FACILITIES AND INFRASTRUCTURE FY 2017 BUDGET AT-A-GLANCE

The Facilities and Infrastructure Program includes EERE's capital investments, operations and maintenance, and site-wide support of the National Renewable Energy Laboratory (NREL). It is the nation's only national laboratory with a primary mission dedicated to the research, development and demonstration (RD&D) of energy efficiency, renewable energy and related technologies. EERE is NREL's steward, primary client and sponsor of NREL's designation as a Federally Funded Research and Development Center. The Facilities and Infrastructure (F&I) budget maintains NREL's research and support infrastructure, ensures availability for EERE's use, and provides a safe and secure workplace for employees.

What We Do

EERE is committed to maintaining and fully utilizing NREL's capabilities as the nation's premier energy efficiency and renewable energy research facility. EERE's investment in NREL's energy technology research, property, people, and support infrastructure is designed to create and maintain the physical and operational assets required to achieve NREL's assigned mission in a safe, secure, and efficient manner.

- ✓ **Operations and Maintenance** subprogram provides the program planning as required by DOE Order 430.1B, Real Property and Asset Management, to maintain the real property assets at NREL. This includes General Plant Projects (GPP), General Purpose Equipment (GPE), Maintenance and Repair (M&R), and Safeguards and Security (S&S) Projects.
- ✓ **Facility Management** subprogram provides User Facility funding for core operations at the Energy Systems Integration Facility (ESIF) ensuring the availability of the Grid Integration laboratories and High Performance Computer (HPC) to partners.
- ✓ **NREL Site-Wide Support** subprogram provides basic site services, functions, and infrastructure for site operations, such as building and grounds maintenance, fire and emergency response, engineering and construction support, electrical safety program, facilities planning support; and activities within the Sustainability and Environmental Health and Safety portfolios. Funding for the NREL Site-Wide Facility Support subprogram moves from individual technology programs to the Facilities and Infrastructure Program.

Program Goals/Metrics

- Provide the laboratory with a safe and secure work environment and protect EERE partners and the public.
- Maintain EERE's science and support infrastructure investments through regular annual reinvestments reflecting age, condition, risk, and DOE and industry standards.
- Renovate research and support infrastructure, as necessary, to ensure the availability of a world-class RD&D environment and support the EERE mission.
- Acquire new mission-critical capabilities, when warranted, and provide direct operating funding for all appropriate activities (GPP, GPE, M&R, and S&S).
- Develop energy systems integration as a new aspect of energy R&D for the nation through experiments and development of capabilities at ESIF through high-performance computer models and hardware-in-the-loop modeling and testing.

(Dollars in Thousands)	FY 2015 Enacted	FY 2016 Enacted	FY 2017 Requested
General Plant Projects	$7,800	$7,800	$7,800
General Purpose Equipment	$3,600	$3,600	$3,600
Maintenance and Repair	$5,400	$5,400	$5,400
Safeguards and Security	$9,200	$9,200	$9,200
ESIF User Facility	$30,000	$36,000	$36,000
NREL Site-Wide Facility Support	$0	$0	$30,000
Total, Facilities and Infrastructure	**$56,000**	**$62,000**	**$92,000**

FY 2017 Priorities

- **Grid Modernization:** Investments in Grid Modernization (as identified by the Quadrennial Technology Review) provides for core operations at ESIF, EERE's user facility.

- **DOE Cybersecurity:** Investments in cybersecurity enable collaboration among national laboratories and the Joint Cybersecurity Coordination Center to test systems and explore challenges to HPC operations in various settings.

- **ESIF Upgrades:** Expand capabilities of the Peregrine (HPC), nearly doubling capacity to about 2.2 petaflops, under a three-year upgrade effort. Provides 1 megawatt of additional PV simulation. Expands the Research Electrical Distribution Bus to enable concurrent experiments on the electrical grid simulation system and ncorporate a large environmental chamber and mechanical controls for testing at—40° C temperature with humidity control at ESIF.

Key Accomplishments

- **Capital Investments:** Capital investments at NREL have provided and maintained a world-class research environment for renewable energy and energy efficiency activities.

- **Simulations:** Simulations conducted on NREL's HPC have led to significant advances in energy efficiency and renewable energy technologies. In the field of bioenergy, simulations have identified new protein engineering targets, identified rate-limiting steps at the molecular level to enable protein engineering, and have led to an improved understanding of how cellulose enzymes work. All of these developments will help reduce the cost of renewable fuels. Additionally, solar energy researchers have used simulations to identify novel alloys and materials with prescribed physical properties. Finally, wind energy, researchers have created models to better understand how upwind turbines impact downwind turbines, leading to reduced cost of electricity.

- **ESIF Research Electrical Distribution Bus:** Operations at the ESIF continued to grow; partner projects utilized ESIF's Research Electrical Distribution Bus (REDB and the REDB associated fixed equipment (grid, PV, and load emulators). These projects are focused on issues including the ability of devices to provide grid service, such as reactive power and voltage support; microgrid devices and architectures to enhance the energy security of forward operating and domestic military bases; and technology solutions to enable high penetrations of clean energy technologies, such as plug-in electric vehicles, smart appliances and variable renewables (e.g., solar).

- **Operations and Maintenance** subprograms provided two laboratory reconfigurations in Field Test Laboratory Building, a National Wind Technology Center site-wide data acquisition system upgrade and connection to ESIF's High Performance Computer.

The Energy Systems Integration Facility at the Energy Department's National Renewable Energy Laboratory in Golden, Colorado has received a LEED® (Leadership in Energy and Environmental Design) Platinum designation for new construction by the U.S. Green Building Council. Photo by Dennis Schroeder, National Renewable Energy Laboratory

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