



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by **Battelle** *Since 1965*



Innovative Solutions for a Sustainable World

2014 SUSTAINABILITY REPORT

-HIGHLIGHTS-

ENVIRONMENTAL STEWARDSHIP | SOCIAL RESPONSIBILITY | ECONOMIC PROSPERITY

U.S. DEPARTMENT OF
ENERGY

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PACIFIC NORTHWEST NATIONAL LABORATORY

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MESSAGE FROM THE DIRECTOR

For over 50 years, PNNL has advanced the frontiers of science and addressed some of the most challenging problems in energy, the environment and national security. Powered by the creativity and innovation of nearly 4,300 exceptional scientists, engineers and support professionals, PNNL provides international leadership in deepening our understanding of climate science, inventing the future power grid, preventing nuclear proliferation and speeding environmental remediation.

PNNL's leadership requires not only creativity and innovation, but also an unwavering commitment to our stakeholders – our sponsors, our employees and our community. By striving for excellence in environmental, social and economic performance, we aim to meet their needs while positioning the Lab for long-term sustainability. Our annual sustainability report provides an integrated view of triple-bottom-line performance and focuses on topics that are material to our stakeholders and our operations.

We have ambitious long-term environmental goals to reduce water and energy consumption. Investments in water efficiency continued to drive down our potable water use, exceeding our goals. Our greatest challenge lies in reducing building energy intensity and greenhouse gas emissions, as fulfilling our research mission drives us to expand into new laboratory- and computing- intensive facilities. To offset these impacts, we are committed to building facilities that meet the Guiding Principles for High-Performance Sustainable Buildings, and to using our facilities as a living laboratory to explore issues that affect not only our campus but also are challenges throughout DOE.

We also leverage our science to create a more sustainable world by training the problem-solvers of the future. Through nearly 1,000 interns, fellows and research associates that we hosted in FY2014 and the STEM education programs we support, we have been fostering the next generation of scientists and engineers as well as developing a STEM-literate community for decades. The local STEM high school spearheaded by Battelle, Delta, has graduated two classes, secured funding for a new facility and out-performed others on state assessments. These efforts haven't gone unnoticed, as the Washington Office of the Superintendent of Public Instruction recognized Battelle for its thought leadership in STEM education.

Our economic performance in FY2014 was strong overall, and with an operating budget of just over \$1 billion, our business practices represent a significant opportunity for impact. Among our accomplishments, we exceeded our goals to support small and socio-economically disadvantaged businesses with our procurement spending.

We have the human capital, research facilities and expertise to enhance global sustainability through our efforts to advance clean energy production, and energy efficient buildings, transportation and infrastructure. We believe that our commitment to sustainable operations and the investment we make in our staff, facilities and capabilities position PNNL and the surrounding community for long-term prosperity.

Dr. Steven Ashby
Laboratory Director

PNNL OVERVIEW

Located in Richland, Washington, Pacific Northwest National Laboratory is one of 17 U.S. Department of Energy national laboratories and one of ten overseen by DOE's Office of Science. Interdisciplinary teams at PNNL address many of America's most pressing issues in energy, the environment, and national security through advances in basic and applied science. In addition to work for DOE, PNNL conducts research for other government agencies including the U.S. Department of Defense and the National Institutes of Health, as well as private industry. At the end of FY2014, PNNL employed 4,308 people and had a budget of over \$1 billion. PNNL has been managed for DOE by Ohio-based Battelle since the Laboratory's inception in 1965.

ABOUT THIS REPORT

This is PNNL's sixth sustainability report and was prepared "in accordance" with the comprehensive option of the Global Reporting Initiative's (GRI) G4 Guidelines. The GRI is a globally recognized sustainability reporting framework that enables organizations of all types to assess and share their triple-bottom-line performance in a similar way. The G4 guidelines require that sustainability reports reflect the organization's significant economic, environmental and social impacts, and the topics that substantively influence assessments and decisions of its stakeholders.

This PDF summary report and content on our website pertain to PNNL's 12 sustainability focus areas, associated goals, and performance against those goals during FY2014. This information is summarized in the honeycomb graphic to the right, and in the Sustainability Performance Scorecard (p. 3). The website includes examples of actions PNNL takes to drive toward sustainable operations and actions employees are empowered to take as well. The full contents of this report are accessible through the 2014 GRI Report Index at http://sustainable.pnnl.gov/report/gri_index.stm.



SUSTAINABILITY PERFORMANCE SCORECARD

 did not meet target

 below target/
within expectation

 met or on track
to meet target

2013

2014

		2013	2014	
ENVIRONMENT	Reducing building energy use and greenhouse gas (GHG) emissions			
	<ul style="list-style-type: none"> Reduce Scope 1&2 GHG emissions 50% from 2008-2025 after renewable electricity¹ (Target: 21,843 MTCO₂e) 	9,990	18,027	
	<ul style="list-style-type: none"> Reduce energy use intensity in buildings 30% from 2003-2015 (Target: 150 kBtu/ft²) 	174	182	
	<ul style="list-style-type: none"> At least 7.5% of electricity use from renewable sources 	58%	50%	
	Traveling smarter			
<ul style="list-style-type: none"> Reduce petroleum-based fuel use in fleet vehicles 30% from 2005-2015 (Target: 31,060 GGE) 	31,244	31,836		
<ul style="list-style-type: none"> Reduce Scope 3 GHG emissions from employee transportation 25% from 2008-2025 (Target: 18,092 MTCO₂e) 	21,932	21,463		
Minimizing water use				
<ul style="list-style-type: none"> Reduce potable water use intensity 16% from 2007-2015 and 36% by 2025 (Targets: 59 and 45 gallons/ft²) 	29	26		
<ul style="list-style-type: none"> Reduce irrigation water use 30% from 2010-2025 (Target: 123M gallons) 	169M	143M		
Reducing material purchases and waste				
<ul style="list-style-type: none"> Divert at least 50% of sanitary waste from landfill 	57%	54%		
SOCIAL	Keeping employees healthy and safe			
	<ul style="list-style-type: none"> Total recordable case rate ≤ .65¹ 	0.60	0.87	
	<ul style="list-style-type: none"> Days away, restricted, or transferred rate ≤ .25¹ 	0.24	0.22	
	Investing in our employees' professional development			
	<ul style="list-style-type: none"> Average participant satisfaction rating from professional development programs ≥ 4.5/5 	4.6	4.7	
Creating an inclusive work environment				
<ul style="list-style-type: none"> No goal established 			N/A	
Fostering the next generation of scientists and engineers				
<ul style="list-style-type: none"> Average participant rating of work-based learning programs ≥ 4.0/5 	4.7	4.6		
ECONOMIC	Transferring technology that makes a difference			
	<ul style="list-style-type: none"> Economic contribution to global economy from licensed technologies (Target: Minimum=\$50M, Stretch=\$100M) 	\$107.7M	\$122.1M	
	Maintaining financial viability though research and operational excellence			
	<ul style="list-style-type: none"> Sales target: >\$835M in 2014 and >\$812M in 2015 	\$1,064M	\$938M	
	<ul style="list-style-type: none"> Business volume/operating budget targets: >\$1,016M in 2014 and >\$931M in 2015 	\$936M	\$1,020M	
Supporting small businesses				
<ul style="list-style-type: none"> Award at least 52% procurement dollars to small businesses 	66%	57%		
Giving back to our communities				
<ul style="list-style-type: none"> Philanthropic investments (No target)² 	\$732,500	\$734,383	N/A	

Note: Historical values for building energy use, greenhouse gas emissions, potable and irrigation water use were revised in 2014, in an effort to align GRI reporting boundaries with those established by the Department of Energy for the PNNL campus.

- Beginning in 2014, PNNL began reducing Scope 2 GHG emissions by the quantity of GHGs avoided from purchasing renewable energy certificates to be consistent with Federal GHG Reporting Guidelines.
- Reported per 200,000 employee hours worked.
- Philanthropic investments are distributed by a committee of employees from Battelle's Pacific Northwest Division. At least 50 percent of giving is directed to STEM education.

ENVIRONMENTAL STEWARDSHIP

Success Story |

Power usage effectiveness (PUE) measures the power used to run computer infrastructure. PNNL met DOE's goal of 1.4 PUE in FY2014. Twenty small, inefficient servers were consolidated into three main energy efficient centers, and plans are in place to achieve even further reductions. In one center, energy was saved with the installation of a new adiabatic cooling system to augment the groundwater cooling system. For nearly 10 years, PNNL has aggressively pursued virtualization as a tool to minimize server sprawl, conserve energy, and reduce the equipment footprint. PNNL's business virtualization was over 85%, which is 5% better than the previous year. PNNL's newest supercomputer Cascade can do in one hour what would take a typical laptop over 20 years to complete. Recently ranked 13th on the "Top 500 List of the World's Fastest Supercomputers," Cascade uses nearly eight times less energy (0.59 kW per teraflop of computing capability) than its predecessor (over 8 kW per teraflop). It is water cooled via rear door heat exchangers, so four air conditioners were removed in the room which further conserved energy.

At a Glance



FLEET VEHICLES

Petroleum-based fuel use
down **18%**

From FY2005 Baseline



by increasing use of electric neighborhood vehicles, optimizing delivery routes, and consolidating loads. A full truck is a sign of success!



SCOPE 1&2 GREENHOUSE GAS EMISSIONS

Decreased
1%
Purchasing renewable energy reduced our emissions impact by: **65%**



SUSTAINABILITY AWARDS

Bronze Bicycle Friendly Business from the League of American Bicyclists



Green Program of the Year award from our local government

Environmental Management System award for establishing and maintaining a sustainable campus from the Eastern Washington Chapter of Certified Hazardous Materials Managers

PAPER PURCHASED WITH 30% RECYCLED CONTENT



Uncoated paper purchases down **13%**

WASTE DIVERSION



diverted from landfill through recycling and composting



BUILDING WATER USE INTENSITY

63% reduction
from FY2007 baseline



Exceeded FY2015 goal to reduce 16%

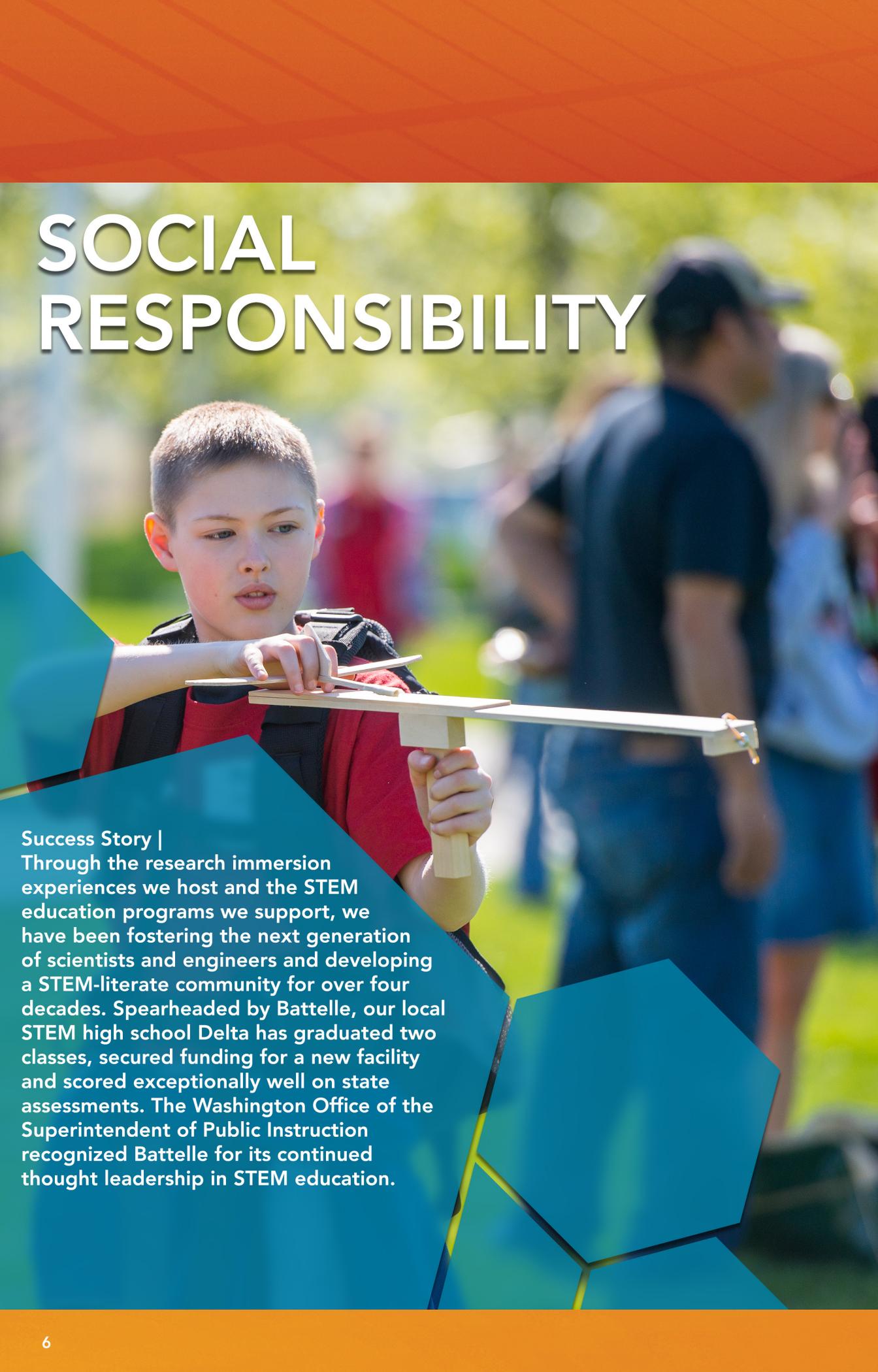
SCOPE 3 GHG EMISSIONS

down
2%



All percent changes on page 5 are relative to a 2013 baseline unless otherwise noted.

SOCIAL RESPONSIBILITY



Success Story |

Through the research immersion experiences we host and the STEM education programs we support, we have been fostering the next generation of scientists and engineers and developing a STEM-literate community for over four decades. Spearheaded by Battelle, our local STEM high school Delta has graduated two classes, secured funding for a new facility and scored exceptionally well on state assessments. The Washington Office of the Superintendent of Public Instruction recognized Battelle for its continued thought leadership in STEM education.

At a Glance



EMPLOYEE HEALTH AND SAFETY

Total recordable cases rate
ABOVE TARGET

Days away from work incident rate
BELOW TARGET!

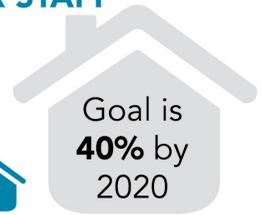
Wellness Program
Promotes healthy lifestyles



TAKING ACTION

Analysis of injury cases causing us to exceed our target suggests workforce wellness and life events were a primary contributor. To foster a healthier workforce, the PNNL Wellness Program is ramping up outreach efforts on preventing these types of cases through better nutrition, weight management, and heart health.

TELEWORK OPTION FOR STAFF



Goal is **40%** by 2020



6.4% participation weekly

A dedicated telework advocate, on-demand training and better video-conferencing and mobile technology tools has helped this option become a success. Staff enjoy better work-life balance while helping PNNL maintain operations during inclement weather or crisis.

VOLUNTEER HOURS



**team
battelle**

RETENTION RATE

93%



FOSTERING THE NEXT GENERATION

966 Research Immersion Experiences for future scientists



ANNUAL STUDENT INTERN ROADSHOW

Show and tell about safety, security, sustainability and wellness at PNNL.



OPERATIONAL EXCELLENCE

87%



of respondents agreed that supervisors are accessible, care about their employees' well-being and take their concerns seriously.

GOVERNOR'S EMPLOYER AWARD

For commitment to diversity, inclusion, affirmative action and equal employment opportunities.



ECONOMIC PROSPERITY

A large construction site is shown under a blue sky with scattered white clouds. A tall lattice boom crane is positioned on the right side of the frame, extending from the ground to the top. In the foreground and middle ground, the steel framework of a multi-story building is visible, with several levels of beams and columns. The ground is dirt and construction materials. In the background, there are some utility poles and a few vehicles. The overall scene depicts an active construction project.

Success Story |

As a national laboratory, we are always looking to understand and increase the value we provide to the nation and our local and regional communities. PNNL exceeded both sales and business volume completed targets, providing a testament to the value of the science and technology. In FY2014, 57% of our procurement spending benefited small businesses, exceeding our goal of 52%. From startups to Fortune 100 companies, we've partnered with hundreds of businesses to make new technologies available for licensing over the years. In FY2014 alone, PNNL had 115 active licensing partnerships with commercial entities.



At a Glance

ECONOMIC DEVELOPMENT

PNNL licensed an advanced battery technology to UniEnergy



Technologies and provided technology assistance for the Seattle-area company's large-scale energy storage product. The battery system is being put to work with two utilities through Washington State's Clean Energy Fund, advancing renewable energy and grid resiliency.

STEM EDUCATION

Invested on the STEM education through PNNL's signature outreach programs

\$727,921



PURCHASED GOODS AND SERVICES

\$395 million



CIVIC AND PHILANTHROPIC CONTRIBUTIONS

\$634,383

Invested in local organizations and programs

- ▶ SE Washington Leadership & Assistance for Science Education Reform
- ▶ Habitat for Humanity
 - ▶ United Way

WORKFORCE

Down

3%

from previous year



PATENTS

109

Domestic



SUPPORTING VETERAN-OWNED BUSINESSES

4.6%

of contracts (target 1%)

SUPPORTING FEMALE-OWNED SMALL BUSINESSES

9.8%

of contracts (target 5%)

PEER-REVIEWED PUBLISHED ARTICLES

1,121






**Pacific Northwest
NATIONAL LABORATORY**

CAMPUS DIRECTORY



 **U.S. DEPARTMENT OF
ENERGY**