

AT A GLANCE: PACIFIC NORTHWEST NATIONAL LABORATORY

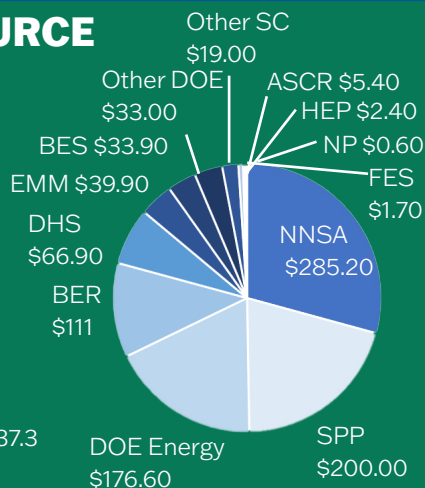


Pacific Northwest National Laboratory (PNNL) advances the frontiers of knowledge, taking on some of the world's greatest S&T challenges. Distinctive strengths in chemistry, Earth sciences, biology and data sciences are the heart of PNNL's science mission, enabling innovations for energy resiliency and national security. PNNL advances theoretical and applied foundations of these disciplines, applying them to critical, complex challenges such as predicting ecosystem responses to climate change, power grid modernization, energy storage, cybersecurity, and nonproliferation.

PNNL stewards the Environmental Molecular Sciences Laboratory, a DOE user facility focused on deeper understanding of environmental processes from the molecular to the Earth system level. PNNL also manages the nine-laboratory DOE Atmospheric Radiation Measurement Program, a unique, distributed user facility with fixed and mobile sites worldwide gathering essential data on Earth's climate. PNNL's Energy Sciences Center, opening in 2021, will be a landmark research facility for the development of new materials and technologies for advanced clean energy systems.

FUNDING BY SOURCE

FY 2019 Costs (in \$M)
 FY 2019 Laboratory Operating Costs: \$938.3
 FY 2019 DOE/NNSA Costs: \$708.7
 FY 2019 SPP (Non-DOE/Non-DHS) Costs: \$200
 FY 2018 SPP % of Total Laboratory Operating Costs: 21.3%
 FY 2018 DHS Costs: \$66.9
 FY 2018 EM-Related Costs*: \$37.3
 *Reflected in Total Laboratory Operating Costs.



HUMAN CAPITAL

4,301 FTE; headcount ~4,700
 150 joint appointments
 287 postdoctoral researchers
 398 undergraduate students
 414 graduate students
 1,557 facility users
 71 visiting scientists

CORE CAPABILITIES

Advanced Computer Science, Visualization, and Data	Cyber and Information Sciences
Applied Materials Science and Engineering	Decision Science and Analysis
Applied Mathematics	Earth Systems Science and Engineering
Biological and Bioprocess Engineering	Environmental Subsurface Science
Biological Systems Science	Nuclear and Radiochemistry
Chemical and Molecular Science	Nuclear Engineering
Chemical Engineering	Power Systems and Electrical Engineering
Climate Change Sciences and Atmospheric Science	Systems Engineering and Integration
Computational Science	User Facilities and Advanced Instrumentation
Condensed Matter Physics and Materials Science	

MISSION UNIQUE FACILITIES

Atmospheric Radiation Measurement User Facility	Environmental Molecular Sciences Laboratory
Bioproducts, Sciences, and Engineering Laboratory	Marine and Coastal Research Laboratory
Electricity Infrastructure Operations Center	Radiochemical Processing Laboratory
Energy Sciences Center	

FACTS

Location: Richland, Washington
 Type: Multiprogram Laboratory
 Contractor: Battelle
 Site Office: Pacific Northwest Site Office
 Website: pnnl.gov

PHYSICAL ASSETS

781 acres (including 117 in Sequim, Wash.)
 76 buildings
 2,316,000 GSF total buildings
 1,180,000 GSF of DOE-owned buildings
 969,000 GSF in 30 leased buildings or third-party agreements
 166,500 GSF in 11 Battelle-owned buildings and 21 OSFs
 Replacement plant value: \$934,315,000



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ACCOMPLISHMENTS



Unique Facility: Energy Sciences Center - The Energy Sciences Center—opening in late 2021—is a research facility at PNNL that will focus on fundamental research in chemistry, materials science and computing. PNNL researchers will apply their findings to develop faster, safer and more efficient chemical processes; turn wastes into commercial fuels; and create more advanced energy storage materials for energy and transportation technologies. Along with specialized equipment and expertise, the center is designed to encourage a collaborative environment, which aims to spur accelerated scientific discovery and technology advancement.



Research Highlight: Keeping America Safe - PNNL researchers are contributing much of the science that underlies detection technologies that are keeping America and the world safe from threats posed by nuclear and chemical weapons of mass effect. PNNL discoveries and innovations form the heart of the radionuclide detection technology used in the International Monitoring System, a global network designed to monitor for nuclear explosions worldwide. The measurements are incredibly sensitive, detecting ultra-trace levels of radioactive xenon hundreds or even thousands of miles away. On the chemical front, an ultrasensitive technology detects explosive vapors, deadly chemicals, and illicit drugs with unparalleled accuracy. And it works in seconds. The non-contact technology is a potential game-changer for transportation hubs, mail facilities, and other safety and security screening applications.



Technology-to-Market Highlight: Jet Fuel from Waste - Recycled carbon from waste is the future of aviation and it's here now, thanks in part to PNNL. In 2018, a blend of jet fuel created from industrial waste gas powered a Virgin Atlantic flight from Orlando to London. LanzaTech—a biotech and carbon recycling company that uses bacteria to convert wastes into chemicals and ethanol—turned to PNNL for its unique catalytic process and proprietary catalysts, to upgrade ethanol to drop-in jet fuel. LanzaTech recently launched LanzaJet, with commercial investors and a DOE grant, to build a demonstration plant that will produce 10 million gallons per year of sustainable aviation fuel from ethanol starting in 2022. LanzaTech's bioconversion process can create ethanol from many waste sources, and PNNL's licensed conversion technology transforms it to sustainable aviation fuel.