

ENERGY & ENVIRONMENT

PNNL'S **energy and environment research** ranges from electric grid modernization to environmental restoration and better batteries. In an increasingly complex landscape, our scientists and engineers are dedicated to improving the resiliency of the U.S. energy system.

MISSION-DRIVEN CAPABILITIES



Coastal Sciences

- Blue economy energy innovation
- Field and laboratory observation and experimentation for continuous data on Sequim Bay and watershed
- Monitoring and modeling the interface between land and sea
- Desalination, mineral extraction, and fuel innovation using seawater



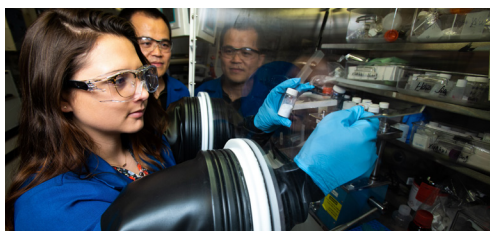
Earth System Science

- Remote interrogation for predictive understanding of complex systems
- Geointelligence and Earth systems predictability
- Water resiliency and sustainable power engineering
- Environmental energy systems engineering
- Operational risk and decision analytics



Electricity Infrastructure & Buildings

- Cyber and resilience that incorporate information and operational technology
- Data analytics and machine learning methods
- Power electronics
- Building-grid integration
- Transportation and manufacturing, with a focus on controls



Energy Processes & Materials

- Innovation in materials and process engineering
- Solid Phase Processing
- Next-generation battery technologies
- Distributed modular process development
- Acid gas capture



Nuclear Sciences

- Radiolysis and irradiation effects to enable new processing paradigms
- Grout formulation and performance to enable cost-effective completion of the Hanford mission
- Molten salt chemistry and separations to support advanced reactors and pyrochemical processing
- Neutron sciences for research beyond californium

We provide science and technology to make the U.S. energy system more efficient, reliable, and resilient. We support the missions of the Offices of Electricity, Energy Efficiency and Renewable Energy, Environmental Management, Nuclear Energy, Fossil Energy, and other agencies.

Learn more: pnnl.gov

DOE MISSIONS WE SUPPORT



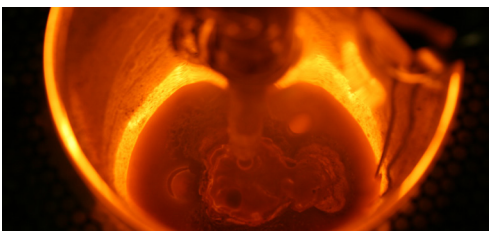
Electricity Infrastructure

- Create new tools, analytics, and architectures to improve grid operations and performance
- Accelerate and validate advanced energy storage concepts to increase grid flexibility
- Deliver national grid cyber situational awareness and response spanning information and operational technology



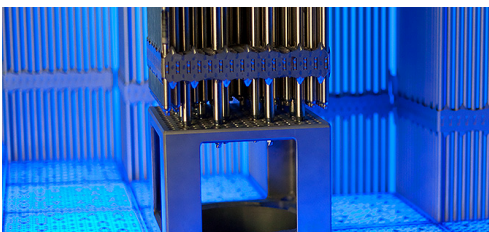
Energy Efficiency & Renewable Energy

- Make energy more affordable and reliable
- Integrate new energy resources with the power grid
- Understand and reduce the environmental impacts of renewable energy



Environmental Management

- Enable tank waste treatment through improved understanding of chemical and physical properties
- Support commissioning, start-up, and initial operations of Waste Treatment Plant
- Develop and deploy innovative solutions for complex remediation clean-up efforts



Nuclear

- Sustain the safe operation of the existing fleet of nuclear power plants
- Enable the advanced reactor pipeline
- Establish the fuel cycle infrastructure



Carbon Management & Fossil Energy

- Partner with industry to advance technologies for industrial and atmospheric decarbonization
- Integrate artificial intelligence with subsurface expertise for real-time management of geologic carbon storage
- Develop flexible, modular generation systems for provision of hydrogen, power, and grid services