PSRP Name: Office of Science		
PSRP Lead Program Office and/or Laboratory/Site Office: Office of Science		
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Does this program align with an existing PART program? Y

Does this program align with an existing CFDA program? N

Office of Science (SC) Allocation of the American Recovery and Reinvestment Act (Recovery Act) funding. The Recovery Act appropriation for SC is $1.6B.

Included as part of the Recovery Act are ongoing construction projects to deliver major scientific user facilities for the nation; investments in existing scientific user facilities, which host more than 20,000 users each year; many important energy-related and basic research investments; support for students and early-career scientists; and investments in national laboratory infrastructure modernization projects.

These improvements in laboratory infrastructure will help re-energize the national laboratories as centers of science and innovation and will help laboratories attract and retain the most talented researchers. In addition, the reductions in out-year commitments permitted by the Recovery Act funding will allow future investments in research for additional projects and initiate new ones earlier to bolster the Nation's long-term scientific portfolio. Today's discoveries will be tomorrow's innovative technologies and hold the key to America's continued prosperity and enhanced energy security in the coming decades.

Included among the approved projects are:

- $330 million for operations and equipment at Office of Science major scientific user facilities, used annually by over 20,000 researchers.
- $277 million for Energy Frontier Research Centers, to be awarded on a competitive basis to universities and DOE National Laboratories across the country. These centers will accelerate the transformational basic science needed to develop plentiful and cost-effective alternative energy sources and pursue advanced research.
- $150 million for ongoing construction on the National Synchrotron Light Source-II at Brookhaven National Laboratory, in Upton, New York. This new, state-of-the-art high intensity light source is expected to facilitate major breakthroughs in next-generation energy technologies, materials science, and biotechnology.
- $125 million for needed infrastructure improvements across nine DOE National Laboratories: Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkley National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Stanford Linear Accelerator Center, and Thomas Jefferson National Accelerator Facility.

- $123 million for major construction, modernization, and needed decommissioning of laboratory facilities at Oak Ridge National Laboratory (ORNL), in Oak Ridge Tennessee; Lawrence Berkeley National Laboratory (LBNL), in Berkeley, California; and Brookhaven National Laboratory.
- $90 million for other core research, providing support for graduate students, postdoctoral fellows, and Ph.D. scientists across the nation. This will create jobs as well as foster scientific advancements that ultimately can be applied in the marketplace.
- $69 million to create a national scale, prototype 100-gigabit per second data network linking research centers across the nation. This effort will enhance the Office of Science's networking capabilities and benefit the commercial telecommunications sector.
- $65 million for construction of the 12-Billion Electron Volt Upgrade of the Continuous Electron Beam Accelerator Facility (CEBAF) at Thomas Jefferson National Accelerator Facility (TJNAF) in Newport News, Virginia. The CEBAF upgrade will provide an international community of physicists with a cutting-edge facility for studying the basic building blocks of the visible universe.

1. Objectives

Program Purpose

SC developed a funding package aligned with the Recovery Act priorities of supporting research and upgrading science infrastructure. SC's Recovery Act-funded projects will preserve and create jobs and promote economic recovery while advancing the Department of Energy (DOE) strategic goals and SC's basic research mission. These projects also contribute to the advancement of scientific knowledge, the development of new technologies, and the training and strengthening of the U.S. scientific workforce, all of which are essential to maintaining America's competitive edge.

Public Benefits

Following the Recovery Act's intent, SC applied two major criteria to select projects for this funding: to preserve and create jobs and promote economic recovery; and to provide investments needed to increase efficiency by spurring technological advances in science.

DOE plans to support the construction of key facilities as well as procure leading-edge instrumentation to provide the U.S. scientific community with the most advanced tools for conducting research on climate change, bioenergy, alternative energy, energy efficiency, and other energy and environmental challenges facing the nation. Additionally, the Recovery Act funding will save jobs in the high-tech instrument manufacturing area and provide jobs for construction personnel, procurement and project management professionals, graduate students, postdoctoral associates, and Ph.D. researchers in the physical, chemical, and biological sciences.

The following are examples of the many benefits that will be gained from SC's Recovery Act-funded projects across SC's six major program offices: Basic Energy Sciences (BES), Advanced Scientific Computing Research (ASCR), Biological and Environmental Research (BER), High Energy Physics (HEP), Nuclear Physics (NP) and Fusion Energy Sciences (FES).

BES' Energy Frontier Research Centers (EFRCs)

- Foster and increase basic research to provide the basis for transformative technologies of the future.
- Create between 100 and 200 jobs for postdoctoral associates, graduate students, and technicians at universities and National Laboratories across the nation.

BES' National Synchrotron Light Source II

- Advance next generation energy technologies, materials science, and biotechnology, from solar energy to advanced batteries to pharmaceutical development.
- Expand the scientific foundations for new and improved energy technologies to understand and mitigate the environmental impacts of energy use.
- Provide a one-time acceleration of the project, enabling the pre-purchase of materials and accelerated civil construction. This will significantly reduce risks in the project.

ASCR's Advanced Networking Initiative

- Build a national-scale research prototype research network that will revolutionalize the way scientists conduct their day to day research.
- Enable telecom vendors to increase fiber optic broadband capacity by a factor of up to ten without replacing the existing fiber plant.
- Provide a supportive environment to develop and potentially commercialize 100 Gigabit per second networking technologies.

BER's Environmental Molecular Sciences Laboratory (EMSL)

- Provide scientists with the most advanced systems for molecular-level research to develop new biofuels; to predict and mitigate the transport of contaminants in the environment; and to develop novel materials that reduce emissions and enable next generation batteries and approaches for sequestering carbon.

HEP's NOvA Major Item of Equipment

- The NOvA detector will study the oscillations of muon neutrinos over long distances to search for the oscillation into electron neutrinos, determine the hierarchy of neutrino masses and measure CP violation in the neutrinos sector if it is large enough.
- Accelerate the completion of the NOvA Major Item of Equipment by accelerating building construction and detector fabrication by 9–12 months.
- Improve America's competitiveness by investing in needed scientific infrastructure.

NP's R&D on Alternative Isotope Production Techniques

- Foster new and innovative isotope production methods for use in medical and scientific applications.
- Reduce the current shortage of isotopes, thereby supporting the health and welfare of the public.

FES' Recovery Act-funded projects

- Improve laboratory infrastructure and increase use of major experimental facilities.
- Generate new plasma science knowledge.

2. Projects and Activities

Kinds and scope of projects and activities to be performed

BES: Recovery Act funding for BES enhances the EFRC program and advances the BES strategic plan for grand challenge and use-inspired energy science. Additional projects include design and construction of a new science support facility for staging and assembly of experimental apparatus. Recovery Act funding also replenishes original equipment and acquires new complementary tools to enhance the capabilities of BES facilities and benefits to the scientific user community.

ASCR: Recovery Act funding for ASCR projects revolve around network capability critical for SC to support significant research efforts that require geographically distributed access to computing capability and large scale scientific data. The Magellan pilot project will provide a more efficient and effective way to fill the gap between desktop systems and high performance systems by establishing a nationwide scientific mid-range distributed computing and data analysis testbed. The goal of this prototype is to demonstrate how enhancements to current distributed computing technology can enable SC to significantly improve the efficiency of DOE's entire portfolio of scientific computing by organizing computing services around a small number of large centers, allowing for efficiencies of scale in the purchase of hardware, power, and service personnel, and eventually by leveraging commercial clouds. The Advanced Computer Architectures project will explore the best design for the exascale computers needed to advance the DOE scientific mission. Computational Partnerships (SciDAC-e) seeks to enhance research activities in applied mathematics and computer science.

BER: Recovery Act funding for BER will be used to develop the next-generation Atmospheric Radiation Measurement (ARM) Climate Research Facility by upgrading instruments needed to advance the collection of atmospheric data that can help to inform a better understanding of climate change. Funds for EMSL will support the recapitalization of EMSL's experimental instrumentation to develop new biofuels, predict and mitigate transport of contaminants in the environment, and develop novel materials to reduce emissions and enable next-generation batteries and approaches for sequestering carbon.

NP: Recovery Act funding for NP is used for twelve individual projects to create or retain jobs, train junior researchers including those with special skills, construct facilities and fabricate equipment for forefront research, enhance research and development and utilization of facilities for production of isotopes, and construct infrastructure. These twelve projects enhance the programs' mission to foster fundamental research in nuclear physics that will provide new insights and advance our knowledge on the nature of matter and energy.

HEP: Recovery Act funding for HEP supports projects including the Neutrinos at the Main Injector Off-Axis Neutrino Appearance (NOvA) experiment which studies the appearance of electron neutrinos. The NOvA project will provide fundamental insight into the nature of the universe, in particular the crucial asymmetry between matter and anti-matter that is responsible

for the universe's existence. Additionally, large-scale infrastructure improvements at Fermilab will be implemented to help U.S. scientists maintain their leadership in particle physics.

FES: Recovery Act funding for FES will improve the infrastructure of the FES experimental facilities, increase the utilization of these facilities, and support science centers. The increased quality of the facilities will provide greater abilities to perform high levels of research necessary to develop new technology.

SLI: Recovery Act funding for Science Laboratories Infrastructure (SLI) will be used to support the implementation of needed improvements in laboratory in facilities infrastructure. SLI Recovery activities are a mix of line-item construction, General Plant Projects (i.e., capital improvements less than $10M in total cost), and operating investments that will improve each laboratory's mission readiness.

WDTS: Recovery Act funding for Workforce Development for Teachers and Scientists (WDTS) creates jobs and stimulates the economy by creating and saving research jobs that will bear fruit in scientific advancements that ultimately can be applied in the marketplace. The impacts are both short-term and long-term, providing jobs now to a scientific workforce that will help maintain America's competitive edge into the future.

List of Projects and Activities

Major Program Area	Program/Project Activity	Net Amount ($M)
Basic Energy Sciences [GRPA Web Unit #10000078 Advanced Scientific Computing Research]		**524.3**
Energy Frontier Research Centers (EFRCs	Energy Frontier Research Centers (EFRCs) will foster and encourage basic research to provide the basis for transformative energy technologies of the future. The recovery funding supports 16 centers fully funded for 5 years. Base funding in the FY 2009 appropriations supports 30 centers.	277.0
National Synchrotron Light Source II (NSLS-II)	The NSLS-II is a major scientific user facility being constructed at Brookhaven National Laboratory on Long Island in New York State to deliver x-rays with unprecedented intensity and brightness as probes for solving some of our most important energy challenges. Funding will be used to support the execution of the civil construction and advance the procurements of Accelerator System Components.	150.0
Linac Coherent Light Source Ultrafast Science Instruments (LUSI) MIE	The LCLS scientific user facility will be the world's first x-ray free electron laser and promises to offer unprecedented new abilities to interrogate and control matter with x-rays when it becomes operational in 2009. The Recovery Act funding will support completion of this critical instrumentation project and make state-of-the-art capabilities available to LCLS users, including academia, research institutions, and industry, earlier than previously planned. (SLAC)	33.6

Major Program Area	Program/Project Activity	Net Amount ($M)
Nanoscale Science Research Centers (NSRCs)	The five DOE NSRC user facilities provide capabilities to fabricate, characterize, assemble, and integrate complex nanostructures. Funding will be used to replenish original equipment and acquire new tools (Argonne National Laboratory, Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, Sandia National Laboratory/Los Alamos National Laboratory).	25.0
Light Source Improvements	Funds provide an immediate infusion of resources for capital equipment and instrumentation to best realize the capabilities of the Light Sources for the benefit of the scientific and industrial user community. The four DOE Synchrotron Radiation Light Source user facilities are National Synchrotron Light Source (at Brookhaven National Laboratory), Advanced Photon Source (at Argonne National Laboratory), Advanced Light Source (at Lawrence Berkeley National Laboratory) and Stanford Synchrotron Light Source (at SLAC National Accelerator Laboratory).	24.0
Advanced Light Source User Support Building (USB)	The Advanced Light Source (ALS) is a national user facility that provides intense ultraviolet and soft x-ray light for scientific and technological research. Funding will be used for construction and pre-purchase of materials. Remainder of construction is fully funded with base funds. (LBNL)	14.7
Advanced Scientific Computing Research [GPRA Web Unit #10000074 Advanced Scientific Computing Research]		**149.1**
Advanced Networking Initiative	Funds will be used to deploy the prototype of a 100 Gigabit per second (Gbps) networking technologies national network and conduct research and development on an advanced network testbed facility. This purpose of this project is to improve the scientific productivity of researchers working on critical problems in energy, global climate, biology, and a number of other fields. It positions U.S. vendors for world leadership in the telecommunications business sector by enabling them to leapfrog their worldwide competition. A successful initiative, carried out through partnership telecom vendors, will provide ten times the capacity over existing fiber plant.	68.9

Major Program Area	Program/Project Activity	Net Amount ($M)
Magellan Distributed Computing and Data Pilot Project	This new project seeks to demonstrate how enhancements to current distributed computing technology can enable the Office of Science to significantly improve the efficiency of DOE's entire portfolio of scientific computing by organizing computing services around a small number of large centers, allowing for efficiencies of scale in the purchase of hardware, power, and service personnel, and eventually by leveraging commercial clouds. The success of this project will be measures against wall clock turn around time for results and ease of use. Both will be measured as compared to existing midrange resources in SC labs.	39.7
Computational Partnerships (SciDAC-e)	This project will provide funds for a one-time stimulus of research efforts in applied mathematics and in computer science to establish the computational foundation and the insight needed to advance the Department's mission across a wide range of areas, including developing novel, renewable and/or ecologically friendly energy sources, and developing smart grids. Focus is on applied mathematics and computational partnerships research in areas that directly impact the Department's energy mission, contributing to many of the mid- and long-term solutions identified in the President's Energy Plan, especially in the areas of diversifying our energy sources and developing the smart grid.	29.2
Advanced Computer Architectures	Research is aimed at creating cost-effective, low power, exascale computers for science that will complement the work of the Institute for Algorithms and Architecture that ASCR jointly funds with National Nuclear Security Administration (NNSA).	5.2
Biological and Environmental Research [GPRA Web Unit # 10000080 Biological and Environmental Research]		**154.7**
ARM Climate Research Facility Initiative	Support procurement of equipment for the Atmospheric Radiation Measurement (ARM) Climate Research Facility to provide scientifically important three-dimensional data on clouds, enhanced aerosol measurements, and enhanced surface flux information at the sites to improve understanding of climate change.	60.0
Environmental Molecular Sciences Laboratory	One-time capital equipment initiative and associated General Plant Projects (GPP) for facility modifications to accommodate instrument upgrades (PNNL).	60.0

Major Program Area	Program/Project Activity	Net Amount ($M)
Bioenergy Research Center Capital Equipment	Funding will be used to support research infrastructure for the DOE Bioenergy Research Centers (BRCs), including BRC partners at other scientific research institutions. The activities at the Bioenergy Research Centers provide the foundation for research and development efforts to develop cost-effective methods of producing cellulosic biofuels on a commercial scale..	13.5
Joint Genome Institute	Funding is to obtain a sequencing machine, consumable reagents, and associated data storage and compute clusters for sequencing and assembling reference plant feedstock genomes (capital equipment and operating funds) at the Joint Genome Institute (JGI) to provide the foundation for plant genome and metagenome sequencing research and development.	13.1
Integrated Assessment Research	The Recovery Act funds will enable procurement of hardware and software systems, data handling and storage, networking, and data/output display equipment for the Integrated Assessment Research Program. The equipment will provide the tools that are required to: 1) develop open source, community based approaches to modeling 2) improve capacity to conduct inter-model comparisons and multi-model studies 3) improve capacity to enhance convergence of models and collaborations across the IA, Earth System Modeling, and Impacts, Adaptation, and Vulnerability research communities, especially for regional scale and multi-scale questions and 4) enhance transparency and accessibility for both data and models by the IA research community, their collaborators, and other user communities.	4.9
Knowledgebase R&D	Funding will provide a foundation for research and development efforts in systems biology by supporting the conceptual design and implementation planning necessary to develop the Systems Biology Knowledgebase.	3.2
High Energy Physics [GPRA Web Unit #10000104 High Energy Physics]		**216.4**
NOvA MIE	Fully fund the cooperative agreement with the University of Minnesota. At Fermilab, complete the final design, construct the integration prototype, and support the production of PVC extrusions to take advantage of the earlier completion of the building in Minnesota where the NOvA neutrino detector will be located..	55.0
Superconducting Radio Frequency (SRF) R&D	Fully fund the development of required SRF infrastructure at Fermilab and develop U.S. industrial SRF capability.	52.7

Major Program Area	Program/Project Activity	Net Amount ($M)
Advanced Plasma Acceleration Facility MIE	This project will fully fund capital equipment procurement and facility modifications necessary for two existing proposals, one for the Facilities for Accelerator Science and Experimental Test Beams (FACET) at the SLAC National Accelerator Laboratory (SLAC) and the other for the Berkeley Lab Laser Accelerator (BELLA) at Lawrence Berkeley National Laboratory (LBNL). The goal of both BELLA and FACET is to accelerate charged particles over a much shorter distance and substantially reduce the size and cost of next generation accelerators.	33.7
Fermilab GPP enhancement	The funding will be used to reduce the backlog by 28% of GPP projects at Fermi National Accelerator Laboratory (Fermilab) and allow the six highest priority projects to be completed.	25.0
Advanced technology R&D enhancement	Funding for in-hand proposals that will advance accelerator and detector technologies for particle physics research.	20.0
Research and Infrastructure enhancement at universities in the HEP program	Renew and improve technical infrastructure so that U.S. universities can remain competitive by developing future detector and accelerator technologies, and provide world-class training for the next generation of experimental scientists. Increases 10% of base funding.	15.0
Long Baseline Neutrino Experiment	Fund preconceptual R&D and conceptual design activities needed to achieve Critical Decision 1 for a Long Baseline Neutrino Experiment (LBNE) comprising a large detector and a neutrino beamline.	15.0
Nuclear Physics [GPRA Web PART #10000114 Nuclear Physics]		**143.8**
Advance funding of 12 GeV CEBAF Upgrade	Advances the funding profile of the 12 GeV Continuous Electron Beam Facility (CEBAF) Upgrade construction project at TJNAF, thereby reducing the project risk, creating additional jobs immediately, and increasing project contingency.	65.0
Enhanced Accelerator Improvement Projects (AIP) funding at NP user facilities	Enhances scientific productivity and trechnological advances at four National User Facilities (RHIC, CEBAF, ATLAS, HRIBF), as well as the 88-Inch Cyclotron.	25.0

Major Program Area	Program/Project Activity	Net Amount ($M)
Nuclear Science Workforce	Increases staff in areas in nuclear physics with compelling scientific opportunities. Recovery Act funding will be used to fund Funding Opportunity Announcement (FOA) proposals for initiatives in Applications of Nuclear Science and Technology, aimed at research and development activities in nuclear science that are relevant to applications important to the nation. The FOA invites experts from across the National Laboratory complex, universities and commercial enterprises to plan, design, carry out, and report on the results of the studies and investigations, and assist in the transfer of these results to practice.	19.4
Enhanced utilization of Isotope facilities	Provides increased levels of operating hours at all isotope facilities so that the program can better respond to customer needs for critical isotopes important to the nation. (BNL, INL, LANL, ORNL)	10.0
Thomas Jefferson Lab Infrastructure Investments	The following high priority GPP projects will be pursued at Thomas Jefferson National Accelerator Facility (TJNAF): Experimental Staging Facility, Expand General Purpose Building, End Station Refrigerator Building and Utilities, Test Lab Serviced Transformer Upgrade, and Roads and Parking Improvements (partial).	10.0
Lattice Quantum ChromoDynamics Computing	Allow the purchase and operation of computer hardware for the first principles calculations of the properties of nuclear matter, based on the theory of quarks and gluons (Lattice Quantum Chromodynamics, LQCD), which will allow realistic calculations that will be used to interpret the results of existing and future experiments.	5.0
R&D on Alternative Isotope Production Techniques	Research for the development of new and innovative isotope production methods, or improvements thereof, for isotopes to be used in medical and scientific applications. Recovery Act funding will be used to fund proposals for research and development on alternative methods to produce and separate stable and radioactive isotopes needed for a wide variety of research and applications.	4.6
PHENIX Forward Vertex Detector MIE full funding	Provide vertex tracking capabilities to PHENIX for RHIC at BNL by adding two silicon endcaps, which is important for both the heavy ion and spin programs.	2.0

Major Program Area	Program/Project Activity	Net Amount ($M)
Nuclear Data Program Initiative	U.S. Nuclear Data Program (USNDP) coordinated through the National Nuclear Data Center (NNDC) at Brookhaven National Laboratory (BNL) is a vital program that collects, evaluates, and disseminates nuclear physics data used for basic nuclear research, a broad spectrum of applied nuclear technologies, nuclear reactor design, and security applications. Recovery Act funding will be used to recruit and train new nuclear data evaluators and compilers with the expectation of developing stable careers in this specialized field.	1.9
Fundamental Neutron Physics Beamline MIE at SNS full funding	Support two major efforts at ORNL that are part of the overall FNPB external experimental building (HVAC and Utilities at $300,000 each)	0.6
PHENIX Silicon Vertex MIE full funding	Support the PHENIX VTX at RHIC at BNL. Decreases project cost by $250k. PHENIX VTX is a barrel of silicon pixel and strip detectors that will provide precision measurement of heavy quark production to study the thermalization process in the heavy ion collisions.	0.3
Fusion Energy Sciences [GPRA Web Unit #10000096 Fusion Energy Sciences]		**83.1**
High Energy Density Laboratory Plasma Matter in Extreme Conditions (MEC) Instrument Project	Funds will be used to procure and install equipment for the MEC instrument, including x-ray beam transport system, x-ray optics and diagnostics, vacuum chamber, short pulse laser, long pulse laser, diagnostics and control systems.	20.0
DIII-D Facility Upgrades	Provide for enhancements to DIII-D auxiliary heating systems and improvements to several diagnostics systems. (General Atomics)	11.7
High Energy Density Laboratory Plasma NDCX-II	Funding will provide for an upgrade to the existing Neutralized Drift Compression Experiment (NDCX-II) at Lawrence Berkeley National Laboratory to increase the energy on target by a factor of 100 for the Heavy Ion Fusion (HIF) and Warm Dense Matter (WDM) research communities.	11.0

Major Program Area	Program/Project Activity	Net Amount ($M)
Plasma Science Centers—additional 2 centers funded for 5 years	Recovery Act funding will be used to fully fund two Plasma Science Centers (PSC) for their entire five-year lifetime. The PSC program started in 2004 with the objective of establishing academic centers of excellence that will focus on fundamental issues of widely recognized importance to plasma science. The PSCs will be supported to perform plasma science research in areas of such wide scope and complexity that it would not be feasible for individual investigators or small groups to make progress, such as plasma turbulence, plasma computational algorithms and non-linear plasma physics. The PSCs will consist of well-coordinated collaborative teams of scientists with the wide breadth of knowledge and skills required to tackle large and complex plasma science problems.	9.7
NSTX Facility Upgrades	The Recovery funding will be used to enhance and upgrade several key components of the National Spherical Torus Experiment (NSTX), one of the Nation's key centers for magnetic fusion energy research. The NSTX Research Enhancement/Upgrade Project will enable timely implementations of key, high priority NSTX facility and diagnostic upgrades that will result in significantly greater research productivity. (PPPL)	7.0
Infrastructure Improvements for Innovative Confinement Concepts (ICC) Experiments	Provide for improvements in infrastructure for ICC experiments by upgrading diagnostics, heating systems, controls, power supplies and other experimental equipment on existing projects that will significantly improve their near-term chances of finding better ways to confine plasmas and to understand the properties of these plasmas.	3.95
PPPL GPP	Provide resources to upgrade the Princeton Plasma Physics Laboratory's 138KV switch gear, transformers, and associated circuit breakers.	5.0
Alcator C-Mod Facility Upgrades	Funding for the Alcator C-Mod Facility Upgrade consists of radio frequency (RF) heating and current drive systems enhancements and several diagnostics systems improvements. (MIT)	5.0
Enhanced operation of Major Fusion Facilities	Allow the three major fusion facilities (DIII-D, C-Mod, and NSTX) to operate for an additional five weeks each in the FY 2009/FY 2010 time frame. (Alcator C-Mod, DIII-D, and NSTX)	4.9
Infrastructure Improvement for General Plasma Science User Facilities	Provides improvement in infrastructure for general plasma science user facilities by upgrading diagnostics, heating systems, controls, power supplies and other experimental equipment on existing projects.	3.9

Major Program Area	Program/Project Activity	Net Amount ($M)
Science Laboratories Infrastructure [GPRA Web Part #NA]		**198.1**
SLI Construction	This stimulus project will support the Infrastructure Modernization Initiative to revitalize SC laboratory infrastructure that includes 35 projects across all ten SC laboratories to be completed in the next ten years. Projects to receive funding include construction of a new materials and chemical sciences research facility at Oak Ridge National Laboratory; renovation of laboratory space at Lawrence Berkeley National Laboratory; construction of a new interdisciplinary science building at Brookhaven National Laboratory; and demolition of the aging Bevatron complex at Lawrence Berkeley National Laboratory that will provide buildable space at the laboratory for future program needs.	108.5
General Plant Project	Support SC's plan to revitalize our laboratories by funding non-line item capital improvements ($10 million or less) to facilities and infrastructure at multi-program laboratories. Facilities include Ames Laboratory (Ames), Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Lawrence Berkeley National Laboratory (LBNL), Pacific Northwest National Laboratory (PNNL), Oak Ridge National Laboratory (ORNL), SLAC National Accelerator Laboratory (SLAC), and the New Brunswick Laboratory, (NBL). The GPP projects will address high-priority facility and infrastructure needs to improve mission readiness, including: building electrical upgrades, roofing, fire safety, space renovation, transformer replacements, electrical substations replacements, seismic upgrades, and new shop/office space. These GPP projects will reduce the risk of facility failure and operational interruptions, improve energy efficiency, reduce operating costs, and reduce safety and health risks.	89.6
Science Program Direction [GPRA Web Part #NA]		**1.6**
OSTI Technology Infrastructure	One-time enhancement of facility operations to upgrade and strengthen the technology backbone by which DOE enables public and scientific community access to the results of its R&D investment, including a redundant internet pathway and a live alternate processing site capable of handling the expected traffic and hosting of OSTI's scientific dissemination services. In addition, increased labor will be needed to leverage these upgrades.	1.6

Major Program Area	Program/Project Activity	Net Amount ($M)
Workforce Development for Teachers and Scientists [GPRA Web Part #NA]		**97.5**
Energy Sciences Fellowships (WDTS)	Create graduate, post-doctoral, and early career fellowship awards to stimulate research careers in energy, environmental, and climate change sciences	12.5
Early Career Awards (BES)		31.1
Early Career Awards (ASCR)		8.0
Early Career Awards (FES)		8.0
Early Career Awards (BER)		11.0
Early Career Awards (HEP)		16.0
Early Career Awards (NP)		11.0
SBIR/STTR [GPRA Web Part #NA]		**19.0**
SBIR/STTR funding from Recovery Act		19.0
Management and Oversight Reserve [GPRA Web Part #NA]		**8.0**
Management and Oversight Reserve		8.0
Unallocated		**4.4**
Unallocated		4.4

3. Characteristics

Types of Financial Awards to be used
B - Project Grants
C - Direct Payments for Specified Use

Type of Recipient
- Government / Public Nonprofit Institution/Organization (includes Institutions of Higher Education, Hospitals)
- Non-government / Profit Organizations
- Non-government / Private Nonprofit Institutions/Organization I (includes Institutions of Higher Education, Hospitals)

Type of Beneficiary
- Public nonprofit institution/organization
- Other public institution/organization
- Private institution of Higher Education
- Private nonprofit institution/organization
- Profit organization

4. Major Planned Program Milestones

The projects selected to be funded under the Recovery Act not only provide critically needed short-term economic relief but also represent a strategic investment in our nation's future. They were selected because of their ability to create thousands of jobs and breathe new life into many local economies, while helping to accelerate new technology development, renew our scientific and engineering workforce, and modernize our nation's scientific infrastructure.

The DOE Office of Science (SC) is steward of ten National Laboratories in eight states across the nation. SC also constructs and operates large-scale scientific facilities such as advanced light sources and nanoscale science research centers that provide the cutting-edge tools of today's advanced energy and physical science research.

Many of the Recovery Act projects are focused on these widely used National Laboratory facilities. The package also provides substantial support for both university- and National Laboratory-based researchers, working on problems in fields ranging from particle and plasma physics to biofuels, solar energy, superconductivity, solid state lighting, electricity storage, and materials science.

The Department is poised to move aggressively on these projects--many already existing, some new--to ensure maximum jobs creation and to maintain America's scientific leadership. At the same time, the Department has put in place controls to provide a high level of accountability, transparency, and responsibility in the deployment of these taxpayer dollars.

Following is a cross-section of project milestones to demonstrate the aggressive timeline pattern the Office of Science will be following for Recovery Act-funded projects.

Milestone #1

Following are the project milestones for the National Synchrotron Light Source II (NSLS-II) project. The NSLS-II is a major scientific user facility being constructed at Brookhaven National Laboratory on Long Island in New York State to deliver x-rays with unprecedented intensity and brightness as probes for solving some of our most important energy challenges. The scope of the NSLS-II Project is to design, build, and install the accelerator hardware, experimental apparatus, civil construction, and central facilities including offices and laboratories required to produce a new synchrotron light source.

Recovery Act funding will be used to accelerate civil construction scope and reduce risk to the NSLS-II Project. The activities accelerated by the Recovery funding are expected to be completed by February 2013. The overall NSLS-II project is expected to be finished by June 2015.

National Synchrotron Light Source II (NSLS-II) project	Estimated Date
Initial Allotment, AFP, and Recovery Act Funds Distribution Issued (150M)	completed 3/20/2009
Issue Ring Building Notice to Proceed	completed 3/25/2009
Work Authorization Approved	completed 3/31/2009
Initial Obligation	completed 4/2/2009

Laboratory Office Building (LOB) Contract Award	3/31/2010
Ring Building First Pentant Ready for Technical Equipment Installation	2/1/2011
Ring Building Fifth Pentant Ready for Technical Equipment Installation	2/9/2012
Laboratory Office Building Construction Complete	4/2/2012
All Civil Construction Complete	8/20/2013
Technical Equipment Installation, Startup and Commissioning	2/2011-6/2015
NSLS-II Project Completion	6/26/2015

Milestone #2

Following are the project milestones for the 12 GeV Continuous Electron Beam Facility (CEBAF) Upgrade construction project. The doubling of the electron beam energy at Jefferson Laboratory's CEBAF to 12 GeV opens the opportunity for new discoveries and an understanding of the mechanism of quark confinement – one of the mysteries of modern physics. This project is expected to be finished by June 2015.

12 GeV Continuous Electron Beam Facility (CEBAF)	
	Estimated Date
Initial Recovery Act Funds Distribution	3/20/2009
AFP and allotment issued	3/20/2009
Annual review of Upgrade project by the Office of project Assessment	9/1/2009
Award Final Stimulus Subcontract – Sept. 2010	9/1/2010
Annual review of Upgrade project by the Office of Project Assessment	Sept. 2010-2014
Critical Decision 4A Completed - Approve Accelerator Project Completion and Start of Operations (CD-4A is accomplished with regular appropriations and Recovery Act funds)	12/1/2014
Critical Decision 4B Completed - Approve Experimental Equipment Project Completion and Start of Operations (CD-4B is accomplished with regular appropriations and Recovery Act funds)	6/1/2015

Milestone #3

Following are the project milestones to support the completion of the NOvA Major Item of Equipment. The NOvA detector will study the oscillations of muon neutrinos over long distances to search for the oscillation into electron neutrinos, determine the hierarchy of neutrino masses and measure CP violation in the neutrinos sector if it is large enough. The project completion date has yet to be determined.

NOvA Major Item of Equipment	
	Estimated Date
Award Revised Budget/Terms and Conditions for University of Minnesota and Fermilab	3/6/2009
Initial Recovery Act Funds Distribution - 1-May - Entire award to Univ. of Minnesota.	5/1/2009
Interviews; Notify Successful Contractor; Groundbreaking with Congressman Oberstar - 5/1/2009 -- Planned before Recovery Act	5/1/2009
Initial Recovery Act Funds Distribution - 5/1/2009	5/1/2009

Milestone #4

Following are the project milestones for capital improvements to the Environmental Molecular Sciences Laboratory (EMSL), a DOE scientific user facility for molecular-level science located at the Pacific Northwest National Laboratory (PNNL) in Richland, Washington. This funding supports the planned recapitalization of EMSL's leading-edge research instrumentation.

Initial Recovery Act Funds Distribution-4/1/2009--Funding will be provided to PNNL through the existing PNNL contract. Individual equipment procurements will be by subcontract, but will be subject to DOE's procurement review and approval process.

Environmental Molecular Sciences Laboratory (EMSL)	
	Estimated Date
Initial Recovery Act Funds Distribution - Funding will be provided to PNNL through the existing PNNL contract. Individual equipment procurements will be by subcontract, but will be subject to DOE's procurement review and approval process.	4/1/2009
Begin preparing documentation (instrument specifications) for multiple equipment system procurements - capital improvements to the Environmental Molecular Sciences Laboratory (EMSL)	4/8/2009
First set of new capabilities for EMSL obligated (e.g., additional data storage capability)	4/29/2009
Second set of new capabilities for EMSL obligated	5/6/2009
Several new capabilities for EMSL obligated	May-09
Additional new capabilities for EMSL obligated. Labor costs for Q3 of FY9 associated with procurement activities and infrastructure improvements	Jun-09
New capabilities for EMSL obligated	Oct 2009-March 2010

Milestone #5

Following are the project milestones for the DIII-D Facility Upgrades auxiliary heating systems and improvements to several diagnostics systems. These activities will increase the scientific productivity of the program through higher reliability and availability of the DIII-D tokamak facility and increase experimental measurements for comparisons with theory and computational models. Some of the funding will be used to increase scientific staff of the DIII-D program to support the increased measurement capability. This project is expected to be finished by April 2011.

DIII-D Facility Upgrades	
	Estimated Date
Initial Recovery Act Funds Distribution -DIII-D auxiliary heating systems and improvements to several diagnostics systems	4/30/2009
Allocation of funds to laboratory contracts	4/10/2009
Begin initial edge diagnostic work by laboratories	5/1/2009
Obligation of funds for DIII - D upgrades to cooperative agreement/grants	5/8/2009
Begin initial edge diagnostic work by grant recipients	Jun-2009
Delivery of gyrotron	Dec-2010
Complete additional staff acquisitions to support diagnostic and experiment analysis (costs will be apportioned generally equally by month from June FY09)	Mar-2011
Complete final gyrotron acceptance testing	Apr-2011

Milestone #6

Following are the project milestones for the Science Laboratories Infrastructure (SLI) Construction project at four laboratories including the Bevatron demolition at Lawrence Berkeley National Laboratory and facilities modernization at Oak Ridge National Laboratory, Lawrence Berkeley National Laboratory and Brookhaven National Laboratory.

SLI Construction	
	Estimated Date
Initial Obligation	3/16/2009
Receive Recovery Act funds	4/1/2009
Modernization of Laboratory Facilities at Oak Ridge National Laboratory: CD-3A, - Approve Start of Early Construction/Long-Lead Procurements	6/30/2009
Stimulus funds obligated to M&O contractors (For all projects at BNL, ORNL, LBNL)	7/31/2009
Modernization of Laboratory Facilities at Oak Ridge National Laboratory: CD-3B, Approve Start of Balance of Construction & Begin Construction	12/31/2009
Bevatron at Lawrence Berkeley National Laboratory (currently in construction) - Bevatron removed	3/31/2010
Bevatron at Lawrence Berkeley National Laboratory: Structure Demolished	7/31/2010
Bevatron at Lawrence Berkeley National Laboratory: Complete Demobilization	3/31/2011
Modernization of Laboratory Facilities at Oak Ridge National Laboratory: Building Construction Complete - CD-4, Approve Project Completion	12/31/2011
Seismic Life Safety – Phase II (Seismic-II) at Lawrence Berkeley National Laboratory CD-1 Approved	9/23/2008
Seismic-II at LBNL CD-2A Approved; When a baseline is established at CD-2, milestones will be added.	3Q FY09
Seismic II at LBNL CD-3A Approved	2Q FY10
Seismic II at LBNL CD-4A Approved	3Q FY12
Interdisciplinary Science Building – Phase I (ISB-I) at Brookhaven National Laboratory CD-1 Approved	9/23/2008
ISB-I at Brookhaven National Laboratory Approve Baseline - When a baseline is established at CD-2, milestones will be added.	TBD
ISB-I at BNL Start Building Construction	TBD
ISB at BNL CD-4, Approve Completion	TBD
Costing of stimulus funds for SLI Construction complete	6/30/2015

Milestone #7

Following are the project milestones for the Energy Sciences Fellowships and Early Career Awards. This program will create graduate fellowships and early career research awards in early FY10 to stimulate research careers in energy, environmental, and climate change sciences. The first graduate fellowships will be awarded in time for the beginning of the spring semester (January 2010). Recovery Act money will be used to forward-fund about 75 graduate fellowships for three years apiece and about 75 early career scientists for four years. An FOA inviting applications from universities and proposals from laboratories would likely be issued in summer 2009. Applications and proposals will undergo peer review in the programs in accordance with 10 CFR 605. Funding decisions will be made in the programs by program managers with specialized scientific expertise.

Energy Sciences Fellowships and Early Career Awards	
	Estimated Date

Post synopsis on grants.gov/recovery.gov	6/20/2009
Post full announcement on grants.gov	7/1/2009
Close Date for proposals	8/30/2009
Complete proposal reviews	12/15/2009
Select Grant(s) for Award(s)	1/1/2010
Award Grant(s)	3/2/2010
Initial Funds Distribution	3/2/2010

Milestone #8

Following are the project milestones for the Energy Frontier Research Centers (EFRCs). EFRCs will foster, encourage, and accelerate basic research to provide the basis for transformative energy technologies of the future. The Centers will bring together the skills and talents of a critical mass of investigators to enable energy relevant, basic research of a scope and complexity that would not be possible with the standard single-investigator or small-group award. EFRCs provide a tremendous opportunity for universities, DOE laboratories, for-profit companies, and non-profit entities to engage, separately or in teams, in fundamental basic research critical to future energy technologies. The Centers will also be designed to inspire, train, and support leading scientists of the future who will ultimately be called upon to solve the nation's energy challenges of the 21st century.

Energy Frontier Research Centers (EFRCs)	
	Estimated Date
Award Grant(s)	Aug/Sept 2009
Initial Funds Distribution	Aug/Sept 2009
Completing weekly merit review process of 261 applications (total 1044)	3/6/2009-3/27/2009
BES selects awards, pending SC-1 approval	4/3/2009
SC-1 approval	4/10/2009
Process Award Packages	5/1/2009-5/8/2009
Obligate Funds	8/30/2009
EFRC research begins (Post-docs, Grad. students, and Undergrads will begin to be hired; Equipment purchases will be made; Number for both unknown until awards are made).	10/1/2009

Milestone #9

Following are the project milestones for the General Plant Project Funding across all SC Laboratories.

General Plant Project Funding Across All SC Laboratories	
	Estimated Date
Negotiate Revised Proposal/Contract	3/31/2009
Award Modification after Signature	3/31/2009
Initial Recovery Act Funds Distribution (Funds obligated to all SC Laboratories)	3/31/2009 to 4/30/09
Guidance and Work Authorization Provided to all SC labs (except SLAC infrastructure)	4/30/09
LBNL Upgrade of Bldg 62 Project Complete	6/30/2010
PNNL Infrastructure Upgrades - Construction Complete	9/20/2010
Ames Infrastructure Upgrades Construction Complete	9/30/2010

BNL Mechanical & Electrical Upgrades - Construction Complete	11/30/2010
BNL Building Roof Replacements Construction Complete	12/30/2010
LBNL Upgrade Bldg 2 - Project Complete	1/31/2011
LBNL Upgrade of Bldg 66 - Project Complete	3/31/2011
SLAC Seismic Upgrade - Construction Complete	10/28/2011
SLAC Electrical Substation Modernization - Construction Complete	11/30/2011
SLAC Infrastructure Upgrades - Construction Complete	12/31/2012

Milestone #10

Following are the project milestones for the Computational Partnerships (SciDAC-e) project. SciDAC-e is a research project in applied mathematics and in computer science to establish the computational foundation and the insight needed to advance the Department's mission across a wide range of areas, including developing novel, renewable and/or ecologically friendly energy sources, and developing smart grids.

Computational Partnerships (SciDAC-e)	
Grants and Use of Existing Grants	
Select Grant(s) for Award(s) (Will fund in hand Math proposals)	2/23/2009
Award Grant(s) (Will forward fund grants for three years)	7/1/2009
Initial Funds Distribution	7/1/2009
Final Funds Distribution	7/1/2009
Final Recovery Act Funds Distribution	9/1/2009
Use of Existing Contracts	
Initial Recovery Act Funds Distribution (Will support two-three years of effort)	2/23/2009
Intermediate Recovery Act Funds Distribution(s) (Will support 2yr Post-docs at facilities)	7/1/2009
Fin Plan requests submitted for Math projects (ASCR)	3/6/2009
Complete selection statements for two math projects	3/13/2009
Complete selection statements for all remaining math projects	3/20/2009
Initiate planning for SciDAC workshop to identify EFRC computational needs	3/27/2009
Finalize plans for SciDAC workshop to identify EFRC computational needs	4/10/2009
Review BES EFRC-selected portfolio (EFRC selection (BES action))	4/17/2009
Identify and categorize EFRC computational needs	4/24/2009
Distribute funds to M&Os in FIN PLAN (DOE budget). Authorize M&Os to begin work (DOE site office). Adjust M&O accounting system to separately track recovery funds (Supports two year post doctoral fellowships for SciDACe user support at ASCR facilities and 2010 SciDAC-e summer school)	5/1/2009
SciDAC workshop to identify EFRC needs	5/8/2009
Supplement requests from existing SciDAC projects	May 2009
Panel review of Supplement requests	June 2009
Grant actions awarded for Math projects (CH)/Grant actions submitted for SciDAC supplements	July 2009
Grant actions awarded for SciDAC supplements	September 2009
Beginning in October 2009 SciDAC activities in support of EFRC begin. Post-docs, Grad. Students and Undergrads will begin to be hired. Number will not be known until selections are made.	October 2009
Program review of SciDAC activities	December 2009
Program review of SciDAC activities	March 2010
Program review of SciDAC activities	June 2010
SciDAC-e summer school	July 2010

Program review of SciDAC activities	September 2010
Program review of SciDAC activities	December 2010
Program review of SciDAC activities	March 2011
Program review of SciDAC activities	June 2011
External review of SciDAC activities	September 2011

5. Monitoring and Evaluation

I. Corporate controls

Recovery Leadership & Operations

The DOE Recovery Office is the central point for implementation and execution of Recovery Act activities. A recovery operations team will oversee implementation management, such as monitoring project status, evaluating cost and schedule progress, ensuring thorough reporting, coordinating with external entities, and holding monthly performance and review meetings with senior departmental managers on the implementation status of specific recovery projects.

Recovery Funding Oversight, Performance

In addition to DOE's standard funds control mechanisms, Recovery Act funds are subject to additional process controls to ensure funds are not co-mingled, are tracked to enable reporting, and are spent responsibly. DOE recovery funds are released for implementation in a staged approach. Programs develop initial project plans that include performance metrics which require management approval.

Office of Internal Review (OIR)

DOE's OIR helps programs ensure that internal controls are in place, effective, and support the risk based approach to managing Recovery Act activities. OIR programs are being implemented or expanded to ensure the Recovery Act objectives are met and DOE managers and partners are both held accountable for successful execution and also have the appropriate tools to ensure that success. These programs include coordinating DOE's "Internal Control Acknowledgment" program, conducting agency wide assessments and analyses and performing oversight of Recovery Act programs, including site and field visits. OIR worked with key impacted programs to produce initial vulnerability assessments identifying potential program specific and cross-cutting risks to ensure successful execution.

II. SC Processes

SC projects are subject to thorough review and reporting requirements and all Recovery Act-funded projects must follow additional monitoring and evaluation guidelines to ensure that performance meets the Recovery Act-specific measures. Project managers involved with Recovery Act projects have been directed to monitor closely the status of their project(s) as well as adherence to the Recovery Act requirements. Following are examples of specific guidelines that will be implemented to monitor and evaluate SC's Recovery Act-funded projects.

The management team for NSLS-II will ensure that cost and timetables are maintained within 10% of the baselines given in the NSLS-II construction project datasheets. These performance measures will be reported in the existing Quarterly Project Report submitted to the DOE Project Acquisition Executive.

The 12 GeV CEBAF Upgrade project will be reviewed by the SC Office of Project Assessment on an annual basis until completed to ensure adherence to cost, schedule, and performance. Monthly and quarterly reports are required to monitor performance. All documentation of project performance will be maintained by TJNAF. Recovery Act funded activities will be tracked separately within the context of the overall 12 GeV CEBAF Upgrade project.

Performance measures for the LUSI SLAC project include maintenance of the timetables within 10% of the baselines given in the LUSI construction project datasheets. These performance measures will be reported in the existing Quarterly Project Report submitted to the DOE Project Acquisition Executive.

BES requires that Recovery Act-funded EFRCs submit performance reports regarding scientific progress on an annual basis, in addition to the Recovery Act-required reporting. These progress reports will allow BES to assess the scientific progress and impact of the EFRCs through such measures as publication output. EFRCs, including those funded under the Recovery Act, that fail to exhibit progress in the interim period will not be allowed to submit renewal proposals for extension of the EFRC past the initial five-year award period.

See the Agency Wide Recovery Plan (www.energy.gov/recovery) for Agency processes.

6. Measures[1]

Variance from planned cumulative obligations

Measure Text
Variance from planned cumulative obligations for Office of Science Recovery Act activities

Measure Type
Output

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
%.

Explanation of Measure
A key aspect of the Recovery Act is to assure timely obligations of funds to the intended beneficiaries. SC plans to make every effort to assure this happens on the plan that it has put forward, which has been designed to also maintain a prudent use of taxpayer funds and provide key research deliverables to the benefit of the public.

[1] Science is in the process of working to develop stronger more relevant measures.

An obligation of funds means a binding agreement is made with SC's contractors and grantees that will result in outlays (a payment for the services or goods they provided) immediately or in the future.

SC intends to obligate all its Recovery Act funds by September 30, 2010. SC will measure its progress towards planned obligations on a quarterly basis. The SC baseline obligation plan (when available) is posted at www.doe.gov/recovery.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
<10

Target (incremental change in performance)
<10

Actual

Goal Lead
Kevin Shaw

Variance from planned cumulative outlays

Measure Text
Variance from planned cumulative outlays for Office of Science Recovery Act activities

Measure Type
Output

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
%.

Explanation of Measure

A key aspect of the Recovery Act is to assure timely outlays of funds to the intended beneficiaries. SC plans to make every effort to assure this happens on the plan that it has put forward, which has been designed to also maintain a prudent use of taxpayer funds and provide key research deliverables to the benefit of the public.

An outlay of funds means a payment that fulfills an obligation and is the measure of Government spending. This is a payment for the services or goods the contractor or grantee provided.

SC will measure its progress towards planned outlays to-date on a quarterly basis. The SC baseline outlay plan (when available) is posted at www.doe.gov/recovery.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
<10

Target (incremental change in performance)
<10

Actual

Goal Lead
Kevin Shaw

Variance from planned SLI General Plant Project (GPP) projects started

Measure Text
Variance from planned SLI General Plant Project (GPP) projects started.

Measure Type
Output

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
%

Explanation of Measure
This project supports SC's plan to revitalize laboratories by funding 18 General Plant Projects (GPP) (i.e., construction projects with a total cost of $10M or less) at the following eight SC laboratories/facilities: Ames Laboratory (Ames), Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Lawrence Berkeley National Laboratory (LBNL), Pacific Northwest National Laboratory (PNNL), Oak Ridge National Laboratory (ORNL), SLAC National Accelerator Laboratory (SLAC), and the New Brunswick Laboratory, (NBL). The activities included in this project will reduce the backlog of general purpose infrastructure rehabilitation, replacement, and renovation needs at the eight laboratories, ensuring improved readiness to perform mission work.

The activities to be funded in this project are consistent with the mission of the Office of Science (SC) Science Laboratories Infrastructure (SLI) program, which is to support the conduct of Departmental research missions at SC national laboratories. Research missions are advanced by funding line-item construction for revitalization and repair of the general-purpose infrastructure, and by cleaning up and removing excess facilities that are not transferable to the Department's Office of Environmental Management.

Performance will be tracked and validated in accordance with Project Management Plans developed at the site level and through milestone updates provided to the SLI program

Science and Discovery: The Recovery Act funding applied to the Modernization Initiative will mean quicker delivery of modern, safe and environmentally friendly laboratories. These critical investments in facilities and infrastructure will help re-energize the national laboratories as centers of science and innovation, will help the laboratories attract and retain the most talented researchers, and will lead to transformational discoveries in new technologies for America's future, all of which will result in long-term economic growth and job creation in the American economy.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
<10

Target (incremental change in performance)
<10

Actual

Goal Lead

Marc Jones

Variance from planned Energy Frontier Research Center Grants Awarded

Measure Text
Variance from planned Energy Frontier Research Center Grants Awarded.

Measure Type
Output

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
%

Explanation of Measure
The procurement plan for the EFRC awards to be made under Recovery Act (RA) funding is identical to that described in the EFRC Funding Opportunity Announcement (FOA - http://www.sc.doe.gov/bes/EFRC.html). Selection of the 16 additional EFRC awards is based on the merit review and other selection criteria described in detail in the FOA. Awards will be made as financial assistance (grants) to universities.

Science and Discovery: EFRCs invest in multi-investigator scientific research collaborations that will lead to transformational discoveries and possibly entire new industries to build long-term energy security and economic growth. EFRCs will also attract and retain the most talented researchers and train the next generation of scientists and engineers. EFRCs will accelerate the rate of discovery in research that is foundational to transformative energy technologies of the future, such as the direct conversion of sunlight, water, and carbon dioxide into chemical fluids. Such transformative technologies have the potential to dramatically lessen the environmental impact of energy use.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
<10

Target (incremental change in performance)
<10

Actual

Goal Lead
Harriet Kung

Variance from planned SC Energy Sciences Fellowships and Early Career Awards Issued

Measure Text
Variance from planned SC Energy Sciences Fellowships and Early Career Awards Issued.

Measure Type
Output

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
%

Explanation of Measure
The awards will support researchers in all energy-related disciplines, encourage research in the science underpinning energy technologies, and encourage the integration of basic and applied work. A Funding Opportunity Announcement will be issued inviting applications from universities and proposals from laboratories. Applications and proposals would undergo peer review in accordance with 10 CFR 605. Based on the applications received, SC plans to issue 70-80 graduate fellowships and 70-80 career research awards, for a total of 140-160 awards.

Science and Discovery: Invest in science to achieve transformational discoveries: organize and focus on breakthrough science, and develop and nurture science and engineering talent. This project provides a pipeline of trained scientists and engineers dedicated to research and development in energy, environmental, and climate change sciences. This is a scientific and technological workforce investment for long-term economic growth.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
<10

Target (incremental change in performance)
<10

Actual

Goal Lead
Linda Blevins

Variance from planned new EMSL Instruments procured

Measure Text
Variance from planned new Environmental Molecular Sciences Laboratory (EMSL) instruments procured

Measure Type
Output

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
%

Explanation of Measure
The Recovery Act funding supports planned capital equipment improvements to the Environmental Molecular Sciences Laboratory (EMSL), a DOE scientific user facility for molecular-level science located at the Pacific Northwest National Laboratory (PNNL) in Richland, Washington. Based on limited funds, the baseline plan for recapitalizing EMSL had been to fund a variety of capital equipment items (experimental instruments) for EMSL over the next few fiscal years beginning in fiscal year 2009. The Recovery Act funding will allow EMSL to obtain 25 new instrument capabilities, thereby enabling the scientific community to have access to the unique experimental tools to address DOE's energy and environmental missions much more quickly than planned.

Science and Discovery: Invest in science to achieve transformational discoveries: Recapitalizing EMSL's leading-edge instrumentation will provide the scientific community with the most advanced experimental capabilities to probe the fundamental

physical, chemical, and biological processes that underpin the complex energy, science, and environmental challenges facing DOE and the nation. Specifically, the new instruments will accelerate research on the types and reactivity of atmospheric aerosols, promote understanding of the microbiological processes involved in carbon sequestration, bioremediation and bioenergy applications, and accelerate research on material, mineral surfaces, and interfaces essential for advancing alternative energy sources and for making energy-intensive processes more efficient.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
<10

Target (incremental change in performance)
<10

Actual

Goal Lead
Anna Palmisano

SLI Construction

Measure Text
The Recovery Act funding will provide the indicated support to the following four SLI construction projects:

(1) Complete demolition of the Bevatron structure at the Lawrence Berkeley National Laboratory.
(2) Begin construction (CD-3) on the Modernization of Laboratory Facilities project at Oak Ridge National Laboratory.
(3) Establish performance baselines (CD-2) and begin construction (CD-3) on RA funded scope for the Seismic Safety - Phase II project at Lawrence Berkeley National Laboratory.
(4) Establish performance baselines (CD-2) and begin construction (CD-3) on RA funded scope for the Interdisciplinary Science Building project Brookhaven National Laboratory.

Measure Type
Outcome

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
Achieve quarterly milestones.

Explanation of Measure
Despite past investments, many Office of Science (SC) laboratory facilities and utility systems are not adequate to support the scientific mission in the coming years because they do not meet the requirements of modern research. Significant work is needed to revitalize SC laboratory infrastructure and SC has implemented the Infrastructure Modernization Initiative, a ten-year program that includes 35 projects spanning all ten SC laboratories. The Recovery Act funding applied to the four modernization efforts associated with this project will allow construction to proceed more efficiently, minimize the constraints of a protracted funding profile and provide mission ready facilities more quickly.

Line management execution and oversight of these projects will be consistent with the Department's Project Management directive (DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*). This directive and its implementation processes and procedures will be the primary tool used to manage this work and measure performance on these activities.

Science and Discovery: The Recovery Act funding applied to the Modernization Initiative will mean quicker delivery of modern, safe, and environmentally friendly laboratories. These critical investments in facilities and infrastructure will help re-energize the National Laboratories as centers of science and innovation, will help the laboratories attract and retain the most talented researchers, and will lead to transformational discoveries in new technologies for America's future, resulting in long-term economic growth and job creation in the American economy.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
6

Target (incremental change in performance)
6

Actual

Goal Lead

Marc Jones

BES National Synchrotron Light Source II

Measure Text
Civil construction activities for National Synchrotron Light Source II (NSLS-II) completed.

Measure Type
Outcome

Measure Frequency
Quarterly

Direction of Measure
+

Unit of Measure
Achieve quarterly milestones.

Explanation of Measure
The National Synchrotron Light Source II (NSLS-II) national user facility currently under construction at Brookhaven National Laboratory in Upton, New York is a one-of-a-kind advanced synchrotron light source. The Recovery Act funding applied to the NSLS-II construction project will allow construction to proceed more efficiently, minimize the constraints of a protracted funding profile and provide the timely delivery of this world class scientific facility.

NSLS-II will strengthen America's role as the world leader in science by providing a new synchrotron light source with a spatial resolution required to perform spectroscopy on a single atom. Research at NSLS-II will focus on some of our most important challenges at the nanoscale, including research directed at clean and affordable energy, molecular electronics, self-assembly of materials, and high-temperature superconductors.

Science and Discovery: Invest in science to achieve transformational discoveries.
A synchrotron light source is a specialized research tool that uses an electron accelerator to create exceptionally intense beams of x-ray or ultraviolet light. Scientists and engineers use this light to conduct research into the structure of matter at nanoscale resolution, advancing a broad range of biological and physical science. The fundamental research conducted in this new facility will contribute to expanding the scientific foundations for new and improved energy technologies, as well as understanding and mitigating the environmental impacts of energy use.

Year
2009-2010

Original Program Target
0

Revised Full Program Target
6

Target (incremental change in performance)
6

Actual

Goal Lead
Harriet Kung

7. Transparency and Accountability:
DOE leverages its existing corporate systems to track and report on Recovery Act activities and to ensure effective funds management. The DOE's iManage Data Warehouse (IDW) is a corporate enterprise system integrating financial, budgetary, procurement, and program information to monitor project execution. Each Recovery Act program is tracked using unique Treasury Appropriation Fund Symbols (TAFS), and each component project is identified by a unique Project Identification Code (PIC).

IDW is a central data warehouse linking common data elements from each of the Department's corporate business systems and serving as a "knowledge bank" of information about portfolios, programs or projects including budget execution, accumulated costs, performance achieved, and critical milestones met. The IDW contains information from multiple corporate systems and will be a tool used to meet information needs for Recovery Act oversight and reporting to Recovery.gov.

The Performance Measure Manager (PMM) is the Department's performance tracking system. PMM tracks high-level budgetary performance and is being expanded to accommodate Recovery Act performance tracking needs. Performance evaluations will be organized and reported along with results from the Department's annual budgetary activities in the Annual Performance Report (APR) and posted on: www.energy.gov/recovery. Performance results will be uploaded into the IDW for required agency reporting.

See DOE's Agency Wide Recovery Plan for additional information on DOE's financial and performance tracking mechanisms, found here: www.energy.gov/recovery.

SC Recovery Act funds will primarily be obligated to existing projects that already have gone through a competitive process and agreements are in place. Prior to the obligation of funds, an H Clause modification will be implemented in the affected M&O contracts to ensure that expenditure of Recovery Act funds meets the requirements established by the Act. An Approved Funding Program (AFP) guidance memorandum will be issued for each M&O receiving Recovery Act funds to serve as the work authorization for executing project scope, and will also include specific guidance on meeting additional Recovery Act reporting requirements. In the

field, appropriate funding modifications will be enacted to implement the AFP guidance and segregate the Recovery Act funds for reporting purposes. Performance of the M&O contractors receiving Recovery Act funding will also be assessed as part of the Performance Evaluation and Measurement Plan established for each contract.

M&O contracting officers will be working directly with grantees and any other entities receiving Recovery Act funding to ensure that they are aware and abide by the required reporting requirements. All recipients of the Recovery Act funding will be monitored to ensure that the spending is in line with Recovery Act's intent as well as the funding guidelines outlined in the AFP. The prescribed weekly, monthly, and subsequently quarterly reports will be enforced to provide DOE with the necessary spending data to be posted on the Recovery.org website. SC will follow DOE's reporting requirement guidelines and ensure that the data captured from the recipients matches the necessary level of information detail.

8. Federal Infrastructure Investments

SC Recovery Act-funded projects related to infrastructure modernization are mandated to incorporate energy efficiency and green building requirements as well as leverage the greatest level of energy and green performance. Infrastructure investments obligated under the Recovery Act will comply with DOE Order 430.1B "Real Property Asset Management," DOE Order 430.2B, "Departmental Energy, Renewable Energy and Transportation", and DOE Order 413.3A, Program and Project Management for the Acquisition of Capital Assets Management (including DOE's High Performance Sustainable Building (HPSB) Guide). SC will collect the information needed to generate the various energy-related reporting requirements.

Following are SC-specific examples where energy efficiency and green building requirements will be incorporated within the project.

Recovery Act-funded projects for SLI will comply with DOE requirements for energy efficiency, green building requirements, and demonstrate Federal leadership in sustainability, energy efficiency, and reducing the agency's environmental impact. Construction of new facilities and/or major renovations to existing facilities will incorporate the Guiding Principles of Executive Order 13423, to the extent practical, and lifecycle cost effectiveness which will be documented in design documents and other project records (e.g., the Project Execution Plan). Compliance will be evaluated at appropriate critical decision points.

The FES Recovery Act activities support various energy efficiency and green practices through building improvements. The General Plant Projects (GPP) activities will replace old breakers and transformers to improve the operational efficiency of the switchyard by removing losses associated with aged equipment. The new equipment will be more energy efficient and easier to maintain. The FES Facilities Operations and Upgrade activities will support the President's energy goals by accelerating research on a potential carbon free energy source and will increase scientific research at U.S. universities, laboratories, and industry.

The building design process for NP's overall 12 GeV CEBAF Upgrade project incorporates sustainable building design principles. Energy and water conservation, minimization of waste, and use of recycled and recyclable materials are the major areas of focus. Infrastructure

investments performed as general plant projects will pursue, where practical, green design features that employ integrated design principles, optimize energy performance, protect and conserve water, enhance indoor environmental quality, and reduce environmental impacts of materials.

As part of BES' IARP project, DOE requires submission and approval of a plan from the contractor, PNNL, outlining their consideration, evaluation, and plans for implementation of cost-effective energy technology and other green building options. The plan will document how the contractor will conform to applicable Federal and DOE requirements and guidelines. More specifically, it will document how the project will meet the requirements outlined in the OMB Recovery guidance, take advantage of technical assistance opportunities (drafting, reviewing or improving design proposals, incorporating on-site renewable energy, etc.), leverage the greatest level of energy and green performance from available stimulus funds, establish green practices that can be used throughout the life cycle of facilities, and identify opportunities to demonstrate innovative and emerging green building technologies and concepts. Highly energy efficient (minimal power usage, minimal heat output, etc.) technologies will be sought for the other five BER projects' procurements of advanced research instrumentation and/or off-the-shelf computing technology and data storage equipment. All Recovery Act-funded BER projects will incorporate energy efficient designs and controls as criteria to evaluate vendor proposals for any advanced research instrumentation.

9. Barriers to Effective Implementation

Following are potential barriers to implementation that could delay Science's Recovery projects and prevent their timely completion.

Potential Barrier: Project Management

Mitigation Plan: Projects where strong management tools are not implemented may be at risk of not being completed on time or going over budget. Before funding is applied towards a project, a thorough risk assessment analysis must be performed to plan for any potential pitfalls and proactively seek out solutions before these issues affect project schedule and delivery. Moreover, the goal of Recovery projects is to inject the funding in the economy as quickly as possible which creates the need for aggressive project timelines. Delays in meeting early deadlines could have ripple-effects throughout the project. Science prides itself in using solid project management tools and structure to analyze project risk before it starts, gauge the progress of each project and flag any potential issues prior to negative impact.

Potential Barrier: Staffing

Mitigation Plan: Projects may be hindered due to insufficient staffing to oversee project performance, schedules and costs (Chicago, Oak Ridge and Headquarters). Additionally, contract acquisition and execution processes may not be able to handle additional volume of transactions resulting from stimulus funds. Lack of staffing to oversee an expanded grant portfolio, including cost and performance reporting, could greatly impact project schedules. A solution that may be applied to implement to address these implementation barriers, would be to use the $4M administrative support fund for additional staff by actively working to get money released to hire contractors for procurement, auditing, and primavera support. Additionally, Science can look to laboratories and Intergovernmental Personnel Act (IPA) for support for program offices. Another option, would be to fill current vacancies and have a full federal staff on board.

Potential Barrier: Competitive Process:

Mitigation Plan: Another potential barrier to implementation could be that the required competitive processes for contracting are not followed thoroughly and that internal controls are circumvented to meet proposed timelines. Accelerated funding schedules and increased workload could create situations where processes are accelerated as a measure to generate the needed awards, which could decrease overall process quality and generate procurement errors. To circumvent any issues, extensive communication plans are being implemented with all parties involved in the required competitive processes. Additionally, increased management scrutiny is being implemented as part of the review process to ensure that approved procedures are being followed. For example, review meetings are held with Oak Ridge, Chicago, and program liaison in weekly meetings to discuss progress or issues that have occurred over the week.

Potential Barrier: Complete Documentation
Mitigation Plan: Inadequate or incomplete funding documents can prevent potential barriers to implementation. Work Authorization forms that are not adequate or not prepared in a timely fashion or statement of work for grants and other vehicles that are not thorough could provide pitfalls that would delay the completion timeline of projects. As prevention measures, Work Authorization forms and other documents were updated to reflect Recovery guidance in coordination with the field representatives. Approvals were obtained from all required parties, including Contracting Officers, before the documents were finalized. Finally, documents were updated based on feedback received from the field to ensure that the forms provide the necessary guidance accurately and succinctly.

Potential Barrier: Volume of Awards
Mitigiation Plan: The sheer volume of awards being made using Recovery funding increases the risk of late starts and project delays. Milestones may be at risk due to unanticipated delays associated with the sheer volume of awards that need to be made. Science's stringent review and award process was developed to ensure that all rigorous control points are met before awardees are selected and funding awarded. Science will continue to follow this same controlled process to ensure that Recovery funding is awarded properly and in accordance with the laws and guidelines governing Science projects. Any delays generated by the award process will be analyzed and dealt with so that project delays are kept at a minimum.

Barrier: Purchase of Capital Equipment
Mitigation Plan: There could be significant barriers of implementation for Science's capital equipment projects, given the nature of these projects. Delays in generating procurements, obtaining acceptable bids, awarding the procurement action and receiving the equipment could greatly impact the overall timeliness of the project. However, Science utilizes project management and oversight processes tailored from DOE Order 413.3A for each equipment procurement effort to ensure an appropriate level of project management rigor and completion of all activities within the required time constraints.

10) Environmental Review Compliance

DOE will determine the appropriate level of NEPA review pursuant to NEPA and its implementing regulations (40 CFR Parts 1500-1508 and 10 CFR Part 1021) for individual projects, which will be proposed predominantly by applicants in response to DOE funding opportunity announcements. For projects at DOE facilities (which are initiated by DOE, rather than by applicants), DOE has complied with NEPA through existing environmental reviews or will complete such reviews prior to making decisions regarding the proposed projects and activities. DOE will similarly comply with other environmental requirements with respect to particular proposals.