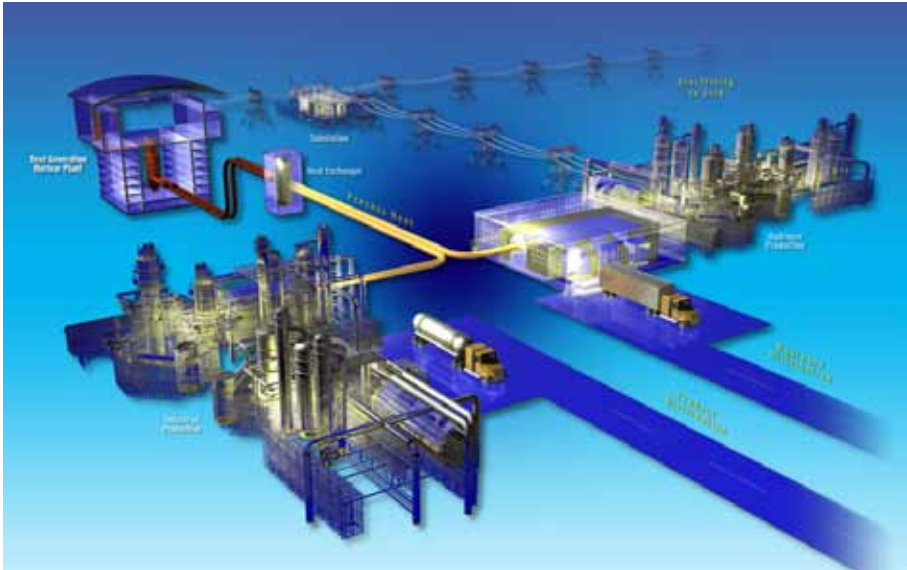
INL develops unique science and engineering solutions for other federal agencies, private companies, universities, and state and local governments through the Work for Others (WFO) program. WFO is the performance of work, such as research and development or applied engineering, for sponsors outside of the Department of Energy.



Green Purchasing

Implementation of a green purchasing program, or Environmentally Preferable Purchasing program, is a requirement for all federal agencies, including INL. Green purchasing minimizes negative impacts to humans and the environment by purchasing:

- Alternative fuels and alternative-fueled vehicles
- Energy-efficient products
- Water-efficient products
- Biobased products
- Non-ozone-depleting substances
- Recycled-content products
- Environmentally preferable products such as green electronics.



The Next Generation Nuclear Plant (NGNP) project being designed at INL engages the corporations you depend on for gasoline, plastics and fertilizer with a progressive approach to energy production.



INL supports renewable energy development by making an annual purchase of Renewable Energy Credits. Although this purchase helps the advancement of renewable energy on a national level, INL continues to evaluate potential onsite renewable energy generation opportunities such as a 20 MW wind farm and a solar array significant enough to be connected to the grid.

The pressing challenge for nuclear energy sets the context for INL's strategy to provide solutions for a secure and affordable energy future. The laboratory is working to create a technically achievable, economically competitive and environmentally sustainable nuclear energy option for the nation that is worthy of public confidence and trust.

Six attributes are critical to our vision:

- World-leading nuclear science and technology programs
- National & Homeland Security and Energy & Environmental programs that leverage our nuclear capabilities
- A robust science base
- A central role revitalizing nuclear science, technology and engineering education in the United States
- Extensive collaborations with the world's premier academic, government and industrial nuclear science and technology organizations
- Forefront research facilities, support infrastructure and management systems.

Research for a Sustainable Future

INL research is focused on developing energy solutions that are efficient, affordable, environmentally sound and secure. Energy security requires the use of a balanced portfolio of conventional energy generation, energy efficiency and the development of additional cost-effective renewable energy generation. Future energy needs will not be met by any single resource or technology, only by a balanced portfolio of energy resources.

Renewable energy includes the

classic technologies of wind, solar, biomass and geothermal. Renewable energy can also be thermal energy from passive solar walls to avoid energy use, or can be in the form of varied energy sources such as ocean tidal, geothermal heat pumps and the increased efficiency of existing hydroelectric systems.

In order to be sustainable, INL needs to participate with the advancement of renewable energy in ways that make sense for INL's location and energy infrastructure.

Beyond Buildings



Social sustainability strives to improve the quality of life for individuals and communities by considering future generations and understanding that our actions impact others.

“Sustainable development is improvement in the quality of human life within the carrying capacity of supporting ecosystems.”
—World Wildlife Fund

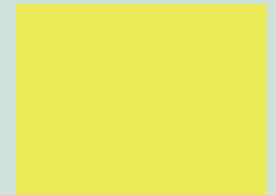
Social Sustainability

INL is providing solutions to issues like global warming, a thinning ozone layer, pollution, finite natural resources and reducing our impact on the environment. The laboratory’s actions on these fronts all get at the heart of sustainability: creating a world where future generations are ensured the resources they need. But INL understands that no sustainable society would be complete without community participation, preservation of cultural identity, diversity, tolerance, literacy, standards of integrity, laws, shared values or equal rights. These myriad



issues are all encompassed in social sustainability, and they should be addressed because they impact the quality of human life.

INL works on issues like unemployment, poverty rates, opportunities for education and training, health and availability of medical services, human rights and equal opportunities, and access to clean drinking water. Each of these issues is a piece of the social sustainability mosaic.



Social sustainability is defined by a sense of optimism. It is an investment to provide good education and meaningful life for an educated, skilled, experienced and healthy human population. Because it is renewed each generation through education, family and community relations, social sustainability is a perpetuating cycle to improve quality of life.

Beyond Buildings

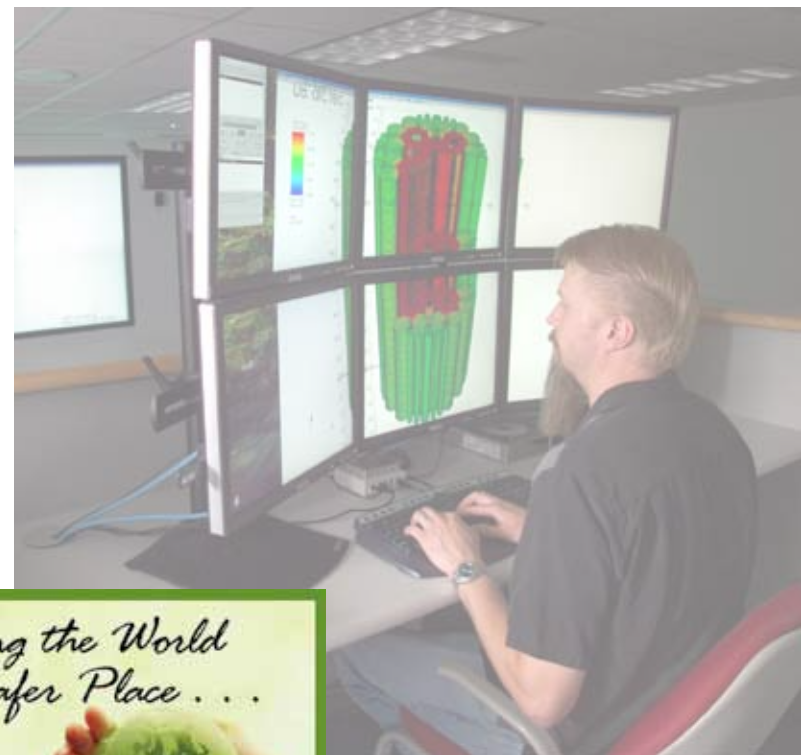


Work Environment

INL has programs designed to improve work life for its employees. Flexible work schedules, ergonomic assessments, iStretch flexibility workshops, health fairs and building cleanup days all improve the quality of the work environment, giving employees work spaces that are more comfortable.

The laboratory also strives to ensure that employees work safely. In 1995, INL established a Voluntary Protection Program to promote and ensure a safe and healthful work site, free of injury and illness.

INL provides opportunities for employees to continue learning. Onsite workshops help employees develop new skills and build confidence in their job functions. The laboratory also provides employees the opportunity to advance their education and improve their career trajectory through a comprehensive education program. INL contracts with Boise State University, Idaho State University and University of Idaho to supply courses and degree programs to INL employees. Hundreds of INL employees take advantage of this program and enroll in classes. Many enroll in graduate programs.



A commitment to a safe working environment ensures that employees are able to return home safely each day.

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Community Work



Team INL is an employee-driven volunteer program supporting causes in the communities where INL employees live.

INL provides numerous safety education programs for the community.



For more than a half-century, INL has put science to work, addressing some of the nation's most pressing environmental, energy and nuclear technology challenges. Given INL's national prominence as a science and research center, many people have a genuine interest to learn more about the laboratory's operations.

We invite you to learn more about INL at www.inl.gov.

INL is dedicated to improving the quality of life in our community and region. We do this through several activities:

Team INL

Team INL is an employee-driven volunteer program that supports causes, events and needs in regional communities. To date, employee volunteer groups have completed more than 100 Team INL projects.

Educational Support and Contributions

INL supports programs that educate the next generation of scientists and engineers by increasing engagement in science and math in public classrooms. In one year, INL contributed nearly \$140,000 to eastern Idaho schools and more than \$130,000 to statewide education programs.

Community Giving Program

INL's prime contractor, Battelle Energy Alliance, provides corporate funds that are used for philanthropic projects focusing on civic and community causes, health and human services,

and arts and culture.

Technology-Based Economic Development

INL partners with organizations to bring new economic vitality to our community and to translate science and technology into new businesses and employment growth.

Community Technical Assistance Program

INL scientists and engineers offer to the community technical skills and laboratory resources that are not normally available without fee.

Community Outreach

- From school groups to civic and professional organizations, nearly 2,000 people tour INL every year.
- INL annually hosts the Hispanic Youth Symposium – an event that provides scholarships for Idaho Latino high school students.
- INL's My Amazing Future program introduces young female students to career options in science, technology and engineering through interactive workshops.

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Education Programs

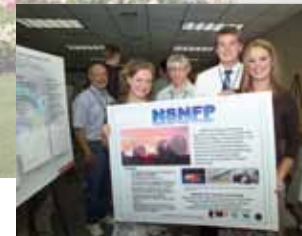
INL has a long history of support for education. The primary objective of INL Education Programs is to provide educational and laboratory-directed research activities. Working with students and faculty over the entire education continuum, INL Education Programs help ensure a future work force that will carry on the long-term mission of INL.

Idaho sits at the hub of a multistate region including Utah, Wyoming, Montana and Nevada. Designated by the Department of Energy (DOE) as the nation's pre-eminent nuclear energy research facility, INL is facilitating and forming regional and national partnerships between industry, academia, government and community-based organizations for the purpose of ensuring that the requisite energy work force is available and adequately trained.

One example of INL's commitment to energy work-force development is a partnership established by INL with

Idaho State University and Partners for Prosperity. This model partnership resulted in the creation of the Energy Systems Technology and Education Center on the ISU campus. This partnership has secured funding to increase the availability of technicians to maintain current energy generation facilities and to construct the next generation. New technicians are needed based on the retirement of the existing energy work force, the increasing demand for energy resources and the overall lack of qualified workers in virtually all technology-based disciplines.

INL also has a world-class internship program that provides educational opportunities for students and recruiting possibilities for the laboratory. This internship program provides students real work experiences in science and technology fields and was included in the 2010 edition of the *Vault Guide to Top Internships*.



INL Education Programs deliver several K-12 education programs in support of DOE and INL missions. INL's K-12 programs promote science, technology, engineering and math to create awareness and to encourage students to pursue careers in these areas.

INL offers internship opportunities that are challenging, innovative and on the cutting edge of today's technology. Students are mentored by INL scientists and engineers to increase the exchange of ideas, information and technology, and hands-on educational experience in the student's field of study.

Our internship program gives high school and college students a preview of the many possible science-, technology-, engineering- and mathematics-related careers available at INL.

Beyond Buildings

Beyond Buildings

INL's Sustainability Policy: Battelle Energy Alliance maintains a sustainable laboratory by applying social, environmental and resource-responsible approaches into planning and operations.

Standards of Performance

- 1. Our commitment to sustainability is fulfilled through a solid balance of economic, environmental and social sustainability principles.*
- 2. Staff members promote and incorporate sustainability into science, engineering, policy and education.*
- 3. INL invests in sustainable technologies for buildings and operations.*
- 4. Leaders and managers encourage, support and implement decisions that support sustainable initiatives, programs and opportunities.*
- 5. INL measures and verifies sustainability performance.*

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We're on the Web! www.inl.gov/sustainable



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