

Pacific Northwest National Laboratory Institutional Plan FY 2004–2008

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Pacific Northwest National Laboratory
Richland, Washington 99352



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PACIFIC NORTHWEST NATIONAL LABORATORY

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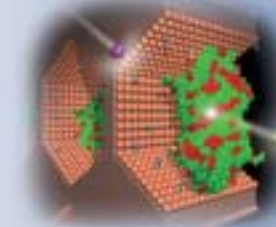
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Science



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Environment



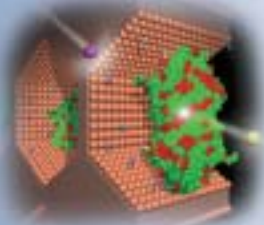
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Stewardship



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Operations



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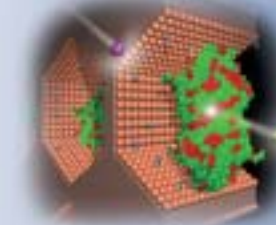
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Laboratory Strategy



Science



Energy



Security



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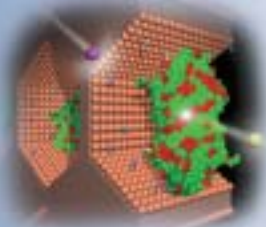
Operations



Stewardship *vii*



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Foreword: Director's Statement



Pacific Northwest National Laboratory— Remarkable Ideas, Remarkable Results

PNNL will transform discoveries at the frontiers of science into beneficial solutions for the U.S. Department of Energy (DOE), the nation, and the world.

A World of Opportunity

The 21st century presents significant challenges and opportunities for the world of science and technology (S&T). Growing concerns around energy supplies and distribution, national and homeland security, and the health of our environment require an accelerated pace in creating technology solutions. These solutions are dependent upon fundamental advances in our understanding of complex chemical, physical, and biological processes that govern the behavior of natural and engineered systems at molecular to real-world scales. Delivering such advances anytime in the near future requires transformations in how we conduct both the research and operational sides of science. The successful and timely delivery of scientific discoveries to beneficial applications is key to managing the significant and fast-paced challenges our country and world face. Our contributions will allow our nation to enjoy a strong economy and a safe and reliable energy system, while protecting the environment, ensuring a healthy populace, and stabilizing global threats. This is the core of our vision and the long-term measure of our success.

Our vision calls for new scientific thinking and types of partnerships that will transform PNNL's and DOE's contributions to our nation's future.

A New Science

Essential to our vision is our promise to develop a new approach to science that fully integrates the key principles of physical, chemical, and biological sciences to focus on total solutions to big problems. For example, systems biology—the ability to understand and mimic the powerful and selective behavior of life systems at the molecular level—is a fundamentally important scientific frontier because of its potential to create transforming knowledge and solutions. We will infuse our integrated strengths in chemistry, materials, catalysis, and high-performance computing into our biological and environmental science programs to create new methods and investigative tools that will revolutionize the study of living systems. This vision builds upon our proven ability to engage the intellectual, instrumental, and computational capabilities across the Laboratory. We will also engage world-class partners from across the scientific community and industry, becoming the focal point for systems biology capabilities and information. And we will continue to work closely with our customers to rapidly translate new discoveries into deployable solutions.

This approach of closely merging research with final solutions will impact the ways we bring staff together from across the organization, invest in capabilities, engage university and industry partners, improve our research operations, and work in our community. Specifically, we must maintain a research campus that enables us to uphold the vitality and flexibility of the Laboratory to respond to emerging DOE needs; attract, develop, and retain the highest caliber people; and reinforce the S&T vitality of our region, while strengthening our visibility and reputation broadly.

Research Campus of the Future. Upgrading and renewing our core capabilities is critically important to our future. We are placing a high priority on relocating mission-critical capabilities from aging facilities scheduled for closure as part of Hanford cleanup, acquiring a proteomics capability as part of the DOE Genomics:GTL Program, building a bioproducts facility with Washington State University, and embarking on a 10-year plan to maintain state-of-the-art capabilities within the William R. Wiley Environmental Molecular Sciences Laboratory. Our strategy also includes a long-term plan to make certain that we have the resources to add, upgrade, and maintain laboratories, infrastructure, and equipment across the PNNL complex.

Local and regional research and development (R&D) advocacy. We need a vital community to attract and retain staff, and we need a thriving S&T community to realize our vision. To that end, it is important that we emphasize this type of growth in our community and in our region. Strong, multilateral university partnerships are essential to that goal, as are mutually beneficial ties with industry. We will be a catalyst for changing the face of DOE in the region from a focus almost exclusively on environmental cleanup to developing and deploying broadly beneficial S&T.

Integration is the Key to Success

Our strong bias for integration—one of our historic strengths—will distinguish us from other laboratories in several ways. Working closely with our university partners, we will strengthen the integration of chemical, physical, and biological sciences, equipping a new generation of physical-chemical biologists with the methods, tools, and experience to respond to tremendous opportunities in systems biology. With our DOE customers, we will translate methods and ideas from our fundamental science programs into our applied programs and from one DOE mission area to another, advancing discoveries at the interfaces of disciplines and missions. With our industrial partners, we will excel at transforming our S&T results into useful and practical commercial solutions with significant economic benefit to the local community, region, and the world.

Getting Down to the Business of R&D

We continue to emphasize our management philosophy of simultaneous excellence—the delivery of mission-related S&T, enhanced by improvements in research management and operations, and accompanied by strong community citizenship. In recent years, we have developed a strong culture of continual improvement and self-assessment, setting records within the national laboratory system for external certification, and establishing the basis for contract improvements in laboratory oversight and management. Our task now is to couple our strong culture of continual improvement with a renewed emphasis on making our research more productive and impactful. Our new Laboratory contract, through its emphasis on vision and scientific and technical performance, establishes both the expectation and opportunity for success in this regard.

At the end of the day, the ultimate proof of our value lies in the tangible results we deliver. This plan presents the Laboratory's vision and plans for reaching its full potential for you—as a customer, partner, staff member, or concerned citizen.



"Excitement about science is part of the culture at PNNL. I plan to make sure that type of enthusiasm prevails by fostering a work environment where people get to do what they do best. As part of DOE's critical science mission, PNNL will continue to be the place where S&T meet, transforming discoveries into tangible, real-world solutions."

The Value and Structure of This Plan

This Institutional Plan documents our strategy to meet future DOE mission and national needs and achieve our Laboratory vision.

The Value of This Plan

This Institutional Plan describes the most important elements of our five-year plan to meet evolving DOE mission needs and provide outstanding value to the nation. Though this plan specifically focuses on the next five years, it reflects our understanding of what we must be working toward to meet DOE's and country's needs for the next several decades.

This is a particularly exciting and crucial time for science. Exciting, because the scientific community is making order-of-magnitude strides in understanding the fundamental building blocks of human biology, creating computational models of increasingly complex natural phenomena, and manipulating matter at the atomic scale. Crucial, because our country is faced with deploying homeland and global security systems to counter ever-changing physical and environmental threats, and developing new energy production and transmission systems to increase the nation's energy security. We are determined to seize this opportunity, and through this Institutional Plan, have laid the groundwork to meet these challenges head-on.

Institutional Planning is Integral to Laboratory Management

We continually evaluate changes in the many environments (scientific, technical, political, and social) in which we operate, and align our strategy in response to those changes. Producing this plan is an essential step in developing, articulating, and obtaining approval of our strategy.

We work closely with DOE to understand and respond to its needs. DOE's Strategic Plan and mission strategies give us the context for our highest-level goals and scientific objectives. Through our institutional planning process, we solidify the objectives, measures, and targets that will guide our work during the next several years. The Institutional Plan represents the integrated work plan that we will follow to meet our contract objectives, and it serves as a basis for our annual performance plan with DOE.

The Institutional Plan and our internal Laboratory strategy provide the context and five-year work plan for our internal business plans and allocation of resources. The evolution of these strategic planning documents, and their critical roles in guiding the direction of the Laboratory, are the reasons that the development of this plan and DOE's approval of it are so important.

Plan Structure Geared Toward Customers

This plan provides the information requested by DOE's institutional planning guidance, and it fully expresses our strategy for the next five years. In contrast to our previous plans, all information related to our support of DOE's specific mission areas is consolidated into single chapters, and supporting information is shifted to appendices or referenced to other documents. This Institutional Plan, coupled with

Chapter 1 presents our Laboratory Strategy.

our Performance Evaluation and Measurement Plan, constitutes our first attempt at a five-year S&T work plan. As this is a first attempt, we expect to significantly refine it in future drafts. The content of each plan section is explained below.

- ◆ Chapter 1 presents the Laboratory's strategy, which includes our mission, vision, major objectives and goals, and implementation approach.
- ◆ Chapters 2 through 5 describe our support to each of DOE's missions and programs. For science, energy resources, national security, and environmental quality, we have consolidated all relevant information:
 - Mission roles, strategic intent, and aligned resource projections
 - Articulation of DOE's current and future needs and our ongoing and anticipated responses, with highlights of our major initiatives
 - Summaries of our Work for Others and their relevance to DOE
 - Infrastructure needs relevant to each mission.
- ◆ Chapter 6 states our goals and intentions related to enhancement of research management and our operational improvement agenda.
- ◆ Chapter 7 describes our essential efforts in community service and long-term stewardship of the Laboratory.
- ◆ The appendixes provide required or supporting information.
 - A Partnerships
 - B Pacific Northwest National Laboratory Key Facilities
 - C Pacific Northwest National Laboratory Profile
 - D Resource Projections
 - E Laboratory Directed Research and Development: Renewing the Capabilities at PNNL
 - F Pacific Northwest National Laboratory Organizational Chart

Plan Structured for Ease in Finding Information

The two-page modular format of this plan makes it easier for readers to quickly spot information that is of interest to them.

- ◆ By scanning the topics, which also form the table of contents, readers can quickly see the type of information contained in this plan.
- ◆ More detail is gained from the thesis statements, which provide the most important point of the module. Readers can then easily decide which modules they want to read.
- ◆ The most detail is in the module's text and figures.



This Institutional Plan plays an essential role in linking DOE strategies to the Laboratory's strategy, annual plans, and performance information.