

OAK RIDGE NATIONAL LABORATORY

ECONOMIC IMPACT REPORT



TABLE OF CONTENTS

About ORNL	4
ORNL's Economic Spending Impact	14
Research, Innovation, and Scholarly Impact	20
ORNL Science and Technology Development	24
Workforce and Community Impact	36
Emerging Economic Opportunities	40
Acronyms	50
Appendix A: Definitions	51
Appendix B: Methodology, Assumptions, and Limitations	53
Appendix C: Charts	56

About the cover: Corporate Fellow Parans Paranthaman and researcher Jayanthi Kumar conduct direct extraction of lithium from brines. Their research advances innovative materials separation technologies that could strengthen domestic supply chains for critical minerals and support secure, reliable energy storage solutions for the nation.



ORNL Director Stephen Streiffer in front of the Frontier supercomputer.

A Letter from the Director

The US Department of Energy’s Oak Ridge National Laboratory (ORNL) delivers science and technology at national scale—bringing together world-leading research facilities and multidisciplinary teams to tackle the nation’s most pressing energy and security challenges.

Across eight science and technology organizations, ORNL’s research spans high-performance computing and artificial intelligence, neutron science, materials and chemical sciences, biology and environmental systems science, fusion and fission energy science, isotope science and enrichment, energy science and technology, and national security.

Through our people and partnerships, we are advancing strategic priorities in the future of computing, nuclear solutions, materials innovation from “atoms to applications,” and secure, resilient systems for abundant energy. These priorities guide how we translate discovery into deployable technologies and systems that strengthen US competitiveness and support a safe, prosperous future.

ORNL’s impact extends well beyond scientific achievement. The basic and applied research conducted here also drives economic growth—especially in East Tennessee—through high-quality jobs, local spending, and collaboration with universities, industry, and regional partners. ORNL and our operating contractor, UT-Battelle LLC, are committed to supporting the prosperity and long-term vitality of the communities where we live and work.

That impact is visible in our growth. ORNL’s workforce increased from 5,527 employees in fiscal year (FY) 2020 to 7,427 in FY 2025, with more than 92% residing in the Knoxville Metropolitan Area. This concentration of talent strengthens the region’s economy

while enabling ORNL to continue delivering national impact through big science, across established mission areas and emerging frontiers. ORNL’s economic activity also supports jobs well beyond our gates: every 100 ORNL jobs support an additional 248 jobs across the United States.

In FY 2025, ORNL’s budget was \$2.8 billion, which contributed to regional and national economic activity through operational spending. In total, the laboratory created an economic output of \$6.6 billion across the United States.

Beyond operational spending, ORNL’s scientific capabilities create unique economic value by expanding access to knowledge and one-of-a-kind facilities. Last year, more than 6,000 visitors came to ORNL to work alongside our researchers and take advantage of our specialized tools and expertise.

FY 2025 was also a landmark year for innovation. ORNL received an unprecedented 20 R&D 100 Awards—the most earned by any national laboratory. ORNL innovators contributed to 73 issued patents and earned 6 Federal Laboratory Consortium awards, and 7 researchers were recognized as Battelle Distinguished Inventors for their success in moving innovations toward the marketplace.

No discovery happens in isolation, and no laboratory succeeds apart from the community it serves. I am proud to live in East Tennessee, and I am proud of ORNL’s impact—locally, regionally, and across the nation.

Dr. Stephen Streiffer

About Oak Ridge National Laboratory

Established in 1943 as part of the Manhattan Project, Oak Ridge National Laboratory’s (ORNL’s) mission is to deliver scientific discoveries and technical breakthroughs needed to realize solutions in energy and national security and provide economic benefit to the nation.

Located in East Tennessee, ORNL operates across 4,421 acres and multiple campuses. In the decades since its founding, ORNL has had a far-reaching impact, partnering with other federal entities, colleges and universities, the Tennessee Valley Authority (TVA), state and local governments, and industry partners to make the region a fertile ground for discovery and innovation.

ORNL’s research accomplishments and impact can be seen in its outstanding record of publications and inventions. In FY 2025 alone, laboratory staff published more than 3,179 papers in technical journals and disclosed approximately 300 inventions. ORNL’s legacy is defined by world-leading experts whose work across disciplines drives its mission and transforms science into meaningful impact.

This report is based on FY 2025 data. Unless otherwise noted, all figures reflect FY 2025 results, and any dollar amounts are presented in FY 2025 dollars. FY 2025 is the period from October 1, 2024, through September 30, 2025.

ORNL is committed to building a strong scientific workforce for the future. In FY 2025, ORNL hosted more than 1,000 student interns and faculty supported by 770 mentors across 59 research and operations divisions, including record participation in the Department of Energy (DOE) Office of Science’s Visiting Faculty Program. Similar participation continues in 2026. ORNL also strengthened K–12 outreach, engaging more than 20,000 students through programs that brought DOE science into classrooms and communities, including teacher workshops to build awareness of DOE mission areas.

Across the state of Tennessee, ORNL’s work supported more than 17,058 jobs and had a statewide economic impact of \$3.6 billion.

\$6.6B
Total US economic impact

25,819
Total US jobs supported

\$3.6B
Total Tennessee economic impact

\$2.39
US economic impact per \$1 funding

\$497.5M
Total spending with small businesses (\$88.3M with veteran-owned small businesses)

3,179
Total technical publications/scholarly output

**R&D
100
AWARDS**

20 awards in 2025, more than any other national laboratory

248
US jobs supported per 100 ORNL jobs

7,427
Total employees

5,000+
Facility users and visiting scientists

Science and Technology Directorates

ORNL’s workforce includes research staff, technical professionals, administrative personnel, postdoctoral researchers, interns, and term employees. ORNL applies DOE’s most expansive portfolio of scientific expertise and employs world-class facilities and equipment to develop scientific and technological solutions for the most pressing questions facing the nation. ORNL’s research enterprise is organized into eight science and technology directorates:



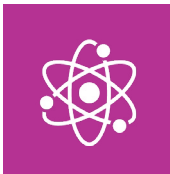
The **Biological and Environmental Systems Science Directorate (BESSD)** leads convergence research in biology, ecology, engineering, data discovery, physical sciences, and computing. This multidisciplinary approach enhances Earth system predictability, bolsters energy security, and strengthens the US bioeconomy.

The **Computing and Computational Sciences Directorate (CCSD)** oversees ORNL’s immense store of computing power and its talented staff of computational scientists and mathematicians, conducting state-of-the-art research and development in support of DOE’s missions and programs. CCSD has the expertise and resources required to continue advancing high-impact industries such as AI, high-performance computing, applied mathematics, software development, and quantum information science.



The **Energy Science and Technology Directorate (ESTD)** plays a pivotal role in securing America’s energy future. ESTD scientists and engineers work with America’s business community to research, develop, and deploy cutting-edge technologies that provide the nation with a competitive, economic advantage. They break down market barriers in transportation, power systems, and advanced and affordable technology for homes, buildings, and manufacturing. Accelerating science-based innovation in energy technology will help provide a portfolio of reliable energy options to support a thriving economy.

The **Fusion and Fission Energy and Science Directorate (FFESD)** addresses compelling challenges in fusion and fission energy systems, enabling ORNL to pursue national priorities in fusion energy and current and advanced nuclear research, development, and deployment. Advancing nuclear technologies will rapidly enhance the nation’s energy production, enabling power for countless new innovations.



The **Isotope Science and Enrichment Directorate (ISED)** is at the forefront of isotope innovation. ISED is a global leader in isotope research, development, and production, meeting the nation’s emerging needs for stable isotopes. By making vital advances in the uses and production of radioisotopes, ISED catalyzes the nation’s economic competitiveness in security, medicine, and nuclear technology.

The **Physical Sciences Directorate (PSD)** leverages a portfolio across numerous industries—materials science and engineering, chemistry, geoscience, nanoscience, soft matter science, analytical chemistry, and nuclear and particle physics—and applies it to a broad range of scientific and technical challenges for the economic benefit of the nation.



From emerging technologies and cyber-physical attacks to nuclear proliferation and supply chain vulnerabilities, the threats to America’s national security continue to evolve at a rapid pace. The **National Security Sciences Directorate (NSSD)** faces these challenges head-on, capitalizing on ORNL’s unique scientific assets to deliver real-world solutions that protect the people, infrastructure, and economy of the United States.

Breakthroughs in medicine, energy, technology, and industry follow advances in the understanding of materials. The **Neutron Sciences Directorate (NScD)** is a global leader in one of the most powerful techniques for exploring the nature of materials and energy—neutron scattering. Developed at ORNL in the 1940s, neutron scattering is used in various industries—automotive, aerospace, defense, industrial materials, energy storage, data storage, biomedicine, and others—to address the 21st century’s major scientific challenges.



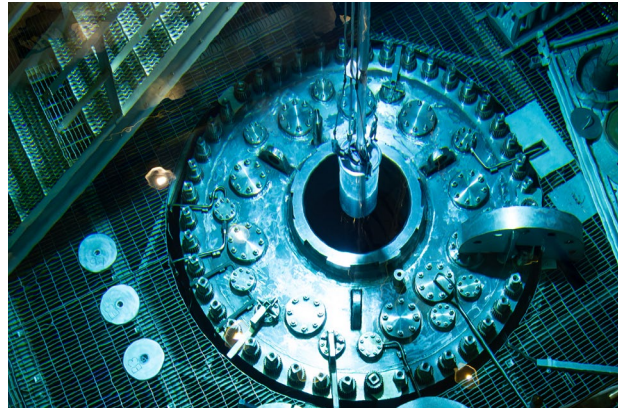
User Facilities

ORNL is home to world-class user facilities available to researchers from universities, industry, and other institutions. Together, these facilities offer a diverse array of tools for research in biology, materials and energy sciences, physics, engineering, and chemistry. They are described in greater detail on pages 28–35.

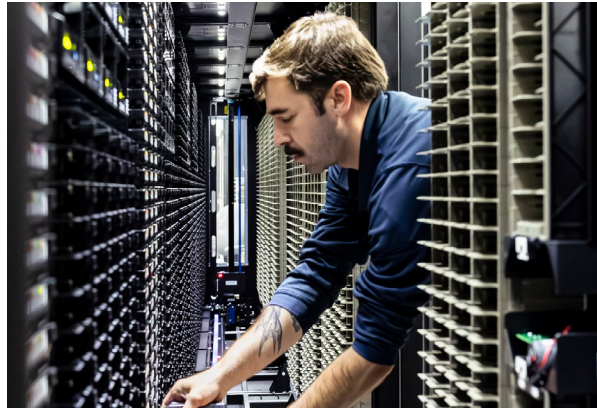
Office of Science User Facilities



Center for Nanophase Materials Sciences (CNMS)



High Flux Isotope Reactor (HFIR)



Oak Ridge Leadership Computing Facility (OLCF)

At ORNL, the Office of Science sponsors large-scale user facilities as shared resources for the research community, providing access to leading-edge capabilities such as supercomputers, neutron sources, and advanced sensors and optics.

ORNL's Applied Research Facilities are designed to support collaboration with industry, helping develop technologies that address market needs and drive breakthroughs. Success is measured differently across these facilities: Office of Science user facilities are often evaluated by their scientific output, including research publications, whereas Applied Research Facilities are assessed by outcomes such as technology transfer, partnership agreements, and intellectual property development.

Spallation Neutron Source (SNS)



Applied Research Facilities



Building Technologies Research and Integration Center (BTRIC)



Carbon Fiber Technology Facility (CFTF)



Manufacturing Demonstration Facility (MDF)



National Transportation Research Center (NTRC)



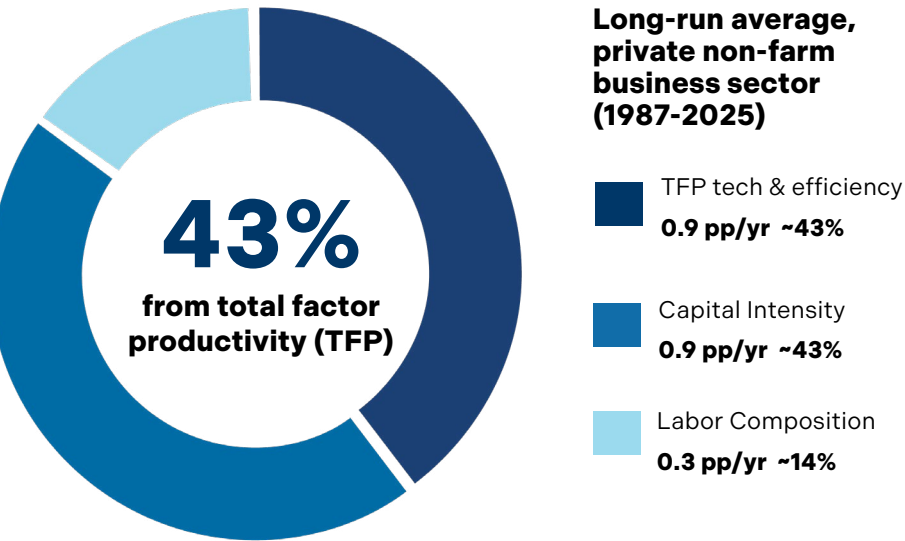
Grid Research Innovation and Development Center (GRID-C)

How ORNL Creates Economic Impact

Technological change and innovation are important drivers of long-term productivity growth, rising living standards, and US competitiveness. From 1987 to 2025, total factor productivity (TFP), which reflects innovation, technological change, efficiency improvements, and other factors, accounted for approximately 43% of the sum of the rounded contributions to private nonfarm business labor-productivity growth.¹

Federal research institutions, including the national laboratories, advance science and technology that can contribute to these productivity gains. As one of the nation’s premier federally funded research laboratories, ORNL operates at the center of the

Contributions to US labor productivity growth (1987-2025)¹



¹ US Bureau of Labor Statistics. Multifactor Productivity Trends. Table B: “Labor productivity growth and the contributions of capital intensity, labor composition, and total factor productivity to labor productivity growth, private nonfarm business and private business sectors.” Washington, DC: US Department of Labor. Available at: <https://www.bls.gov/news.release/prod3.htm>.

regional innovation ecosystem and translates that federal research investment into scientific breakthroughs, technology commercialization, workforce development, and industry partnerships that support long-term US economic competitiveness.

Recent causal estimates indicate that federal nondefense R&D generated historical gross rates of return of 140% to 210% and accounted for at least 20% of postwar business-sector TFP growth.² Industry tends to underinvest in foundational discovery; federal funding helps address this gap by financing and de-risking foundational science that the private sector later translates and scales. Over time, increases in nondefense government R&D appropriations produce delayed gains in innovative activity and business-sector productivity, supporting long-term US economic growth.³

R&D contributes to technological change and innovation, which can increase TFP. TFP captures growth in labor productivity that is not explained by increases in capital intensity or changes in labor composition. Because TFP accounts for a substantial share of US labor productivity growth, R&D represents an important pathway through which the national laboratory system can support economic growth, higher living standards, and US competitiveness.

² Fieldhouse, Andrew J., and Karel Mertens. *The Social Returns to Public R&D*. Federal Reserve Bank of Dallas, Research Department Working Paper No. 2519. May 2025. Available from the Federal Reserve Bank of Dallas. dallasfed.org/research/papers/2025/wp2519.

³ Fieldhouse, Andrew J., and Karel Mertens. *The Returns to Government R&D: Evidence from U.S. Appropriations Shocks*. Federal Reserve Bank of Dallas, Research Department Working Paper No. 2305. May 2023; revised November 2024. Available from the Federal Reserve Bank of Dallas. dallasfed.org/research/papers/2023/wp2305.

About This Report

Measuring the economic impact of a national laboratory requires recognizing that innovation-driven growth operates through both clearly quantifiable channels and broader, system-level effects that are more diffuse. This report presents ORNL’s economic impact in two complementary categories.

First, the impact of ORNL’s spending—payroll, procurement, construction, and visitor activity—was quantified using established input–output modeling techniques. These models estimate direct, indirect, and induced effects, translating laboratory expenditures into measures such as total economic output, jobs supported, labor income, and value added. This approach provides a transparent, defensible estimate of the near-term economic activity supported by ORNL’s operations.

Second, ORNL’s innovation-driven impact was assessed using widely accepted indicators of technological advancement. These include intermediate outputs, such as patents and licenses, as well as a tracked subset of downstream outcomes that can be consistently attributed to ORNL and readily quantified in this report, such as deployed technologies, start-ups launched, and industry adoption. Broader downstream impacts, such as economy-wide value realized from past ORNL advances, are not comprehensively captured here; therefore, the downstream outcomes reported should be viewed as conservative estimates of ORNL’s total impact.

Accordingly, this report presents a portfolio of innovation indicators—research funding, publications, intellectual property, commercialization activity, workforce development, and industry partnerships—to illustrate how ORNL converts federal R&D investment into scientific discovery, technological insight and adoption, and long-term economic growth that extends well beyond what can be captured in a single number.



The Legacy of ORNL Innovation

Although this report tracks measurable outcomes, ORNL’s full economic impact extends far beyond what can be captured in annual metrics. The laboratory’s investments in basic science lay the foundation for technologies that industry refines, scales, and transforms into products, companies, and entire markets over years—and often decades. The examples presented here illustrate how foundational research can evolve into industry-changing innovations that generate lasting economic value and public benefit.

ORNL has long helped shape the regulatory framework that enables the nation’s nuclear power plants to operate safely and efficiently. In **2007**, the laboratory’s advanced risk assessment capabilities and high-performance computing provided the technical foundation for Nuclear Regulatory Commission standards governing reactor license renewals, helping more than **40%** of the nation’s reactors remain in operation and avoiding more than **\$30 billion** in replacement costs.

Today, ORNL continues to support the NRC by generating modeling, testing, and experimental data needed to qualify advanced fuels, enable power uprates, and extend reactor lifetimes. Together, these capabilities help the existing reactor fleet produce more power, operate longer, and meet growing energy demand while maintaining the nation’s rigorous safety standards.



ORNL is accelerating construction of Kairos Power’s Hermes demonstration reactor. Working with Barnard Construction, the MDF 3D printed reusable composite forms for the reactor’s concrete shielding columns—complex, high-precision structures that are difficult and costly to produce using conventional methods. The approach reduced production time from weeks to days.

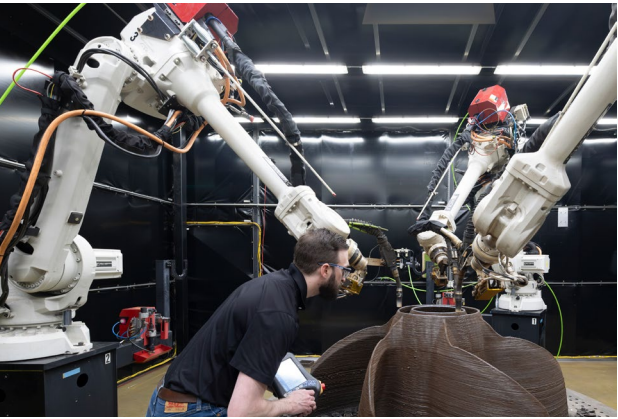
By partnering with ORNL, Kairos Power tapped into expertise in advanced manufacturing, building technologies, computing, materials science, and fission energy. This is a bold step toward transforming how nuclear infrastructure is built, an impact that will ripple for decades.



In **1972**, ORNL researchers demonstrated that mammalian embryos could survive freezing and thawing, laying the scientific foundation for modern cryopreservation. The resulting technologies transformed animal agriculture by enabling embryo transfer and accelerating genetic improvement in livestock. Today, those same principles support routine human fertility treatments and are advancing organ preservation techniques that could one day dramatically expand access to lifesaving transplants.



Beginning in the early **1990s**, ORNL researchers partnered with DOE and General Electric to develop ceramic matrix composites (CMCs)—lightweight, heat- and corrosion-resistant materials that outperform conventional metal alloys in demanding industrial applications. By **2017**, decades of research helped bring CMCs into commercial aviation through the GE/Safran LEAP engine, whose CMC turbine shrouds enabled operation at higher temperatures while improving fuel efficiency. The success of CMC technology underscores how sustained investments in basic research can create long-term economic value through industry adoption.



Big area additive manufacturing (BAAM) was pioneered at ORNL through industry collaboration more than 2 decades ago. Early demonstrations, including 3D printing a car, helped industry recognize the technology’s wide-ranging potential, from new approaches to material testing to novel manufacturing applications.

In **2024**, ORNL and Lincoln Electric partnered with the US Army Corps of Engineers to manufacture a replacement for a damaged ship arrestor arm at the Poe Lock in Michigan, a vital link in international shipping. Traditional manufacturing methods were expected to take nearly 2 years. Working with ORNL, Lincoln Electric fabricated the approximately 6,000-pound arrestor arm in 12 weeks without sacrificing quality, helping avert an estimated **\$3 trillion** in damage to US GDP and the loss of about **33 million jobs**.

ORNL's Economic Spending Impact

Economic impact modeling tracks how initial dollars spent circulate through a local or regional economy:

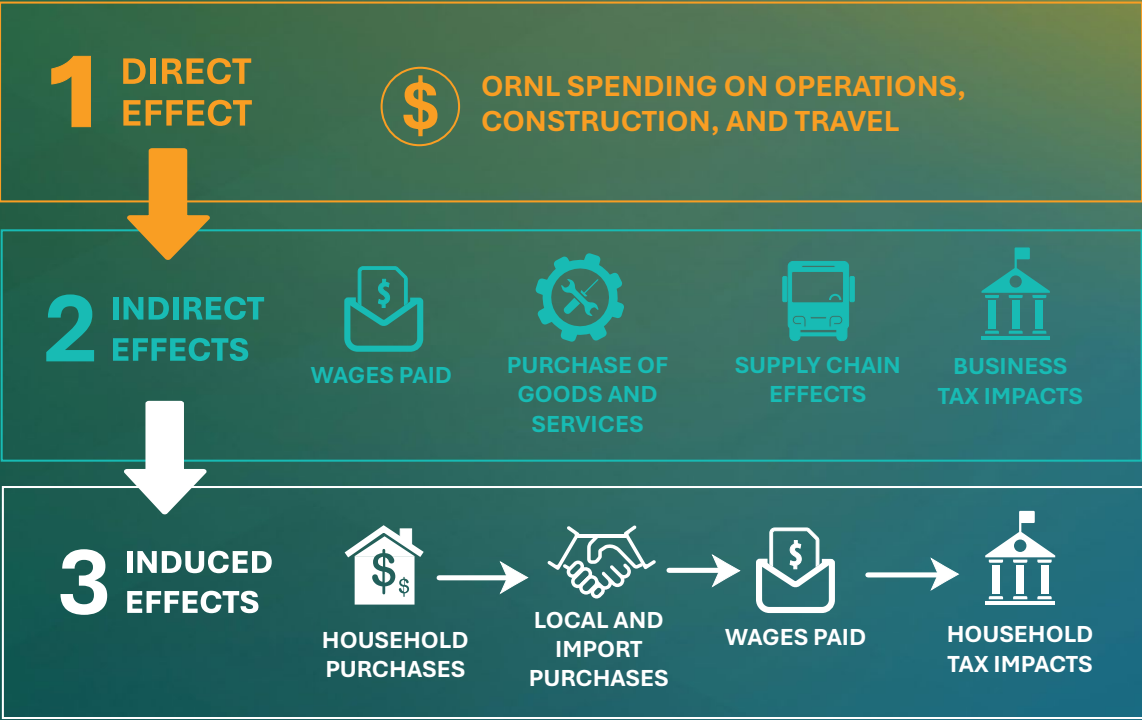
Direct effects are the initial, measurable activity—for example, ORNL-related purchases from vendors, construction outlays, and travel- or visitor-related spending.

Indirect effects occur when those vendors and contractors buy goods and services from other businesses in the supply chain.

Induced effects occur when workers spend their earnings locally on household needs (e.g., rent, groceries, health care).

Tax impacts represent the state, local, and federal tax revenues generated by direct, indirect, and induced spending effects.

IMPLAN, the economic impact analysis software that ORNL used for this report, estimates these ripple effects using an input-output model and a social accounting matrix, which together describe how industries buy from each other and how households spend labor income.



Economic impacts depend on where spending occurs and where suppliers and workers are located. This analysis uses a multi-regional input-output setup to estimate impacts across four nested geographies: the Knoxville metropolitan statistical area (MSA), Tennessee, the Southeast, and the United States. This approach helps illustrate the impacts of ORNL-related activity across all four regions.

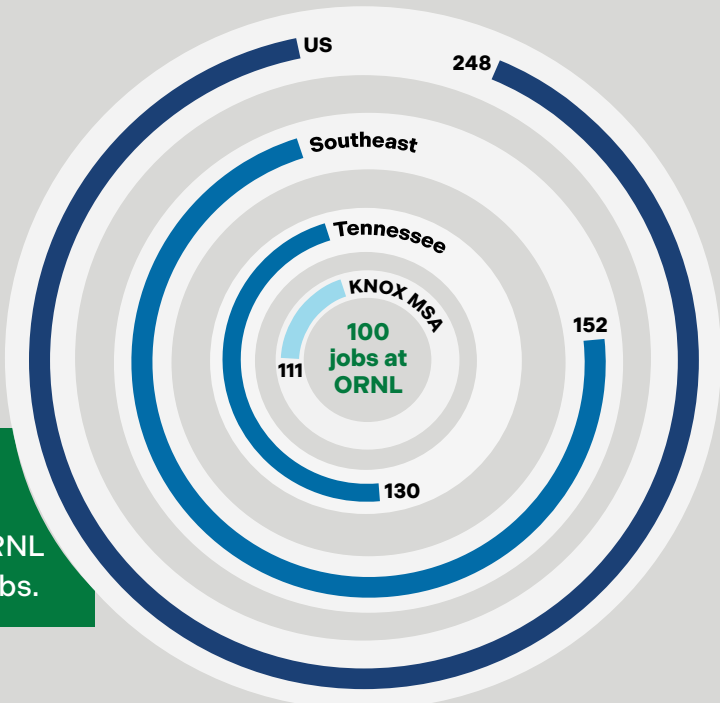
ORNL's impact was quantified using three categories of measurable activity:

- **Operations Spending** (includes wages, benefits, utilities, and procurement)
- **Construction Spending**
- **Travel Spending**

These three categories, plus pension spending, international spending, and international procurement, which are not included in this analysis, add up to **ORNL's \$2.8 billion FY 2025 budget**.

A full description of the methodology, assumptions, and limitations used to compile this analysis can be found in Appendix B.

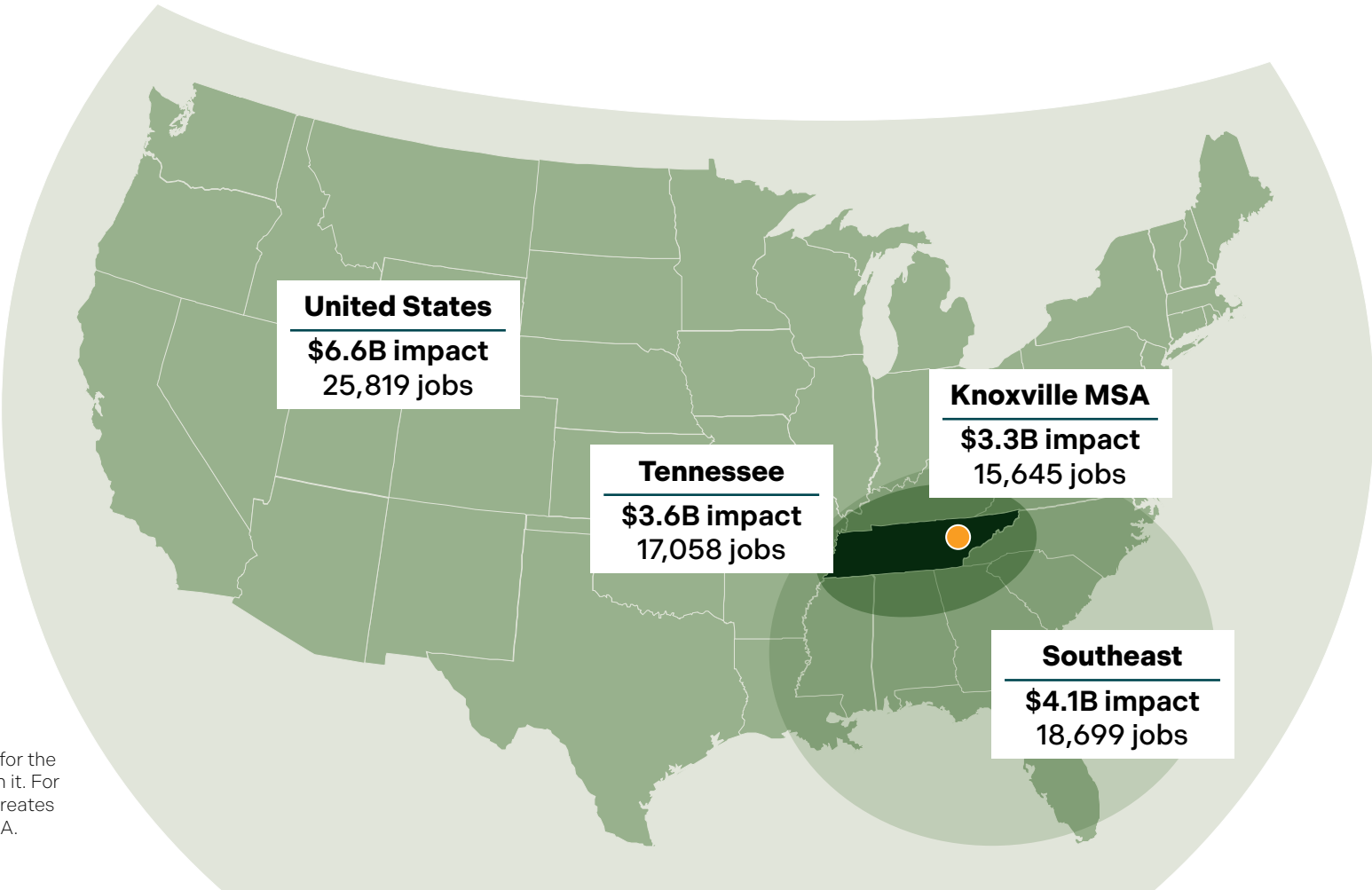
Budget Category	Funds
Procurement	\$950M
Utilities	\$72M
Wages	\$1.02B
Benefits	\$335M
Construction	\$194M
Travel	\$32M
Pension	\$165M
Grand Total	\$2.8B



In the Knoxville MSA, ORNL's employment multiplier is 2.11, meaning every 100 jobs at ORNL support 111 additional local jobs.

For every job at ORNL, additional jobs are created or sustained throughout the United States. This is a reflection of ORNL's **strong employment multiplier** and its deeply embedded role in the regional workforce.

For every **\$1 of federal investment or funding** in ORNL, **\$2.39 of economic output** is generated across the US.



Each figure includes economic impact and jobs for the geographic area outside the smaller areas within it. For instance, ORNL has a \$296 million impact and creates 1,413 jobs in Tennessee outside the Knoxville MSA.

Operations Impact

In FY 2025, ORNL employed **7,427 workers**. Ninety-two percent of ORNL employees reside within the Knoxville MSA, concentrating a substantial share of labor income and consumer spending in the local economy. ORNL’s average annual wage for FY 2025 was **\$134,936**, more than double the Knoxville MSA average annual wage of **\$64,737**.

In FY 2025, ORNL’s procurement staff obligated more than \$950 million for procurements in the United States. ORNL’s procurement activities spanned nearly all 50 states, supporting businesses from small regional enterprises to major research and technical service providers. The laboratory spent **\$497.5 million** in FY 2025 alone with small businesses, which amounts to **48.5 percent** of overall subcontract spending.

Construction Impact

Capital investment at ORNL drives significant economic activity beyond the laboratory’s boundaries. In FY 2025, ORNL’s construction and facility improvement expenditures totaled approximately \$194 million, supporting jobs in skilled trades, engineering services, materials supply, and project management across the region.

Construction spending generates some of the highest employment multipliers of any economic activity—each dollar spent on construction ripples broadly through local supply chains and household spending. In FY 2025, ORNL’s construction activity supported an estimated 943 direct construction jobs and an additional 637 indirect and induced jobs, for a total employment impact of **1,580 jobs**. Total economic output from ORNL construction activities is estimated at more than **\$325 million**, with **\$120 million** in increased household income and **\$165 million** in contributions to gross regional product.

As ORNL continues to invest in modernizing and expanding its research infrastructure—including user facilities upgrades, computing capabilities, and campus development—the construction footprint of the laboratory will remain a meaningful and sustained source of economic activity for East Tennessee.



Members of the Ironworkers Local 384 at the construction of the Stable Isotope Production and Research Center (SIPRC)

Travel Impact

ORNL’s spending on travel to other states for business purposes has economic impact across all 50 states and the District of Columbia. When ORNL staff, researchers, and administrators travel to conferences, partner institutions, and federal agency meetings, they inject spending into local economies across the nation—on airfare, lodging, meals, and ground transportation.

In FY 2025, ORNL’s domestic travel supported an estimated 299 direct travel industry jobs and an additional 174

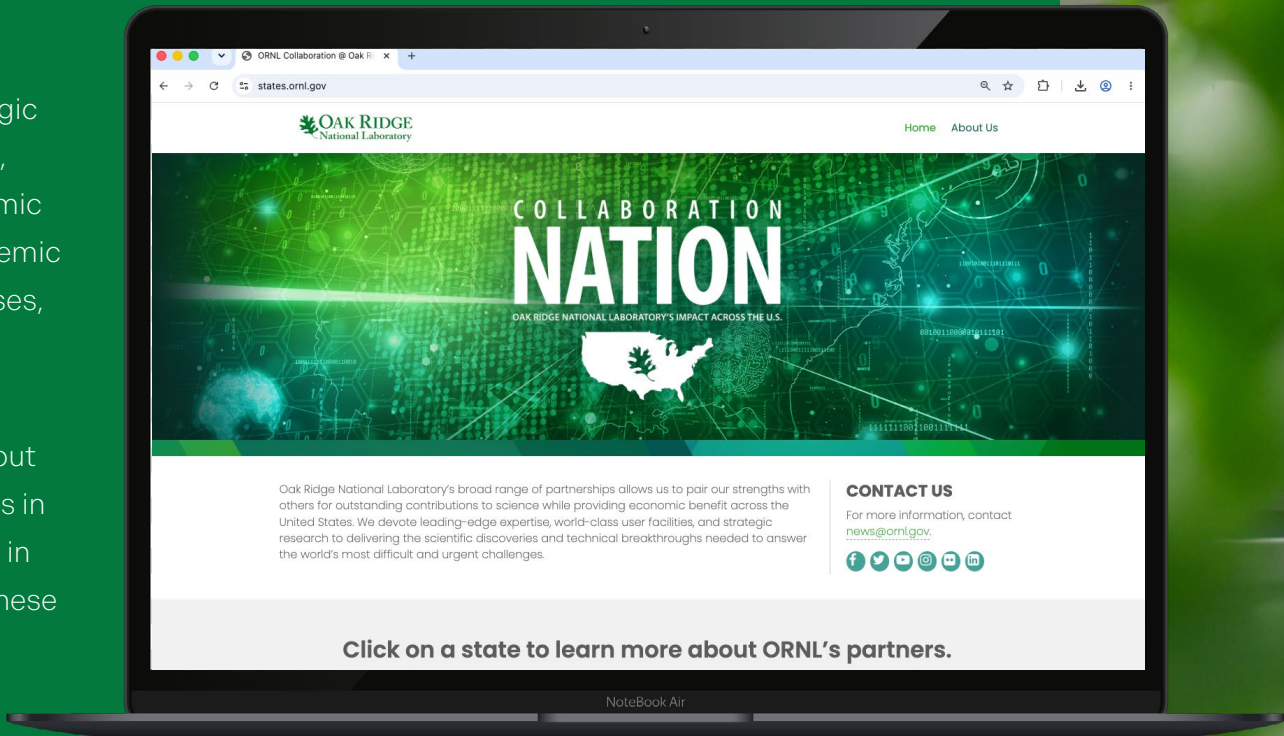
indirect and induced jobs, for a total employment impact of **445 jobs**. Total economic output from ORNL travel activities is estimated at more than **\$42 million**, with **\$13.8 million** in increased household income and **\$25 million** in contributions to the GDP.

Travel spending also supported tax revenues of \$13.7 million at the federal level, \$6.9 million at the state level, and \$855,000 at the county level across the nation.

State-by-State Impact

ORNL’s reach extends far beyond the borders of Tennessee. Through university collaborations, strategic research partnerships, technology transfer activities, and procurement spending, ORNL generates economic activity in every state. These connections span academic institutions, private industry partners, small businesses, and federal facilities from coast to coast.

The breadth of ORNL’s national footprint reflects the laboratory’s role, not merely as a regional employer, but as a national scientific asset—one whose investments in people, facilities, and ideas support jobs and income in communities beyond East Tennessee. Learn about these impacts on our Collaboration Nation site.



Researcher Kelsey Carter harvests penny-cress plants as part of the Orchestrated Platform for Autonomous Laboratories project.

Research, Innovation, and Scholarly Impact

The United States now stands at a major inflection point in science and technology, where rapidly evolving forces are converging to create both extraordinary opportunities and consequential risks. At this critical juncture—and responding with the same sense of urgency that defined its origins—ORNL is embracing new national priorities such as the Genesis Mission and has launched a bold science and technology laboratory strategy to accelerate scientific discoveries and their translation into scalable solutions over the next decade.

ORNL delivers translational research that advances both basic and applied science to meet national priorities. With a broad portfolio in science and technology, the laboratory leads cross-cutting initiatives and pioneers future-focused technologies. Many of ORNL’s signature strengths—nuclear science, isotopes, neutron scattering, materials science, biological and environmental systems science, and high-performance computing—trace directly to its Manhattan Project legacy. As national priorities have evolved, so too has ORNL’s portfolio, which now also spans energy science, national security, and emerging technologies such as AI and quantum information science.

In addition to creating innovations that transform industry, ORNL researchers make significant contributions to global scientific understanding, driving breakthroughs with strong research and economic impacts. ORNL is committed to developing the next-generation workforce and maintaining its position at the forefront of future advancements through collaboration with academic institutions across the Southeast.

As an R&D organization,
publications are among ORNL’s
primary outputs.

Publications deepen our credibility with industry partners by demonstrating that ORNL is at the forefront of scientific research.

Total number of ORNL publications

3,179
FY 2025

808
High-Impact
Journals

239

Laboratory Directed Research and
Development (LDRD) Publications

Publications in high-impact journals as
a percentage of total scholarly output

25.42%

In FY 2025, there were
598
ORNL–UT-Knoxville joint publications and
361
joint publications between ORNL and
other core university partners.

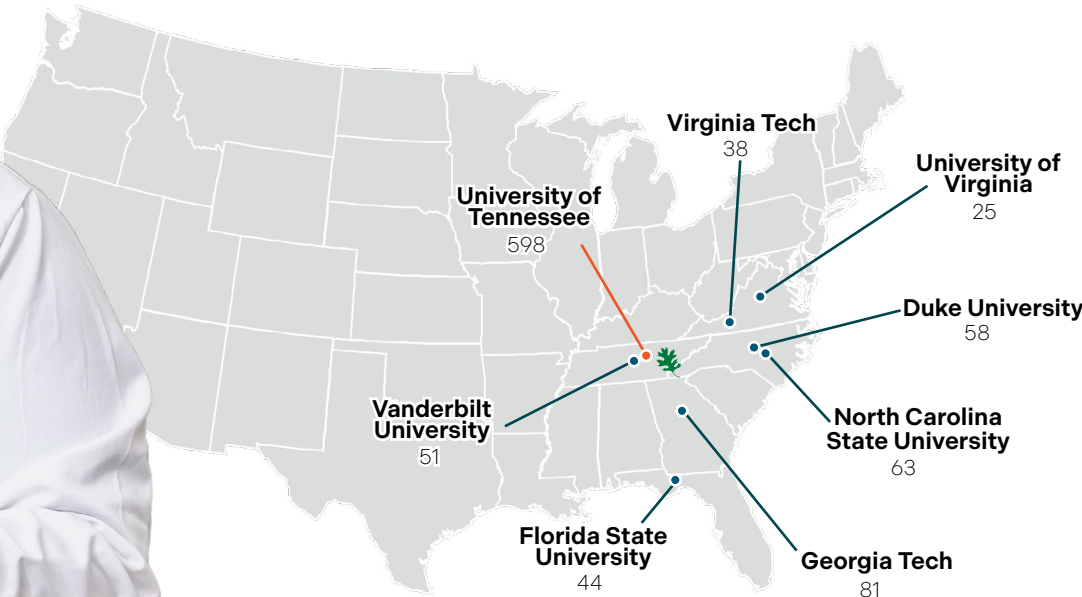
Rohit Kousika,
University of Tennessee
PhD student

Scholarly Collaborations

As part of the management and operation of ORNL for DOE, UT-Battelle established a founding group of core partners with the major Southeastern research universities. This approach helped the laboratory facilitate the initial establishment of joint appointments, collaborative research, and graduate student opportunities that have since spread across the country.

In addition to its managing partner the University of Tennessee (UT) System, ORNL’s core university partners include Duke University, Georgia Tech, Florida State University, North Carolina State University, Oak Ridge Associated Universities, Vanderbilt University, University of Virginia, and Virginia Tech.

ORNL’s joint appointments with UT Knoxville, foster collaboration across discipline and academic division, enabling greater breadth and depth of research.





Translating Research into Impact



A Letter from Susan Hubbard, Deputy for Science and Technology

For more than 8 decades, Oak Ridge National Laboratory has advanced discoveries that strengthen US competitiveness, energy security, and economic prosperity. In 2025, ORNL built significant momentum across science and technology fields, delivering breakthroughs and investing strategically to position the nation—and the region—for long-term growth and innovation.

A defining achievement of the year was ORNL's leadership role in the DOE's AI Genesis

Mission, which seeks to accelerate scientific discovery and improve productivity through the convergence of AI, high-performance computing, and advanced experimentation—historic strengths of the laboratory. ORNL was selected to lead development of the American Science Cloud Genesis Mission platform and announced two AI-optimized computing systems, Discovery and Lux, establishing new capabilities that will accelerate innovation.

ORNL also strengthened its leadership in quantum science and advanced computing. The renewal of the Quantum Science Center, opening of new quantum laboratories, and deployment of ORNL's first on-site quantum computers expanded the laboratory's capabilities. ORNL also partnered with Chattanooga's Electric Power Board and the University of Tennessee at Chattanooga to achieve the first transmission of an entangled quantum signal over a commercial fiber network without service interruptions, an important milestone toward a future quantum Internet.

Nuclear science and technology remained a major emphasis in 2025. ORNL advanced new capabilities and entered into several key partnerships critical for accelerating deployment timelines for both advanced fission and fusion energy. ORNL is developing the Material Plasma Exposure eXperiment and partnering with Type One Energy to establish a high-heat flux testing facility, both to enable investigation of materials that can withstand harsh conditions inside a

fusion reactor. ORNL also partnered with Kairos Power and Barnard Construction to advance large-scale additive manufacturing for advanced reactor deployment and entered into a strategic agreement with Atomic Canyon to use AI to accelerate the nuclear licensing and regulatory processes. These and other efforts are helping establish East Tennessee as one of the nation's leading hubs for advanced nuclear innovation and private-sector investment.

ORNL also expanded major research capabilities in 2025, including site preparation for the Second Target Station (STS) at the Spallation Neutron Source. Already a global leader in neutron science for materials discovery and home to the most productive neutron facilities in the nation, STS will propel neutron science into a new regime, providing insights into quantum and engineered materials important for future industries. In 2025, ORNL also achieved important milestones for the Stable Isotope Production and Research Center, delivered a record number of isotope shipments, and continued progress on facilities that will strengthen domestic supply chains and energy security.

Together, these accomplishments demonstrate how ORNL translates scientific excellence into economic and social impact—creating new technologies, enabling industry partnerships, attracting investment, developing talent, and strengthening the economic and innovation ecosystem of Tennessee and the nation.

ORNL researchers Marcy Lamb and Subhamay Pramanik operate equipment supporting critical mineral separation and analysis.

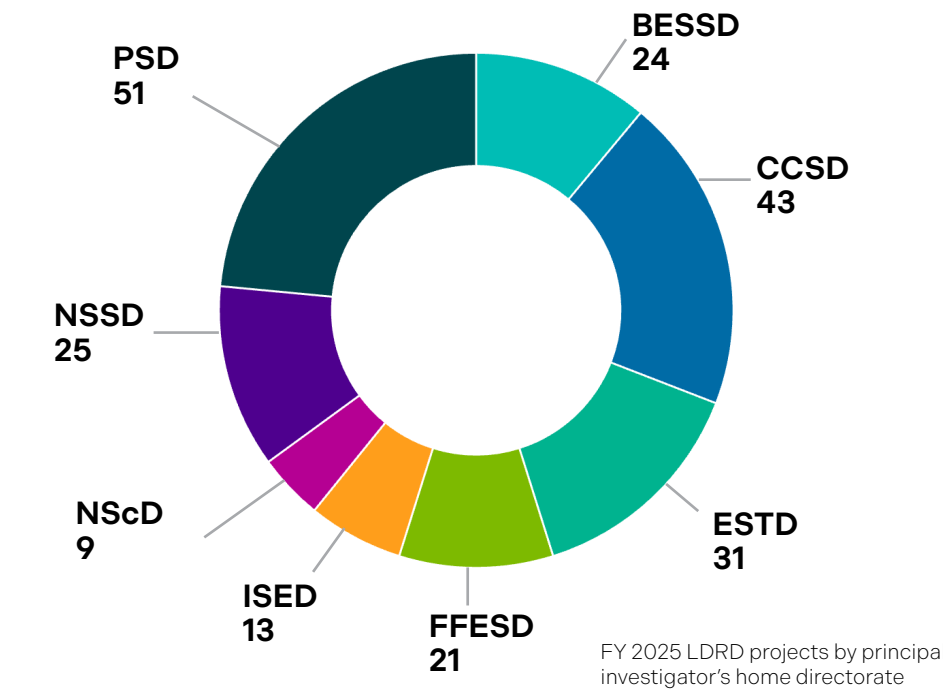
ORNL Science and Technology Development

LDRD emerged from a program initially introduced more than 50 years ago by former ORNL Director Herman Postma to fund exploratory research in “high-risk, high-reward” concepts. Since then, LDRD has evolved to strengthen ORNL’s competitive edge by enabling innovative R&D and supporting strategic investments in research, capabilities, and expertise that position the laboratory for future success.

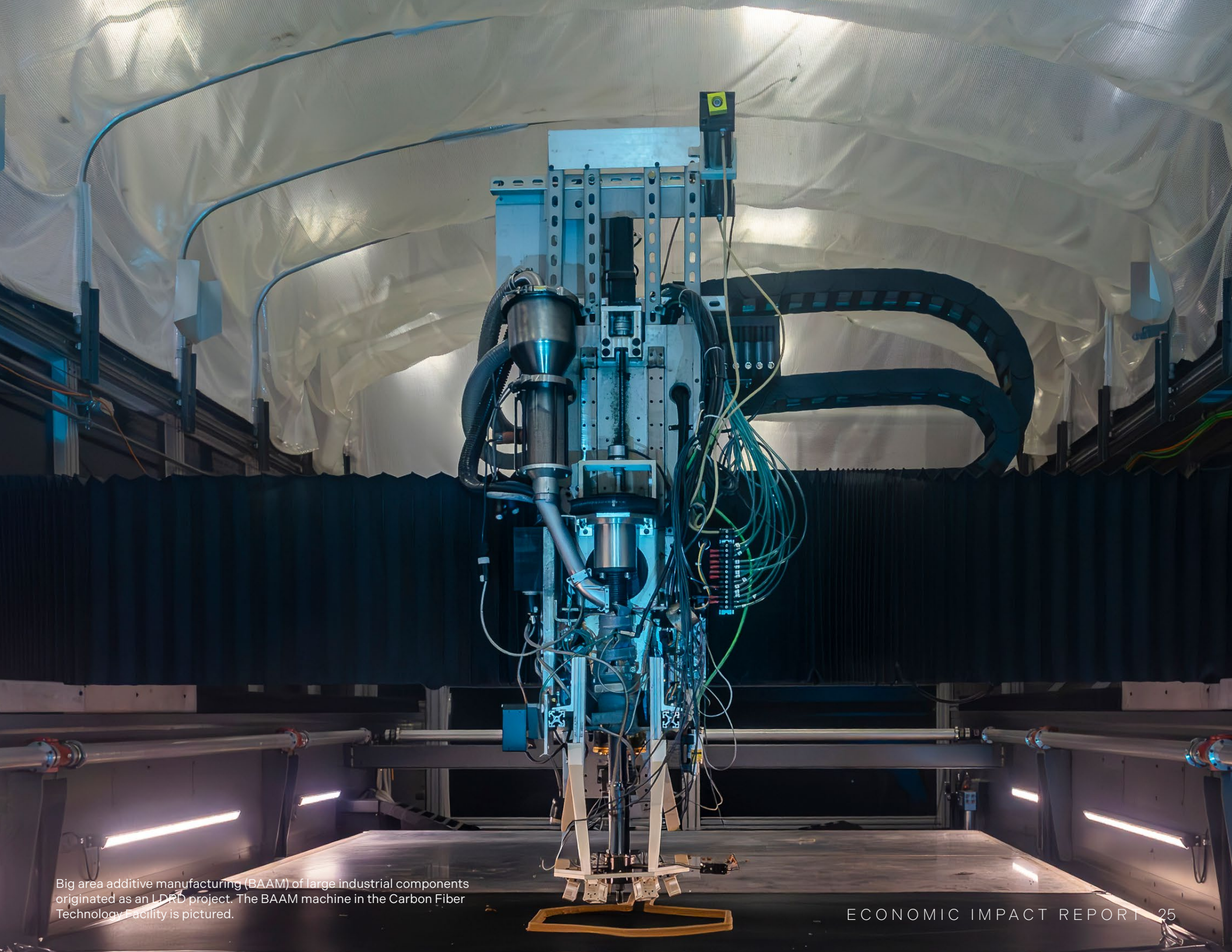
By investing in high-risk, high-value research that might not otherwise receive support, LDRD accelerates breakthroughs in areas that are critical to DOE missions and of strategic importance to the laboratory.

Each year, ORNL funds more than **200 LDRD projects** through

its portfolio of six programs, supporting R&D across science and technology directorates and laboratory initiatives. LDRD is overseen by the laboratory director with strategic leadership by the deputy for science and technology and managed by the Office of Institutional Strategic Planning. All science and technology associate laboratory directors contribute to LDRD strategy and planning, and directorates support operations such as hiring, equipment installation, purchases, and other activities supporting LDRD projects within their mission spaces.



Begun as an exploratory, one-year project funded through LDRD, VIZRAD AR used ORNL’s Virtual Interaction with Physics Enhanced Reality (VIPER) methodology to mathematically model radiation behavior. The technology was licensed to Teletrix, a company specializing in radiation training tools.



Big area additive manufacturing (BAAM) of large industrial components originated as an LDRD project. The BAAM machine in the Carbon Fiber Technology Facility is pictured.

Partnerships

ORNL fuels economic impact by connecting its scientific breakthroughs with industry, academia, and government. With a focus on innovation, ORNL turns research into real-world advancements that boost US competitiveness. ORNL achieves this mission by protecting and licensing intellectual property, collaborating with the private sector and entrepreneurs, and supporting a nationwide innovation ecosystem.

Innovation Crossroads is a DOE Laboratory-Embedded Entrepreneurial Program (LEEP) node based at ORNL. LEEP recruits top entrepreneurial talent through a national call for a 2-year, fully funded fellowship. The program supports founders with early-stage energy start-ups and emerging technologies, helping them advance their innovations and bring them to market.

Innovation Crossroads fellows are embedded for 2 years at ORNL, where they receive mentorship from leading laboratory scientists and access to the world-class capabilities of a national laboratory. LEEP also offers support at the local, regional, and national level, including entrepreneurship training and access to a robust networking ecosystem, helping to overcome the challenges often faced by early-stage energy and manufacturing technology ventures.

Since its launch a decade ago, Innovation Crossroads has supported 51 start-ups that have collectively secured approximately **\$320 million** in follow-on funding, generated more than **\$40 million** in sales revenue, and created more than **340 jobs**.

Half of Innovation Crossroads alumni companies stay in East Tennessee. The successes of Innovation Crossroads companies demonstrate durable venture creation, regional demonstrations with civic and utility partners, and stronger US supply chains, directly supporting DOE’s mission and East Tennessee’s innovation economy. In FY 2025, six new companies were selected and embedded at ORNL as Cohort 2025.



Rajan Kumar, CEO of Ateios Systems and Innovation Crossroads Cohort 2022 fellow, licensed ORNL technology that became the basis for a faster and less energy- and equipment-intensive process for heat curing battery electrodes.



FY 2025



Economic Development and Industrial Partnerships Manager Jesse Smith leads members of the Knoxville Chamber of Commerce on a tour highlighting advanced manufacturing components produced at the facility.

Economic Development

In FY 2025, ORNL assisted the Tennessee Department of Economic and Community Development and the TVA economic development team in securing **\$1.6 billion** in capital investment in the state through six projects.

This investment resulted in more than 1,000 high-paying Tennessee jobs.

By connecting prospective companies to researchers with relevant expertise and ORNL resources, including user facilities, the laboratory’s Economic Development team showcases ORNL as a critical asset to enable growth in American industry.

DOE Programs, User Facilities, and Technical Collaborations

ORNL’s impact is enabled by its extraordinary ecosystem of world-leading user facilities—including four DOE Office of Science facilities and four applied energy facilities—that serve more than **5,000** researchers annually from academia, industry, and government. These facilities empower the scientific community to tackle problems of a scale and complexity that would otherwise be difficult to address.

Oak Ridge Leadership Computing Facility

The Oak Ridge Leadership Computing Facility (OLCF) helps researchers solve some of the world’s most challenging scientific problems through leadership-class high-performance computing and deep expertise in scientific computing. OLCF is home to Frontier, the world’s fastest supercomputer for open science, which supports tightly integrated simulation, data, and AI workflows at unprecedented scale.

In FY 2025, OLCF supported **1,955** unique users through competitive allocation programs that provide access to resources far beyond what is available through conventional computing resources, accelerating discovery while reducing technical risk and development timelines. OLCF-enabled research has improved the safety and performance of nuclear power plants and aircraft, advanced drug and materials development, and informed the design of advanced fusion systems. OLCF also serves as a catalyst for industrial competitiveness. Companies—from start-ups to Fortune 500 firms—use leadership-class computing resources and hands-on expertise

to innovate faster, lower costs, and bring products to market more quickly. In one example, researchers working with GE Aerospace and the University of Melbourne used Frontier to conduct high-fidelity simulations of how microscopic surface degradation affects jet engine turbines, producing insights that can improve fuel efficiency, durability, and next-generation engine design.

OLCF plays a growing role in quantum information science through its Quantum Computing User Program (QCUP), which connects researchers to emerging quantum resources and enables direct comparison of quantum and classical computing approaches. This work supports the development of hybrid computing architectures with future scientific and industrial applications.

Gold-plated components and specialized wiring keep quantum processors operating at temperatures colder than outer space. QCUP provides users with access to state-of-the-art resources for discovery and innovation.



FY 2025, QCUP

268
Users

97
Publications

84
Projects

Although many wild plants have adapted to survive drought, most cultivated crops tend to be vulnerable to such conditions. In 2023, the United States experienced significant crop losses, with Texas alone reporting \$4.8 billion in damages, of which nearly 80 percent were attributed to drought, according to the American Farm Bureau Federation. To prevent losses of crops to drought and other seasonal hardships, researchers from Budapest, Hungary, and ORNL studied a plant known to endure periods of little to no rain. *Ctenanthe setosa*, also called the Never Never plant, can survive up to 60 days without water and recover once rehydrated, making it the perfect candidate for this study conducted in part at ORNL. Beyond its ability to survive a drought, the Never Never plant possesses a subsequent recovery mechanism that the team studied using the Extended Q-Range Small-Angle Neutron Scattering Diffractometer (EQ-SANS), located at SNS.

Neutron scientist Gergely Nagy holds a material sample to be studied using neutron scattering.



Spallation Neutron Source

The Spallation Neutron Source (SNS) at ORNL is the world’s most powerful pulsed neutron source, providing researchers from industry, academia, and government with unparalleled capabilities to probe the structure and dynamics of materials. By enabling discoveries that directly inform product development, manufacturing processes, and materials performance, SNS plays a critical role in US industrial competitiveness and innovation.

In FY 2025, SNS supported **1,059** unique users, representing academia, government, and industry. Fifty-eight experiments conducted at SNS in FY 2025 included industrial funding, collaborations, or other partnerships. Industrial users range from small and mid-sized enterprises to major multinational corporations, spanning sectors such as manufacturing, aerospace, nuclear energy, oil and gas, and pharmaceuticals. SNS experiments are integrated with ORNL scientific expertise, providing companies with not only access to world-class instruments but also to specialized staff who help translate experimental results into actionable engineering and commercial insights.

High Flux Isotope Reactor

The High Flux Isotope Reactor (HFIR) is the most powerful reactor-based source of neutrons in the United States. Its capabilities enable the exploration of the molecular and magnetic structures and behaviors of materials—including high-temperature superconductors, polymers, metals, and biological samples—and, uniquely, the production of high-value isotopes at nationally significant scale, delivering an outsized impact for US security and industry. In FY 2025, HFIR hosted nearly **400** users from academia, government, and industry. Fourteen experiments conducted at HFIR in FY 2025 included industrial funding, collaborations, or other partnerships.

HFIR’s neutron scattering instruments provide capabilities that complement those of SNS, allowing researchers to study materials using both continuous and pulsed neutron techniques. Together, the two facilities offer a comprehensive suite of neutron-based tools, enabling users to select the approach best suited to their scientific or industrial challenge and, in many cases, to combine measurements across facilities for deeper insight. Industrial users leverage HFIR to investigate complex, heterogeneous systems that are difficult to characterize using other methods.



Researcher Masaaki Matsuda and postdoctorate associate Kaleb Burrage work with the HB-1 triple-axis spectrometer, which uses polarized neutrons to study spin and lattice dynamics in advanced materials.



America’s national security relies in part on the US Navy’s nuclear-powered submarines, which can operate more than 800 feet below the ocean’s surface. The crew’s survival depends on the ability of the sub’s steel hull—and its welded joints—to withstand immense water pressures that can exceed 50,000 pounds per square foot. The long-term integrity of the welded joints, or seams, where the plates meet is the subject of neutron experiments at ORNL. Neutrons can reveal weld quality through techniques such as neutron diffraction and neutron radiography, which provide insights into residual stresses and internal defects.

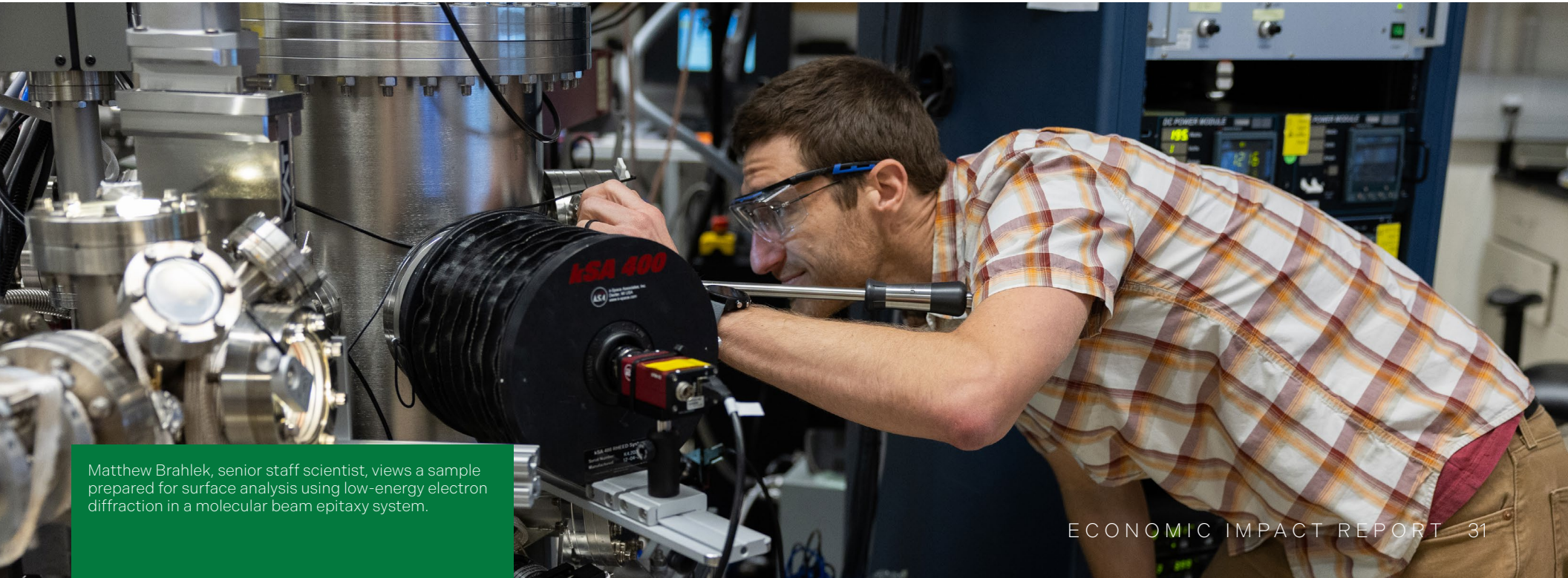
Center for Nanophase Materials Sciences

The Center for Nanophase Materials Sciences (CNMS) is a DOE Office of Science user facility that enables discovery and innovation at the nanoscale, where materials can be engineered to deliver new and enhanced functionality. By integrating advanced synthesis, characterization, theory, and nanofabrication capabilities, CNMS supports research critical to emerging technologies in energy, electronics, quantum materials, and advanced manufacturing.

In FY 2025, CNMS hosted **957** unique users, with 38 percent drawn from ORNL and UT Knoxville. This strong local user base, in conjunction with a thriving staff-led research program, supports deep, sustained collaboration while complementing a broader national user community from academia, industry, and government.

Together, these users leverage CNMS capabilities to design and understand materials with tailored electronic, optical, magnetic, and chemical properties—advancing applications such as energy storage and conversion, catalysis, sensing, and nanoelectronics.

Through its tightly integrated experimental and computational approach, CNMS accelerates the transition from fundamental discovery to application-relevant insight, helping reduce technical risk and support downstream development. By advancing nanoscale science with clear relevance to emerging industries, CNMS strengthens the nation’s materials innovation ecosystem and supports US competitiveness.



Matthew Brahlek, senior staff scientist, views a sample prepared for surface analysis using low-energy electron diffraction in a molecular beam epitaxy system.

Building Technologies Research and Integration Center

The Building Technologies Research and Integration Center (BTRIC), established in 1993, is the only DOE user facility dedicated to performing research and development for the deployment of advanced building technologies. BTRIC provides industry partners with real-world testing, modeling, and validation capabilities to support product development and market adoption.

BTRIC is supported by the Building Technologies Office within DOE’s Office of Critical Minerals and Energy Innovation (CMEI).

In 2025, BTRIC maintained **70** active agreements, including CRADAs, SPPs, and user agreements. Through its Technology Collaboration Program, BTRIC supported 24 active industry projects. Partners provided a 20 percent cost share, demonstrating strong private-sector investment and demand for the facility’s capabilities.



ORNL researcher Zoriana Demchuk demonstrates how polymer research technologies can enhance building performance and durability.

BTRIC scientists used an AI framework and the ORNL-developed simulation tool ThermoPI to develop foam insulation for buildings that delivers thermal performance more than 30 percent higher than current commercially available polyisocyanurate (PIR)-based foam insulation. The new PIR foam formulation enabled the achievement of an initial R-value of 8.3 per inch, which is the highest yet for this type of insulation.

Carbon Fiber Technology Facility

The Carbon Fiber Technology Facility (CFTF) is the nation’s only facility for carbon fiber science and technology innovation. Established in 2013 by DOE’s Advanced Materials and Manufacturing Technologies Office (AMMTO), this user facility supports the development and scale-up of advanced carbon fiber and related materials critical to energy, transportation, and national security applications. By bridging laboratory research and industrial production, CFTF accelerates commercialization and strengthens domestic materials supply chains.

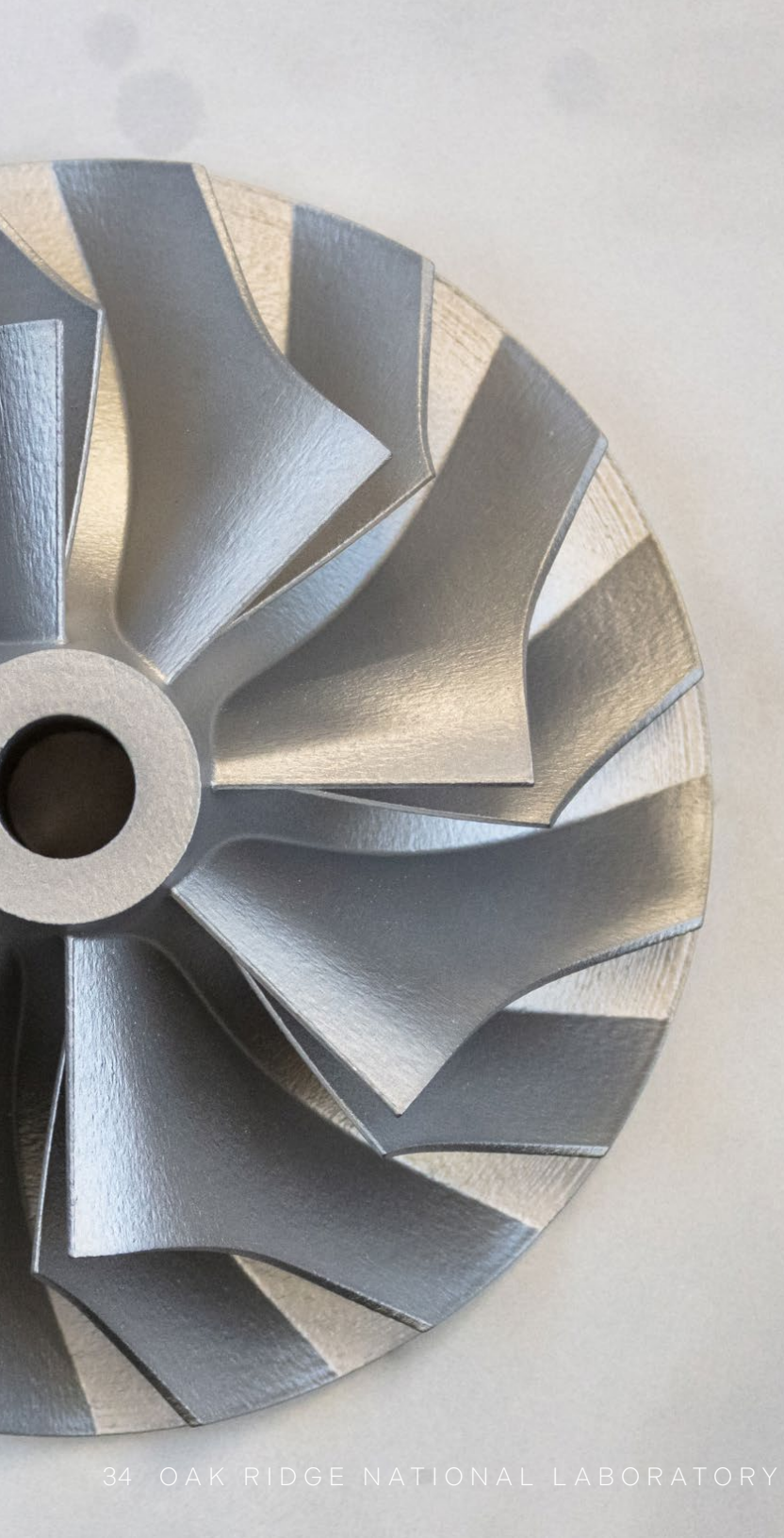
In 2025, a long-running collaboration with ACP Technologies advanced petroleum-derived pitch from laboratory development to pilot-scale manufacturing. Pitch is a precursor for high-value carbon products, including graphite and carbon fiber, that underpin supply chains for energy storage, transportation, aerospace, and defense.

Through laboratory-scale fiber spinning research and pilot demonstrations at CFTF, the team refined isotropic and mesophase pitch formulations now produced at a new 75-pound-per-hour continuous pilot facility, with a commercial-scale plant under development.

Such DOE-supported work at CFTF reduces technical and financial risk for industry partners, expands domestic production of critical materials, and enhances US manufacturing competitiveness and economic security.



Line technician Terry Wyrick checks the feed in the bobbin creel station at the CFTF.



Manufacturing Demonstration Facility

The Manufacturing Demonstration Facility (MDF) serves as a national hub for advancing and scaling next-generation manufacturing technologies, with a strong emphasis on industry engagement and rapid technology transition. MDF enables companies to de-risk advanced manufacturing processes, integrate digital tools, and move innovations from laboratory concepts to production-ready solutions.

Through MDF, ORNL offers distinctive world-leading capabilities in manufacturing and materials research technologies and characterization facilities. MDF provides a collaborative,

shared infrastructure to help industry adopt energy-efficient, rapid, and flexible manufacturing technologies to lower production costs, and create new products and opportunities for high-paying jobs.

In 2025, MDF hosted **4,082** visitors representing **2,551** companies, reflecting broad participation from manufacturers ranging from small and mid-sized enterprises to major industrial firms. MDF and CFTF jointly supported 68 active industry projects through user agreements and CRADAs, underscoring MDF's central role in strengthening US manufacturing competitiveness.

MDF's ecosystem model has catalyzed real-world industrial growth. For example, early additive manufacturing work at MDF helped launch the start-up Volunteer Aerospace, where engineers adapted large-format 3D printing for aluminum aerospace components in collaboration with ORNL and partners. That venture evolved into Beehive Industries, which now produces precision jet engine components for aerospace and defense (left image) at a new \$4 million 60,000-square-foot facility, with anticipated employment exceeding 150 high-technology jobs. MDF continues to provide technical support and collaboration opportunities for Beehive and other manufacturers, demonstrating how facility access can help grow regional supply chains and technology-driven enterprises.

National Transportation Research Center

Established in 2000, the National Transportation Research Center (NTRC), is DOE's only user facility focused on performing early-stage research and development in transportation technologies. NTRC provides a collaborative research environment for advancing transportation technologies, systems, and infrastructure across energy, mobility, and security domains.

NTRC is supported by the Transportation Technologies Office within DOE's CMEI.

In 2025, NTRC maintained **67** active agreements, including 6 user agreements, 15 CRADAs, and 46 SPPs. These partnerships reflect strong engagement with public and private sectors to accelerate innovation in transportation technologies.

R&D Associate Lauren Heinrich and Hybrid Manufacturing Engineer Tyler Crisp work on manufacturing a conformal cooling channel injection mold for a technical collaboration.



Researchers at NTRC, in collaboration with BorgWarner, developed a rotary transformer-based wireless excitation system (top image) for electric motors that eliminates the need for rare earth magnets and high-maintenance brushes. The system demonstrated 92 to 95 percent efficiency at high speeds and temperatures. It also increased power density by up to 25 percent, while enhancing supply chain security and reducing costs.

Workforce and Community Impact

A strong workforce is essential to sustaining innovation, economic growth, and community prosperity. ORNL invests across the full talent pipeline, from K-12 STEM engagement to community college partnerships, apprenticeships, internships, undergraduate and graduate research experiences, postdoctoral training, and industry-aligned professional development. These efforts prepare individuals not only for careers in science and technology but also for skilled technical trades, operations, manufacturing, cybersecurity, and other high-demand fields that support the broader innovation ecosystem.

Working closely with regional universities, community colleges, industry partners, and workforce organizations, ORNL helps align education and training with evolving labor market needs. Through hands-on learning, internships, mentoring, and reskilling initiatives, the laboratory expands access to high-wage career pathways while strengthening the regional and national workforce needed to support emerging industries. ORNL is preparing the workforce through its education and training programs.

Participation in ORNL’s educational programs reached a record **1,050 students** and faculty representing more than **200 academic institutions** in FY 2025, supported by **770 mentors** across **59 divisions**.

Alumni of ORNL’s internship programs go on to work in every state and, on average, earn salaries higher than the national average.



Intern Veronica Montgomery and senior R&D staff member Oscar Martinez conduct a drop test by intentionally dropping a representative radioactive material shipping package to simulate an accident and using digital image correlation to measure impact deceleration loads.

Success after ORNL

Approximately **250 interns** from 2021 to 2026 were hired as ORNL staff between 2022 and 2026.

Former intern Allie Davis now works as an Operations Technician at ORNL.



Researchers Yadu Sasikumar and Rinkle Juneja and Onboarding and Relocation Specialist Sabine Curry participate in the kickoff event for the annual, employee-led ORNL Gives campaign.

Giving back to the community

From fundraising events, in-kind donation drives, volunteer opportunities, and payroll deduction options, employees are empowered to support the community through the annual ORNL Gives campaign.

During the 2025 ORNL Gives campaign, **\$1,066,820** was raised to support **153 charities**.

Employees registered through Volunteer East Tennessee recorded over **1,745 hours**, representing an **estimated value of \$53,309**.



Staff members support the Second Harvest Food Drive for Hunger Awareness event.

Community Engagement and K-12 STEM

ORNL’s commitment to regional vitality extends beyond scientific discovery to strengthening communities and inspiring the next generation of innovators. Through corporate giving, employee volunteerism, and targeted STEM outreach, ORNL supports nonprofit organizations, educational institutions, and civic initiatives across East Tennessee. By investing in hands-on science education, mentoring, and community partnerships, ORNL helps cultivate future talent while fostering a thriving, resilient regional economy.

K-12 STEM

ORNL’s K-12 education programs help foster an early interest in science by providing scholarly competitions, summer education workshops, science camps, and various research participation opportunities. The laboratory’s STEM outreach activities reached **more than 20,000** K-12 students in FY 2025. In addition, 185 local teachers participated in ORNL-led professional development sessions, embedding current ORNL science into classroom practice. Across internships and educational programs, ORNL reached 77 schools in 12 Tennessee districts and engaged students across 12 states.

The ORNL Traveling Science Fair invites guests of all ages to learn more about science and the importance of the ORNL research directly from scientists while touring carnival-style, interactive mobile exhibits that describe various fields of research and areas of future career opportunities. The exhibits reached more than 6,000 students across the City of Oak Ridge and Knox, Hamblen, and Morgan counties in FY 2025, delivering hands-on demonstrations aligned with DOE mission topics.



Science Accelerating Growth and Engagement in STEM (SAGE) summer camp students tour the Plant Science Laboratory and Aquatics Laboratory.

Tours and Visitors

ORNL is a key stop on the DOE Public Facilities Bus Tour, which explores the three sites of the Manhattan Project in Oak Ridge. The 2025 season welcomed **1,913 guests** across more than 60 tours.

In FY 2025, ORNL welcomed over **10,000 unique visitors** to its main campus. Visitors to ORNL generate meaningful economic activity in Anderson and Knox counties and the surrounding region. Their spending on lodging, meals, transportation, and local services creates jobs and income for businesses that may have no direct relationship with the laboratory itself.

Sources of Visitors

User facilities: Users of ORNL's world-class user facilities travel from across the globe to conduct research using the laboratory's resources. Learn more about user facilities in pages 26–33.

Industry visits: ORNL supports regional and statewide business attraction and retention by hosting industry visitors at key facilities and connecting them with relevant researchers. These engagements demonstrate ORNL's value as a critical resource for companies considering locating or expanding in Tennessee, particularly those working within the laboratory's priority science and technology focus areas.

Conferences: ORNL hosts gatherings on-site in the form of user forums, conferences, hackathons, seminars, technical workshops, and more.

Visiting scholars: ORNL also hosts visiting scholars and researchers every year. The nation's best and brightest come to ORNL to learn about, participate in, and connect with its research.



Building Materials, Systems, and Integration Section Head Diana Hun shares polymer research technologies with industry executives.



Environmental toxicologist and quantitative ecologist Louise Stevenson speaks with undergraduate interns as they tour the Aquatics Lab.



Laboratory Director Stephen Streiffer watches as Under Secretary for Science and Genesis Mission Director Darío Gil signs a computing cabinet.

Emerging Economic Opportunities

Sustained economic growth depends not only on today’s research infrastructure but also on strategic investments in next-generation facilities. ORNL’s upcoming major projects—including the **Second Target Station (STS)** at SNS, the **Stable Isotope Production and Research Center (SIPRC)**, and next-generation supercomputing systems such as **Discovery** and **Lux**—will expand US scientific leadership while catalyzing new industry partnerships, supply chains, and workforce development opportunities. Together, these facilities represent long-term investments in national competitiveness across energy, healthcare, advanced manufacturing, and security.

Facilities Under Development

Now in development at ORNL, **STS** will create a third, world-leading neutron source to complement SNS and HFIR. Designed to deliver transformative new capabilities for materials research, STS will provide performance gains of up to 100 to 1,000 times beyond current instruments, enabling experiments not possible anywhere else in the world. The facility will accelerate discovery in critical fields such as quantum materials, polymers and soft materials, biology and life sciences, energy materials, and structural materials—areas directly tied to advanced manufacturing, energy, computing, and national security. By expanding US leadership in neutron science and supporting thousands of academic, industrial, and government users, STS will strengthen domestic innovation capacity and help drive next-generation technologies that underpin economic growth.

SIPRC, now under construction at ORNL, will significantly expand the nation’s ability to enrich stable isotopes for medical,

industrial, research, and national security applications. Designed as a 64,000-square-foot facility with multiple production lines and room for future expansion, SIPRC will house advanced isotope separation technologies developed through more than a decade of research, prototyping, and demonstration activities. Among these is electromagnetic isotope separation, which enables enrichment of isotopes across the periodic table and opens new opportunities for both established and emerging applications.

SIPRC will help reduce US dependence on foreign suppliers for critical isotopes while enabling multiple simultaneous production campaigns to meet growing demand. With initial operations targeted for 2030 and full completion expected by 2032, SIPRC positions ORNL to strengthen domestic isotope independence and support expanding markets in medical diagnostics, disease treatment, advanced materials, and national security.



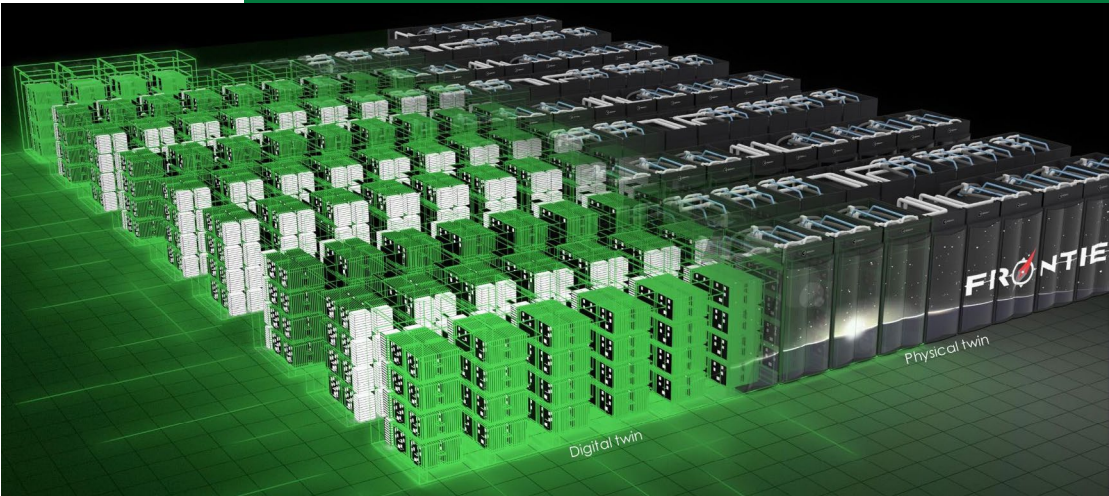
SNS, STS, and CNMS are three world-class facilities advancing materials research by providing powerful neutron and nanoscale characterization tools and driving innovation in energy, security, and manufacturing.

Discovery and Lux: Advancing AI and Scientific Computing Leadership

ORNL’s next-generation supercomputing systems—Discovery and the forthcoming Lux AI cluster—will significantly expand DOE capacity for AI and data-intensive science. The AMD-accelerated and HPE-built Discovery supercomputer coming online in 2028 will provide a powerful platform optimized for AI-driven research and large-scale data analytics, complementing Frontier’s exascale simulation capabilities. Lux, scheduled for deployment in 2026 under an innovative collaboration with AMD, will further expand DOE’s near-term AI capacity and accelerate progress on the Genesis Mission’s national science and technology challenges, including fusion and fission energy, materials discovery, quantum systems, advanced manufacturing, and grid resilience. Built on AMD’s next-generation GPUs, Lux will deliver a secure, open, and efficient AI software stack to support large-scale model training and distributed inference across the DOE laboratory system. Together, Discovery and Lux strengthen ORNL’s leadership in AI-enabled science, positioning the region at the forefront of advanced computing innovation and reinforcing US competitiveness in rapidly growing AI-driven industries.



An ORNL-led team received an R&D 100 Award for their work on ExaDigiT, a first-of-its-kind integrated framework that allows up-to-the-second virtual representation of computing centers for maximum performance. The software, developed in partnership with HPE, is an improvement on previous modeling systems that offered small-scale, narrower models restricted to single perspectives such as power only or cooling only.



High-Impact Industries

Artificial Intelligence: Powering the Next Era of Discovery and Competitiveness

AI is reshaping how science is conducted and how industries innovate, enabling faster insight from massive datasets, optimization of complex systems, and accelerated technology development. ORNL has emerged as a national leader in AI for science, combining leadership-class computing, interdisciplinary expertise, and strong industry partnerships to translate AI advances into economic impact.

At ORNL, AI supports high-value applications across healthcare, materials science, advanced manufacturing, energy systems, and cybersecurity. Machine learning models accelerate materials discovery, improve manufacturing processes, strengthen grid

resilience, and inform fusion system design. Through the Center for Artificial Intelligence Security Research, ORNL also advances secure and trustworthy AI practices critical to national infrastructure.

ORNL’s AI capabilities are tightly integrated with its high-performance computing leadership. Frontier provides exascale computing power for AI-driven simulation and data analytics, and next-generation systems such as Lux and Discovery will further expand DOE’s AI capacity. These platforms enable tightly coupled AI–simulation workflows that reduce technical risk, shorten development timelines, and unlock new scientific capabilities.

ORNL is a key contributor to the DOE Genesis Mission, a national initiative uniting the DOE laboratories to deploy AI across scientific discovery, energy innovation, and national security. As part of the Genesis Mission, ORNL is leading development of the American Science Cloud, a secure, interconnected computing and data ecosystem designed to link AI, supercomputing, and experimental facilities across the DOE complex. This infrastructure will create a unified platform for AI-enabled discovery at national scale.

The economic opportunity is substantial. According to UN Trade and Development, the global AI market is expected to grow from \$189 billion in 2023 to \$4.8 trillion by 2033, representing a 25-fold increase in just 10 years. By advancing AI infrastructure, developing secure and scalable tools, and partnering with industry to apply them, ORNL strengthens US competitiveness in one of the fastest-growing sectors of the global economy.

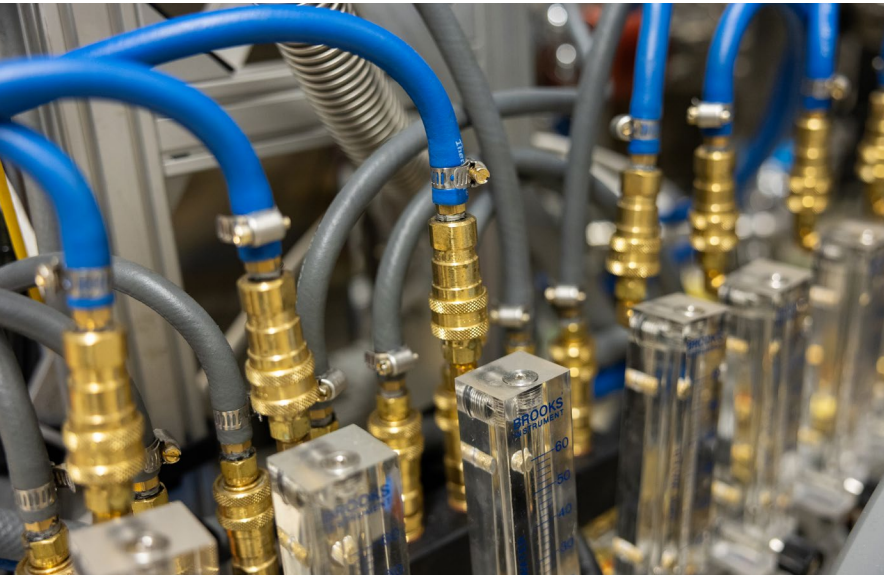
Researchers Renata Kimpara and Namwon Kim examine data simulating the use of new software for building energy management.

Quantum Technology: Accelerating the Next Frontier of Innovation

Quantum science and technology are rapidly transitioning from foundation research to real-world applications with the potential to transform computing, communication, chemistry, sensing, energy systems, and materials discovery. ORNL has built on decades of foundational work to position itself at the forefront of this second quantum revolution, anticipating and developing the infrastructure, expertise, and partnerships needed to turn quantum promise into economic impact.

At ORNL, investments in quantum research span advanced computing, materials discovery, precise sensing, and secure networking—areas that are increasingly relevant to industry and national challenges. The laboratory’s strategic focus and early institutional support helped establish capabilities, such as a quantum Internet testbed and on-site quantum computing systems, and cultivated expertise in controlling and manipulating quantum systems that go beyond what traditional computing can achieve.

ORNL’s quantum technologies support industry in multiple innovative ways, from improving computational approaches for complex problems to enabling quantum-enhanced sensors and secure communication systems that could bolster applications in logistics, energy system optimization and security, intelligent transportation systems, secure digital advanced manufacturing, and sectors such as advanced materials, energy, defense, and telecommunications. This engagement helps companies explore quantum-relevant tools and understand how emerging quantum capabilities can accelerate product and process innovation.



The economic landscape for quantum technology underscores this momentum. Research by McKinsey forecasts that the three main quantum technologies—computing, communications, and sensing—could create up to **\$2.7 trillion** in revenue worldwide by 2035.

As industry investments broaden and quantum systems evolve, ORNL’s deep computational and experimental ecosystem provides a unique platform for industry, academia, and government to collaborate on advancing quantum solutions. By connecting cutting-edge research with practical application pathways, ORNL is helping unlock quantum-enabled economic opportunities across US innovation sectors.



Quantum Computing User Program

ORNL is home to the nation's first quantum computer access program, which connects researchers with industry partners to employ state-of-the-art commercial quantum computing systems for applied research and discovery.



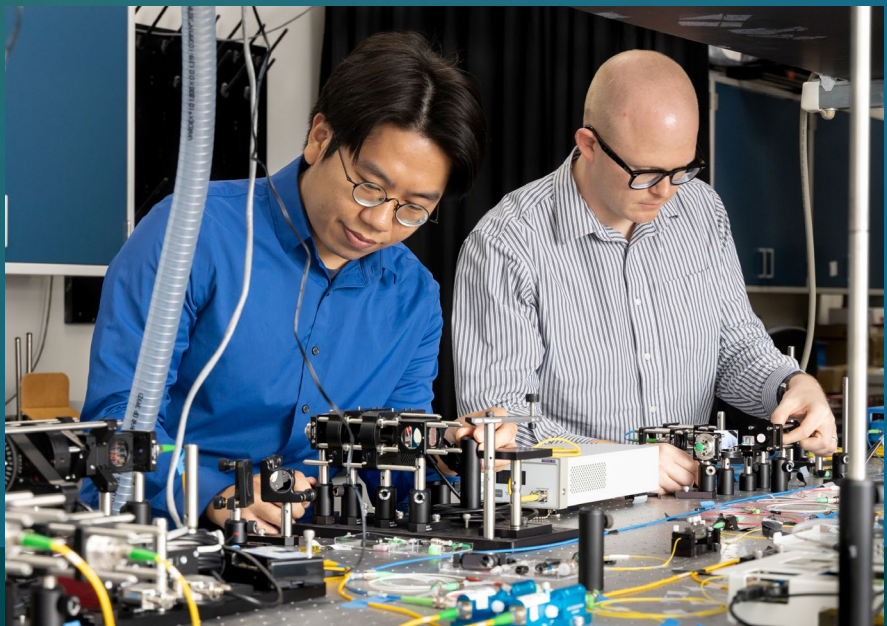
On-Site Quantum Systems Integration

ORNL has partnerships with multiple quantum computing companies to deploy on-premises commercial quantum computing platforms to enable application benchmarking, algorithm development, and industry collaboration in a secure research environment. ORNL is also focusing efforts on integrating commercial quantum computers with its classical high-performance computing systems.



Quantum Science Center (QSC)

ORNL is the headquarters for the QSC, a DOE-funded National Quantum Information Science Research Center creating the first fault-tolerant ecosystem for hybrid quantum-high-performance computing by uniting national laboratories, academic institutions, and industry partners.



Quantum Network Collaboration with EPB and IonQ

ORNL is a partner with local industry on the development of the nation's first industry-led commercial quantum network to help secure the power grid and other critical infrastructure from cyberattacks while establishing East Tennessee as a nationally recognized center for quantum networking research, deployment, and private-sector growth.

Nuclear Energy: A Catalyst for Emerging Economic Opportunity

With energy demand expected to surge in the coming years, federally funded research investments are critical in the march toward more abundant and affordable energy. Often the first step in nuclear energy innovations, ORNL’s scientific capabilities and experts play a key role in facilitating new industry investments in advancing nuclear reactor designs and fusion devices. These investments in science, infrastructure, and workforce development are driving long-term economic opportunity.

To meet this growing energy demand, nuclear energy is an important component of the country’s energy, national security, and advanced manufacturing strategies—and Oak Ridge is at the center of this effort. Building on decades of leadership in nuclear science, materials, and fuel-cycle innovation, the region is now translating research strength into large-scale private investment and commercial deployment.

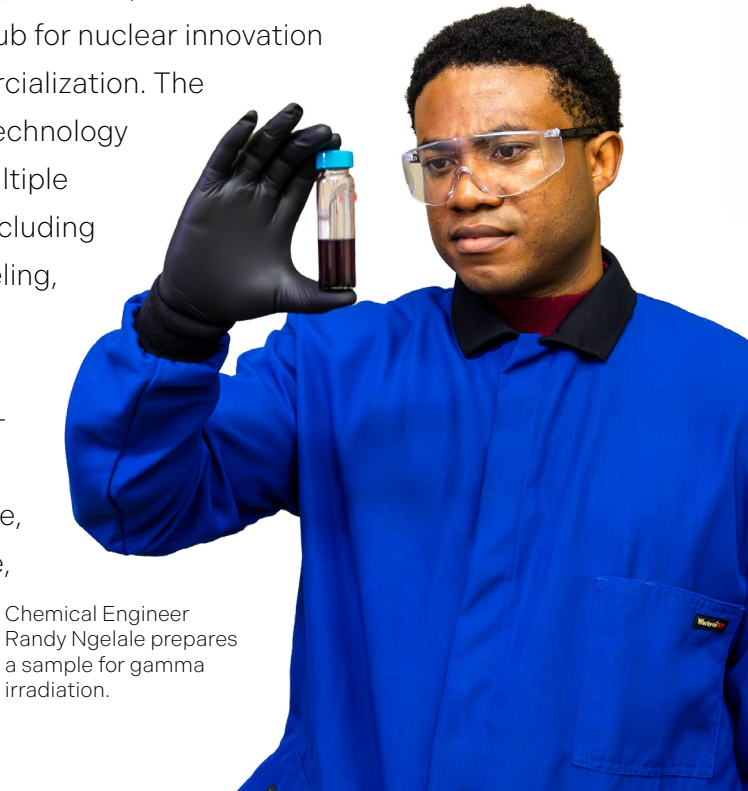
Over the past several years, Oak Ridge has attracted more than **\$10 billion** in announced nuclear-related investments, spanning the full spectrum of the nuclear value chain: uranium enrichment, advanced fuel fabrication, reactor manufacturing, recycling, and next-generation fission and fusion technologies. These investments reflect growing demand for reliable baseload power and a renewed focus on domestic nuclear supply chains.

Major announcements include multibillion-dollar enrichment and fuel-cycle facilities from the nuclear and technology industries, positioning the region as a national hub for advanced uranium technologies. At the same time, other pivotal investments underscore Oak Ridge’s

expanding role in advanced fuel manufacturing and recycling—critical capabilities for supporting small modular reactors, microreactors, and future reactor fleets.

Reactor and system developers are also choosing Oak Ridge as a launch point. Projects led by Kairos Power, Radiant Industries, and TVA highlight the region’s importance in demonstrating and manufacturing next-generation nuclear systems, while Type One Energy’s and Kyoto Fusioneering’s collaboration with ORNL signals momentum toward fusion energy. Together, these efforts represent a shift from conceptual development to early deployment, manufacturing, and commercialization.

Research conducted at ORNL is crucial to industry partners looking to demonstrate their novel reactor and fusion device designs. Supported by long-standing scientific expertise, world-class facilities, and capabilities found only at ORNL, East Tennessee has quickly become the hub for nuclear innovation in the path to commercialization. The laboratory supports technology maturation across multiple science disciplines, including materials, fuels, modeling, safety, and systems integration. This deep technical foundation—combined with an experienced workforce, existing infrastructure, and a growing



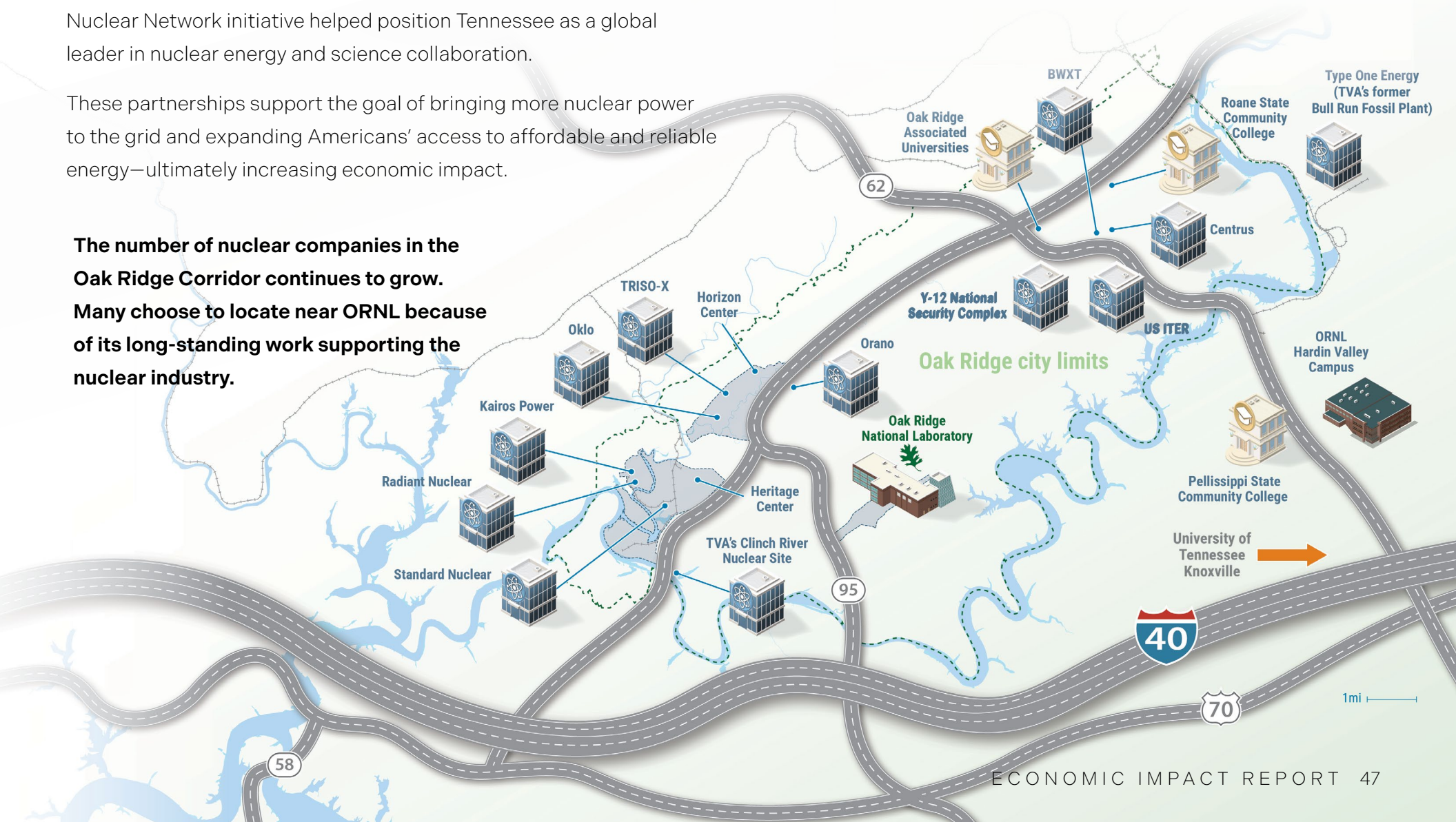
Chemical Engineer Randy Ngelale prepares a sample for gamma irradiation.

industrial ecosystem—has made Oak Ridge a natural destination for nuclear investment.

ORNL is also facilitating partnerships among key stakeholders, who are taking this foundational knowledge to create the economics necessary to build an energy ecosystem along the Oak Ridge Corridor. Partnerships with UT Knoxville’s nuclear engineering program, TVA, the East Tennessee Economic Council, and the Governor’s Tennessee Nuclear Network initiative helped position Tennessee as a global leader in nuclear energy and science collaboration.

These partnerships support the goal of bringing more nuclear power to the grid and expanding Americans’ access to affordable and reliable energy—ultimately increasing economic impact.

The number of nuclear companies in the Oak Ridge Corridor continues to grow. Many choose to locate near ORNL because of its long-standing work supporting the nuclear industry.



Radiopharmaceuticals: Growing Precision Medicine and Regional Opportunity

Radiopharmaceuticals—radioactive compounds used for diagnosis and treatment of disease, particularly cancer—are emerging as a major growth area in precision medicine. These agents enable clinicians to visualize disease with high sensitivity through advanced nuclear imaging techniques and deliver targeted therapy that can improve outcomes while reducing side effects compared with conventional treatments. The global radiopharmaceuticals market is expected to grow significantly over the coming decade, driven by rising incidence of cancer and chronic disease, broader adoption of advanced imaging, and expanding clinical use of targeted therapeutic isotopes.

East Tennessee, anchored by ORNL and UT, is strategically positioned to become a national hub for nuclear medicine and

radiopharmaceutical innovation. ORNL is one of the oldest producers of medical isotopes in the nation; it first shipped a medical isotope, carbon-14, to a St. Louis hospital in 1946. Today, the laboratory supplies critical materials such as actinium-225 for clinical research and partners with regional institutions to advance next-generation molecules and delivery methods. Clinicians in the region are already expanding the use of advanced nuclear imaging and therapeutic radiopharmaceuticals such as lutetium-177 treatments for prostate and neuroendocrine tumors, reflecting broader clinical adoption.

Achieving this potential will require not only scientific and manufacturing capacity but also development of a specialized workforce—including radiopharmacists, medical physicists, dosimetrists, and technicians—integrated across research, clinical, and production environments. With its deep expertise in isotopes, collaborative research ecosystem, and proximity to clinical partners,

ORNL is playing a central role in bridging discovery and translation, helping establish East Tennessee as a growth corridor for nuclear medicine innovation and economic opportunity.

Building the Nuclear and Radiopharmaceutical Workforce

ORNL is expanding training pathways and strengthening partnerships with regional institutions—including Pellissippi State Community College and Roane State Community College—to develop a skilled nuclear workforce.

UT–Oak Ridge Innovation Institute’s Radiopharmaceutical Therapies Convergent Initiative brings ORNL and the university together to advance interdisciplinary research and workforce development that bridges nuclear science and biomedical innovation, strengthening the regional talent pipeline for radiopharmaceutical careers.



R&D Radiochemist Pavithra Kankanamalage weighs resin to pack a column that will later be used to separate radioisotopes.

Some of the medical isotopes produced at ORNL



Actinium-225

Produced at ORNL and currently in clinical trials for targeted radiotherapy cancer treatments, enabling highly precise tumor targeting.



Radium-224

Produced at ORNL, radium-224 is used in generator systems that produce lead-212, supporting next-generation targeted alpha therapies under clinical evaluation.



Xenon-129

Primarily used in hyperpolarized MRIs to image lung ventilation and gas exchange. Because it is not radioactive, it can be used repeatedly to monitor lung function over the course of treatment.



Actinium-227

Produced at ORNL and supplied to Bayer, actinium-227 is used to produce radium-223, the active ingredient in Xofigo, a therapy for metastatic castration-resistant prostate cancer with symptomatic bone metastases.



Tungsten-188

Produced at ORNL, tungsten-188 is used in generator systems that produce rhenium-188, supporting targeted radiotherapy research and clinical applications for cancer treatment.



Acronyms

AMMTO—Advanced Materials and Manufacturing Technologies Office

B—billion

BAAM—big area additive manufacturing

BESSD—Biological and Environmental Systems Science Directorate

BTRIC—Building Technologies Research and Integration Center

CCSD—Computing and Computational Sciences Directorate

CFTF—Carbon Fiber Technology Facility

CMC—ceramic matrix composite

CMEI—Office of Critical Minerals and Energy Innovation

CNMS—Center for Nanophase Materials Sciences

CRADA—Cooperative Research and Development Agreement

DOE—Department of Energy

ESTD—Energy Science and Technology Directorate

FFESD—Fusion and Fission Energy and Science Directorate

FY—fiscal year

GDP—Gross Domestic Product

GRID-C—Grid Research Innovation and Development Center

HFIR—High Flux Isotope Reactor

IMPLAN—IMpact analysis for PLANning

I-O—input-output

ISED—Isotope Science and Enrichment Directorate

K—thousand

LDRD—Laboratory Directed Research and Development

LEEP—Laboratory-Embedded Entrepreneurial Program

M—million

MDF—Manufacturing Demonstration Facility

MFP—multifactor productivity

MRIO—multiregional input-output

MSA—metropolitan statistical area

NScD—Neutron Sciences Directorate

NSSD—National Security Sciences Directorate

NTRC—National Transportation Research Center

OLCF—Oak Ridge Leadership Computing Facility

ORNL—Oak Ridge National Laboratory

PIR—polyisocyanurate

PSD—Physical Sciences Directorate

QCUP—Quantum Computing User Program

QSC—Quantum Science Center

R&D—research and development

SAM—social accounting matrix

SIPRC—Stable Isotope Production and Research Center

SNS—Spallation Neutron Source

SPP—Strategic Partnership Project, formerly known as “Work for Others” (WFO)

STEM—science, technology, engineering, and mathematics

STS—Second Target Station

TFP—total factor productivity

TN—Tennessee

TVA—Tennessee Valley Authority

US—United States

UT—University of Tennessee

Appendix A: Definitions

Average annual wage—The mean total compensation paid to workers over a full calendar year, calculated by dividing the total wages earned in a region or sector by the number of employees. It serves as a benchmark for comparing earnings across industries, occupations, or geographic areas.

Capital expenditure—Funds spent by an organization to acquire, upgrade, or maintain long-term physical assets such as buildings, equipment, or infrastructure. These investments are typically expected to generate value over multiple years and are treated differently from day-to-day operating expenses in accounting.

Cooperative Research and Development Agreement (CRADA)—A formal legal arrangement between a US federal laboratory and one or more external partners, such as private companies, universities, or state agencies, to collaborate on research.

Direct impacts—The immediate, first-order economic effects resulting from a specific activity or spending event. For example, hiring staff or purchasing supplies directly tied to a project counts as a direct impact because it represents the initial injection of economic activity.

Economic impact—The overall effect that an event, policy, project, or organization has on the economy of a defined area. This encompasses changes in output, employment, income, and tax revenue, and is typically measured across direct, indirect, and induced layers of activity.

Fiscal year—A 12-month accounting and budgeting period. ORNL’s fiscal year runs from October 1 through September 30.

Gross domestic product (GDP)—The total monetary value of all goods and services produced within a country’s borders during a specific time period, typically one year or one quarter. It is the most widely used measure of the size and health of a national economy.

High-impact journal—A peer-reviewed academic publication recognized for the significance and influence of the research it publishes, often measured by metrics such as citation frequency or journal impact factor. Articles appearing in these outlets tend to shape the direction of their respective fields.

Indirect impacts—The second-order economic effects that arise from the supply chain activity triggered by a direct spending event. For instance, when a research facility purchases equipment, the manufacturers and suppliers of that equipment experience indirect impacts as they respond to increased demand.

Induced impacts—Economic effects generated when employees whose incomes stem from direct or indirect activity spend their wages within the local economy. This household spending on goods, services, and housing cycles additional money through the regional economy.

Input-output (I-O) model—An analytical framework that maps the interdependencies among different sectors of an economy, showing how the output of one industry serves as an input for others. It is commonly used to estimate how a change in spending in one sector ripples through the broader economy.

Appendix A: Definitions

Labor income—The total earnings paid to employees and self-employed individuals, including wages, salaries, benefits, and proprietor income, as a result of economic activity.

Laboratory Directed Research and Development (LDRD)—A program that allows US Department of Energy national laboratories to allocate a portion of their operating budgets to internally selected, exploratory research projects. It is designed to foster scientific innovation and maintain cutting-edge technical capabilities that may not yet be funded by external sponsors.

Social accounting matrix (SAM)—An extended version of an input–output (I-O) table that captures financial flows among all actors in an economy, including households, businesses, and government, within a single, balanced data structure. It provides a more complete picture of income distribution and economic circulation than a standard I-O model alone.

Strategic partnership project (SPP)—A mechanism through which US national laboratories provide specialized technical services, facilities, or expertise to non-federal entities, including private companies, on a full-cost-reimbursement basis. SPPs allow labs to leverage their unique capabilities while avoiding competition with the private sector.

Tax impacts—The changes in government tax revenues at local, state, or federal levels that result from economic activity associated with a project or organization. These include taxes on income, sales, property, and business profits generated across the direct, indirect, and induced spending layers.

Total factor productivity (TFP)—A measure of how efficiently an economy or firm converts all of its inputs, such as labor, capital, and raw materials, into output. Growth in TFP reflects technological advancement, improved processes, or innovation, and is considered a key driver of long-run economic growth.

Value added—The net economic value created by an industry’s production, equivalent to its contribution to regional GDP, after excluding the cost of intermediate goods and services purchased from other businesses.

Appendix B: Methodology, Assumptions, and Limitations

Overview of modeling approach and study regions

This analysis used IMpact analysis for PLANning (**IMPLAN**) to estimate the economic impacts associated with Oak Ridge National Laboratory (ORNL) related activity. IMPLAN is an input–output (I-O) and social accounting matrix (SAM) modeling system that traces how an initial change in spending supports additional business-to-business activity (indirect effects) and household spending (induced effects).

Overall assumptions and limitations

All I-O studies rely on assumptions. The IMPLAN framework operates under standard assumptions and limitations inherent to I-O/SAM-based economic impact studies and provides important context when interpreting results as estimates of economic activity supported under the modeled conditions.

- **Constant returns to scale:** If spending increases by 10 percent, modeled inputs increase proportionately.
- **Fixed input structure/no substitution:** Industries use the same “recipe” of inputs.
- **Industry homogeneity:** Firms within an industry are represented by an average production function. A specific vendor’s supply chain may differ from the sector average.
- **No supply constraints:** Capacity limits and shortages are not explicitly modeled.
- **Static model:** No built-in price changes or policy/behavioral responses.

To learn more about the I-O model and IMPLAN’s underlying assumptions and methodology, please visit the IMPLAN website.¹

Regional model structure

A multi-regional input–output (MRIO) setup was used to allocate impacts for operational spending across four nested geographies:

1. Knoxville metropolitan statistical area (MSA)
2. Tennessee (excluding Knoxville MSA)
3. Southeast United States (excluding Tennessee)
4. United States (excluding Southeast)

For construction spending, only the Knoxville MSA was used, because that is where the spending occurred.

For travel spending, data were available by state (plus the District of Columbia) so that results could be aggregated to Tennessee, Southeast, and US geographies.

¹ IMPLAN Data Team. *Detailed Key Assumptions of IMPLAN & Input-Output Analysis*. IMPLAN, June 27, 2017. Available at: support.implan.com/hc/en-us/articles/115009505587-Detailed-Key-Assumptions-of-IMPLAN-Input-Output-Analysis.

Appendix B: Methodology, Assumptions, and Limitations

Definitions of geographic regions

Knoxville MSA: Anderson, Blount, Campbell, Grainger, Knox, Loudon, Morgan, Roane, and Union counties, per the 2023 Office of Management and Budget (OMB) delineations¹

Tennessee: all other counties in Tennessee

Southeast United States: Kentucky, Tennessee, Arkansas, Louisiana, Mississippi, Alabama, Georgia, South Carolina, North Carolina, and Florida

United States: 50 states and District of Columbia

IMPLAN year settings

All expenditures were analyzed in dollar year 2025 (DY 2025) to maintain consistency throughout the analysis. Because date-level spending data were unavailable, it was not possible to apply a proportionate split between DY 2024 and DY 2025 for the October–December 2024 portion of the fiscal year. Approximately 25 percent of FY 2025 spending is assumed to have occurred during this period, which would nominally be expressed in DY 2024 dollars. By applying DY 2025 dollars uniformly, expenditures falling within the first quarter of the fiscal year are marginally overstated in inflation-adjusted terms. Based on the GDP implicit price deflator published by the US Bureau of Economic Analysis, the inflation rate between DY 2024 and DY 2025 was approximately 2.2 percent, yielding an estimated margin of error of approximately 0.55 percent. This represents a negligible deviation that does not materially affect the findings or conclusions of the analysis.

Impact categories

Quantifiable impacts were split into three categories due to differing methods of analysis for each:

- 1. **Operations** (procurement, wages, benefits, and utilities)
- 2. **Construction**
- 3. **Travel**

Operations impacts

Operations impacts were based on FY 2025 procurement and operations spending provided by the ORNL Finance Office that was available with a North American Industry Classification System code assignment, and then translated to IMPLAN sectors.

Appendix B: Methodology, Assumptions, and Limitations

Total procurement spending was summed for each IMPLAN industry code. The sector share was then calculated using:

Share (%) = $\left(\frac{\text{Procurement Spending in IMPLAN Code}}{\text{Total Procurement Spending}} \right) \times 100$

These shares were then used to build an IMPLAN custom spending pattern.

Pension disbursements were not included to avoid double counting because they are typically transfer payments and may not be attributable to current-year operations.

Construction impacts

Although numerous ORNL construction projects span multiple years, only spending that occurred in FY 2025 was used for this analysis. ORNL does not track its construction spending in a way that allows a breakdown across IMPLAN’s industry codes. This limits the ability to tailor the IMPLAN analysis to the actual mix of work performed. As a result, all spending was placed in IMPLAN Industry Code 55, “Maintenance and repair construction of nonresidential structures,” per IMPLAN project consultation staff’s recommendation. This classification will inherently underreport the actual impacts of ORNL’s construction spending.

Like all I-O analyses, the results assume that purchases occur consistent with modeled trade flows and do not impose supply constraints.

Travel impacts

Only domestic travel impacts were analyzed. More than \$7 million in foreign travel spending was excluded from the analysis because resulting impacts were external to the United States.

The travel spending pattern allocation is an estimate based on an estimated distribution of FY 2025 travel-related expenses across broad industry categories from the ORNL Finance Office. These categories were airfare, lodging, meals, registration fees, ground transportation, and miscellaneous retail.

Place-of-spend vs. place-of-benefit: Some travel purchases (e.g., airfare) may accrue outside the local economy depending on carrier ownership and where services are provided. The model relies on IMPLAN’s regional trade and production structure to assign local vs. nonlocal effects.

Contact

Please direct any questions about the IMPLAN analysis methodology to **Madison Gould**, Economic Development Analyst, at gouldmr@ornl.gov.

¹ JobsEQ. *Economic Overview: Knoxville, TN MSA*. 2024 Q1. Chmura Economics & Analytics, 2024. Available from the Knoxville Chamber at: knoxvillechamber.com/wp-content/uploads/2024/07/Economic-Overview-Knoxville-TN-MSA-Q1-2024.pdf.

Appendix C: Impact Tables and Charts

Total economic impacts of Oak Ridge National Laboratory (ORNL)
spending in FY 2025 by geographic region

	Tennessee		Southeast United States		United States		Total	
Impact	Employment	Output	Employment	Output	Employment	Output	Employment	Output
Direct	9,485	\$2.1B	214	\$150.5M	925	\$828.0M	10,624	\$3.1B
Indirect	1,092	\$253.9M	818	\$221.0M	3,439	\$1.1B	5,349	\$1.5B
Induced	6,481	\$1.3B	609	\$119.3M	2,756	\$606.2M	9,846	\$2.0B
Total	17,058	\$3.6B	1,641	\$490.8M	7,120	\$2.5B	25,819	\$6.6B

Total tax revenue impacts of ORNL spending in FY 2025

Impact	Subcounty General	Subcounty Special Districts	County	State	Federal	Total
Direct	\$7.9M	\$3.5M	\$7.7M	\$38.2M	\$333.7M	\$391.0M
Indirect	\$8.3M	\$6.8M	\$6.0M	\$33.2M	\$121.2M	\$175.5M
Induced	\$16.6M	\$7.6M	\$16.7M	\$77.6M	\$157.7M	\$276.3M
Total	\$32.7M	\$17.9M	\$30.4M	\$149.1M	\$612.6M	\$842.8M

Note: All figures are approximate and rounded to the nearest thousand (K), million (M), or billion (B) to reflect the level of accuracy inherent in an input–output model. Due to independent rounding, the sum of individual values shown in the table may differ slightly from the reported total.

Appendix C: Impact Tables and Charts

Total operations spending impacts

Impact	Employment	Labor Income	Value Added	Output
Direct	9,404	\$1.5B	\$1.8B	\$2.9B
Indirect	4,999	\$495.5M	\$767.7M	\$1.5B
Induced	9,391	\$630.7M	\$1.2B	\$1.9B
Total	23,794	\$2.6B	\$3.8B	\$6.3B

Total operations tax impacts

Impact	Subcounty General	Subcounty Special Districts	County	State	Federal	Total
Direct	\$6.6M	\$2.9M	\$6.8M	\$34.8M	\$313.8M	\$365.0M
Indirect	\$7.3M	\$6.7M	\$5.0M	\$29.2M	\$115.2M	\$163.3M
Induced	\$15.7M	\$7.5M	\$15.9M	\$74.0M	\$151.1M	\$264.1M
Total	\$29.7M	\$17.1M	\$27.6M	\$138.0M	\$580.1M	\$792.5M

Appendix C: Impact Tables and Charts

Total construction spending impacts

Impact	Employment	Labor Income	Value Added	Output
Direct	943	\$81.5M	\$89.7M	\$194.6M
Indirect	265	\$17.8M	\$34.7M	\$63.1M
Induced	372	\$20.8M	\$41.0M	\$67.9M
Total	1,580	\$120.1M	\$165.4M	\$325.6M

Total construction tax impacts

Impact	Subcounty General	Subcounty Special Districts	County	State	Federal	Total
Direct	\$212.7K	\$2.8K	\$248.9K	\$1.1M	\$16.2M	\$17.8M
Indirect	\$782.8K	\$10.4K	\$906.3K	\$3.6M	\$4.5M	\$9.8M
Induced	\$640.1K	\$8.5K	\$741.2K	\$3.0M	\$5.3M	\$9.7M
Total	\$1.6M	\$21.8K	\$1.9M	\$7.7M	\$26.0M	\$37.3M

Appendix C: Impact Tables and Charts

Total travel spending impacts

Impact	Employment	Labor Income	Value Added	Output
Direct	277	\$7.7M	\$14.5M	\$24.6M
Indirect	85	\$3.3M	\$5.2M	\$9.4M
Induced	83	\$2.8M	\$5.3M	\$8.5M
Total	445	\$13.8M	\$25.0M	\$42.5M

Total travel tax impact

Impact	Subcounty General	Subcounty Special Districts	County	State	Federal	Total
Direct	\$1.1M	\$530.9K	\$603.8K	\$2.3M	\$3.7M	\$8.2M
Indirect	\$162.6K	\$98.0K	\$109.3K	\$474.3K	\$1.5M	\$2.3M
Induced	\$192.2K	\$138.9K	\$142.0K	\$587.5K	\$1.4M	\$2.4M
Total	\$1.4M	\$767.8K	\$855.0K	\$3.4M	\$6.5M	\$13.0M

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