

Trends

No Data Available

Legend:

⬆ Increase, ⬇ Decrease, ➡ Steady

Key Performance Areas

No Data Available

Productivity

No Data Available

Legend:

⬆ Improving, ⬇ Worsening,
➡ Maintaining

For more information on administrative key, and productivity measures, go to www.vaperforms.virginia.gov/agencylevel/index.cfm

Background & History

Jefferson Laboratory (JLab) is a Department of Energy (DOE) Office of Science facility for conducting nuclear physics research, and is managed by Jefferson Science Associates (JSA), LLC. Construction of the Continuous Electron Beam Accelerator Facility (CEBAF) started in 1987 and the first experiment began in 1995. JLab leads the world in exploring the complex dynamics by which quarks (elementary particles of matter), interacting via gluons (the strong force between quarks), form the stable and solid massive matter of everyday experience. The Lab conducts experiments (178 to date) using a unique facility that is continually being upgraded to serve some 1,300 users. JLab is a world leader in the technology of superconducting radio frequency (SRF) and energy recovering linacs (linear accelerators).

The Free Electron Laser (FEL) – providing terahertz to deep ultraviolet light - will support a science program (examining dynamics in complex physical, chemical, and biological systems) and support the development of applications ranging from nanostructures to thin films of unprecedented properties.

Primary Product & Services

To provide world-class unique facilities for research in nuclear physics -- products are Ph.D.s, papers in refereed journals, invited talks and scientific and technical prizes or awards.

Provide research support and development of industry-university in emerging fields partnerships to explore and develop applications for lab-developed technologies that could provide economic benefit to the Commonwealth -- products are collaborations, partnerships, proposals, research papers and publications, patents, and licenses.

Customer Base

JSA/Jefferson Lab has four specific categories of customers served by activities funded by the Commonwealth:

- Nuclear physics researchers in hadronic (particles of quarks and gluons) physics
- Nuclear physics faculty and students in the Commonwealth
- Free Electron Laser research and development community
- University faculty and students in Virginia who use advanced light sources for science research

It is expected that the first and second categories (United States and Virginia nuclear physics users and faculty) will increase as Jefferson Lab continues to deliver its forefront experimental program and construction continues on the 12 GeV upgrade of the facility. The upgrade, doubling the current energy of the accelerator, will enhance the capabilities available for the current program and allow researchers access to new discovery-caliber science. Because the upgrade includes a new experimental hall, it will increase by nearly one-fourth the number of scientific users (currently 1,300) and will result in a commensurate projected increase.

Customer Listing

No Data Available

Key Agency Statistics

Agency Executive Progress Report

It is expected that the total number of publications will increase as completed experiments undergo analysis and new experiments start producing results. The total number of Ph.D.s awarded is also projected to increase as future experiments provide opportunities for university faculty and students to participate and produce theses based on JLab research.

Commonwealth support of Jefferson Lab's research activities and technology development provides important benefits including emerging technologies with economic development potential and opportunities for Virginia research universities to participate in research at an international level. This research may lead to important developments in science, defense, security, health and manufacturing with economic impact. Additionally, The Governor's Distinguished Continuous Electron Beam Facility (CEBAF) Professorships, Scientists and Fellows program provides salary support that allows JSA and Jefferson Lab to attract and retain top scientific and technological talent in the Commonwealth.

Jefferson Laboratory has approximately 1,300 active users from the international scientific community, including 133 on approved experiments led by scientists at Virginia's research universities. More than one-third of all nuclear science Ph.D.s awarded in the United States are based on Jefferson Lab's science. Four hundred fifty-five Ph.D.s (138 from Virginia institutions) have been awarded to-date, with 200 more in progress (70 from Virginia institutions). Jefferson Lab research has been cited in more than 74,000 times in scientific literature, including some top-cited papers in the field. The Jefferson Lab Free Electron Laser was awarded a 2005 R&D 100 Award as one of the 100 top technology advances in the United States. Work at Jefferson Lab has resulted in 112 patents and one spin-off company, Dilon Technologies, now producing breast imagers for use in centers around the world, and was featured on the ABC Evening News on October 23, 2006. Eighty-two faculty positions in nuclear science and JLab related technologies have been created at Virginia's research universities.

According to a recent study, Jefferson Lab generates an estimated \$132 million in income in the Hampton Roads area, while creating 1,607 jobs. Statewide, it is estimated that the Lab generates \$151 million income and more than 1,700 jobs. Nationwide, the Lab is estimated to produce \$318 million in income and nearly 2,700 jobs.

Finances

Financial assistance for educational and general services supports the Governor's Distinguished CEBAF Professorships, Scientists and Fellows, provides research support for development of new technologies from Jefferson Laboratory facilities, and leverages federal investment in the \$310 million 12 GeV upgrade. A critical component of the 12 GeV upgrade is the new experimental Hall D, which will provide capabilities to explore new scientific avenues that address some of the most pressing fundamental questions regarding the quark structure of matter and the force that holds matter together. The Laboratory has received \$1.8 million in funding from the Commonwealth in FY2013 and expects \$1.2 million in FY2014 (through Old Dominion University) to support upgrading the Free Electron Laser equipment, specifically the Cryogenic Unit and Buncher Cavity. Commonwealth support of \$6 million in FY 2010 and \$3 million in FY 2011, from the Higher Education Research Initiative in Chapters 879/781 and Chapters 874/890, supported the 12 GeV project. Hall D construction is now complete and ready for installation of experimental equipment.

Fund Sources

No Data Available

Revenue Summary Statement

Jefferson Laboratory is not a revenue generating entity.

Key Risk Factors

The primary impediment to the accomplishment of goals is the availability of adequate federal funding to operate and upgrade Jefferson Lab. Newly mandated sequestration on federal budgets could pose a risk to lab operations and to the future FEL program. Pressure on the discretionary portion of the federal budget since 2009 will continue to impact the Lab and could delay or obstruct progress toward goals and initiatives.

Performance Highlights

Jefferson Science Associates (JSA)/Jefferson Laboratory measures its progress and performance via a performance-based management and operating contract with the United States Department of Energy (U.S. DOE). For activities funded by the Commonwealth of Virginia, it also reports progress towards metrics to the Virginia Performs database. These activities are:

- 1) Support for new research directions and technology development, including emerging technologies with economic development potential. Support for these research activities provide an opportunity for Virginia research universities to participate in research at an international level, and may lead to important developments in science, defense, security, health and manufacturing with economic impact.
- 2) The Governor's Distinguished Continuous Electron Beam Accelerator Facility (CEBAF) Professorships, Scientists and Fellows provide support for salaries that allow JSA and Jefferson Lab to attract and retain top scientific and technological talent to the Commonwealth.
- 3) Leveraging support for the \$310 million federal investment in the 12 GeV upgrade of Jefferson Laboratory.

Jefferson Science Associates (JSA)/Jefferson Lab has shown excellent scientific and technological productivity in its basic research and technology transfer missions. The lab has more than 1,300 active users from the international scientific community, including 133 on approved experiments led by scientists at Virginia research universities.

Note: "At A GLANCE" Performance -- Productivity ratio measuring federal to state funds is temporarily trending downward due to the tapering-off of additional federal funds for the 12 GeV project construction - the trend for the measure is "Maintaining" for Operational funding.

Note: The second measure below had a target of 10 through FY 2010, when it was based on Free Electron Laser (FEL) state funds vs. FEL non-state funds. The measure was revised in FY 2011 to compare total state-provided funds to total lab federal/private matching funds, with a current target of 90.

Performance Measures

Management Discussion & Analysis

General Information about the Ongoing Status of the Agency

JSA/Jefferson Lab will continue to be a national and international center for nuclear physics research and with the 12 GeV upgrade, will remain at the forefront of the field for the next several decades. JLab expects to sustain or increase our scientific productivity in terms of Ph.D.s produced and in scientific papers and journal articles based on this program expansion. Jefferson Lab is also well-positioned to compete for another planned machine that is currently in the latter portion of the Office of Science 20-year plan.

JSA/Jefferson Lab will continue its participation in photon science research and development (R&D) and technology using the capabilities of the FEL, building on the investments made by the Navy and leveraging Commonwealth funds to develop applications that will ultimately benefit economic development in Virginia.

JSA/Jefferson Lab will continue to identify and develop emerging research opportunities that open new avenues for collaboration with university researchers and business/industry partners.

Information Technology

JSA/Jefferson Lab receives its primary funding from the DOE Office of Science that supports the information technology requirements of the facility.

Workforce Development

JSA/JLab faces a specific workforce challenge in recruiting for positions with highly specialized skill sets that are critical to the Lab's success including SRF scientists and engineers, superconducting magnet engineers, electrical and mechanical R&D engineers.

Physical Plant

JSA/Jefferson Lab receives its primary funding from the U.S. DOE Office of Science that supports the infrastructure and maintenance requirements of the facility.

Agency Executive Progress Report